DKC310I / DKU305I
DISK SUBSYSTEM

Maintenance Manual

REV.7

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Preface

This manual describes the maintenance of DKC310I Disk Control Unit and DKU305I Disk Drive Unit, including installation and replacement.
Before starting maintenance, read the manual carefully to be familiar with operating procedures and instructions.
Particularly, be familiar with the Safety Section and obey its instructions.
Keep the manual on hand for your convenience.

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0	Dec.1997	—	—	—	Original Edition
1	Feb.1998	—	SAFETY00-10	1	Correction
			SAFETY02-10	1	
			START02-10,20	1	
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			INST02-10,11,12,13,14,15,20, 21,22,23,24,25	1	
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			INST02-60,61,70,71,80	0	
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			INST03-411	0	
			INST03-450,530,540,760,820, 880,930,980,1050,1110,1190, 1230,1380,1390,1630,2470, 2500,2510	1	
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			INST03-2520,2530,2540,2550	1	
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			INST03-2560,2570,3070	1	
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1	Feb.1998	—	INST04-930,940,950,960,970, 980,9901000,1010,1020,1030, 1040,1050,1060,1070,1080, 1090,1100,1110,1120,1130, 1140,1150,1160,1170,1180, 1190,1200,1210,1260,1310, 1360,1410,1470,1520,1570, 1580,1590,1600,1610,1620, 1630,1640,1650,1660,1670, 1680,1690	1	Correction
			INST05-10,20,30,40,50,60,70, 80,140,170,180,190,200,210, 220,230,240,250,260,280,290, 300,310,311,312,313,320,340, 350,360,370,380,390,400,410, 420,430,440,450,460,470,480, 490,520,540,550	1	
			INST05-551,552,553,554,555, 556	0	
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			INST05-700,710,720,730,750, 770,780,790,800,810,820,830, 840,860,870	1	
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			INST05-910,920,930,940,960	1	
			INST06-10,20,30	0	
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			STATUS Section	—	Deletion
			MICRO-FC01-20	1	Correction
			MICRO-FC03-20,30,60,100, 110,120,140,150	1	

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1	Feb.1998	—	MICRO-FC04-20,30	1	Correction
			MICRO-FC04-33,36	0	
			MICRO-FC04-40,50,60,90, 100,140,150,170	1	
			MICRO-FC05-20,30,40	1	
			MICRO-FC06-10,20,30,40,60, 80,90,100,110,120,130	1	
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			TRBL04-10	1	
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			TRBL06-160,170,180	1	Correction
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			TRBL07-10,20,30,40,50,60, 70,80,90,100	0	
			REP00-10	1	
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			REP02-10,20,40,60,70,80,100, 110,120,140,150,160,180,190, 200,210,230,240,250,260,280, 290,300,310,320,330,350,360, 370,380,400,420,430,440,460, 470,480,500,510,520,530,540, 550,560,570,590,600,610,620, 630,640,650,660,670,690,700, 710,720,730,740,750,760,770, 780,800,810,820,840,850,860, 870,880,890,910,930	1	
			REP03-30,40,70,100,130,160, 190	1	
			REP03-221,221A,221B,221C, 222,222A,222B,222C,222D, 222E,222F,222G,222H,222J	0	

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1	Feb.1998	—	REP03-222K,222L,223,223A, 223B,223C,223D,223E,223F, 223G,223H,223J,223K,223L, 224,224A,224B,224C,224D, 224E,224F,224G,224H,224J, 224K,224L,225,225A,225B, 225C,225D,225E,225F,225G, 225H,225J,225K,225L,226, 226A,226B,226C,226D,226E, 226F,226G,226H,226J,227, 227A,227B,227C,227D,227E, 227F,227G,227H,227J,228, 228A,228B,228C,228D,228E, 228F,228G,228H,228J,229, 229A,229B,229C,229D,229E, 229F,229G,229H,229J	0	Correction
			REP03-1120,1140,1300,1320, 1410,1460,1480,1500,1550, 1570,1595,1600,1610,1840, 1950,1970,2070,2150,2220, 2250	1	
			REP04-20,40,50,70,90,110, 120,140,160,170,180,190,260, 270,340,350,370,390,430,440, 460,470,480,500,510,520,530, 540,550,560,570,590,600,610, 620,630,640,650,660,670,680, 690,700,710,720,730,750,760, 770,780,790,800,810,830,840, 850,860,870,890,900,910,920, 930,940	1	
			DIAG00-10	1	
			DIAG01-10,20	1	
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			DIAG05-10,20,30,40,50	1	
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			DIAG07-40,60,70,80,90,100, 110,120,130,140,150,270,330	1	

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			SHEET	REV.	
1	Feb.1998	—	DIAG07-335	0	Correction
			DIAG07-340,350,360,370,380	1	
			PERIOD04-20	1	
			SVP00-10	1	
			SVP00-20	0	
			SVP01-50,60,70,100	1	
			SVP01-110	—	Deletion
			SVP02-10,30,40,50,60,70,80, 90,100,110,130,140	1	Correction
			SVP02-145	0	
			SVP02-150,160,180,190,200, 220,230,240,260,270,280,300, 310,320,330,340,350,360,370, 390,400,410,430,440,450,460, 480,490,500,510,530,540,550, 560,570,580,600,610,620,630, 640,650,660,670,680,690,700	1	
			SVP02-705	0	
			SVP02-710,730	1	
			SVP02-735	0	
			SVP02-740	1	
			SVP02-745	0	
			SVP02-750,760,770,790,810, 820,830,840,850,860,870,880, 890,900,910,920	1	
			SVP02-925	0	
			SVP02-930,940,950,960	1	
			SVP02-970,980,990,1000, 1010,1020,1030,1040,1050, 1060,1070,1080,1090,1100, 1110,1120,1130,1140,1150, 1160,1170,1180,1190	0	
			SVP03-10,20,30,40,50,60,70, 80,85,90,100,110,120,130, 140,150,160,170,180,190,200, 210,220	0	
			SVP04-10,20,30,40,50,60,70, 80,90,100,110,120,130,140, 150,160,170,180,190,200,210, 220,230,240	0	
			SVP05-10,20,30,40	0	

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1	Feb.1998	—	PARTS00-10	1	Correction
			PARTS01-10	0	
			PARTS02-10,20,30,40,50,60, 70,80,90,100	1	
			PARTS02-110,120,130	0	
			PARTS03-10,20,30,40,50,60, 70,80,90,100	0	
			PARTS04-10,20,30,40,50,60	0	
			PARTS05-10,20,30	1	
			PARTS05-40,50,60,70,80,90, 100,110,120,130,140	0	
			PARTS06-10,20,30,40	1	
			PARTS07-10	0	
			THEORY00-10	1	
			THEORY00-20	0	
			THEORY01-10,20,30	1	
			THEORY03-20,30,50,60,90, 100,110,120,140,150,160,220, 230	1	
			THEORY03-231	0	
			THEORY03-240,270,280,290, 310,320,340	1	
			THEORY03-390,400,410,420, 430,440,450,460,470,480,490, 500,510,520,530,540,550,560, 570,580,590,600,610,620,630, 640,650,660,670,680,690,700, 710,720,730,740,750,760,770, 780,790,800,810,820,830,840	0	
			THEORY04-10,20,30	1	
			THEORY05-20,30,40,50,60, 70	1	
			SIM-RC02-20,30,40,60,70, 110,120,140,150,160,180,210	1	
			SIM-RC02-230	—	Deletion
			ACC04-620,630,640,650,660, 670	1	Correction
			SVPMSG00-10	1	
			SVPMSG02-10	1	
			SVPMSG02-20,30,40,50,60, 70,80,90,100,110,120	—	Deletion
			SVPMSG03-10,20,30	1	Correction

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1	Feb.1998	—	SVPMSG04-50,240,250,260, 270,280,290,300,310,320,330, 340,350,360,370,380,390,400, 410,420,430,440,450,460,470, 480,490,500,510,520,530,540, 550,560,570,580,590	1	Correction
			SVPMSG04-600,610,620,630, 640,650,660,670,680,690,700, 710,720,730,740,750,760,770, 780,790,800,810,820,830,840, 850,860,870,880,890,900,910, 920,930,940,950,960,970,980, 990,1000,1010,1020,1030, 1040,1050,1060,1070,1080, 1090,1100,1110,1120,1130, 1140,1150,1160,1170,1180, 1190,1200,1210,1220,1230, 1240,1250,1260,1270,1280, 1290,1300,1310,1320,1330, 1340,1350,1360,1370,1380, 1390,1400,1410,1420,1430, 1440,1450,1460,1470,1480, 1490,1500,1510,1520,1530, 1540,1550,1560,1570,1580, 1590,1600,1610,1620,1630, 1640,1650,1660,1670,1680, 1690,1700,1710,1720,1730, 1740,1750,1760,1770,1780, 1790,1800,1810,1820,1830, 1840,1850,1860,1870,1880, 1890,1900,1910,1920,1930, 1940,1950,1960,1970,1980, 1990,2000,2010,2020,2030, 2040,2050,2060,2070,2080	0	
			SVPMSG05-10	0	
			SVPMSG06-10,20	0	
			HRC&HODM Section	—	Deletion
			MULTI00-00 | MULTI09-140	0	Addtion (all pages of MULTIPLATFORM section)
			SSB03-300	1	Correction
			SSB03-301,302	0	
			SSB03-660,1440	1	

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			SSBLOG00-20	1	
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2	Apr.1998	—	SAFETY00-20	1	Correction
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			SAFETY01-30	1	
			SAFETY02-10	2	
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			LOCATION03-90	1	
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			LOCATION05-10	1	
			LOCATION06-20	1	
			LOCATION06-30	2	
			LOCATION06-85	0	
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			LOCATION06-110	2	
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			INST01-10	1	
			INST01-20	2	
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			INST01-280	1	
			INST01-302,304	0	
			INST01-310,320,330,350	1	

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			INST03-750,800,810,860,870, 910,920,960,970,1030,1040, 1070,1090,1100	1	
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			INST05-330	1	
			INST05-340	2	
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			INST05-445	0	
			INST05-450	2	
			INST05-500	1	
			INST05-501	0	
			INST05-510	1	
			INST05-520	2	
			INST05-525	0	
			INST05-530,551	1	
			INST05-551A	0	
			INST05-552,553,555,556	1	
			INST05-560,570,580	2	
			INST05-591,593,595	1	
			INST05-599A	0	
			INST05-610,640,690	2	
			INST05-694	1	
			INST05-721,722,723,724	0	
			INST05-730	2	
			INST05-731	0	
			INST05-750,790,800,830,840, 870	2	
			INST05-870A	0	
			INST05-871,874	1	
			INST05-875	0	
			INST05-880,890	2	
			INST05-891	0	
			INST05-900,920,940,960	2	
			INST07-30,80	1	
			INST07-85	0	

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			INST07-350,360,370,380,390, 400,410,420,430	0	
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			MICRO-FC03-30	2	
			MICRO-FC03-40,90	1	
			MICRO-FC03-100,120,140	2	
			MICRO-FC04-36	1	
			MICRO-FC06-10,20,30,40	2	
			MICRO-FC06-50	1	
			MICRO-FC06-60	2	
			MICRO-FC06-70	1	
			MICRO-FC06-80,90	2	
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			MICRO-FC08-10	0	
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			TRBL05-430,440,450	0	
			REP00-10	2	
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			REP01-150,170	2	
			REP02-30,50	1	
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			REP02-410	1	
			REP02-420,430,620,650,690	2	
			REP03-170,180	1	
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			REP03-1341,1342	0	

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			REP03-1790,2160,2170,2180	1	
			REP04-10	1	
			REP04-40,50,110,120,170, 180,270,340,350	2	
			REP04-400,410	1	
			REP04-430,440,600,660,670, 680,690	2	
			REP04-695	0	
			REP04-700,850,870	2	
			DIAG00-10	2	
			DIAG04-280	2	
			DIAG05-40	2	
			DIAG05-41	0	
			DIAG07-350	2	
			DIAG07-420,430,440,450, 460,470,480,490,500,510,520, 530,540,550,560,570,580,590, 600,610,620,630,640,650,660, 670,680,690,700,710,720,730, 740,750,760,770,780,790,800, 810,820,830,840,850,860,870, 880,890,900,910,920,930,940, 950	0	
			PERIOD02-30	1	
			SVP00-00	1	
			SVP00-10	2	
			SVP00-20	1	
			SVP01-10,20,30,40	1	
			SVP01-50	2	
			SVP01-55	0	
			SVP01-60	2	
			SVP02-30	2	
			SVP02-165	0	
			SVP02-570	2	
			SVP02-590	1	
			SVP02-600,610,630,650,670, 680	2	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
2	Apr.1998	—	SVP02-695	0	Correction
			SVP02-700	2	
			SVP02-720,735	1	
			SVP02-736	0	
			SVP02-770	2	
			SVP02-780	1	
			SVP02-781	0	
			SVP02-920,940	2	
			SVP02-1200,1210,1220,1230, 1240,1250,1260,1270,1280, 1290,1300,1310,1320,1330, 1340,1350,1360,1370,1380, 1390,1400,1410,1420,1430, 1440,1450,1460,1470,1480, 1490,1500,1510,1520,1530, 1540,1550	0	
			SVP03-70,80,85,120	1	
			SVP04-10,20,40,190	1	
			SVP05-20,30,40	1	
			SVP06-10	0	
			SVP07-10,20,30,40,50,60,70, 80,90,100,110,120,130,140, 150,160,170,180,190,200,210	0	
			PARTS02-60	2	
			PARTS03-40,50	1	
			PARTS03-55	0	
			PARTS03-60,80	1	
			PARTS03-85	0	
			PARTS04-10,50,60	1	
			PARTS05-120	1	
			PARTS06-10,20,30	2	
			THEORY00-10	2	
			THEORY02-10	1	
			THEORY03-210	1	
			THEORY03-220,230,240,280	2	
			THEORY03-290,300,310,320, 330,340,350	—	Deletion
			THEORY03-390,400,410,470, 480,550	1	Correction
			THEORY03-555	0	
			THEORY03-590	1	
			THEORY03-591	0	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
2	Apr.1998	—	THEORY03-760	1	Correction
			THEORY05-20,30,40,50,60	2	
			ACC03-20	1	
			ACC04-260	1	
			ACC04-265	0	
			ACC04-270	1	
			ACC04-275	0	
			ACC04-280	1	
			ACC04-285	0	
			ACC04-290	1	
			ACC04-295	0	
			ACC04-300	1	
			ACC04-305	0	
			ACC04-310	1	
			ACC04-315	0	
			ACC04-320	1	
			ACC04-325	0	
			ACC04-330	1	
			ACC04-335	0	
			ACC04-340	1	
			ACC04-345	0	
			ACC04-350	1	
			ACC04-355	0	
			ACC04-360	1	
			ACC04-365	0	
			ACC04-370	1	
			ACC04-375	0	
			ACC04-380	1	
			ACC04-385	0	
			ACC04-390	1	
			ACC04-395	0	
			ACC04-400	1	
			ACC04-405	0	
			ACC04-410	1	
			ACC04-415	0	
			ACC04-420	1	
			ACC04-425	0	
			ACC04-430	1	
			ACC04-435	0	
			ACC04-440	1	
			ACC04-445	0	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
2	Apr.1998	—	ACC04-450	1	Correction
			ACC04-455	0	
			ACC04-460	1	
			ACC04-465	0	
			ACC04-470	1	
			ACC04-475	0	
			ACC04-480	1	
			ACC04-485	0	
			ACC04-490	1	
			ACC04-495	0	
			ACC04-500,510,520,530,540, 550,560,570,580,590,600,610	1	
			ACC04-620,630,640,650,660, 670	2	
			ACC04-770	1	
			SIM-RC02-10	1	
			SIM-RC02-20,40,60,110,120	2	
			SIM-RC02-130	1	
			SIM-RC02-140	2	
			SIM-RC02-141	0	
			SVPMSG04-50	2	
			SVPMSG04-70	1	
			SVPMSG04-250,260,270,290, 310,320,330,510,520	2	
			SVPMSG04-910,960,1330, 1340,1350,1500,1510,1520, 1530,1540,1550,1570,1580, 1590,1600,1610,1620,1640, 1650,1660,1670	1	
			SVPMSG04-2090,2100,2110, 2120,2130,2140,2150,2160, 2170	0	
			SVPMSG06-20	1	
			MULTI00-20	1	
			MULTI03-100	1	
			MULTI08-50,60,70,80,90,100	0	
			MULTI09-10,60	1	
			MULTI09-70,80,90,100,110, 120,130,140	—	Deletion
			SSDOPT00-00 | SSDOPT02-130	0	Addtion (all pages of SSD OPTIONAL FUNCTION section)

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
2	Apr.1998	—	SSB02-20	1	Correction
			SSB03-215	0	
			SSB04-140	1	
			SSB04-150,160	2	
			SSB04-250,270,280,290,310, 320,330	1	
			SSBLOG00-10	1	
			SSBLOG02-20	1	
			SSBLOG05-365,366	0	
			SSBLOG05-480,510	1	
			SSBLOG05-3630	2	
			SSBLOG05-3880,4520,4530, 4540,4700	1	
			SSBLOG05-4710,4730,4750, 4800,4810	2	
			SSBLOG05-4820	1	
			SSBLOG05-4830	2	
			SSBLOG05-4831	0	
3	Jun.1998	—	LOCATION02-20	2	Correction
			LOCATION02-30,50,60	1	
			LOCATION02-70	2	
			LOCATION03-20,30	1	
			LOCATION06-10	1	
			LOCATION06-20	2	
			INST00-10,40,60	1	
			INST00-70,80	2	
			INST01-10	2	
			INST01-20	3	
			INST01-25	0	
			INST01-40,60,70	2	
			INST01-80	1	
			INST01-90	3	
			INST01-100,110	2	
			INST01-112	1	
			INST01-113,114,115	2	
			INST01-116,117	0	
			INST01-260	3	
			INST01-310,330	2	
			INST01-340	1	
			INST02-11	3	
			INST02-12,13,22,24,25,31	2	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	INST02-34,40	3	Correction
			INST02-41	2	
			INST02-43,51,53,54	3	
			INST02-100	2	
			INST02-110	1	
			INST03-150,750	2	
			INST03-780,790	1	
			INST03-800,810	2	
			INST03-830,850	1	
			INST03-860,970	2	
			INST03-990,1020	1	
			INST03-1030,1170,1190	2	
			INST03-1200	1	
			INST03-1210,1230	2	
			INST03-1240	1	
			INST03-1260,1290,1310	2	
			INST03-1340	1	
			INST03-1350,1370	2	
			INST03-1400,1700,1710, 1720,1730,1740,1750,1760, 1770,1780,1790,1840,1870, 1880,2600	1	
			INST03-3130	0	
			INST04-20,40	2	
			INST04-50	1	
			INST04-60,80	2	
			INST04-90	1	
			INST04-110,120,140,180,200, 230	2	
			INST04-290,300,320	1	
			INST04-990,1000,1010,1020, 1030,1040,1050,1060,1070, 1080,1090	2	
			INST04-1110	3	
			INST04-1120	2	
			INST04-1220,1230,1270, 1280,1330,1380,1420,1430, 1490	1	
			INST04-1590,1630,1670	2	
			INST04-1790	1	
			INST04-1940	0	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	INST05-20	2	Correction
			INST05-21,22	0	
			INST05-30	2	
			INST05-60	3	
			INST05-65	0	
			INST05-70	3	
			INST05-75,110,130	1	
			INST05-170	2	
			INST05-175,181,182,183	0	
			INST05-190	2	
			INST05-200	3	
			INST05-210,220,260	2	
			INST05-290	3	
			INST05-330,380	2	
			INST05-390	3	
			INST05-470	2	
			INST05-520	3	
			INST05-540,551,552,555,556	2	
			INST05-560,580	3	
			INST05-591	2	
			INST05-592	1	
			INST05-593	2	
			INST05-594	1	
			INST05-595	2	
			INST05-597,598,599,599A	1	
			INST05-599B,599C,599D	0	
			INST05-900	3	
			INST05-901,902	1	
			INST05-903,904,905	0	
			INST05-910	2	
			INST05-920,940	3	
			INST05-945	0	
			INST07-20,40	1	
			INST07-80	2	
			INST07-110	1	
			INST07-120	2	
			INST07-130,170,180	1	
			INST07-190,200	2	
			INST07-210	1	
			INST07-220,230	2	
			INST07-240,260,270	1	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	INST07-280,290	2	Correction
			INST07-300,310,320,330,340, 360,380,390,400,410,420,430	1	
			INST08-10	0	
			MICRO-FC01-10	1	
			MICRO-FC03-20,90	2	
			MICRO-FC03-120,140	3	
			MICRO-FC04-33	1	
			MICRO-FC04-36,50	2	
			MICRO-FC04-70,80	1	
			MICRO-FC04-150	2	
			MICRO-FC06-20,30	3	
			MICRO-FC06-31	0	
			MICRO-FC08-10	1	
			TRBL00-20	3	
			TRBL04-10	2	
			TRBL05-290	1	
			TRBL05-340,350,360,361	2	
			TRBL05-362	3	
			TRBL05-440,450	1	
			TRBL05-460,470	0	
			TRBL06-10	1	
			TRBL06-15	0	
			TRBL06-20,30,40,60,70,80, 90,100,110,130,140,150	1	
			TRBL06-160,170	2	
			TRBL06-175	0	
			TRBL06-190	1	
			TRBL08-10	0	
			REP00-00	1	
			REP00-10	3	
			REP01-110	2	
			REP01-111,112	1	
			REP01-113	0	
			REP01-120,130,140	2	
			REP01-150	3	
			REP01-160	1	
			REP01-170	3	
			REP01-190,200	1	
			REP02-50	2	
			REP02-60,70	3	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	REP02-110,120	2	Correction
			REP02-140	3	
			REP02-150,160	2	
			REP02-170	1	
			REP02-180,190	3	
			REP02-200	2	
			REP02-210,230	3	
			REP02-240,260,280	2	
			REP02-290,300,320,350,360	3	
			REP02-370	2	
			REP02-390	1	
			REP02-400,410	2	
			REP02-420,430	3	
			REP02-440,510,610,720,760, 770	2	
			REP02-900	1	
			REP02-950,960,970,980,990	0	
			REP03-20,50,60	1	
			REP03-70	2	
			REP03-80,90,110,120	1	
			REP03-130	2	
			REP03-140,150	1	
			REP03-170,180	2	
			REP03-200,210,220,221A, 240,270,1110,1160,1190, 1230,1240	1	
			REP03-1350	2	
			REP03-1360,1440,1520,1740	1	
			REP03-1745	0	
			REP03-1760,1800	1	
			REP03-1805	0	
			REP03-1870,1990	1	
			REP03-2220	2	
			REP04-20	2	
			REP04-40	3	
			REP04-90	2	
			REP04-110,120	3	
			REP04-140	2	
			REP04-150	1	
			REP04-160	2	
			REP04-170,180	3	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	REP04-190,260	2	Correction
			REP04-270	3	
			REP04-300	1	
			REP04-340	3	
			REP04-370,390	2	
			REP04-450	1	
			REP04-460,470,480,510,520, 630	2	
			REP04-670,690	3	
			REP04-691,692	0	
			REP04-830,840	2	
			REP04-950,960,970,980	0	
			DIAG04-10	2	
			DIAG05-40	3	
			DIAG05-41	1	
			DIAG06-20,40	2	
			PERIOD02-30	2	
			SVP00-10	3	
			SVP00-20	2	
			SVP00-30	0	
			SVP02-580	2	
			SVP02-610	3	
			SVP02-620	2	
			SVP02-630	3	
			SVP02-640	2	
			SVP02-650	3	
			SVP02-660	2	
			SVP02-680	3	
			SVP02-690	2	
			SVP02-695,705	1	
			SVP02-706,707,708,709, 709A,709B,709C	0	
			SVP02-735	2	
			SVP02-736	1	
			SVP02-740,750,760,860,880,	2	
			SVP02-920	3	
			SVP02-970,980,990,1000, 1010,1020,1030,1040,1050, 1060,1070,1080,1090,1100, 1110,1120,1130,1140,1150, 1160,1170,1180,1190	1	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	SVP02-1195	0	Correction
			SVP02-1200,1350,1360,1370, 1380,1390,1400,1410,1420, 1430,1440,1450,1460,1470, 1500,1510	1	
			SVP03-200,210	1	
			SVP04-10,20	2	
			SVP04-30	1	
			SVP04-41,42,43,44	0	
			SVP04-50,60,70,80,90,100, 110,120,130,140,150,160,170, 180	1	
			SVP04-190	2	
			SVP04-200	1	
			SVP04-205,206	0	
			SVP04-210,220,230	1	
			SVP04-235	0	
			SVP04-240	1	
			SVP07-10,20,30,70,100,110, 130,160,170,180,210	1	
			SVP08-10,20,30,40,50,60,70, 80,90,100,110,120,130,140, 150,160,170,180,190,200,210	0	
			PARTS04-10	2	
			PARTS04-20,30,40	1	
			PARTS04-50,60	2	
			PARTS06-10	3	
			THEORY00-10	3	
			THEORY03-230	3	
			THEORY03-231	1	
			THEORY03-232	0	
			THEORY03-240	3	
			THEORY03-500,520,600,780	1	
			THEORY03-850,860,870,880, 890,900,910,920,930,940,950, 960,970,980	0	
			GLOSSARY01-10,20,30	1	
			ACC04-20,30,40	1	
			SIM-RC02-40	3	
			SIM-RC02-70	2	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
3	Jun.1998	—	SIM-RC02-80	1	Correction
			SVPMSG04-50	3	
			SVPMSG04-70	2	
			SVPMSG04-110	1	
			SVPMSG04-250,260,270,290, 310,320,330,510,520	3	
			SVPMSG04-910,960,1330, 1340,1350,1500,1510,1520, 1530,1540,1550,1570,1580, 1590,1600,1610,1620	2	
			SVPMSG04-1630	1	
			SVPMSG04-1640,1650,1660, 1670	2	
			SVPMSG04-1680,1760,2100, 2170	1	
			SVPMSG04-2180,2190,2200, 2210,2220,2230,2240,2250, 2260,2270,2280,2290,2300, 2310,2320,2330,2340,2350, 2360,2370,2380	0	
			SVPMSG05-10	1	
			SVPMSG05-20	0	
			MULTI00-10	1	
			MULTI00-20	2	
			MULTI00-30	0	
			MULTI01-30,50,60	1	
			MULTI01-65	0	
			MULTI03-100	2	
			MULTI03-105	0	
			MULTI03-110,120	1	
			MULTI03-125,126	0	
			MULTI03-130	1	
			MULTI06-10,20	1	
			MULTI07-20,30,40	1	
			MULTI08-20,60	1	
			MULTI09-10	2	
			MULTI10-10,20	0	
			MULTI11-10,20,30	0	
			DKCREP00-00 | DKCREP06-10	0	Addtion (all pages of DKC REPLACEMENT PROCEDURE section)

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			SHEET	REV.	
3	Jun.1998	—	SSB02-30,40,60	1	Correction
			SSB03-330,340,350,360,430, 450,470,490,510,530,1350, 1360	1	
			SSB03-1431,1438,1439,1690, 1700,1710	0	
			SSB04-250	2	
			SSB04-260,270	1	
			SSB04-280,290	2	
			SSB04-300	1	
			SSB04-310,320,330	2	
			SSBLOG02-20	2	
			SSBLOG02-30,40,50,60	1	
			SSBLOG04-140,160	1	
			SSBLOG05-620,630,640,650, 660,670,680	2	
			SSBLOG05-1960,1970,1980, 1990,2030,2050,2070,2170, 2190,2210	1	
			SSBLOG05-4132,4134,4136	0	
			SSBLOG05-4300,4310,4320, 4330,4340,4350,4360	1	
			SSBLOG05-4520	2	
			SSBLOG05-4522,4524,4526, 4528	0	
			SSBLOG05-4530	2	
			SSBLOG05-4532,4534	0	
			SSBLOG05-4540	2	
			SSBLOG05-4730	3	
4	Oct.1998	—	LOCATION02-20,70	3	Correction
			LOCATION03-80	1	
			LOCATION03-90	2	
			LOCATION03-100	1	
			LOCATION04-40	2	
			INST00-10	3	
			INST00-30	2	
			INST00-70,80,90	3	
			INST01-25	1	
			INST01-40	3	
			INST01-55	0	
			INST01-80	2	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
4	Oct.1998	—	INST01-91,92	0	Correction
			INST01-310	3	
			INST01-320	2	
			INST01-330	3	
			INST01-340,350	2	
			INST02-10,12,13	3	
			INST02-16	0	
			INST02-20,21,22	3	
			INST02-23,30	2	
			INST02-31,32,33	3	
			INST02-34,40,43,51,53	4	
			INST02-59A,59B,59C,59D	0	
			INST02-100	3	
			INST02-120	0	
			INST03-770	1	
			INST03-830	2	
			INST03-890,940	1	
			INST03-990,1040	2	
			INST03-1060	1	
			INST03-1070,1090,1160	2	
			INST03-1170	3	
			INST03-1200	2	
			INST03-1210	3	
			INST03-1240,1250	2	
			INST03-1260	3	
			INST03-1280	1	
			INST03-1290,1310	3	
			INST03-1320,1340	2	
			INST03-1350,1370,1380	3	
			INST03-1400,1410	2	
			INST03-1430	1	
			INST03-1490,1530,1570,1580	2	
			INST03-1890	1	
			INST04-10	2	
			INST04-20	3	
			INST04-50	2	
			INST04-60	3	
			INST04-90,100	2	
			INST04-110,120,140	3	
			INST04-150	2	
			INST04-170	1	

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			SHEET	REV.	
4	Oct.1998	—	INST04-180,200	3	Correction
			INST04-210	2	
			INST04-230	3	
			INST04-250,280,330,1480	1	
			INST04-1520	2	
			INST04-1700	1	
			INST05-10	3	
			INST05-22	1	
			INST05-40,75,80	2	
			INST05-90	1	
			INST05-130,160	2	
			INST05-170	3	
			INST05-180	2	
			INST05-200	4	
			INST05-210,280,300	3	
			INST05-320	2	
			INST05-330	3	
			INST05-345	1	
			INST05-350,430	2	
			INST05-445	1	
			INST05-450	3	
			INST05-460	2	
			INST05-470	3	
			INST05-480	2	
			INST05-520	4	
			INST05-525	1	
			INST05-552	3	
			INST05-553	2	
			INST05-556	3	
			INST05-560	4	
			INST05-570,591	3	
			INST05-592	2	
			INST05-593	3	
			INST05-594	2	
			INST05-595	3	
			INST05-598,599,599A	2	
			INST05-599C	1	
			INST05-599-10,599-20, 599-30,599-40	0	
			INST05-610	3	
			INST05-620,670	2	

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			SHEET	REV.	
4	Oct.1998	—	INST05-690	3	Correction
			INST05-692	1	
			INST05-694	2	
			INST05-850,870A,872,875, 905	1	
			INST05-910	3	
			INST05-920	4	
			INST07-40	2	
			INST07-80	3	
			INST07-85	1	
			INST07-200	3	
			INST07-210	2	
			INST07-350	1	
			INST07-360,380,390,400,410, 420,430	2	
			INST07-440,450,460,470,480, 490,500,510,520	0	
			INST09-10,20,30,40,50,60	0	
			MICRO-FC01-10,20	2	
			MICRO-FC03-10	1	
			MICRO-FC03-40	2	
			MICRO-FC03-80	1	
			MICRO-FC03-90	3	
			MICRO-FC03-120,140	4	
			MICRO-FC04-10	1	
			MICRO-FC04-30,33,40	2	
			MICRO-FC04-120	1	
			MICRO-FC04-140	2	
			MICRO-FC04-150	3	
			TRBL00-20	4	
			TRBL04-10	3	
			TRBL05-170	2	
			TRBL05-180,190	3	
			TRBL05-200	1	
			TRBL05-210,220,230,240,250	2	
			TRBL05-255	0	
			TRBL06-10,20	2	
			TRBL06-155	0	
			TRBL09-10,20,30,40,50	0	
			REP00-10	4	
			REP01-113	1	

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			SHEET	REV.	
4	Oct.1998	—	REP01-114	0	Correction
			REP01-150	4	
			REP01-160,190	2	
			REP01-210	0	
			REP02-20	2	
			REP02-50	3	
			REP02-60	4	
			REP02-100	3	
			REP02-140	4	
			REP02-150	3	
			REP02-190	4	
			REP02-240	3	
			REP02-460,710,820,890,900, 910	2	
			REP02-920	1	
			REP02-930	2	
			REP02-970,980	1	
			REP03-30,40	2	
			REP03-170,180,190	3	
			REP03-1330	2	
			REP03-1335	0	
			REP03-1340	2	
			REP03-1341,1342	1	
			REP03-1343,1344,1345,1346, 1347,1348,1349	0	
			REP03-1350	3	
			REP03-1351,1352	1	
			REP03-1353,1354,1355	—	Deletion
			REP03-1360	2	Correction
			REP03-1361,1362,1363,1364, 1365	1	
			REP03-1366,1367,1368,1369	0	
			REP03-1370,1371,1372,1373	1	
			REP03-1374,1375,1376,1377	0	
			REP04-610	2	
			REP04-660	3	
			REP04-670	4	
			REP04-700	3	
			REP04-960,970	1	
			DIAG01-10	2	
			DIAG02-20	2	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
4	Oct.1998	—	DIAG04-30	2	Correction
			DIAG07-120,130,360,370	2	
			DIAG07-520,600,610,750, 940,950	1	
			SVP00-20	3	
			SVP00-30	1	
			SVP00-40	0	
			SVP02-10	2	
			SVP02-20,145	1	
			SVP02-360,400,480,540	2	
			SVP02-570,600	3	
			SVP02-610	4	
			SVP02-620	3	
			SVP02-630,650	4	
			SVP02-660	3	
			SVP02-680	4	
			SVP02-700	3	
			SVP02-706,707,709,709A, 709B	1	
			SVP02-720	2	
			SVP02-735	3	
			SVP02-840,930,960,1060, 1080	2	
			SVP02-1196,1197	0	
			SVP02-1200	2	
			SVP02-1210,1220,1280,1290	1	
			SVP02-1350,1370	2	
			SVP02-1371,1372	0	
			SVP02-1380,1390,1400,1410	2	
			SVP02-1411,1412	0	
			SVP02-1420,1430,1440,1450, 1460,1470	2	
			SVP02-1490	1	
			SVP02-1510	2	
			SVP02-1520,1530,1550	1	
			SVP02-1560,1570,1580,1590, 1600,1610,1620,1630,1640, 1650,1660,1670,1680,1690, 1700,1710,1720,1730,1740, 1750,1760,1770	0	
			SVP03-70,80,200,210	2	
			SVP04-41	1	

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			SHEET	REV.	
4	Oct.1998	—	SVP04-100,120,130,140,200	2	Correction
			SVP07-10,20	2	
			SVP07-40	1	
			SVP07-41,42	0	
			SVP07-50,60	1	
			SVP07-70	2	
			SVP07-80,90	1	
			SVP07-100,110,130	2	
			SVP07-140,150	1	
			SVP07-160,170	2	
			SVP07-171,172	0	
			SVP07-180	2	
			SVP07-190	1	
			SVP08-10,20,30,40,50,60,70,80	1	
			SVP08-83,86	0	
			SVP08-90,100	1	
			SVP08-105	0	
			SVP08-110,120,130,140,150,160,170,180,190,200,210	1	
			SVP08-220	0	
			SVP09-10,20,30,40,50,60,70,80,90,100,110,120,130,140,150,160,170,180,190,200,210,220	0	
			PARTS02-90	2	
			PARTS03-40,50	2	
			PARTS03-55	1	
			PARTS03-56	0	
			PARTS03-60,80	2	
			PARTS03-85	1	
			PARTS04-10,50,60	3	
			PARTS05-120	2	
			PARTS06-10	4	
			PARTS06-20	3	
			THEORY00-10	4	
			THEORY03-230	4	
			THEORY03-250	1	
			THEORY03-270	2	
			THEORY03-360	1	
			THEORY05-10	1	

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			SHEET	REV.	
4	Oct.1998	—	THEORY05-20,30,40,50,60	3	Correction
			THEORY05-70	2	
			ACC00-10	1	
			ACC03-10	1	
			ACC03-20	2	
			ACC04-20	2	
			ACC04-25	0	
			ACC04-30,40	2	
			ACC04-50,220,250	1	
			ACC04-260	2	
			ACC04-262	0	
			ACC04-350	2	
			ACC04-355	1	
			ACC04-360	2	
			ACC04-365	1	
			ACC04-370	2	
			ACC04-375	1	
			ACC04-380	2	
			ACC04-385	1	
			ACC04-390	2	
			ACC04-395	1	
			ACC04-400	2	
			ACC04-405	1	
			ACC04-410	2	
			ACC04-415	1	
			ACC04-420	2	
			ACC04-425	1	
			ACC04-430	2	
			ACC04-435	1	
			ACC04-440	2	
			ACC04-445	1	
			ACC04-450	2	
			ACC04-455	1	
			ACC04-460	2	
			ACC04-465	1	
			ACC04-470	2	
			ACC04-475	1	
			ACC04-480	2	
			ACC04-485	1	
			ACC04-490	2	
			ACC04-495	1	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
4	Oct.1998	—	ACC04-500	2	Correction
			ACC04-505	0	
			ACC04-510	2	
			ACC04-515	0	
			ACC04-520	2	
			ACC04-525	0	
			ACC04-530	2	
			ACC04-535	0	
			ACC04-540	2	
			ACC04-545	0	
			ACC04-550	2	
			ACC04-555	0	
			ACC04-560	2	
			ACC04-565	0	
			ACC04-570	2	
			ACC04-575	0	
			ACC04-580	2	
			ACC04-585	0	
			ACC04-680,690,730,760	1	
			ACC04-825	0	
			ACC04-830,840	1	
			ACC05-10	1	
			SIM-RC02-10	2	
			SIM-RC02-15	0	
			SIM-RC02-20	3	
			SIM-RC02-30	2	
			SIM-RC02-40	4	
			SIM-RC02-50	1	
			SIM-RC02-60	3	
			SIM-RC02-105	0	
			SVPMSG04-10,90,220,230	1	
			SVPMSG04-330	4	
			SVPMSG04-350	2	
			SVPMSG04-990,1110,1150, 1360,1430,1440	1	
			SVPMSG04-1520	3	
			SVPMSG04-1680	2	
			SVPMSG04-1720,1750	1	
			SVPMSG04-1760	2	

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			SHEET	REV.	
4	Oct.1998	—	SVPMSG04-1780,1850,1870, 1890,1970,1980,1990,2000, 2020,2050,2060,2090	1	Correction
			SVPMSG04-2100	2	
			SVPMSG04-2150	1	
			SVPMSG04-2170	2	
			SVPMSG04-2220,2230,2270, 2380	1	
			SVPMSG04-2390,2400,2410, 2420,2430,2440,2450,2460, 2470,2480,2490,2500	0	
			SVPMSG05-10	2	
			SVPMSG05-30	0	
			SVPMSG06-10	1	
			MULTI00-30	1	
			MULTI01-10,40	1	
			MULTI01-50,60	2	
			MULTI01-65	1	
			MULTI03-80,90	1	
			MULTI03-110,120	2	
			MULTI03-127	0	
			MULTI06-10,20	2	
			MULTI07-30,40	2	
			MULTI08-20	2	
			MULTI08-50	1	
			MULTI11-10,20,30	1	
			MULTI12-10,20,30	0	
			SSDOPT01-30	1	
			SSDOPT01-35	0	
			SSDOPT01-40	1	
			SSDOPT02-10,30	1	
			DKCREP00-20	0	
			DKCREP03-50,60	0	
			DKCREP07-10,20	0	
			DKCREP08-10,20,30,40,50 60,70,80	0	
			DKCREP09-10,20,30	0	
			SSB01-10	1	
			SSB02-10	1	
			SSB03-70,1200,1210	1	
			SSBLOG04-170	1	

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			SHEET	REV.	
4	Oct.1998	—	SSBLOG05-320,910,940	1	Correction
			SSBLOG05-1010,4700	2	
			SSBLOG05-4710	3	
			SSBLOG05-4730	4	
			SSBLOG05-4795	0	
			SSBLOG05-5500,5510,5520, 5530,5540,5550,5560,5570, 5580,5590,5600,5610,5620, 5630	—	Deletion
5	Mar.1999	—	LOCATION02-20	4	Correction
			LOCATION04-40	3	
			INST00-10	4	
			INST00-20	2	
			INST00-30	3	
			INST00-40,50,60	2	
			INST00-70,80	4	
			INST01-25,30	2	
			INST01-60,70,80	3	
			INST01-90	4	
			INST01-91,92	1	
			INST01-100,110	3	
			INST01-111,111A,111B, 111C,111D,111E	0	
			INST01-112	2	
			INST01-113,114,115	3	
			INST01-116,117	1	
			INST01-118,119,119A,119B	0	
			INST01-130,140	2	
			INST01-260	4	
			INST01-290,300	2	
			INST01-304	1	
			INST01-310	4	
			INST01-320	3	
			INST01-330	4	
			INST01-340,350	3	
			INST02-10,11,21	4	
			INST02-23,30	3	
			INST02-33	4	
			INST02-40	5	
			INST02-42	2	
			INST02-43	5	

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			SHEET	REV.	
5	Mar.1999	—	INST02-44,50	2	Correction
			INST02-51	5	
			INST02-52	2	
			INST02-53	5	
			INST02-60	1	
			INST02-110	2	
			INST02-130,200,210,220,230, 240,250,260,270,280,290,300, 310,320	0	
			INST03-1100	2	
			INST03-1110	3	
			INST03-1120,1130,1140,1150	2	
			INST03-1500,1520,1680	1	
			INST03-1685	0	
			INST04-980	2	
			INST04-985	0	
			INST04-1530,1540,1550,1560	2	
			INST04-1570	3	
			INST04-1620	2	
			INST04-1630	3	
			INST05-120	2	
			INST05-125	0	
			INST05-130,140	3	
			INST05-150	2	
			INST05-151	1	
			INST05-160,260	3	
			INST05-500	2	
			INST05-501	1	
			INST05-510	2	
			INST05-520	5	
			INST05-525,530	2	
			INST05-540	3	
			INST05-550	2	
			INST05-551	3	
			INST05-551A	1	
			INST05-552	4	
			INST05-553	3	
			INST05-554	1	
			INST05-556,570,580	4	
			INST05-581	0	
			INST05-591	4	

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			SHEET	REV.	
5	Mar.1999	—	INST05-592	3	Correction
			INST05-593,595	4	
			INST05-599A	3	
			INST05-599B	1	
			INST05-599C	2	
			INST05-599D	1	
			INST05-599E	0	
			INST05-901,902	2	
			INST05-903,904	1	
			INST07-110	2	
			INST07-120	3	
			INST07-130,140	2	
			INST07-150	1	
			INST07-151,152,153,154,155, 156,157	0	
			INST07-430	3	
			INST09-20	1	
			MICRO-FC01-10	3	
			MICRO-FC01-30	0	
			MICRO-FC03-10	2	
			MICRO-FC03-40	3	
			MICRO-FC03-90	4	
			MICRO-FC03-91,92,93	0	
			MICRO-FC03-120,140	5	
			MICRO-FC04-10	2	
			MICRO-FC04-30,33,140	3	
			MICRO-FC04-150	4	
			MICRO-FC07-40,50	1	
			TRBL00-20	5	
			TRBL05-40,160	2	
			TRBL05-480	0	
			TRBL06-50	1	
			TRBL06-100	2	
			REP00-10	5	
			REP01-200	2	
			REP01-220	0	
			REP02-20,510	3	
			REP02-515	0	
			REP02-610	3	
			REP03-10	1	
			REP03-170	4	

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			SHEET	REV.	
5	Mar.1999	—	REP03-1730	1	Correction
			REP03-1740	2	
			REP03-1745	1	
			REP03-1800	2	
			REP03-1805	1	
			DIAG07-40,90,100	2	
			DIAG07-120,130	3	
			DIAG07-515,945	0	
			PERIOD02-30	3	
			SVP00-20	4	
			SVP00-30	2	
			SVP00-40	1	
			SVP01-20,70	2	
			SVP02-290,1197	1	
			SVP02-1370	3	
			SVP02-1372	1	
			SVP03-80	3	
			SVP03-130,150,170	1	
			SVP03-210	3	
			SVP04-250,260,270	0	
			SVP07-160	3	
			SVP07-171,200	1	
			SVP10-10,20,30,40,50,60,70, 80,90,100,110,120,130,140, 150,160,170,180,190,200,210, 220,230,240,250,260,270,280, 290,300,310,320,330,340,350	0	
			SVP11-10,20,30,40,50,60,70	0	
			PARTS02-20,50,70,80	2	
			PARTS02-130	1	
			PARTS03-40,50	3	
			PARTS03-55	2	
			PARTS03-56,70	1	
			PARTS03-80	3	
			PARTS04-10,60	4	
			PARTS06-10	5	
			PARTS06-20	4	
			PARTS06-30	3	
			PARTS06-40	2	
			PARTS07-10	1	

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			SHEET	REV.	
5	Mar.1999	—	THEORY00-10	5	Correction
			THEORY00-20	1	
			THEORY02-10	2	
			THEORY02-11	0	
			THEORY03-220	3	
			THEORY03-230	5	
			THEORY03-231	2	
			THEORY03-232	1	
			THEORY03-233	0	
			THEORY03-240	4	
			THEORY03-850,860,870,880, 890	1	
			THEORY03-990,1000,1010, 1020,1030,1040	0	
			ACC04-260,530	3	
			ACC04-535	1	
			ACC04-540	3	
			ACC04-545	1	
			ACC04-550	3	
			ACC04-555,790	1	
			SIM-RC02-10	3	
			SIM-RC02-20	4	
			SIM-RC02-40	5	
			SIM-RC02-100,105	1	
			SIM-RC02-150	2	
			SIM-RC02-220	1	
			SIM-RC02-230	0	
			SIM-RC03-70	1	
			SVPMSG04-610,730,1130, 1210,1220,1250,1260,1280, 1300	1	
			SVPMSG04-1500,1570	3	
			SVPMSG04-1630	2	
			SVPMSG04-1650,1660,1760	3	
			SVPMSG04-1810,1860	1	
			SVPMSG04-1970	2	
			SVPMSG04-2120,2130,2140, 2200,2240,2310,2320,2350, 2410,2420,2430,2450,2460, 2470,2480,2490,2500	1	
			SVPMSG04-2510	0	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
5	Mar.1999	—	MULTI00-10	2	Correction
			MULTI01-40	2	
			MULTI03-105	1	
			MULTI03-110,120	3	
			MULTI03-126	1	
			MULTI03-130	2	
			MULTI03-145	0	
			MULTI06-10,20	3	
			MULTI07-30,40	3	
			MULTI11-20,30	2	
			MULTI11-40	0	
			SSDOPT01-30	2	
			SSDOPT01-35	1	
			SSDOPT01-36	0	
			SSDOPT01-40	2	
			SSDOPT02-40	1	
			DKCREP00-10,20	1	
			DKCREP01-20	1	
			DKCREP01-40	0	
			DKCREP02-10,20,30,40,50, 60	1	
			DKCREP02-65	0	
			DKCREP02-70,80,90,100	1	
			DKCREP07-20	1	
			DKCREP08-10,30,40,50,60	1	
			DKCREP08-65	0	
			DKCREP08-70	1	
			DKCREP08-75	0	
			DKCREP08-80	1	
			DKCREP10-10,20,30,40,50, 60,70,80	0	
			DKCREP11-10,20,30	0	
			DKCREP12-10,20,30,40,50	0	
			SSB04-130	1	
			SSBLOG05-711,712,1231, 1232,1233,1234,1235,1236, 1237,1238,1239,1239A, 1239B,1239C,1239D,1239E, 1239F,1239G,1239H,1239J, 1239K,1239L,1239M,1239N, 1239P,1239Q	0	

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			SHEET	REV.	
5	Mar.1999	—	SSBLOG05-2370	1	Correction
			SSBLOG05-4700	3	
			SSBLOG05-4710	4	
			SSBLOG05-4730	5	
			SSBLOG05-4790	1	
6	Aug.1999	—	START02-10	2	Correction
			LOCATION06-120	1	
			INST00-00	1	
			INST00-90	4	
			INST01-130,140	3	
			INST02-100	4	
			INST02-101	0	
			INST02-110	3	
			INST02-200,220,240,250,260, 270,280,300,320	1	
			INST03-620,700,710	1	
			INST03-830	3	
			INST03-1460,1480	1	
			INST03-1500,1520	2	
			INST03-1540,1560	1	
			INST03-1840	2	
			INST03-1850,3010,3040,3050	1	
			INST03-3051,3052	0	
			INST03-3060	1	
			INST03-3070	2	
			INST04-1580	2	
			INST04-1590,1620	3	
			INST04-1630	4	
			INST04-1660	2	
			INST04-1670	3	
			INST05-10	4	
			INST05-220,320	3	
			INST05-591	5	
			INST05-592	4	
			INST05-593	5	
			INST05-594	3	
			INST05-595	5	
			INST05-596	1	
			INST05-597	2	
			INST05-599	3	
			INST05-599A	4	

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			SHEET	REV.	
6	Aug.1999	—	INST05-599B	2	Correction
			INST05-599C	3	
			INST05-599D	2	
			INST05-599E	1	
			INST05-599F,599G,599H, 599J,599K	0	
			INST05-599-10,599-20, 599-30,599-40	1	
			INST05-599-50,599-60, 599-70,599-80,599-90, 599-100,599-110,599-120	0	
			INST07-10	1	
			INST07-30	2	
			INST07-31	0	
			INST07-40	3	
			INST07-41	0	
			INST07-140	3	
			INST07-150	2	
			INST07-151,152,153,154,155, 156,157	1	
			INST07-158	0	
			INST07-160	1	
			INST07-170	2	
			INST07-190	3	
			INST07-191	0	
			INST07-200	4	
			INST07-210	3	
			INST07-215,216	0	
			INST07-220,230	3	
			INST07-235	0	
			INST07-240,260	2	
			INST07-280	3	
			INST07-300,310,320,330,340	2	
			INST07-360,380,390,400,410, 420	3	
			INST07-430	4	
			MICRO-FC03-10	3	
			MICRO-FC03-91,92,93	1	
			MICRO-FC03-94,95	0	
			MICRO-FC03-150	2	
			MICRO-FC04-160	1	

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			SHEET	REV.	
6	Aug.1999	—	MICRO-FC04-170	2	Correction
			MICRO-FC07-30	1	
			MICRO-FC07-50	2	
			MICRO-FC07-110,140	1	
			TRBL00-10	2	
			TRBL00-20	6	
			TRBL03-10,30,60	2	
			TRBL04-10	4	
			TRBL04-30,31	1	
			TRBL05-20,70,90,130	2	
			TRBL05-180,190	4	
			TRBL05-210,220,230,240,250	3	
			TRBL05-255	1	
			TRBL05-270	2	
			TRBL05-275,295,330,400	1	
			TRBL06-10	3	
			TRBL06-12	0	
			TRBL06-15	1	
			TRBL06-20	3	
			TRBL06-25	0	
			TRBL06-40,50,90	2	
			TRBL06-135	0	
			TRBL06-150	2	
			TRBL06-151,152,153,154	0	
			TRBL07-61,62,63,64	0	
			TRBL07-70	1	
			TRBL07-70A,70B,70C,70D, 71,72,73,74,75,76,77,78,79, 79A,79B,79C,79D,79E,79F	0	
			TRBL07-80	1	
			TRBL09-20	1	
			TRBL10-10	0	
			REP01-113	2	
			REP01-190	3	
			REP01-191	0	
			REP01-200	3	
			REP02-430	4	
			REP03-20,1730	2	
			REP03-1740	3	
			REP03-1745	2	
			DIAG07-525,960	0	

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			SHEET	REV.	
6	Aug.1999	—	PERIOD02-30	4	Correction
			PERIOD04-20	2	
			SVP00-20	5	
			SVP00-30	3	
			SVP00-40	2	
			SVP00-50	0	
			SVP02-460,530	2	
			SVP02-571,572	0	
			SVP02-720,740,750	3	
			SVP02-910,970,980,990,1000, 1010	2	
			SVP02-1015	0	
			SVP02-1020,1030	2	
			SVP02-1035	0	
			SVP02-1040,1050	2	
			SVP02-1060	3	
			SVP02-1070	2	
			SVP02-1080	3	
			SVP02-1085	0	
			SVP02-1090,1100,1110,1170, 1180,1190	2	
			SVP02-1191,1192,1193,1194	0	
			SVP02-1195,1196	1	
			SVP02-1197	2	
			SVP02-1350	3	
			SVP02-1360	2	
			SVP02-1370	4	
			SVP02-1371	1	
			SVP02-1372	2	
			SVP02-1380,1390,1400,1410	3	
			SVP02-1411,1412	1	
			SVP02-1420,1430,1440,1450, 1460,1470	3	
			SVP02-1530	2	
			SVP02-1540	1	
			SVP02-1550	2	
			SVP02-1555	0	
			SVP03-130	2	
			SVP03-190	1	
			SVP03-210	4	
			SVP03-220	1	

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			SHEET	REV.	
6	Aug.1999	—	SVP03-230,240	0	Correction
			SVP04-10,20	3	
			SVP04-25	0	
			SVP04-30,40,41	2	
			SVP04-42	1	
			SVP04-90,110	2	
			SVP04-120,130,140	3	
			SVP04-150,170,180	2	
			SVP04-190,200	3	
			SVP04-201	0	
			SVP04-210,230	2	
			SVP04-235,250,260,270	1	
			SVP07-10,20	3	
			SVP07-41	1	
			SVP07-60	2	
			SVP07-70	3	
			SVP07-90	2	
			SVP07-110,130	3	
			SVP07-160	4	
			SVP07-170	3	
			SVP07-171	2	
			SVP08-70,100	2	
			SVP08-105	1	
			SVP08-200	2	
			SVP10-10,20,30	1	
			SVP10-31	0	
			SVP10-40,50,60,80,90,100	1	
			SVP10-105	0	
			SVP10-110,120,130,140	1	
			SVP10-145	0	
			SVP10-150	1	
			SVP10-151	0	
			SVP10-160,170,180,190,200, 210	1	
			SVP10-211,212	0	
			SVP10-250,260	1	
			SVP10-265	0	
			SVP10-270,280,290,310,320	1	
			SVP11-10,20,30,40,50,60,70	1	

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REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
6	Aug.1999	—	SVP11-80,90,100,110,120, 130,140,150,160,170,180,190, 200,210,220,230,240,250,260, 270,280,290,300,310,320,330, 340,350,360,370,380,390,400, 410,420,430,440	0	Correction
			PARTS02-50,70	3	
			PARTS03-40,80	4	
			PARTS06-10	6	
			PARTS06-40	3	
			THEORY00-10	6	
			THEORY00-20	2	
			THEORY03-20	2	
			THEORY03-220	4	
			THEORY03-232	2	
			THEORY03-233	1	
			THEORY03-390	2	
			THEORY03-391	0	
			THEORY03-500,520	2	
			THEORY03-555	1	
			TEHORY03-760	2	
			THEORY03-770,790,800,830	1	
			TEHORY03-850,870	2	
			THEORY03-891,892,893,894, 895,896,897,898	0	
			THEORY03-930	1	
			THEORY03-985,1050,1060, 1070,1080,1090,1100,1110, 1120,1130,1140,1150,1160, 1170,1180,1190,1200,1210, 1220,1230,1240,1250,1260, 1270,1280,1290,1300,1310, 1320,1330,1340,1350,1360, 1370,1380,1390,1395,1400, 1410,1420,1430,1440,1450, 1460,1470,1480,1490,1500, 1510,1520,1530,1540,1550, 1560,1570,1580,1590,1600, 1610	0	
			THEORY04-10	2	
			GLOSSARY01-30	2	
			ACC00-10	2	

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			SHEET	REV.	
6	Aug.1999	—	ACC03-10	2	Correction
			ACC04-800	1	
			ACC04-840	2	
			SIM-RC02-10	4	
			SIM-RC02-20	5	
			SIM-RC02-50	2	
			SIM-RC02-60	4	
			SIM-RC02-101,102	0	
			SIM-RC02-105	2	
			SIM-RC02-141	1	
			SIM-RC02-220	2	
			SIM-RC02-230	1	
			SVPMSG04-20,30,40	1	
			SVPMSG04-390,460,500	2	
			SVPMSG04-510	4	
			SVPMSG04-515	0	
			SVPMSG04-520	4	
			SVPMSG04-530,550,560	2	
			SVPMSG04-620,630,640	1	
			SVPMSG04-910	3	
			SVPMSG04-915	0	
			SVPMSG04-990	2	
			SVPMSG04-1000,1120	1	
			SVPMSG04-1330,1340	3	
			SVPMSG04-1345	0	
			SVPMSG04-1350,1680	3	
			SVPMSG04-1880	1	
			SVPMSG04-2140,2410,2420, 2480,2490,2500	2	
			SVPMSG04-2510	1	
			SVPMSG04-2520,2530,2540, 2550,2560,2570,2580,2590, 2600,2610,2620	0	
			SVPMSG06-20	2	
			MULTI00-10,20	3	
			MULTI00-30	2	
			MULTI03-100	3	
			MULTI03-105	2	
			MULTI03-110,120	4	
			MULTI03-124	0	
			MULTI03-125	1	

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			SHEET	REV.	
6	Aug.1999	—	MULTI03-126	2	Correction
			MULTI03-127	1	
			MULTI03-128,129	0	
			MULTI03-130	3	
			MULTI06-10,20	4	
			MULTI06-30	0	
			MULTI07-30,40	4	
			MULTI08-20	3	
			MULTI08-25	0	
			MULTI08-30	1	
			MULTI08-31	0	
			MULTI11-20,30	3	
			MULTI11-40	1	
			MULTI12-10,20,30	1	
			MULTI13-10,20,30	0	
			SSDOPT01-30	3	
			SSDOPT01-35	2	
			SSDOPT01-36	1	
			SSDOPT02-40	2	
			SSB01-10	2	
			SSB02-20	2	
			SSB02-50	1	
			SSB03-1520,1530,1540,1550	1	
			SSBLOG05-2370	2	
			SSBLOG05-3551,3552	0	
			SSBLOG05-4700	4	
			SSBLOG05-4710	5	
			SSBLOG05-4740	1	
			SSBLOG05-4791,4792	0	
			SSBLOG05-4795,4831	1	
7	Jan.2000	—	INST00-40	3	Correction
			INST00-70	5	
			INST01-30	3	
			INST01-35,56	0	
			INST01-91,92	2	
			INST01-111A,111C,111D, 111E	1	
			INST01-116,117	2	
			INST01-119,119A,119B	1	
			INST02-11	5	
			INST02-23,30	4	

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			SHEET	REV.	
7	Jan.2000	—	INST02-42,44,50,52	3	Correction
			INST02-130	1	
			INST02-320	2	
			INST03-750,810,970	3	
			INST03-1460,1480	2	
			INST03-1500,1520	3	
			INST03-1540,1560,1680	2	
			INST03-1685,3100	1	
			INST04-980	3	
			INST04-985	1	
			INST04-1580	3	
			INST04-1590,1620	4	
			INST04-1630	5	
			INST04-1660	3	
			INST04-1670	4	
			INST05-120	3	
			INST05-130	4	
			INST05-150	3	
			INST05-260	4	
			INST05-400	2	
			INST05-500,510,525,530	3	
			INST05-540	4	
			INST05-550	3	
			INST05-551	4	
			INST05-551A	2	
			INST05-552	5	
			INST05-553	4	
			INST05-554	2	
			INST05-555	3	
			INST05-556,570,580	5	
			INST05-581	1	
			INST05-590	2	
			INST05-599-31,599-32	0	
			INST05-599-40	2	
			INST05-599-70,599-90, 599-100	1	
			INST07-170	3	
			INST07-190,210	4	
			INST07-215,216	1	
			INST07-220	4	
			INST07-235	1	

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			SHEET	REV.	
7	Jan.2000	—	INST07-240,300	3	Correction
			INST07-350	2	
			INST07-360,380,400	4	
			INST07-405,406	0	
			INST07-410,420	4	
			INST07-430	5	
			INST07-440,450,470,490,500, 510,520	1	
			MICRO-FC00-10	2	
			MICRO-FC01-30	1	
			MICRO-FC03-30	3	
			MICRO-FC03-94,95	1	
			MICRO-FC04-30	4	
			MICRO-FC05-20	2	
			MICRO-FC06-10,40	3	
			MICRO-FC06-70	2	
			MICRO-FC07-10	2	
			MICRO-FC07-90	1	
			MICRO-FC07-150	0	
			MICRO-FC09-10,20,30,40,50	0	
			TRBL00-20	7	
			TRBL03-10,30	3	
			TRBL06-15	2	
			TRBL06-20	4	
			TRBL06-152	1	
			TRBL11-10	0	
			TRBL12-10	0	
			REP00-10	6	
			REP01-220	1	
			REP03-10	2	
			REP03-1330,1360,1730	3	
			REP03-1740	4	
			REP03-1745	3	
			REP03-1790	2	
			REP03-1800	3	
			REP03-1805	2	
			PERIOD02-30	5	
			SVP00-20	6	
			SVP00-30	4	
			SVP00-40	3	
			SVP00-50	1	

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			SHEET	REV.	
7	Jan.2000	—	SVP02-970,980,990,1000, 1010	3	Correction
			SVP02-1015	1	
			SVP02-1020,1030	3	
			SVP02-1035	1	
			SVP02-1040,1050	3	
			SVP02-1080	4	
			SVP02-1085	1	
			SVP02-1090,1110	3	
			SVP02-1194	1	
			SVP02-1195,1196	2	
			SVP02-1197	3	
			SVP02-1198	0	
			SVP02-1350	4	
			SVP02-1370	5	
			SVP02-1371	2	
			SVP02-1372	3	
			SVP02-1380,1390	4	
			SVP02-1395	0	
			SVP02-1400,1410	4	
			SVP02-1411,1412	2	
			SVP02-1420,1430,1440,1450, 1460,1470	4	
			SVP02-1551,1552,1553,1554	0	
			SVP02-1555	1	
			SVP03-240	1	
			SVP04-10,20	4	
			SVP04-25	1	
			SVP04-35	0	
			SVP04-40,150,170	3	
			SVP04-190	4	
			SVP04-260	2	
			SVP07-10,20	4	
			SVP07-25	0	
			SVP07-30,40,41	2	
			SVP07-42	1	
			SVP07-100	3	
			SVP07-110,130	4	
			SVP07-140,150	2	
			SVP07-160	5	
			SVP07-170	4	

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			SHEET	REV.	
7	Jan.2000	—	SVP07-171	3	Correction
			SVP07-172	1	
			SVP07-173	0	
			SVP07-180	3	
			SVP07-220,230,240	0	
			SVP10-10,20,30	2	
			SVP10-31	1	
			SVP10-40,50,60	2	
			SVP10-70	1	
			SVP10-80,90,100	2	
			SVP10-105	1	
			SVP10-110,120,130,140,150	2	
			SVP10-151	1	
			SVP10-170,180,190,200,210	2	
			SVP10-211,212,220,230,240	1	
			SVP10-250,260	2	
			SVP10-265	1	
			SVP10-270,280,290	2	
			SVP10-300	1	
			SVP10-310,320	2	
			SVP10-350	1	
			SVP11-50,60,70	2	
			SVP11-90,100,180,190,200, 250,260,270,280,300,310,330, 350,360,380,410	1	
			PARTS02-20	3	
			PARTS02-50	4	
			PARTS02-60	3	
			PARTS02-70	4	
			PARTS02-130	2	
			PARTS03-40	5	
			PARTS03-60	3	
			PARTS03-80	5	
			PARTS06-10	7	
			PARTS06-20	5	
			PARTS06-30,40	4	
			THEORY00-10	7	
			THEORY00-20	3	
			THEORY02-11	1	
			THEORY03-220	5	
			THEORY03-230	6	

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REVISION CONTROL OF DKC310I/DKU305I MAINTENANCE MANUAL

REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
7	Jan.2000	—	THEORY03-231,232	3	Correction
			THEORY03-233	2	
			THEORY03-560,650,660,680, 710,720	1	
			THEORY03-850	3	
			THEORY03-852,854,856	0	
			THEORY03-860	2	
			THEORY03-862,864,866	0	
			THEORY03-870	3	
			THEORY03-872,874	0	
			THEORY03-880	2	
			THEORY03-882,884,886,888	0	
			THEORY03-890	2	
			THEORY03-891,892,893,894, 895,896,897,898,1000,1010, 1030,1040,1460,1470,1480	1	
			THEORY05-120	0	
			ACC04-260	4	
			ACC04-262,265	1	
			ACC04-270	2	
			ACC04-275	1	
			ACC04-280	2	
			ACC04-285	1	
			ACC04-290	2	
			ACC04-295	1	
			ACC04-300	2	
			ACC04-305	1	
			ACC04-310	2	
			ACC04-315	1	
			ACC04-590	2	
			ACC04-595	0	
			ACC04-600	2	
			ACC04-605	0	
			ACC04-610	2	
			ACC04-615	0	
			SIM-RC02-10	5	
			SIM-RC02-15	1	
			SIM-RC02-70	3	
			SIM-RC02-80	2	
			SIM-RC02-90	1	
			SIM-RC02-100	2	

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REVISION CONTROL OF DKC310I/DKU305I MAINTENANCE MANUAL

REV.	DATE.	ECN/TN No.	REVISED SHEET		DESCRIPTION
			SHEET	REV.	
7	Jan.2000	—	SIM-RC02-101,102	1	Correction
			SIM-RC02-105	3	
			SIM-RC02-141	2	
			SVPMSG04-570	2	
			SVPMSG04-1510,1630	3	
			SVPMSG04-1730	1	
			SVPMSG04-2230	2	
			SVPMSG04-2370	1	
			SVPMSG04-2410,2420	3	
			SVPMSG04-2430	2	
			SVPMSG04-2440,2570,2580, 2590,2620	1	
			SVPMSG04-2630,2640,2650, 2660,2670,2680,2690,2700	0	
			SVPMSG05-10	3	
			SVPMSG06-20	3	
			SVPMSG06-30	0	
			MULTI00-20	4	
			MULTI00-30	3	
			MULTI02-20	1	
			MULTI03-128	1	
			MULTI06-10	5	
			MULTI08-110,120	0	
			MULTI11-30	4	
			MULTI11-50,60,70,80	0	
			MULTI12-20	2	
			MULTI13-20	1	
			SSBLOG05-4700	5	
			SSBLOG05-4705	0	
			SSBLOG05-4710	6	
			SSBLOG05-4791,4792	1	

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SAFETY SECTION

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FCC STATEMENT Federal Communications Commission (FCC) Statement

WARNING : This equipment generates , uses , and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual , may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules , which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

"EINE LEICHT ZUGÄNGLICHE TRENN-VORRICHTUNG,MIT EINER KONTAKT-ÖFFNUNGSWEITE VON MINDESTENS 3mm IST IN DER UNMITTELBAREN NÄHE DER VERBRAUCHERANLAGE ANZUORDEN (4-POLIGE ABSCHALTUNG)."

Maschinen lärm informations verordnung 3. GSGV, 18.01.1991: Der ”höchste” Schalldruckpegel beträt 70 db(A) oder weniger gemäß ISO 7779.

CLASS 1 LASER PRODUCT

Warning
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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1.4 Prevention of electric shocks SAFETY01-30
1.5 Preventing being caught by rotating or moving parts SAFETY01-40
1.6 Procedures in an emergency SAFETY01-40
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2.3 CAUTION Statements SAFETY02-10

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Safety Summary

1 ⚠ General Safety Guidelines

Read the following safety guidelines carefully and follow them when you conduct maintenance of the machine.

1.1 Before starting maintenance

- Maintenance of the machine must be done only by trained and qualified field engineers.
- Read and follow the safety guidelines and procedures in this manual and the related manuals.
- In this manual and on the machine, hazard warnings are provided to aid you in preventing or reducing the risk of death, personal injury, or product damage.
  Understand and follow these hazard warnings fully.
- The hazard warnings which appear on the warning labels on the machine or in the manual have one of the following alert headings consisting of an alert symbol and a signal word, DANGER, WARNING, or CAUTION.

⚠ DANGER:	indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING:	indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.
⚠ CAUTION:	indicates a hazardous situation which, if not avoided, will or can result in minor or moderate injury, or serious damage of product.
	The alert symbol shown left precedes every signal word for hazard warnings, and appears in safety related descriptions in the manual.

The signal ward 'NOTICE' is used to present warnings which are not directly related to personal injury hazards.

- When warning labels become dirty or start peeling off, replace them.
- If any physical accident such as abnormal noise, smell, smoke or falling down occurs on the Disk Subsystem while running, immediately power off the Disk Subsystem by pulling one of the UNIT EMERGENCY POWER OFF switch on the Disk Subsystem.
- Keep in mind that the hazard warnings in this manual or on the machine cannot cover every possible case, as it is impossible to predict and evaluate all circumstances before hand.
  Be alert and use your common sense.

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⚠ SAFETY SUMMARY (Continued)

1.2 UNIT EMERGENCY POWER OFF switch

A UNIT EMERGENCY POWER OFF switch is provided on the operator panel on the front side of the DKC for an emergency powering off. When any abnormality such as an abnormal sound or smell or emitting smoke is perceived, power off the disk subsystem by operating the switch following the procedure below. The procedure for operating the switch is as follows.

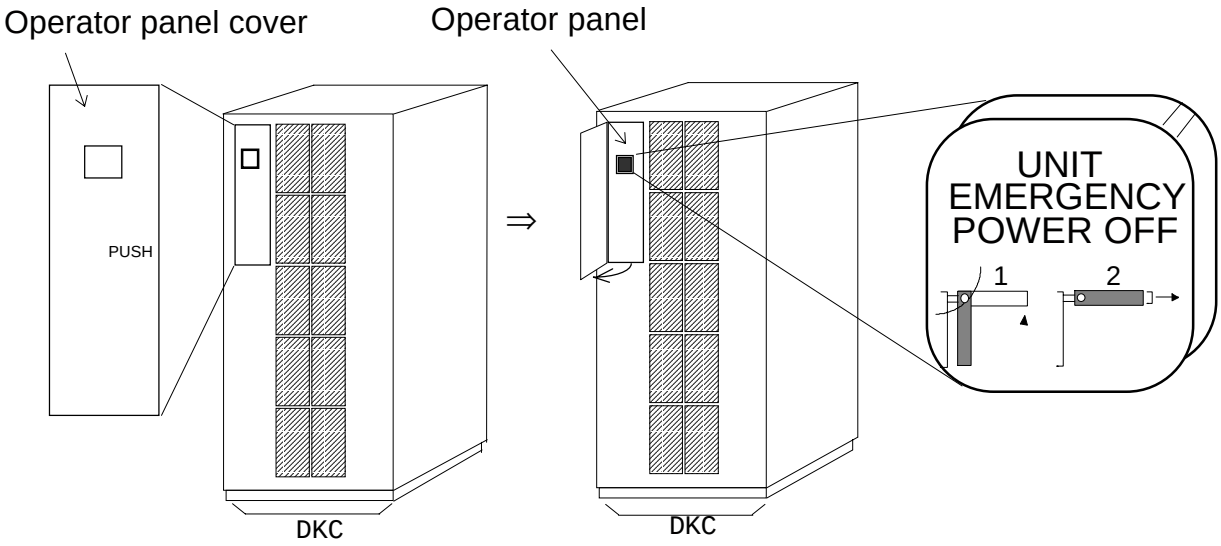

Figure 2.2 Operation of UNIT EMERGENCY POWER OFF switch

- Push the operator panel cover at the portion where a sign "PUSH" is marked, open the operator panel cover, then operate the EMERGENCY POWER OFF switch.
- In using a UNIT EMERGENCY POWER OFF switch, first pull it up and then pull it toward you as illustrated.
- Pulling a UNIT EMERGENCY POWER OFF switch on the Disk Controller instantly shuts down, neglecting the systems power off sequence. Jobs in process are aborted and their integrity after recovery is not guaranteed. Therefore, this method should be used only in an emergency and not in usual maintenance.
- UNIT EMERGENCY POWER OFF switch on the Disk Controller only provide partial power off capability, and AC input power present at primary circuit yet. Therefore, do not use the switches on these units unless powering off of the own unit is obviously enough and safe as an emergency measure.
- When pulled, a UNIT EMERGENCY POWER OFF switch locks itself to prevent further powering on and requires a trained and qualified field engineer for recovery.

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⚠ SAFETY SUMMARY (Continued)

1.3 During work

- For each procedure, follow the given sequence of steps.
- Use the spare parts, consumable and materials for maintenance which are specified in the manual; otherwise, personal injury or damage of the machine, as well as deterioration of the product's quality, may result.
- Use the special tools and instruments specified for the work in the manual or commercially available tools and instruments which fit the purpose.
- Use measurement instruments and powered tools which are properly calibrated or periodically inspected.
- Keep the maintenance area neat and tidy.
- Always put away parts, materials or tools when not in use.
- Wear an eye protector where liquid may splash or anything may fly about.
- When lifting anything heavy, hold it close to yourself and keep your back erect, to prevent injury to your back or spine.
  When lifting anything, for the weight of which CAUTION is indicated, use a proper lifting tool or have somebody help you.
- Keep a soldering iron and its stand away from you to prevent accidental contact and burns.
- When using sharp objects or cutting tools, make sure that no part of your body lies in the path of the blade bit, or point.
- Before finishing you work, make sure that all parts removed during maintenance have been installed back in their original positions in the machine.
  Make sure that no tool or foreign material is left in the machine.

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⚠ SAFETY SUMMARY (Continued)

1.4 Prevention of electric shocks

- Before starting work, make sure that, unless otherwise specifically instructed, there is no potential electric hazard in the maintenance area such as insufficient grounding or a wet floor.
- Before starting work, note where the emergency power-off switches are located and make sure you know how to operate them.
- Unless otherwise specifically instructed, cut off all power sources to the machine before stating maintenance. Just switching off the machine power supplies is usually not enough.
  When power is fed from a wall or floor outlet, unplug the power supply cord, or turn off the switch on the power distribution panel or board.
  Attach a notice on the panel or board prohibiting the use of the switch.
  If the machine power has been already turned off, make sure yourself that these conditions are satisfied.
- Do not touch any uninsulated conductor or surface, where so instructed, which remains charged for a limited time after the external power supply to the machine is disconnected.
- When working on a machine which has a grounding terminal, make sure that the terminal is properly connected to the facility's ground.
- When working close to a hazardously energized part, do not work alone; work with another person who can immediately turn off the power in an emergency.
- Do not wear any metallic item such as a wrist watch with a metallic surface, or metallic accessories.
  If you wear eyeglasses with a metallic frame, take care not to let the frame touch an uninsulated surface.
- Make sure that your hands and arms are dry.
- Unless otherwise specifically instructed, use only one hand when it is necessary to work near an exposed live electric circuit.
  This prevents the completion of the circuit through both hands even if you accidentally touch the circuit.
- Do not use a dental mirror near an exposed live electric circuit.
  The mirror surface is conductive and can become hazardous even if it is made of plastic.
- Unless otherwise specifically instructed, do not supply power to any subassembly such as a power supply unit or a motor while it is removed from the machine.

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1.5 Preventing being caught by rotating or moving parts

- Tuck in your tie, scarf, shirt, or any other loose clothing so that it will not be caught by a rotating or moving part.
- Tie up long hair.
- Unless otherwise specifically instructed, do not supply power to any device with rotating or moving parts which are not properly covered.
- When instructed to supply power to any device with rotating or moving parts whose covers have been removed, work with another person who can immediately turn off the power in an emergency.

1.6 Procedures in an emergency

1.6.1 For electric shock

- Do not be panicked. Do not become another victim through contact with the injured person.
- First, shut off the electric current passing through the victim.
  Use the emergency power-off switch if there is one, or otherwise a normal power-off switch.
  If this cannot be done, push the victim away from the source of the electric current by using a nonconductive object such as a dry wooden stick.
- Then, call an ambulance.
- If the victim is unconscious, artificial respiration may be necessary.
  A proper method for performing artificial respiration or resuscitation should be learned beforehand.
- If the victim's heart is not beating, cardio-pulmonary resuscitation should be performed by a trained and qualified person.

1.6.2 For outbreak of fire

- First, shut off all the power from the machine using the emergency power-off switch if there is one, or otherwise the normal power-off switch.
- If the fire continues burning after the power is shut off, take suitable actions including the use of a fire extinguisher or a call for the fire department.

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2 Hazard Warning Statements

The following are the hazard warning statements contained in this manual.

2.1 ⚠ DANGER Statements

- The DKC and the basic DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU, and the 4th DKU also has Two Main Disconnect Devices.
  (LOCATION04-10, LOCATION04-20)

2.2 ⚠ WARNING Statements

- Do not touch the internal parts of the AC power cable, the AC Box, or the Breaker Box. Line voltage is present even if the circuit breaker is off.
  (INST03-610, INST03-3000)

- Be Careful of Electric Shock.
  (INST04-1810, INST04-1830, INST04-1880, INST04-1900, REP03-1420, REP03-1440, REP03-1510, REP03-1530, REP03-1630, REP03-1650, REP03-1690, REP03-1850, REP03-1880, REP03-1980, REP03-2000, REP03-2080, REP03-2090)

2.3 ⚠ CAUTION Statements

- Mind Your Head.
  (INST04-1810, INST04-1880, REP03-1420, REP03-1510, REP03-1630, REP03-1850, REP03-1980)

- Perform The Hz Conversion with care.
  (INST03-630)

- Perform The Outlet Box with care.
  (INST03-2500, INST03-2540)

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START SECTION

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All Maintenance Procedures Start from Here!

1 Precautions

- All maintenance operations to be performed on this subsystem are controlled through the SVP. When taking maintenance actions, carefully read this maintenance manual to avoid operation mistakes.
- The subsystem is designed so that troubles are isolated using the action code (ACC). If no ACC is presented, isolate the trouble based on TROUBLE SHOOTING SECTION.
- This subsystem supports new technologies such as RAID and live part plugging/unplugging. The service personnel should read THEORY OF OPERATION SECTION and understand its contents.

1.1 How to Use This Maintenance Manual

When servicing the subsystem by using this manual, select the item to be checked from the START ENTRY TABLE in START SECTION and follow the instructions given in the corresponding test procedure.

(Note)
Each SVP screen on this maintenance manual is a sample, and it may not be the same as the actual screen.

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2 Start Entry Table

Select the test item to be executed on this subsystem and follow the instructions given on the indicated pages.

	Test Item	Go To
A. Error Analysis		
A-1	Analyzing errors with ACC	TRBL03-10
A-2	Analyzing errors without ACC	TRBL03-20
A-3	Analyzing electric system errors (alarm, breaker trip, power-on failure, etc.)	TRBL03-60 TRBL03-80 - 100
A-4	Analyzing PC (SVP) errors	TRBL03-70
A-5	Analyzing SVP Messages	SVPMSG01-10
A-6	ACC analysis in SSB	ACC01-10
A-7	PIN track recovery	TRBL04-10
A-8	Recovery procedure for abnormal correction copy termination	TRBL04-10
A-9	Recovery procedure for BUS Blocking	TRBL05-20
A-10	Recovery procedure for Common SCSI Bus Error	TRBL05-30
A-11	Recovery procedure for LAN Error	TRBL05-70
A-12	Recovery procedure for the Replacement of CHA/DKA	TRBL05-110
A-13	Recovery procedure for micro-program replacement failure	MICRO-FC07-10
A-14	Recovery procedure for cache replacement failure	TRBL05-140
A-15	Recovery procedure for cache double-side failure	TRBL05-150
A-16	Message “Internal Subsystem is under maintenance...” was displayed during maintenance by the SVP.	TRBL05-160
A-17	Recovery procedure for drive restoration failure	TRBL05-170
A-18	Recovery procedure for installing failure	INST02-60
A-19	DIAG Trouble shooting	DIAG05-10
B. Status Display		
B-1	Displaying processor and path block status and drive copy status	SVP03-10
C. Installation		
C-0	Subsystem Configuration Outline	INST01-10
C-1	New Installation Procedure General Flow	INST02-10
C-2	Non-Disruptive Installation Procedure General Flow	INST02-20
C-3	Non-Disruptive De-Installation Procedure General Flow	INST02-29
C-4	Disruptive Installation Procedure General Flow	INST02-40
C-5	Disruptive De-Installation Procedure General Flow	INST02-50
D. Microprogram FC		
D-1	Performing micro-program FC (off-line)	MICRO-FC03-10
D-2	Performing micro-program FC (on-line)	MICRO-FC04-10
D-3	Performing MP Install	MICRO-FC05-10
D-4	Performing configuration exchange	MICRO-FC08-10

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	Test Item	Go To
E. Part Replacement		
E-1	Replacing parts	REP00-10
E-2	Periodic replacing	PERIOD04-10
E-3	Periodic checking	PERIOD01-10
F. SVP Panel Manipulation		
F-1	Getting SVP panel manipulation information	SVP01-10
F-2	Checking log information	SVP02-30
F-3	Log delete	SVP02-150
F-4	Displaying the ratio of the processor, cache and write pending data etc.	SVP02-200
F-5	Checking On-line Read Margin (ORM) information	SVP02-250
F-6	Setting SIM report level	SVP02-370
F-7	Management of Drive Threshold Values	SVP02-390
F-8	Copying the Dump, Log files to a floppy disk	SVP02-460
F-9	SIM Log complete	SVP02-500
F-10	Performing Manual Dump	SVP02-530
F-11	Performing Logical Device Maintenance	SVP02-580
F-12	Display the Pinned Track	SVP02-710
F-13	System Option	SVP02-760
F-14	Bus recovery processing	SVP02-790
G. Diagnostics		
G-1	Performing CUDG4/LCDG4	DIAG04-10
G-2	Performing DKU INLINE	DIAG04-100
H. Others		
H-1	Knowing outline of this subsystem	THEORY01-10

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LOCATION SECTION

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LOCATION

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2.2 PCB and Power Supply Location ---------- LOCATION02-20
2.3 Shared Memory Module Location ---------- LOCATION02-50
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3 Panel ---------- LOCATION03-10
3.1 Operator Panel ---------- LOCATION03-10
3.2 Other Switches and LEDs ---------- LOCATION03-40
3.3 Circuit Breakers ---------- LOCATION03-70

4 Connection of External Cable ---------- LOCATION04-10
4.1 AC Cabling ---------- LOCATION04-10
4.1.1 DKC310I/DKU305IU ---------- LOCATION04-10
4.1.2 DKC310I/DKU305IE ---------- LOCATION04-20
4.2 Channel Interface ---------- LOCATION04-40
4.3 PCI Cabling ---------- LOCATION04-90
4.4 RCU Cabling ---------- LOCATION04-90

5 Internal Cabling Block Diagram ---------- LOCATION05-10

6 Jumper Setting ---------- LOCATION06-10
6.1 Shut Down Jumpers ---------- LOCATION06-10
6.2 Other Jumpers ---------- LOCATION06-30
6.3 Voltage Selector ---------- LOCATION06-120

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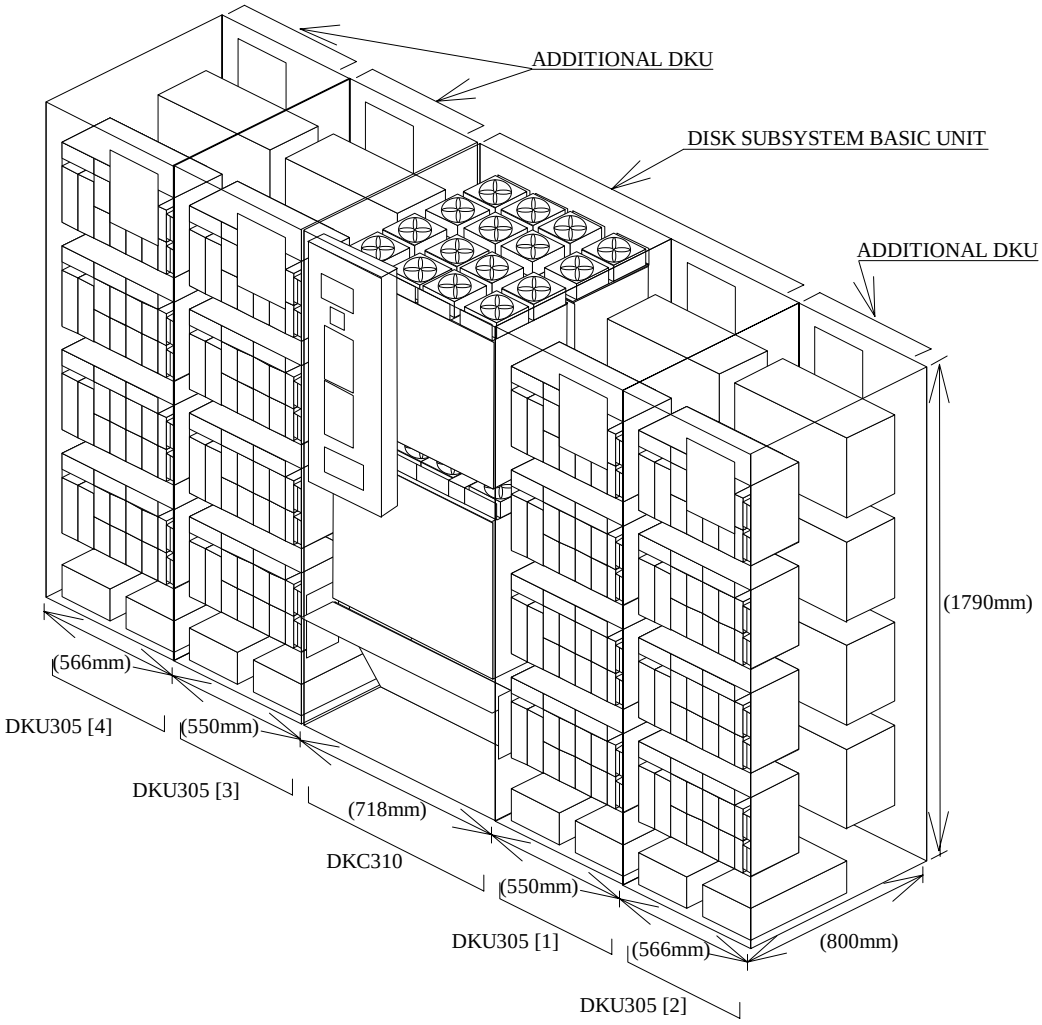
1 Overview of Disk Subsystem



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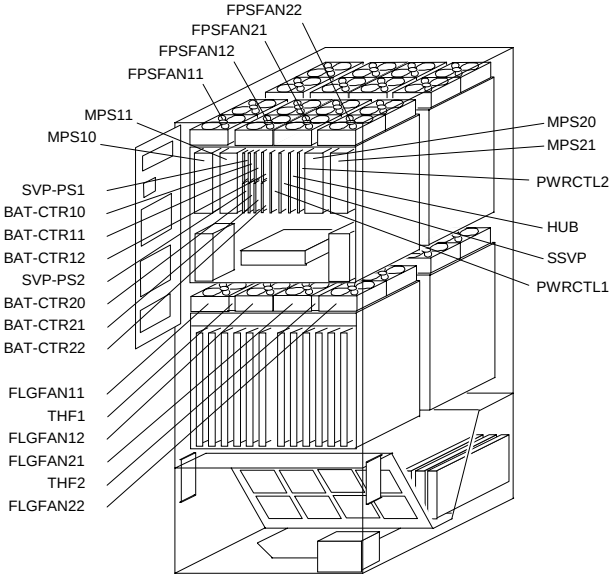
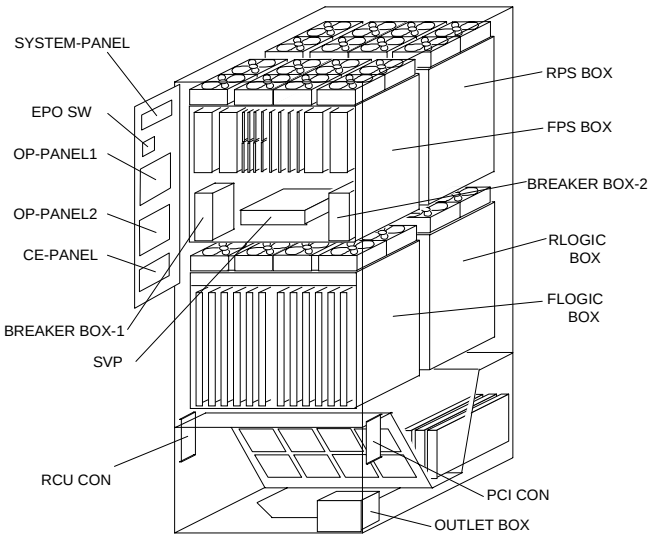
2 Parts Location

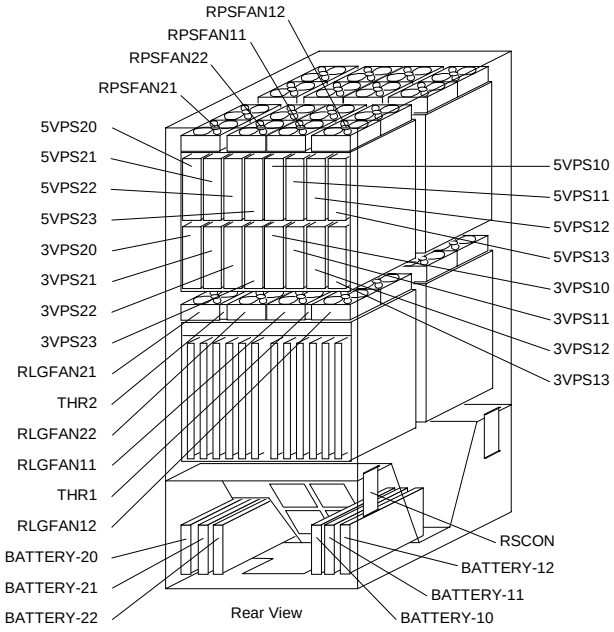
2.1 Disk Controller Unit



Front View

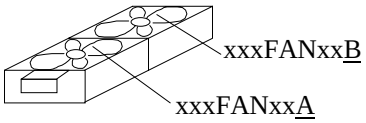


Front View



Rear View

FAN ASSY



(Note)
xxxFANxx : FAN ASSY Location

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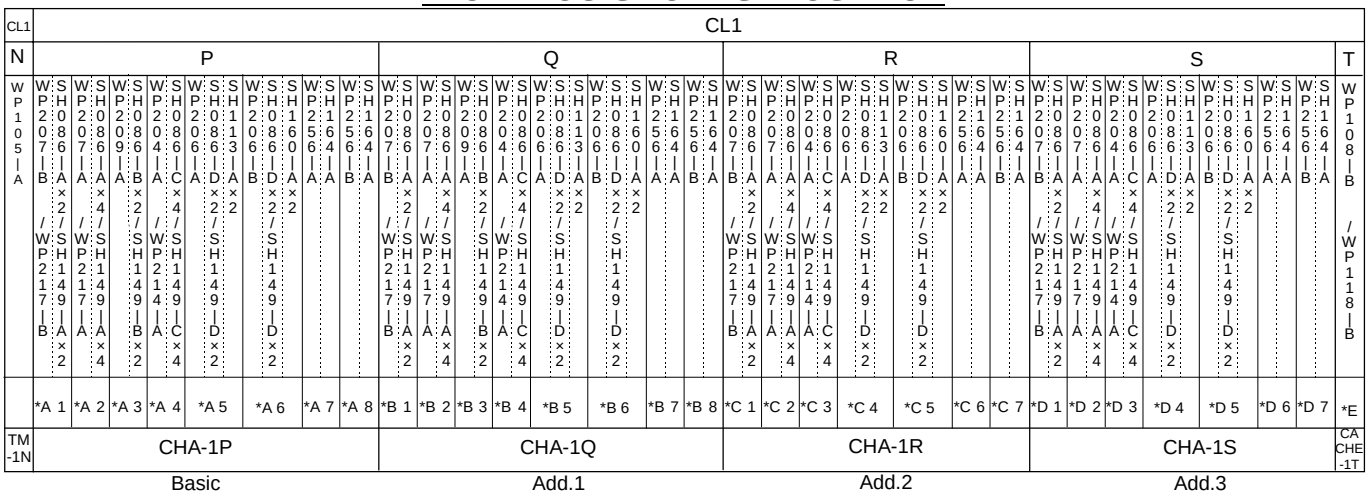
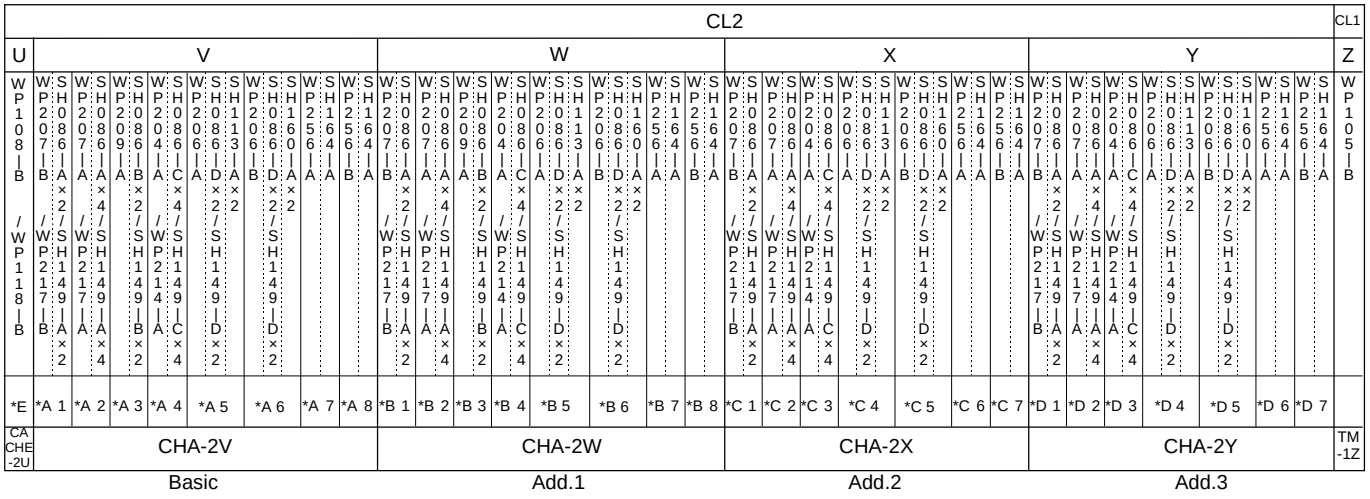
2.2 PCB and Power Supply Location

FRONT LOGIC BOX PCB LOCATION





*A1: DKC-F310I-4S×1 set
*A2: DKC-F310I-8S×1 set
*A3: DKC-F310I-8P or 8PS×1 set
*A4: DKC-F310I-8C×1 set
*A5: DKC-F310I-4F×1 set
*A6: DKC-F310I-4FE×1 set
*A7: DKC-F310I-4GS×1 set
*A8: DKC-F310I-4GL×1 set
*B1: DKC-F310I-4S×2 sets
*B2: DKC-F310I-8S×2 sets
*B3: DKC-F310I-8PS×2 sets
*B4: DKC-F310I-8C×2 sets
*B5: DKC-F310I-4F×2 sets
*B6: DKC-F310I-4FE×2 sets
*B7: DKC-F310I-4GS×2 sets
*B8: DKC-F310I-4GL×2 sets
*C1: DKC-F310I-4S×3 sets
*C2: DKC-F310I-8S×3 sets
*C3: DKC-F310I-8C×3 sets
*C4: DKC-F310I-4F×3 sets
*C5: DKC-F310I-4FE×3 sets
*C6: DKC-F310I-4GS×3 sets
*C7: DKC-F310I-4GL×3 sets
*D1: DKC-F310I-4S×4 sets
*D2: DKC-F310I-8S×4 sets
*D3: DKC-F310I-8C×4 sets
*D4: DKC-F310I-4F×4 sets
*D5: DKC-F310I-4FE×4 sets
*D6: DKC-F310I-4GS×4 sets
*D7: DKC-F310I-4GL×4 sets
*E: DKC-F310I-20

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REAR LOGIC BOX PCB LOCATION

CL2	CL2								CL1										CL2
M	L		K		J		H		G	F	E		D		C		B		A
WP1002|A	WP1002|A *C	WP1002|B/WP1302|B *F	WP1002|A *B	WP1002|B/WP1302|B *E	WP1002|A *A	WP1002|B/WP1302|B *D	WP1002|A	WP1002|B/WP1302|B	WP1008|A/WP1182|A	WP1008|A/WP1182|A	WP1002|A *C	WP1002|B/WP1302|B *F	WP1002|A *B	WP1002|B/WP1302|B *E	WP1002|A *A	WP1002|B/WP1302|B *D	WP1002|A	WP1002|B/WP1302|B	WP1000|B
TM-2M	DKA-2L		DKA-2K		DKA-2J		DKA-2H		CACHE-2G	CACHE-1F	DKA-1E		DKA-1D		DKA-1C		DKA-1B		TM-2A
	Add.3		Add.2		Add.1		Basic		Basic	Basic	Add.3		Add.2		Add.1		Basic		

*A: DKC-F310I-50×1 set
*B: DKC-F310I-50×2 sets
*C: DKC-F310I-50×3 sets
*D: DKC-F310I-50E×1 set
*E: DKC-F310I-50E×2 sets
*F: DKC-F310I-50E×3 sets

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FRONT PS BOX PS and PCB LOCATION

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS10	MPS11	SVPPS1	BATCTR10	BATCTR11	BATCTR12	PWRCTR1	SSVP	HUB	PWRCTR2	MPS20	MPS21
Multi PS	Multi PS	SH1111|A	SH093|A	SH093|A	SH093|A *B	SH092|A	SH0900|A / SH0911|A	SH088|A	SH092|A	Multi PS	Multi PS
		SH1111|A	SH093|A	SH093|A	SH093|A *B						
		SVPPS2	BATCTR20	BATCTR21	BATCTR22						
	*A	KL	JL	HL	GL						*A

*A: DKC-F310I-81
*B: DKC-F310I-20

REAR PS BOX PS LOCATION

CL2				CL1			
5VPS20	5VPS21	5VPS22	5VPS23	5VPS10	5VPS11	5VPS12	5VPS13
5V PS	5V PS *A	5V PS *B	5V PS *C	5V PS	5V PS *A	5V PS *B	5V PS *C
3V PS	3V PS *A	3V PS *B	3V PS *C	3V PS	3V PS *A	3V PS *B	3V PS *C
3VPS20	3VPS21	3VPS22	3VPS23	3VPS10	3VPS11	3VPS12	3VPS13

*A: DKC-F310I-81
*B: DKC-F310I-80
*C: DKC-F310I-82

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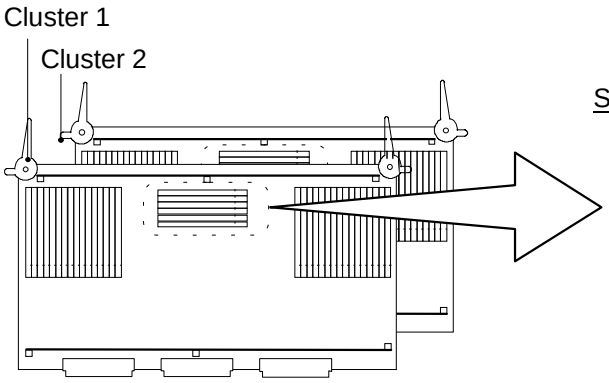
2.3 Shared Memory Module Location



Shared Memory Module Location

SM00 : SH024-B / SH100-B *1
SM01 : SH024-B / SH100-B *2
SM02 : SH024-B / SH100-B *3
SM03 : SH024-B / SH100-B *4
SM04 : SH100-B *5

*1 DKC-F310I-32 or DKC-F310I-128 (1 set)
*2 DKC-F310I-32 or DKC-F310I-128 (2 sets)
*3 DKC-F310I-32 or DKC-F310I-128 (3 sets)
*4 DKC-F310I-32 or DKC-F310I-128 (4 sets)
*5 DKC-F310I-128 (5 sets)

Note : Shared Memory Module specifications
For mixture mounting of SH024-B and SH100-B, satisfy the condition of the following table in Shared Memory.

Location	DKC-F310I-32/128	DKC-F310I-128
SM00	SH024-B (1 set) *1	SH100-B (1 set) *2
SM01	SH024-B (2 sets) *1	SH100-B (2 sets) *2
SM02	SH024-B (3 sets) *1	SH100-B (3 sets) *2
SM03	SH024-B (4 sets) *1	SH100-B (4 sets) *2
SM04	SH100-B (1 set) *2	un-mountable
Capacity	32 to 256 MB	128 to 512 MB

*1: DKC-F310I-32
*2: DKC-F310I-128

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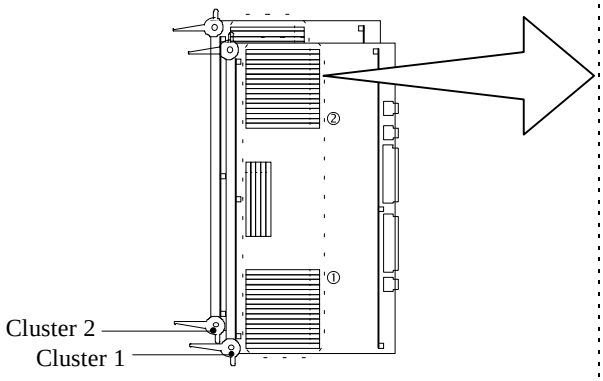
2.4 Cache Memory Module Location

1. Standard Cache Memory PCB



Cache Memory PCB
(WP108-A/WP118-A)

Cache Memory Module Location

②			
CM03	:	SH024-A/SH100-A	*1
CM13	:	SH024-A/SH100-A	*2
CM23	:	SH024-A/SH100-A	*3
CM33	:	SH024-A/SH100-A	*4
CM43	:	SH024-A/SH100-A	*5
CM53	:	SH024-A/SH100-A	*6
CM63	:	SH024-A/SH100-A	*7
CM73	:	SH024-A/SH100-A	*8
CM01	:	SH024-A/SH100-A	*1
CM11	:	SH024-A/SH100-A	*2
CM21	:	SH024-A/SH100-A	*3
CM31	:	SH024-A/SH100-A	*4
CM41	:	SH024-A/SH100-A	*5
CM51	:	SH024-A/SH100-A	*6
CM61	:	SH024-A/SH100-A	*7
CM71	:	SH024-A/SH100-A	*8
①			
CM70	:	SH024-A/SH100-A	*8
CM60	:	SH024-A/SH100-A	*7
CM50	:	SH024-A/SH100-A	*6
CM40	:	SH024-A/SH100-A	*5
CM30	:	SH024-A/SH100-A	*4
CM20	:	SH024-A/SH100-A	*3
CM10	:	SH024-A/SH100-A	*2
CM00	:	SH024-A/SH100-A	*1
CM72	:	SH024-A/SH100-A	*8
CM62	:	SH024-A/SH100-A	*7
CM52	:	SH024-A/SH100-A	*6
CM42	:	SH024-A/SH100-A	*5
CM32	:	SH024-A/SH100-A	*4
CM22	:	SH024-A/SH100-A	*3
CM12	:	SH024-A/SH100-A	*2
CM02	:	SH024-A/SH100-A	*1

*1 DKC-F310I-256 / DKC-F310I-1024 (1 set)
*2 DKC-F310I-256 / DKC-F310I-1024 (2 sets)
*3 DKC-F310I-256 / DKC-F310I-1024 (3 sets)
*4 DKC-F310I-256 / DKC-F310I-1024 (4 sets)
*5 DKC-F310I-256 / DKC-F310I-1024 (5 sets)
*6 DKC-F310I-256 / DKC-F310I-1024 (6 sets)
*7 DKC-F310I-256 / DKC-F310I-1024 (7 sets)
*8 DKC-F310I-256 / DKC-F310I-1024 (8 sets)

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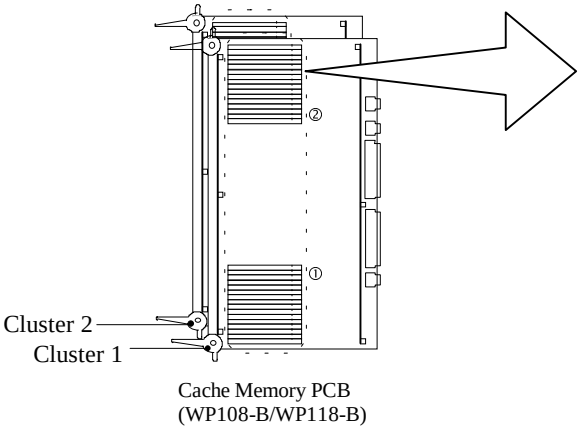
2. Cache Memory PCB Constituting DKC-F310I-20



Cache Memory PCB
(WP108-B/WP118-B)

Cache Memory Module Location

②

CM03	:	SH024-A/SH100-A	*9
CM13	:	SH024-A/SH100-A	*A
CM23	:	SH024-A/SH100-A	*B
CM33	:	SH024-A/SH100-A	*C
CM43	:	SH024-A/SH100-A	*D
CM53	:	SH024-A/SH100-A	*E
CM63	:	SH024-A/SH100-A	*F
CM73	:	SH024-A/SH100-A	*G
CM01	:	SH024-A/SH100-A	*9
CM11	:	SH024-A/SH100-A	*A
CM21	:	SH024-A/SH100-A	*B
CM31	:	SH024-A/SH100-A	*C
CM41	:	SH024-A/SH100-A	*D
CM51	:	SH024-A/SH100-A	*E
CM61	:	SH024-A/SH100-A	*F
CM71	:	SH024-A/SH100-A	*G

①

CM70	:	SH024-A/SH100-A	*G
CM60	:	SH024-A/SH100-A	*F
CM50	:	SH024-A/SH100-A	*E
CM40	:	SH024-A/SH100-A	*D
CM30	:	SH024-A/SH100-A	*C
CM20	:	SH024-A/SH100-A	*B
CM10	:	SH024-A/SH100-A	*A
CM00	:	SH024-A/SH100-A	*9
CM72	:	SH024-A/SH100-A	*G
CM62	:	SH024-A/SH100-A	*F
CM52	:	SH024-A/SH100-A	*E
CM42	:	SH024-A/SH100-A	*D
CM32	:	SH024-A/SH100-A	*C
CM22	:	SH024-A/SH100-A	*B
CM12	:	SH024-A/SH100-A	*A
CM02	:	SH024-A/SH100-A	*9

*9 DKC-F310I-256 / DKC-F310I-1024 (9 sets)
*A DKC-F310I-256 / DKC-F310I-1024 (10 sets)
*B DKC-F310I-256 / DKC-F310I-1024 (11 sets)
*C DKC-F310I-256 / DKC-F310I-1024 (12 sets)
*D DKC-F310I-256 / DKC-F310I-1024 (13 sets)
*E DKC-F310I-256 / DKC-F310I-1024 (14 sets)
*F DKC-F310I-256 / DKC-F310I-1024 (15 sets)
*G DKC-F310I-256 / DKC-F310I-1024 (16 sets)

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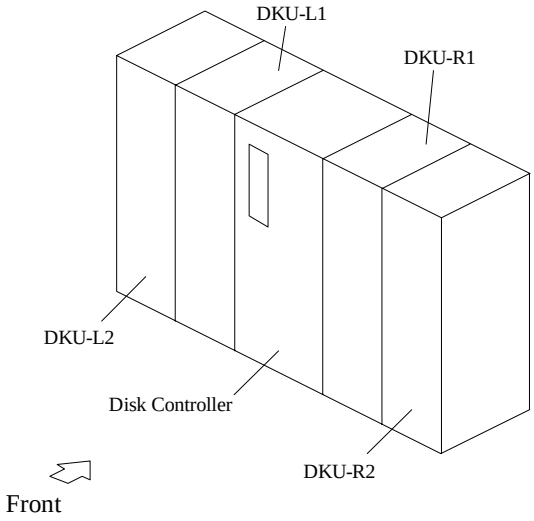
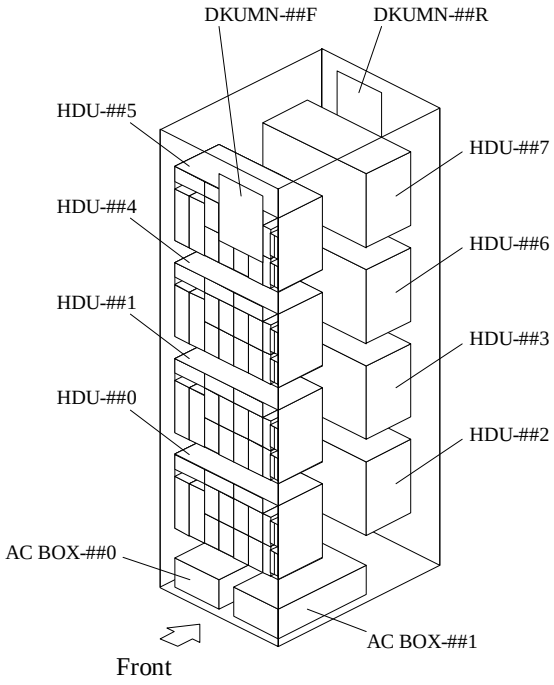
2.5 Disk Unit

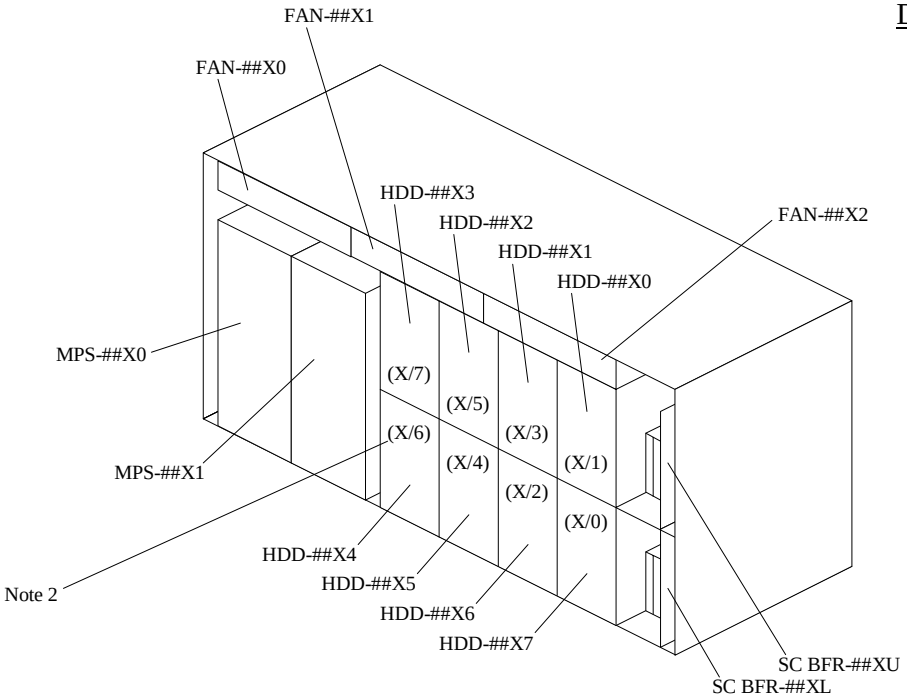


Disk Subsystem



Note: ##=Disk Unit Location(R1,R2,L1,L2)

Disk Unit



Note 1: ##X=HDU Box Location(R10,R11,･･･,L27)

Note 2: The HDD canister location is expressed in the form "(Column/row)" in the SSB/SIM LOG.
Column No. : Last digit of the HDU Box location.
Row No. : 0, 1, 2,･･･ ,7

HDU BOX

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3 Panel

3.1 Operator Panel

[1] Operator Panel
Fig. 3.1-1 and Table 3.1-1 show the Operator Panel and its functions respectively.
Circled numbers in Fig. 3.1-1 correspond to the numbers in Table 3.1-1.

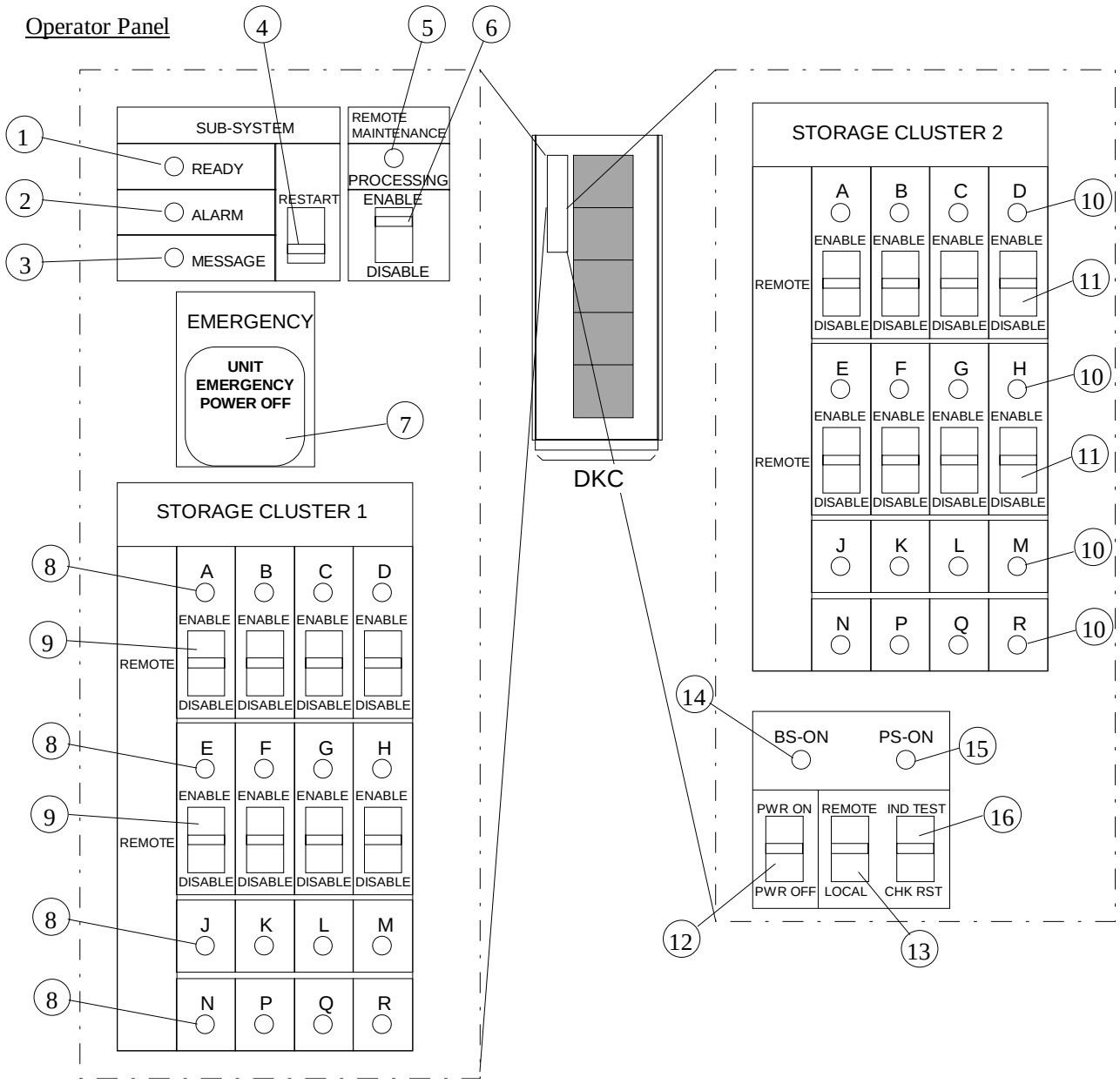

Fig. 3.1-1 Operator Panel

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Table 3.1-1 Part Function on Operator Panel

No.	Parts Name	Class	Function
1	SUBSYSTEM READY	LED (Green)	Indicates that input/output operation on the channel interface is enabled.
2	SUBSYSTEM ALARM	LED (Red)	Indicates DC under voltage, DC over current, abnormally high temperature, or an unrecoverable failure occurred.
3	SUBSYSTEM MESSAGE	LED (Amber)	Indicates that any message has been issued from Clusters.
4	SUBSYSTEM RESTART	Switch	Used to unfence the fenced drive path and to release Write Inhibit.
5	REMOTE MAINTENANCE PROCESSING	LED (Amber)	Indicates that remote maintenance is being processed.
6	REMOTE MAINTENANCE ENABLE/DISABLE	Switch	Used to permit remote maintenance.
7	EMERGENCY POWER OFF	Switch	Used to power off the storage subsystem in an emergency situation.
8	STORAGE CLUSTER 1 CHANNEL A-R ENABLE	LED (Green)	Parallel Channel (Only Channel A-H): Indicates that corresponding channel route is enabled. Serial Channel/Fibre Channel: (1) On : Indicates some of the logical paths are established. (2) Fast blinking : Indicates that the corresponding channel route is executing the channel command. (Only Serial Channel) (3) Slow blinking : Indicates none of the logical path is established. (4) Off : Indicates that the corresponding channel route is not enabled. SCSI Channel: On : Indicates the SCSI cable and terminator are connected correctly to the corresponding channel route and channel route is ready. Off : Indicates the some of the following conditions occured. • None of Logical Unit is set up to the corresponding channel route • SCSI cable or terminator is not connected correctly. • Corresponding channel route is not ready.
9	STORAGE CLUSTER 1 CHANNEL A-H ENABLE	Switch	Parallel Channel: Used to enable or disable the corresponding channel routes. (1) Enable : Enable the corresponding channel route. (2) Disable : Disable the corresponding channel route. (3) Remote : Enable/Disable control is made by remote switch. Serial Channel/SCSI Channel/Fibre Channel: This switch is ineffective.

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Table 3.1-1 Part Function on Operator Panel

No.	Parts Name	Class	Function
10	STORAGE CLUSTER 2 CHANNEL A-R ENABLE	LED (Green)	Parallel Channel (Only Channel A-H): Indicates that corresponding channel route is enabled. Serial Channel/Fibre Channel: (1) On : Indicates some of the logical paths are established. (2) Fast blinking : Indicates that the corresponding channel route is executing the channel command. (Only Serial Channel) (3) Slow blinking : Indicates none of the logical path is established. (4) Off : Indicates that the corresponding channel route is not enabled. SCSI Channel: On : Indicates the SCSI cable and terminator are connected correctly to the corresponding channel route and channel route is ready. Off : Indicates the some of the following conditions occured. • None of Logical Unit is set up to the corresponding channel route • SCSI cable or terminator is not connected correctly. • Corresponding channel route is not ready.
11	STORAGE CLUSTER 2 CHANNEL A-H ENABLE/REMOTE/DISABLE	Switch	Parallel Channel: Used to enable or disable the corresponding channel routes. (1) Enable : Enable the corresponding channel route. (2) Disable : Disable the corresponding channel route. (3) Remote : Enable/Disable control is made by remote switch. Serial Channel/SCSI Channel/Fibre Channel: This switch is ineffective.
12	PWR ON/PWR OFF	Switch	Used to power on/off the subsystem. This switch is valid when the REMOTE/LOCAL switch is set to the LOCAL position.
13	PWR ON/PWR OFF REMOTE/LOCAL	Switch	REMOTE position : Subsystem is powered on/off by the instructions from the CPU. LOCAL position : Subsystem is powered on/off by PWR ON/PWR OFF switch.
14	BS ON	LED (Yellow)	Indicates that the Sub-PS is on.(CL 1 or CL 2)
15	PS ON	LED (Green)	Indicates that the subsystem is powered on.
16	IND TEST/CHK RESET	Switch	IND TEST position : The LEDs on Operator panel and CE panel go on. CHK RESET position : The PS ALARM and TH ALARM is reset.

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3.2 Other Switches and LEDs

Fig. 3.2-1 and Table 3.2-1 show the other switches and LEDs and their functions respectively. Circled numbers in Fig. 3.2-1 correspond to the numbers in Table 3.2-1.

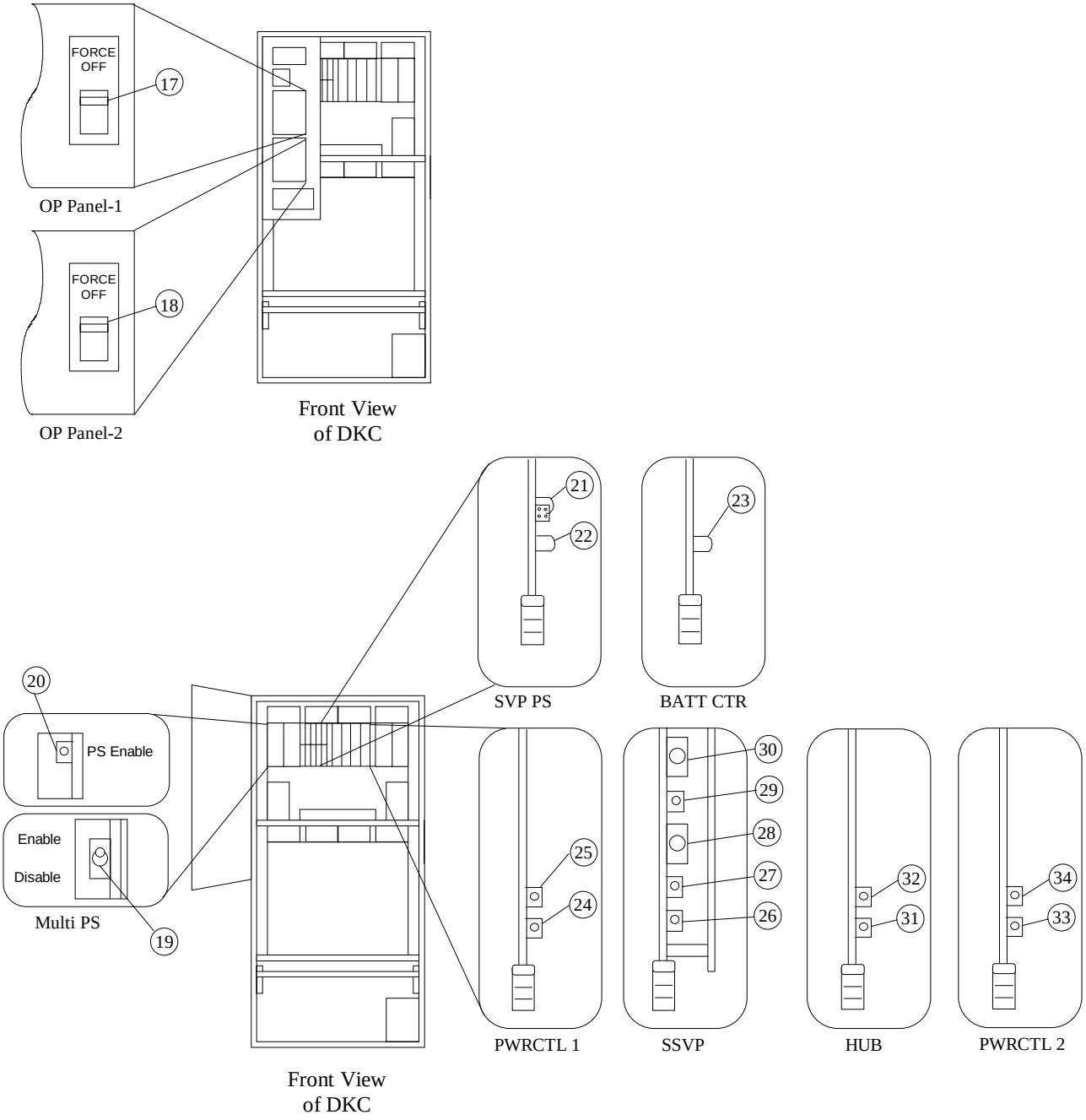

Fig. 3.2-1 Other Switches and LEDs (1/2)

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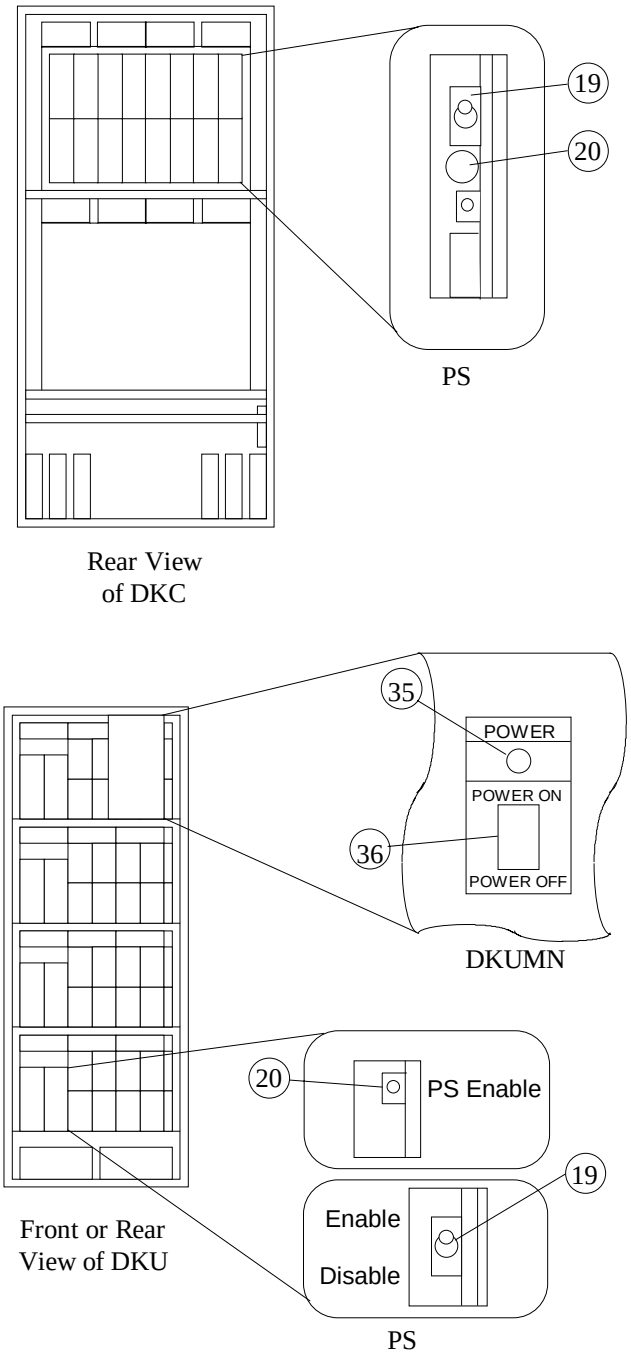

Fig 3.2-1 Other Switches and LEDs (2/2)

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Table 3.2-1 Function of Other Switches and LEDs

No.	Parts Name	Class	Function
17	STORAGE CLUSTER 1 FORCE OFFLINE	Switch	Parallel Channel: Used to inhibit channel interface operations for all channel routes of storage cluster 1 Serial channel/SCSI channel: This switch is ineffective.
18	STORAGE CLUSTER 2 FORCE OFFLINE	Switch	Parallel Channel: Used to inhibit channel interface operations for all channel routes of Storage Cluster 2. Serial channel/SCSI channel: This switch is ineffective.
19	PS Enable/Disable	Switch	Used to power on/off the PS.
20	PS Enable	LED (Green)	Indicates that the PS is providing output voltage.
21	SVP PS ENABLE	LED (Green)	Indicates that the SVP PS is powered on.
22	SVP PS Shut Down LED	LED (Red)	Indicates that the removal of the SVP PS is possible when the subsystem is powered on.
23	BAT CTR Shut Down LED	LED (Red)	Indicates that the removal of the BAT CTR is possible when the subsystem is powered on.
24	PWRCTL-1 ENABLE	LED (Green)	Indicates that the PWRCTL-1 is powered on.
25	PWRCTL-1 Shut Down LED	LED (Red)	Indicates that the removal of the PWRCTL-1 is possible when the subsystem is powered on.
26	SSVP ENABLE	LED (Green)	Indicates that the SSVP is powered on.
27	SSVP Shut Down LED	LED (Red)	Indicates that the removal of the SSVP is possible when the subsystem is powered on.
28	SSVP DUMP	Switch	The data in SVP memory is written to the HDD.
29	SSVP ALARM	LED (Red)	This LED shows the state of SSVP. Lighting.....BOOT detected abnormality of hardware. Slow blinking ..The dump acquisition of SSVP ended. Fast blinking....Micro Code of SSVP ended abnormally.
30	SSVP ALARM RESET	Switch	The SSVP detection alarm is reset. Then IMPL of the SVP is executed.
31	HUB ENABLE	LED (Green)	Indicates that the HUB is powered on.
32	HUB Shut Down LED	LED (Red)	Indicates that the removal of the HUB is possible when the subsystem is powered on.
33	PWRCTL-2 ENABLE	LED (Green)	Indicates that the PWRCTL-2 is powered on.
34	PWRCTL-2 Shut Down LED	LED (Red)	Indicates that the removal of the PWRCTL-2 is possible when the subsystem is powered on.
35	DKUMN POWER ON	LED (Green)	Indicates that each DKUMN is powered on.
36	DKUMN POWER ON/OFF	Switch	Used to power on/off each DKUMN.

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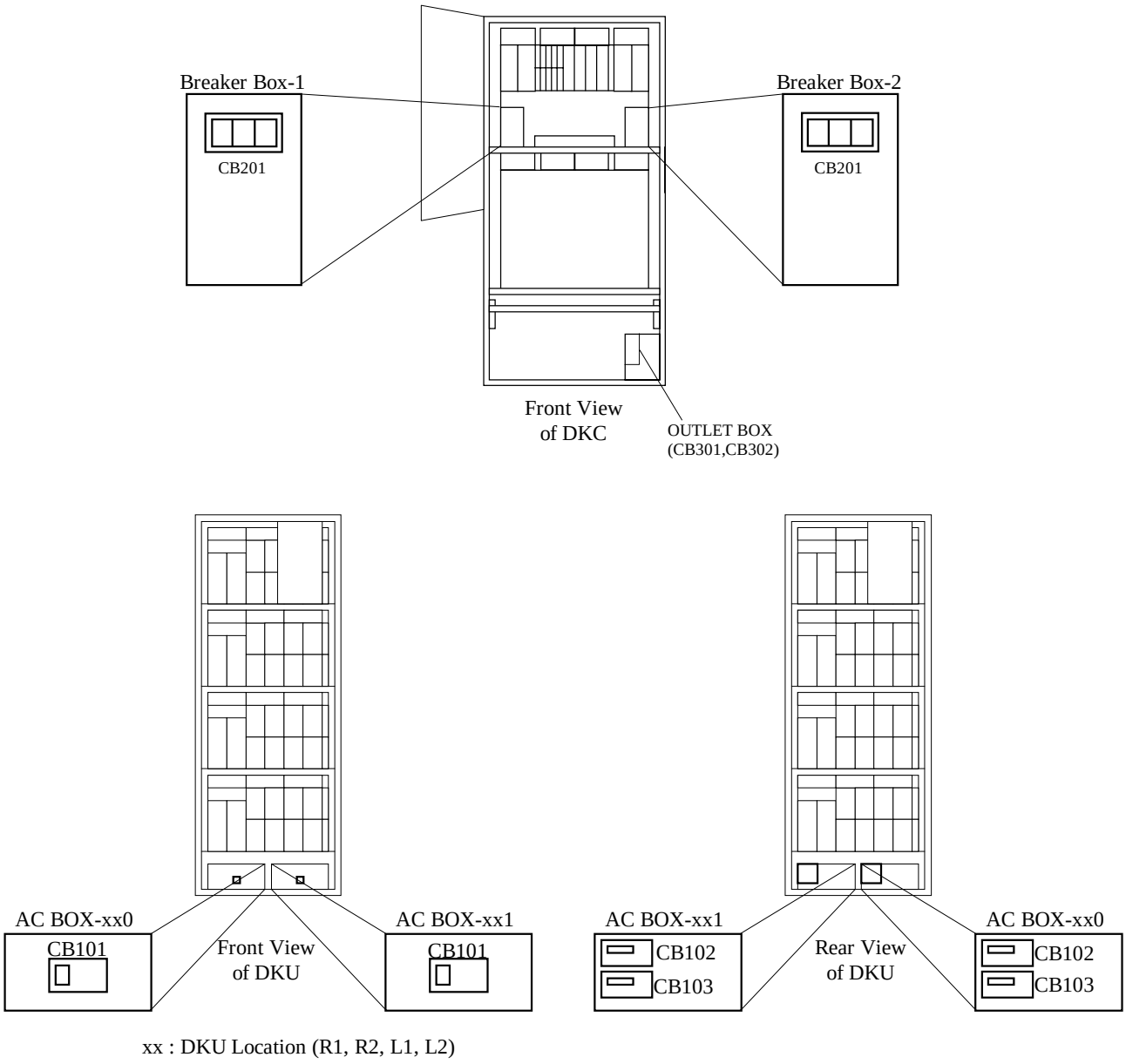
3.3 Circuit Breakers

Fig. 3.3-1 show the locations of Circuit Breakers.
Fig. 3.3-2, Fig. 3.3-3 and Fig. 3.3-4 show the connection of power supplies.



xx : DKU Location (R1, R2, L1, L2)

Fig. 3.3-1 Locations of Circuit Breakers

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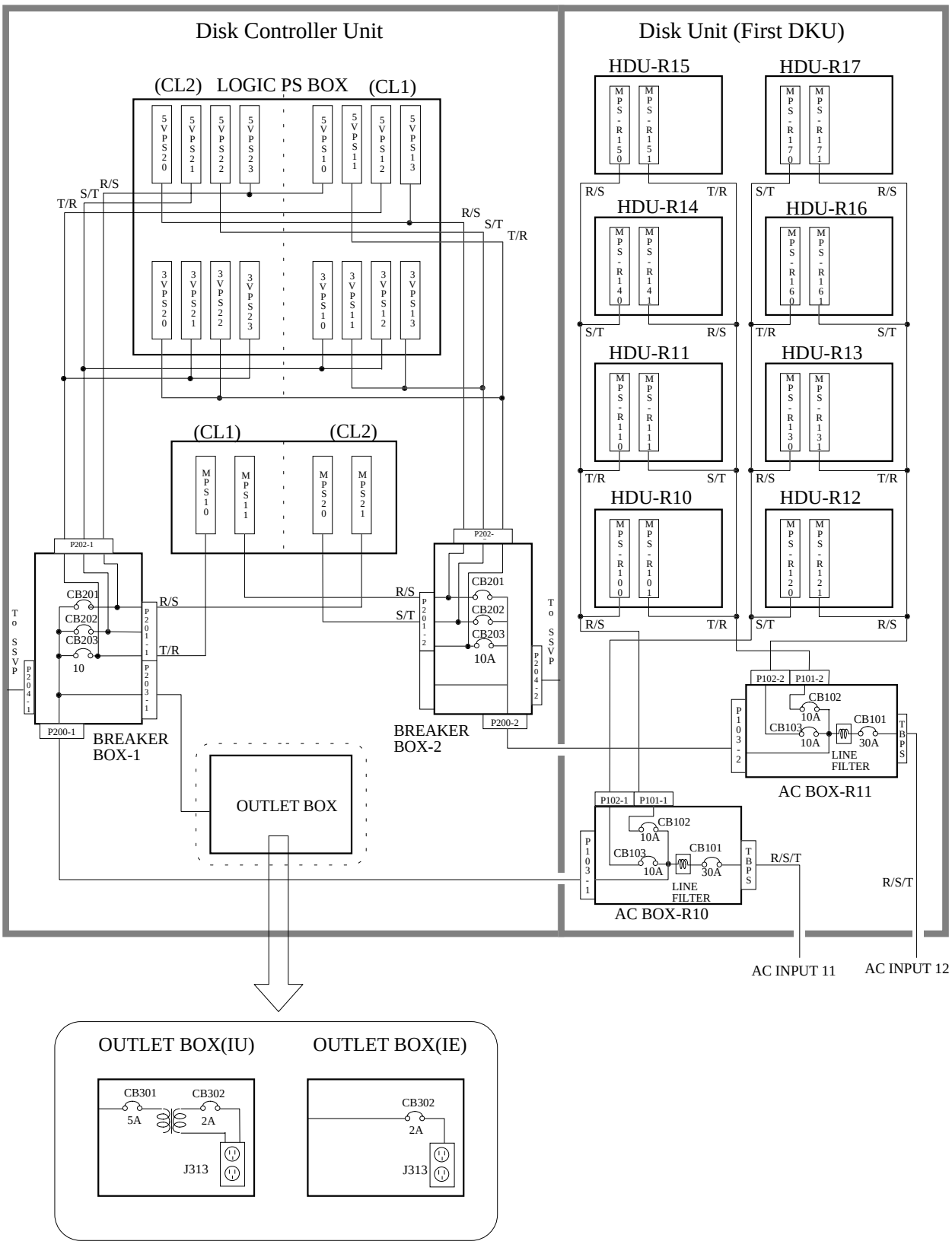

Fig. 3.3-2 Connection of POWER SUPPLIES (1/3)

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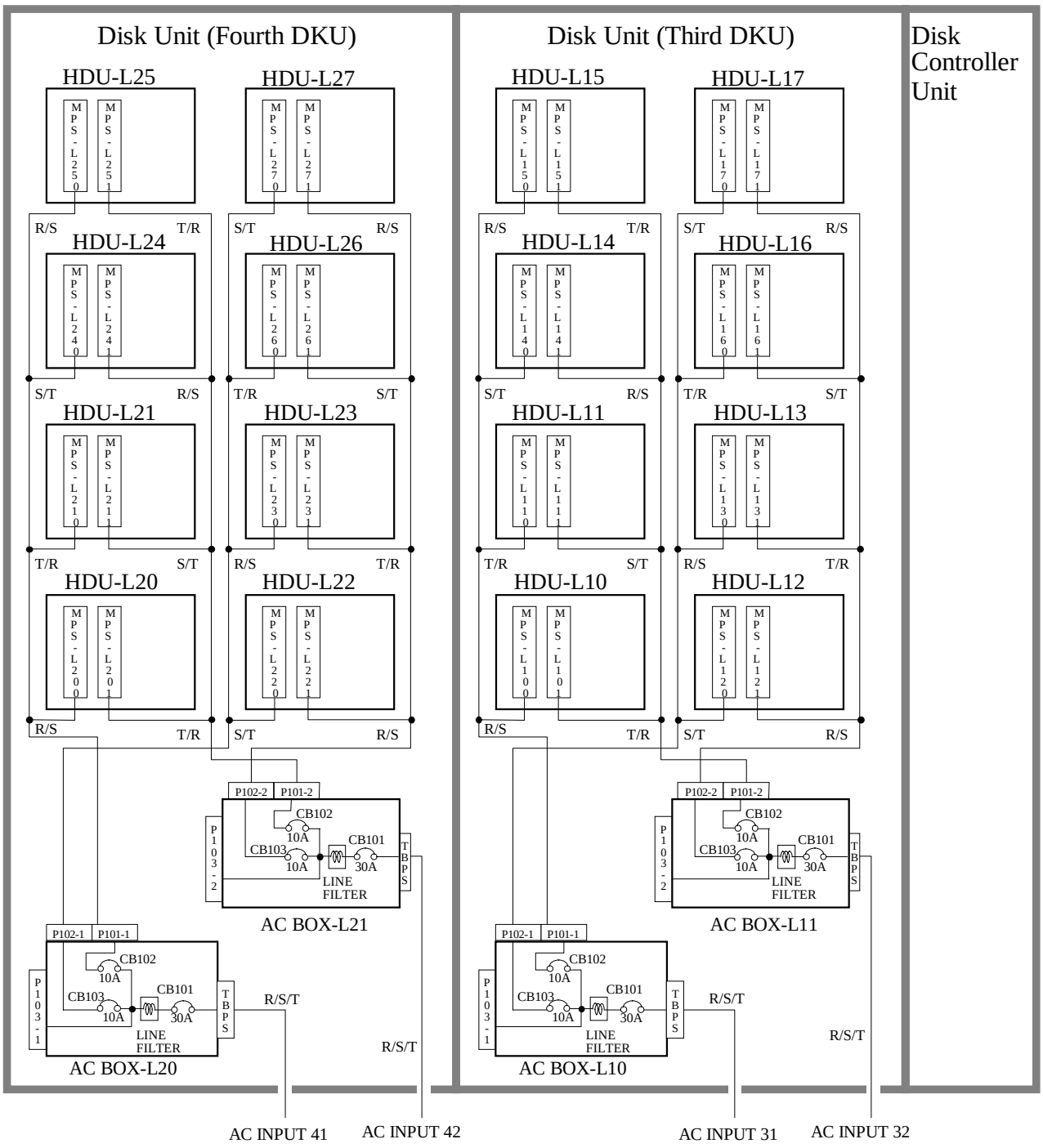

Fig. 3.3-3 Connection of POWER SUPPLIES (2/3)

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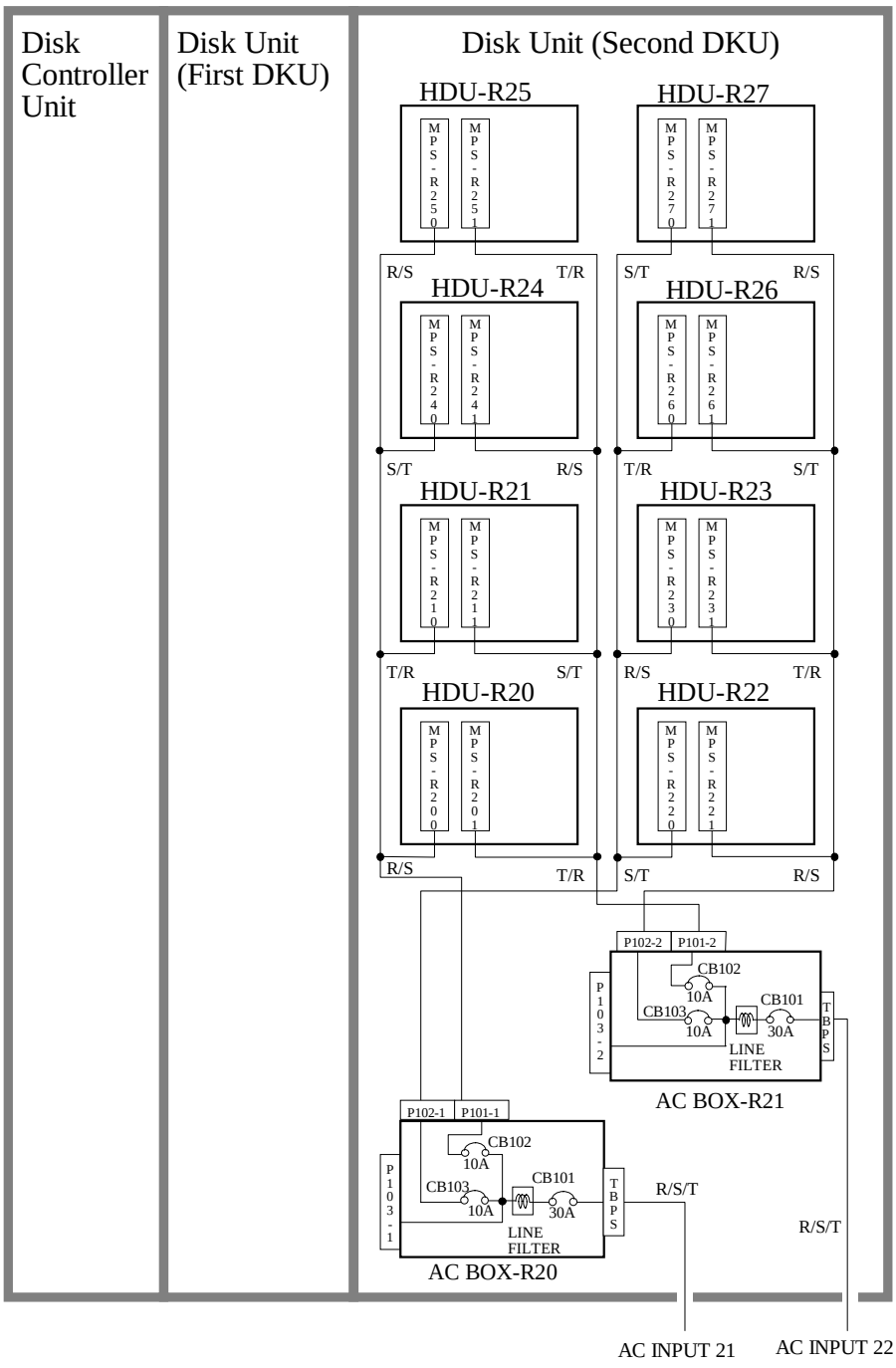

Fig. 3.3-4 Connection of POWER SUPPLIES (3/3)

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4 Connection of External Cable

4.1 AC Cabling

4.1.1 DKC310I/DKU305IU

⚠ DANGER

The DKC and the basic DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU and, the 4th DKU also has Two Main Disconnect Devices. Refer to LOCATION03-70 "Circuit Breakers".
Observe all instructions described in this manual before connecting the equipment to the power source and before servicing.

A. Connection of Power Supply Cord
The unit has two power supply cords with attachment plug type R&S 3760 or 3760PDG. Be sure to prepare the following socket receptacles and power cords between the power distribution board of the building and the attachment plugs for the unit.

Socket Receptacle : R&S 3754 or 3934
Power Cord : Type ST or equivalent, shielded type, with four min. #8 AWG conductors. Terminated at one end with an assembled on above socket receptacle cap.

B. Requirements to Branch Circuit
This unit relies on the building installation for protection of the internal components of the equipment. Each line (R/S/T line) should be protected by a short circuit protective device and by an overcurrent protective device rated 30 amp on building installation.
The protective device on building installation shall comply with the NEC requirements (or CEC requirements when installed in Canada), and if a protective device interrupts a conductor, it shall also interrupt all other supply conductors.
This protection is not required for the neutral line of this unit.

C. Disconnection from Power Supply
Each unit has Two Main Disconnect Device(Two Main Breaker CB101s for Dual Power Lines). To remove all utility power from the unit, turn off both main disconnect device CB101s at the same time.

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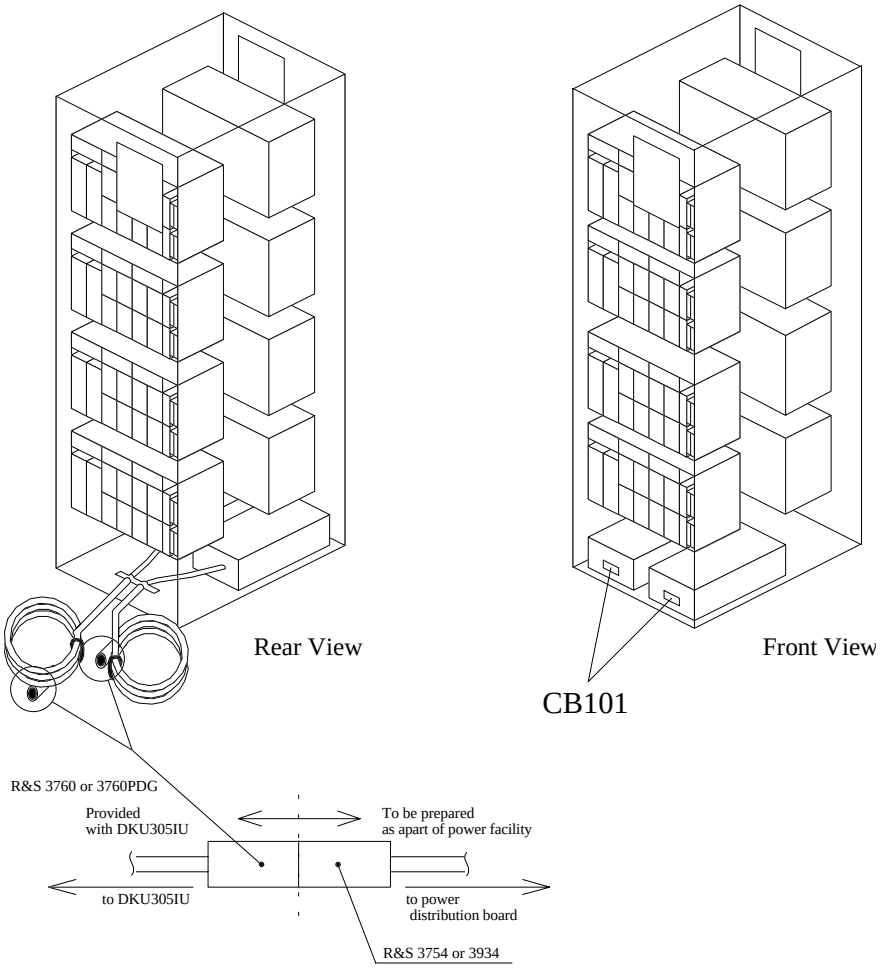

4.1.2 DKC310I/DKU305IE

⚠ DANGER

The DKC and the basic DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU, and the 4th DKU also has Two Main Disconnect Devices. Refer to LOCATION03-70 "Circuit Breakers".
Observe all instructions described in this manual before connecting the equipment to the power source and before servicing.

A. Connection of Power Supply Cord

The unit has two power supply cords. Be sure to prepare the following socket receptacles and power cords between the power distribution board of the building and the power cords for the unit.

Socket Receptacle : As shown in the following figure.
Power Cord : Type H07RN-F or equivalent, with five 6.0 mm^2 conductors.

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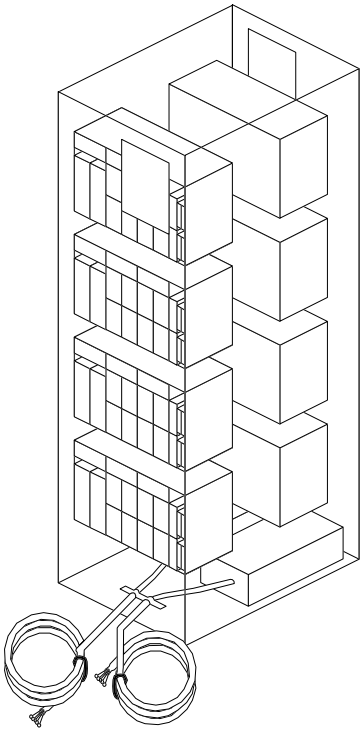
Be sure to connect a power cord to the distribution box as illustrated in the following figure. The wrong connection of neutral line may cause damages or fire of the equipment.
To reduce the risk of wrong connection, you should use approved type attachment plug and socket for power cord connection.
High leakage current may be caused between the power supply and this unit. To avoid an electric shock by high leakage current, perform the protective earthing connection before the supply connections and disconnect it after the supply connections.

B. Requirements to Branch Circuit

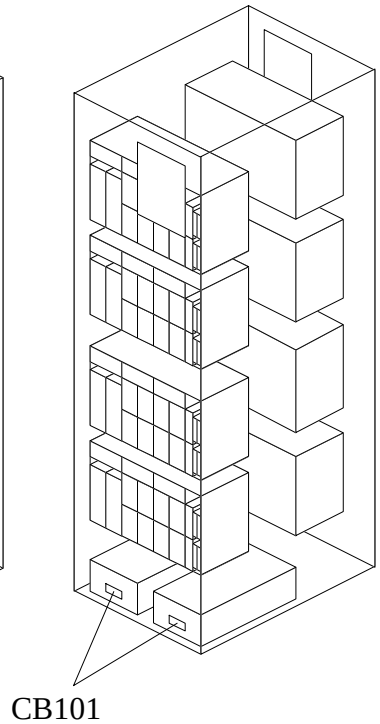
This unit relies on the building installation for protection of the internal components of the equipment. Each line (R/S/T line) should be protected by a short circuit protective device and by an overcurrent protective device rated 30 amp on building installation.
The protective device on building installation shall be comply with National Standards of the country where the units shall be installed, and if a protective device interrupts a conductor, it shall also interrupt all other supply conductors.
This protection is also required for the neutral line of this unit.

C. Disconnection from Power Supply

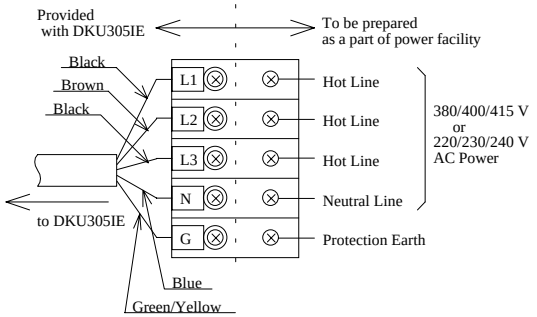
Each unit has Two Main Disconnect Device (Two Main Breaker CB101s for Dual Power Lines). To remove all utility power from the unit, turn off both main disconnect device CB101s at the same time.



Rear View



Front View



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4.2 Channel Interface

Table 4.2-1 shows the mounting limitations of channel options and the corresponding interface connector panel locations.

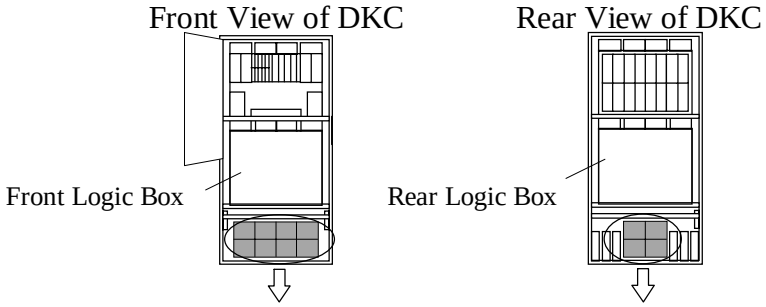

Table 4.2-1 The Mounting Limitation of Channel Options

Case	Location				Number of Channel Ports	I/F Connector Panel Location and Channel No.	
	Basic	Add.1	Add.2	Add.3		Front View of DKC	Rear View of DKC
1	8P	×	—	—	16	CL1 CL1 CL2 E F / G H | A | B | E F / G H | C | D |	CL2 A | B C | D
2	8P	8PS	—	—	16	CL1 CL1 CL2 E F | A | B | E F G H | C | D | G H	CL2 A | B C | D
3	8P	×	×	—	24	CL1 CL1 CL2 E F / G H | A | B | E F / G H J K / L M | C | D | J K / L M	CL2 A | B C | D
4	8PS	×	×	×	32	A B C D | E F / G H | J K / L M — CL1 A B C D | E F / G H | J K / L M — CL2	N P / Q R | — CL1 N P / Q R | — CL2
5	8PS	8PS	×	×	32	A B C D E F G H — CL1 A B C D E F G H — CL2	J K / L M | N P / Q R — CL1 J K / L M | N P / Q R — CL2
6	×	×	×	×	32	A B / C D | E F / G H | J K / L M | N P / Q R — CL1 A B / C D | E F / G H | J K / L M | N P / Q R — CL2	

— : Uninstallable
× : F8S/4S/8C/4F/4FE/4GS/4GL
A-R : Channel No.

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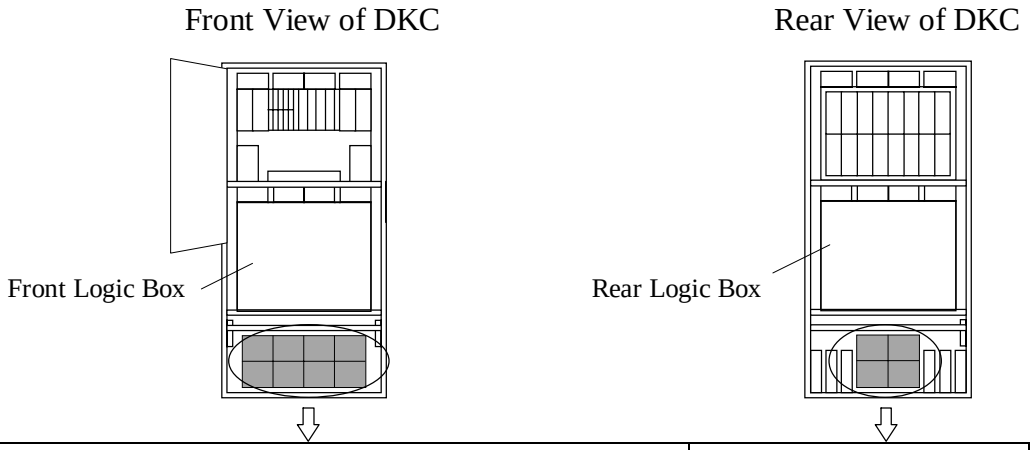
[1] Parallel Channel Interface



Location		Interface Connector Panel (Front View of DKC)	Interface Connector Panel (Rear View of DKC)
Basic	Add.1		
8P	-	CL1: CH A, CH B, CH C, CH D (TAG OUT / BUS OUT / TAG IN / BUS IN)	CL2: CH A, CH B, CH C, CH D (TAG OUT / BUS OUT / TAG IN / BUS IN)
8P	8PS	CL1: CH E, CH F (T OUT / B OUT / T IN / B IN); CL1: CH A, CH B, CH C, CH D (TAG OUT / BUS OUT / TAG IN / BUS IN); CL2: CH E, CH F (T OUT / B OUT / T IN / B IN); CH G, CH H (T OUT / B OUT / T IN / B IN)	CL2: CH A, CH B, CH C, CH D (TAG OUT / BUS OUT / TAG IN / BUS IN)
8PS	8PS	CH A, CH B, CH C, CH D, CH E, CH F, CH G, CH H (T OUT / B OUT / T IN / B IN) — CL1	
		CH A, CH B, CH C, CH D, CH E, CH F, CH G, CH H (T OUT / B OUT / T IN / B IN) — CL2	

Note T OUT : TAG OUT B OUT : BUS OUT
T IN : TAG IN B IN : BUS IN

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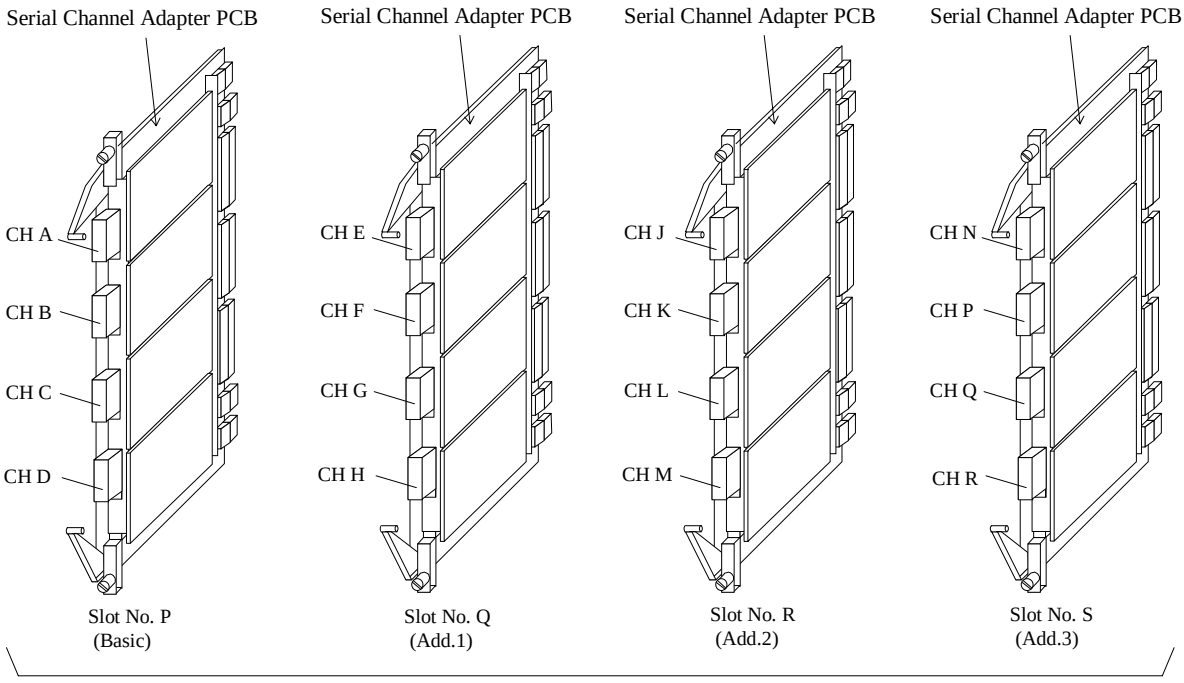
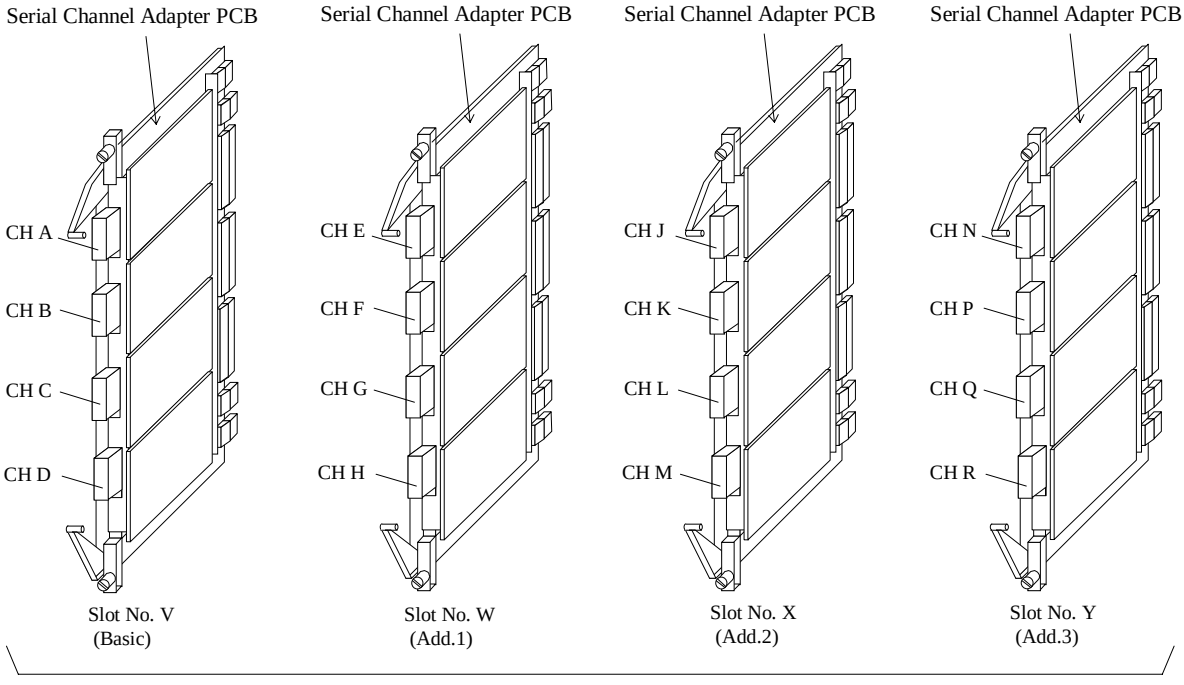
[2] Serial Channel Interface





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[3] SCSI Channel Interface

	Basic	Add. 1	Add. 2	Add. 3
CL1	CH A OUT / CH B OUT CH A IN / CH B IN CH C OUT / CH D OUT CH C IN / CH D IN	CH E OUT / CH F OUT CH E IN / CH F IN CH G OUT / CH H OUT CH G IN / CH H IN	CH J OUT / CH K OUT CH J IN / CH K IN CH L OUT / CH M OUT CH L IN / CH M IN	CH N OUT / CH P OUT CH N IN / CH P IN CH Q OUT / CH R OUT CH Q IN / CH R IN
CL2	CH A OUT / CH B OUT CH A IN / CH B IN CH C OUT / CH D OUT CH C IN / CH D IN	CH E OUT / CH F OUT CH E IN / CH F IN CH G OUT / CH H OUT CH G IN / CH H IN	CH J OUT / CH K OUT CH J IN / CH K IN CH L OUT / CH M OUT CH L IN / CH M IN	CH N OUT / CH P OUT CH N IN / CH P IN CH Q OUT / CH R OUT CH Q IN / CH R IN

The location of the SCSI channel interface panels are shown in the Table 5.3-1. Refer to LOCATION 04-40.

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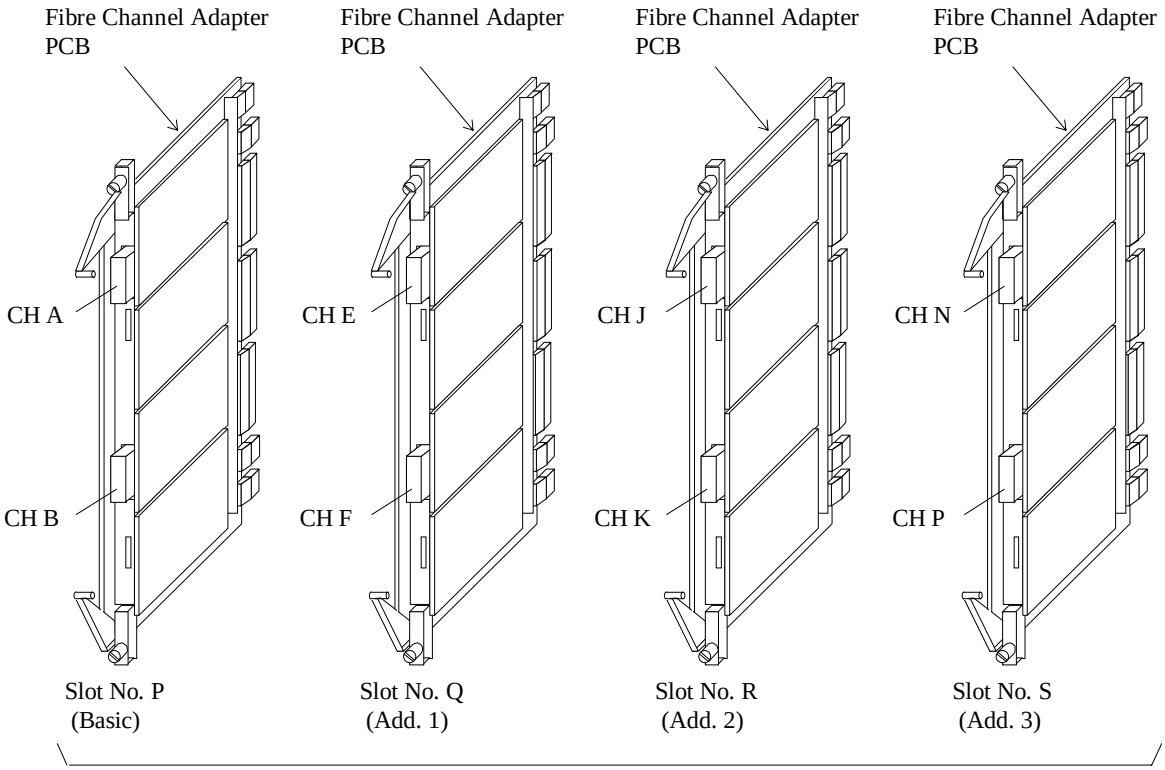
[4] Fibre Channel Interface



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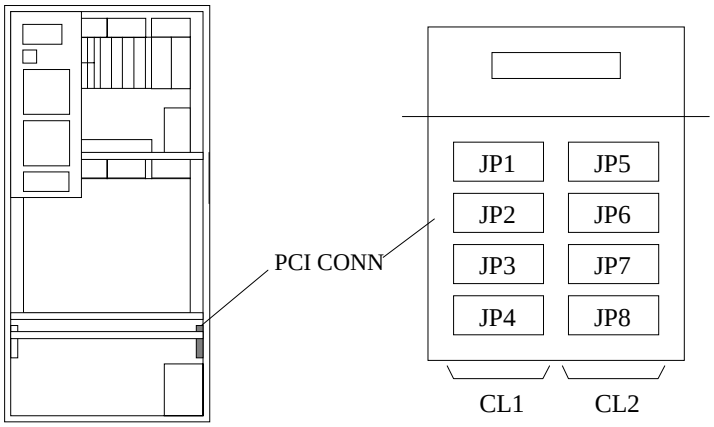
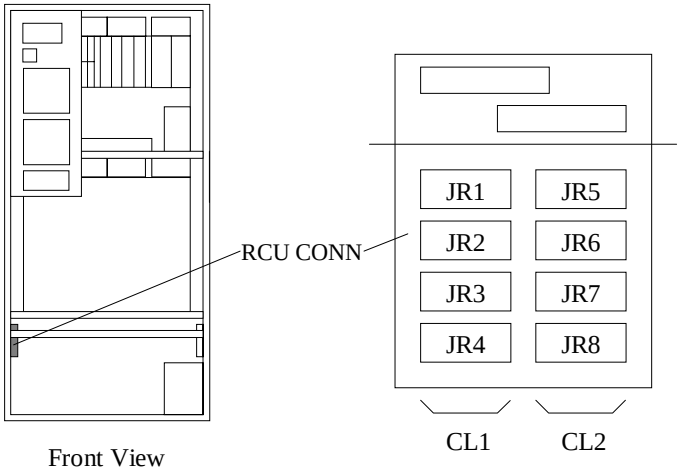
4.3 PCI Cabling



Front View
of DKC

4.4 RCU Cabling



Front View
of DKC

Connector No.	Enable/Disable Route
JR1	CL1 CH A, B
JR2	CL1 CH C, D
JR3	CL1 CH E, F
JR4	CL1 CH G, H
JR5	CL2 CH A, B
JR6	CL2 CH C, D
JR7	CL2 CH E, F
JR8	CL2 CH G, H

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5 Internal Cabling Block Diagram

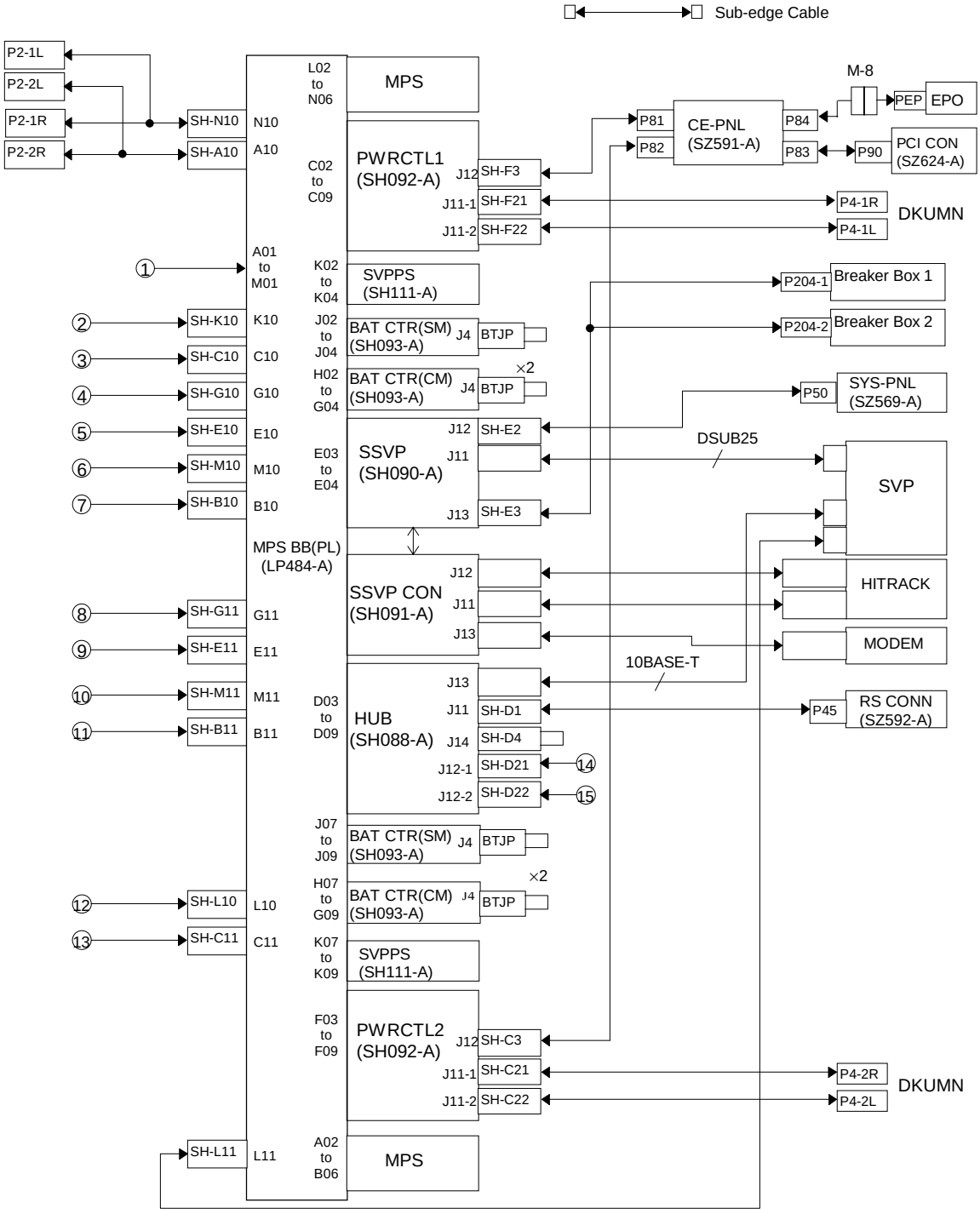

Fig. 5-1 Subsystem Internal Cabling Diagram ① (1/2)

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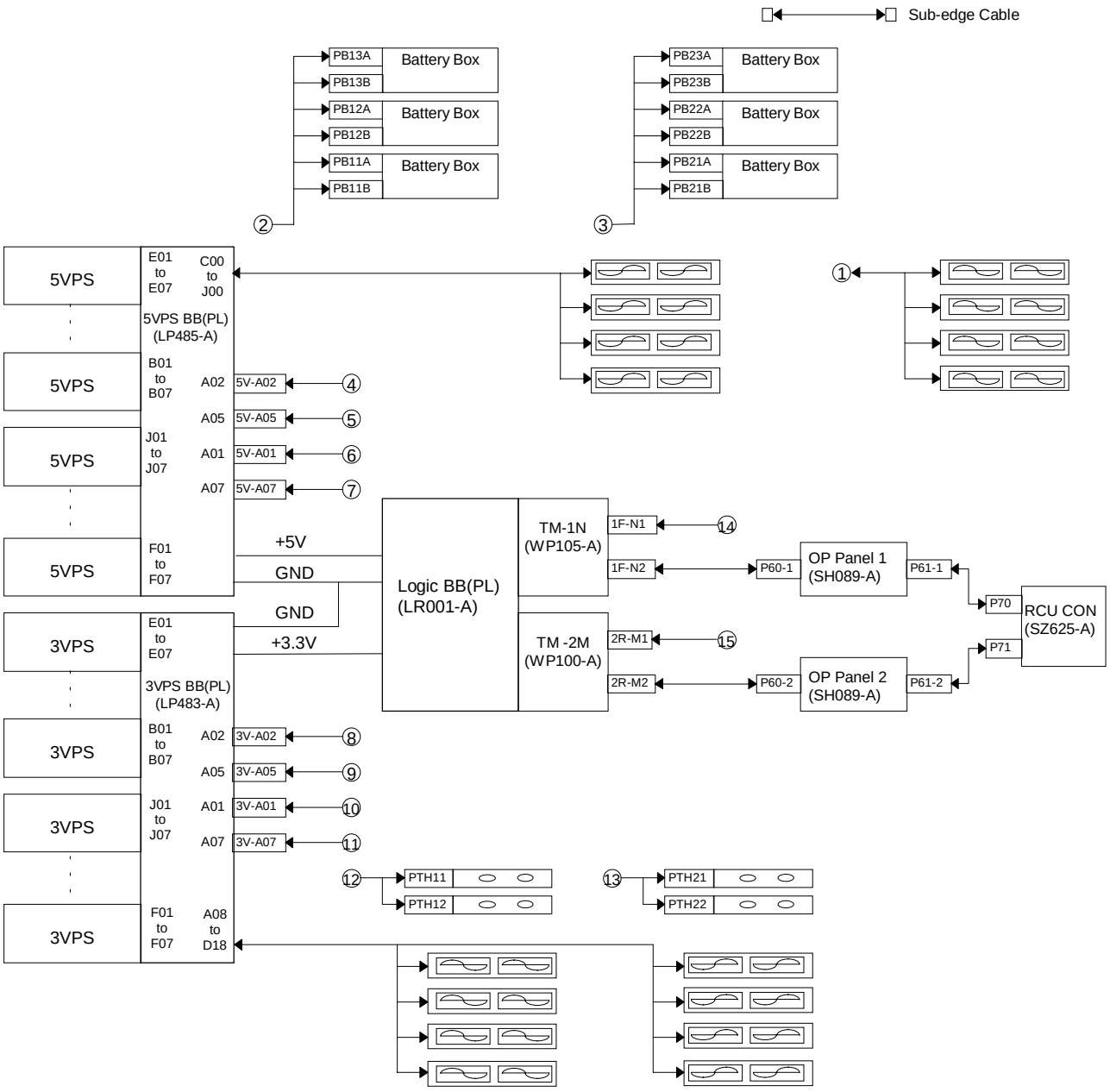

Fig. 5-2 Subsystem Internal Cabling Diagram ① (2/2)

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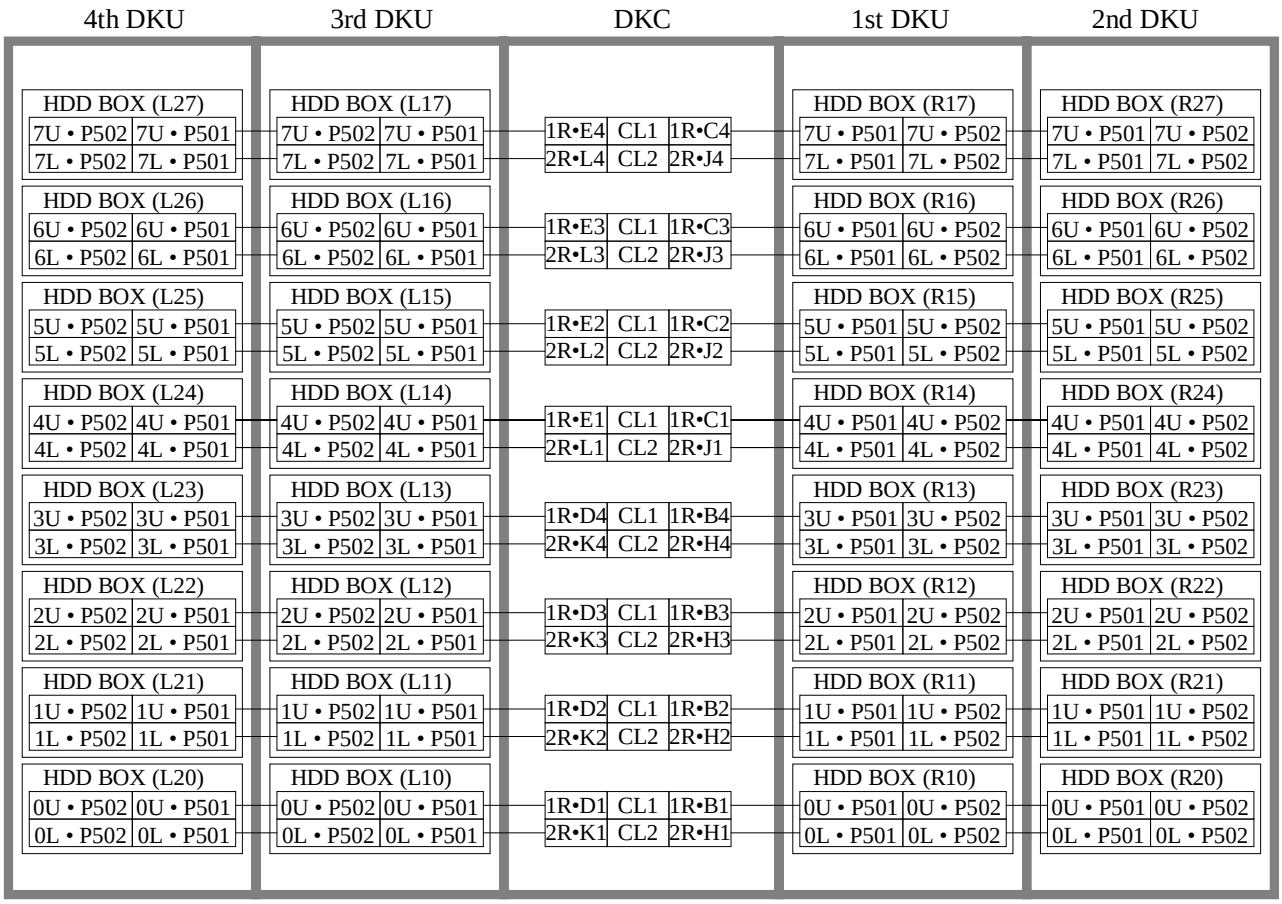

Fig. 5-3 Subsystem Internal Cabling Diagram ②

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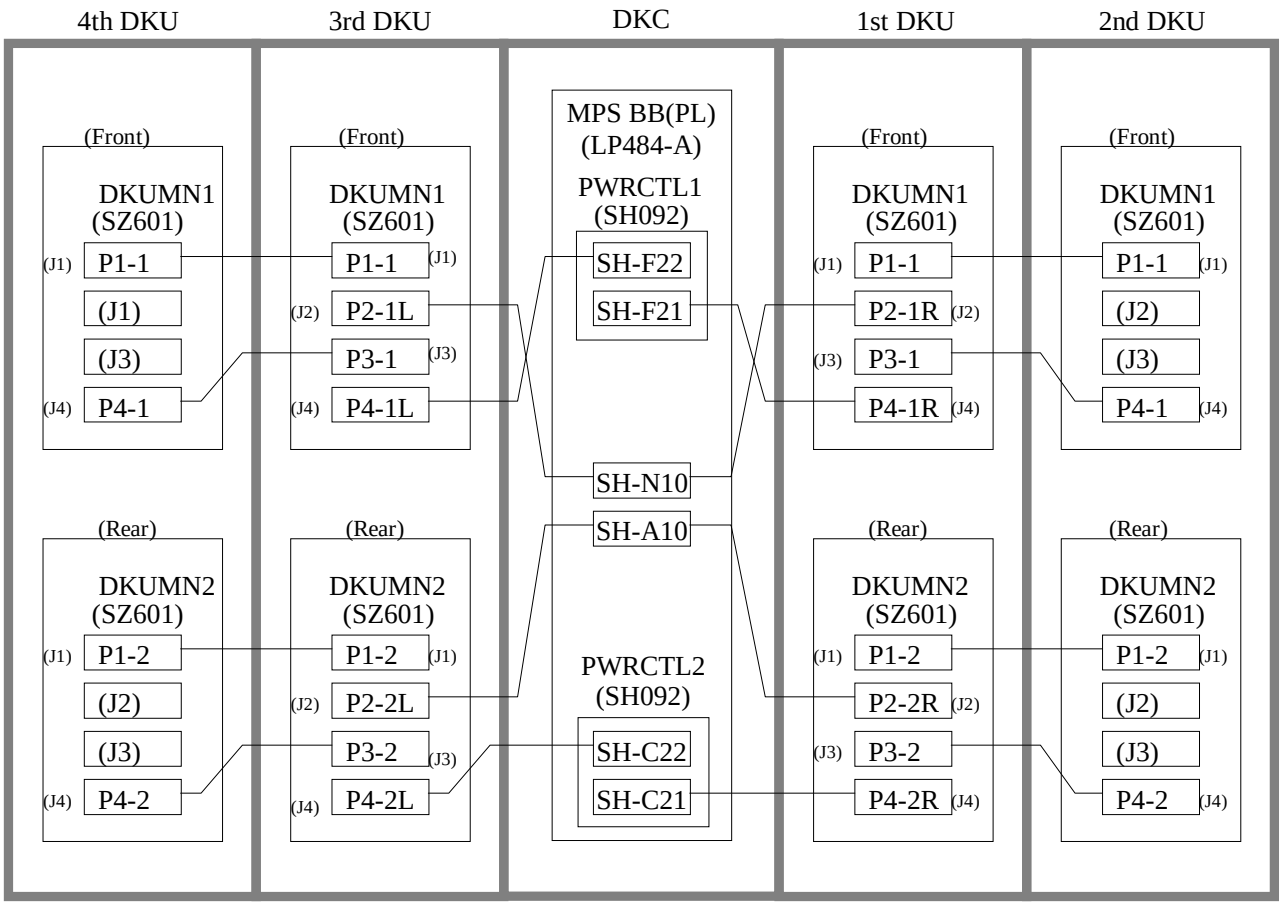

Fig. 5-4 Subsystem Internal Cabling Diagram ③

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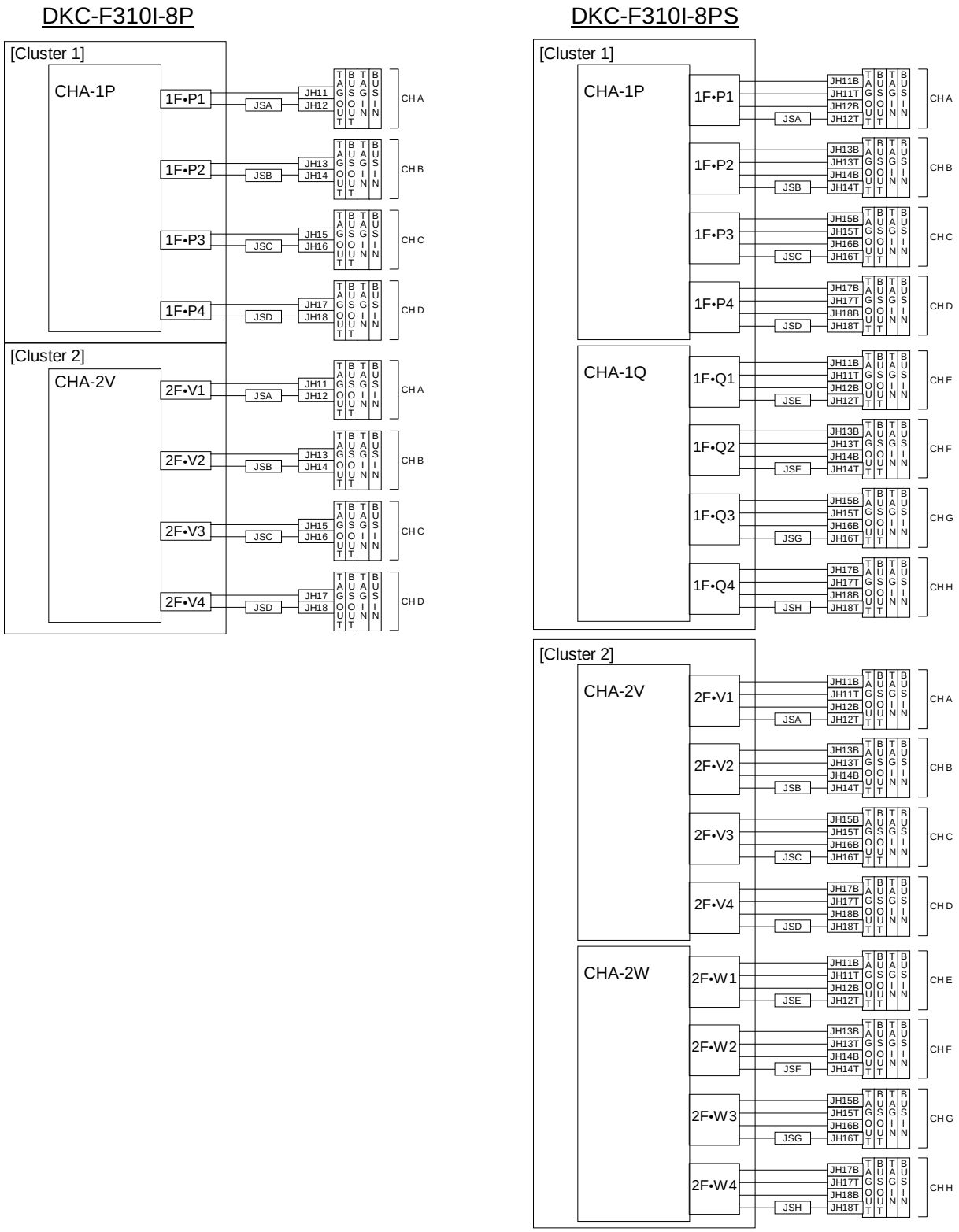

Fig. 5-5 Subsystem Internal Cabling Diagram ④

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DKC-F310I-4S/8S

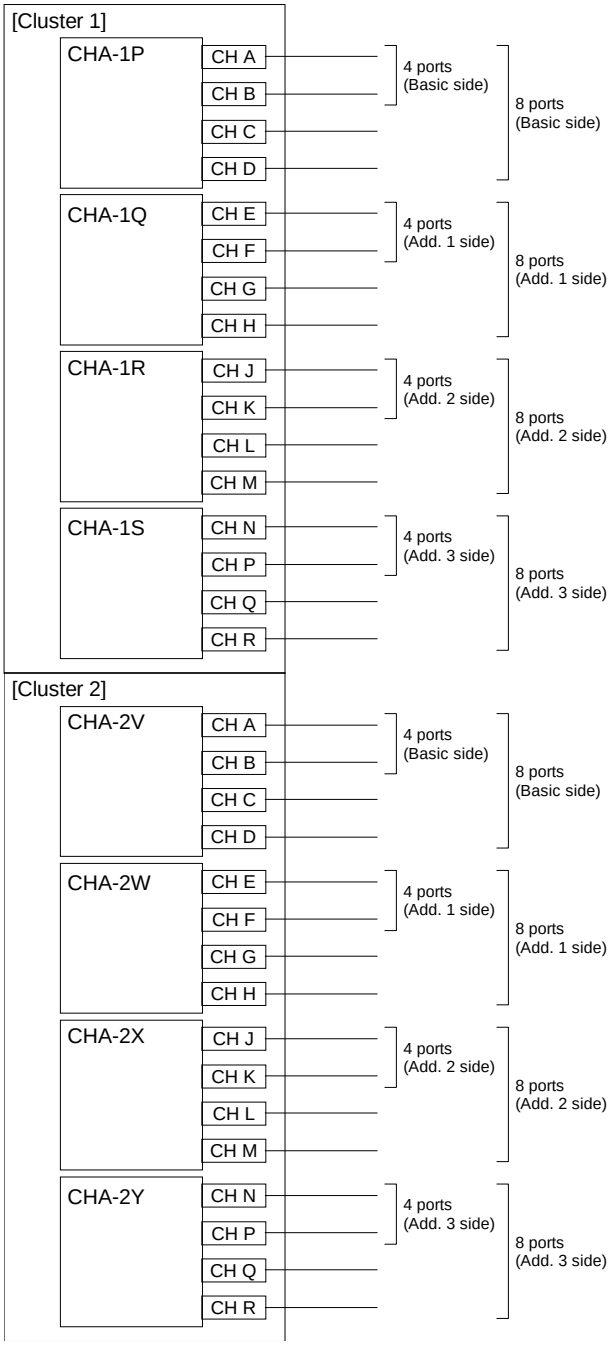

Fig. 5-6 Subsystem Internal Cabling Diagram ⑤

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DKC-F310I-8C

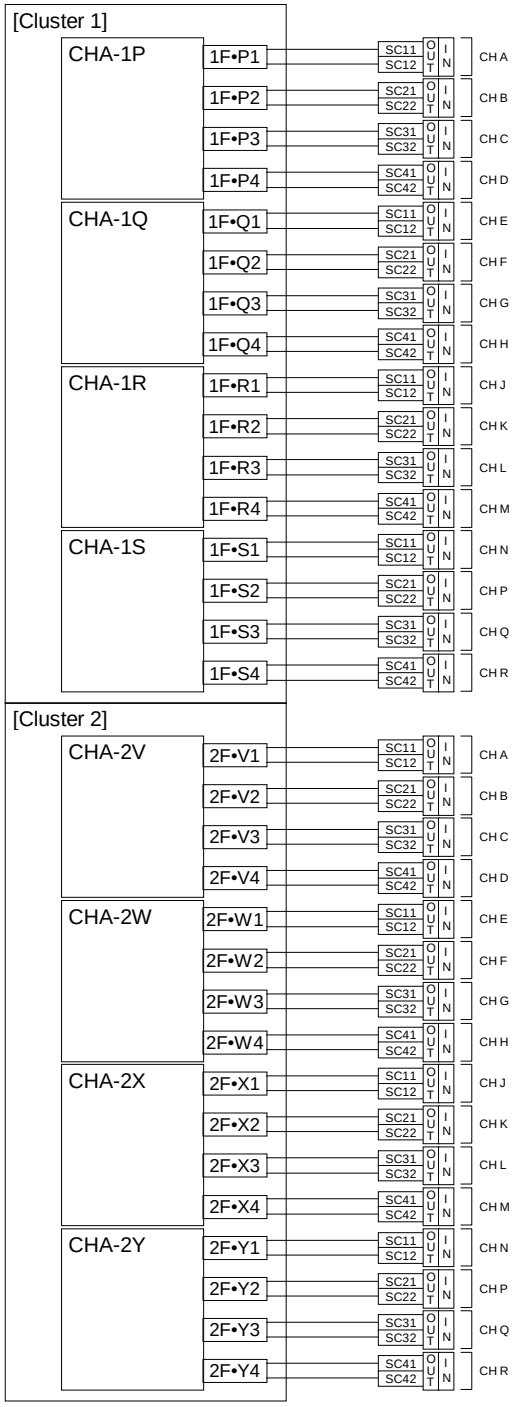

Fig. 5-7 Subsystem Internal Cabling Diagram ⑥

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6 Jumper Setting

6.1 Shut Down Jumpers

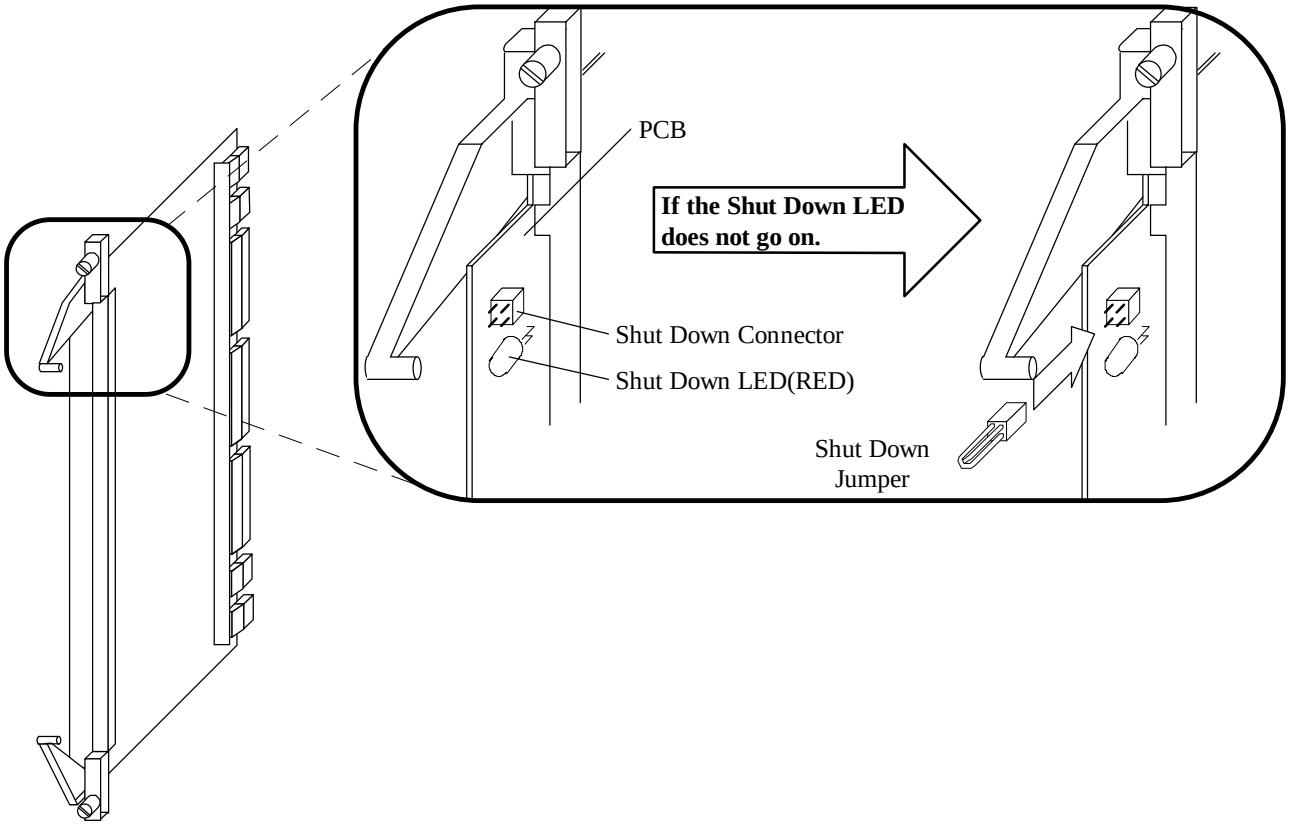
[1] Front or Rear Logic Box
Check that the Shut Down LED is turned on. If not, connect the Shut Down Jumper to the Shut Down Connector. (Only hot replace procedure)

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.

Table 6.1-1 Shut Down Jumpers List

No.	Function Name	Function	Remarks
1	Channel Adapter	Shut down jumper	
2	Disk Adapter		
3	Cache		
4	LTM		



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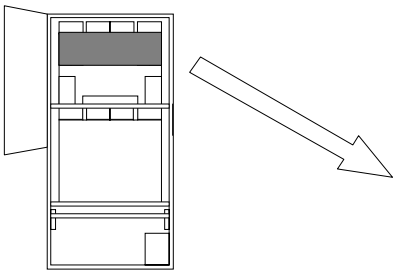
[2] Front PS Box

a. SVP PS

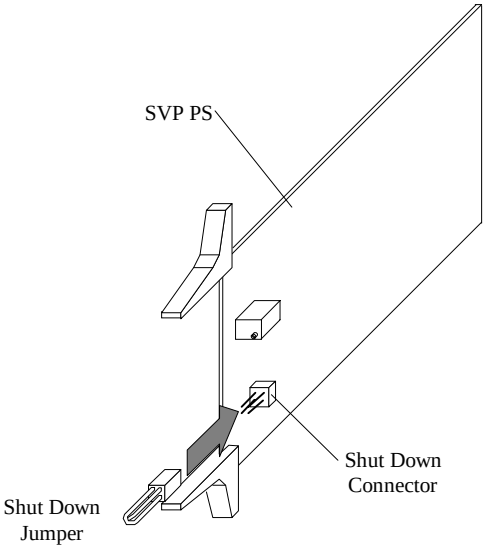
When replacing the SVP PS PCB, perform the replacement after blocking it forcibly by inserting the Shut Down Jumper regardless of turning on or off of the Shut Down LED.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



Front View of DKC



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTL 1	SSVP	HUB	PWR CTL 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

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6.2 Other Jumpers

Table 6.2 Jumper Stetting List

No.	Function Name	Jumper No.	Settings	Remarks
1	CE PANEL	JP1	EPO signal	
		JP2	EPO signal	
2	RS CONN	JP2	Termination	
3	BAT CTR	J4	Jumper connector (BTJP)	
4	PWRCTL	JP1	Alarm INH Jumper (AI)	
		JP2	Not used	
5	HUB	J14	CE Panel INH Jumper (SH-D4)	
6	SVP PS	JP1	Output Voltage	
7	Channel Adapter	JP1 - JP4	Priority	Parallel 8 Channel Switch Only
8	DKUMN	JP1	Specification of address number	
		JP3	Additional Platform for Canister mount	
9	HDU Box	JP01	Specification of SCSI ID	

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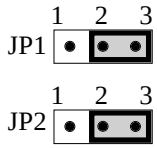
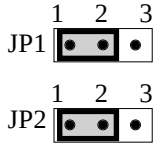
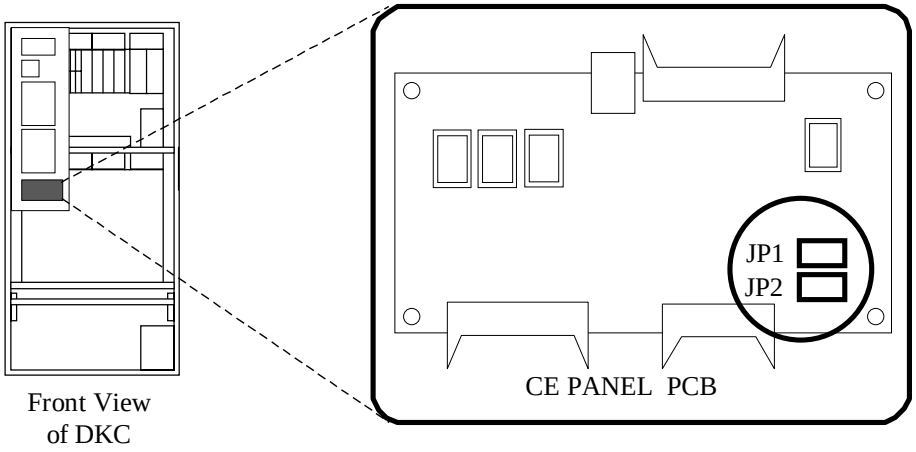
[1] CE PANEL

JP1, 2: EPO Signal

Setting	JP1 and JP2 Settings
When power is controlled from the host (at least one PCI cable attached to JP1-JP8 on PCI CONN PCB), set the jumpers as shown.	
When power is not controlled from the host, no PCI Cable attached to JP1-JP8 PCI CONN PCB or to disable the EPO of host, set the jumpers as shown.	



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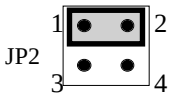
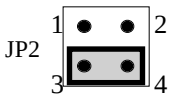
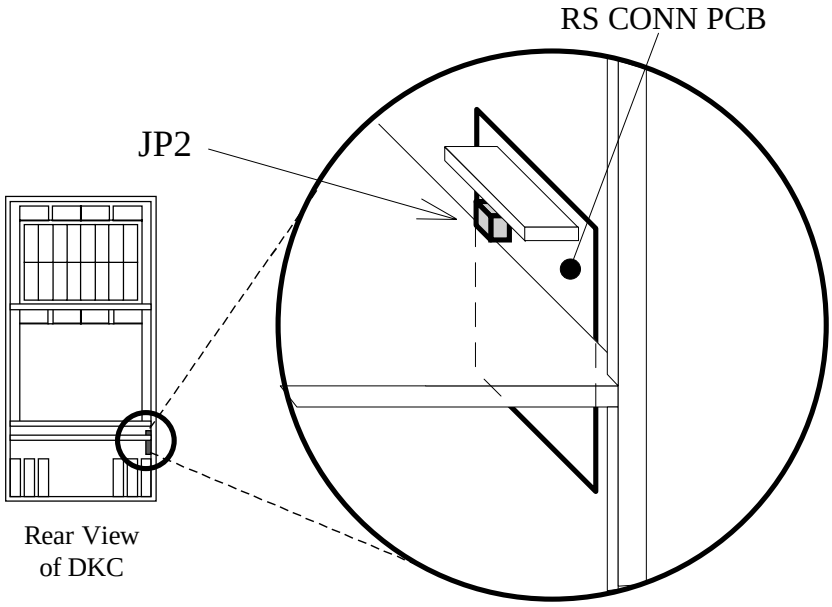
[2] RS CONN

JP2: Termination

Setting	JP2 Settings
This setting attaches terminator to RS-422.	
This setting detaches terminator to RS-422.	



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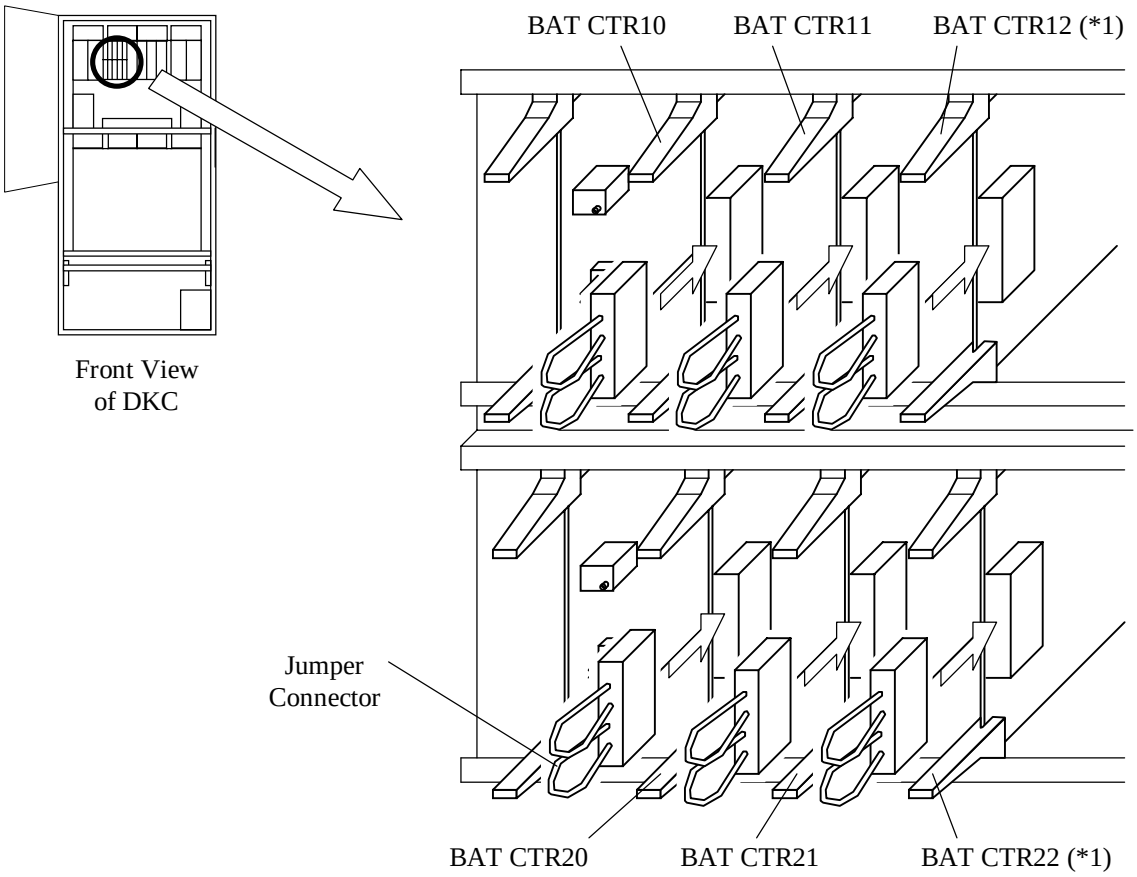
[3] BAT CTR

Set the jumper connectors shown below to make mounted batteries operative.

When the power is off over 48 hours.

Be sure to save the data in the cache and shared memories before disconnecting the jumper plugs.

Note: The data in the cache and shared memories is deleted when turning off the power and disconnecting the jumper plugs before saving the data.



*1 DKC-F310I-20

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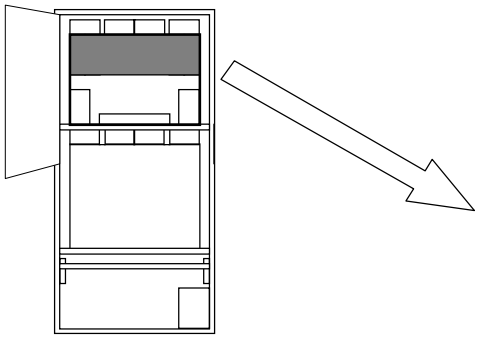
[4] PWRCTL

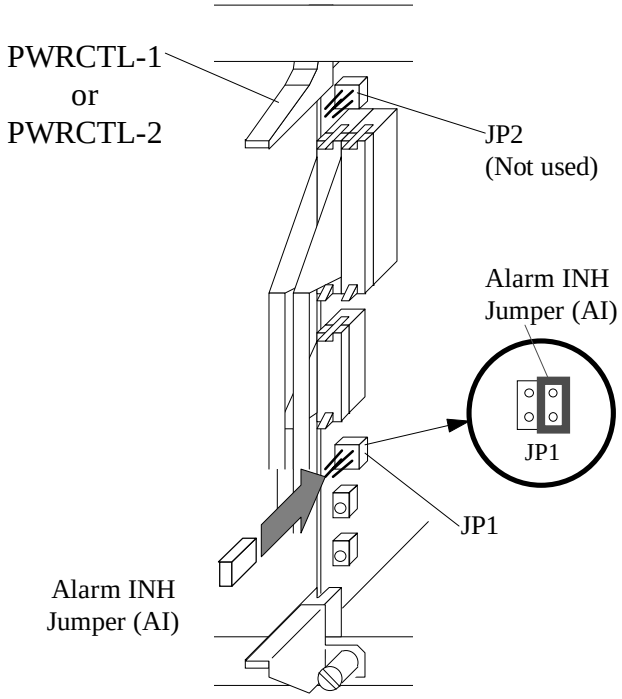
Function Name	Jumper No.	Setting	Remarks
PWRCTL-1	JP1	The voltage and thermal alarm signals are inhibited on the cluster1 by inserting alarm INH jumper.	Label : AI
	JP2	Not used	
PWRCTL-2	JP1	The voltage and thermal alarm signals are inhibited on the cluster2 by inserting alarm INH jumper.	Label : AI
	JP2	Not used	



Front View of DKC

Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWRCTL1	SSVP	HUB	PWRCTL2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						



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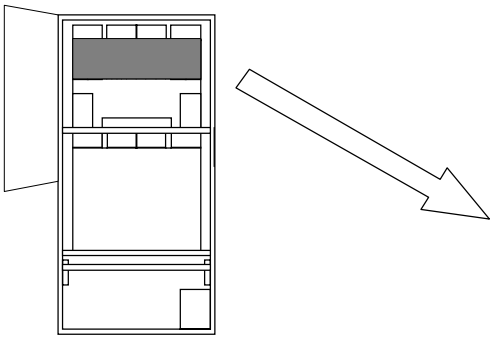
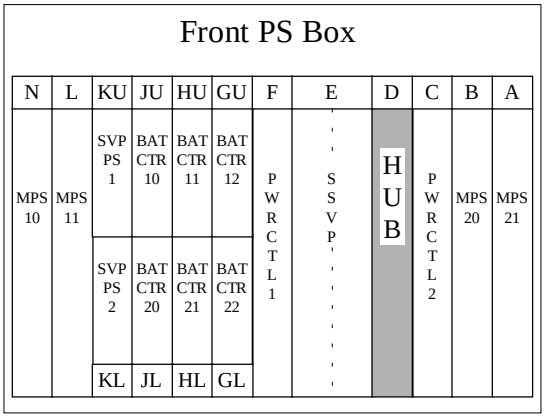
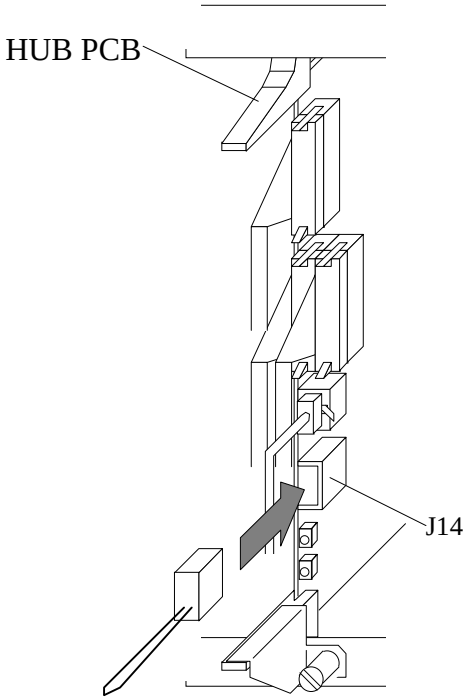
[5] HUB

Function Name	Jumper No.	Setting	Remarks
HUB	J14	The function of CE panel is inhibited by inserting CE panel INH jumper.	Label: SH-D4



Front View of DKC





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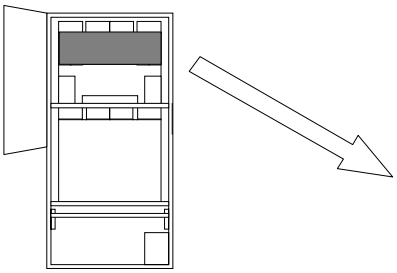
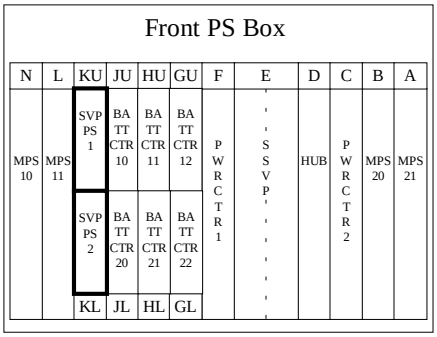
[6] SVP PS

JP1: Output Voltage

Function Name	Jumper No.	Setting	JP1 Setting
SVP PS 1 or SVP PS 2	JP1	By setting these jumper pins output voltage of the SVP PS PCB to be supplied to the SVP is determined.	JP1 3 1 6 4 9 7 12 10



Front View of DKC



SVP PS1 or SVP PS 2 (Parts Side)

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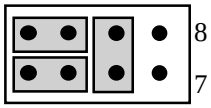
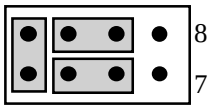
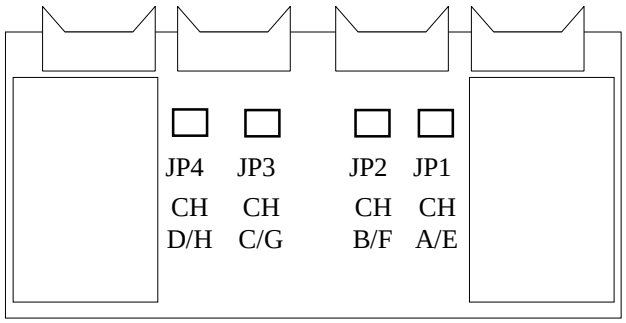
[7] CHANNEL ADAPTER (Parallel 8 Channel Switch)

JP1 - JP4: Priority

Setting	JP1-JP4 settings
Selected by SELECT OUT	
Selected by SELECT IN	



Channel Adapter PCB (Parallel 8 Channel Switch)

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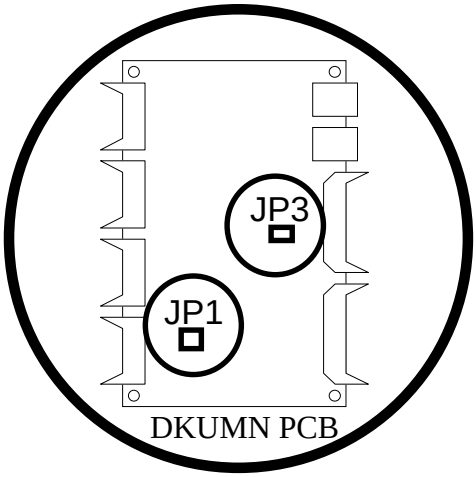
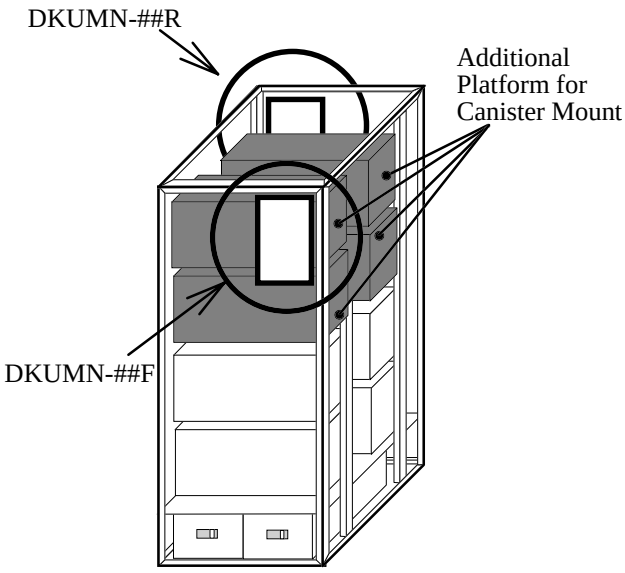
[8] DKUMN



DKUMN PCB



Front View

JP1: Specification of Address Number

DKUMN -R1F	Specification of Address Number	1st Disk Unit	Cluster : 1	∗10 12 JP1 1 3
DKUMN -R1R			Cluster : 2	∗10 12 JP1 1 3
DKUMN -R2F		2nd Disk Unit	Cluster : 1	∗10 12 JP1 1 3
DKUMN -R2R			Cluster : 2	∗10 12 JP1 1 3
DKUMN -L1F		3rd Disk Unit	Cluster : 1	∗10 12 JP1 1 3
DKUMN -L1R			Cluster : 2	∗10 12 JP1 1 3
DKUMN -L2F		4th Disk Unit	Cluster : 1	∗10 12 JP1 1 3
DKUMN -L2R			Cluster : 2	∗10 12 JP1 1 3

∗ #10 - #12: Reserved

JP3: Additional Platform for Canister Mount

DKUMN -##F	No Additional Platform for Canister Mount (DKU-F305I-B4) Installed (Four HDU Boxes)	Cluster : 1	JP3 4 1 6 3
DKUMN -##R		Cluster : 2	JP3 4 1 6 3
DKUMN -##F	Additional Platform for Canister Mount (DKU-F305I-B4) Installed (Eight HDU Boxes)	Cluster : 1	JP3 4 1 6 3
DKUMN -##R		Cluster : 2	JP3 4 1 6 3

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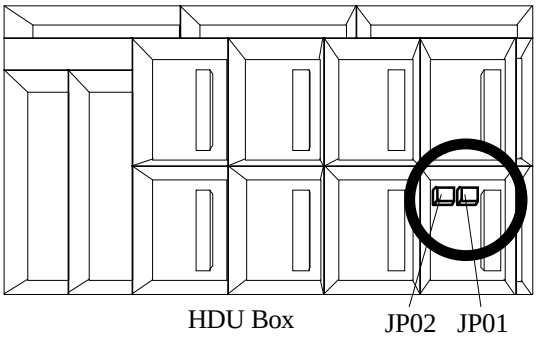
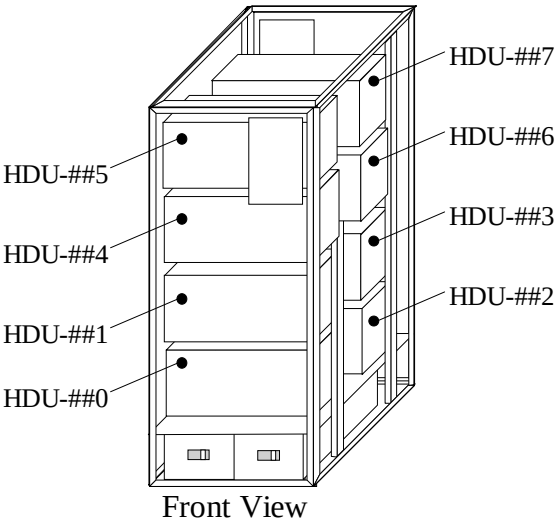
[9] HDU BOX

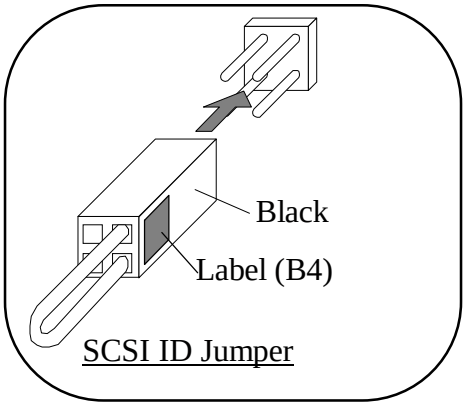
JP01, JP02: Specification of SCSI ID

HDU-R10 to R17 HDU-L10 to L17	Specification of SCSI ID	1st Disk Unit 3rd Disk Unit	JP02: 3 1 / 4 2	JP01: 3 1 / 4 2	SCSI ID: 8 to F
HDU-R20 to R27 HDU-L20 to L27		2nd Disk Unit 4th Disk Unit	JP02: 3 1 / 4 2	JP01: 3 1 / 4 2	SCSI ID: 0 to 6





Front View



SCSI ID Jumper

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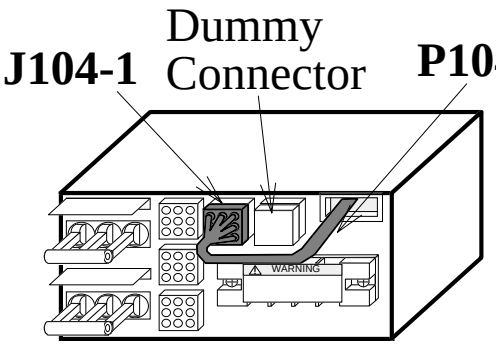
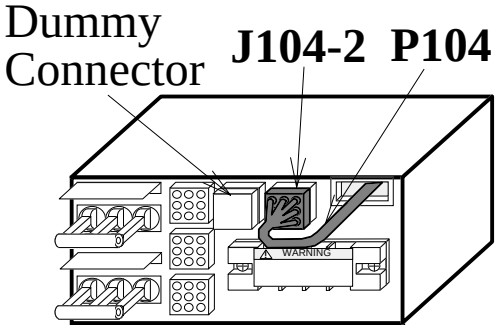
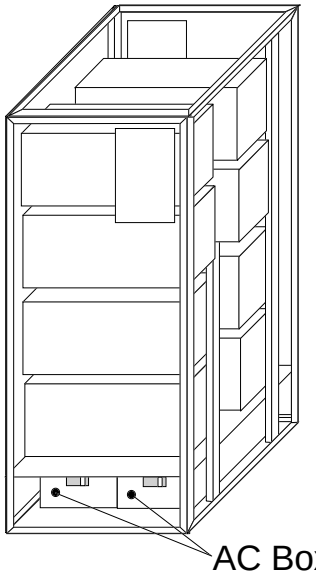
6.3 Voltage Selector

[1] AC BOX

P104: AC Input Voltage

AC Input Voltage	200 - 240 Vac		J104-2: dummy connector
	380 - 415 Vac		J104-1: dummy connector



Rear View

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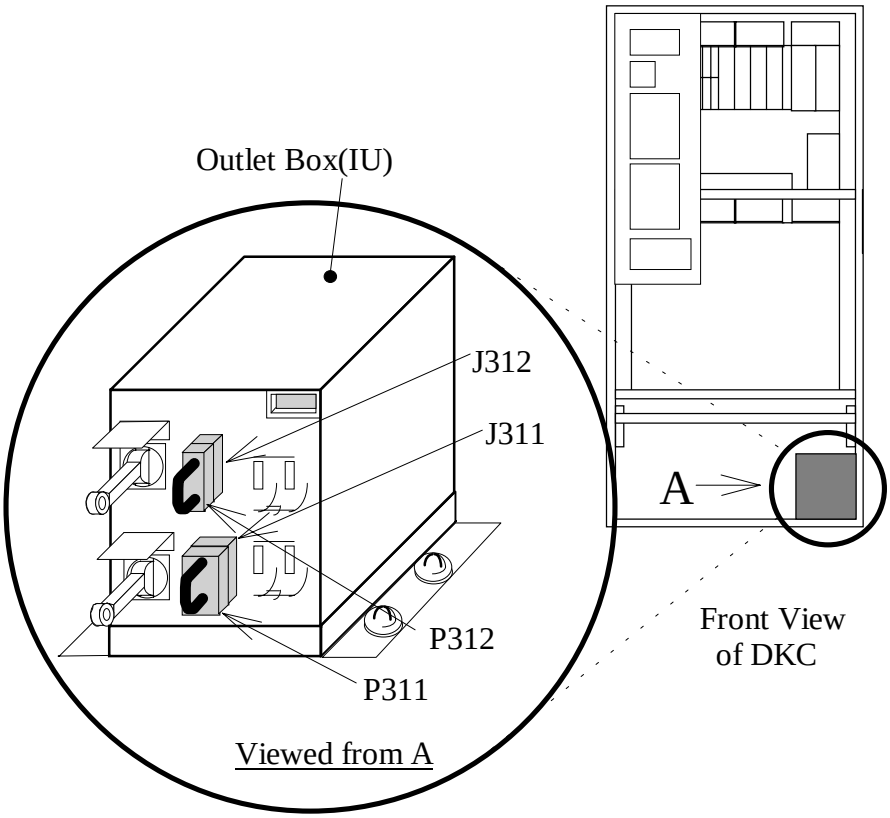
[2] OUTLET BOX

Input voltage 208-230 Vac (Outlet Box (IU)) ONLY

J311: AC Input Voltage
J312: AC Output Voltage

Input		Jumper Connectors		
Input Voltage	Frequency	J311	J312	Output Voltage
208 Vac	60 Hz	P311 208 V	P312 115 V	115 Vac
230 Vac		P311 230/400 V	P312 115 V	



Note : There is not Jumper setting of Outlet Box (IE).

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INSTALLATION SECTION

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1 Subsystem Configuration Outline

1.1 General Information

1.1.1 Model List

1. Model of DKC310I

Table 1.1.1-1 shows the model list of DKC310I.

Table 1.1.1-1 Model List of DKC310I

No	Model Number	Model Name	Major Part	Remarks
1	DKC310I-5	Disk Controller	• Breaker Box × 2 • LP483-A (3VPS-PL) • LP485-A (5VPS-PL) • LP484-A (MPS-PL) • +5V PS × 2 • +3V PS × 2 • Multi PS × 2 • FAN ASSY × 16 • SCSI Cable between DKC and 1st DKU • LR001-A (L/G-PL) • WP102-A (DKA) × 2 • WP108-A/WP118-A (CACHE) × 2 • WP100-A (TM2) × 1 • WP100-B (TM2) × 1 • WP105-A (TM1) × 1 • WP105-B (TM1) × 1	DKC310 Disk Controller doesn't contain channel switches, cache memory module and shared memory module. It is necessary to attach the following options according to the configuration. • Channel Adapters DKC-F310I-4S/8S/8P/ 8PS/8C/4F • Cache Memory Module DKC-F310I-256/1024 • Shared Memory Module DKC-F310I-32/128
2	DKC310I-5E	Disk Controller (Support of HMRCF)	• Breaker Box × 2 • LP483-A (3VPS-PL) • LP485-A (5VPS-PL) • LP484-A (MPS-PL) • +5V PS × 2 • +3V PS × 2 • Multi PS × 2 • FAN ASSY × 16 • SCSI Cable between DKC and 1st DKU • LR001-A (L/G-PL) • WP102-B/WP132-B (DKA) × 2 • WP108-A/WP118-A (CACHE) × 2 • WP100-A (TM2) × 1 • WP100-B (TM2) × 1 • WP105-A (TM1) × 1 • WP105-B (TM1) × 1	DKC310 Disk Controller doesn't contain channel switches, cache memory module and shared memory module. It is necessary to attach the following options according to the configuration. • Channel Adapters DKC-F310I-4S/8S/8P/ 8PS/8C/4F • Cache Memory Module DKC-F310I-256/1024 • Shared Memory Module DKC-F310I-32/128

(To be continued)

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(Continued from the preceding page)

No	Model Number	Model Name	Major Part	Remarks
3	DKC-F310I-20	Additional Cache Board	• WP108-B/WP118-B (CACHE) × 2 • Battery ASSY × 2 • BATT CTR (SH093-A) × 2	Required for cache capacity of more than 2 GB or 8 GB.
4	DKC-F310I-256	Additional Cache Memory Module (256 MB)	• SH024-A (32 MB)	
5	DKC-F310I-1024	Additional Cache Memory Module (1024 MB)	• SH100-A (128 MB)	
6	DKC-F310I-32	Additional Shared Memory Module (32 MB)	• SH024-B (16 MB)	
7	DKC-F310I-128	Additional Shared Memory Module (128 MB)	• SH100-B (64 MB)	
8	DKC-F310I-50	Additional Disk Adapter	• WP102-A (DKA) × 2	
9	DKC-F310I-50E	Additional Disk Adapter	• WP102-B/WP132-B (DKA) × 2	Support of HMRCF
10	DKC-F310I-4S	Serial 4-port Adapter	• SH086/149-A (MP) × 2 WP207/217-B (2-port) × 2 • I/F Con. Panel	
11	DKC-F310I-8S	Serial 8-port Adapter	• SH086/149-A (MP) × 4 WP207/217-A (4-port) × 2 • I/F Con. Panel	
12	DKC-F310I-8P	Parallel 8CH Switch (Previous I/F Connector)	• SH086/149-B (MP) × 2 WP209-A (4CH) × 2 • I/F Con. Panel (1) • Internal Cable (1)	
13	DKC-F310I-8PS	Parallel 8CH Switch (Shrink I/F Connector)	• SH086/149-B (MP) × 2 WP209-A (4CH) × 2 • I/F Con. Panel (2) • Internal Cable (2)	
14	DKC-F310I-8C	SCSI 8-port Adapter	• SH086/149-C (MP) × 4 WP204/214-A (4 SCSI) × 2 • I/F Con. Panel • Internal Cable	
15	DKC-F310I-4F	Fibre 4-port Adapter for Optical Cable	• SH086/149-D (MP) × 2 SH113-A (LC) × 2 WP206-A (2 port) × 2 • I/F Con. Panel (1)	
16	DKC-F310I-80	CL Additional Power Supply	• +5V PS × 2 • +3V PS × 2	This model must be installed when installing three or more channel options.
17	DKC-F310I-81	CL Redundant Power Supply	• +5V PS × 2 • +3V PS × 2 • Multi PS × 2	
18	DKC-F310I-82	CL Additional Redundant Power Supply	• +5V PS × 2 • +3V PS × 2	
19	DKC-F310I-18	PCI I/F Connector	• PCI I/F Con.	
20	DKC-F310I-19	RCU I/F Connector	• RCU I/F Con.	
21	DKC-F310I-M80	Backup/Restore Function for Multi-Platform	• Floppy Disk	

(To be continued)

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(Continued from the preceding page)

No	Model Number	Model Name	Major Part	Remarks
22	DKC-F310I-M81	Dynamic Cache Resident Feature	• Floppy Disk	
23	DKC-F310I-M82	Customized Volume Size Feature	• Floppy Disk	
24	DKC-F310I-M83	Hitachi Multiple RAID Coupling Facility Feature	• Floppy Disk	Support of HMRCF
25	—	Outlet Box	• Outlet Box (IE Type) • Outlet Box (IU Type)	This is Special Tool. (See to PARTS07-10.)
26	DKC-F310I-4FE	Fibre 4-port Adapter for Optical Cable	• SH086/149-D (MP) × 2 SH160-A (LC) × 2 WP206-B (2 port) × 2 • I/F Con. Panel	
27	DKC-F310I-4GS	Fibre 4-port Adapter for Short Wavelength	• SH164-A (MP) WP256-A (LC) × 2 • I/F Con. Panel	
28	DKC-F310I-4GL	Fibre 4-port Adapter for Long Wavelength	• SH164-A (MP) WP256-B (LC) × 2 • I/F Con. Panel	

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2. Model of DKU305I

Table 1.1.1-2 shows the model list of DKU305I.

Table 1.1.1-2 Model List of DKU305I

No	Model Number	Model Name	Major Part	Remarks
1	DKU305IU-14 DKU305IE-14 (DKU305I-14)	Disk Unit	• AC Box × 2 • AC Cable • Input Power Cable • SZ601-A × 2 • HDU Box × 4 • LP481-A × 4 • SH087-A × 8 • FAN ASSY × 12 • 5/12V PS × 8	The basic part of Disk Unit has no HDD canister.
2	DKU-F305I-B4	Platform for Canister Mount	• HDU Box × 4 • LP481-A × 4 • SH087-A × 8 • FAN ASSY × 12 • 5/12V PS × 8	
3	DKU-F305I-3C	DEV I/F Cable (1)	• SCSI Cable × 16	DKC ↔ 3rd DKU
4	DKU-F305I-24C	DEV I/F Cable (2)	• SCSI Cable × 16	1st DKU ↔ 2nd DKU or 3rd DKU ↔ 4th DKU
5	DKU-F305I-6F4	4 HDD Canisters	• DK3F1-60 × 4	
6	DKU-F305I-6F1	1 HDD Canister	• DK3F1-60 × 1	
7	DKU-F305I-907	7 HDD Canisters	• DK308/309-90 × 7	
8	DKU-F305I-904	4 HDD Canisters	• DK308/309-90 × 4	
9	DKU-F305I-901	1 HDD Canister	• DK308/309-90 × 1	
10	DKU-F305I-1804	4 HDD Canisters	• DK309/30A-180 × 4	
11	DKU-F305I-1801	1 HDD Canister	• DK309/30A-180 × 1	
12	DKU-F305I-9F1	1 HDD Canister	• DK3F2-90 × 1	
13	DKU-F305I-9F4	4 HDD Canisters	• DK3F2-90 × 4	
14	DKU-F305I-15F4	4 HDD Canisters	• DK3F2-150 × 4	
15	DKU-F305I-15F1	1 HDD Canister	• DK3F2-150 × 1	
16	DKU-F305I-3604	4 HDD Canisters	• DK30A-360 × 4	
17	DKU-F305I-3601	1 HDD Canister	• DK30A-360 × 1	
18	DKU-F305I-18J4	4 HDD Canisters	• DKR2B-J18SC × 4	
19	DKU-F305I-18J1	1 HDD Canister	• DKR2B-J18SC × 1	
20	DKU-F305I-47J4	4 HDD Canisters	• DKR1B-J47SC × 4	
21	DKU-F305I-47J1	1 HDD Canister	• DKR1B-J47SC × 1	
22	DKU-F305I-56	Hz Conversion Kit (50 Hz → 60 Hz)	• Input Power Cable • Nameplate (IE → IU)	
23	DKU-F305I-65	Hz Conversion Kit (60 Hz → 50 Hz)	• Input Power Cable • Nameplate (IU → IE)	

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SVP displays each drive model as the following table.

Disk drive model	SVP screen
DK309-180	DK309-18
DK3F1-60	DK3F1-06
DK3F2-150	DK3F2-15
DK30A-360	DK30A-36
DK3F2-90	DK3F2-09
DK30A-180	DK30A-18
DKR2B-J18SC	DKR2B-J18
DKR1B-J47SC	DKR1B-J47

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1.1.2 Cache / Shared memory capacity and number of necessary options

1.1.2.1 Cache memory capacity and number of necessary options

There are two types of cache memory: SH024-A (16 Mbit DRAM) and SH100-A (64 Mbit DRAM). Cache memory capacities and corresponding number of options required are shown in Table 1.1.2-1.

Table 1.1.2-1 Cache memory capacity and number of necessary options

Cache memory capacity (MB)	Configuration with SH024-A only		Configuration with SH100-A only	
	DKC-F310I-256	DKC-F310I-20	DKC-F310I-1024	DKC-F310I-20
256	1	0	-	-
512	2	0	-	-
768	3	0	-	-
1,024	4	0	1	0
1,280	5	0	-	-
1,536	6	0	-	-
1,792	7	0	-	-
2,048	8	0	2	0
2,304	9	1	-	-
2,560	10	1	-	-
2,816	11	1	-	-
3,072	12	1	3	0
3,328	13	1	-	-
3,584	14	1	-	-
3,840	15	1	-	-
4,096	16	1	4	0
5,120	-	-	5	0
6,144	-	-	6	0
7,168	-	-	7	0
8,192	-	-	8	0
9,216	-	-	9	1
10 GB	-	-	10	1
11 GB	-	-	11	1
12 GB	-	-	12	1
13 GB	-	-	13	1
14 GB	-	-	14	1
15 GB	-	-	15	1
16 GB	-	-	16	1

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1.1.2.2 Shared memory capacity and number of necessary options

There are two types of shared memory: SH024-B (16Mbit DRAM) and SH100-B (64Mbit DRAM). Shared memory capacities and corresponding number of options required are shown in Table 1.1.2-2.

Table 1.1.2-2 Shared memory capacity and number of necessary options

Shared Memory capacity	Configuration with SH100-B	Configuration with mixture of SH024-B and SH100-B	
	DKC-F310I-128	DKC-F310I-32	DKC-F310I-128
256MB	2	4	1
384MB	3	-	-
512MB	4	-	-

In the table above, shared memory capacities corresponding column(s) to which is filled up with hyphen(s) ("-") cannot be set.

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1.1.2.3 Relation between Shared Memory and Cache Memory

The relation between the Shared Memory capacity and the Cache Memory capacity is shown below.

Table 1.1.2-3 Sizes of Cache Memory and Shared Memory
(In the case that one or two CUs are installed)

Item. No	Cache Memory capacity	Number of Configuration with DKC-F310I-128			
		BASIC	DK30A-360	MRCF (64 pairs or more)	TPF
1	256 MB to 4GB	2 sets (256 MB)	2 sets (256 MB)	3 sets (384 MB)	3 sets or 4 sets *1
2	5 GB	2 sets (256 MB)	2 sets (256 MB)	3 sets (384 MB)	3 sets or 4 sets *1
3	6 GB	2 sets (256 MB)	2 sets (256 MB)	3 sets (384 MB)	3 sets or 4 sets *1
4	7 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	3 sets or 4 sets *1
5	8 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	3 sets or 4 sets *1
6	9 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
7	10 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
8	11 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
9	12 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
10	13 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
11	14 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
12	15 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
13	16 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)

Table 1.1.2-4 Sizes of Cache Memory and Shared Memory
(In the case that three or four CUs are installed)

Item No.	Cache Memory capacity	Number of Configuration with DKC-F310I-128			
		BASIC	DK30A-360	MRCF (64 pairs or more)	TPF
1	256 MB to 4 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	3 sets or 4 sets *1
2	5 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	3 sets or 4 sets *1
3	6 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
4	7 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
5	8 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
6	9 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
7	10 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
8	11 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
9	12 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
10	13 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
11	14 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
12	15 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
13	16 GB	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)

*1 : The number of sets of the shared memory (DKC-F310I-128) required when supporting the TPF is that obtained by adding one to each number of sets required for the BASIC, DK30A-360, or MRCF (64 pairs or more).

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Table 1.1.2-5 Sizes of Cache Memory and Shared Memory
(In the case that one or two CUs are installed)

Item. No	Cache Memory capacity	Number of Configuration with DKC-F310I-128			
		BASIC	DKR1B-J47	MRCF (64 pairs or more)	TPF
1	256 MB to 1 GB	2 sets (256 MB)	2 sets (256 MB)	3 sets (384 MB)	3 sets or 4 sets *1
2	2 GB	2 sets (256 MB)	2 sets (256 MB)	3 sets (384 MB)	3 sets or 4 sets *1
3	3 GB	2 sets (256 MB)	2 sets (256 MB)	3 sets (384 MB)	3 sets or 4 sets *1
4	4 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
5	5 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
6	6 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
7	7 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
8	8 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
9	9 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
10	10 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
11	11 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
12	12 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
13	13 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
14	14 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
15	15 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
16	16 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)

Table 1.1.2-6 Sizes of Cache Memory and Shared Memory
(In the case that three or four CUs are installed)

Item No.	Cache Memory capacity	Number of Configuration with DKC-F310I-128			
		BASIC	DKR1B-J47	MRCF (64 pairs or more)	TPF
1	256 MB to 1 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	3 sets or 4 sets *1
2	2 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
3	3 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
4	4 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
5	5 GB	2 sets (256 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
6	6 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
7	7 GB	3 sets (384 MB)	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)
8	8 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
9	9 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
10	10 GB	3 sets (384 MB)	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)
11	11 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
12	12 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
13	13 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
14	14 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
15	15 GB	3 sets (384 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)
16	16 GB	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)	4 sets (512 MB)

*1 : The number of sets of the shared memory (DKC-F310I-128) required when supporting the TPF is that obtained by adding one to each number of sets required for the BASIC, DKR1B-J47, or MRCF (64 pairs or more).

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1.1.3 Disk capacity and number of necessary options

1.1.3.1 9GB HDD, RAID5 (RAID UNIT: 6D + 1P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.1-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.1-1.

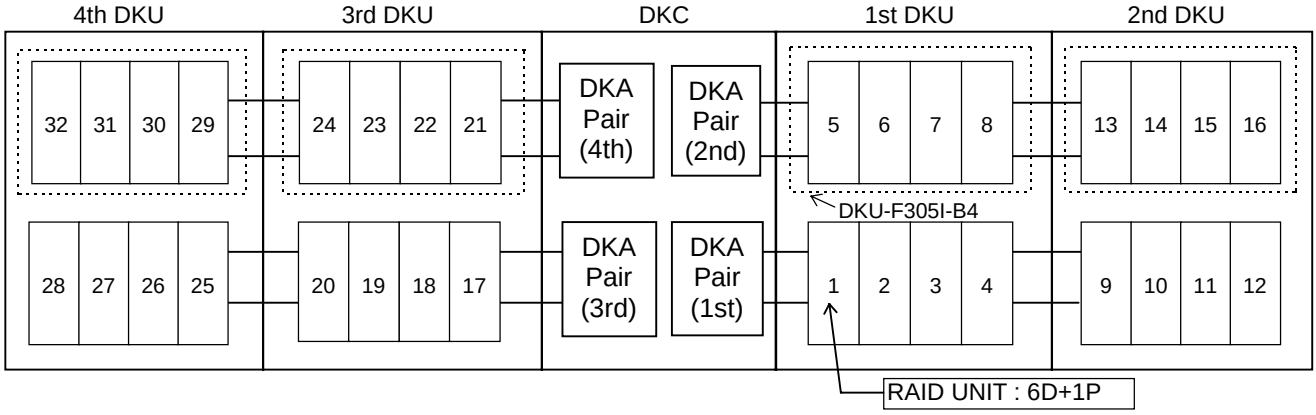

Fig. 1.1.3.1-1 Order of Adding RAID Unit(s) (For RAID5 using 9GB HDDs)

Table 1.1.3.1-1 Disk capacity and number of necessary options (9GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-907	F305I-3C	F305I-24C
45.0	16		2		4	1		1		1		
90.0	32		2		4	1		1		2		
135.0	48		2		4	1		1		3		
180.0	64		3		4	1		1		4		
225.0	80		3		4	1	1	1	1	5		
270.0	96		4		4	1	1	1	1	6		
315.0	112		4		4	1	1	1	1	7		
360.0	128		6		4	1	1	1	1	8		
405.0	144		6		4	1	1	2	1	9		1
450.0	160		8		4	1	1	2	1	10		1
495.0	176		8		4	1	1	2	1	11		1
540.0	192		8		4	1	1	2	1	12		1
585.0	208	1	10		4	1	1	2	2	13		1
630.0	224	1	10		4	1	1	2	2	14		1
675.0	240	1	12		4	1	1	2	2	15		1
720.0	256	1	12		4	1	1	2	2	16		1
765.0	272	1	14		4	1	2	3	2	17	1	1
810.0	288	1	14		4	1	2	3	2	18	1	1
855.0	304	1	16		4	1	2	3	2	19	1	1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-907	F305I-3C	F305I-24C
900.0	320	1	16		4	1	2	3	2	20	1	1
945.0	336	1	0	5	4	1	3	3	3	21	1	1
990.0	352	1	0	5	4	1	3	3	3	22	1	1
1,035.0	368	1	0	5	4	1	3	3	3	23	1	1
1,080.0	384	1	0	5	4	1	3	3	3	24	1	1
1,125.0	400	1	0	6	0	3	3	4	3	25	1	2
1,170.0	416	1	0	6	0	3	3	4	3	26	1	2
1,215.0	432	1	0	6	0	3	3	4	3	27	1	2
1,260.0	448	1	0	6	0	3	3	4	3	28	1	2
1,305.0	464	1	0	7	0	3	3	4	4	29	1	2
1,350.0	480	1	0	7	0	3	3	4	4	30	1	2
1,395.0	496	1	0	7	0	3	3	4	4	31	1	2
1,440.0	512	1	0	7	0	3	3	4	4	32	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

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1.1.3.2 18GB HDD, RAID5 (RAID UNIT: 3D + 1P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.2-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.2-1 and Table 1.1.3.2-2.

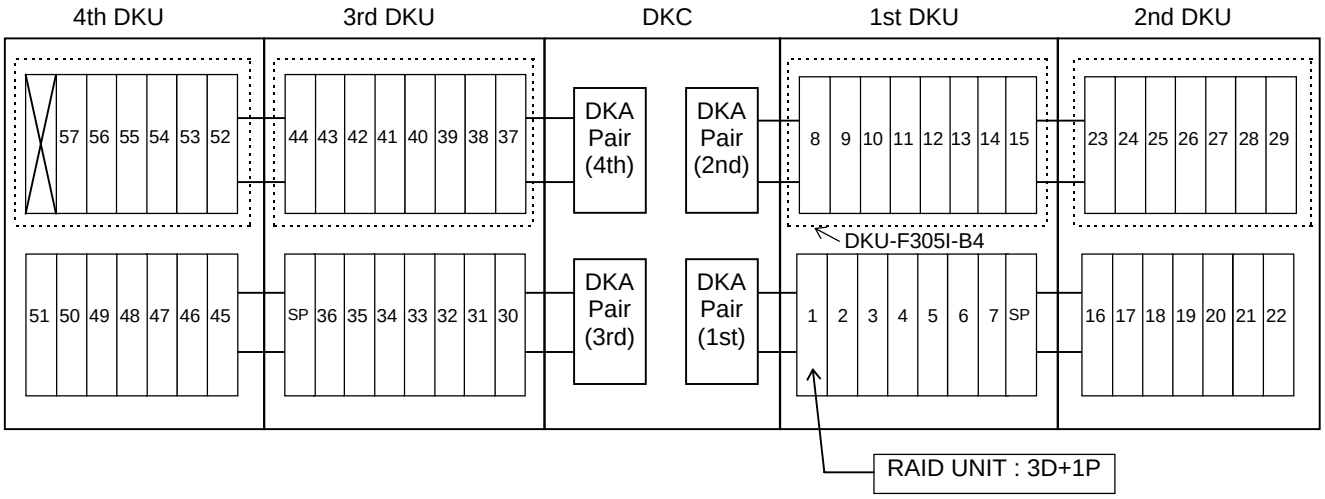

Fig. 1.1.3.2-1 Order of Adding RAID Unit(s) (For RAID5 using 18GB HDDs)

Table 1.1.3.2-1 Disk capacity and number of necessary options for Large Storage (18GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-1804	F305I-3C	F305I-24C
51.0	18		2		4	1		1		1		
102.0	36		2		4	1		1		2		
153.0	54		2		4	1		1		3		
204.0	72		2		4	1		1		4		
255.0	90		2		4	1		1		5		
306.0	108		2		4	1		1		6		
357.0	126		3		4	1		1		7		
408.0	144		3		4	1	1	1	1	8		
459.0	162		3		4	1	1	1	1	9		
510.0	180		4		4	1	1	1	1	10		
561.0	198		4		4	1	1	1	1	11		
612.0	216		4		4	1	1	1	1	12		
663.0	234		4		4	1	1	1	1	13		
714.0	252		6		4	1	1	1	1	14		
765.0	270		6		4	1	1	1	1	15		
816.0	288		6		4	1	1	2	1	16		1
867.0	306		6		4	1	1	2	1	17		1
918.0	324		8		4	1	1	2	1	18		1
969.0	342		8		4	1	1	2	1	19		1

(To be continued.)

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Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-1804	F305I-3C	F305I-24C
1,020.0	360		8		4	1	1	2	1	20		1
1,071.0	378		8		4	1	1	2	1	21		1
1,122.0	396		8		4	1	1	2	1	22		1
1,173.0	414	1	10		4	1	1	2	2	23		1
1,224.0	432	1	10		4	1	1	2	2	24		1
1,275.0	450	1	10		4	1	1	2	2	25		1
1,326.0	468	1	12		4	1	1	2	2	26		1
1,377.0	486	1	12		4	1	1	2	2	27		1
1,428.0	504	1	12		4	1	1	2	2	28		1
1,479.0	522	1	12		4	1	1	2	2	29		1
1,530.0	540	1	14		4	1	2	3	2	30	1	1
1,581.0	558	1	14		4	1	2	3	2	31	1	1
1,632.0	576	1	14		4	1	2	3	2	32	1	1
1,683.0	594	1	16		4	1	2	3	2	33	1	1
1,734.0	612	1	16		4	1	2	3	2	34	1	1
1,785.0	630	1	16		4	1	2	3	2	35	1	1
1,836.0	648	1	16		4	1	2	3	2	36	1	1
1,887.0	666	0	0	5	4	1	3	3	3	37	1	1
1,938.0	684	0	0	5	4	1	3	3	3	38	1	1
1,989.0	702	0	0	5	4	1	3	3	3	39	1	1
2,040.0	720	0	0	5	4	1	3	3	3	40	1	1
2,091.0	738	0	0	5	4	1	3	3	3	41	1	1
2,142.0	756	0	0	5	4	1	3	3	3	42	1	1
2,193.0	774	0	0	5	4	1	3	3	3	43	1	1
2,244.0	792	0	0	5	4	1	3	3	3	44	1	1
2,295.0	810	0	0	6	0	3	3	4	3	45	1	2
2,346.0	828	0	0	6	0	3	3	4	3	46	1	2
2,397.0	846	0	0	6	0	3	3	4	3	47	1	2
2,448.0	864	0	0	6	0	3	3	4	3	48	1	2
2,499.0	882	0	0	6	0	3	3	4	3	49	1	2
2,550.0	900	0	0	6	0	3	3	4	3	50	1	2
2,601.0	918	0	0	6	0	3	3	4	3	51	1	2
2,652.0	936	0	0	7	0	3	3	4	4	52	1	2
2,703.0	954	0	0	7	0	3	3	4	4	53	1	2
2,754.0	972	0	0	7	0	3	3	4	4	54	1	2
2,805.0	990	0	0	7	0	3	3	4	4	55	1	2
2,856.0	1,008	0	0	7	0	3	3	4	4	56	1	2
2,901.0	1,024	0	0	7	0	3	3	4	4	57	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

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Table 1.1.3.2-2 Disk capacity and number of necessary options for Standard Storage (18GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-1804	F305I-3C	F305I-24C
51.0	18		2		4	1		1		1		
102.0	36		2		4	1		1		2		
153.0	54		3		4	1		1		3		
204.0	72		3		4	1		1		4		
255.0	90		4		4	1		1		5		
306.0	108		4		4	1		1		6		
357.0	126		6		4	1		1		7		
408.0	144		6		4	1	1	1	1	8		
459.0	162		8		4	1	1	1	1	9		
510.0	180		8		4	1	1	1	1	10		
561.0	198	1	10		4	1	1	1	1	11		
612.0	216	1	10		4	1	1	1	1	12		
663.0	234	1	12		4	1	1	1	1	13		
714.0	252	1	12		4	1	1	1	1	14		
765.0	270	1	14		4	1	1	1	1	15		
816.0	288	1	14		4	1	1	2	1	16		1
867.0	306	1	16		4	1	1	2	1	17		1
918.0	324	1	16		4	1	1	2	1	18		1
969.0	342	0	0	5	4	1	1	2	1	19		1
1,020.0	360	0	0	5	4	1	1	2	1	20		1
1,071.0	378	0	0	5	4	1	1	2	1	21		1
1,122.0	396	0	0	5	4	1	1	2	1	22		1
1,173.0	414	0	0	6	0	3 **	1	2	2	23		1
1,224.0	432	0	0	6	0	3 **	1	2	2	24		1
1,275.0	450	0	0	6	0	3 **	1	2	2	25		1
1,326.0	468	0	0	7	0	3 **	1	2	2	26		1
1,377.0	486	0	0	7	0	3 **	1	2	2	27		1
1,428.0	504	0	0	7	0	3 **	1	2	2	28		1
1,479.0	522	0	0	7	0	3	1	2	2	29		1
1,530.0	540	0	0	8	0	3	2	3	2	30	1	1
1,581.0	558	0	0	8	0	3	2	3	2	31	1	1
1,632.0	576	0	0	8	0	3	2	3	2	32	1	1
1,683.0	594	0	0	8	0	3	2	3	2	33	1	1
1,734.0	612	0	0	8	0	3	2	3	2	34	1	1
1,785.0	630	0	0	8	0	3	2	3	2	35	1	1
1,836.0	648	0	0	8	0	3	2	3	2	36	1	1
1,887.0	666	0	0	8	0	3	3	3	3	37	1	1
1,938.0	684	0	0	8	0	3	3	3	3	38	1	1
1,989.0	702	0	0	8	0	3	3	3	3	39	1	1
2,040.0	720	0	0	8	0	3	3	3	3	40	1	1
2,091.0	738	0	0	8	0	3	3	3	3	41	1	1
2,142.0	756	0	0	8	0	3	3	3	3	42	1	1
2,193.0	774	0	0	8	0	3	3	3	3	43	1	1
2,244.0	792	0	0	8	0	3	3	3	3	44	1	1
2,295.0	810	0	0	8	0	3	3	4	3	45	1	2
2,346.0	828	0	0	8	0	3	3	4	3	46	1	2

(To be continued.)

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Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-1804	F305I-3C	F305I-24C
2,397.0	846	0	0	8	0	3	3	4	3	47	1	2
2,448.0	864	0	0	8	0	3	3	4	3	48	1	2
2,499.0	882	0	0	8	0	3	3	4	3	49	1	2
2,550.0	900	0	0	8	0	3	3	4	3	50	1	2
2,601.0	918	0	0	8	0	3	3	4	3	51	1	2
2,652.0	936	0	0	8	0	3	3	4	4	52	1	2
2,703.0	954	0	0	8	0	3	3	4	4	53	1	2
2,754.0	972	0	0	8	0	3	3	4	4	54	1	2
2,805.0	990	0	0	8	0	3	3	4	4	55	1	2
2,856.0	1,008	0	0	8	0	3	3	4	4	56	1	2
2,901.0	1,024	0	0	8	0	3	3	4	4	57	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.3.3 6GB HDD, RAID5 (RAID UNIT: 3D + 1P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.3-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.3-1.

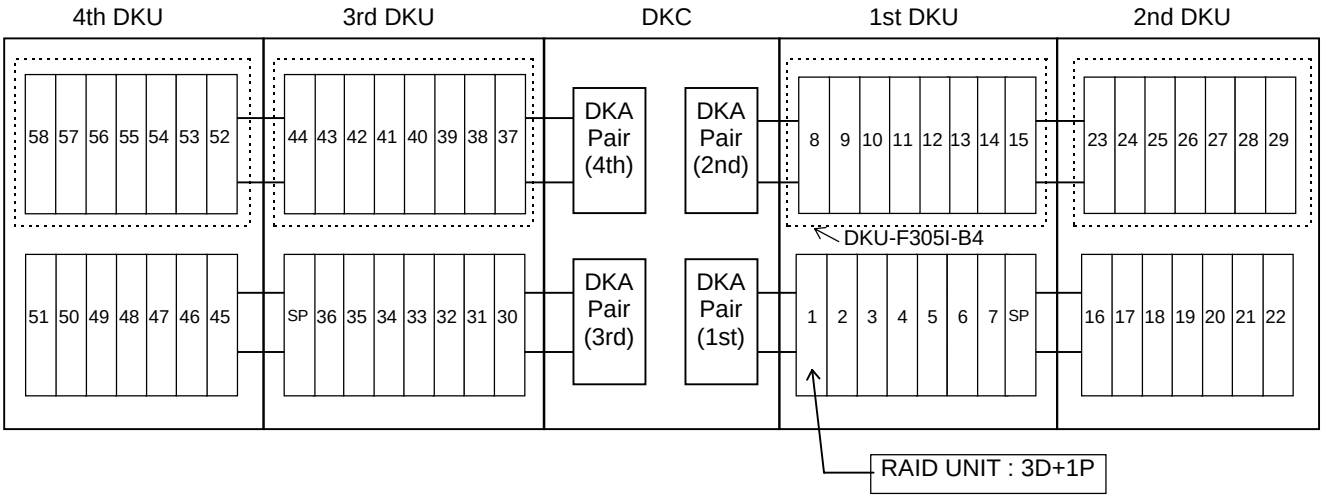

Fig. 1.1.3.3-1 Order of Adding RAID Unit(s) (For RAID5 using 6GB HDDs)

Table 1.1.3.3-1 Disk capacity and number of necessary options
(6GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-6F4	F305I-3C	F305I-24C
17.0	6		2		4	1		1		1		
34.0	12		2		4	1		1		2		
51.0	18		2		4	1		1		3		
68.0	24		2		4	1		1		4		
85.0	30		2		4	1		1		5		
102.0	36		2		4	1		1		6		
119.0	42		2		4	1		1		7		
136.0	48		2		4	1	1	1	1	8		
153.0	54		2		4	1	1	1	1	9		
170.0	60		2		4	1	1	1	1	10		
187.0	66		2		4	1	1	1	1	11		
204.0	72		3		4	1	1	1	1	12		
221.0	78		3		4	1	1	1	1	13		
238.0	84		3		4	1	1	1	1	14		
255.0	90		3		4	1	1	1	1	15		
272.0	96		4		4	1	1	2	1	16		1
289.0	102		4		4	1	1	2	1	17		1
306.0	108		4		4	1	1	2	1	18		1
323.0	114		4		4	1	1	2	1	19		1
340.0	120		4		4	1	1	2	1	20		1

(To be continued.)

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Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-6F4	F305I-3C	F305I-24C
357.0	126		6		4	1	1	2	1	21		1
374.0	132		6		4	1	1	2	1	22		1
391.0	138		6		4	1	1	2	2	23		1
408.0	144		6		4	1	1	2	2	24		1
425.0	150		6		4	1	1	2	2	25		1
442.0	156		8		4	1	1	2	2	26		1
459.0	162		8		4	1	1	2	2	27		1
476.0	168		8		4	1	1	2	2	28		1
493.0	174		8		4	1	1	2	2	29		1
510.0	180		8		4	1	2	3	2	30	1	1
527.0	186		8		4	1	2	3	2	31	1	1
544.0	192		8		4	1	2	3	2	32	1	1
561.0	198		8		4	1	2	3	2	33	1	1
578.0	204	1	10		4	1	2	3	2	34	1	1
595.0	210	1	10		4	1	2	3	2	35	1	1
612.0	216	1	10		4	1	2	3	2	36	1	1
629.0	222	1	10		4	1	3	3	3	37	1	1
646.0	228	1	10		4	1	3	3	3	38	1	1
663.0	234	1	12		4	1	3	3	3	39	1	1
680.0	240	1	12		4	1	3	3	3	40	1	1
697.0	246	1	12		4	1	3	3	3	41	1	1
714.0	252	1	12		4	1	3	3	3	42	1	1
731.0	258	1	12		4	1	3	3	3	43	1	1
748.0	264	1	12		4	1	3	3	3	44	1	1
765.0	270	1	14		4	1	3	4	3	45	1	2
782.0	276	1	14		4	1	3	4	3	46	1	2
799.0	282	1	14		4	1	3	4	3	47	1	2
816.0	288	1	14		4	1	3	4	3	48	1	2
833.0	294	1	14		4	1	3	4	3	49	1	2
850.0	300	1	16		4	1	3	4	3	50	1	2
867.0	306	1	16		4	1	3	4	3	51	1	2
884.0	312	1	16		4	1	3	4	4	52	1	2
901.0	318	1	16		4	1	3	4	4	53	1	2
918.0	324	1	16		4	1	3	4	4	54	1	2
935.0	330	1	16		4	1	3	4	4	55	1	2
952.0	336	0	0	5	4	1	3	4	4	56	1	2
969.0	342	0	0	5	4	1	3	4	4	57	1	2
986.0	348	0	0	5	4	1	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

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1.1.3.4 High Speed 9GB HDD, RAID5 (RAID UNIT: 3D + 1P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.4-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.4-1.

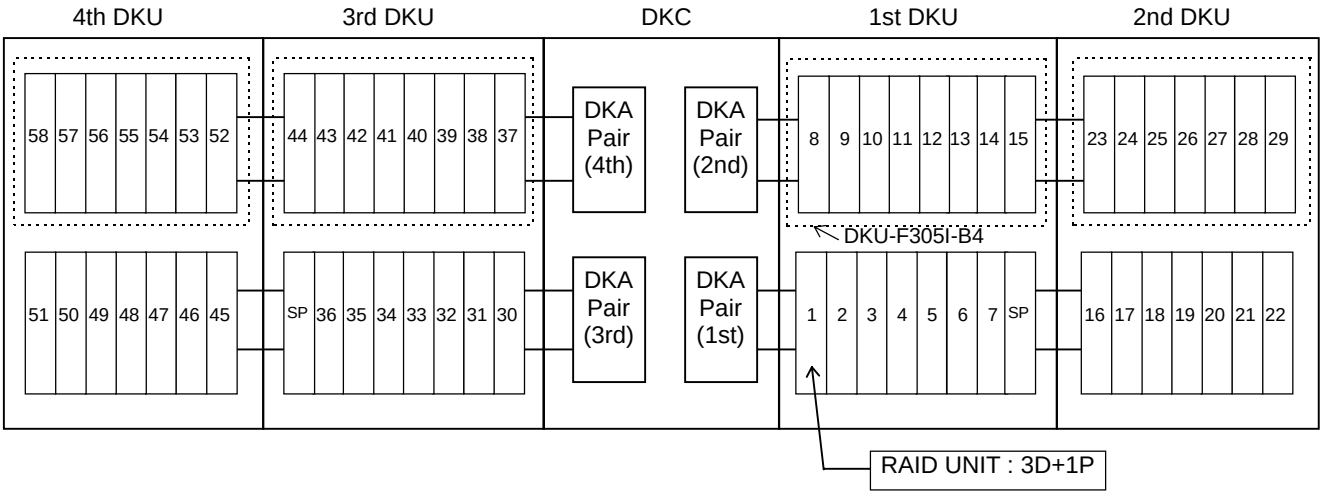

Fig. 1.1.3.4-1 Order of Adding RAID Unit(s) (For RAID5 using High Speed 9GB HDDs)

Table 1.1.3.4-1 Disk capacity and number of necessary options
(High Speed 9GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-9F4	F305I-3C	F305I-24C
25.5	9		2		4	1		1		1		
51.0	18		2		4	1		1		2		
76.5	27		2		4	1		1		3		
102.0	36		2		4	1		1		4		
127.5	45		2		4	1		1		5		
153.0	54		2		4	1		1		6		
178.5	63		2		4	1		1		7		
204.0	72		3		4	1	1	1	1	8		
229.5	81		3		4	1	1	1	1	9		
255.0	90		4		4	1	1	1	1	10		
280.5	99		4		4	1	1	1	1	11		
306.0	108		4		4	1	1	1	1	12		
331.5	117		4		4	1	1	1	1	13		
357.0	126		4		4	1	1	1	1	14		
382.5	135		6		4	1	1	1	1	15		
408.0	144		6		4	1	1	2	1	16		1
433.5	153		6		4	1	1	2	1	17		1
459.0	162		6		4	1	1	2	1	18		1
484.5	171		8		4	1	1	2	1	19		1
510.0	180		8		4	1	1	2	1	20		1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-9F4	F305I-3C	F305I-24C
535.5	189		8		4	1	1	2	1	21		1
561.0	198	1	10		4	1	1	2	1	22		1
586.5	207	1	10		4	1	1	2	2	23		1
612.0	216	1	10		4	1	1	2	2	24		1
637.5	225	1	10		4	1	1	2	2	25		1
663.0	234	1	12		4	1	1	2	2	26		1
688.5	243	1	12		4	1	1	2	2	27		1
714.0	252	1	12		4	1	1	2	2	28		1
739.5	261	1	14		4	1	1	2	2	29		1
765.0	270	1	14		4	1	2	3	2	30	1	1
790.5	279	1	14		4	1	2	3	2	31	1	1
816.0	288	1	14		4	1	2	3	2	32	1	1
841.5	297	1	16		4	1	2	3	2	33	1	1
867.0	306	1	16		4	1	2	3	2	34	1	1
892.5	315	1	16		4	1	2	3	2	35	1	1
918.0	324	0	0	5	4	1	2	3	2	36	1	1
943.5	333	0	0	5	4	1	3	3	3	37	1	1
969.0	342	0	0	5	4	1	3	3	3	38	1	1
994.5	351	0	0	5	4	1	3	3	3	39	1	1
1,020.0	360	0	0	5	4	1	3	3	3	40	1	1
1,045.5	369	0	0	5	4	1	3	3	3	41	1	1
1,071.0	378	0	0	5	4	1	3	3	3	42	1	1
1,096.5	387	0	0	5	4	1	3	3	3	43	1	1
1,122.0	396	0	0	5	4	1	3	3	3	44	1	1
1,147.5	405	0	0	6	0	3 **	3	4	3	45	1	2
1,173.0	414	0	0	6	0	3 **	3	4	3	46	1	2
1,198.5	423	0	0	6	0	3 **	3	4	3	47	1	2
1,224.0	432	0	0	6	0	3 **	3	4	3	48	1	2
1,249.5	441	0	0	6	0	3 **	3	4	3	49	1	2
1,275.0	450	0	0	6	0	3 **	3	4	3	50	1	2
1,300.5	459	0	0	6	0	3 **	3	4	3	51	1	2
1,326.0	468	0	0	7	0	3 **	3	4	4	52	1	2
1,351.5	477	0	0	7	0	3 **	3	4	4	53	1	2
1,377.0	486	0	0	7	0	3 **	3	4	4	54	1	2
1,402.5	495	0	0	7	0	3 **	3	4	4	55	1	2
1,428.0	504	0	0	7	0	3 **	3	4	4	56	1	2
1,453.5	513	0	0	7	0	3	3	4	4	57	1	2
1,479.0	522	0	0	7	0	3	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.3.5 High Speed 15GB HDD, RAID5 (RAID UNIT: 3D + 1P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.5-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.5-1.

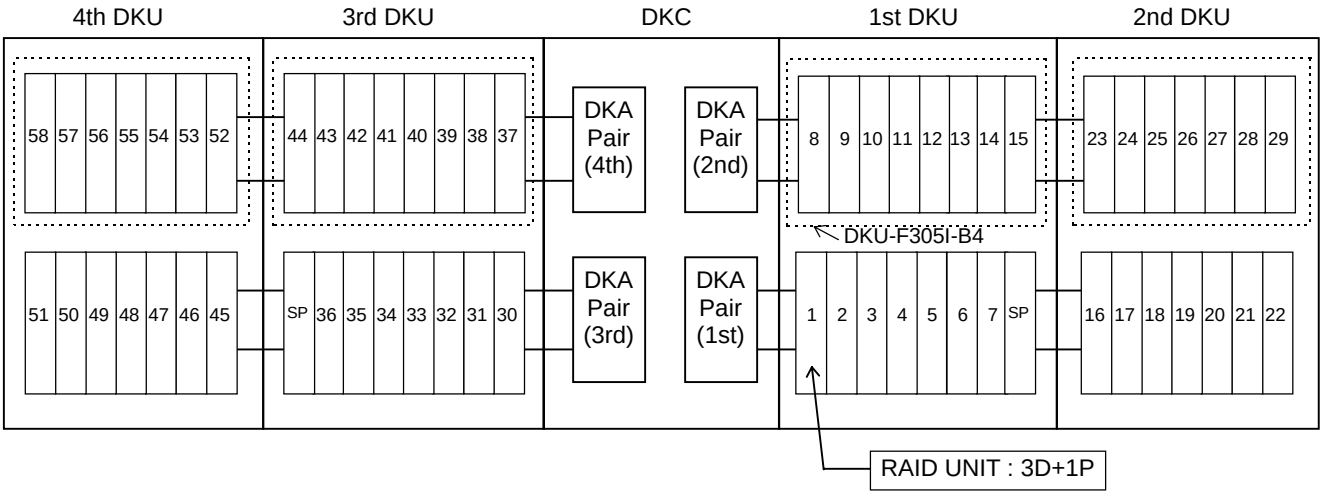

Fig 1.1.3.5-1 Order of Adding RAID Unit(s) (For RAID5 using High Speed 15GB HDDs)

Table 1.1.3.5-1 Disk capacity and number of necessary options
(High Speed 15GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-15F4	F305I-3C	F305I-24C
42.6	15		2		4	1		1		1		
85.2	30		2		4	1		1		2		
127.8	45		2		4	1		1		3		
170.4	60		3		4	1		1		4		
213.0	75		3		4	1		1		5		
255.6	90		4		4	1		1		6		
298.2	105		4		4	1		1		7		
340.8	120		4		4	1	1	1	1	8		
383.4	135		6		4	1	1	1	1	9		
426.0	150		6		4	1	1	1	1	10		
468.6	165		8		4	1	1	1	1	11		
511.2	180		8		4	1	1	1	1	12		
553.8	195		8		4	1	1	1	1	13		
596.4	210	1	10		4	1	1	1	1	14		
639.0	225	1	10		4	1	1	1	1	15		
681.6	240	1	12		4	1	1	2	1	16		1
724.2	255	1	12		4	1	1	2	1	17		1
766.8	270	1	14		4	1	1	2	1	18		1
809.4	285	1	14		4	1	1	2	1	19		1
852.0	300	1	16		4	1	1	2	1	20		1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-15F4	F305I-3C	F305I-24C
894.6	315	1	16		4	1	1	2	1	21		1
937.2	330	0	0	5	4	1	1	2	1	22		1
979.8	345	0	0	5	4	1	1	2	2	23		1
1,022.4	360	0	0	5	4	1	1	2	2	24		1
1,065.0	375	0	0	5	4	1	1	2	2	25		1
1,107.6	390	0	0	5	4	1	1	2	2	26		1
1,150.2	405	0	0	6	0	3 **	1	2	2	27		1
1,192.8	420	0	0	6	0	3 **	1	2	2	28		1
1,235.4	435	0	0	6	0	3 **	1	2	2	29		1
1,278.0	450	0	0	6	0	3 **	2	3	2	30	1	1
1,320.6	465	0	0	7	0	3 **	2	3	2	31	1	1
1,363.2	480	0	0	7	0	3 **	2	3	2	32	1	1
1,405.8	495	0	0	7	0	3 **	2	3	2	33	1	1
1,448.4	510	0	0	7	0	3 **	2	3	2	34	1	1
1,491.0	525	0	0	7	0	3	2	3	2	35	1	1
1,533.6	540	0	0	8	0	3	2	3	2	36	1	1
1,576.2	555	0	0	8	0	3	3	3	3	37	1	1
1,618.8	570	0	0	8	0	3	3	3	3	38	1	1
1,661.4	585	0	0	8	0	3	3	3	3	39	1	1
1,704.0	600	0	0	8	0	3	3	3	3	40	1	1
1,746.6	615	0	0	8	0	3	3	3	3	41	1	1
1,789.2	630	0	0	8	0	3	3	3	3	42	1	1
1,831.8	645	0	0	8	0	3	3	3	3	43	1	1
1,874.4	660	0	0	8	0	3	3	3	3	44	1	1
1,917.0	675	0	0	8	0	3	3	4	3	45	1	2
1,959.6	690	0	0	8	0	3	3	4	3	46	1	2
2,002.2	705	0	0	8	0	3	3	4	3	47	1	2
2,044.8	720	0	0	8	0	3	3	4	3	48	1	2
2,087.4	735	0	0	8	0	3	3	4	3	49	1	2
2,130.0	750	0	0	8	0	3	3	4	3	50	1	2
2,172.6	765	0	0	8	0	3	3	4	3	51	1	2
2,215.2	780	0	0	8	0	3	3	4	4	52	1	2
2,257.8	795	0	0	8	0	3	3	4	4	53	1	2
2,300.4	810	0	0	8	0	3	3	4	4	54	1	2
2,343.0	825	0	0	8	0	3	3	4	4	55	1	2
2,385.6	840	0	0	8	0	3	3	4	4	56	1	2
2,428.2	855	0	0	8	0	3	3	4	4	57	1	2
2,470.8	870	0	0	8	0	3	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.3.6 36GB HDD, RAID5 (RAID UNIT: 3D + 1P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.6-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.6-1 and 1.1.3.6-2.

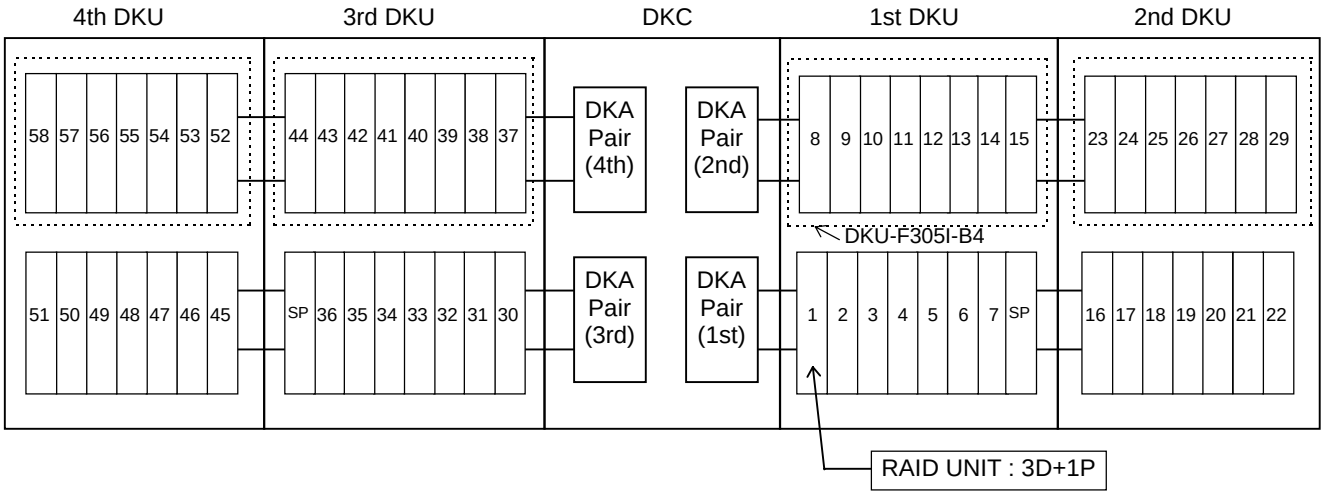

Fig. 1.1.3.6-1 Order of Adding RAID Unit(s) (For RAID5 using 36GB HDDs)

Table 1.1.3.6-1 Disk capacity and number of necessary options for Large Storage (36GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-3604	F305I-3C	F305I-24C
102.0	36		2		0	3 **		1		1		
204.0	72		2		0	3 **		1		2		
306.0	108		2		0	3 **		1		3		
408.0	144		3		0	3 **		1		4		
510.0	180		4		0	3 **		1		5		
612.0	216		4		0	3 **		1		6		
714.0	252		6		0	3 **		1		7		
816.0	288		6		0	3 **	1	1	1	8		
918.0	324		8		0	3 **	1	1	1	9		
1,020.0	360		8		0	3 **	1	1	1	10		
1,122.0	396		8		0	3 **	1	1	1	11		
1,224.0	432	1	10		0	3 **	1	1	1	12		
1,326.0	468	1	12		0	3 **	1	1	1	13		
1,428.0	504	1	12		0	3 **	1	1	1	14		
1,530.0	540	1	14		0	3	1	1	1	15		
1,632.0	576	1	14		0	3	1	2	1	16		1
1,734.0	612	1	16		0	3	1	2	1	17		1
1,836.0	648	1	16		0	3	1	2	1	18		1
1,938.0	684	0	0	5	0	3	1	2	1	19		1
2,040.0	720	0	0	5	0	3	1	2	1	20		1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-3604	F305I-3C	F305I-24C
2,142.0	756	0	0	5	0	3	1	2	1	21		1
2,244.0	792	0	0	5	0	3	1	2	1	22		1
2,346.0	828	0	0	6	0	3	1	2	2	23		1
2,448.0	864	0	0	6	0	3	1	2	2	24		1
2,550.0	900	0	0	6	0	3	1	2	2	25		1
2,652.0	936	0	0	7	0	3	1	2	2	26		1
2,754.0	972	0	0	7	0	3	1	2	2	27		1
2,856.0	1,008	0	0	7	0	3	1	2	2	28		1
2,901.0	1,024	0	0	7	0	3	1	2	2	29		1

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

Table 1.1.3.6-2 Disk capacity and number of necessary options for Standard Storage (36GB HDD, RAID5, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-3604	F305I-3C	F305I-24C
102.0	36		2		0	3 **		1		1		
204.0	72		3		0	3 **		1		2		
306.0	108		4		0	3 **		1		3		
408.0	144		6		0	3 **		1		4		
510.0	180		8		0	3 **		1		5		
612.0	216	1	10		0	3 **		1		6		
714.0	252	1	12		0	3 **		1		7		
816.0	288	1	14		0	3 **	1	1	1	8		
918.0	324	1	16		0	3 **	1	1	1	9		
1,020.0	360	0	0	5	0	3 **	1	1	1	10		
1,122.0	396	0	0	5	0	3 **	1	1	1	11		
1,224.0	432	0	0	6	0	3 **	1	1	1	12		
1,326.0	468	0	0	7	0	3	1	1	1	13		
1,428.0	504	0	0	7	0	3	1	1	1	14		
1,530.0	540	0	0	8	0	3	1	1	1	15		
1,632.0	576	0	0	8	0	3	1	2	1	16		1
1,734.0	612	0	0	8	0	3	1	2	1	17		1
1,836.0	648	0	0	8	0	3	1	2	1	18		1
1,938.0	684	0	0	8	0	3	1	2	1	19		1
2,040.0	720	0	0	8	0	3	1	2	1	20		1
2,142.0	756	0	0	8	0	3	1	2	1	21		1
2,244.0	792	0	0	8	0	3	1	2	1	22		1
2,346.0	828	0	0	8	0	3	1	2	2	23		1
2,448.0	864	0	0	8	0	3	1	2	2	24		1
2,550.0	900	0	0	8	0	3	1	2	2	25		1
2,652.0	936	0	0	8	0	3	1	2	2	26		1
2,754.0	972	0	0	8	0	3	1	2	2	27		1
2,856.0	1,008	0	0	8	0	3	1	2	2	28		1
2,901.0	1,024	0	0	8	0	3	1	2	2	29		1

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.3.7 6GB HDD, RAID1 (RAID UNIT: 2D + 2D)

Order of adding RAID unit(s) is shown in Figure 1.1.3.7-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.7-1.

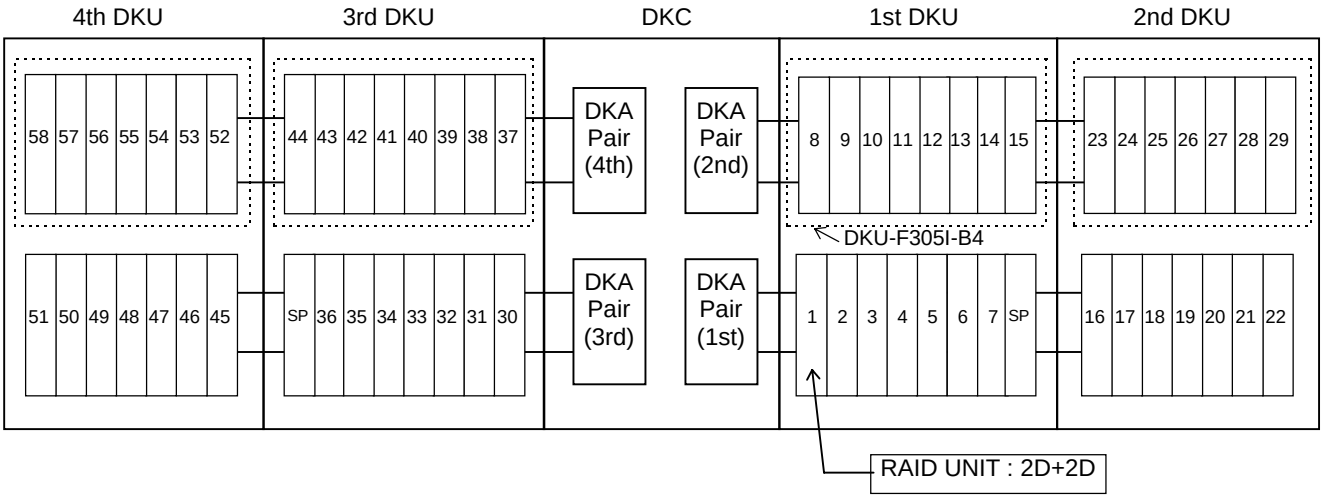

Fig. 1.1.3.7-1 Order of Adding RAID Unit(s) (For RAID1 using 6GB HDDs)

Table 1.1.3.7-1 Disk capacity and number of necessary options
(6GB HDD, RAID1, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-6F4	F305I-3C	F305I-24C
11.4	4		2		4	1		1		1		
22.8	8		2		4	1		1		2		
34.2	12		2		4	1		1		3		
45.6	16		2		4	1		1		4		
57.0	20		2		4	1		1		5		
68.4	24		2		4	1		1		6		
49.8	28		2		4	1		1		7		
91.2	32		2		4	1	1	1	1	8		
102.6	36		2		4	1	1	1	1	9		
114.0	40		2		4	1	1	1	1	10		
125.4	44		2		4	1	1	1	1	11		
136.8	48		2		4	1	1	1	1	12		
148.2	52		2		4	1	1	1	1	13		
159.6	56		2		4	1	1	1	1	14		
171.0	60		2		4	1	1	1	1	15		
182.4	64		2		4	1	1	2	1	16		1
193.8	68		3		4	1	1	2	1	17		1
205.2	72		3		4	1	1	2	1	18		1
216.6	76		3		4	1	1	2	1	19		1
228.0	80		3		4	1	1	2	1	20		1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-6F4	F305I-3C	F305I-24C
239.4	84		3		4	1	1	2	1	21		1
250.8	88		3		4	1	1	2	1	22		1
262.2	92		4		4	1	1	2	2	23		1
273.6	96		4		4	1	1	2	2	24		1
285.0	100		4		4	1	1	2	2	25		1
296.4	104		4		4	1	1	2	2	26		1
307.8	105		4		4	1	1	2	2	27		1
319.2	112		4		4	1	1	2	2	28		1
330.6	116		4		4	1	1	2	2	29		1
342.0	120		4		4	1	2	3	2	30	1	1
353.4	124		4		4	1	2	3	2	31	1	1
364.8	128		4		4	1	2	3	2	32	1	1
376.2	132		6		4	1	2	3	2	33	1	1
387.6	136		6		4	1	2	3	2	34	1	1
399.0	140		6		4	1	2	3	2	35	1	1
410.4	144		6		4	1	2	3	2	36	1	1
421.8	148		6		4	1	3	3	3	37	1	1
433.2	152		6		4	1	3	3	3	38	1	1
444.6	156		8		4	1	3	3	3	39	1	1
456.0	160		8		4	1	3	3	3	40	1	1
467.4	164		8		4	1	3	3	3	41	1	1
478.8	168		8		4	1	3	3	3	42	1	1
490.2	172		8		4	1	3	3	3	43	1	1
501.6	176		8		4	1	3	3	3	44	1	1
513.0	180		8		4	1	3	4	3	45	1	2
524.4	184		8		4	1	3	4	3	46	1	2
535.8	188		8		4	1	3	4	3	47	1	2
547.2	192		8		4	1	3	4	3	48	1	2
558.6	196		8		4	1	3	4	3	49	1	2
570.0	200	1	10		4	1	3	4	3	50	1	2
581.4	204	1	10		4	1	3	4	3	51	1	2
592.8	208	1	10		4	1	3	4	4	52	1	2
604.2	212	1	10		4	1	3	4	4	53	1	2
615.6	216	1	10		4	1	3	4	4	54	1	2
627.0	220	1	10		4	1	3	4	4	55	1	2
638.4	224	1	10		4	1	3	4	4	56	1	2
649.8	228	1	10		4	1	3	4	4	57	1	2
661.2	232	1	10		4	1	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

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1.1.3.8 9GB and High Speed 9GB HDD, RAID1 (RAID UNIT: 2D + 2D)

Order of adding RAID unit(s) is shown in Figure 1.1.3.8-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.8-1.

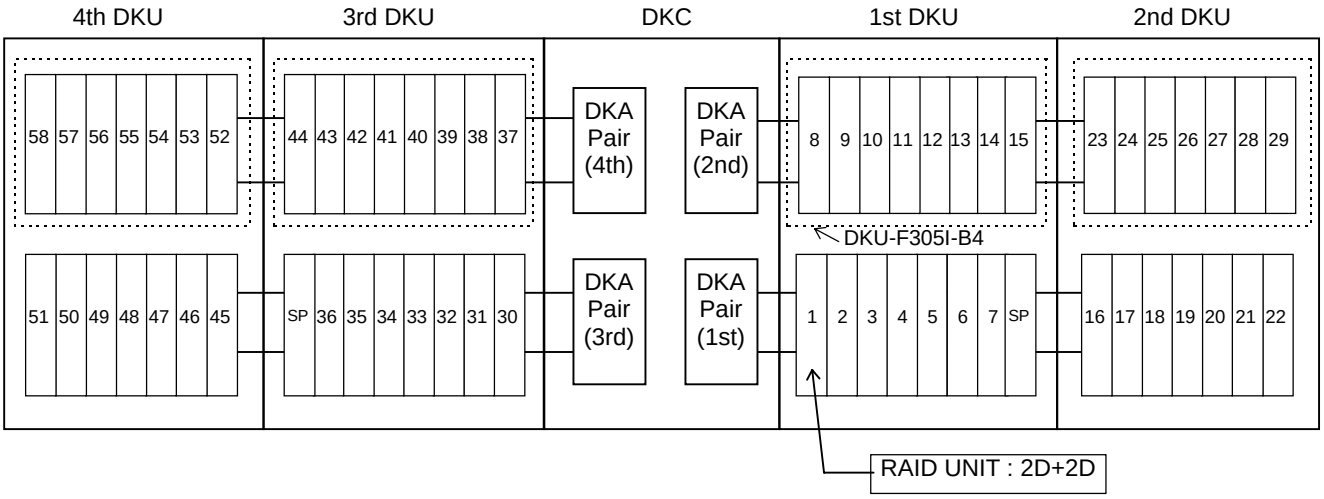

Fig. 1.1.3.8-1 Order of Adding RAID Unit(s)
(For RAID1 using 9GB and High Speed 9GB HDDs)

Table 1.1.3.8-1 Disk capacity and number of necessary options
(9GB and High Speed 9GB HDD, RAID1, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-904/9F4	F305I-3C	F305I-24C
17.0	6		2		4	1		1		1		
34.0	12		2		4	1		1		2		
51.0	18		2		4	1		1		3		
68.0	24		2		4	1		1		4		
85.0	30		2		4	1		1		5		
102.0	36		2		4	1		1		6		
119.0	42		2		4	1		1		7		
136.0	48		2		4	1	1	1	1	8		
153.0	54		2		4	1	1	1	1	9		
170.0	60		2		4	1	1	1	1	10		
187.0	66		3		4	1	1	1	1	11		
204.0	72		3		4	1	1	1	1	12		
221.0	78		3		4	1	1	1	1	13		
238.0	84		4		4	1	1	1	1	14		
255.0	90		4		4	1	1	1	1	15		
272.0	96		4		4	1	1	2	1	16		1
289.0	102		4		4	1	1	2	1	17		1
306.0	108		4		4	1	1	2	1	18		1
323.0	114		4		4	1	1	2	1	19		1
340.0	120		4		4	1	1	2	1	20		1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-904/9F4	F305I-3C	F305I-24C
357.0	126		4		4	1	1	2	1	21		1
374.0	132		6		4	1	1	2	1	22		1
391.0	138		6		4	1	1	2	2	23		1
408.0	144		6		4	1	1	2	2	24		1
425.0	150		6		4	1	1	2	2	25		1
442.0	156		6		4	1	1	2	2	26		1
459.0	162		8		4	1	1	2	2	27		1
476.0	168		8		4	1	1	2	2	28		1
493.0	174		8		4	1	1	2	2	29		1
510.0	180		8		4	1	2	3	2	30	1	1
527.0	186		8		4	1	2	3	2	31	1	1
544.0	192		8		4	1	2	3	2	32	1	1
561.0	198	1	10		4	1	2	3	2	33	1	1
578.0	204	1	10		4	1	2	3	2	34	1	1
595.0	210	1	10		4	1	2	3	2	35	1	1
612.0	216	1	10		4	1	2	3	2	36	1	1
629.0	222	1	10		4	1	3	3	3	37	1	1
646.0	228	1	10		4	1	3	3	3	38	1	1
663.0	234	1	12		4	1	3	3	3	39	1	1
680.0	240	1	12		4	1	3	3	3	40	1	1
697.0	246	1	12		4	1	3	3	3	41	1	1
714.0	252	1	12		4	1	3	3	3	42	1	1
731.0	258	1	14		4	1	3	3	3	43	1	1
748.0	264	1	14		4	1	3	3	3	44	1	1
765.0	270	1	14		4	1	3	4	3	45	1	2
782.0	276	1	14		4	1	3	4	3	46	1	2
799.0	282	1	14		4	1	3	4	3	47	1	2
816.0	288	1	14		4	1	3	4	3	48	1	2
833.0	294	1	16		4	1	3	4	3	49	1	2
850.0	300	1	16		4	1	3	4	3	50	1	2
867.0	306	1	16		4	1	3	4	3	51	1	2
884.0	312	1	16		4	1	3	4	4	52	1	2
901.0	318	1	16		4	1	3	4	4	53	1	2
918.0	324		0	5	4	1	3	4	4	54	1	2
935.0	330		0	5	4	1	3	4	4	55	1	2
952.0	336		0	5	4	1	3	4	4	56	1	2
969.0	342		0	5	4	1	3	4	4	57	1	2
986.0	348		0	5	4	1	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

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1.1.3.9 18GB HDD, RAID1 (RAID UNIT: 2D + 2D)

Order of adding RAID unit(s) is shown in Figure 1.1.3.9-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.9-1.

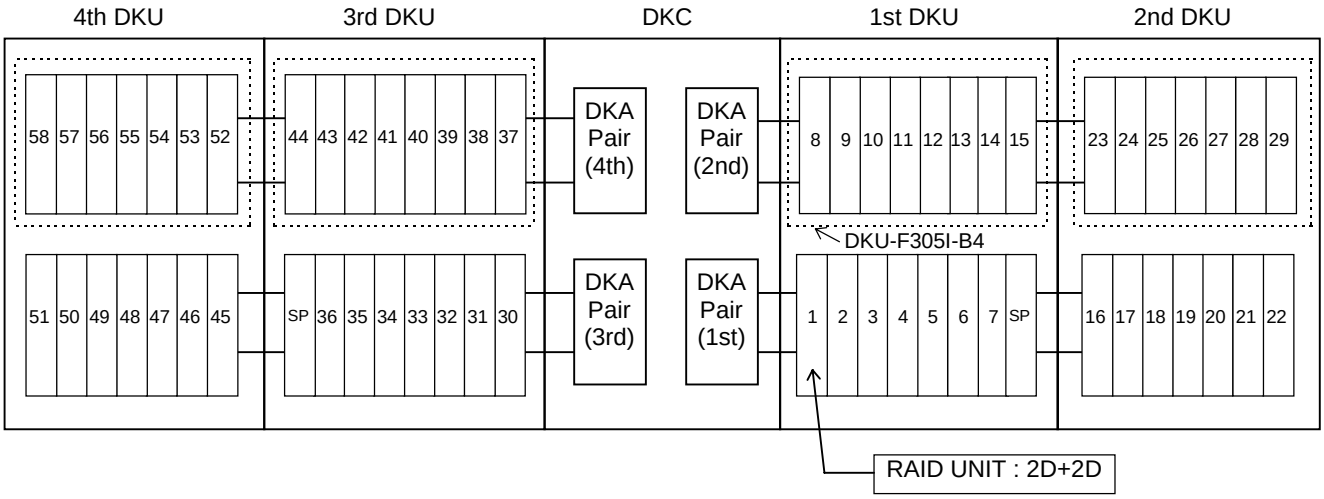

Fig. 1.1.3.9-1 Order of Adding RAID Unit(s) (For RAID1 using 18GB HDDs)

Table 1.1.3.9-1 Disk capacity and number of necessary options
(18GB HDD, RAID1, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-1804	F305I-3C	F305I-24C
34.0	12		2		4	1		1		1		
68.0	24		2		4	1		1		2		
102.0	36		2		4	1		1		3		
136.0	48		2		4	1		1		4		
170.0	60		2		4	1		1		5		
204.0	72		3		4	1		1		6		
238.0	84		4		4	1		1		7		
272.0	96		4		4	1	1	1	1	8		
306.0	108		4		4	1	1	1	1	9		
340.0	120		4		4	1	1	1	1	10		
374.0	132		6		4	1	1	1	1	11		
408.0	144		6		4	1	1	1	1	12		
443.0	156		6		4	1	1	1	1	13		
477.0	168		8		4	1	1	1	1	14		
511.0	180		8		4	1	1	1	1	15		
545.0	192		8		4	1	1	2	1	16		1
579.0	204		10		4	1	1	2	1	17		1
613.0	216		10		4	1	1	2	1	18		1
647.0	228		10		4	1	1	2	1	19		1

(To be continued.)

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Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-1804	F305I-3C	F305I-24C
681.0	240		12		4	1	1	2	1	20		1
715.0	252		12		4	1	1	2	1	21		1
749.0	264		14		4	1	1	2	1	22		1
783.0	276		14		4	1	1	2	2	23		1
817.0	288		14		4	1	1	2	2	24		1
852.0	300		16		4	1	1	2	2	25		1
886.0	312		16		4	1	1	2	2	26		1
920.0	324		16		4	1	1	2	2	27		1
954.0	336		0	5	4	1	1	2	2	28		1
988.0	348		0	5	4	1	1	2	2	29		1
1,022.0	360		0	5	4	1	2	3	2	30	1	1
1,056.0	372		0	5	4	1	2	3	2	31	1	1
1,090.0	384		0	5	4	1	2	3	2	32	1	1
1,124.0	396		0	5	4	1	2	3	2	33	1	1
1,158.0	408	1	0	6	4	1	3 **	3	2	34	1	1
1,192.0	420	1	0	6	4	1	3 **	3	2	35	1	1
1,226.0	432	1	0	6	4	1	3 **	3	2	36	1	1
1,260.0	444	1	0	6	4	1	3 **	3	3	37	1	1
1,295.0	456	1	0	6	4	1	3 **	3	3	38	1	1
1,329.0	468	1	0	7	4	1	3 **	3	3	39	1	1
1,363.0	480	1	0	7	4	1	3 **	3	3	40	1	1
1,397.0	492	1	0	7	4	1	3 **	3	3	41	1	1
1,431.0	504	1	0	7	4	1	3 **	3	3	42	1	1
1,465.0	516	1	0	7	4	1	3	3	3	43	1	1
1,499.0	528	1	0	7	4	1	3	3	3	44	1	1
1,533.0	540	1	0	8	4	1	3	4	3	45	1	2
1,567.0	552	1	0	8	4	1	3	4	3	46	1	2
1,601.0	564	1	0	8	4	1	3	4	3	47	1	2
1,635.0	576	1	0	8	4	1	3	4	3	48	1	2
1,669.0	588	1	0	8	4	1	3	4	3	49	1	2
1,704.0	600	1	0	8	4	1	3	4	3	50	1	2
1,738.0	612	1	0	8	4	1	3	4	3	51	1	2
1,772.0	624	1	0	8	4	1	3	4	4	52	1	2
1,806.0	636	1	0	8	4	1	3	4	4	53	1	2
1,840.0	648	1	0	8	4	1	3	4	4	54	1	2
1,874.0	660	0	0	8	4	1	3	4	4	55	1	2
1,908.0	672	0	0	8	4	1	3	4	4	56	1	2
1,942.0	684	0	0	8	4	1	3	4	4	57	1	2
1,976.0	696	0	0	8	4	1	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.3.10 High Speed 15GB HDD, RAID1 (RAID UNIT: 2D + 2P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.10-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.10-1.

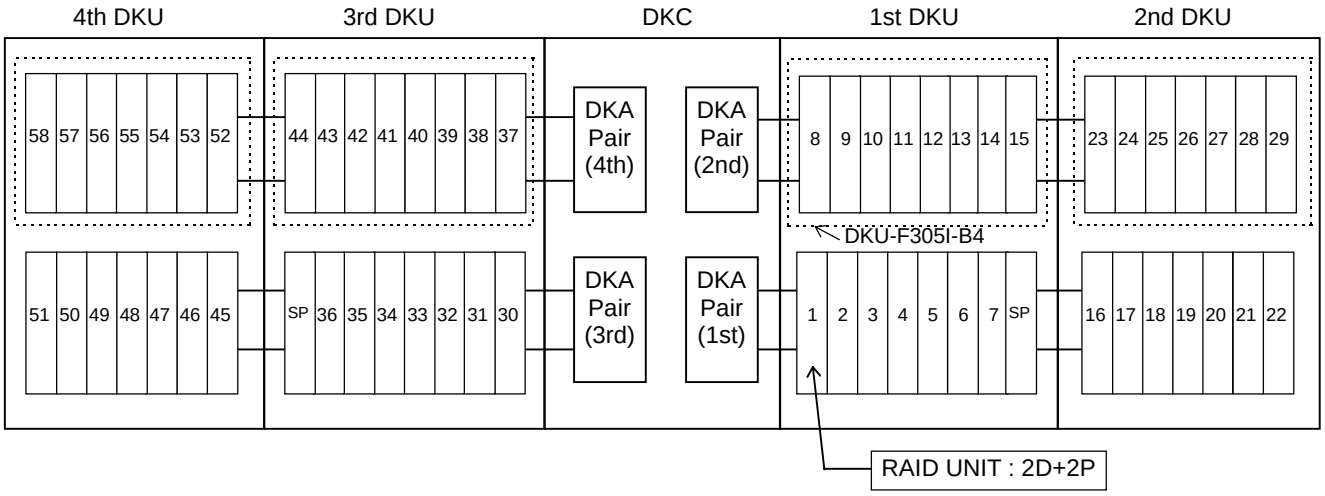

Fig. 1.1.3.10-1 Order of Adding RAID Unit(s) (For RAID1 using High Speed 15GB HDDs)

Table 1.1.3.10-1 Disk capacity and number of necessary options
(High Speed 15GB HDD,RAID1, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-15F4	F305I-3C	F305I-24C
28.4	10		2		4	1		1		1		
56.8	20		2		4	1		1		2		
85.2	30		2		4	1		1		3		
113.6	40		2		4	1		1		4		
142.0	50		2		4	1		1		5		
170.4	60		2		4	1		1		6		
198.8	70		3		4	1		1		7		
227.2	80		3		4	1	1	1	1	8		
255.6	90		4		4	1	1	1	1	9		
284.0	100		4		4	1	1	1	1	10		
312.4	110		4		4	1	1	1	1	11		
340.8	120		4		4	1	1	1	1	12		
369.2	130		6		4	1	1	1	1	13		
397.6	140		6		4	1	1	1	1	14		
426.0	150		6		4	1	1	1	1	15		
454.4	160		6		4	1	1	2	1	16		1
482.8	170		8		4	1	1	2	1	17		1
511.2	180		8		4	1	1	2	1	18		1
539.6	190		8		4	1	1	2	1	19		1
568.0	200	1	10		4	1	1	2	1	20		1

(To be continued.)

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Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-15F4	F305I-3C	F305I-24C
596.4	210	1	10		4	1	1	2	1	21		1
624.8	220	1	10		4	1	1	2	1	22		1
653.2	230	1	10		4	1	1	2	2	23		1
681.6	240	1	12		4	1	1	2	2	24		1
710.0	250	1	12		4	1	1	2	2	25		1
738.4	260	1	14		4	1	1	2	2	26		1
766.8	270	1	14		4	1	1	2	2	27		1
795.2	280	1	14		4	1	1	2	2	28		1
823.6	290	1	14		4	1	1	2	2	29		1
852.0	300	1	16		4	1	2	3	2	30	1	1
880.4	310	1	16		4	1	2	3	2	31	1	1
908.8	320	1	16		4	1	2	3	2	32	1	1
937.2	330			5	4	1	2	3	2	33	1	1
965.6	340			5	4	1	2	3	2	34	1	1
994.0	350			5	4	1	2	3	2	35	1	1
1,022.4	360			5	4	1	2	3	2	36	1	1
1,050.8	370			5	4	1	3	3	3	37	1	1
1,079.2	380			5	4	1	3	3	3	38	1	1
1,107.6	390			5	4	1	3	3	3	39	1	1
1,136.0	400			6	0	3 **	3	3	3	40	1	1
1,164.4	410			6	0	3 **	3	3	3	41	1	1
1,192.8	420			6	0	3 **	3	3	3	42	1	1
1,221.2	430			6	0	3 **	3	3	3	43	1	1
1,249.6	440			6	0	3 **	3	3	3	44	1	1
1,278.0	450			6	0	3 **	3	4	3	45	1	2
1,306.4	460			6	0	3 **	3	4	3	46	1	2
1,334.8	470			7	0	3 **	3	4	3	47	1	2
1,363.2	480			7	0	3 **	3	4	3	48	1	2
1,391.6	490			7	0	3 **	3	4	3	49	1	2
1,420.0	500			7	0	3 **	3	4	3	50	1	2
1,448.4	510			7	0	3 **	3	4	3	51	1	2
1,476.8	520			7	0	3	3	4	4	52	1	2
1,505.2	530			7	0	3	3	4	4	53	1	2
1,533.6	540			8	0	3	3	4	4	54	1	2
1,562.0	550			8	0	3	3	4	4	55	1	2
1,590.4	560			8	0	3	3	4	4	56	1	2
1,618.8	570			8	0	3	3	4	4	57	1	2
1,647.2	580			8	0	3	3	4	4	58	1	2

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.3.11 36GB HDD, RAID1 (RAID UNIT: 2D + 2P)

Order of adding RAID unit(s) is shown in Figure 1.1.3.11-1; disk capacities and corresponding number of necessary options are shown in Table 1.1.3.11-1.

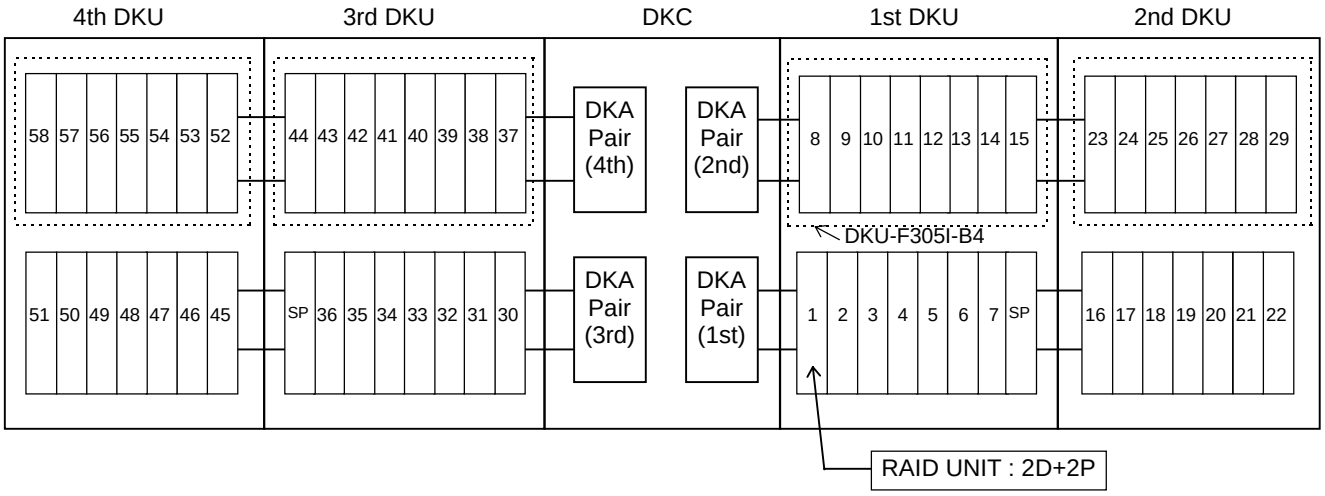

Fig. 1.1.3.11-1 Order of Adding RAID Unit(s) (For RAID1 using 36GB HDDs)

Table 1.1.3.11-1 Disk capacity and number of necessary options
(36GB HDD, RAID1, 3390-3 emulation)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-3604	F305I-3C	F305I-24C
68.2	24		2		0	3 **		1		1		
136.2	48		2		0	3 **		1		2		
204.5	72		3		0	3 **		1		3		
272.6	96		4		0	3 **		1		4		
340.8	120		4		0	3 **		1		5		
409.0	144		6		0	3 **		1		6		
477.1	168		8		0	3 **		1		7		
545.3	192		8		0	3 **	1	1	1	8		
613.4	216	1	10		0	3 **	1	1	1	9		
681.6	240	1	12		0	3 **	1	1	1	10		
749.8	264	1	14		0	3 **	1	1	1	11		
817.9	288	1	14		0	3 **	1	1	1	12		
886.1	312	1	16		0	3 **	1	1	1	13		
954.2	336	0	0	5	0	3 **	1	1	1	14		
1,022.4	360	0	0	5	0	3 **	1	1	1	15		
1,090.6	384	0	0	5	0	3 **	1	2	1	16		1
1,158.7	408	0	0	6	0	3 **	1	2	1	17		1
1,226.9	432	0	0	6	0	3 **	1	2	1	18		1
1,295.0	456	0	0	6	0	3 **	1	2	1	19		1
1,363.2	480	0	0	7	0	3	1	2	1	20		1

(To be continued.)

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(Continued from preceding sheet.)

Disk Capacity	No. of Logical VOL	Number of necessary DKC options						Number of necessary DKU options				
		F310I-20	F310I-256	F310I-1024	F310I-32*	F310I-128*	F310I-50/50E	DKU 305I-14	F305I-B4	F305I-3604	F305I-3C	F305I-24C
1,431.4	504	0	0	7	0	3	1	2	1	21		1
1,499.5	528	0	0	7	0	3	1	2	1	22		1
1,567.7	552	0	0	8	0	3	1	2	2	23		1
1,635.8	576	0	0	8	0	3	1	2	2	24		1
1,704.0	600	0	0	8	0	3	1	2	2	25		1
1,772.2	624	0	0	8	0	3	1	2	2	26		1
1,840.3	648	0	0	8	0	3	1	2	2	27		1
1,908.5	672	0	0	8	0	3	1	2	2	28		1
1,976.6	696	0	0	8	0	3	1	2	2	29		1
2,044.8	720	0	0	8	0	3	2	3	2	30	1	1
2,113.0	744	0	0	8	0	3	2	3	2	31	1	1
2,181.1	768	0	0	8	0	3	2	3	2	32	1	1
2,249.3	792	0	0	8	0	3	2	3	2	33	1	1
2,317.4	816	0	0	8	0	3	2	3	2	34	1	1
2,385.6	840	0	0	8	0	3	2	3	2	35	1	1
2,453.8	864	0	0	8	0	3	2	3	2	36	1	1
2,521.9	888	0	0	8	0	3	3	3	3	37	1	1
2,590.1	912	0	0	8	0	3	3	3	3	38	1	1
2,658.2	936	0	0	8	0	3	3	3	3	39	1	1
2,726.4	960	0	0	8	0	3	3	3	3	40	1	1
2,794.6	984	0	0	8	0	3	3	3	3	41	1	1
2,862.7	1,008	0	0	8	0	3	3	3	3	42	1	1
2,908.2	1,024	0	0	8	0	3	3	3	3	43	1	1

* : Four units of F310I-32 (32MB × 4 = 128MB) and a F310I-128 (128MB) are same.

** : In case that one or two CUs are installed, 256MB is required.

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1.1.4 Specifications

1. DKU305I Specifications

The DKU305I specifications are shown in the following table:

DKU305I Specifications (1/3) (DK3F1-60, RAID5)

Item			Specification					
			3390-3	3390-2	3390-1	3380-J	3380-E	3380-K
Logical volumes per unit	Minimum		6	8	16	16	12	8
	Maximum		348	464	928	928	696	464
	Increment		6	8	16	16	12	8
RAID level			5 (3 data + 1 parity configuration)					
Spare drives (optional)			Max. 8					
Logical volume characteristics	Capacity (GB)		2.83	1.89	0.95	0.63	1.26	1.89
	Data format		CKD					
	Bytes per track		56,664			47,476		
	Tracks per cylinder		15					
	Cylinders		3,339	2,226	1,113	885	1,770	2,655
Drive characteristics	Capacity (GB)		6					
	Data format		FBA					
	Average latency (ms)		2.5					
	Seek time (Read/Write)	Min. (ms)	0.6 / 0.8					
		Ave. (ms)	6.0 / 7.0					
		Max. (ms)	14.0 / 16.0					
	Data transfer rate (MB/s)		13.8 - 16.2					
	Ports		2					
	Access mechanism		1					
Drive/Unit			Max. 64 (Containing 8 spare drives)					

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DKU305I Specifications (2/3) (DK308/309-90, RAID5)

Item			Specification						
			3390-9	3390-3	3390-2	3390-1	3380-J	3380-E	3380-K
Logical volumes per unit	Minimum		6	16	16 or 24 or 32 *1				
	Maximum		192	512	768	768	1024	768	768
	Increment		6	16	16 or 24 or 32 *1				
RAID level			5 (6 data + 1 parity configuration)						
Spare drives (optional)			Max. 8						
Logical volume characteristics	Capacity (GB)		8.49	2.83	1.89	0.95	0.63	1.26	1.89
	Data format		CKD						
	Bytes per track		56,664				47,476		
	Tracks per cylinder		15						
	Cylinders		10,017	3,339	2,226	1,113	885	1,770	2,655
Drive characteristics	Capacity (GB)		9.23						
	Data format		FBA						
	Average latency (ms)		4.8						
	Seek time (Read/Write)	Min. (ms)	2.0 / 2.0						
		Ave. (ms)	11.5 / 12.5						
		Max. (ms)	24.0 / 26.0						
	Data transfer rate (MB/s)		7.6 - 10.7						
	Ports		2						
	Access mechanism		1						
Drive/Unit			Max. 64 (Containing 8 spare drives)						

*1 : 32 is available only in 3380-J emulation.

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DKU305I Specifications (3/3) (DK309-180, RAID5)

Item			Specification		
			3390-9	3390-3	3380-K
Logical volumes per unit	Minimum		6	16 or 18	16 or 18
	Maximum		348	1024	1024
	Increment		6	16 or 18	16 or 18
RAID level			1 (3 data + 1 parity configuration)		
Spare drives (optional)			Max. 8		
Logical volume characteristics	Capacity (GB)		8.49	2.83	1.89
	Data format		CKD		
	Bytes per track		56,664		47,476
	Tracks per cylinder		15		
	Cylinders		10,017	3,339	2,655
Drive characteristics	Capacity (GB)		18.46		
	Data format		FBA		
	Average latency (ms)		4.8		
	Seek time (Read/Write)	Min. (ms)	2.0 / 2.0		
		Ave. (ms)	11.5 / 12.5		
		Max. (ms)	24.0 / 26.0		
	Data transfer rate (MB/s)		10.0 - 15.3		
	Ports		2		
	Access mechanism		1		
Drive/Unit			Max. 64 (Containing 8 spare drives)		

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2. DKC310I Physical Specifications

The DKC310I physical specifications are shown in the following table:

Table 1.1.4-1 DKC310I Physical Specifications

No	Item / Model Number	Weight (kg)	Heat Output (kW)	Power Consumption (kVA)	Dimension (mm)			Air Flow (m^3/min.)
					Width	Depth	Height	
1	DKC310I-5	380	0.816	0.878	750	800	1790	24
	DKC310I-5E							
2	DKC-F310I-20	16.4	0.017	0.018	—	—	—	—
3	DKC-F310I-256	0.1	0.002	0.002	—	—	—	—
4	DKC-F310I-1024	0.1	0.003	0.003	—	—	—	—
5	DKC-F310I-32	0.1	0.001	0.001	—	—	—	—
6	DKC-F310I-128	0.1	0.002	0.002	—	—	—	—
7	DKC-F310I-50	2.6	0.129	0.139	—	—	—	—
	DKC-F310I-50E							
8	DKC-F310I-4S	4.1	0.097	0.105	—	—	—	—
9	DKC-F310I-8S	5.5	0.245	0.263	—	—	—	—
10	DKC-F310I-8P	4.0	0.245	0.263	—	—	—	—
11	DKC-F310I-8PS	4.0	0.245	0.263	—	—	—	—
12	DKC-F310I-80	10.0	0.075	0.080	—	—	—	—
13	DKC-F310I-81	15.0	0.168	0.180	—	—	—	—
14	DKC-F310I-82	10.0	0.075	0.080	—	—	—	—
15	DKC-F310I-8C	5.4	0.277	0.298	—	—	—	—
16	DKC-F310I-4F	5.4	0.220	0.236	—	—	—	—
17	DKC-F310I-18	0.5	0.002	0.003	—	—	—	—
18	DKC-F310I-19	0.5	0.001	0.001	—	—	—	—
19	DKC-F310I-M80	—	—	—	—	—	—	—
20	DKC-F310I-M81	—	—	—	—	—	—	—
21	DKC-F310I-M82	—	—	—	—	—	—	—
22	DKC-F310I-4FE	5.4	0.215	0.230	—	—	—	—
23	DKC-F310I-4GS	5.4	0.238	0.255	—	—	—	—
24	DKC-F310I-4GL	5.4	0.238	0.255	—	—	—	—

*1: This includes the thickness of side covers (16 mm × 2).

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3. DKU305I Physical Specifications

The DKU305I physical specifications are shown in the following table:

Table 1.1.4-2 DKU305I Physical Specifications

No	Item / Model Number	Weight (kg)	Heat Output (kW)	Power Consumption (kVA)	Dimension (mm)			Air Flow (m^3/min.)
					Width	Depth	Height	
1	DKU305IE/U-14	230	0.51	0.64	550	800	1790	6
2	DKU-F305I-B4	70	0.51	0.64	—	—	—	6
3	DKU-F305I-1801	2.1	0.024	0.024	—	—	—	—
4	DKU-F305I-1804	8.5	0.10	0.10	—	—	—	—
5	DKU-F305I-3C	5	—	—	—	—	—	—
6	DKU-F305I-24C	3	—	—	—	—	—	—
7	DKU-F305I-56	—	—	—	—	—	—	—
8	DKU-F305I-65	—	—	—	—	—	—	—
9	DKU-F305I-901	2.1	0.026	0.026	—	—	—	—
10	DKU-F305I-907	15	0.18	0.18	—	—	—	—
11	DKU-F305I-904	8.4	0.104	0.104	—	—	—	—
12	DKU-F305I-6F1	2.3	0.029	0.029	—	—	—	—
13	DKU-F305I-6F4	9	0.12	0.12	—	—	—	—
14	DKU-F305I-9F1	2.3	0.023	0.023	—	—	—	—
15	DKU-F305I-9F4	9.0	0.09	0.09	—	—	—	—
16	DKU-F305I-15F1	2.3	0.023	0.023	—	—	—	—
17	DKU-F305I-15F4	9.0	0.09	0.09	—	—	—	—
18	DKU-F305I-3601	2.3	0.022	0.022	—	—	—	—
19	DKU-F305I-3604	9.0	0.09	0.09	—	—	—	—

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1.1.5 Environmental Specifications

The environmental specifications are shown in the following table:

Table 1.1.5-1 Environmental Specifications

Item	Condition		
	Note 1 Operating	Note 2 Non-operating	Note 3 Shipping & Storage
Temperature (º)	16 ~ 32º	-10 ~ 43º	-25 ~ 60º
Note 4 Relative Humidity (%)	20 ~ 80	8 ~ 90	5 ~ 95
Max. Wet Bulb (ºC)	26	27	29
Temperature Deviation (ºC/hour)	10	10	20
Vibration	0.25mm, 5~10Hz 0.05G, 10~300Hz	2.5mm, 5~10Hz 0.5G, 10~70Hz 0.05mm, 70~99Hz 1.0G, 99~300Hz	0.5G, 15min. Note 6 At four most severe resonance between 5~200Hz
Shock	—	8G, 15ms	Horizontal: Note 7 Incline Impact 1.22m/s Vertical: Note 8 Rotational Edge 0.1m

Note: 1. Environmental specification for operating condition should be satisfied before the disk subsystem is powered on. Max. temperature of 32º should be strictly satisfied at the air inlet portion. The recommended temperature range is 21~24º.
2. Non-operating condition includes both packing and unpacking conditions unless otherwise specified.
3. On shipping/storage condition, the product should be packed with factory packing.
4. No condensation in and around the drive should be observed under any conditions.
5. The above specifications of vibration and shock apply to all three axes.
6. See ASTM D999-86 Standard Methods for Vibration Testing of Shipping Containers.
7. See ASTM D880-86 Standard Methods of Incline Impact Test for Shipping Containers.
8. See ASTM D775-80 Standard Methods for Drop Test for Loaded Boxes.

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1.1.6 Power requirement

The input voltage and input frequency are as follows:

- DKU305IE/IU

  +6%
  One of 208V or 230V AC -8%
  60Hz ±0.5Hz 3 Phase 3 Wire + Ground

  +6%
  One of 220V, 230V, or 240V AC -8%
  50Hz ±0.5Hz 3 Phase 3 Wire + Ground

  +6%
  One of 380V, 400V, or 415V AC -8%
  50Hz ±0.5Hz 3 Phase 4 Wire + Ground

Note: The distribution board with circuit breaker or equivalent is rated 30A for the Disk Drive Unit.

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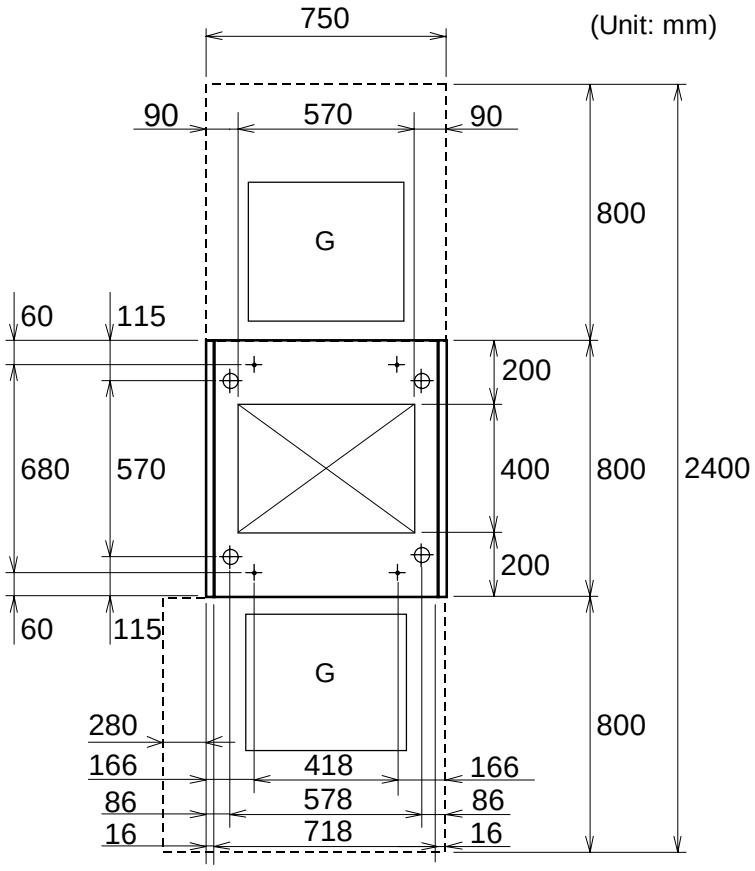
1.1.7 Service Clearance and Floor Cutout

1. DKC310I

The service clearance is the space required for CE work. Never use this space for storage of any article to prevent damage.



Front

Floor cutout area for cables

Screw jack

Caster

Service clearance

G Grid panel (over 450mm×450mm)

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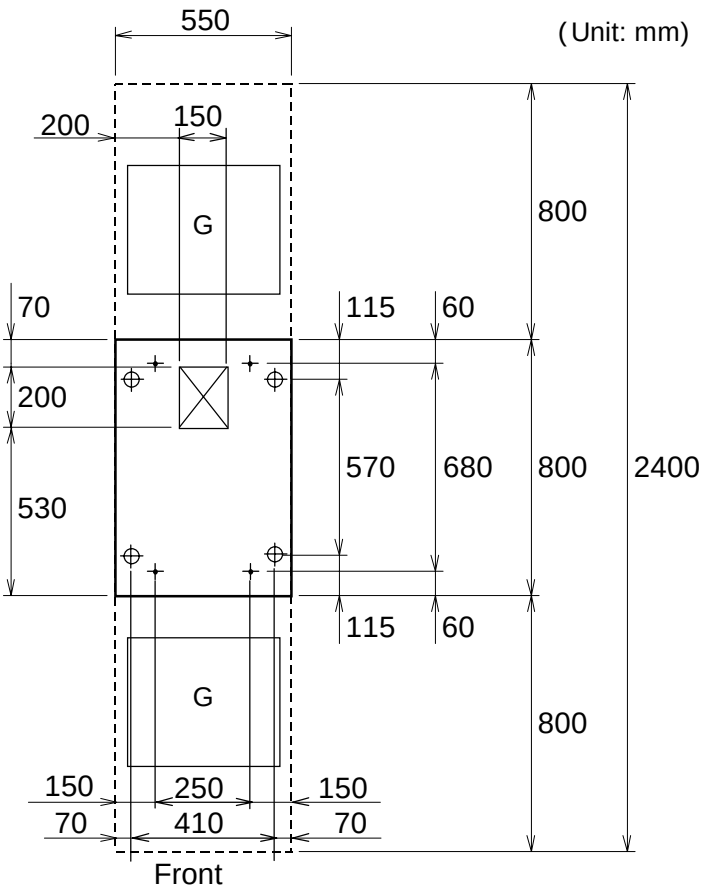
2. DKU305I

The service clearance is the space required for CE work. Never use this space for storage of any article to prevent damage.



Floor cutout area for cables

Screw jack

Caster

Service clearance

G Grid Panel (over 450mm×450mm)

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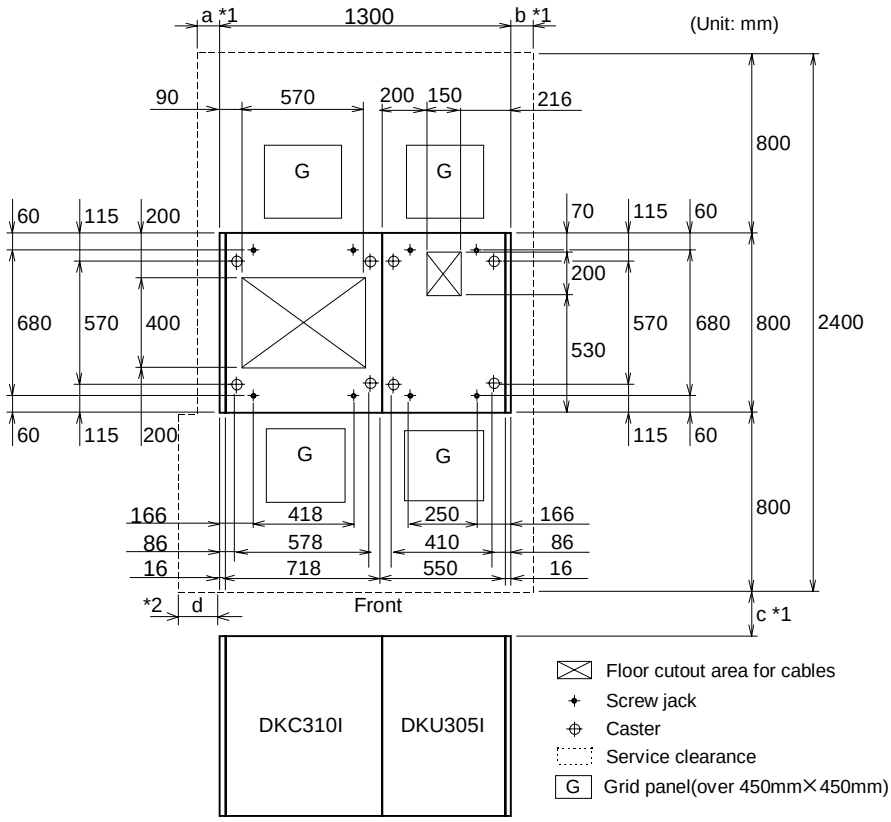
3. Subsystem Basic configuration

The service clearance is the space required for CE work. Never use this space for storage of any article to prevent damage.



*1: Clearance (a+b) is dependent on the floor load rating and clearance c.
Floor load rating and required clearances are shown below.

*2: Clearance (d) is required over 0.28m so as to open the DKC front door. In case that clearance (d) is less than clearance (a), give priority to clearance (a).

Floor load rating (kg/m^2)	Required clearance (a+b) (mm)				
	C=0	C=200	C=400	C=600	C=1000
500	0	0	0	0	0
450	200	100	0	0	0
400	500	300	100	0	0
350	900	700	500	300	100
300	1500	1200	1000	800	400

Note: 1. Actual clearances for installation should be decided after consulting with construction specialist responsible for installation building, as they could vary depending on the size/layout of the system and building conditions.
2. When various configurations of subsystems are arranged in a row, clearance values based on the largest subsystem configuration should be used.
3. From the viewpoint of maintenance operations, it is suggested that Clearance (c) be made as large as possible.

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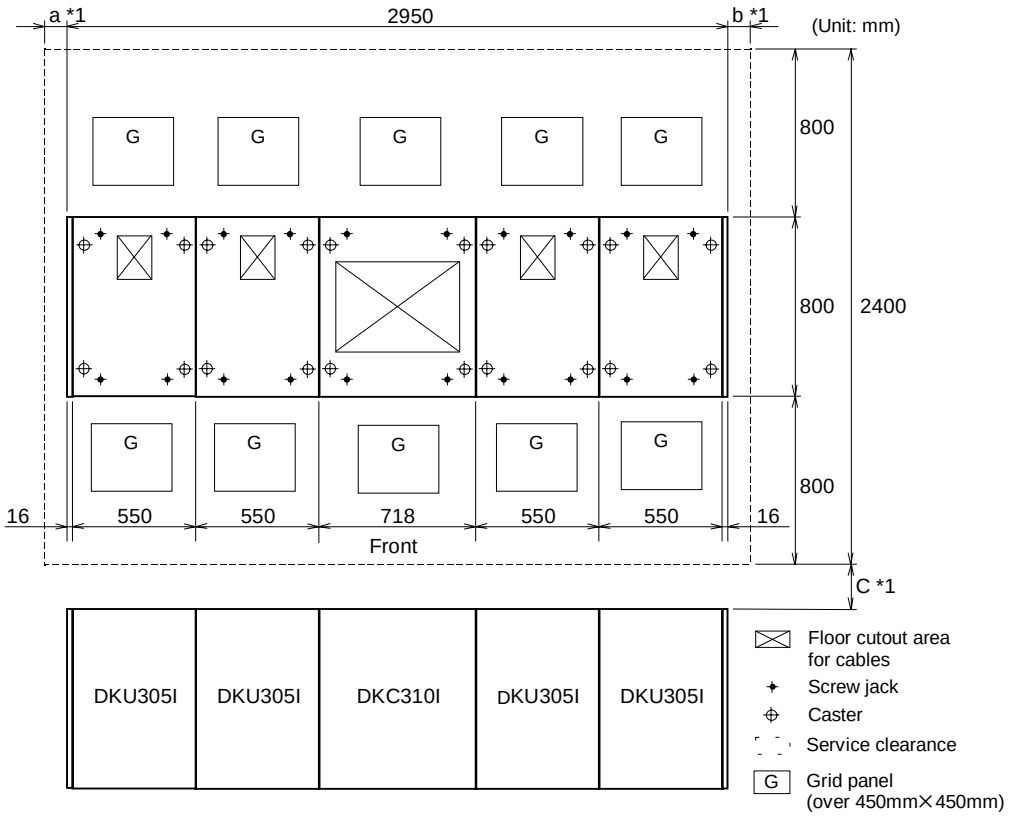
4. Subsystem Full configuration

The service clearance is the space required for CE work. Never use this space for storage of any article to prevent damage.



*1: Clearance (a+b) is dependent on the floor load rating and clearance c.
Floor load rating and required clearances are shown below.

Floor load rating (kg/m^2)	Required clearance (a+b) (mm)				
	C=0	C=200	C=400	C=600	C=1000
500	400	0	0	0	0
450	900	400	100	0	0
400	1600	1100	700	300	0
350	2600	1900	1500	1100	400
300	4100	3300	2700	2200	1400

Note: 1. Actual clearances for installation should be decided after consulting with construction specialist responsible for installation building, as they could vary depending on the size/layout of the system and building conditions.
2. When various configurations of subsystems are arranged in a row, clearance values based on the largest subsystem configuration should be used.
3. From the viewpoint of maintenance operations, it is suggested that Clearance (c) be made as large as possible.

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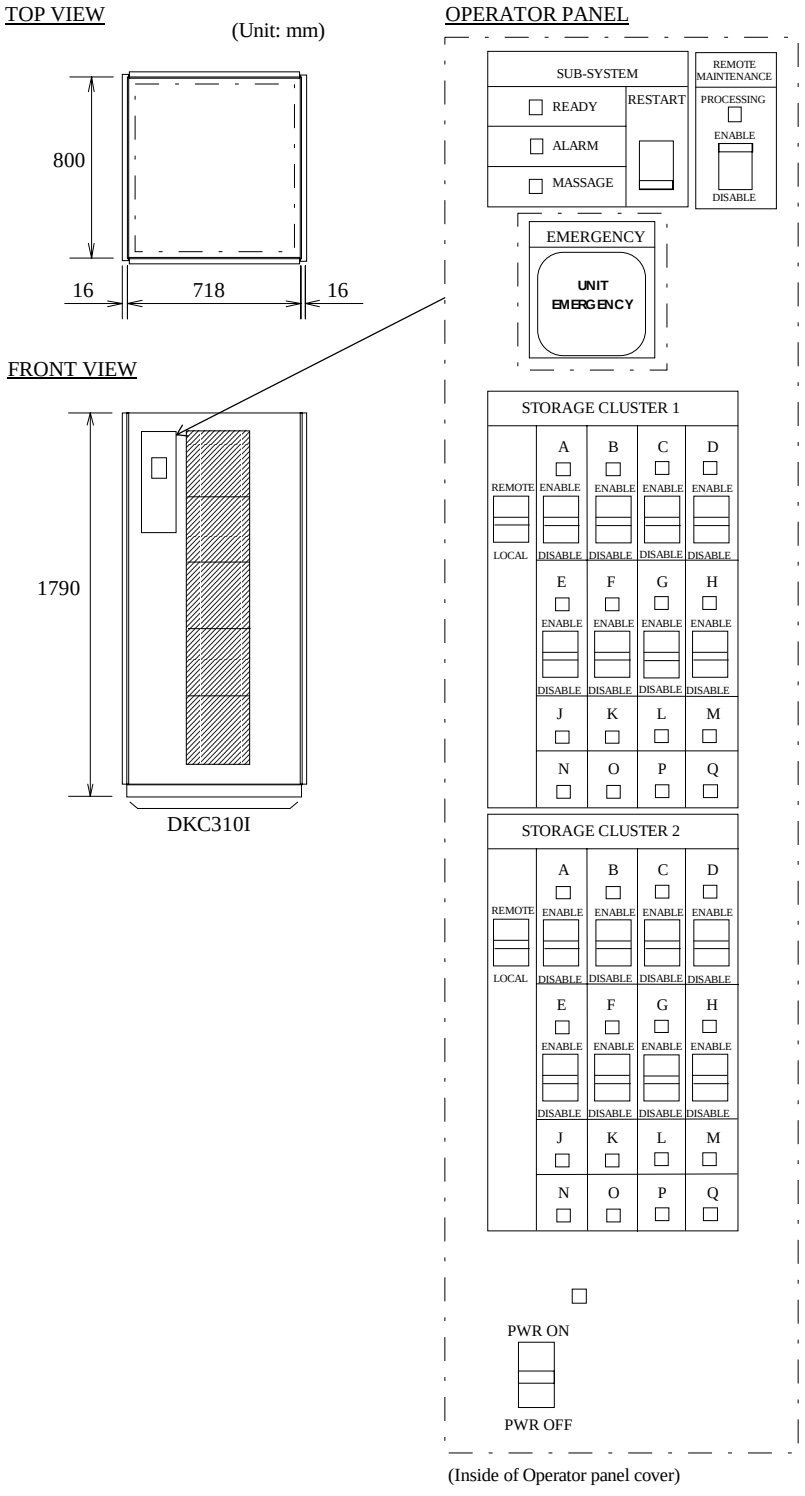
1.1.8 Layout

1. DKC310I Layout



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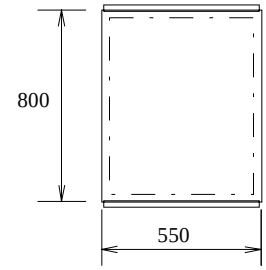
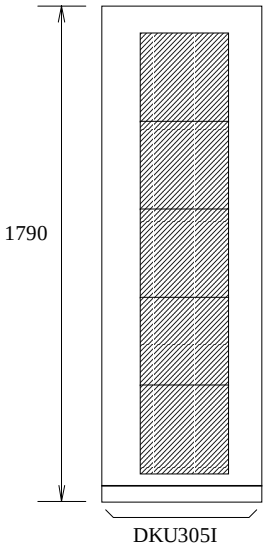
2. DKU305I Layout

(Unit: mm)

TOP VIEW



FRONT VIEW



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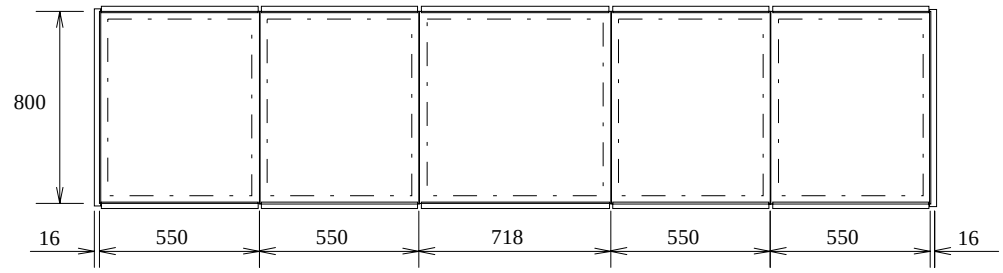
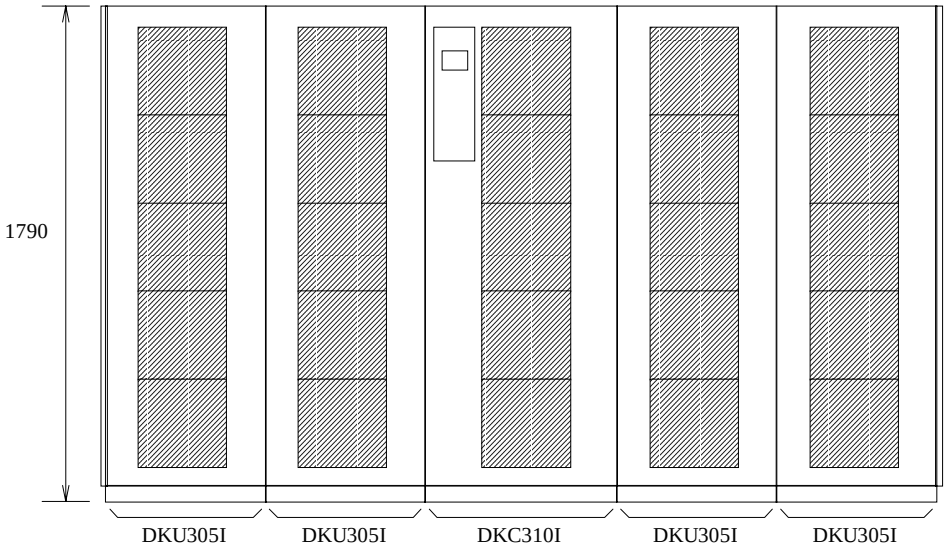
3. Full configuration of DKC310I and DKU305I

TOP VIEW

(Unit: mm)



FRONT VIEW



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1.1.9 Power and Grounding Check

1.1.9.1 Facility power check

The customer's outlet for the 60Hz UL Listed unit must be either of the followings.

Connector R & S 3934
Receptacle R & S 3754

The plug type for the AC power cable must be R & S 3760 or 3760PDG.

1.1.9.2 Facility grounding check

The subsystem must meet all of the following three conditions of installation for GROUNDING.

a. An insulated grounding conductor that is identical in size and insulation material and thickness to the grounded and ungrounded branch-circuit supply conductors. It should be green, with or without yellow stripes, and is to be installed as a part of the branch circuit that supplies the unit or system.

b. The grounding conductor mentioned in item (a.), should be grounded to earth at the service equipment or other acceptable building earth ground such as the building frame in the case of a high rise steel-frame structure.

c. The attachment-plug receptacles in the vicinity of the unit or system are all to be a grounding type. The grounding conductors serving these receptacles should be connected to earth ground at the service equipment or other acceptable building earth ground such as the building frame in the case of a high-rise steel-frame structure.

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1.2 Subsystem Frame Configuration

Fig. 1.2 shows the subsystem configuration.

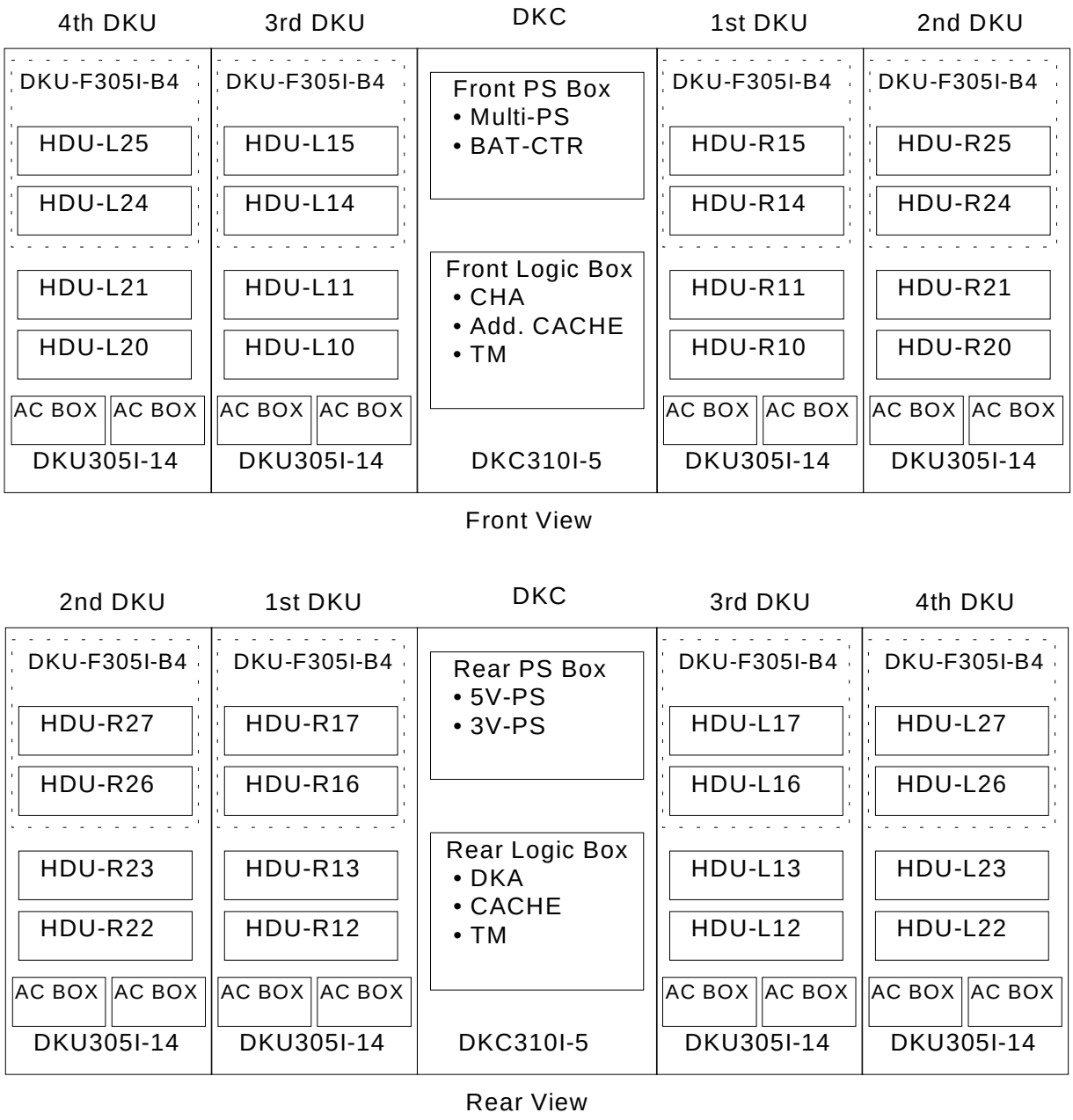

Fig. 1.2 Configuration of Subsystem Frame

Addition of the DKU frames are to be done in the following order: 1st DKU, 2nd DKU, 3rd DKU, and 4th DKU. However, when a mixture of different types of HDD is installed or a mixture of different emulation types is used, connection of the 3rd and 4th DKUs omitting the 2nd DKU is permitted. A disk drive connecting cable DKU-F305I-3C is required to add the 3rd DKU, and a cable DKU-F305I-24C to add the 2nd or 4th DKU.

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1.3 Drive Expansion Sequence

The order in which DKU-F305I-907 (7 HDD canisters) units are to be installed in a DKU-F305I-B4 is shown in Fig. 1.3-1 and the order in which DKU-F305I-901 (spare HDD) units are to be installed in Fig. 1.3-2.
The order in which DKU-F305I-1804/6F4/3604/15F4/9F4 (4 HDD canisters) units are to be installed in a DKU-F305I-B4 is shown in Fig. 1.3-3 and the order in which DKU-F305I-1801/6F1/3601/15F1/9F1 (spare HDD) units are to be installed in Fig. 1.3-4.
The order in which DKU-F305I-904 (4 HDD canisters) units are to be installed in a DKU-F305I-B4 is shown in Fig. 1.3-5 and the order in which DKU-F305I-901 (spare HDD RAID1) units are to be installed in Fig. 1.3-6.

NOTICE:

(1) The position to be installed in the 2nd or 4th DKU is different from one in the 1st or 3rd DKU. Be sure to set the HDDs in the right position.

(2) Don't use the position marked as X in the 2nd and 4th DKU.
Wrong setting of a HDD in the 2nd or 4th DKU may cause DKU failure on the same SCSI path.

(3) The specification for selecting the spare HDD can be common in the subsystem if there exists a spare HDD having the same capacity as that of the data HDD, though the HDD types coexist.

- Arrangement of the spare HDD is determined according to the RAID type (RAID 5: 6D + 1P, RAID5: 3D + 1P, or RAID1: 2D + 2D) of each DKA pair.
- Concerning the spare HDD type, install the HDD of the type supported in the subsystem.

No.	RAID type of DKA pair	Spare HDD arrangement (for each DKA pair)
1	RAID5 : 6D + 1P (DK308/9-90)	Shown in Fig. 1.3-2.
2	RAID5 : 3D + 1P (DK309-180, DK3F1-60, DK30A-360, DK3F2-150, DK3F2-90)	Shown in Fig. 1.3-4.
3	RAID1 : 2D + 2D (DK308/9-90, DK309-180, DK3F1-60, DK30A-360, DK3F2-150, DK3F2-90)	Shown in Fig. 1.3-4 (DK309-180, DK3F1-60, DK30A-360, DK3F2-150, DK3F2-90) and Fig. 1.3-6 (DK308/9-90)

Note : When the HDD types coexist, be careful that the HDD arrangement differs for each RAID type of the DKA pair.

(4) In case of changing the RAID type under DKA pair, all data HDD and spare HDD under the DKA pair have to be de-installed once. And then, install data HDD and spare HDD of new RAID type.

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No.	Model Number	Model Name	Data and Parity
1	DKU-F305I-907	7 HDD Canisters	Data and Parity Drive

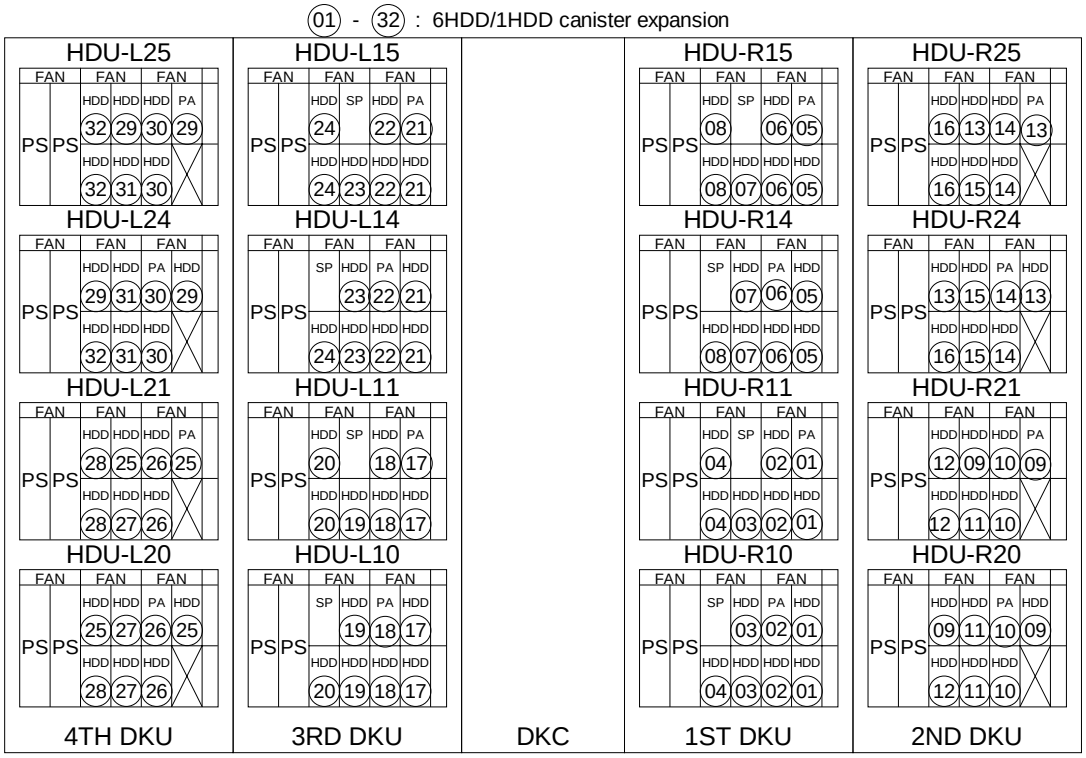

Fig. 1.3-1 Data Drive/Parity Drive Expansion Sequence

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No.	Model Number	Model Name	Spare
2	DKU-F305I-901	1 HDD Canister	Spare Drive (RAID5)

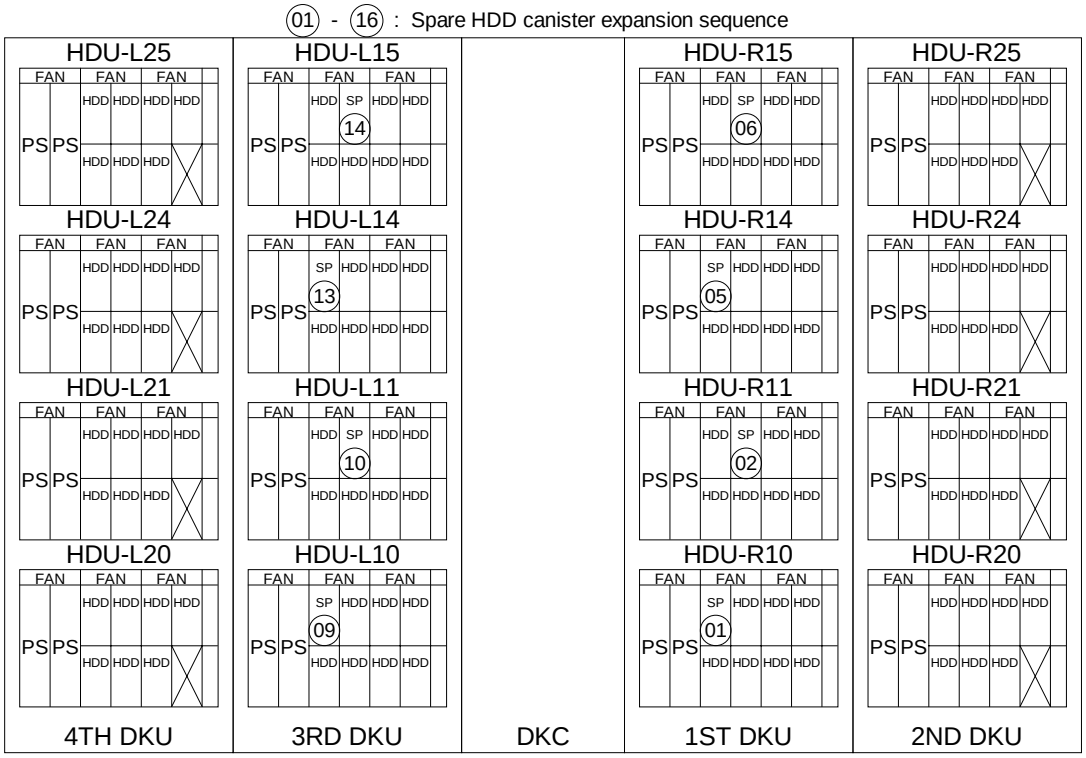

Fig. 1.3-2 Spare Drive Expansion Sequence

Note : Install spare drive corresponding to the number of parity groups installed in each DKU-F305I-B4 option according to Fig. 1.3-2.

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No.	Model Number	Model Name	Data and Parity
3	DKU-F305I-1804/3604	4 HDD Canisters	Data and Parity Drive
4	DKU-F305I-6F4/9F4/15F4	4 HDD Canisters	Data and Parity Drive

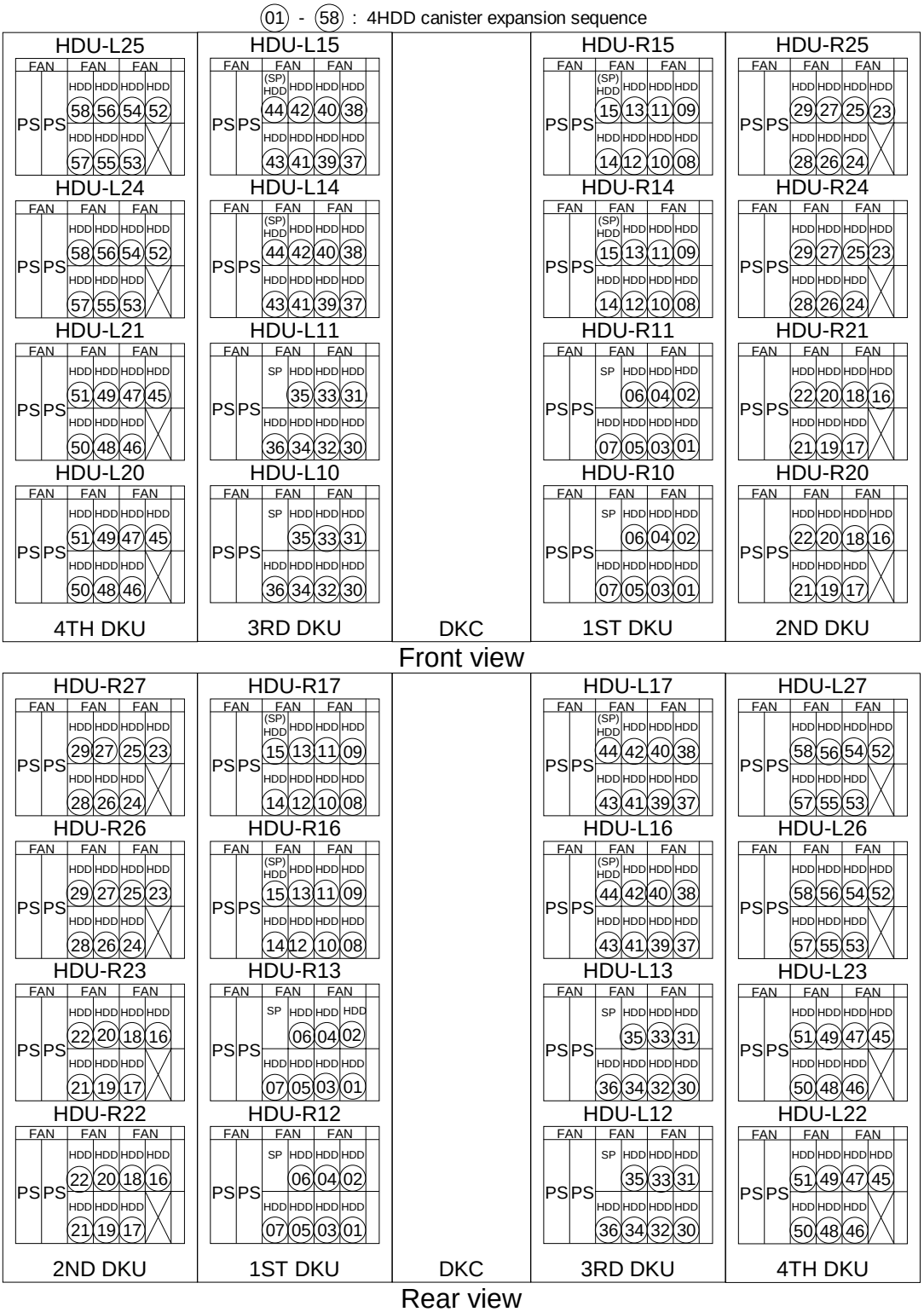

Fig. 1.3-3 Data Drive/Parity Drive Expansion Sequence

Note : Number of (15) and (44) can be used as spare disk or data disks.

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No.	Model Number	Model Name	Spare
5	DKU-F305I-1801/3601	1 HDD Canister	Spare Drive
6	DKU-F305I-6F1/9F1/15F1	1 HDD Canister	Spare Drive

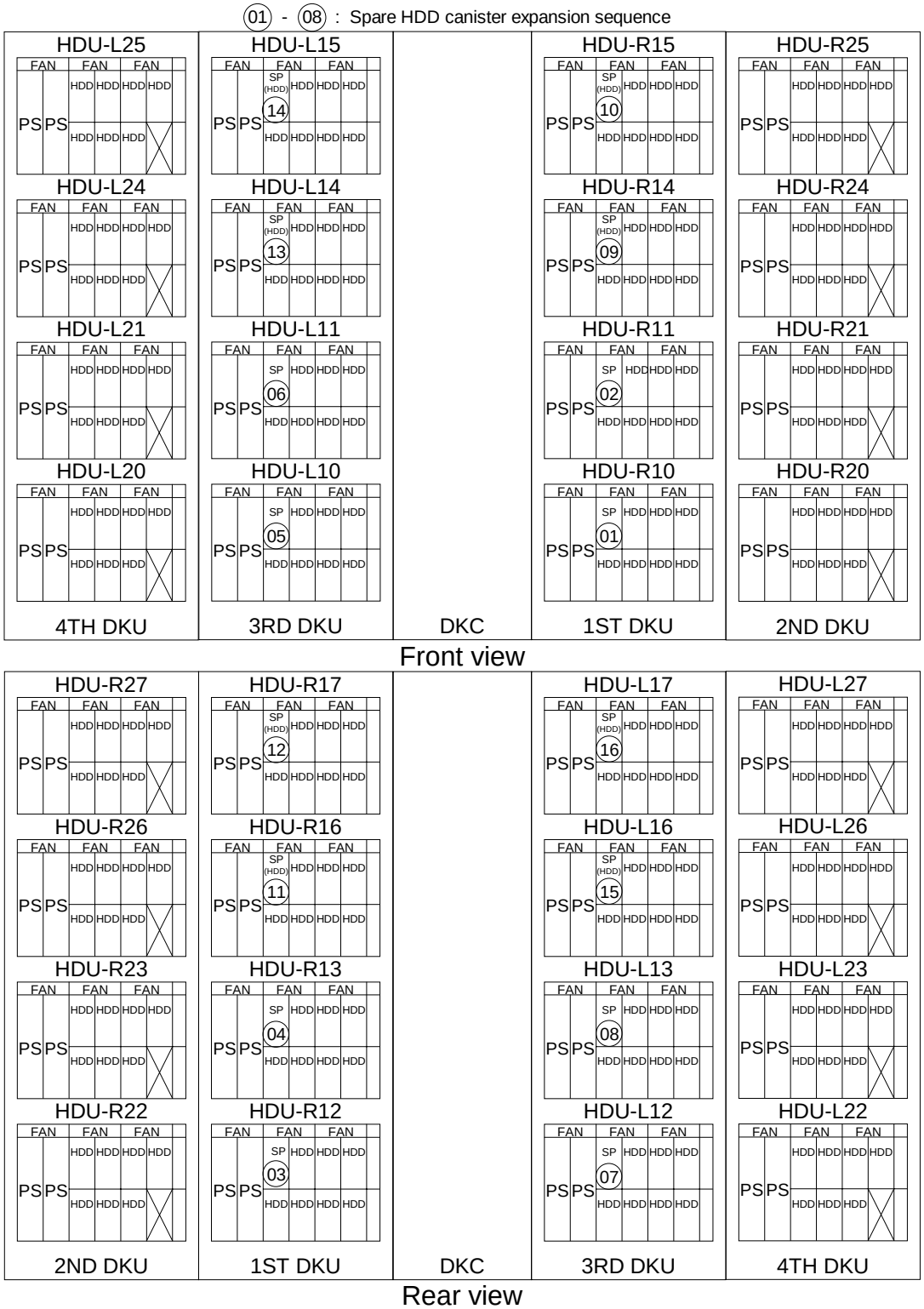

Fig. 1.3-4 Spare Drive Expansion Sequence

Note : Install spare drive corresponding to the number of parity groups installed in each DKU-F305I-B4 option according to Fig. 1.3-4. From 09 to 16 can be used as spare disk or data disks.

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No.	Model Number	Model Name	Data and Parity
7	DKU-F305I-904	4 HDD Canisters	Data and Parity Drive

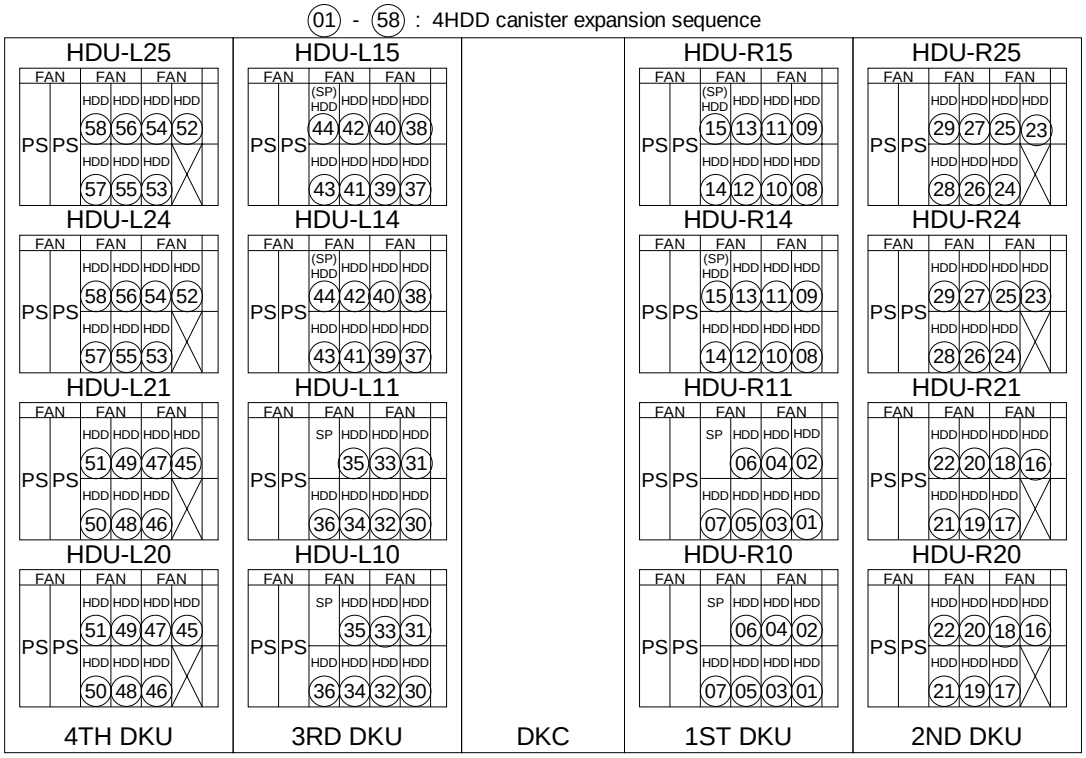

Fig. 1.3-5 Data Drive/Parity Drive Expansion Sequence

Note : Number of (15) and (44) can be used as spare disk or data disks.

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No.	Model Number	Model Name	Spare
8	DKU-F305I-901	1 HDD Canister	Spare Drive (RAID1)

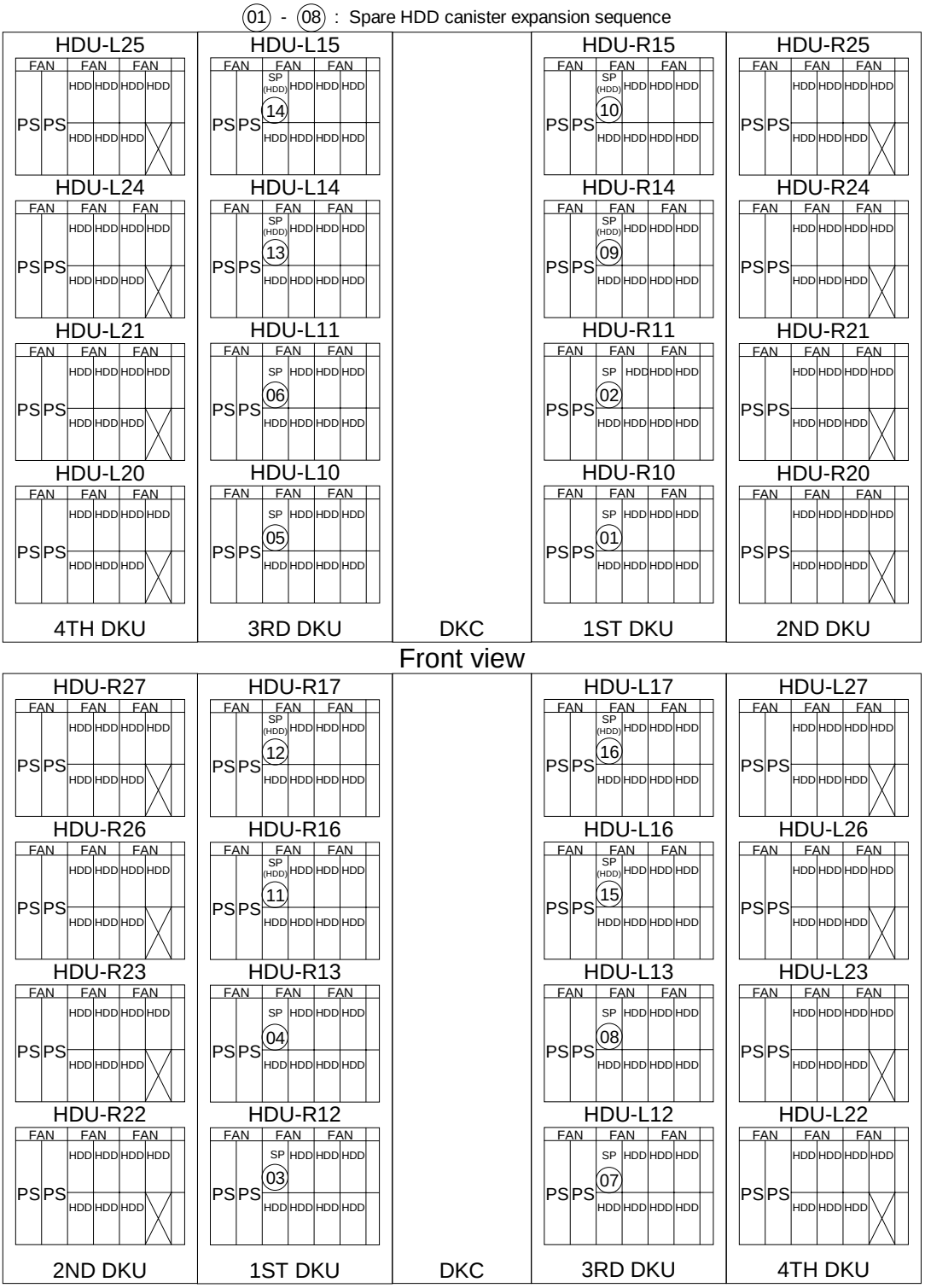

Fig. 1.3-6 Spare Drive Expansion Sequence

Note : Install spare drive corresponding to the number of parity groups installed in each DKU-F305I-B4 option according to Fig. 1.3-6. From (09) to (16) can be used as spare disk or data disks.

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1.4 Explanation of Channel Option Configuration

1.4.1 List of Channel Options

Channel options which can be installed in the DKC310 are shown in Table 1.4-1. Up to 4 sets of them can be installed in the entire subsystem.

Table 1.4-1 List of Channel Options

No.	Model Number	Model Name	Major Part	Remarks
1	DKC-F310I-4S	Serial 4-port Adapter	• SH086/149-A (MP) × 2 WP207/217-B (2 Port) × 2 • I/F Con. Panel	For connection to the main frame
2	DKC-F310I-8S	Serial 8-port Adapter	• SH086/149-A (MP) × 4 WP207/217-A (4 Port) × 2 • I/F Con. Panel	For connection to the main frame
3	DKC-F310I-8P	Parallel 8CH Switch (Previous I/F Connector)	• SH086/149-B (MP) × 2 WP209-A (4CH) × 2 • I/F Con. Panel (1) • Internal Cable (1)	For connection to the main frame This option is installed in the basic unit; it uses a conventional type interface connector.
4	DKC-F310I-8PS	Parallel 8CH Switch (Shrink I/F Connector)	• SH086/149-B (MP) × 2 WP209-A (4CH) × 2 • I/F Con. Panel (2) • Internal Cable (2)	For connection to the main frame This option can be installed in either of the basic and additional units; it uses a small interface connector.
5	DKC-F310I-8C	SCSI 8-port Adapter	• SH086/149-C (MP) × 4 WP204/214-A (4SCSI) × 2 • I/F Con. Panel • Internal Cable	For connection to the open system
6	DKC-F310I-4F	Fibre 4-port Adapter for Optical Cable	• SH086/149-D (MP) × 2 SH113-A (LC) × 2 WP206-A (2 Port) × 2 • I/F Con. Panel	For connection to the open system
7	DKC-F310I-4FE	Fibre 4-port Adapter for Optical Cable	• SH086/149-D (MP) × 2 SH160-A (LC) × 2 WP206-B (2 Port) × 2 • I/F Con. Panel	For connection to the open system
8	DKC-F310I-4GS	Fibre 4-port Adapter for Short Wavelength	• SH164-A (MP) WP256-A (LC) × 2 • I/F Con. Panel	For connection to the open system
9	DKC-F310I-4GL	Fibre 4-port Adapter for Long Wavelength	• SH164-A (MP) WP256-B (LC) × 2 • I/F Con. Panel	For connection to the open system

Note: Only up to 2 sets of parallel 8-channel switches can be installed in each subsystem.

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1.4.2 Channel Specifications

Specifications for each channel option are shown in table 1.4-2.

Table 1.4-2 Channel Specifications

Item	Main frame				Open system		
	Serial 4-port	Serial 8-port	Parallel 8-port		SCSI 8-port		Fibre 4-port
Option name	4S	8S	8P	8PS	8C		4F/4FE
Data transfer rate (MB/s)	10/17	10/17	3/4.5/6/9	3/4.5/6/9	Max.20	Max.40	Max.100
Number of connected ports/option	4	8	8	8	8	8	4
Number of MPs/option	4	8	4	4	8	8	4
Host interface	Serial channel	Serial channel	Parallel channel	Parallel channel	Fast/Wide SCSI	Ultra SCSI	Fibre channel (optical)
Number of installable options/subsystem	1/2/3/4	1/2/3/4	1	1/2	1/2/3/4	1/2/3/4	1/2/3/4
Cable length	3 km	3 km	122 m	122 m	20 m	20 m	500 m

Item	Open system	
	Fibre (Short) 4-port	Fibre (Long) 4-port
Option name	4GS	4GL
Data transfer rate (MB/s)	Max.100	Max.100
Number of connected ports/option	4	4
Number of MPs/option	8	8
Host interface	Fibre Channel (Short wavelength)	Fibre Channel (Long wavelength)
Number of installable options/subsystem	1/2/3/4	1/2/3/4
Cable length	500 m	10 km

Up to 4 sets of combinations of the aforementioned channel options and up to 32 ports can be connected to each subsystem. However, when the option 8P is installed, the number of connectable ports is restricted to up to 24 ports and when the options 8P and 8PS are installed, it is restricted to up to 16 ports.

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1.4.3 Installing Location

(1) Option installing location
The channel option installing location and the interface connector installing section are shown in Figure 1.4-1.

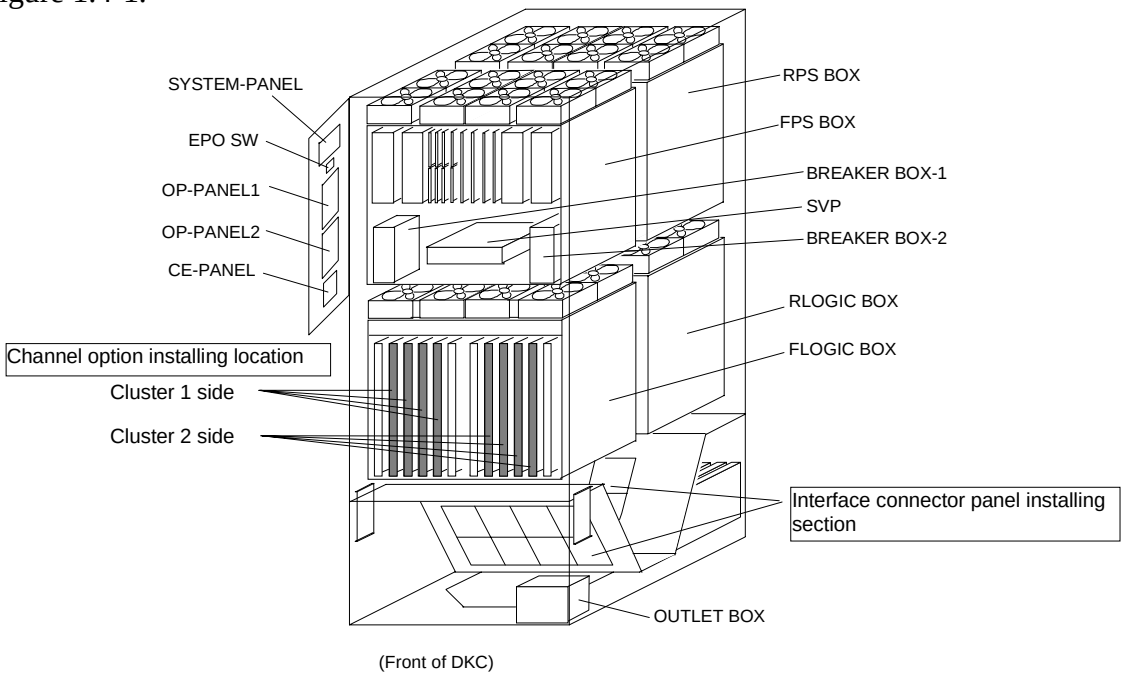

Fig. 1.4-1 Channel Option Installation

(2) PCB location diagram
Location of channel option PCBs are shown in Table 1.4-3.

Table 1.4-3 PCB Location Diagram

CL1	CL1						CL2					CL1
N	P	Q	R	S	T		U		V	W	X	Y	Z
W	8P	—	—	—	W	W	W	W	8P	—	—	—	W
P	8PS	8PS	—	—	P	P	P	P	8PS	8PS	—	—	P
1	4S	4S	4S	4S	1	1	1	1	4S	4S	4S	4S	1
0	8S	8S	8S	8S	0	1	0	1	8S	8S	8S	8S	0
5	8C	8C	8C	8C	8	8	8	8	8C	8C	8C	8C	5
-A	4F	4F	4F	4F	-B	-B	-B	-B	4F	4F	4F	4F	-B
	4FE	4FE	4FE	4FE					4FE	4FE	4FE	4FE	
	4GS	4GS	4GS	4GS					4GS	4GS	4GS	4GS	
	4GL	4GL	4GL	4GL					4GL	4GL	4GL	4GL	
TM-1N	CHA-1P (Basic)	CHA-1Q (Add.1)	CHA-1R (Add.2)	CHA-1S (Add.3)	CACHE-1T		CACHE-2U		CHA-2V (Basic)	CHA-2W (Add.1)	CHA-2X (Add.2)	CHA-2Y (Add.3)	TM-1Z

8P : PCB for DKC-F310I-8P 8PS : PCB for DKC-F310I-8PS 4FE : PCB for DKC-F310I-4FE
4S : PCB for DKC-F310I-4S 8S : PCB for DKC-F310I-8S 4GS : PCB for DKC-F310I-4GS
8C : PCB for DKC-F310I-8C 4F : PCB for DKC-F310I-4F 4GL : PCB for DKC-F310I-4GL
— : Uninstallable
(For the configuration of each PCB, see Table 1.4-1.)

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1.4.4 Restrictions of Installation

When a parallel channel option is to be installed, following restrictions are imposed on the installing location.

(1) Types of parallel channel options

For the DKC310, a parallel channel option (DKC-F310I-8PS) with a miniaturized interface connector for the connection to the host CPU is newly provided in order to make it possible to connect up to 32 paths to the host CPU.

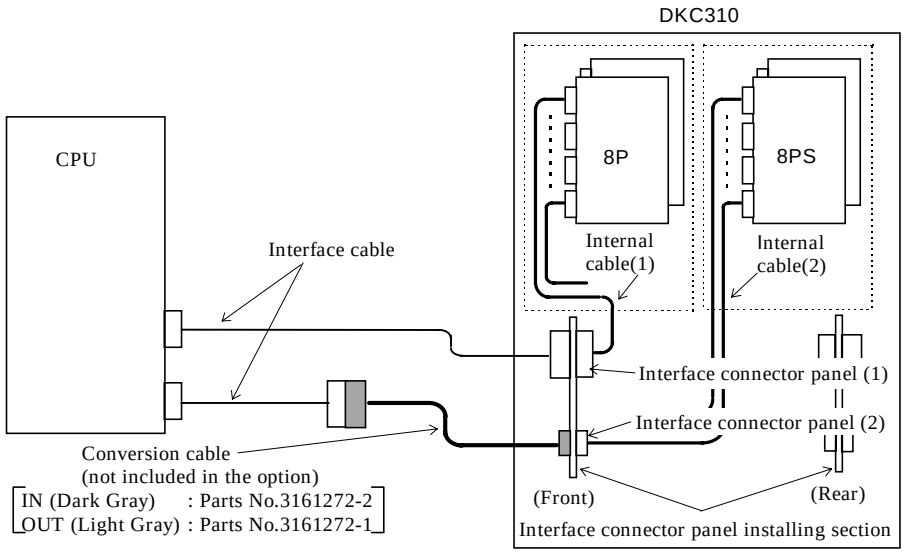

Fig. 1.4-2 Parallel Channel Connection Diagram

(2) Interface connector panel installing section

The interface connector panel installing section is shown in Fig. 1.4-3 and the number of necessary interface connector panels for each option is shown in Table 1.4-4.
(For the installing location, see Fig. 1.4-1)

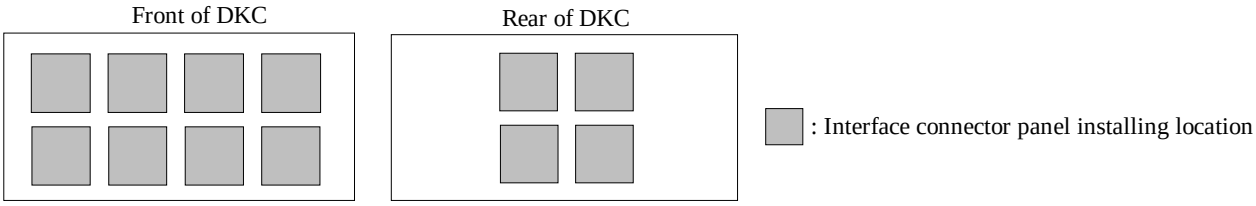

Fig. 1.4-3 Interface connector panel installing section

Table 1.4-4 Number of necessary interface connector panel

Option model	Number of necessary interface connector panels
DKC-F310I-4S/8S/8C/4F/4FE/ 4GS/4GL	CL1 CL2
DKC-F310I-8PS	CL1 CL1 CL2 CL2
DKC-F310I-8P	CL1 CL1 CL2 CL2 CL1 CL1 CL2 CL2

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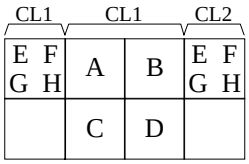
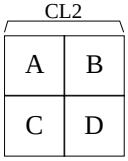
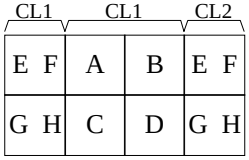
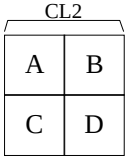
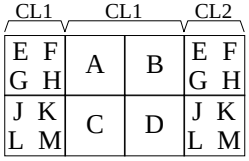
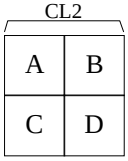
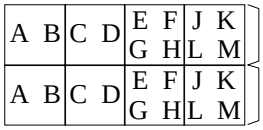
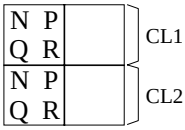
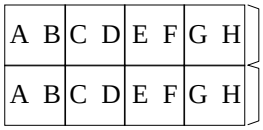
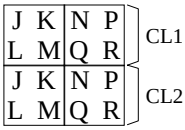
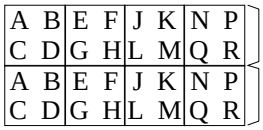
(3) Restrictions imposed on option installation

When installing a channel option, following restrictions are imposed on the installing location.

Case	Installing location				Maximum number of connectable channel ports	Interface connector panel installation diagram	
	Basic	Add.1	Add.2	Add.3		Front of DKC	Rear of DKC
1	8P	×	Not installed	Not installed	16		
2	8P	8PS	—	—	16		
3	8P	×	×	—	24		
4	8PS	×	×	×	32		
5	8PS	8PS	×	×	32		
6	×	×	×	×	32		

— : Uninstallable

× : One of the options, that is, F8S, 4S, 8C, 4F, 4FE, 4GS, and 4GL can be installed.

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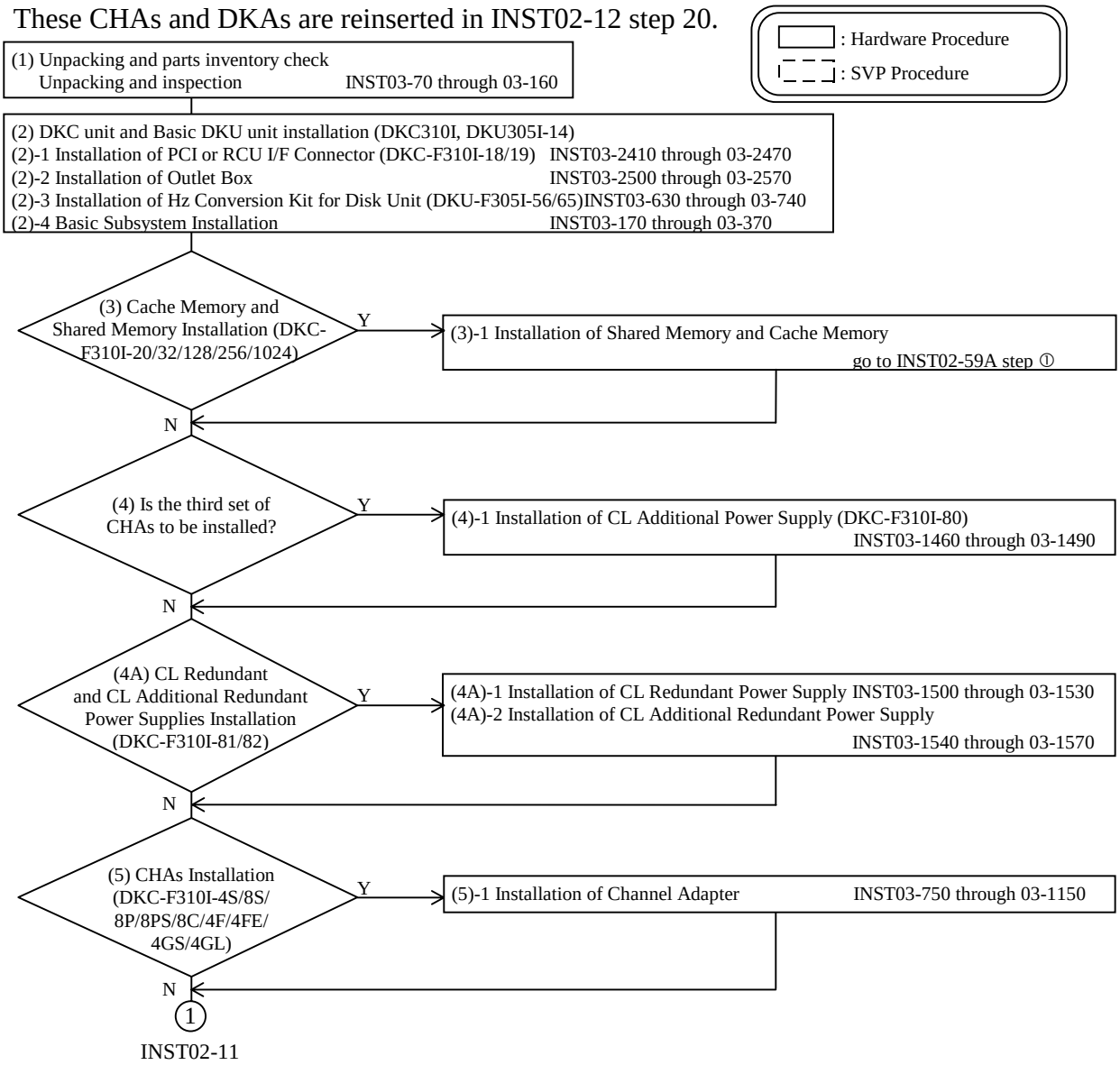
2 Installation and De-installation procedure

2.1 New Installation Procedure General Flow

When installing Subsystem for the first time, perform all hardware installation procedures before initiating the installation through SVP procedure. The general procedure for installing a new Subsystem is shown below. Each procedure is performed referring to the following flow chart. Skip the next procedure when the procedure is not necessary. If any problems arise during the following procedure, isolate failure part with analysis of SIM log or SSB log. If neither SIM log nor SSB log has been created, re-check the general procedure and see TROUBLE SHOOTING SECTION.

Precaution on New Installation

- The CL Additional Power Supply (DKC-F310I-80) must be installed when installing three or more channel options.
  In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.
- After all hardware Installation procedures , pull out the specified CHAs and DKAs temporarily (Location DKA:C,D,E,J,K,L CHA:Q,R,S,W,X,Y) in INST02-12 step 14.
  These CHAs and DKAs are reinserted in INST02-12 step 20.



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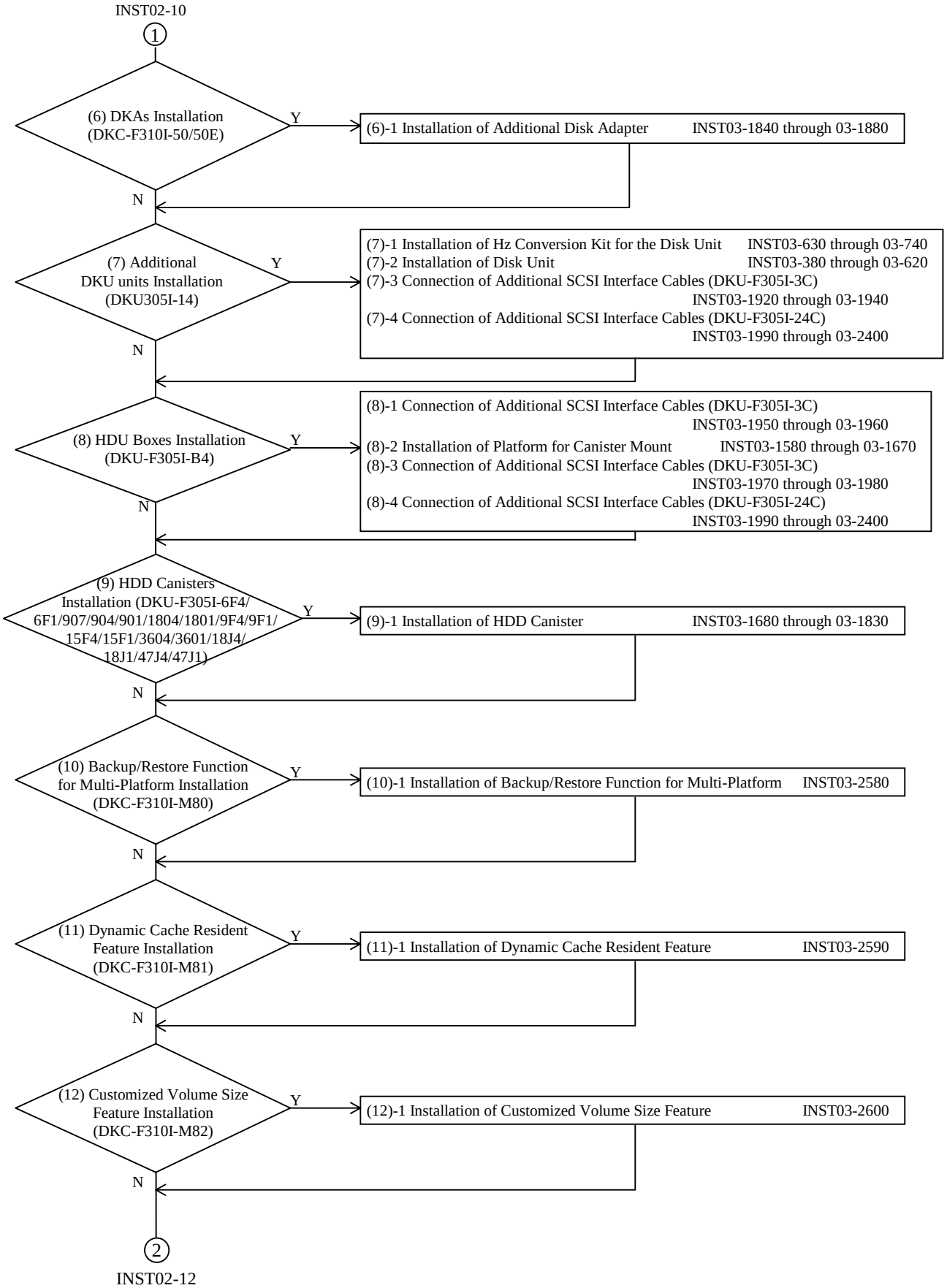

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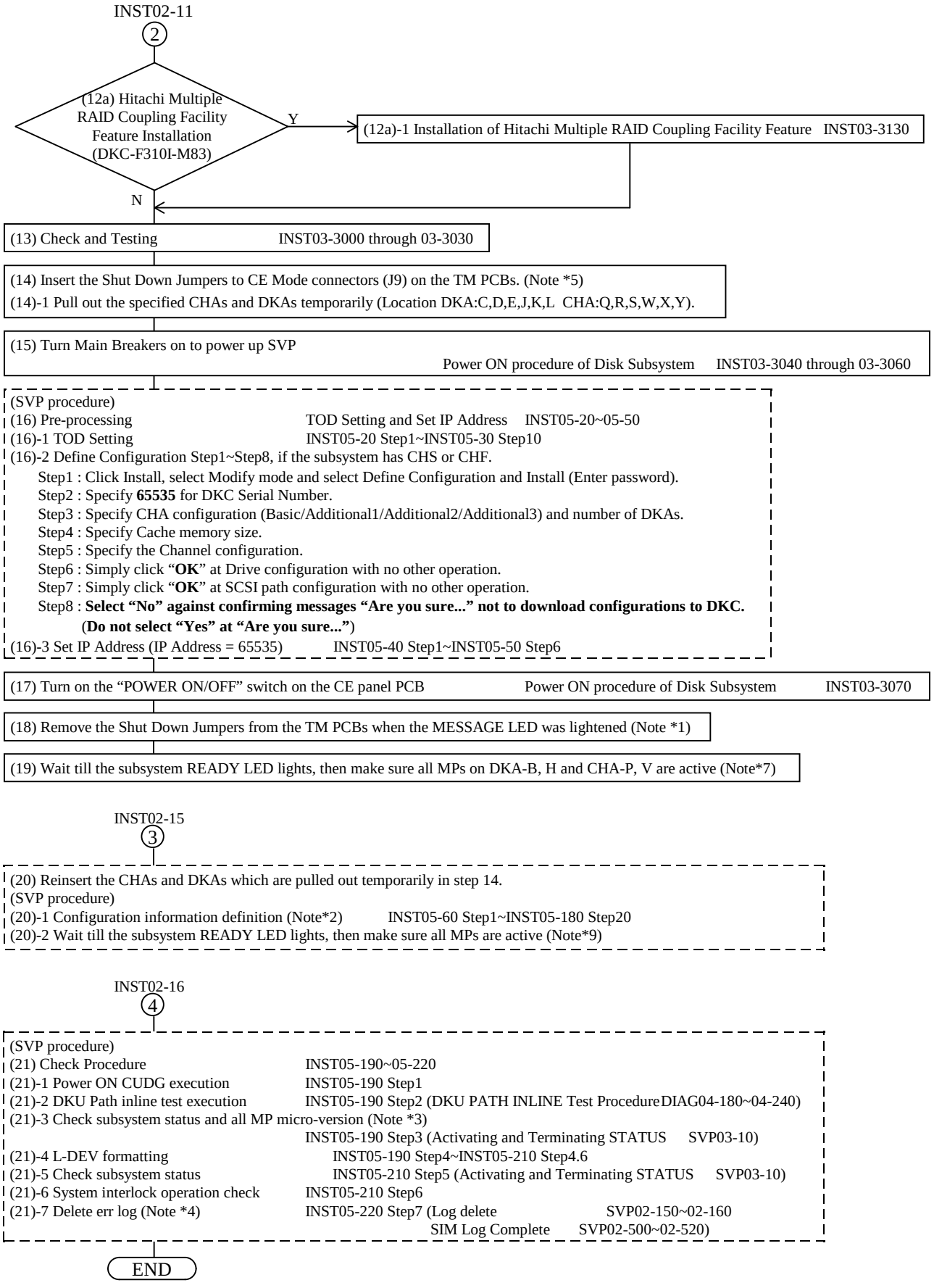

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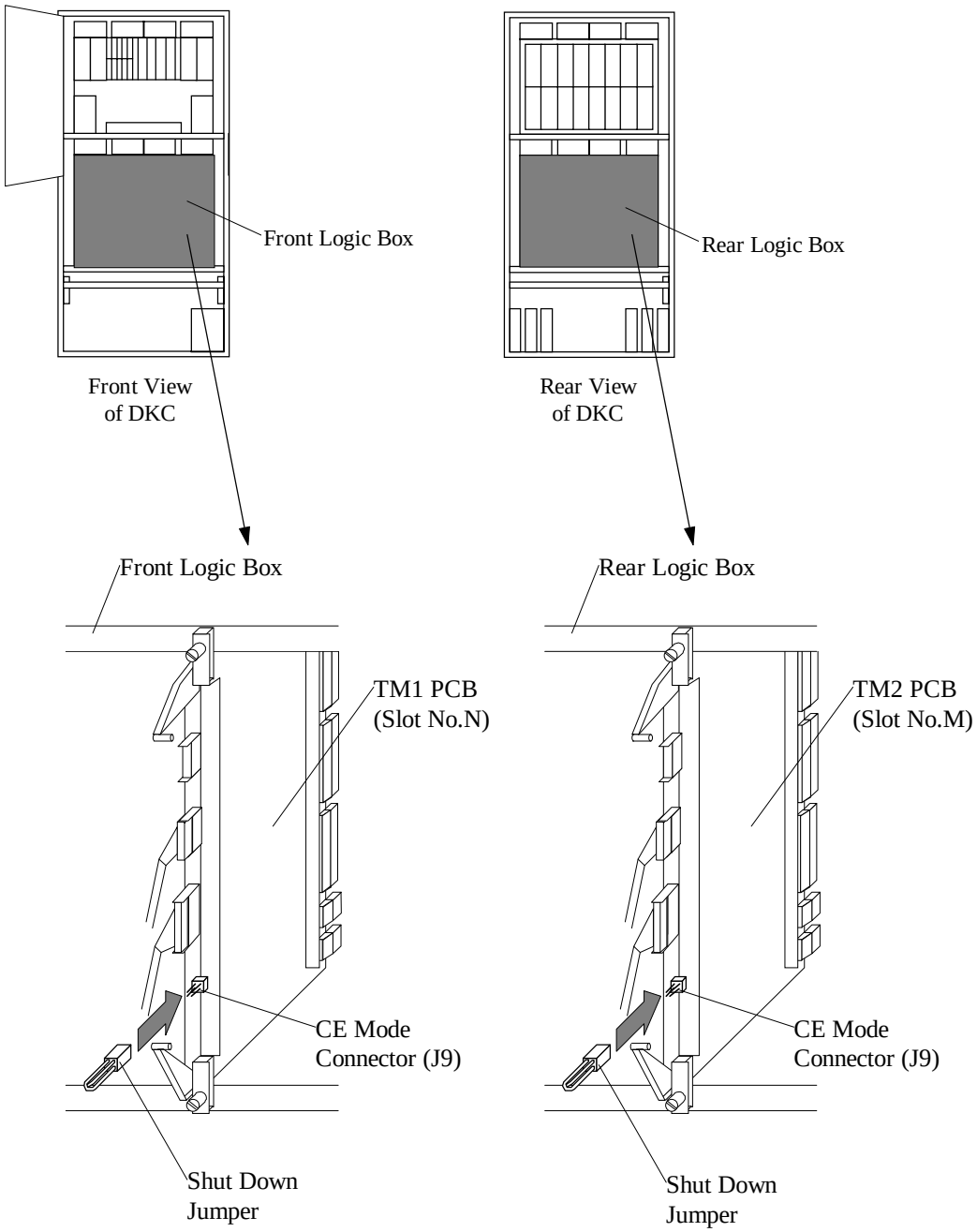
Note *1 : Pull out jumper plugs when the MESSAGE LED is lightened and while it's lighting. The MESSAGE LED is lightened for 3 minutes as soon as the Power on. The jumper plugs must not be set after it. If you forget or failed to pull out them while the MESSAGE LED is lighting, execute "Power Off Procedure". And then, re-execute from step (14).

Note *2 : At this time, specify the "DKC Serial Number" without fail. Refer to INST02-14 Note *6.

Note *3 : If the micro version is different from expected ones, execute the "Micro-Program Exchange". The procedure to exchange the Micro-Program, refer to MICRO-FC01-10~07-10.

Note *4 : It's necessary to execute the procedure of "SIM Log Complete" before deleting SIM data.

Note *5



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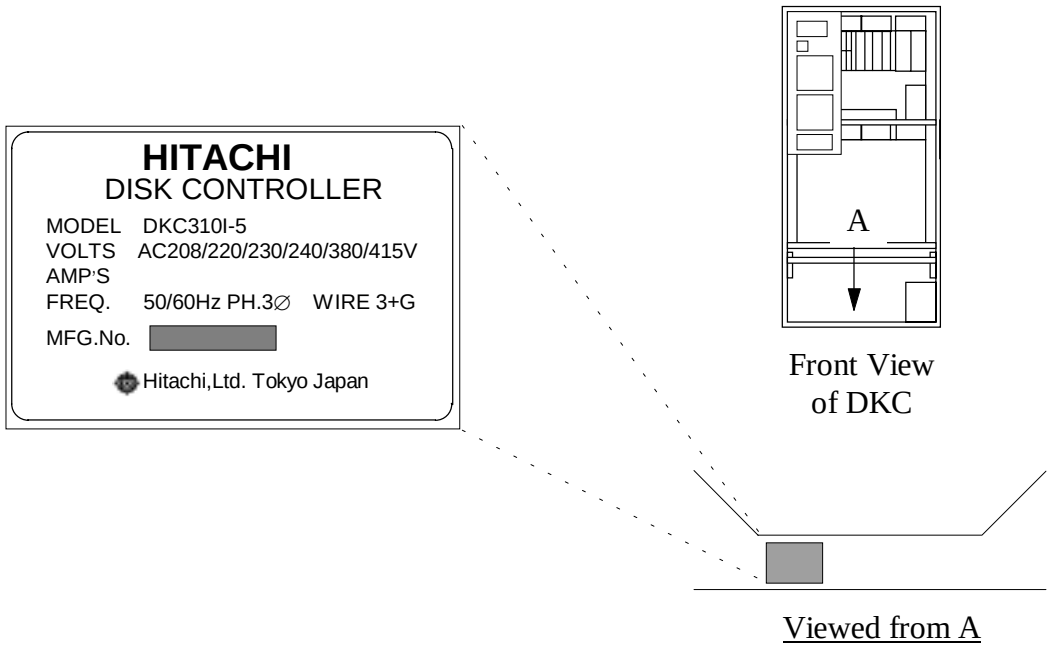
Note *6



Note *7 : Refer to Note *8 for the procedure. If Power Event Log (SYSTEM ON) was reported from all installed MPs, go to step (20) in the procedure. For MPs that did not report Power Event Log, execute the procedure shown in Note *8.

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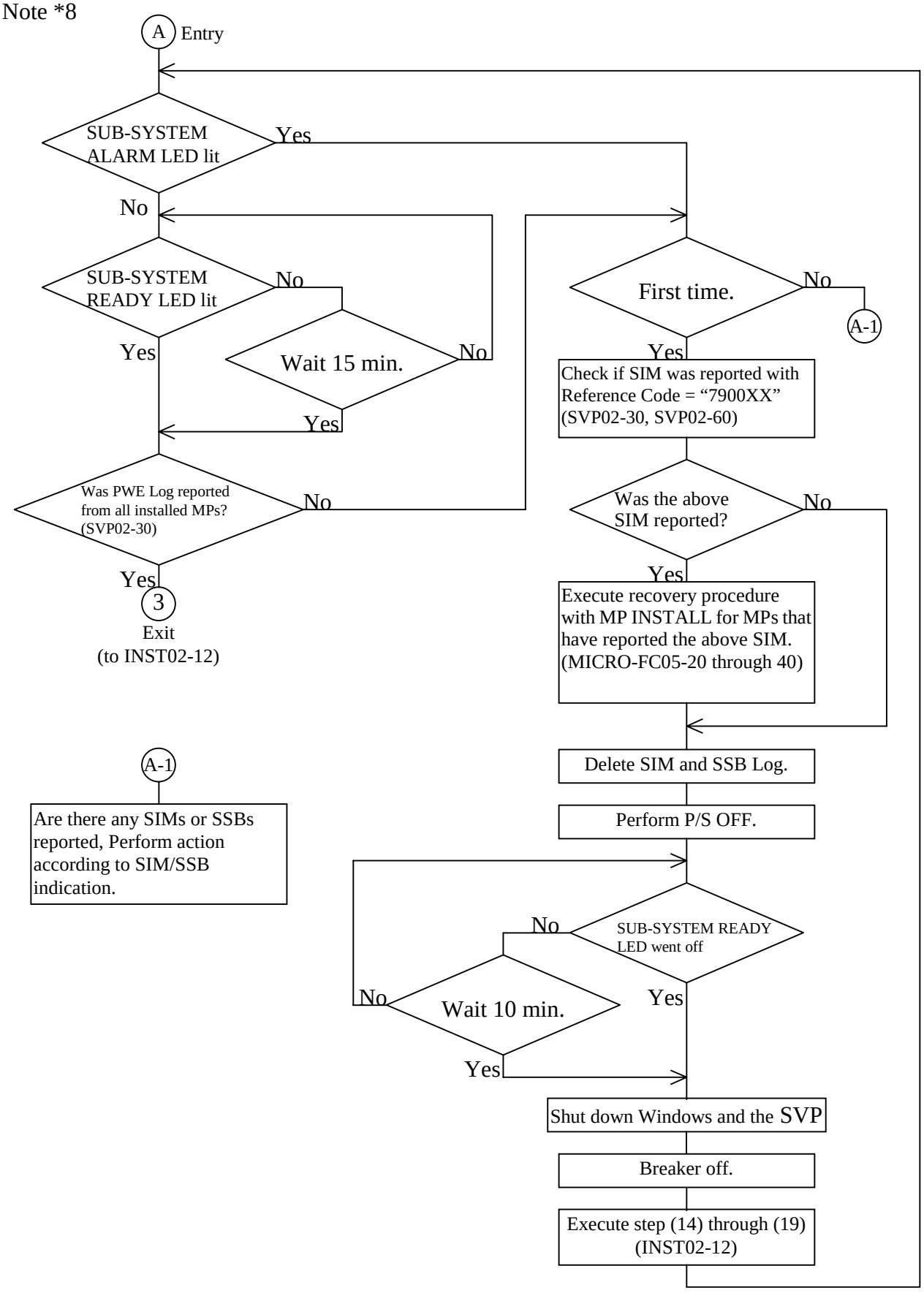
Note *8



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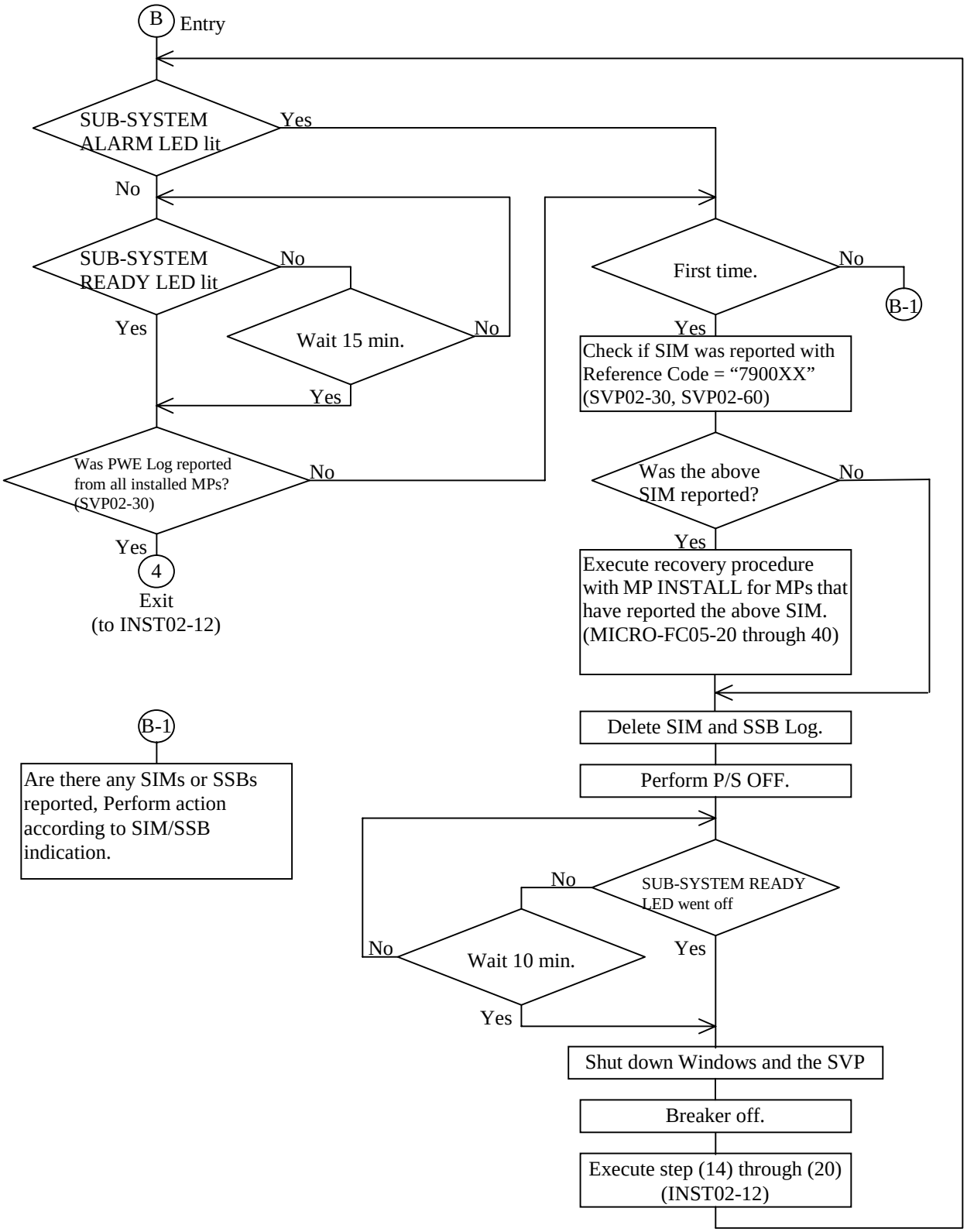
Note *9 : Refer to Note *10 for the procedure. If Power Event Log (SYSTEM ON) was reported from all installed MPs, go to step (21) in the procedure. For MPs that did not report Power Event Log, execute the procedure shown in Note *10.

Note *10



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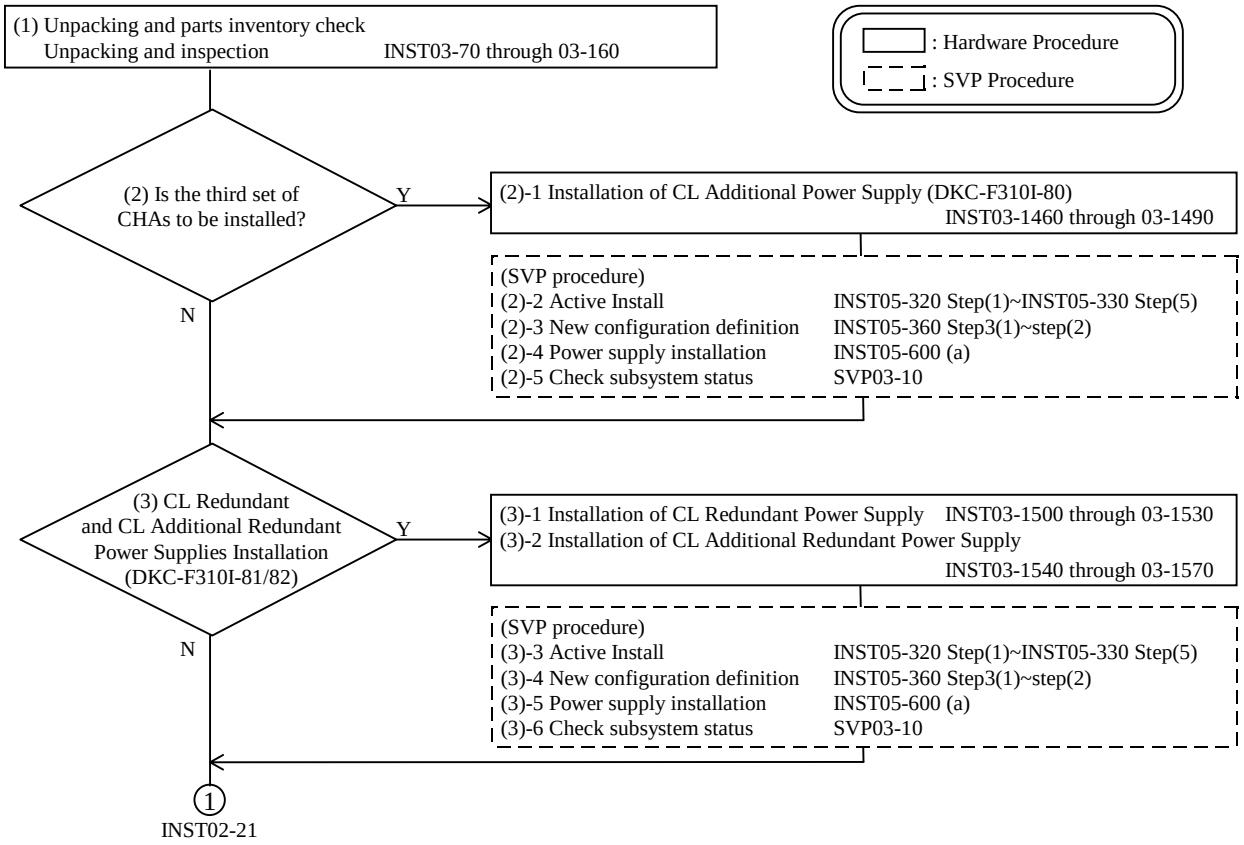
2.2 Non-Disruptive Installation Procedure General Flow

Install additional non-disruptive options according to the flow shown below. This work is completed by installing additional hardware for each option and performing SVP-controlled installation.
If a fault occurs during or after additional installation, see INST02-60 to locate a faulty unit and take action. If any other message than the list is displayed, see the SVP Message section.

Precautions on Non-Disruptive Installation

- "Non-Disruptive" means that the subsystem is connected to the host (OS). Non-Disruptive Installation shall be done with the subsystem power ON. However, the subsystem may be disconnected from the host (OS).
- Install additional Cache Memory and Shared Memory (DKC-F310I-20/32/128/256/1024) on one side first without affecting subsystem operation according to the SVP guidance.
- The CL Additional Power Supply (DKC-F310I-80) must be installed when installing three or more channel options.
  In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.
- When the type of the CHAs is changed (e.g. from parallel to serial channel), de-install the old CHAs temporarily before installing new CHAs.
- When installing 2nd and 4th DKUs, it is necessary to block the target DKA from the SVP before connecting the SCSI cables.
- When adding a new HDD Box (DKU-F305I-B4) to the 1st or 3rd DKU or both, perform DKA upgrade procedure before proceeding with HDD upgrade procedure.
- When changing configuration definition of SCSI path, it is necessary to stop concerned SCSI channel path before proceeding with configuration definition change procedure.



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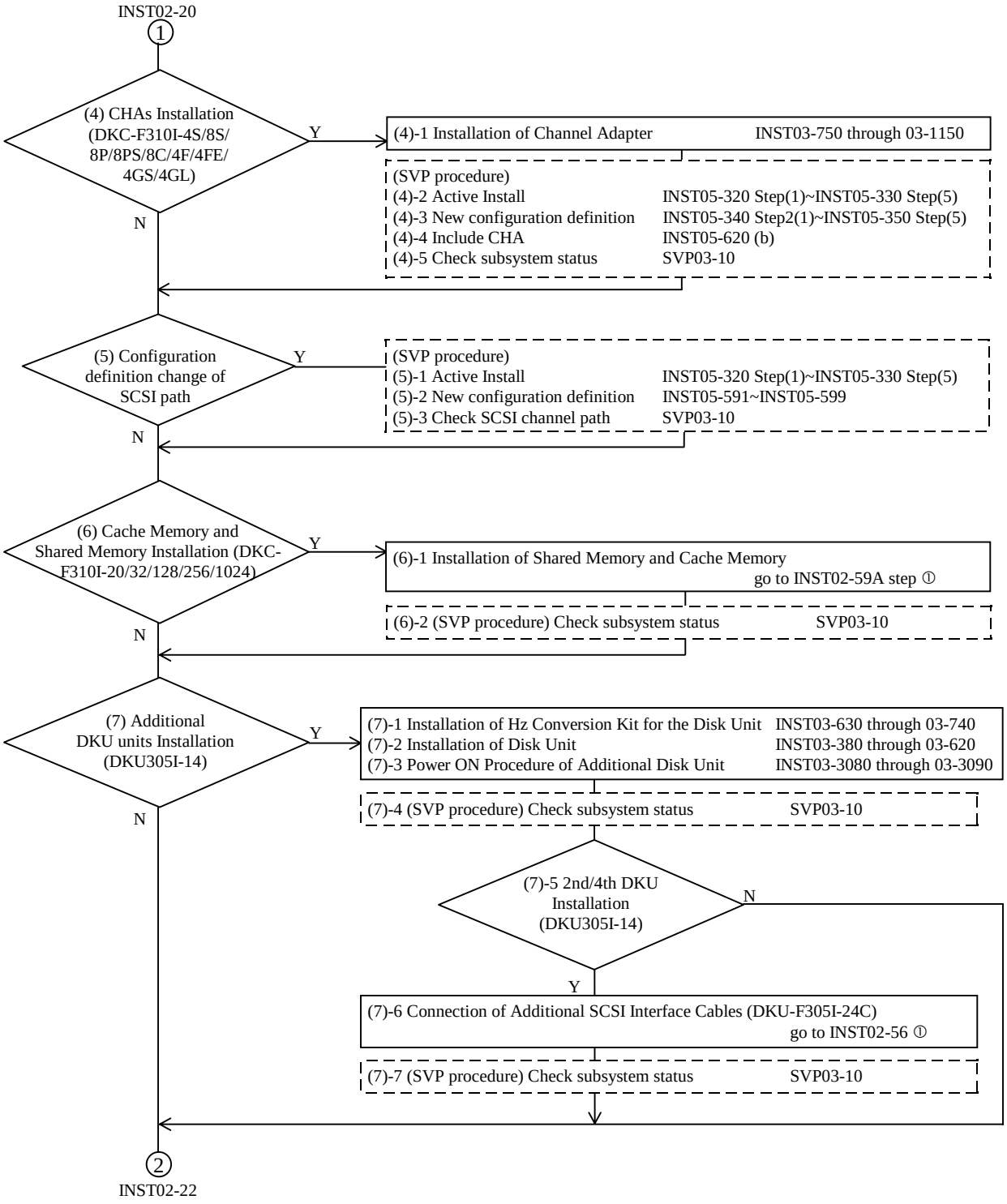

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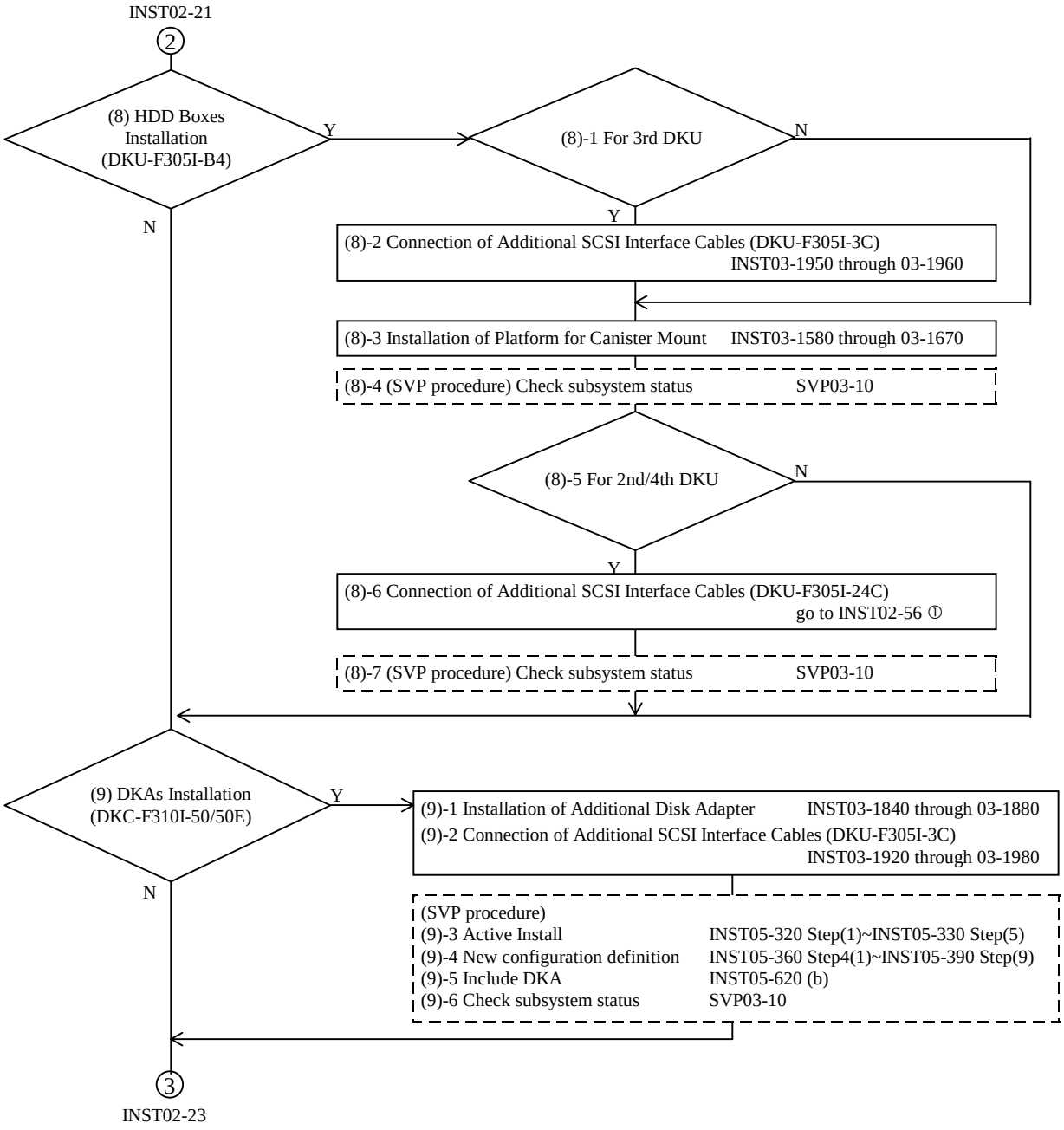

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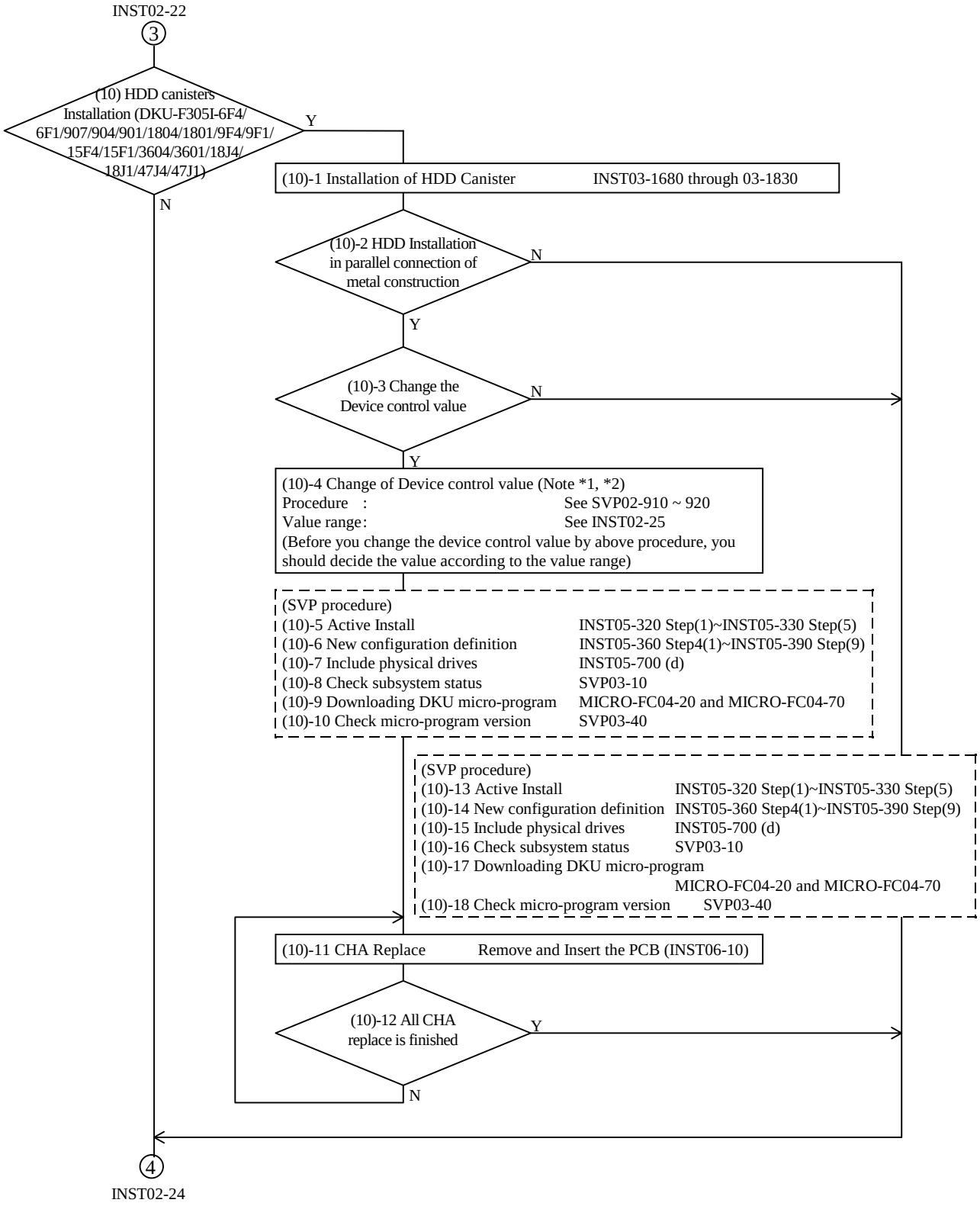

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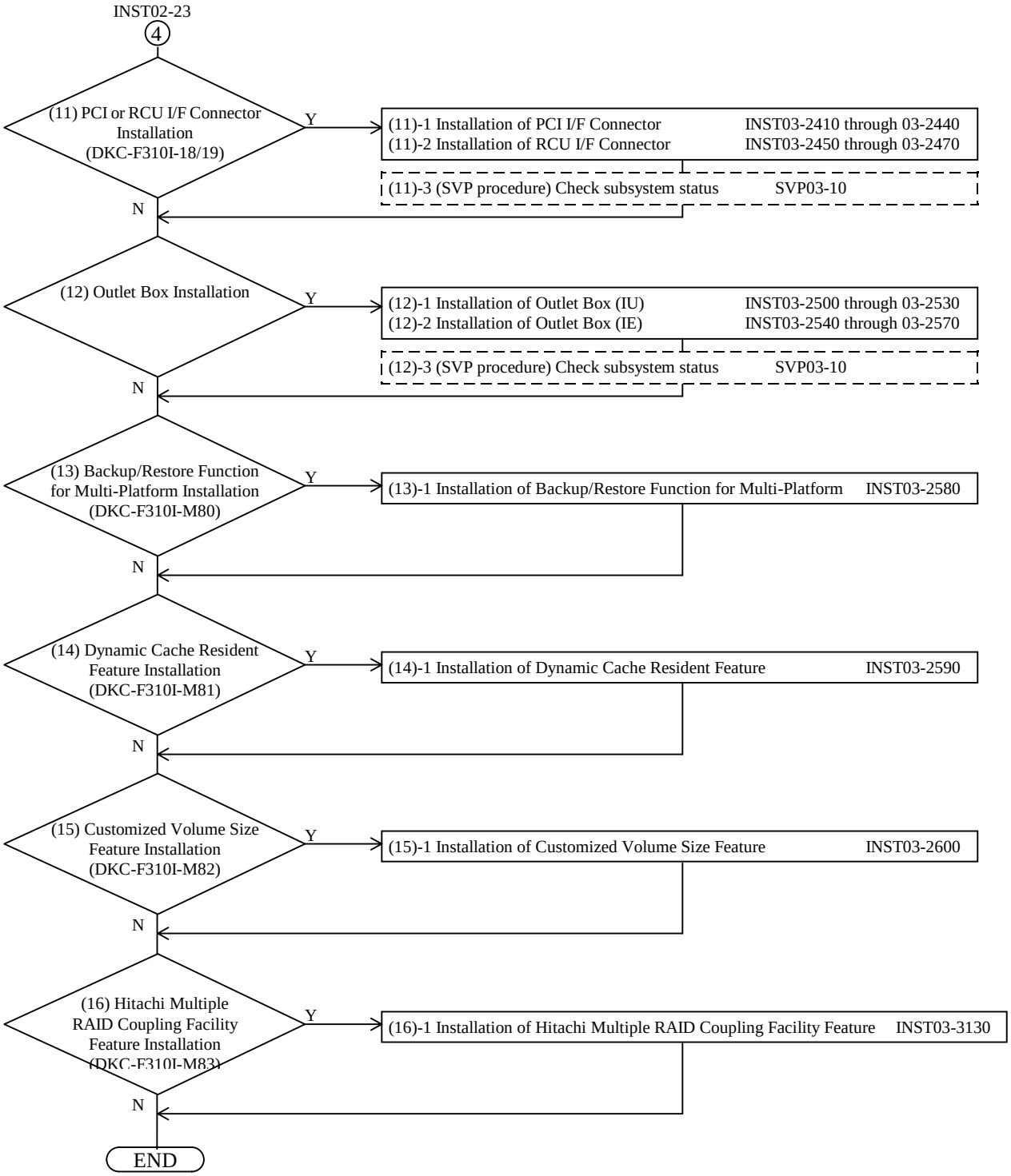

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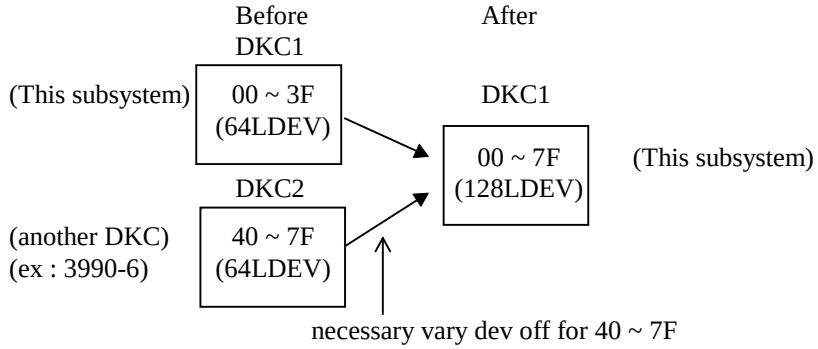
Note *1 : Preparation for changing Device control value in HDD installation

EXAMPLE : In the case of extension by HDD installation



Note *2 Available range of HDD installation

32LDEV control → 64LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 1	before	◄- - - - ►							
	after	◄- - - - - - - - - - - - - - - - - - ►							
case 2	before			◄- - - - ►					
	after			◄- - - - - - - - - - - - - - - - - - ►					
case 3	before					◄- - - - ►			
	after					◄- - - - - - - - - - - - - - - - - - ►			
case 4	before							◄- - - - ►	
	after							◄- - - - - - - - - - - - - - - - - - ►	

32LDEV control → 128LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 5	before	◄- - - - ►							
	after	◄- ►							
case 6	before					◄- - - - ►			
	after					◄- ►			

32LDEV control → 256LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 7	before	◄- - - - ►							
	after	◄- - - - - - - - - - - - - - - - - - - -

2.3 Non-Disruptive De-installation Procedure General Flow

Remove additional non-disruptive options according to the flow shown below. This work is completed by removing hardware for each option and performing SVP-controlled removal.
When De-Installation has been all done, make sure that all the removed units are displayed as "empty" and that the other units are normal (See the STATUS Section).
If a fault occurs during or after removal, see INST02-70 to locate a faulty unit and take action. If any other message than the list is displayed, see the SVP Message section.

Precautions on Non-Disruptive De-Installation

- "Non-Disruptive" means that the subsystem is connected to the host (OS). Non-Disruptive De-Installation shall be done with the subsystem power ON. However, the subsystem may be disconnected from the host (OS).
- Remove additional Cache Memory and Shared Memory (DKC-F310I-20/32/128/256/1024) on one side first without affecting subsystem operation according to the SVP guidance.
- When de-installing HDU Box (DKU-F305I-B4) from the 2nd and 4th DKUs, it is necessary to maintenance-block the counterpart DKA from the SVP before disconnecting the SCSI cables.
- When removing HDU Box from 1st or 3rd DKU, remove HDD canisters first and then DKA.
- When de-installing HDU Box from the 1st or 3rd DKU or both, perform DKA de-installing procedure after proceeding with HDD de-installing procedure.
- When de-installing SCSI channel adapter, HDD assigned to SCSI volumes, or configuration definition of SCSI path, it is necessary to stop concerned SCSI channel path before proceeding with de-installing procedure.

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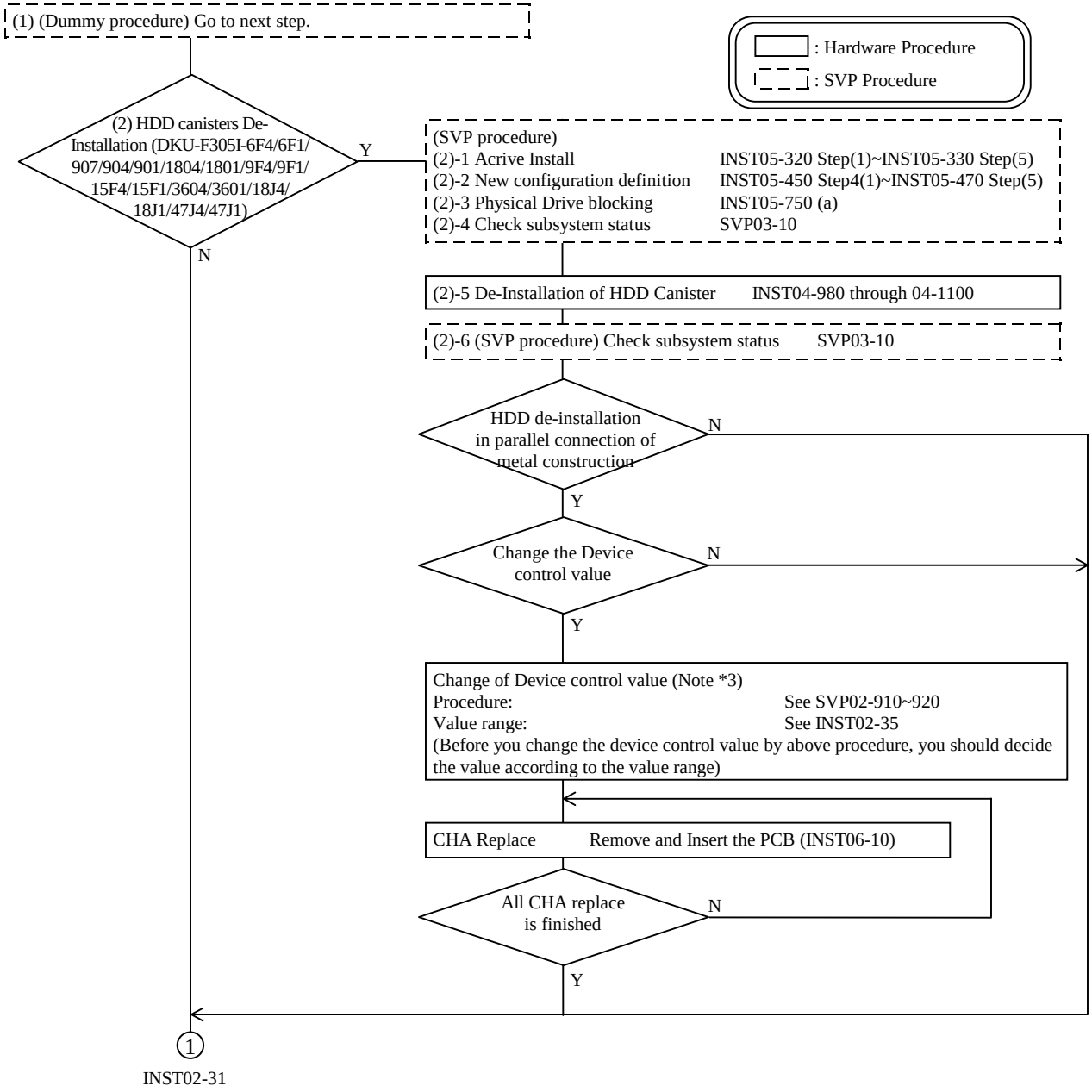

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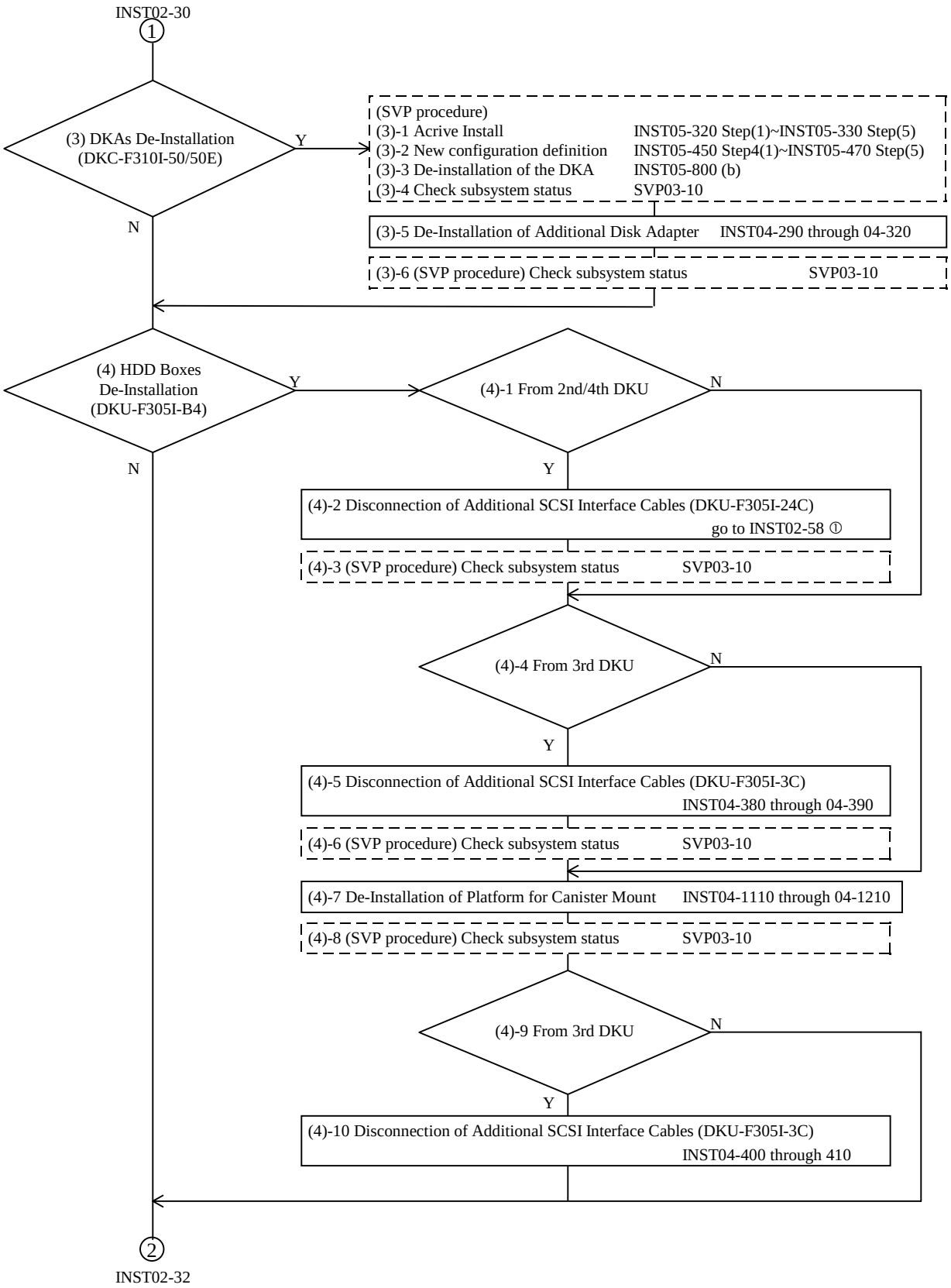

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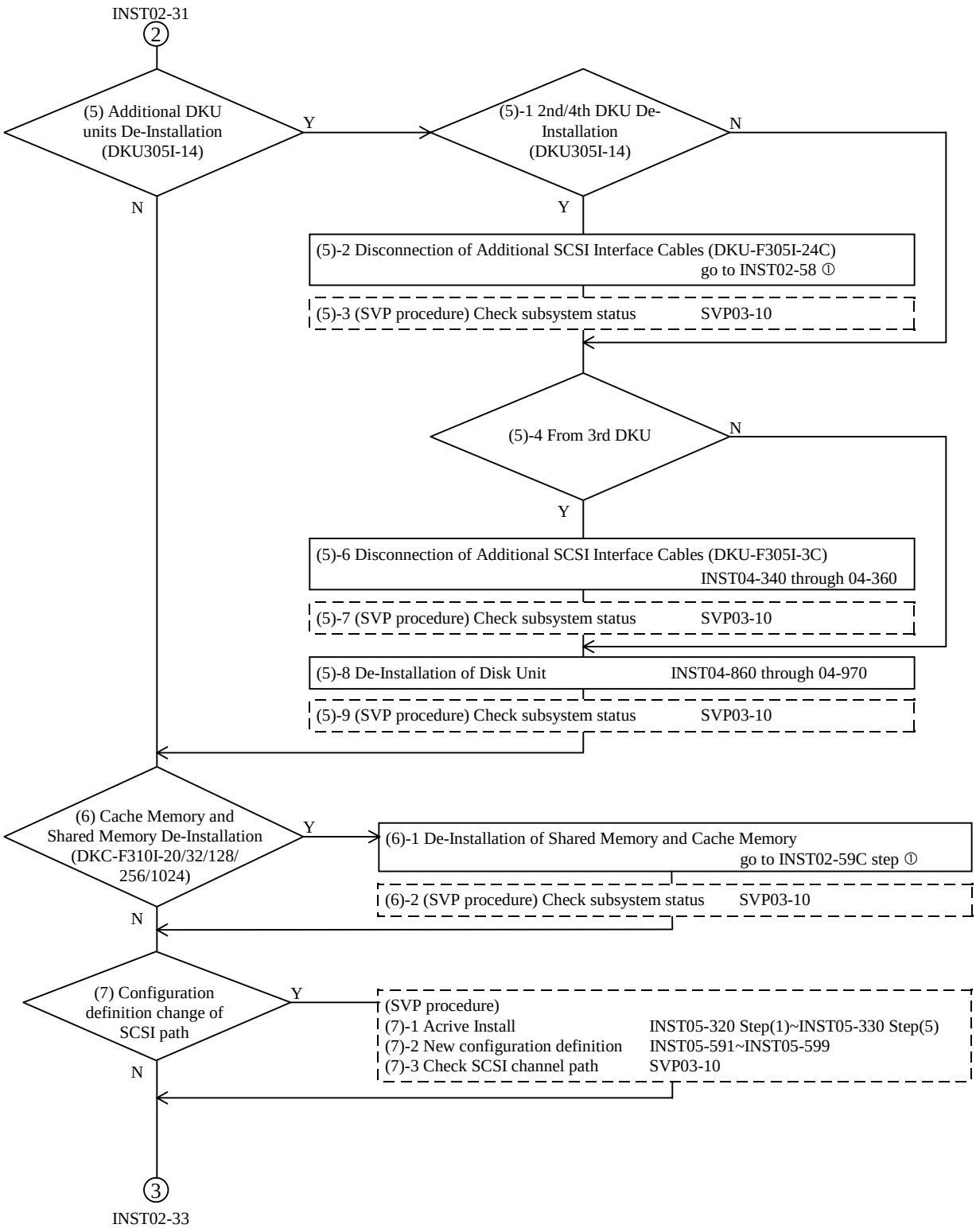

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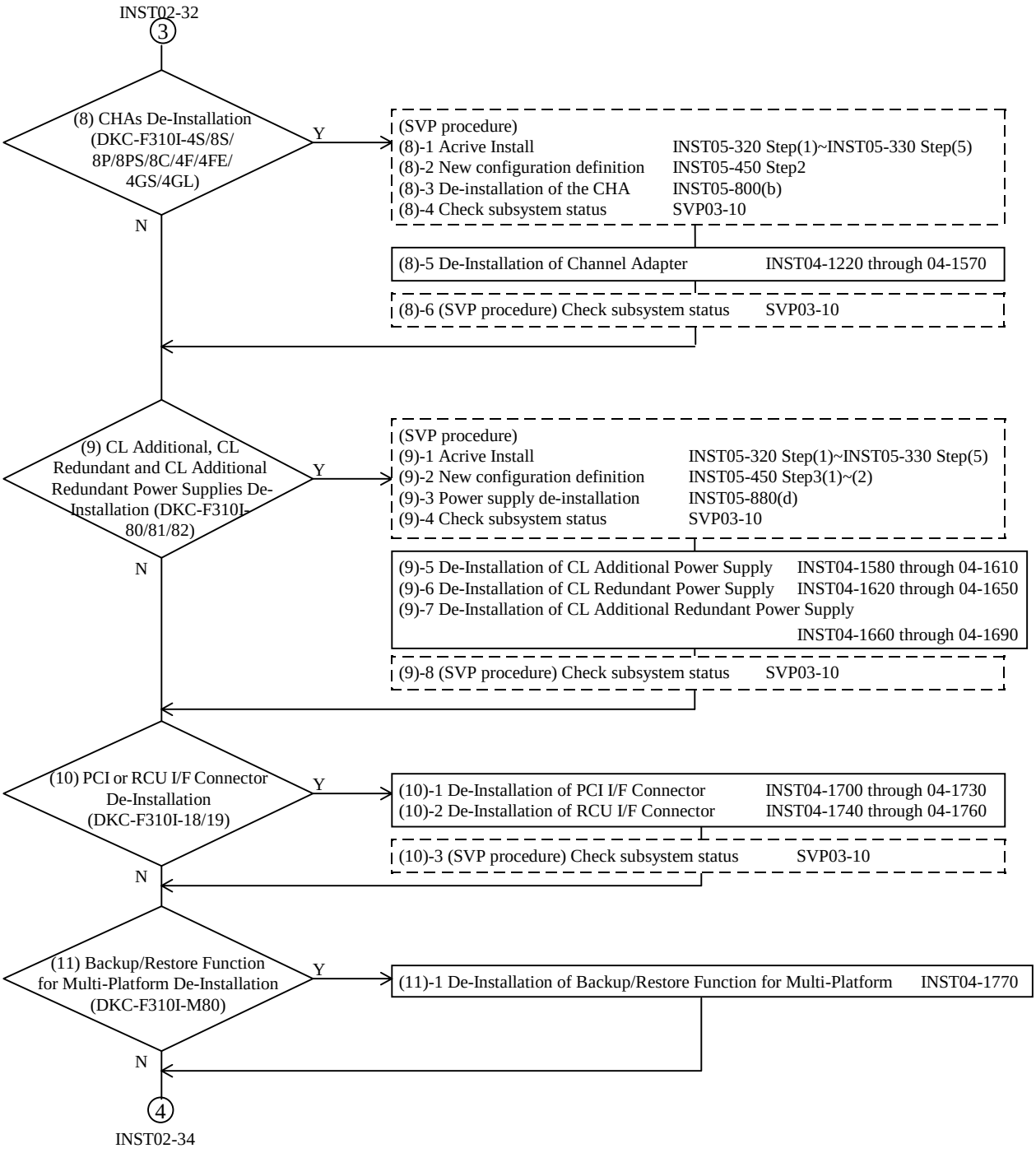

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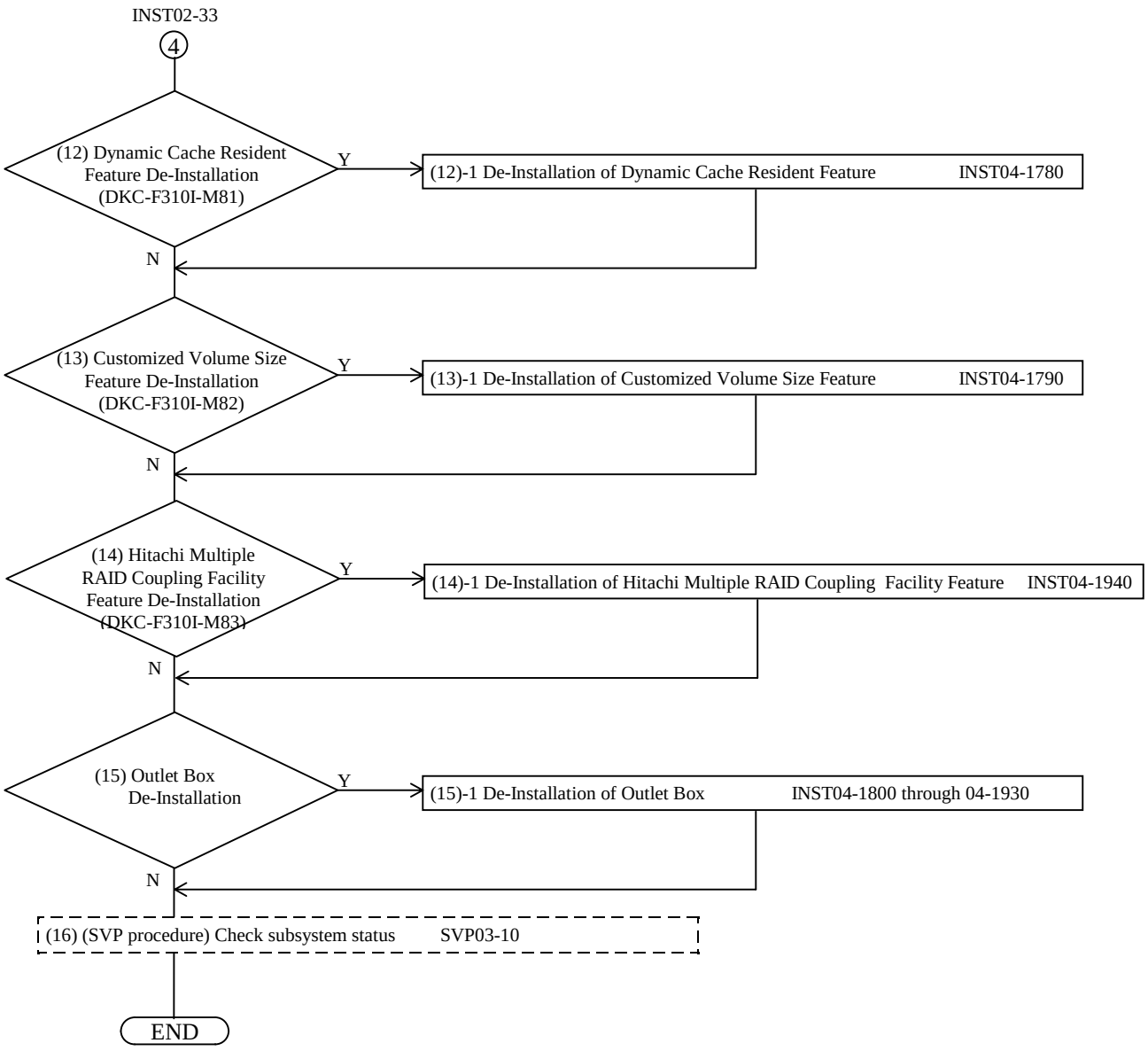

Note : If any trouble has occurred during following procedure, go to INST02-60.

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Note *3 Available range of HDD de-installation

256LDEV control → 32LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 1	before	◄----------►							
	after	◄-------►							

256LDEV control → 64LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 2	before	◄----------►							
	after	◄----------►							

256LDEV control → 128LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 3	before	◄----------►							
	after	◄----------►							

128LDEV control → 32LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 4	before	◄----------►							
	after	◄-------►							
case 5	before					◄----------►			
	after					◄-------►			

128LDEV control → 64LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 6	before	◄----------►							
	after	◄----------►							
case 7	before					◄----------►			
	after					◄----------►			

64LDEV control → 32LDEV control

	LDEVNO.	0 ~ 31	32 ~63	64 ~ 95	96 ~ 127	128 ~ 159	160 ~ 191	192 ~ 223	224 ~ 255
case 8	before	◄----------►							
	after	◄-------►							
case 9	before			◄----------►					
	after			◄-------►					
case 10	before					◄----------►			
	after					◄-------►			
case 11	before							◄----------►	
	after							◄-------►	

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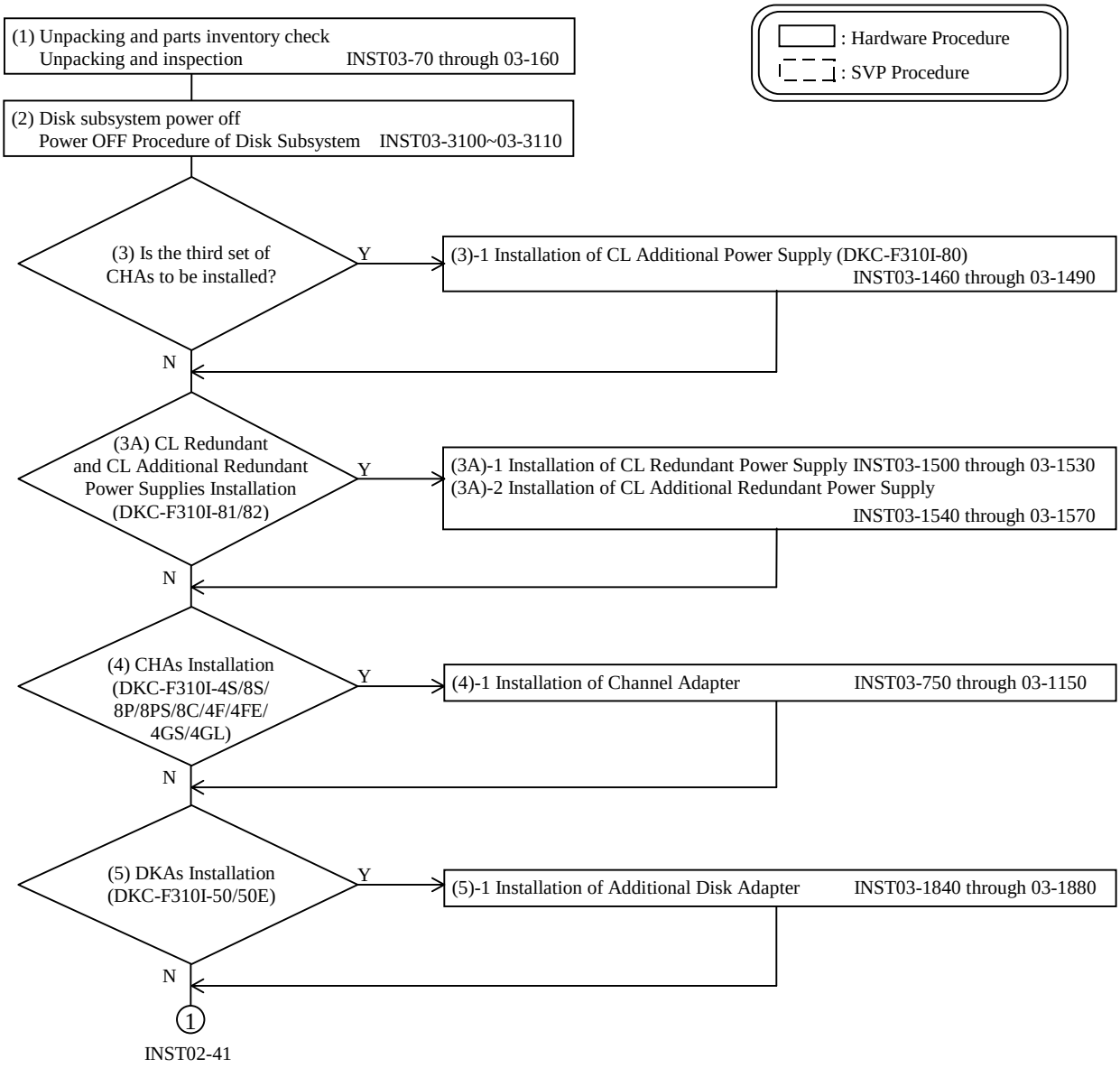
2.4 Disruptive Installation Procedure General Flow

Install additional disruptive options according to the flow shown below.
If a fault occurs during or after additional installation, see INST02-60 to locate a faulty unit and take action. If any other message than the list is displayed, see the SVP Message section.

Precautions on Disruptive Installation

- "Disruptive" means that the subsystem is disconnected from the host (OS). Disruptive Installation shall be done with the subsystem power OFF. However, be sure to turn on the subsystem whenever installing additional Cache Memory and Shared Memory (DKC-F310I-20/32/128/256/1024) because configuration information must be updated simultaneously according to the SVP guidance.
- The CL Additional Power Supply (DKC-F310I-80) must be installed when installing three or more channel options.
  In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.



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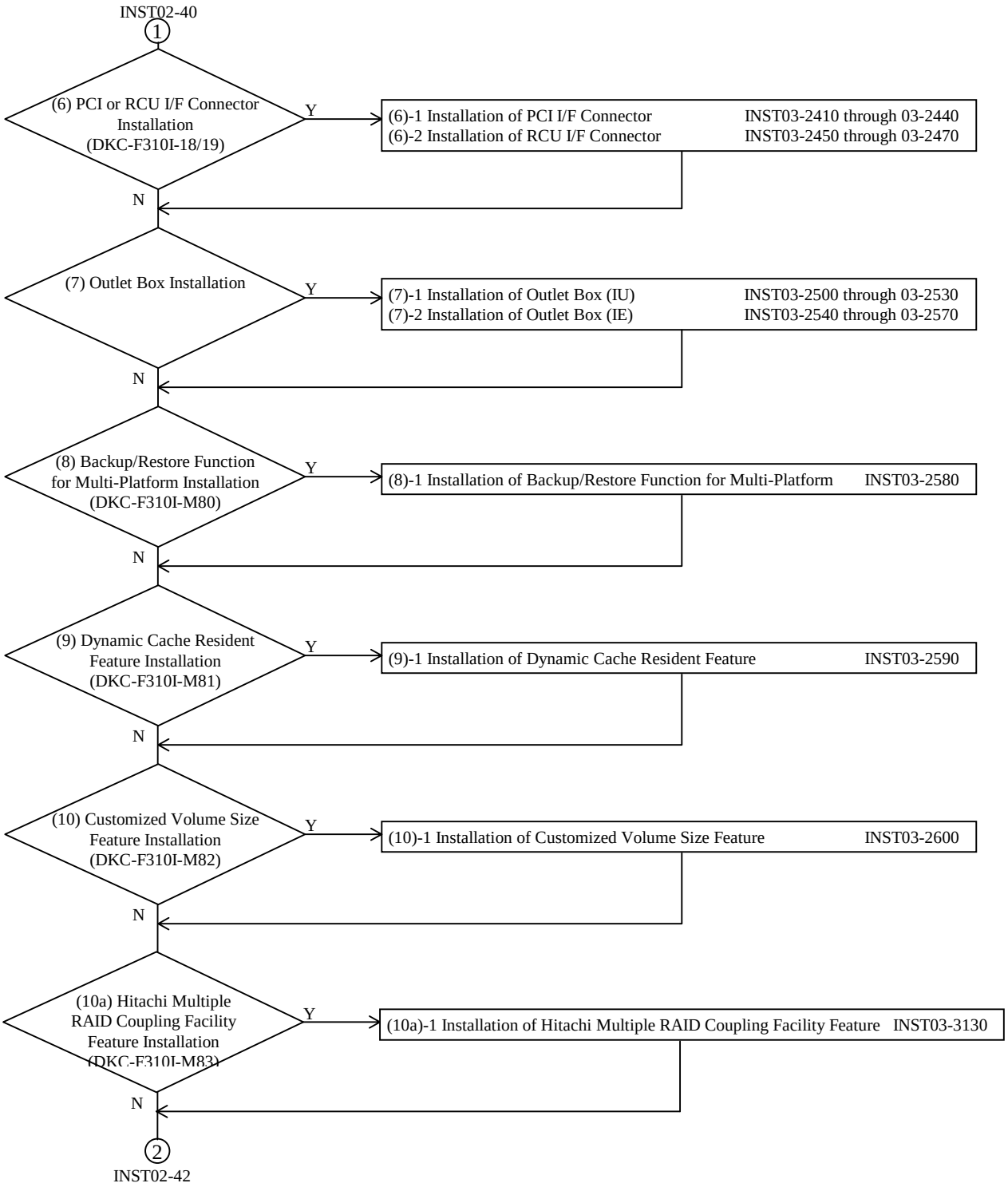

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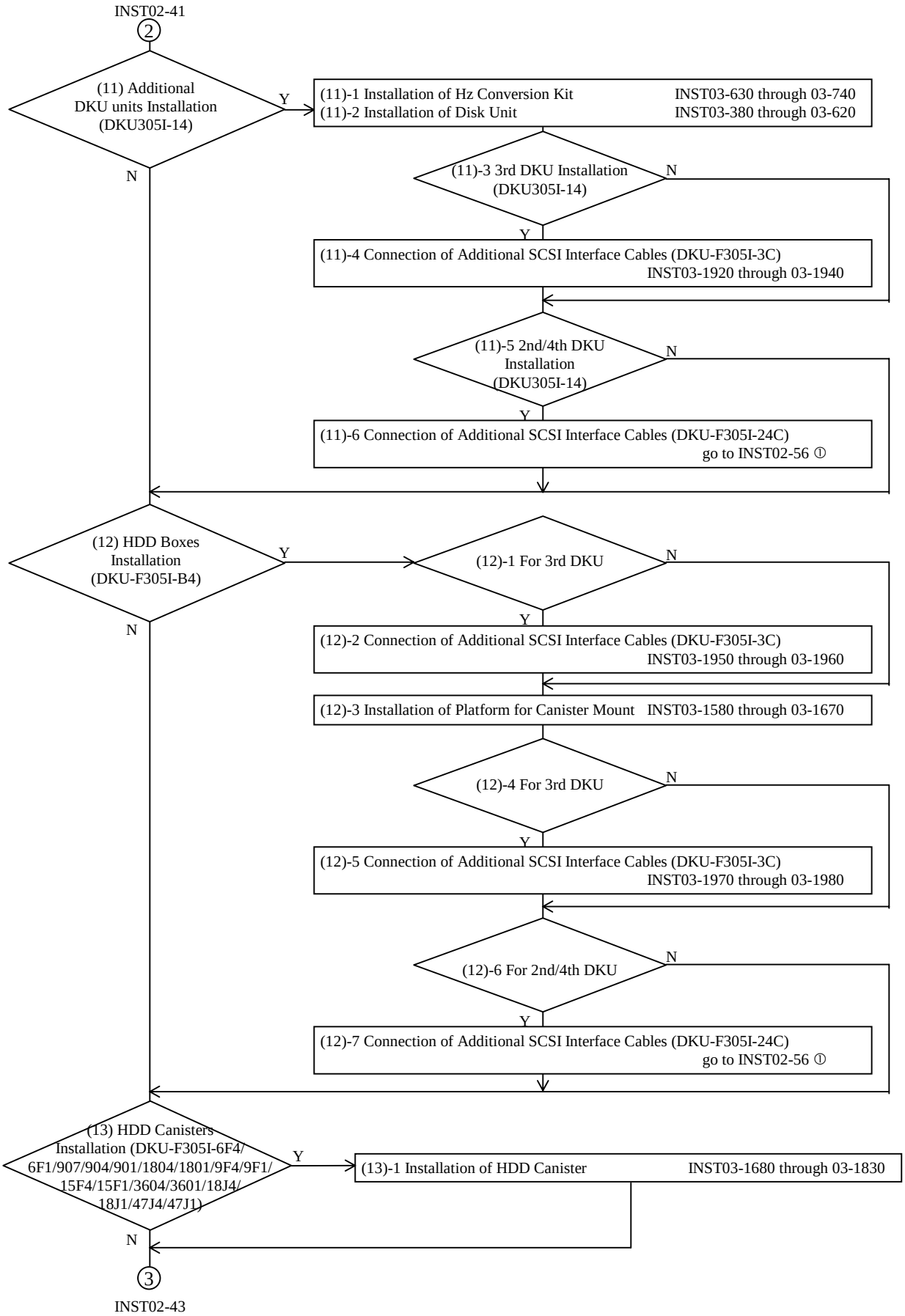

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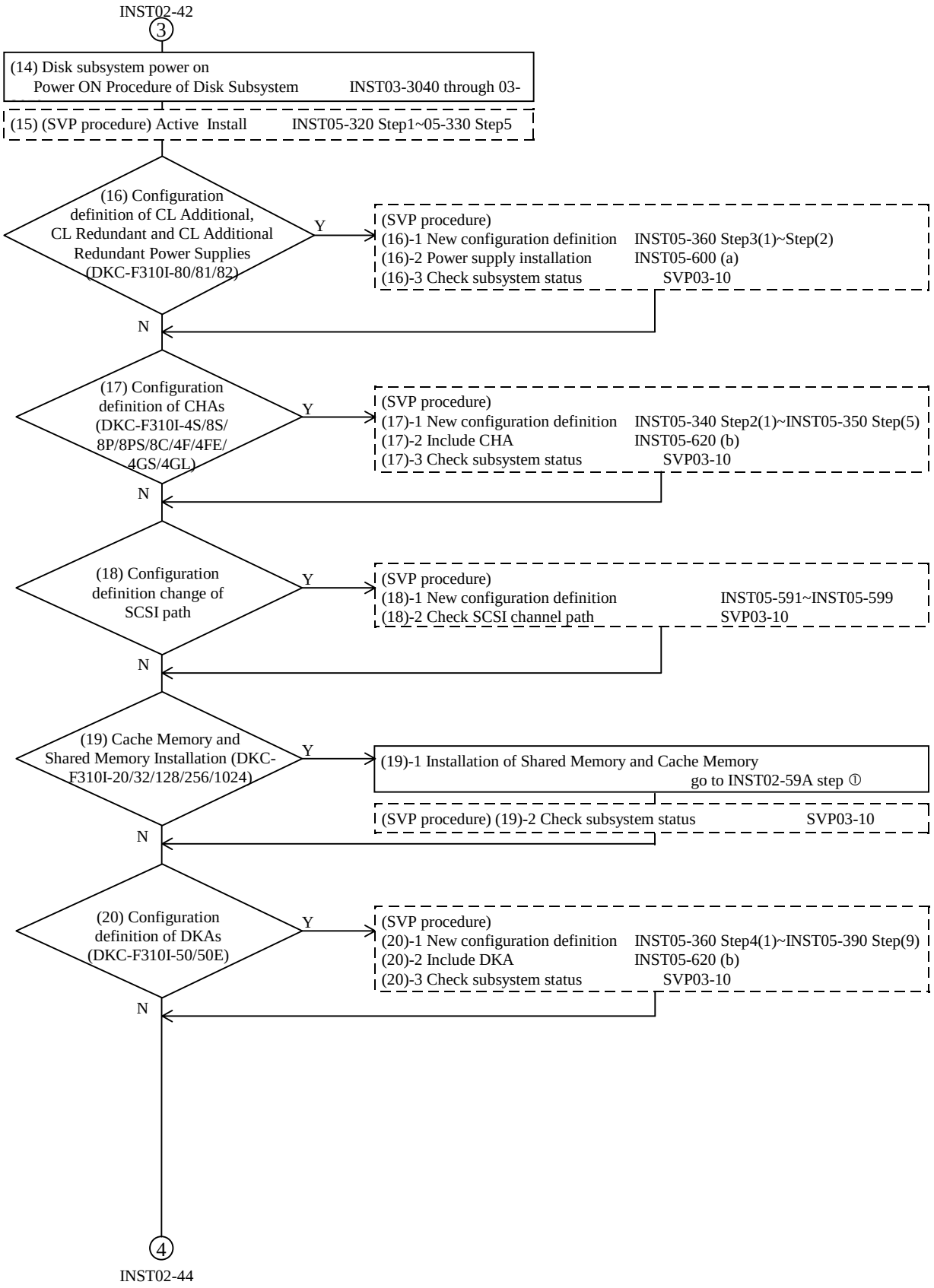

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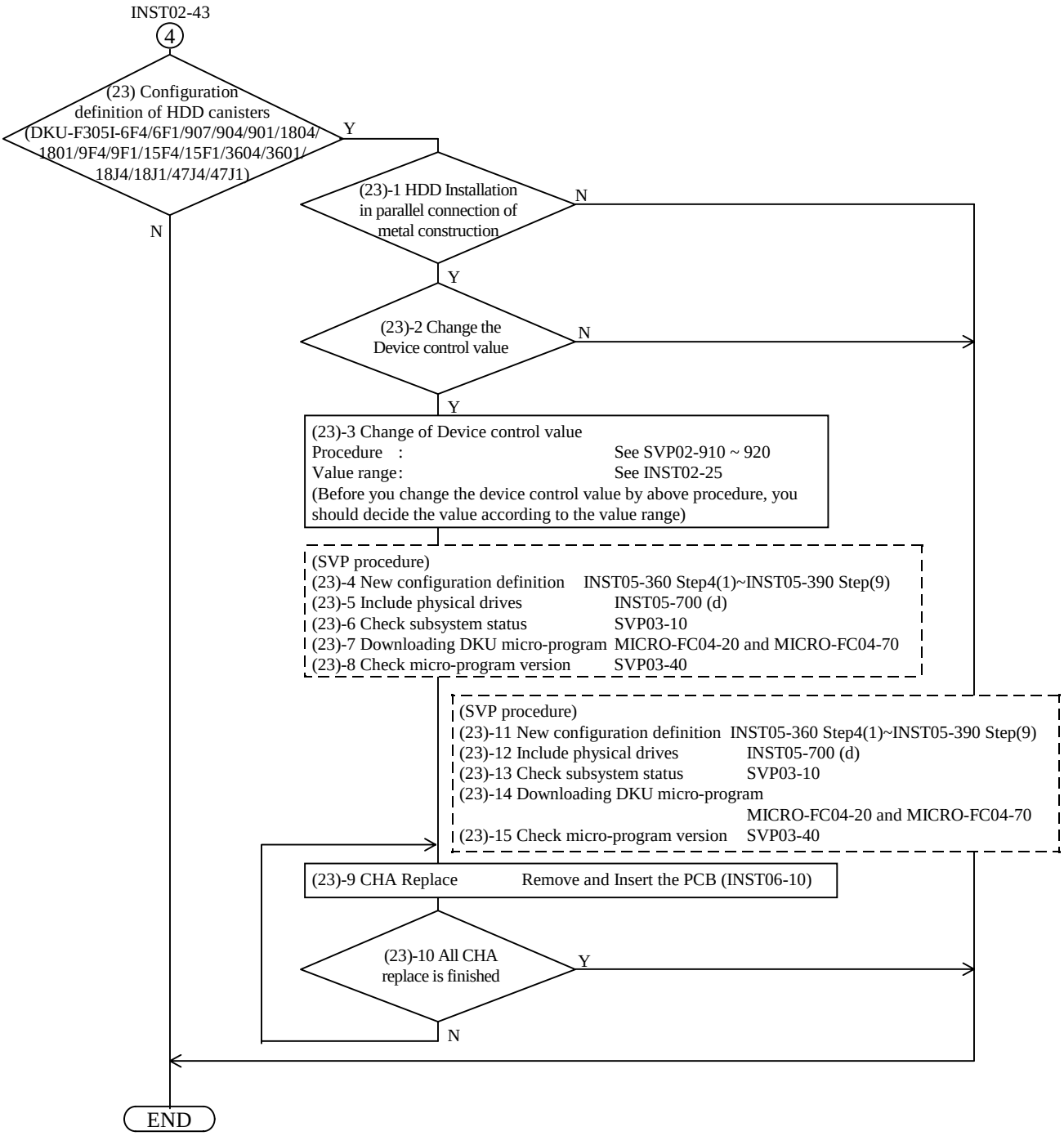

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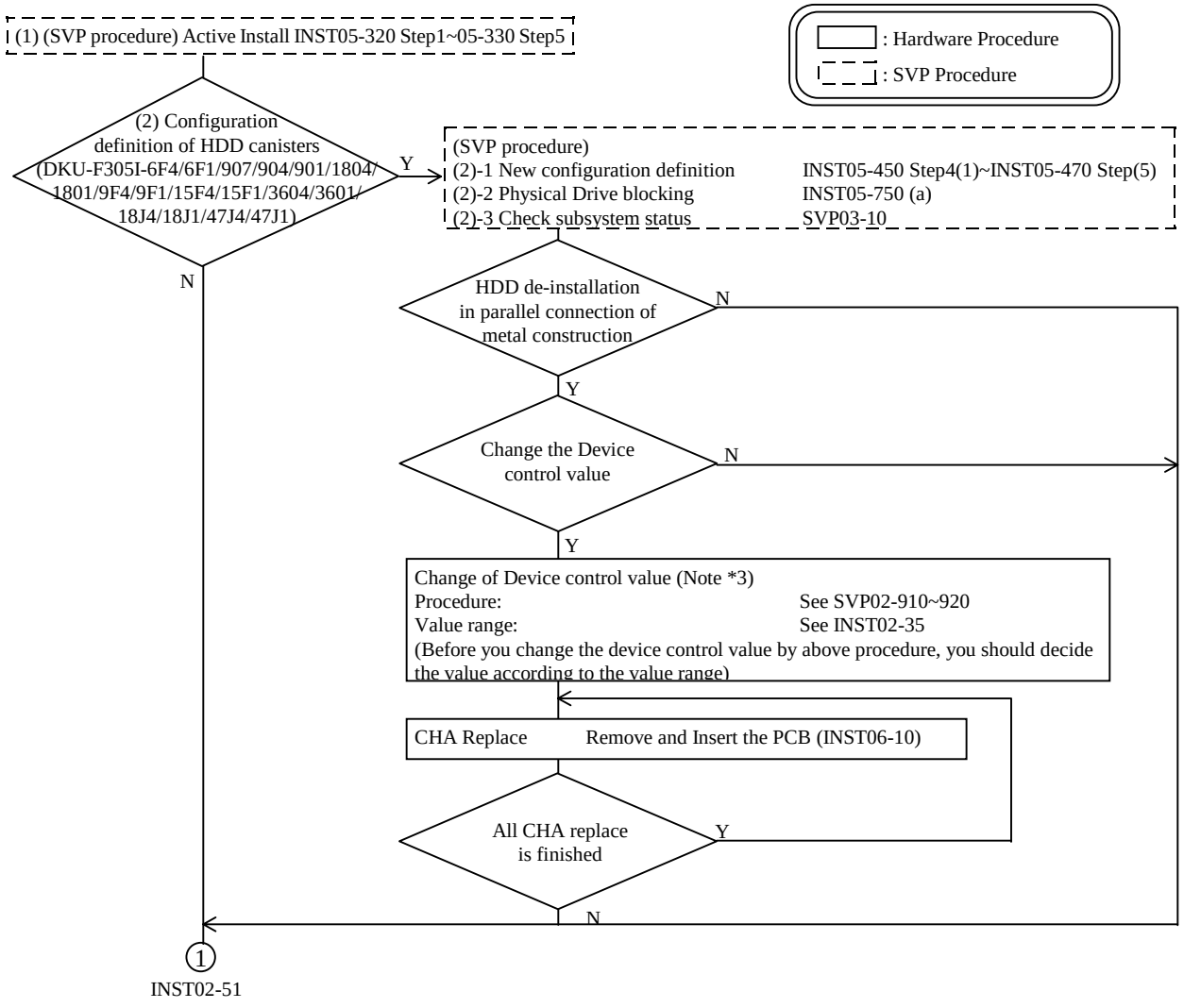
2.5 Disruptive De-installation Procedure General Flow

Remove additional disruptive options according to the flow shown below.
When De-Installation has been all done, make sure that all the removed units are displayed as "empty" and that the other units are normal (See the STATUS Section).
If a fault occurs during or after removal, see INST02-70 to locate a faulty unit and take action. If any other message than the list is displayed, see the SVP Message section.

Precautions on Disruptive De-Installation

- "Disruptive" means that the subsystem is disconnected from the host (OS). Disruptive De-installation shall be done with the subsystem power OFF. However, be sure to turn on the subsystem whenever removing additional Cache Memory and Shared Memory (DKC-F310I-20/32/128/256/1024) because configuration information side must be updated simultaneously according to the SVP guidance.
- When de-installing SCSI channel adapter or HDD assigned to SCSI Volumes, it is necessary to stop concerned SCSI channel path before proceeding with de-installation procedure.



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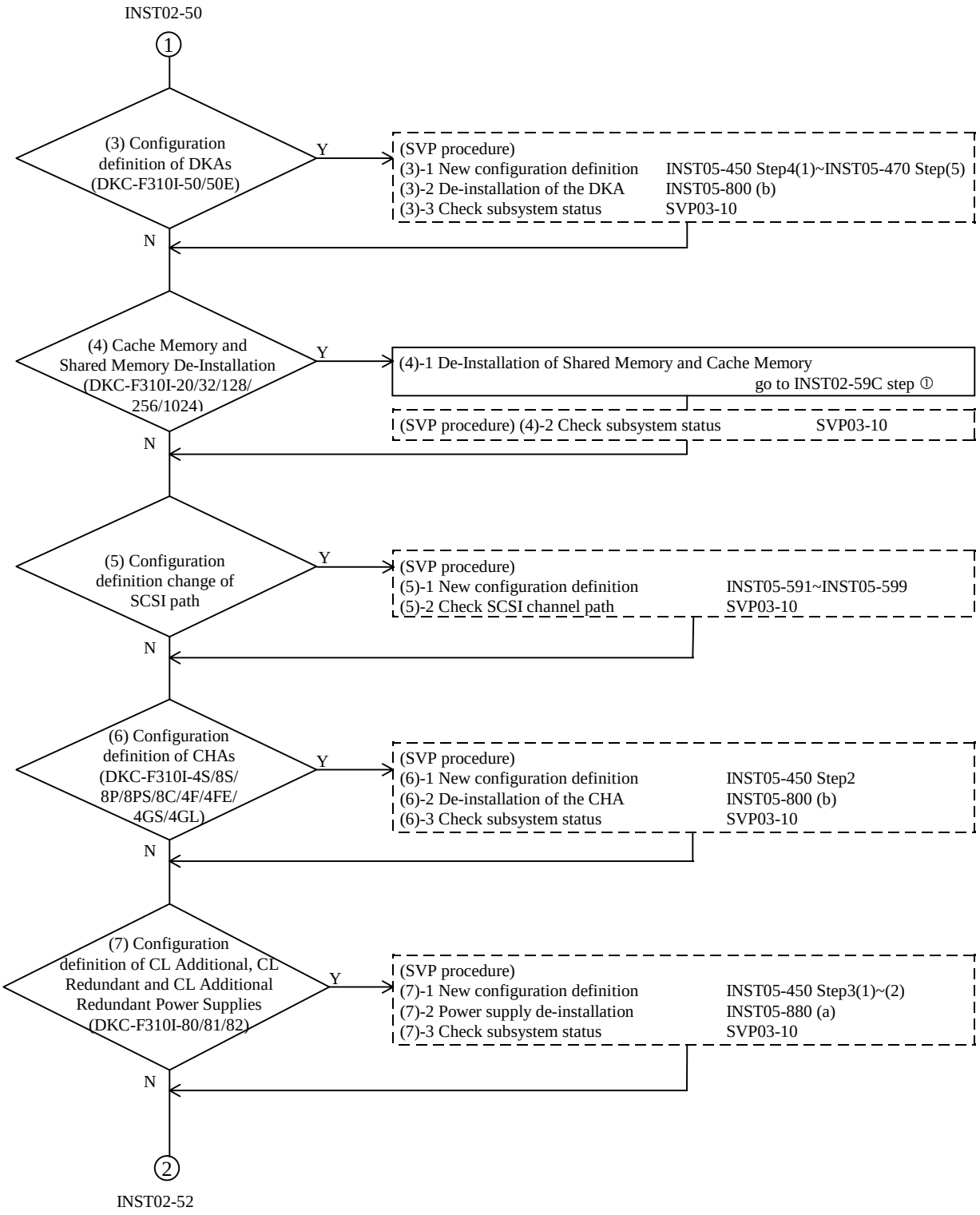

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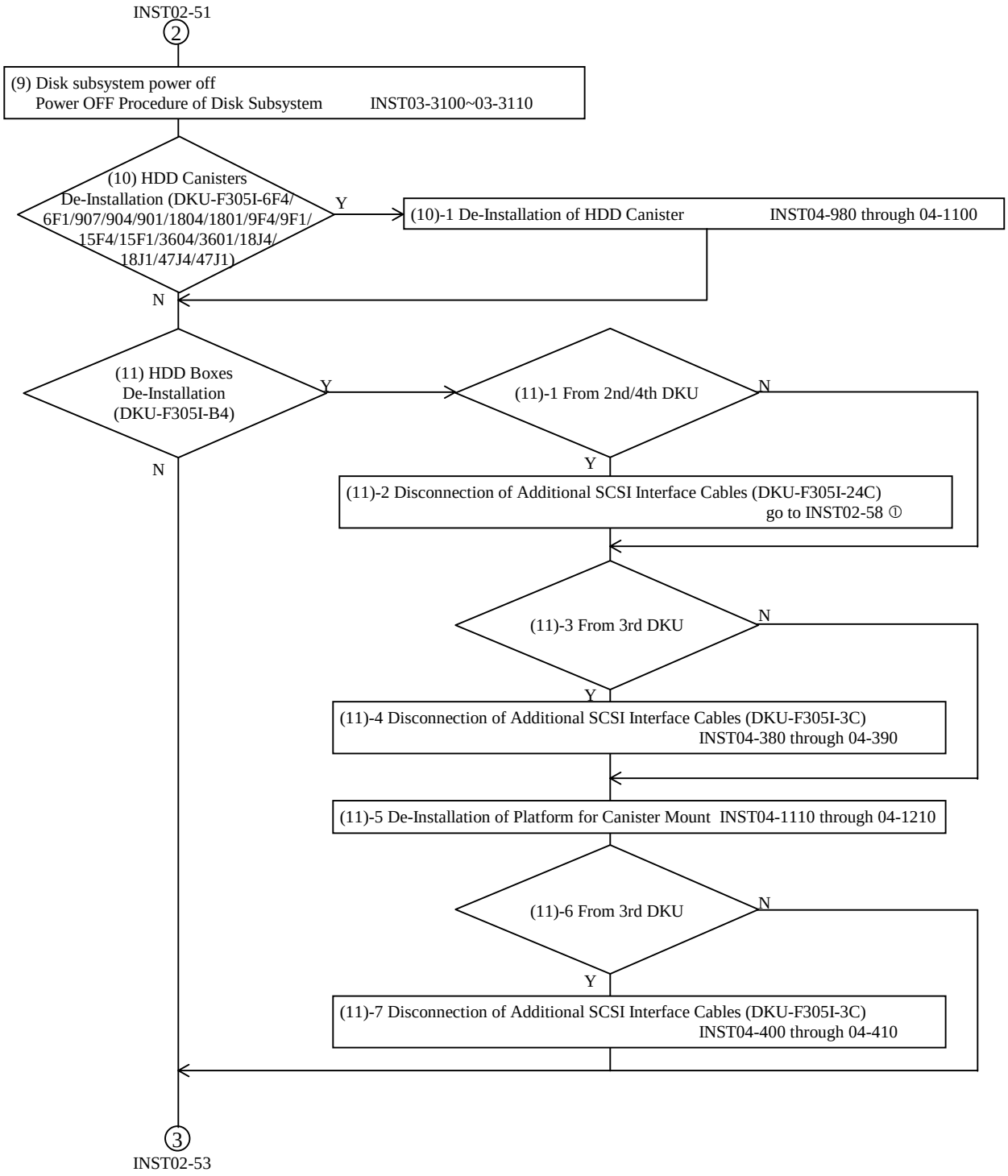

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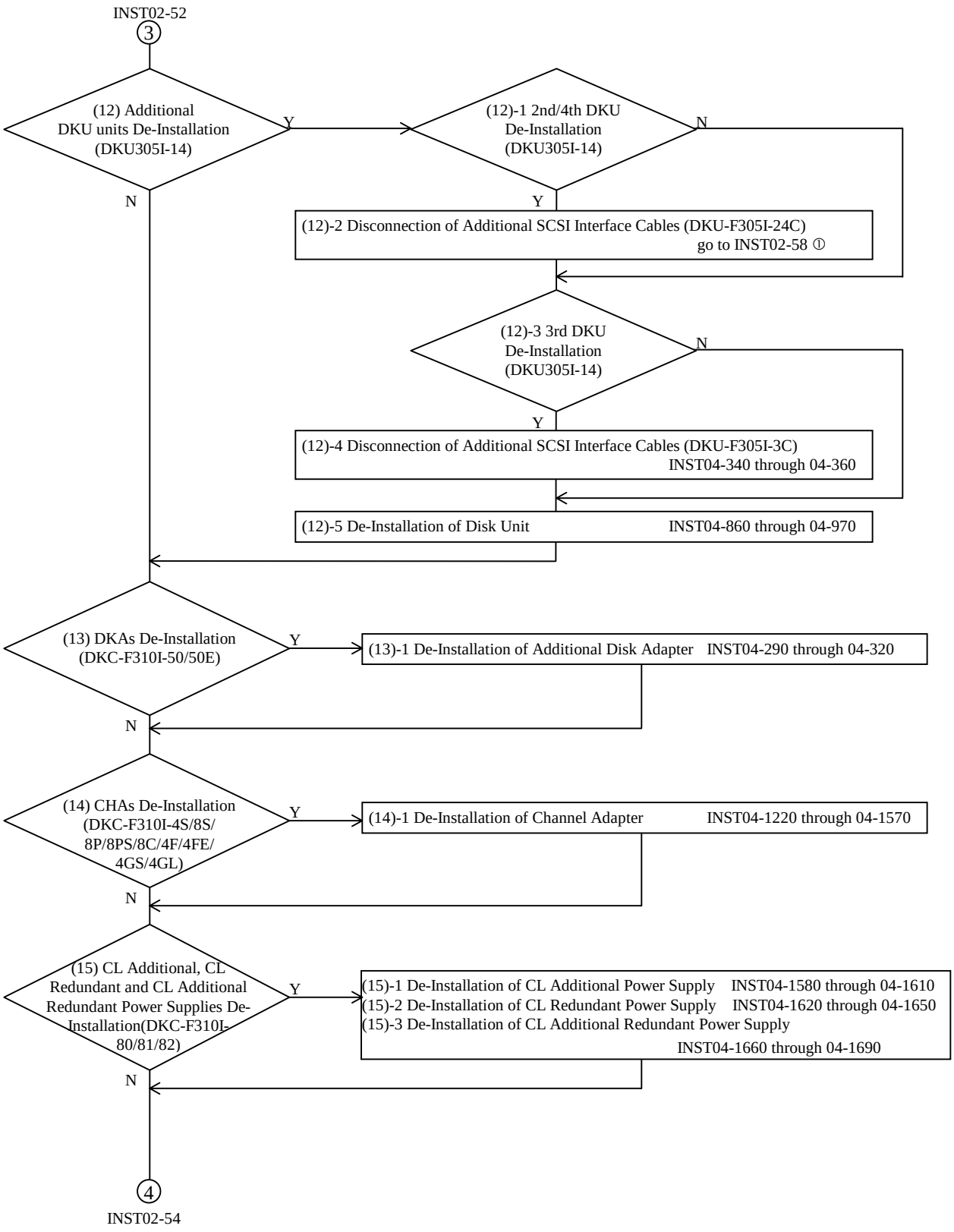

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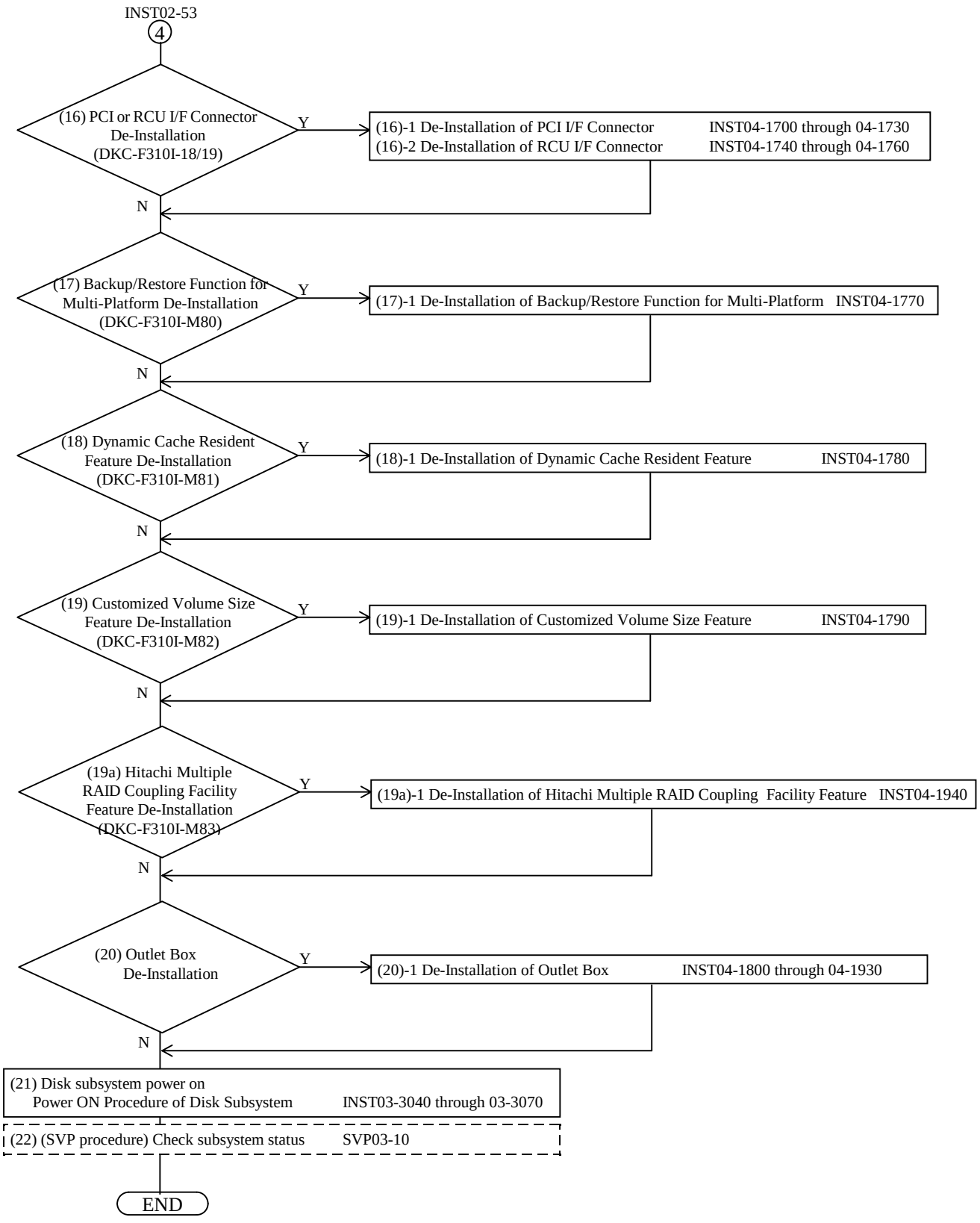

Note : If any trouble has occurred during following procedure, go to INST02-60.

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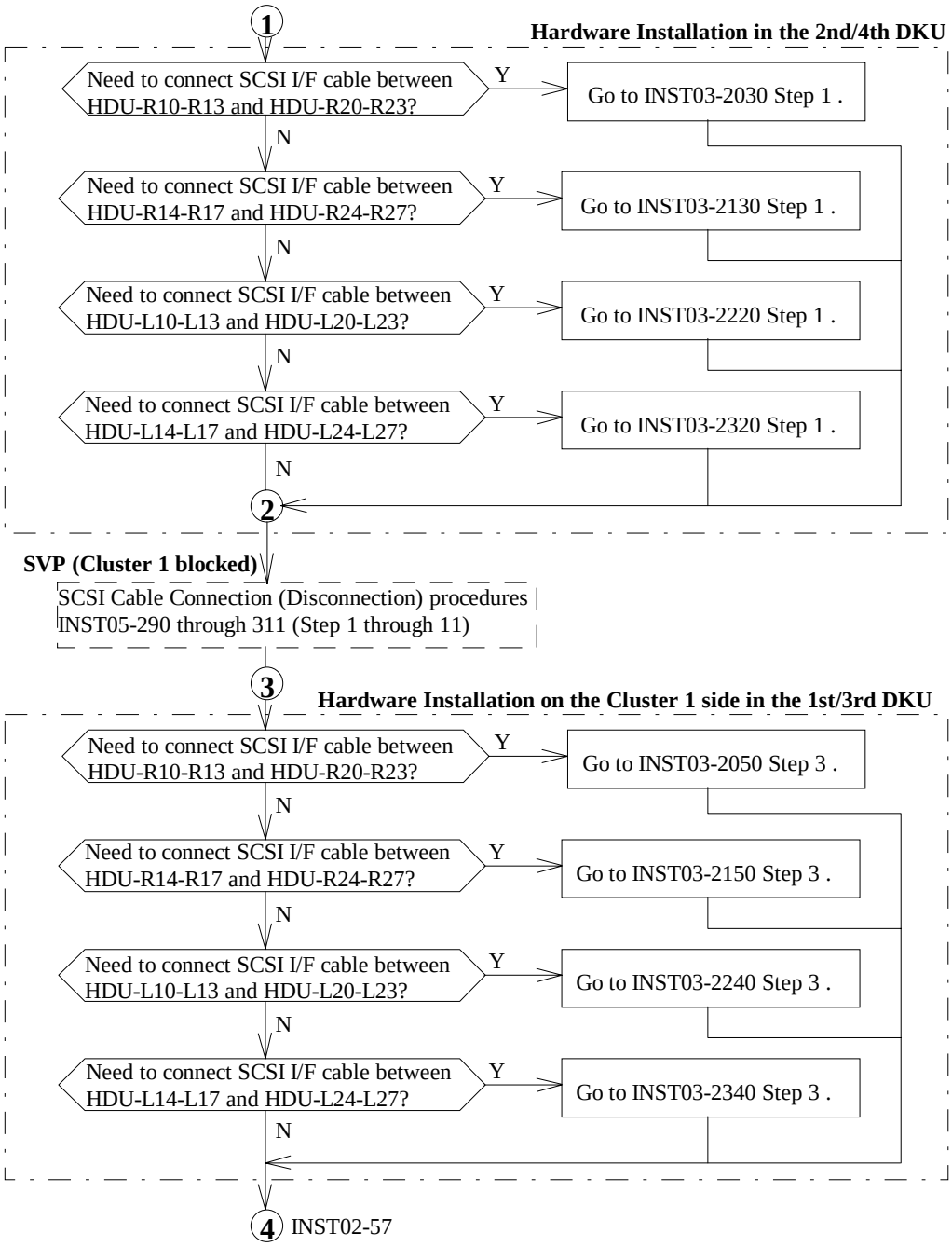
Non-Disruptive / Disruptive Installation General Flow of Additional SCSI Interface Cables (DKU-F305I-24C)



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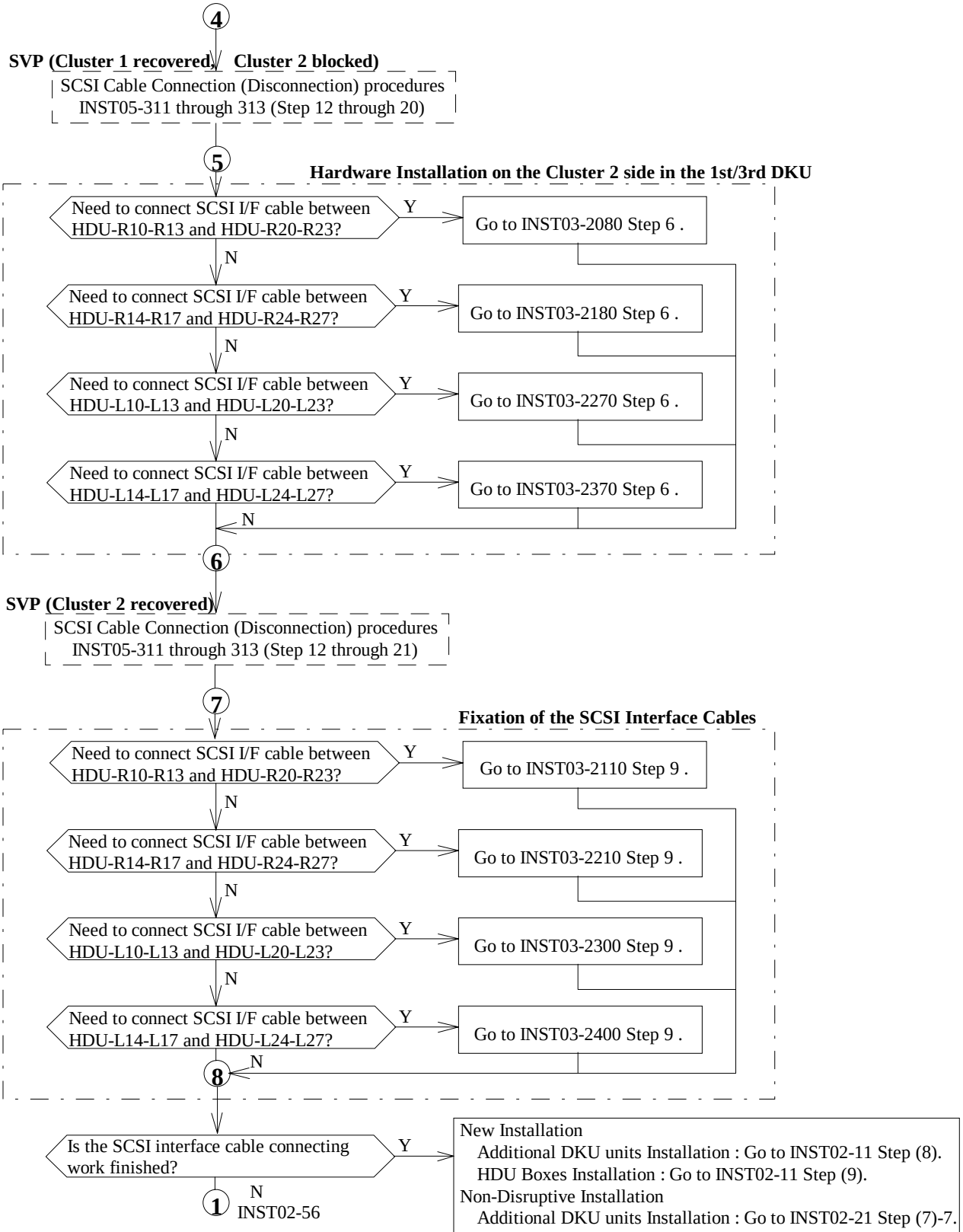

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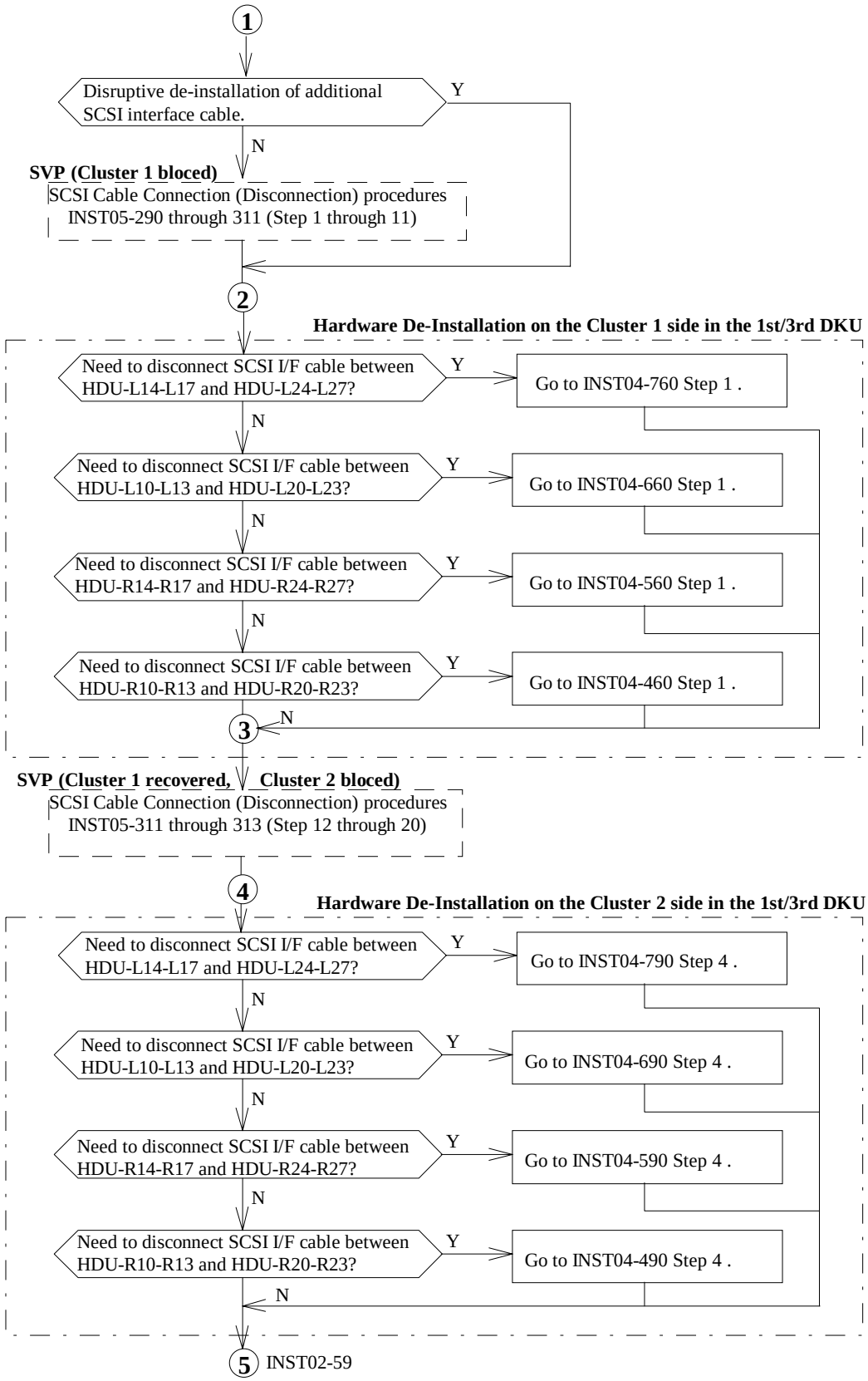
Non-Disruptive / Disruptive De-Installation General Flow of Additional SCSI Interface Cables (DKU-F305I-24C)



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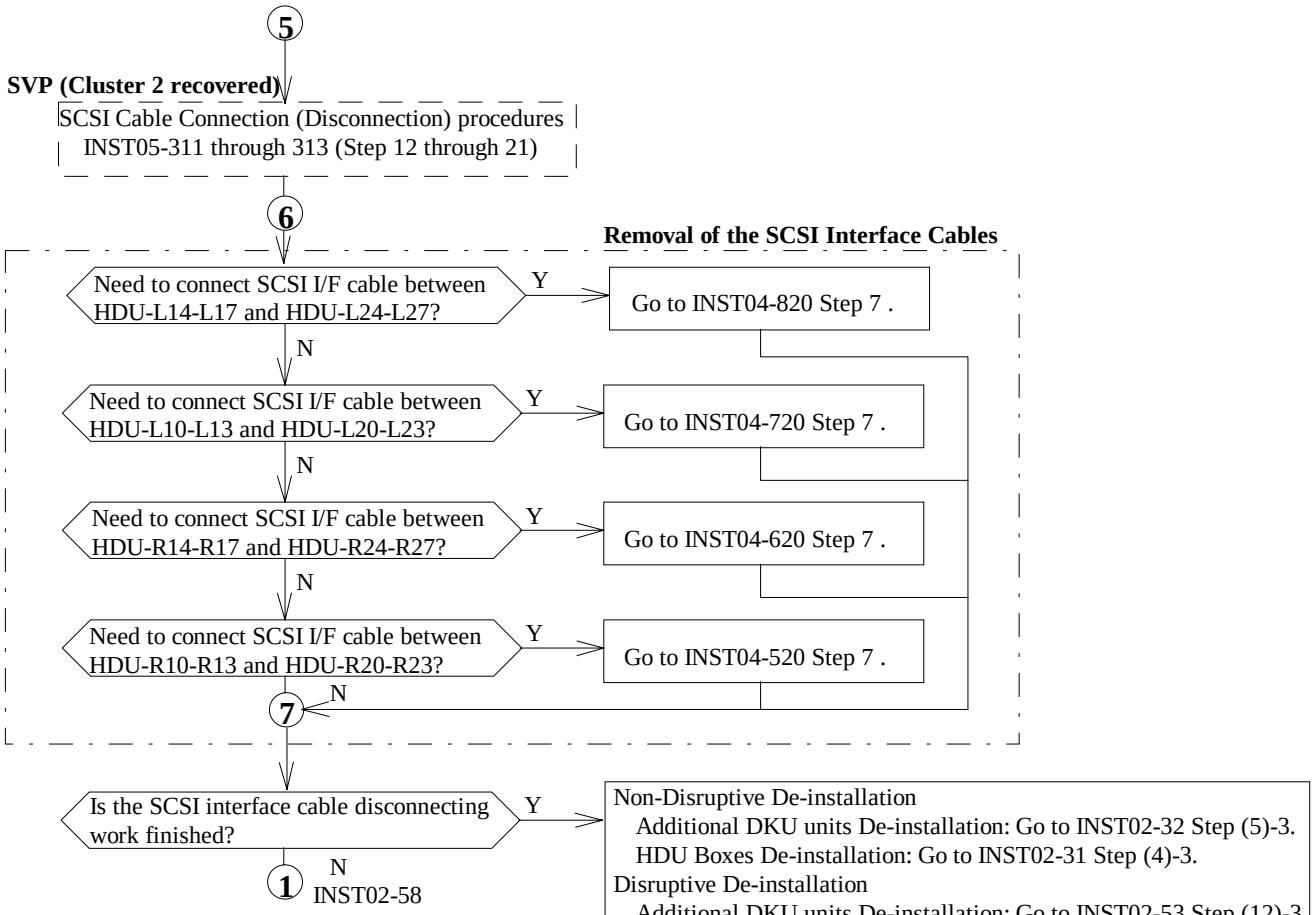

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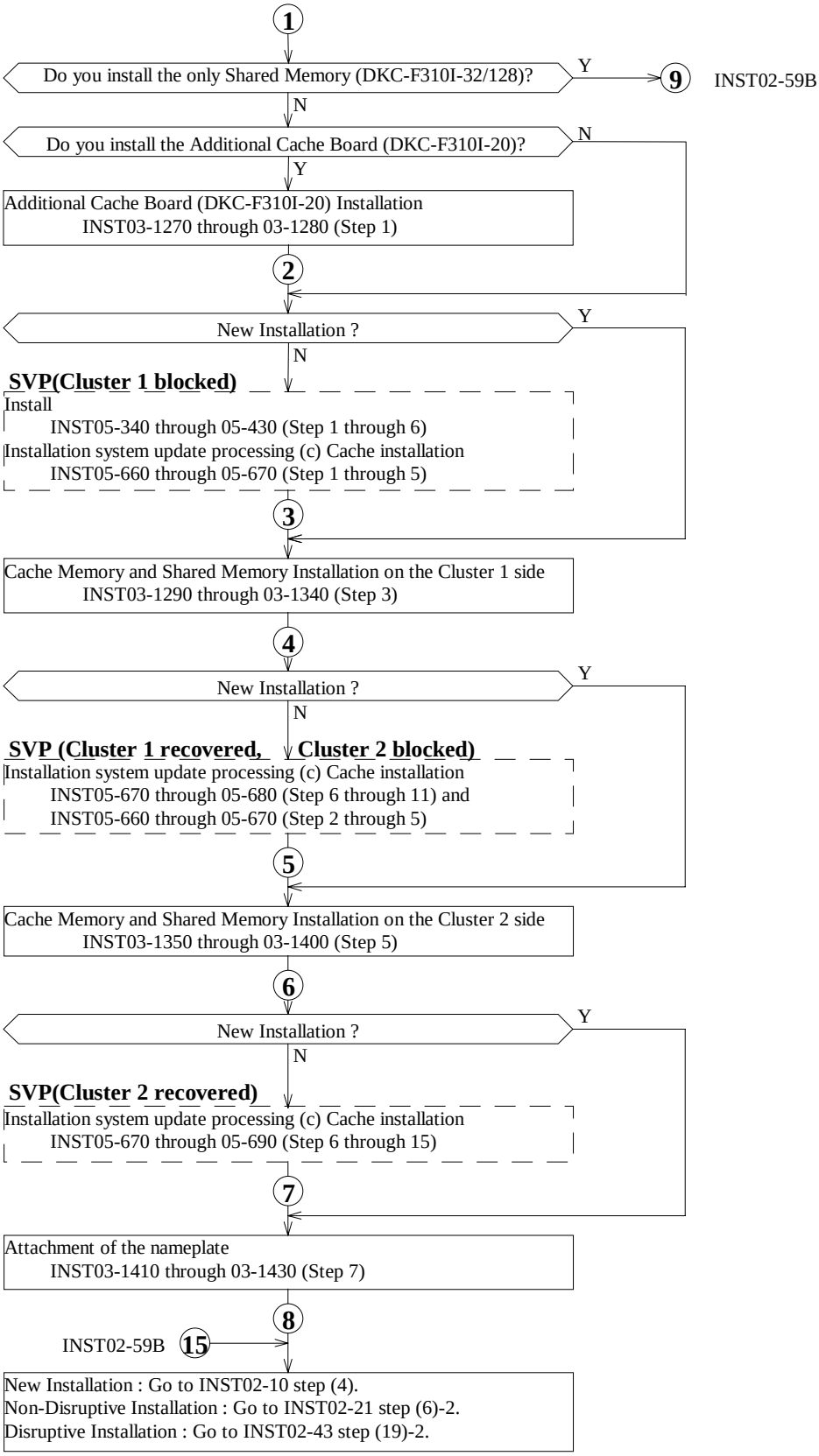
1. Installation of Cache Memory and Shared Memory (DKC-F310I-20/32/128/256/1024)



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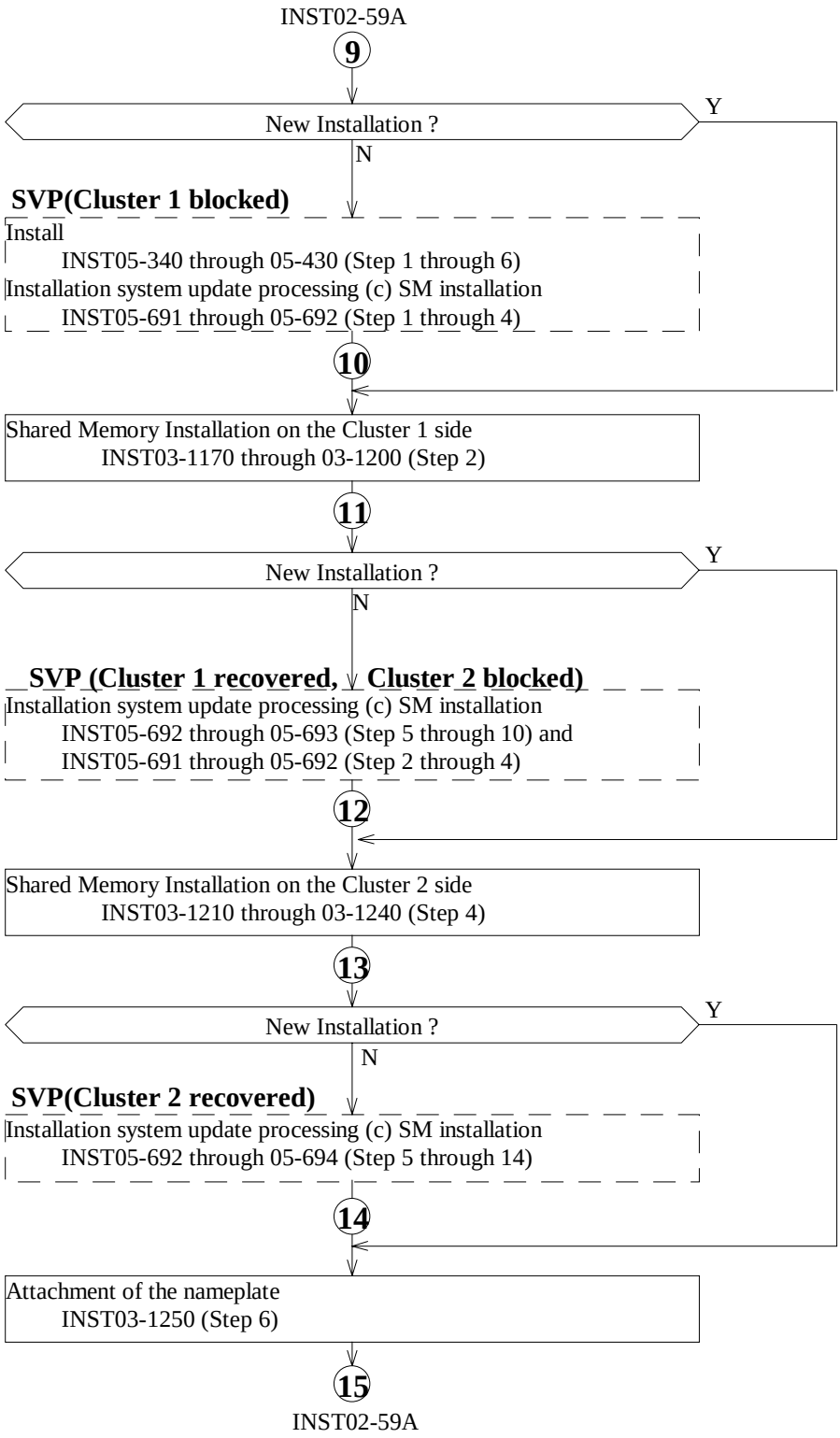

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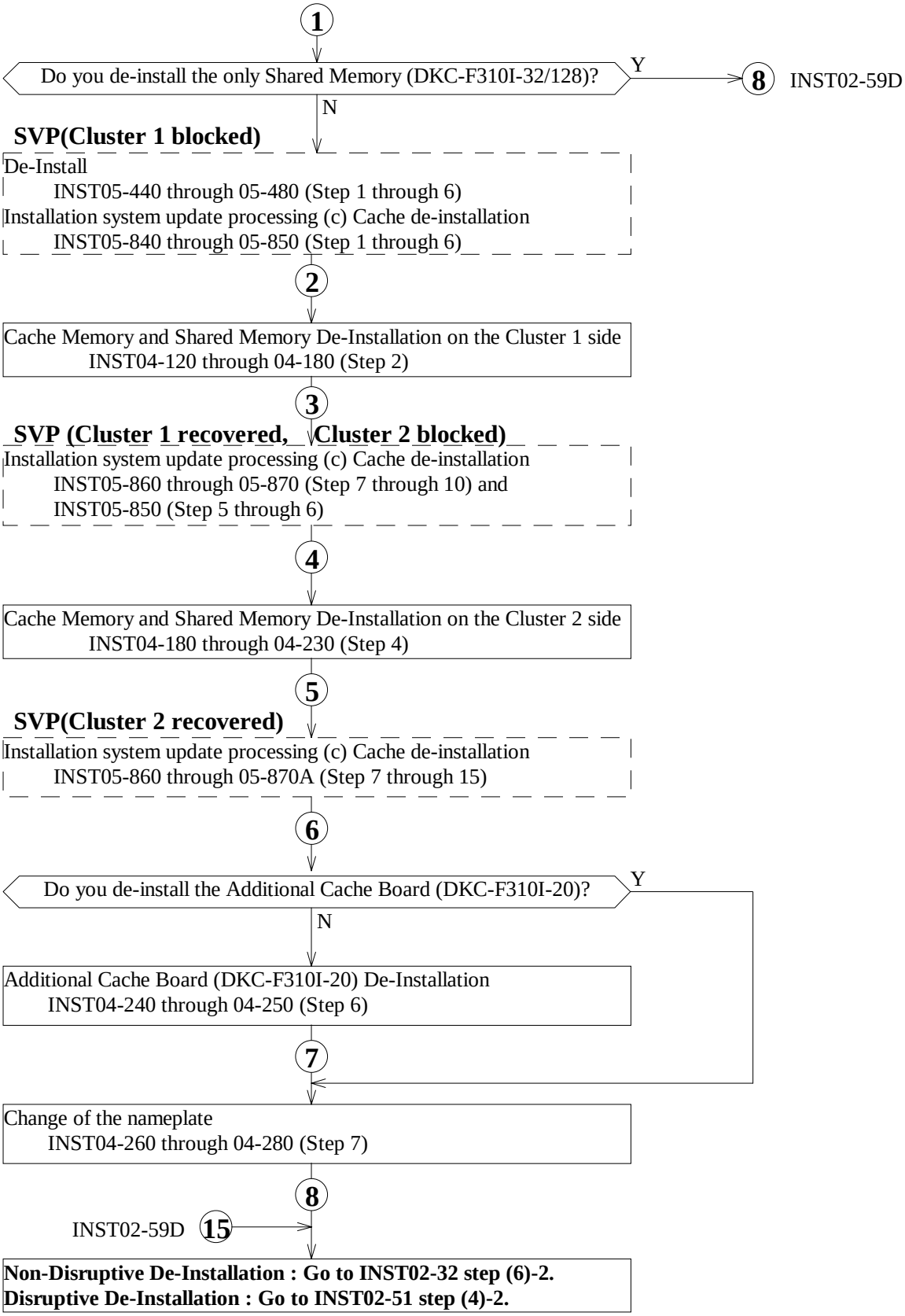
2. De-Installation of Cache Memory and Shared Memory (DKC-F310I-20/32/128/256/1024)



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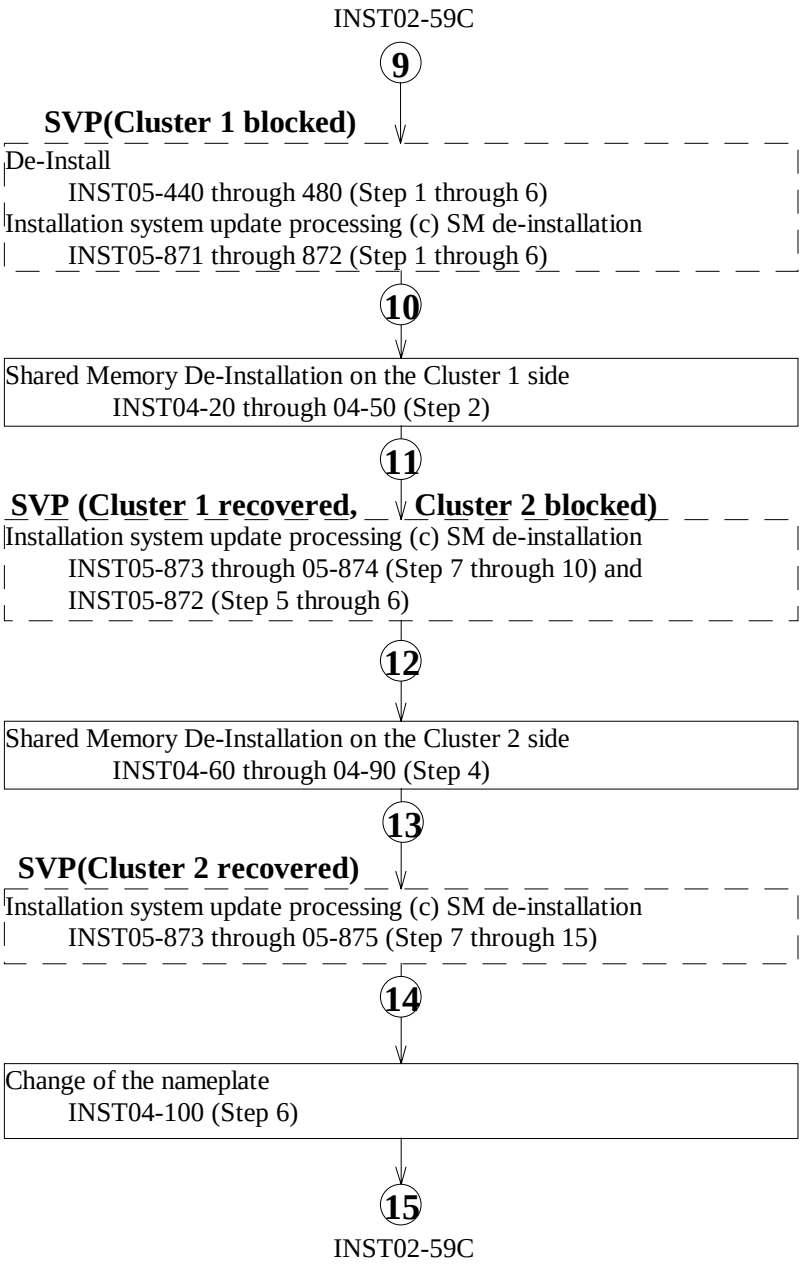

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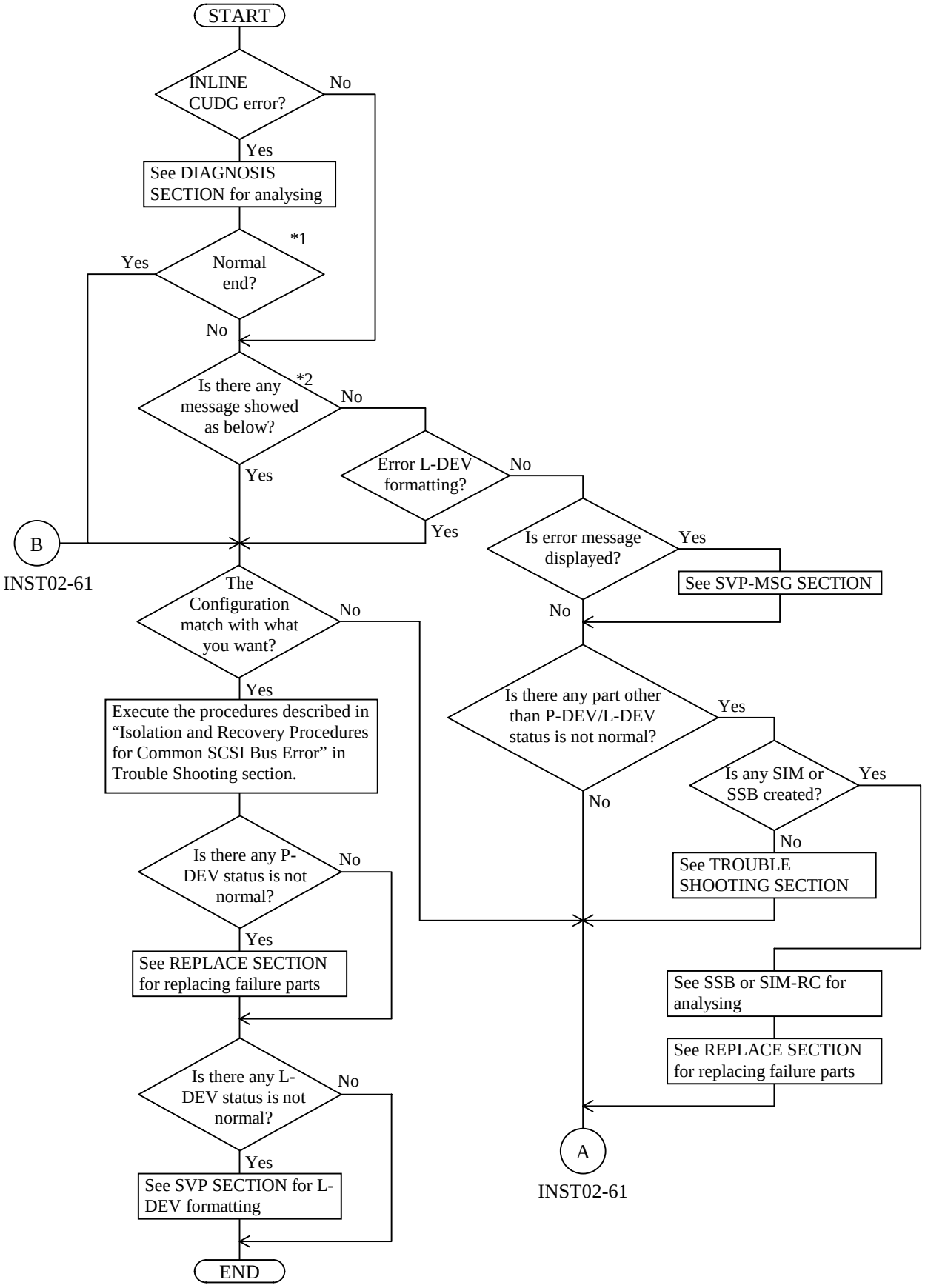
2.6 Trouble shooting for errors in install SVP procedure



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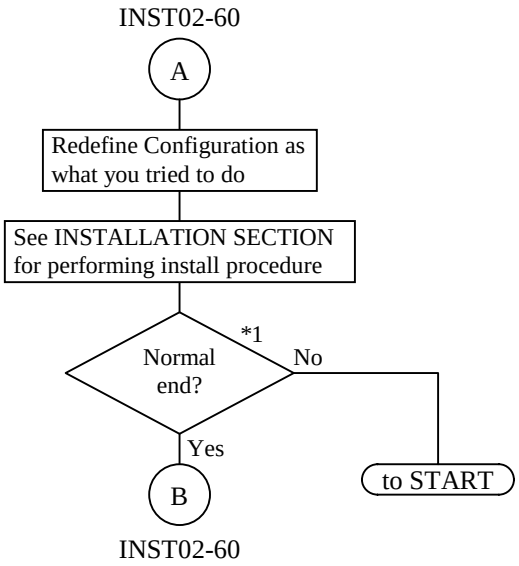

*1 In case of the message “Renewal process has completed”

*2 “There is no change in configuration data (upgrade/de-install)”

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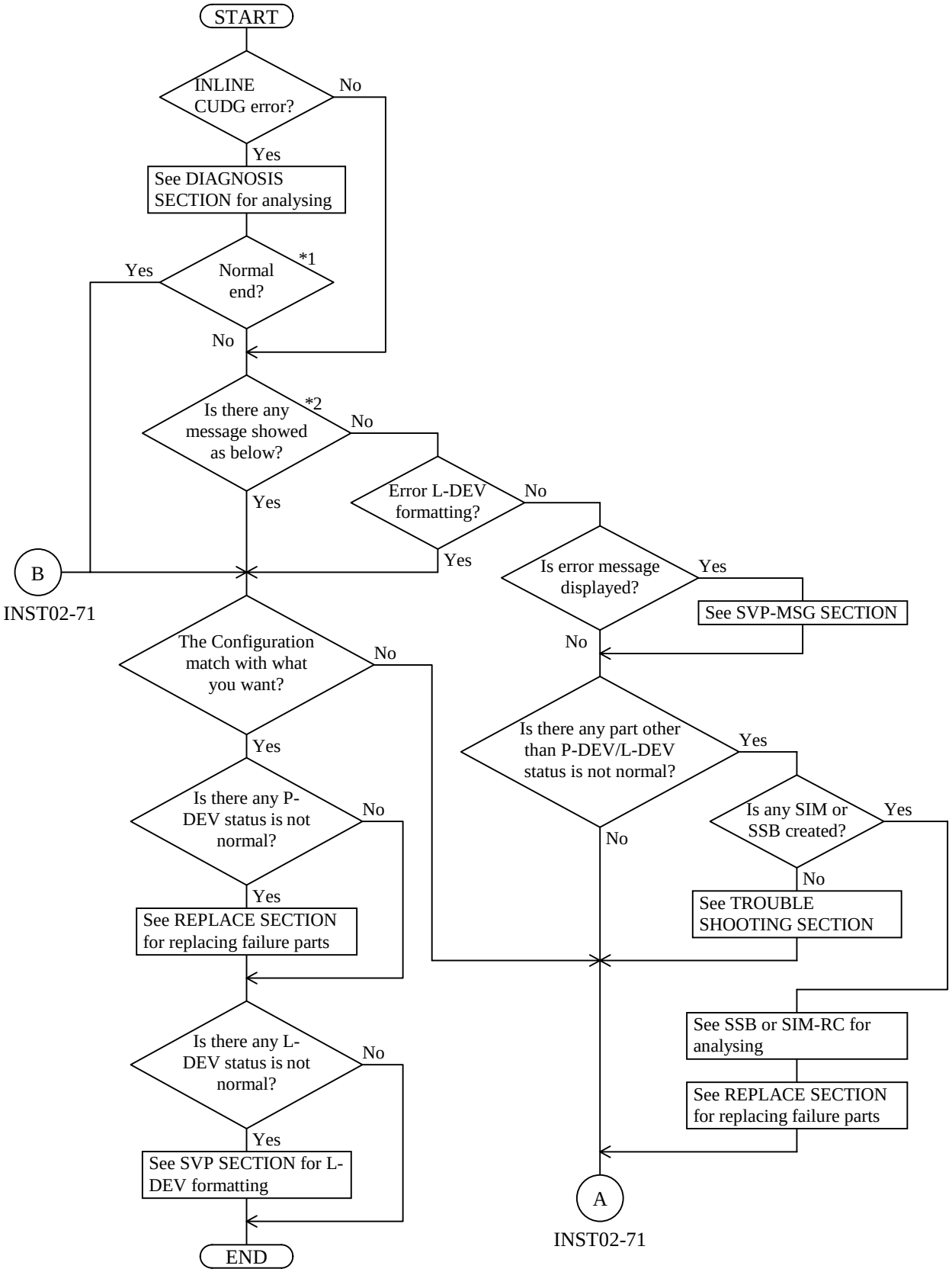
2.7 Trouble shooting for errors in de-install SVP procedure



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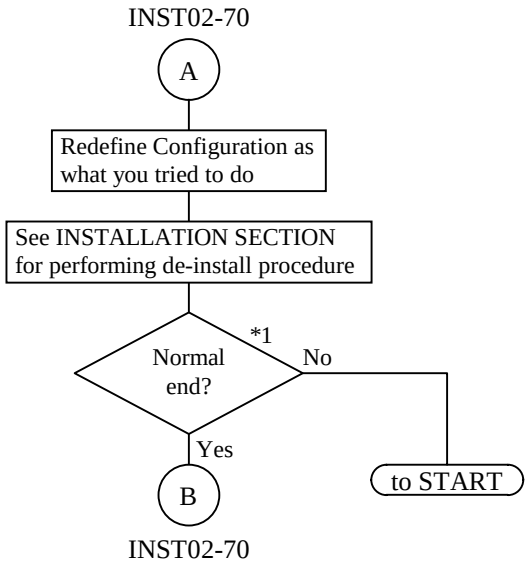

*1 In case of the message “Renewal process has completed”

*2 “There is no change in configuration data (upgrade/de-install)”

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2.8 Change Configuration

When Changing Configuration Information such as subsystem ID, DKC Emulation Type, Control Devices, Device Address, and Channel Speed, perform the following General flow chart.
Above Configuration Information can not change while subsystem is running.
After changing Configuration Information, PS off/on required.

System tuning 1) Device Structure Set Up 2) Channel Configuration 3) System Option

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2.9 Availability of Installation and De-installation

(1) Availability of the online maintenance when HRC/HORC is used

Component	Maintenance Type	Condition	HRC path established		During initial copy		After finished copy		Suspend	
			MCU	RCU	MCU	RCU	MCU	RCU	MCU	RCU
HDD canister	Installation	—	×	×	SVP2059W	SVP2079W	× (**)	×	×	×
	De-installation	—	×	×	SVP2031W (SVP2059W)	SVP2034W (SVP2079W)	SVP2031W	SVP2034W	SVP2031W	SVP2034W
Cache PCB	Installation	—	×	×	SVP2059W	SVP2079W	× (**)	×	×	×
	De-installation	—	×	×	SVP2059W	SVP2079W	× (**)	×	×	×
CHA	Installation	Alternate path exist.	×	×	×	×	×	×	×	×
		Alternate path not exist.	×	×	×	×	×	×	×	×
	De-installation	Alternate path exist.	×	×	×	SVP2038W	×	SVP2038W	×	SVP2038W
		Alternate path not exist.	× (*)	×	SVP2073W (*)	SVP2038W	SVP2074W (*)	SVP2038W	SVP2075W (*)	SVP2038W
CHS	Installation	—	×	×	×	×	×	×	×	×
	De-Installation	—	×	×	×	×	×	×	×	×
CHF	Installation	—	×	×	×	×	×	×	×	×
	De-Installation	—	×	×	×	×	×	×	×	×
DKA	Installation	—	×	×	×	×	×	×	×	×
	De-Installation	—	×	×	×	×	×	×	×	×

(To be continued)

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(Continued from preceding sheet)

Component	Maintenance Type	Condition	Suspending		Deleting	
			MCU	RCU	MCU	RCU
HDD canister	Installation	—	× (**)	×	× (**)	×
	De-Installation	—	SVP2031W	SVP2034W	SVP2031W	SVP2034W
CACHE	Installation	—	× (**)	×	× (**)	×
	De-Installation	—	× (**)	×	× (**)	×
CHA	Installation	Alternate path exist.	×	×	×	×
		Alternate path not exist.	×	×	×	×
	De-Installation	Alternate path exist.	○	SVP2038W	○	SVP2038W
		Alternate path not exist.	SVP2075W (*)	SVP2038W	SVP2075W (*)	SVP2038W
CHS	Installation	—	×	×	×	×
	De-Installation	—	×	×	×	×
CHF	Installation	—	×	×	×	×
	De-Installation	—	×	×	×	×
DKA	Installation	—	×	×	×	×
	De-Installation	—	×	×	×	×

× : Maintenance is available
SVPXXXXW : Maintenance is not available based on the specification. Refer to SVP-MSG SECTION.

The pair will be suspended if the ESTPAIR or paircreate(pairesync) command issues during the HDD Canister or the Cache PCB installation/de-installation. Please ask for the consent of a customer before the online maintenance operation.

* : In the case of that all connected HRC/HODM/HORC Path(s) will be deleted by this operation, SVP displays a warning message with SVP2032W.

** : If the maintenance operation must be done while HRC asynchronous is using, you must confirm that the usage of Sidefile monitor less than 20% of total Cache capacity before you start the maintenance operation. Only when the usage of Sidefile monitor is less than 20% of total Cache capacity, you can proceed the maintenance operation.
Refer to “Monitoring” in the SVP SECTION about sidefile monitor.

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(2) Availability of the online maintenance when HODM is used

Component	Maintenance Type	Condition	HODM path established		During initial copy		Waiting for erase	
			MCU	RCU	MCU	RCU	MCU	RCU
HDD canister	Installation	—	×		SVP2059W		×	
	De-installation	—	×		SVP2031W (SVP2059W)		SVP2031W	
Cache PCB	Installation	—	×		SVP2059W		×	
	De-installation	—	×		SVP2059W		×	
CHA	Installation	Alternate path exist.	×		×		×	
		Alternate path not exist.	×		×		×	
	De-installation	Alternate path exist.	×		×		×	
		Alternate path not exist.	× *		SVP2076W *		SVP2078W *	
CHS	Installation	—	×		×		×	
	De-installation	—	×		×		×	
CHF	Installation	—	×		×		×	
	De-installation	—	×		×		×	
DKA	Installation	—	×		×		×	
	De-Installation	—	×		×		×	

Component	Maintenance Type	Condition	Suspend		During for R-Vol Erasing		Erasing Error	
			MCU	RCU	MCU	RCU	MCU	RCU
HDD canister	Installation	—	×		×		×	
	De-installation	—	SVP2031W		SVP2031W		SVP2031W	
Cache PCB	Installation	—	×		×		×	
	De-installation	—	×		×		×	
CHA	Installation	Alternate path exist.	×		×		×	
		Alternate path not exist.	×		×		×	
	De-installation	Alternate path exist.	×		×		×	
		Alternate path not exist.	SVP2077W *		SVP2078W		SVP2078W	
CHS	Installation	—	×		×		×	
	De-installation	—	×		×		×	
CHF	Installation	—	×		×		×	
	De-installation	—	×		×		×	
DKA	Installation	—	×		×		×	
	De-Installation	—	×		×		×	

× : Maintenance is available

SVPXXXXW : Maintenance is not available based on the specification. Refer to SVP-MSG SECTION.

* : In the case of that all connected HRC/HODM/HORC Path(s) will be deleted by this operation, SVP displays a warning message with SVP2032W.

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(3) Availability of the System tuning when HRC/HODM/HORC is used.
It is impossible to change the DKCNo ,SSID ,or DKC Emulation type by system tuning when HRC, HODM or HORC is used.

(4) Availability of the online maintenance when HMRCF is used

Component	Maintenance Type	Condition	HMRCF Reserve Volume	Pending/Resync /SP-Pend		Duplex		Split		Suspend	
				S-VOL	T-VOL	S-VOL	T-VOL	S-VOL	T-VOL	S-VOL	T-VOL
HDD canister (DATA)	Installation	—	×	×		×		×		×	
	De-installation	—	SVP2485W	SVP2485W		SVP2485W		SVP2485W		SVP2485W	
HDD canister (SPARE)	Installation	—	×	×		×		×		×	
	De-installation	—	×	×		×		×		×	
Cache PCB	Installation	—	×	SVP2486W		×		×		×	
	De-installation	—	×	SVP2486W		×		×		×	
CHA	Installation	—	×	×		×		×		×	
	De- installation	—	×	×		×		×		×	
DKA	Installation	—	×	×		×		×		×	
	De-Installation	—	×	×		×		×		×	

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(5) Availability of the online maintenance when Concurrent Copy(CC)/HXRC is used

Component	Maintenance Type	During initial copy		Established		Suspend	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
HDD canister	Installation	*	x	*	x	*	x
	De-installation	*	x	*	x	*	x
Cache PCB	Installation	*	x	*	x	*	x
	De-installation	*	x	*	x	*	x
CHA	Installation	x	x	x	x	x	x
	De-installation	x	x	x	x	x	x
DKA	Installation	x	x	x	x	x	x
	De-installation	x	x	x	x	x	x

x: Maintenance is available.

*: When a maintenance operation is needed while CC/HXRC is using, I/O's for CC/HXRC pair volumes or CC/HXRC itself should be stopped before the maintenance operation.
If the maintenance operation must be done while CC/HXRC is using, you must confirm that the usage of Sidefile monitor less than 20% of total Cache capacity before you start the maintenance operation. Only when the usage of Sidefile monitor is less than 20% of total Cache capacity, you can proceed the maintenance operation.
Refer to "Monitoring" in the SVP SECTION about sidefile monitor.
Select the [Information] icon in the 'SVP' window.
Next select the [Monitor] menu in the 'Information' window and select [start...].
Next select the 'Sidefile' box in the 'Item' menu in the 'Monitoring' window and select [OK].

Availability of the System tuning when HXRC is used.

When the following System tuning operation is needed while CC/HXRC is using, CC/HXRC should be stopped before the System tuning operation.

- It is impossible to change the DKC No, SSID, or DKC Emulation type by System tuning operation while CC/HXRC is using.
- When the DRV emulation type of CC/HXRC pair volumes are 3390-3 or 3390-3R, it is impossible to change the emulation type between 3390-3 and 3390-3R by CHANGE EMULATION operation while CC/HXRC is using.

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2.10 New Installation procedures without the pre-installation at a customer site

2.10.1 Application

These procedures are applied to a new installation without the pre-installation at a customer site or the pre-installation at the warehouse as shown below.

- Installing the appropriate micro programs according to the various types of the packages.
- Installing the configuration information appropriating for the customer.

If these procedures are used in other cases, their processes are not assured.

2.10.2 Conditions to use these procedures

These procedures can be used in the following conditions.

① The installation of the Hardware parts (for example, the connections of cables, power supplies and so on) have been finished.
② The PC (SVP) can be used.

For the Hardware installation, refer to “2.1 New Installation Procedure General Flow” (INST 02-10~02-12 (13)) of Maintenance Manual.

2.10.3 Procedures

(1) Summary

The procedures are divided roughly into 4 processes.

① Pre-processing ((1)-(11) in the following flow)
② Using 4 Packages (2 CHAs (or 2 CHSs/CHFs/CHTs) and 2 DKAs) at the basic locations (1P and 2V for CHA, 1B and 2H for DKA), the define configuration and installation of their packages is defined. ((12)-(32) in the following flow)
③ Installing more than 4 Packages, the additional installation of their packages is executed. ((33)-(42) in the following flow)
④ others ((43)-(61) in the following flow)

(2) Processing Flow

The processing flow of the new installation is as follows.

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START

(1)-1 Confirm to be in the breaker off (DKU). (Turn off the breaker if it is “on”). [INST03-3110]
(1)-2 Make sure that the size of the Cache and SM SIMM equipped with the DKC and memorize them. They must be specified in step (31).

(2) Insert the Shut Down Jumpers to CE Mode connectors (J9) on the TM PCBs. (Note *1)

(3) Pull out the SSVP to disconnect from the SVP. (Note *2)

(4) Breaker on (DKU and DKC)
(Execute Power ON procedures except the “POWER ON/OFF” switch on the CE panel PCB)
(Power ON procedures of Disk Subsystem:[INST03-3040 – INST03-3050])

(SVP procedure)
(5) TOD setting
(In this time, “Communication Error” may occurred. But it should be neglected.)
[INST05-20 – INST05-40]

(SVP procedure)
(6) Execute “setcopy.bat” to install micro-programs into the HD 0f SVP.
[Install FD to SVP] [REP04-660 2.(1), (2) and 3.]
step1: Prepare Fds (Note *3).
step2: Shut down Windows.
step3: Restart the computer in MS-DOS mode.
step4: Set No.1 FD into FDD of SVP PC.
step5: Enter the following command in the DOS mode.
a:\setcopy.bat (return)
step6: Set FDs according to the SVP guidance to install their FDs into the SVP HD.
step7: Reboot PC (Press the following keys at the same time:[Ctrl],[Alt],[Delete]).
[Initialize SVP icon]
step8: Set the No.1 FD into FDD of SVP.
step9: Click [Start] and select [Run].
step10: Enter below
a: \setup.exe (return)
The ‘SVP’ and the ‘Startup’ groups are made.
step11: Remove the No.1 FD from FDD.

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(SVP procedure) -- (Define Configuration for the SVP)

(7) Execute the "Define Configuration and Install" without installing into the DKC.
In this definition, define the configuration information for the basic configuration only even if it's needed to install the packages more than 4 (that is, more than 2 CHAs and 2 DKAs). (Note *4) [INST05-60 – INST05-170 14.(1)]

step1: Change the mode to "Initial Setting", select "Install" and select "Define Configuration and Install". (Note *5, Note *6)

step2: Specify 65535 for "DKC Serial Number" in the DKC configuration screen.

step3: Select Basic for "CHA", and specify 2 for "Number of DKA" in the DKC configuration screen.

step4: Specify Cache memory size (as installed at step (1)-2 of this procedure).

step5: Specify the Channel configuration corresponding to the current packages setting in the basic location. (Note *7)

step6: Simply click "Next" at Drive configuration with no other operation.

step7: Simply click "OK" at SCSI path configuration with no other operation. (Note *8, Note *9)

step8: Simply click "OK" at Lun Security configuration with no other operation. (Note *8, Note *9)

step9: Reply "NO" to the message "Are you sure you want to install the defined config…?". For, the SVP need this configuration information, the DKC need not it. (Never reply "YES" to the message "Are you sure ...?")

(8) Set IP Address (IP Address=65535) [INST05-40 – INST05-50]

(9) Shut down the SVP.

(10) Turn off the breaker (DKC).

(11) Set the SSVP to connect to the SVP. (reverse action as step (3) of this procedure)

(12) Set the packages according to the definition information in (7), that is, CHAs (or CHS/CHF/CHT) to 1P and 2V, and DKAs to 1B and 2H. [LOCATION02-20 – LOCATION02-30]

(13) Confirm that the Shut Down Jumpers to CE mode connectors (J9) on the TM PCBs is set. (Note *1)

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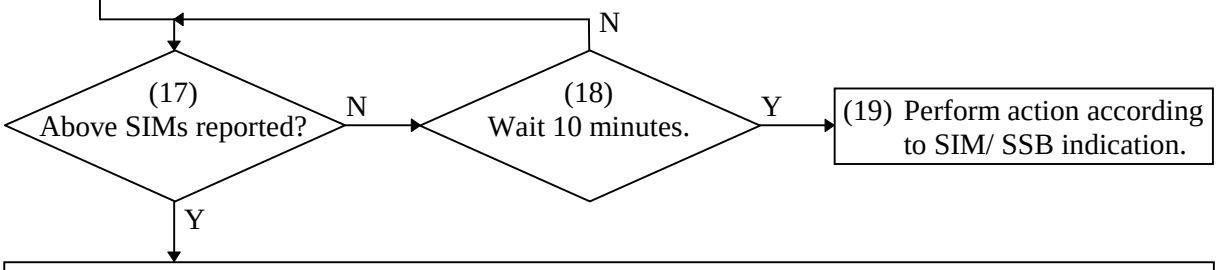
(14) Turn on the breaker(DKC) and the "POWER ON/OFF" switch on the CE panel PCB.
And then, execute quickly the step (15).
(Power ON procedure of Disk Subsystem:[INST03-3050 , INST03-3070])

(15) Pull out the Shut Down Jumpers from the TM PCBs when the MESSAGE LED is lit after the step (14) was done. Also, after pulling out the Shut Down Jumpers from the TM PCBs, then insert the Shut Down Jumpers to CE Mode connectors(J9) on the TM PCBs again within 10~20 seconds after pulling out the Shut Down Jumpers. The MESSAGE LED is lit for about 3 minutes. (Note *10)
If you have failed this processes, for example, you were too late to pull out the Shut Down jumpers, try again the step (13) – (15) after Turn off the "POWER ON/OFF" switch on the CE Panel PCB.

(16) Wait until SIMs with Reference Code = "7900XX/7901XX" are reported for all installed Mps.
(Check SVP Information SIM LOG.)



(20) Execute MP INSTALL with the minimum configuration for all MPs of the basic configuration.
[MICRO-FC05-20 – MICRO-FC50-40] (Note *11, Note*12)

(21) Turn off the "POWER ON/OFF" switch on the CE Panel PCB. [INST03-3070]

(22) Pull out the Shut Down Jumpers from the TM PCBs. (Note *1)

(23) Pull out the jumper connectors in the BATT CTR PCBs to make the SM volatilize, and wait for 1 minute. And set them again. [LOCATION06-60] (Note *13)

(24) Turn on the "POWER ON/OFF" switch on the CE panel PCB.
(Power ON procedure of Disk Subsystem: [INST03-3070])

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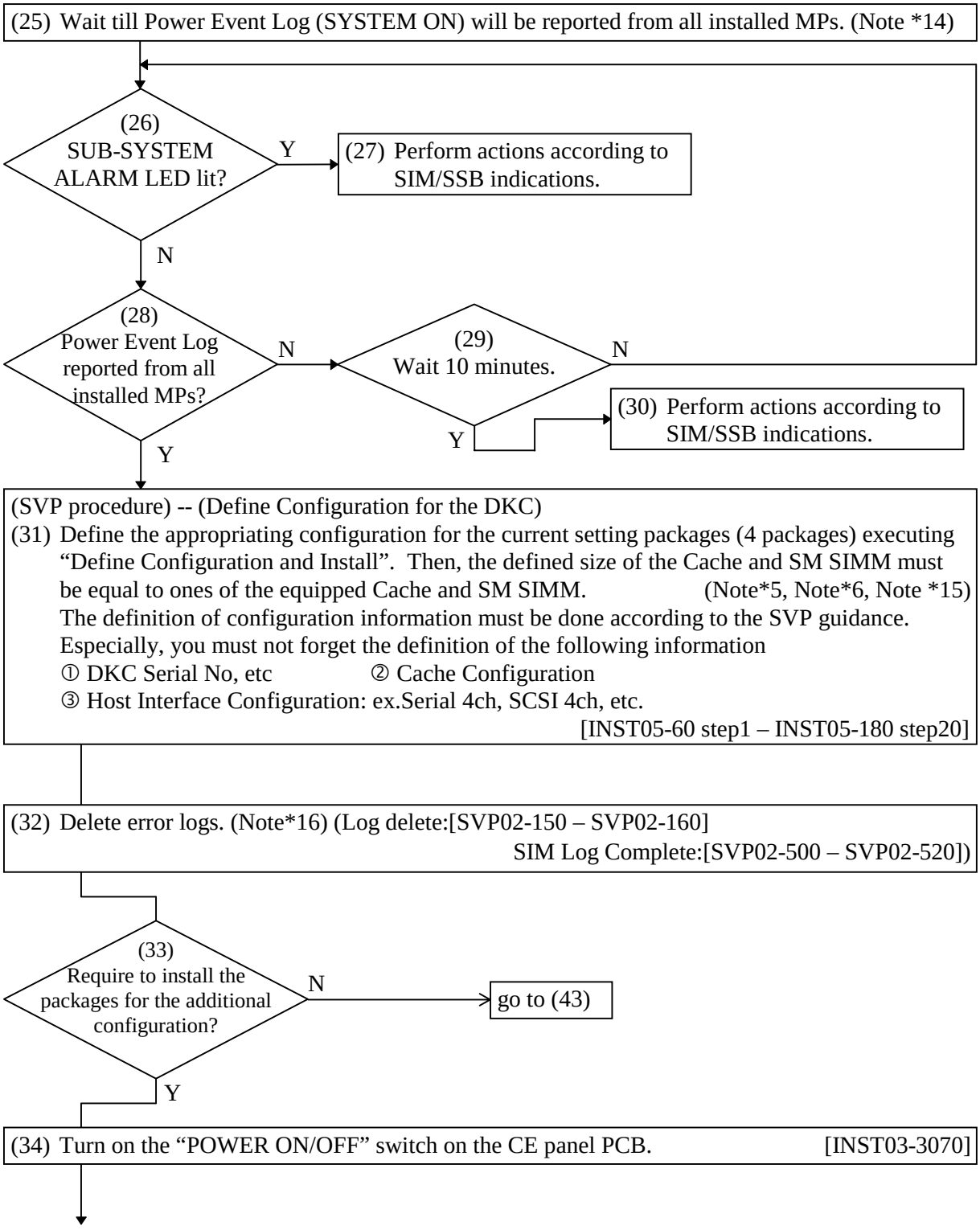

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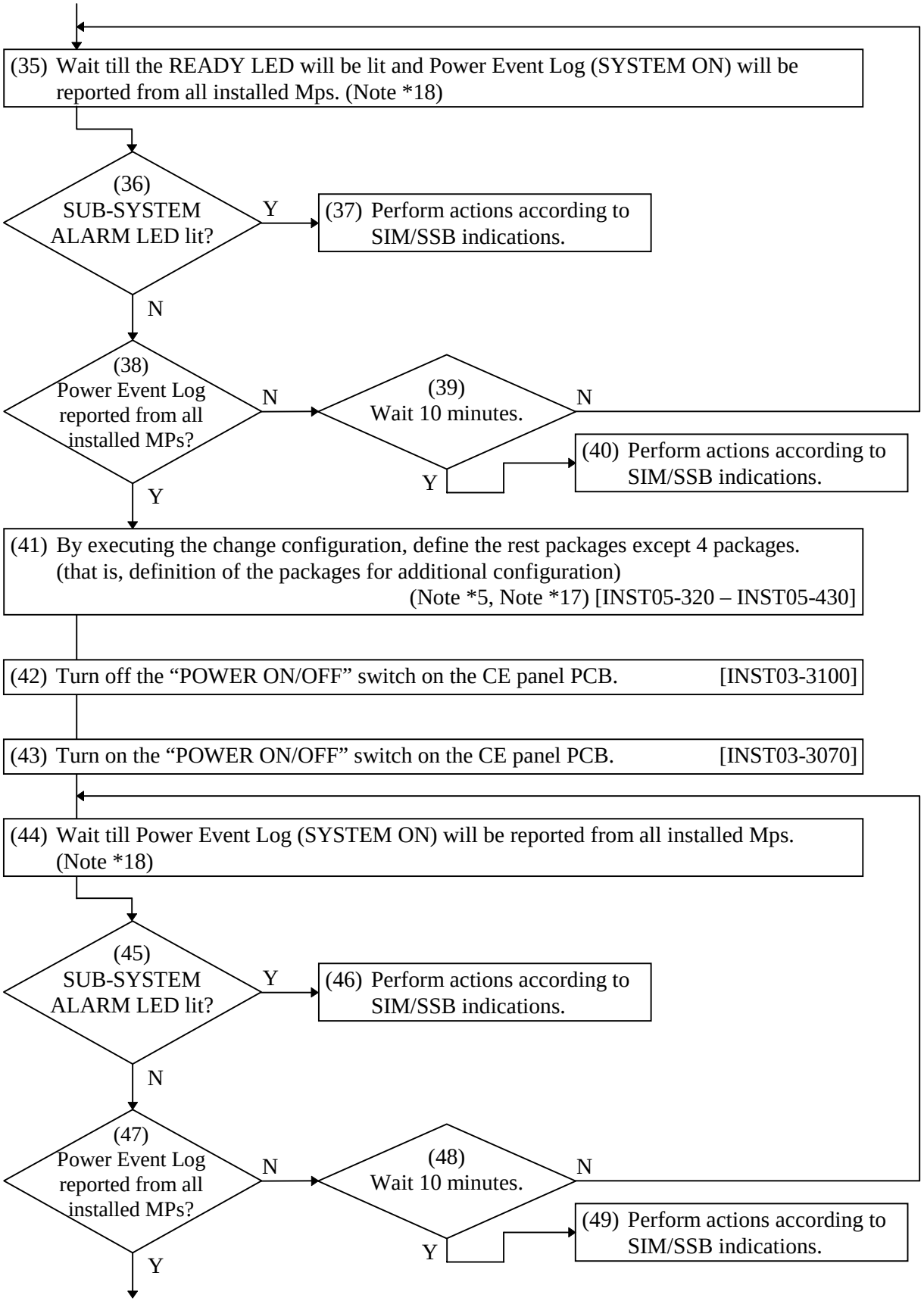

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(50) Confirm that the status come to be the appropriating configuration for the customer which was defined in (31). (Note *19) [SVP03-10 – SVP03-90, SVP03-130 – SVP03-170]

(51) Turn off the “POWER ON/OFF” switch on the CE panel PCB. [INST03-3100]

(SVP procedure)
(52) Turn on the “POWER ON/OFF” switch on the CE panel PCB. [INST03-3070]
(53) DKU Path inline test execution [INST05-190 step2.]
(DKU PATH INLINE Test Procedure :[DIAG04-180 – DIAG04-240])
(54) Check subsystem status and all MP micro-versions (Note *19)
[INST05-190 step3 (Activating and Terminating STATUS :
[SVP03-10 – SVP03-90, SVP03-130 – SVP03-170])
(55) LDEV formatting [INST05-200 – INST05-210 step4.5]
READY LED will be lit after LDEV formatting for CHS, CHF and/or CHT only configuration.
(56) Check subsystem status.
[INST05-210 step5(Activating and Terminating STATUS: SVP03-10 – SVP03-90])

(57) Was the CHT defined at (31) or (41)?

N

Y

(58) Execute the Micro-program Exchange Procedure (Off-line) to install FOP into the CHAs. (Note *20, *21) [MICRO-FC03-10 – MICRO-FC03-130]

(SVP procedure)
(59) Check subsystem status and all MP micro-versions
[INST05-190 step3(Activating and Terminating STATUS:
[SVP03-10 – SVP03-90, SVP03-130 – SVP03-170])

(60) Execute the “Online Micro program Exchange” for the DKU
[MICRO-FC04-10 – MICRO-FC04-60]

(SVP procedure)
(61) Delete error logs. (Note *16)
[INST05-220 step7(Log delete SVP02-150 – SVP02-160
SIM Log Complete SVP02-500 – SVP02-520])

END

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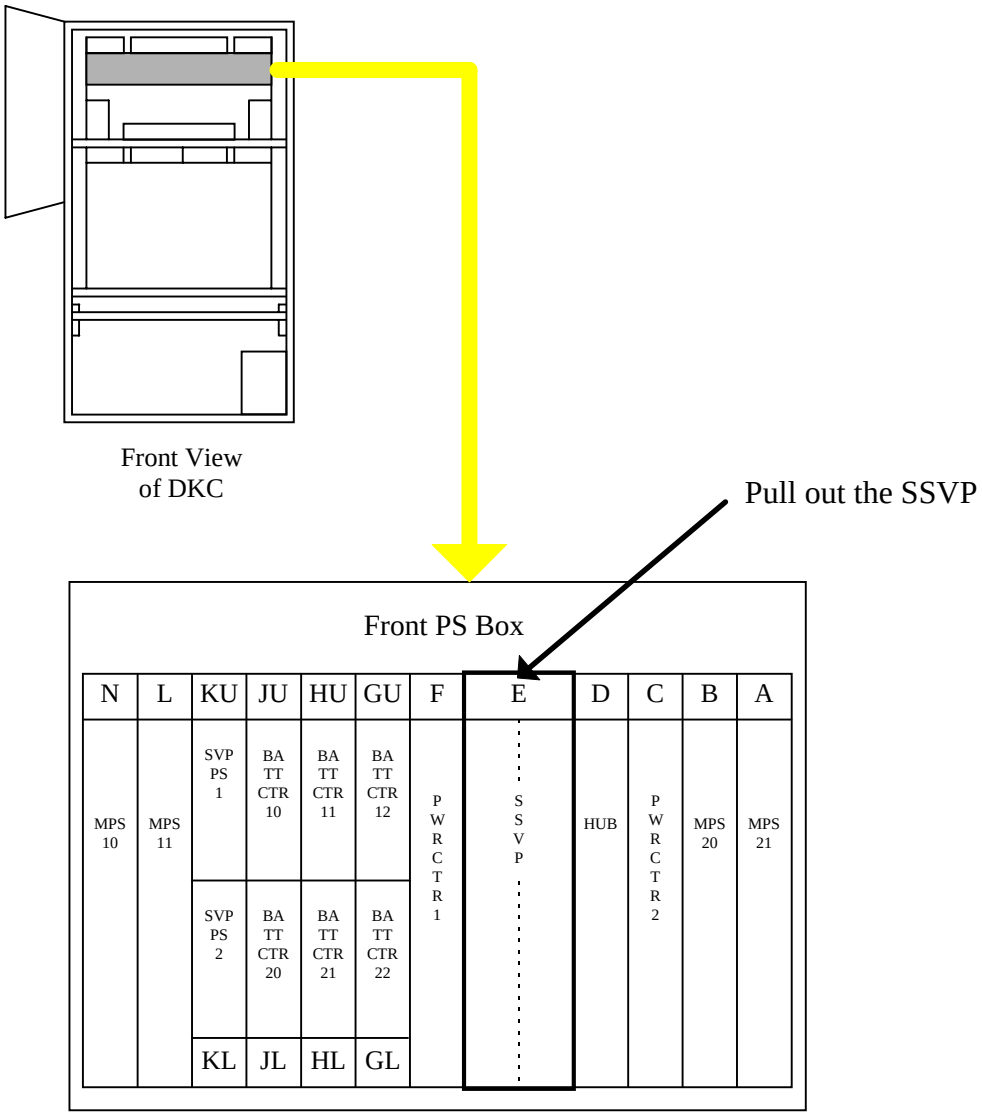
Note *1: Refer to “INST02-13 Note*5” about the Shut Down Jumpers.

Note *2: Before (3) is executed, the SVP must be powered off.



Note *3: The FDs include the micro-programs installed into the DKC subsystem.

Note *4: The basic configuration means the configuration with 2 CHAs (or CHSs/CHFs/CHTs) and 2 DKAs. And their PCB locations must be as follows.
1P and 2V for CHA. 1B and 2H for DKA.

Note *5: To change the mode to “Initial Setting”, press the following keys at the same time on the SVP window. :[CTRL], [SHIFT], [I]
And reply the password. (*22)

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Note *6: Reply the password required to execute the Define Configuration. (*22)

Note *7: For example, if the CHS packages are set, specify SCSI 4ch and if the CHA 4ch packages are set, specify Serial 4ch. If the right package type (Host interface configuration) for the setting packages is not specified, the different micro programs form setting packages are output. So, the unexpected errors are caused in new installation procedures.

Note *8: If the Serial 4/2ch or Parallel 4ch is specified at the step5, the step7 and 8 is not required. Also, if the SCSI 4ch is specified, the step8 is not required.

Note *9: In the step (7), the DKC is not operated yet, that is, the POWER ON/OFF switch on the CE panel PCB is still off. So, the following messages may be output.
[SVP2019W] Time out error has occurred [err Code=8001]…at step7
[INS0469E] Communication error has occurred.…at step8
But they should be neglected. (You neglect them and can progress the processing.)

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Note *10: Notice of the jumper operation

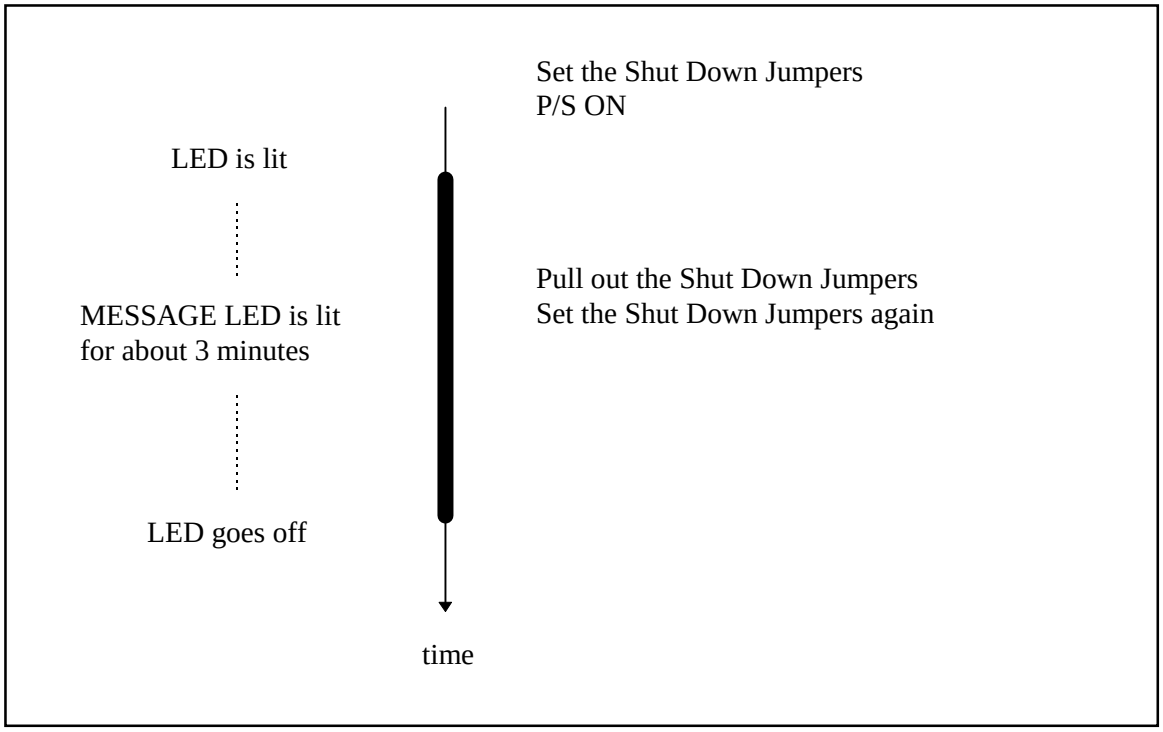
MESSAGE LED is lit after turning on P/S ON switch and the LED is lighting for about 3 minutes.

(1) Turn on P/S ON switch.

(2) Pull out the Shut Down Jumpers from the TM PCBs soon after MESSAGE LED is lit. The LED is lighting for about 3 minutes.
Please pull out the Shut Down Jumpers within 10~20 seconds after the LED began to be lighted.

(3) Insert the Shut Down Jumpers to CE Mode connectors (J9) on the TM PCBs again soon after pulling out them.
Please insert the Shut Down Jumpers again within 10~20 seconds after pulling out them.

Operation (2) and (3) must be executed during the Message LED is lighing.



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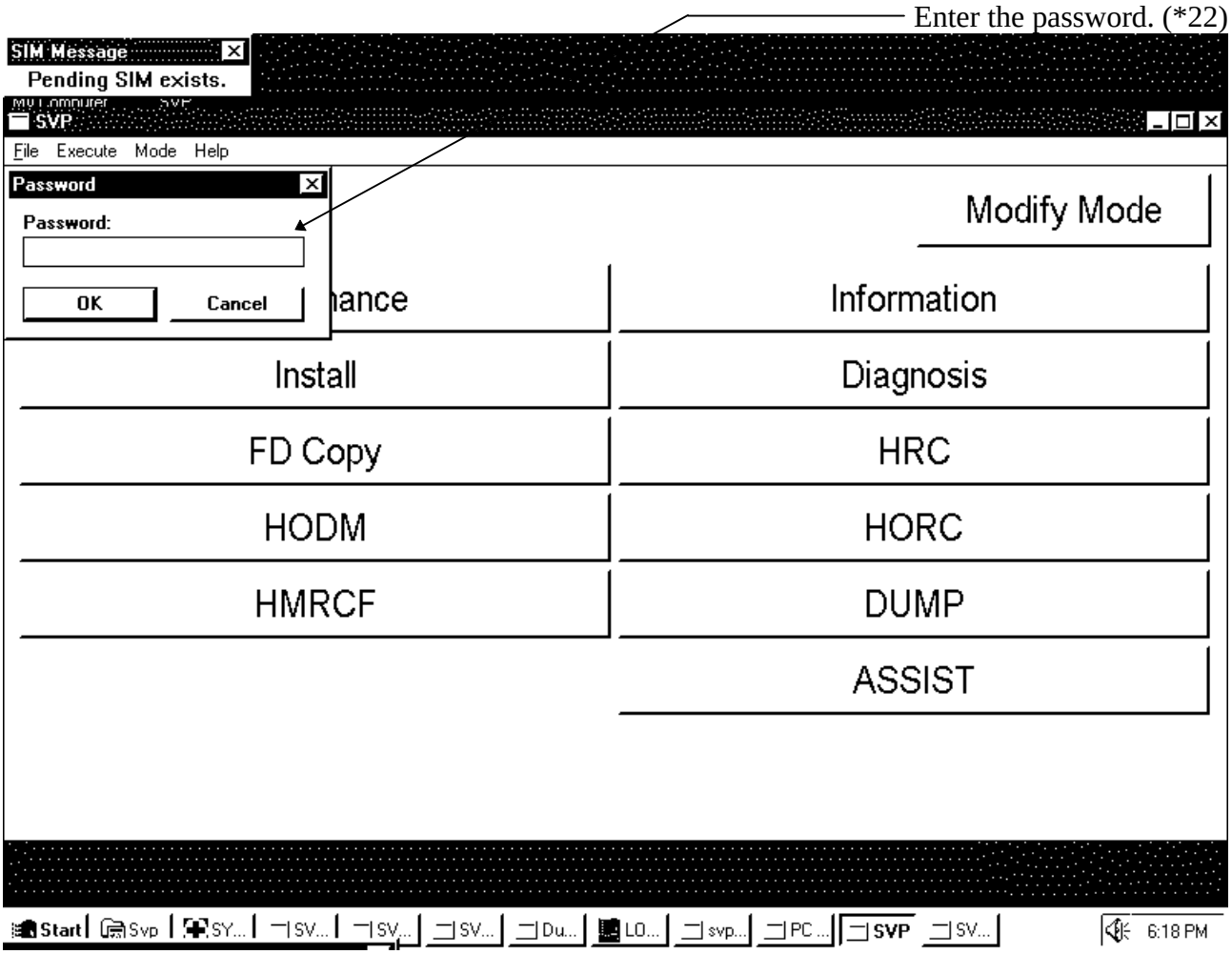
Note *11: The procedure of the MP Install with the minimum configuration is as follows.

(1) Return to the SVP window.
(2) Press the some keys at the same time. (*22)
(3) Enter the password.
This password must be used only for this procedure. Don't use for other purposes without approval by the technical support center or the factory.



(4) Select "INSTALL".
(5) <INSTALL window>
Select "Micro Program Install".
(6) <Menu Dialog window>
Select "MP Install"
(7) <MP Install window>
(a) Select all objects and all CHAs and DKAs displayed in the screen.
(LCP/MCP/LCDG/RAMBOOT/DKCMAIN/Configuration(Minimum))
(b) Select "OK".

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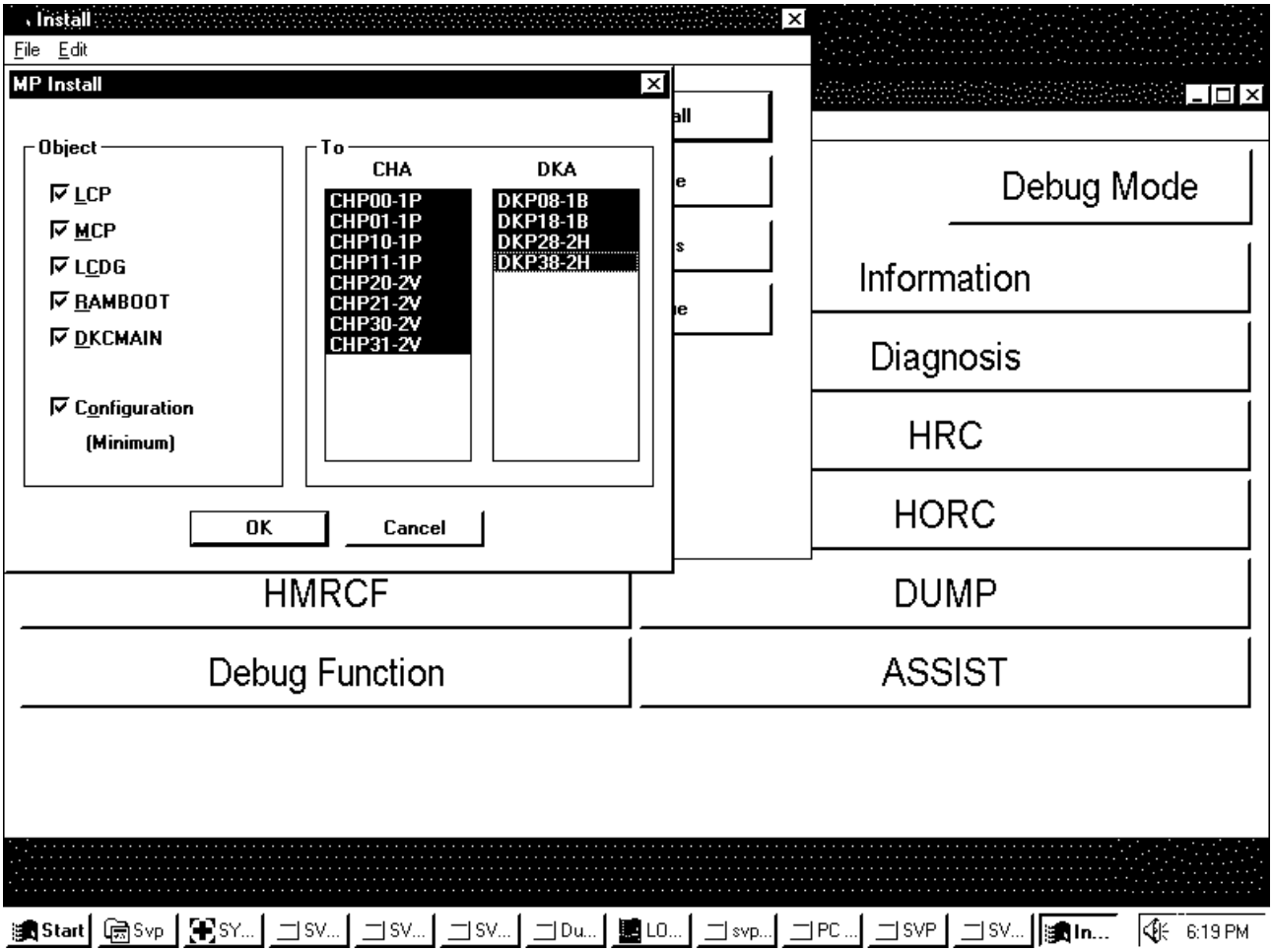

Note *12: The minimum configuration is the temporary and is used forcibly to unify the configuration of the DKC when it is unknown.
The following information is defined in the minimum configuration.
① Basic DKC Configuration
IP Address=65535
Serial 4ch for Host interface configuration of CL-1(CHA-1P)
Serial 2ch for Host interface configuration of CL-2(CHA-2V)
2 as the number of DKA
② Others
The LDEV information is not defined at all.
And so on.

Note *13: The following SIM Logs are output by pulling out the jumper connectors in the BATT CTR PCBs.
SIM Logs: bf5010, bf5210, bf5020, bf5220
But you can neglect them.

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Note *14: In this time, the standing-up by the Power on is performed, using the minimum configuration. So, the READY LED is not lit and the SIM Log (3073XX) may be output if the other packages than the CHA and the DKA as the minimum configuration are set. Also, 399042 and 399043 SIM Log may be output. But they should be neglected.

Note *15: The current setting packages should be 4 packages and their locations should be 1P and 2V for CHA (or CHS/CHF/CHT), 1B and 2H for DKA.
And at (20), the minimum configuration is installed and it is a temporary configuration. Therefore the right configuration must be defined for them (current setting 4 packages) at (31).
Also, at (31), specify the actual DKC Serial Number.
And, the defined value for the size of the Cache and SM SIMM should be equal to the value that was confirmed at (1). After the P/S OFF of the DKC and the reboot of the SVP according to the execution of "Define Configuration and Install" in (31) was finished, the Serial Number of the DKC and SVP should be same.

Note *16: It's necessary to execute the procedure of "SIM Log Complete" before deleting SIM data.

Note *17: In (41), "Change Configuration", that is, the procedures of the additional installation of the packages that were not defined in (31) are needed.
If the addition of CHAs (or CHS/CHF/CHT) and DKAs are needed, the following procedures must be executed.

(a) Changing of "number of Channel" for CHAs (or CHS/CHF/CHT).
(b) Changing of "DKA+ECC group+LDEV" for DKAs.

Note *18: In the case of CHTs, those channel lamps may be not lit. But, it should be neglected.

Note *19: In the CHTs, the installation of the micro-program of FOP are not executed yet. So, it's micro-program version (or revision) is not same one that you will expect. But it should be neglected.

Note *20: When this Micro-program Exchange (Off-line) is executed, the password is required. Reply to it. (*22)

Note *21: It need to install FOP.
At (6), the micro-programs are installed into the HD of SVP. So, select 'Offline FC' for 'HOW', and 'Hard disk' for 'From' in the 'Setup Microprogram' dialog box. And in the 'Microprogram Exchange' dialog box, select 'FOP'.
('DKCMAIN' must be already selected. Select nothing except 'DKCMAIN' and 'FOP'.)

Note *22: For the passwords or the keys, ask the technical support center. And use them with it's approval.

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3. Hardware Installation

3.1 Common Item of Installation and De-Installation

3.1.1 How to open/close the cover

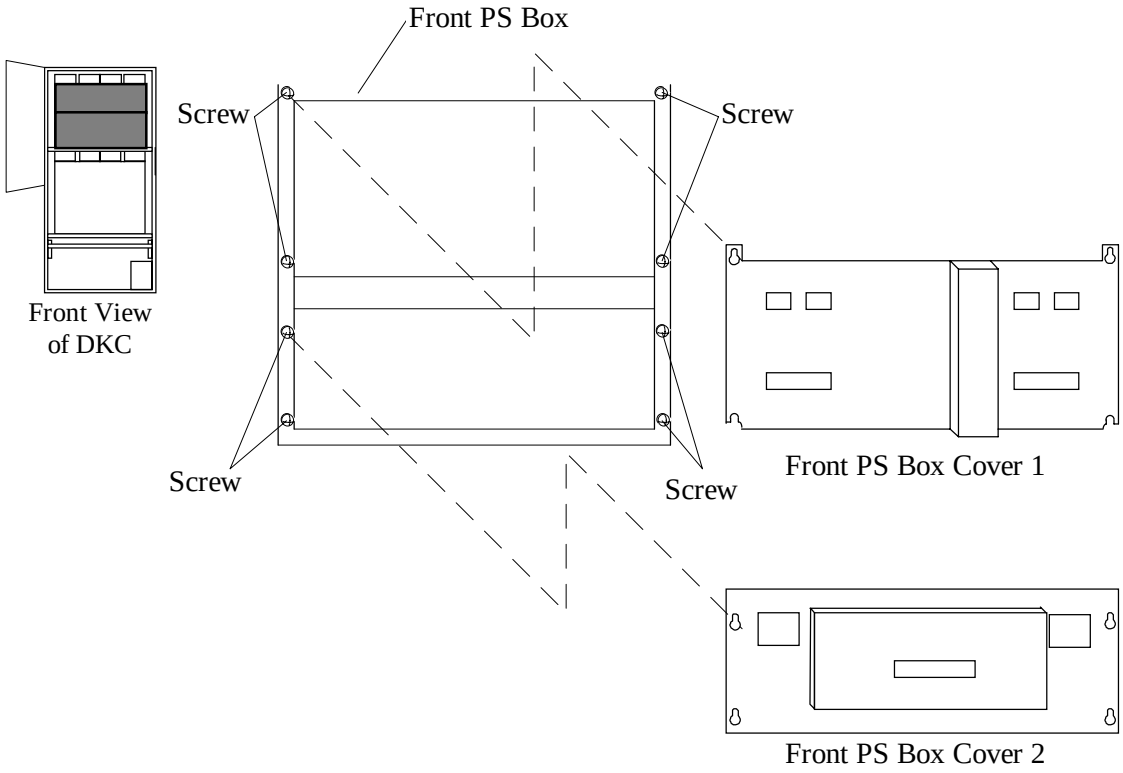
1. Front PS Box Cover 1 or 2

   Attachment

   a. Attach the Front PS Box Cover 1 or 2 to the Front PS Box.
   b. Tighten the four screws.

   Removal

   a. Loosen the four screws.
   b. Remove the Front PS Box Cover 1 or 2 from the Front PS Box.



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2. Front Logic Box Cover

Attachment

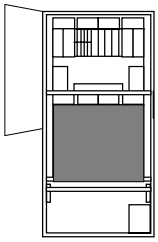
a. Attach the Front Logic Box Cover to the Front Logic Box.

b. Tighten the six screws.

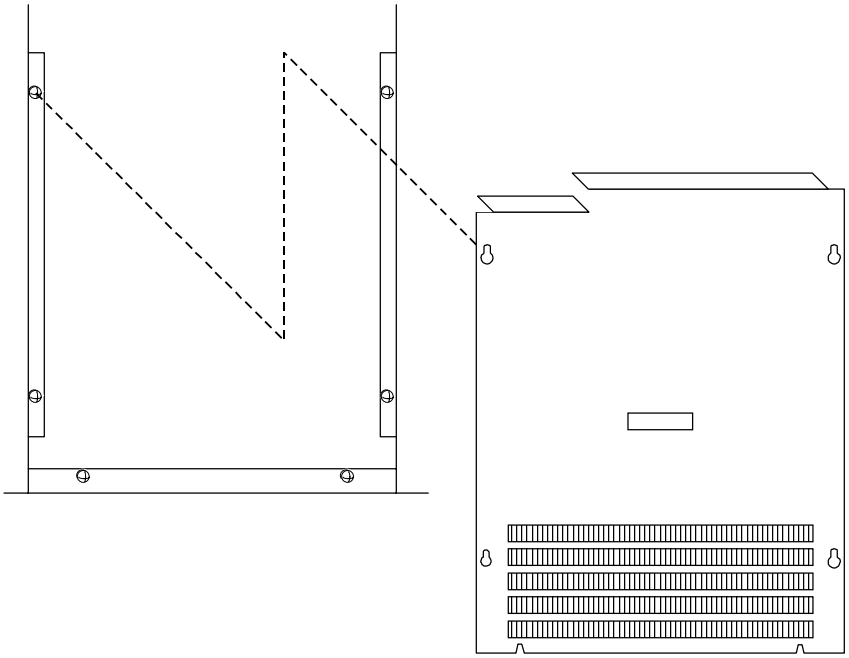
Removal

a. Loosen the six screws.

b. Remove the Front Logic Box Cover from the Front Logic Box.



Front View of DKC



Front Logic Box Cover

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3. Rear PS Box Cover

Attachment

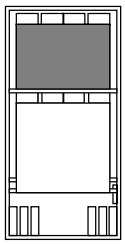
a. Attach the Rear PS Box Cover to the Rear PS Box .

b. Tighten the four screws.

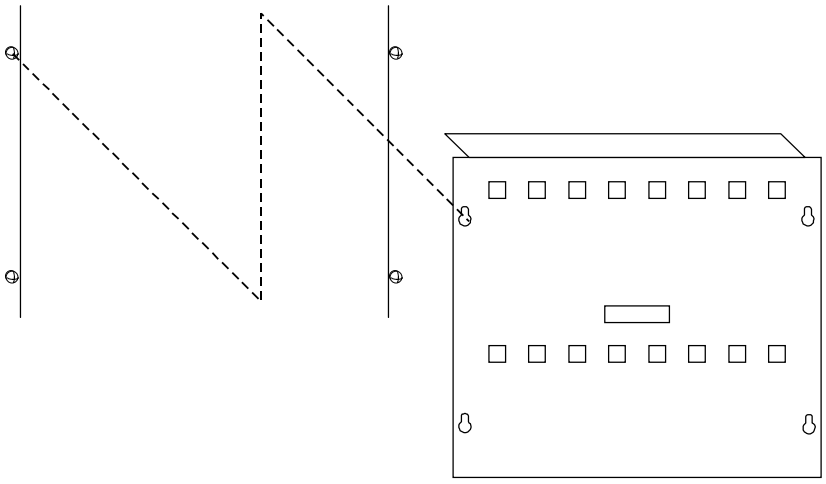
Removal

a. Loosen the four screws.

b. Remove the Rear PS Box Cover from the Rear PS Box.



Rear View of DKC



Rear PS Box Cover

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4. Rear Logic Box Cover

Attachment

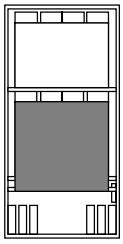
a. Attach the Rear Logic Box Cover to the Rear Logic Box .

b. Tighten the six screws.

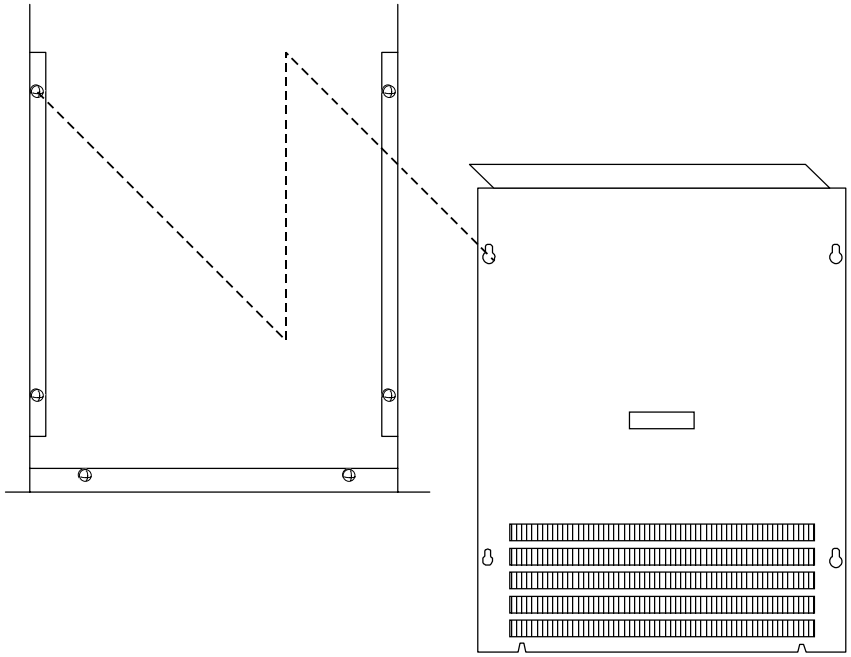
Removal

a. Loosen the six screws.

b. Remove the Rear Logic Box Cover from the Rear Logic Box.



Rear View of DKC



Rear Logic Box Cover

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3.1.2 Attaching the Wrist Strap

(1) To protect the IC and LSI on the PCB from static electricity damage, put on the wrist straps and connect them into the ground wires on the DKC/DKU before starting work (see Fig. 3.1.2-1 and 3.1.2-2).

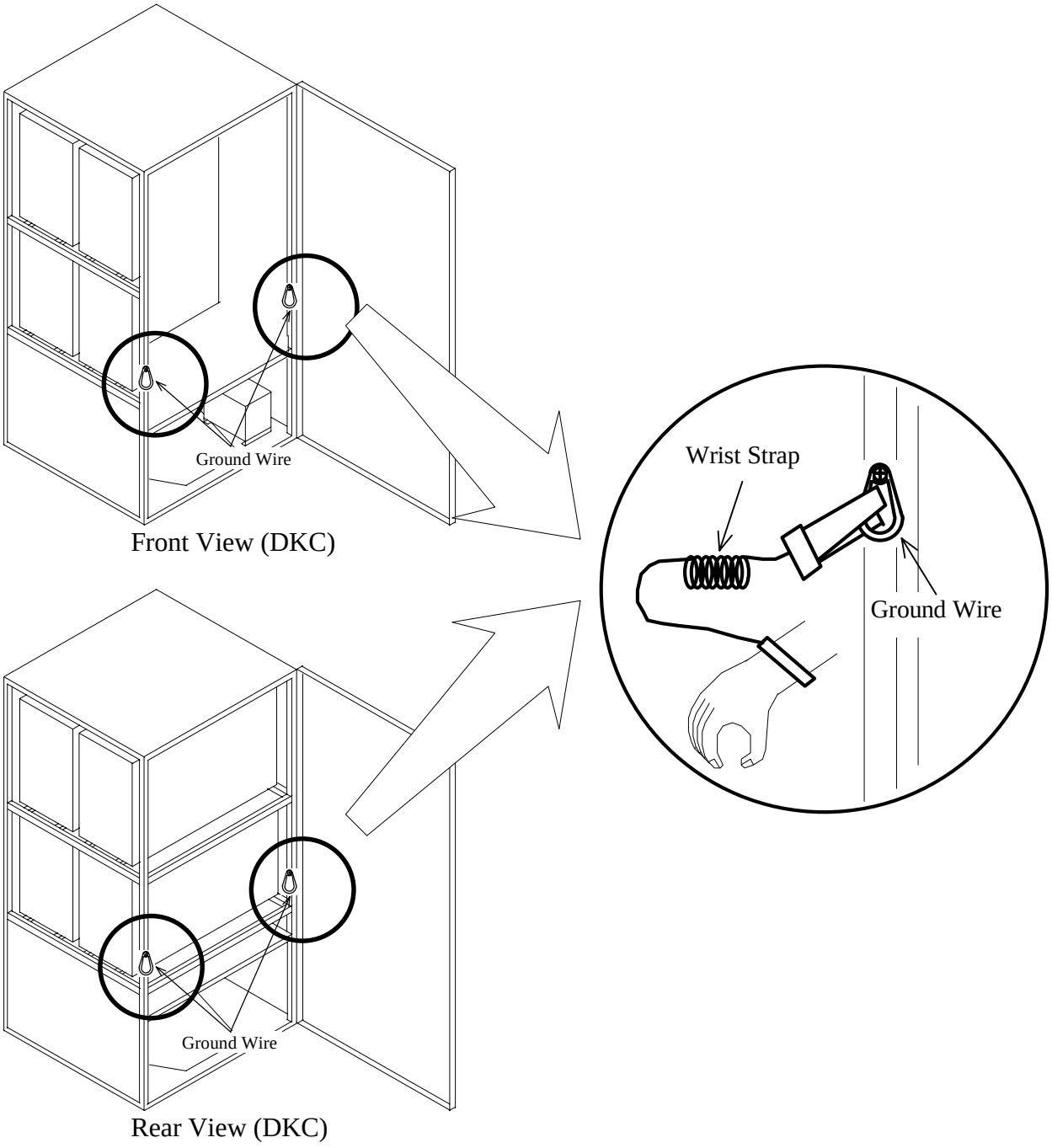

Fig. 3.1.2-1 Location of Ground Wire on the DKC

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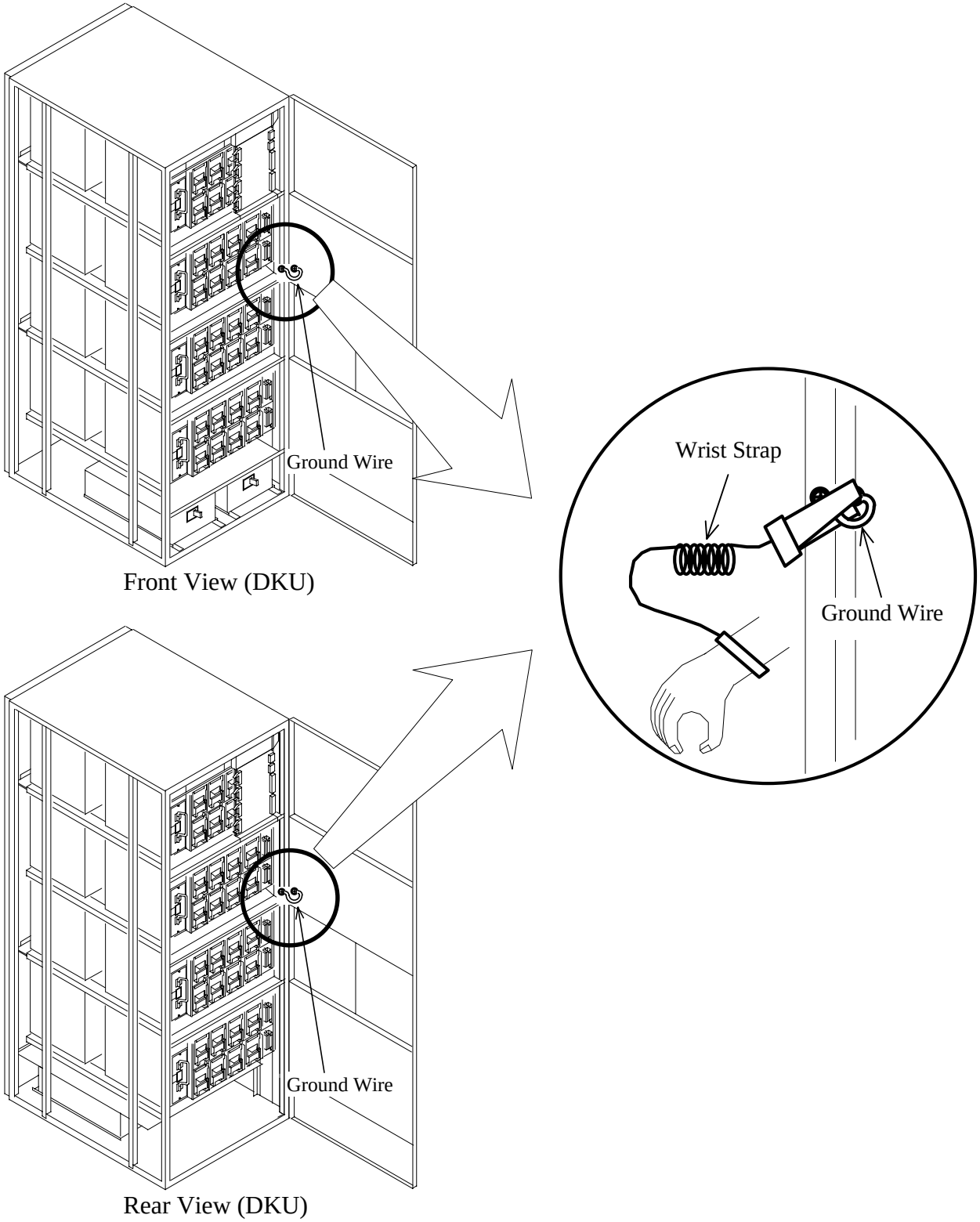

Fig. 3.1.2-2 Location of Ground Wire on the DKU

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3.2 UNPACKING AND INSPECTION

Receiving and Inspection

Before unpacking the unit, check the physical condition of the packed unit.

1. Prior to unpacking, check the container for visible damage or any indication of excessive shock, tilt or anything else abnormal during transportation and handling.

2. Obtain and check shipping manifest for missing units.

3. If anything abnormal is found, appropriate action should be taken before starting an installation.

Unpacking Procedure

NOTICE:
- Be very careful when handling the equipment.
- Do not drop the equipment from a height more than 5 mm (0.2in.) high.
- Floor unevenness must be less than 10 mm (0.4in.). Move slowly and lift the four screw jacks at the bottom of each frame to the highest position to prevent contact with the ramp.

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3.2.1 Unpacking

3.2.1.1 Disk Controller (DKC310I)

1. Card board crate overview is shown in Fig. 3.2.1.1-1.
2. Cut the polyester bands.
3. Remove the nails.

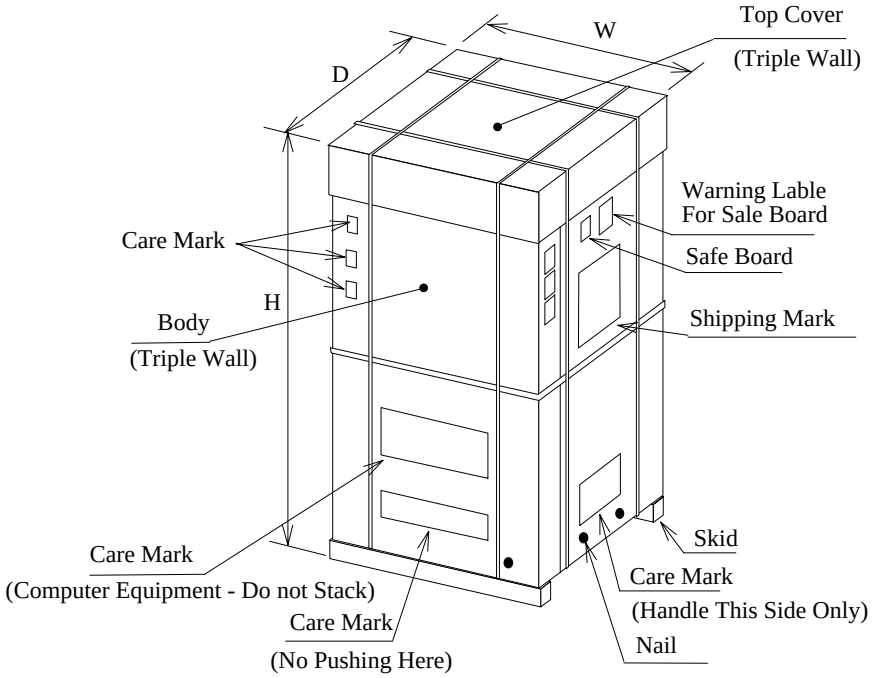

Fig. 3.2.1.1-1 Card Board Crate Overview

4. Remove Top Cover and Side Covers.

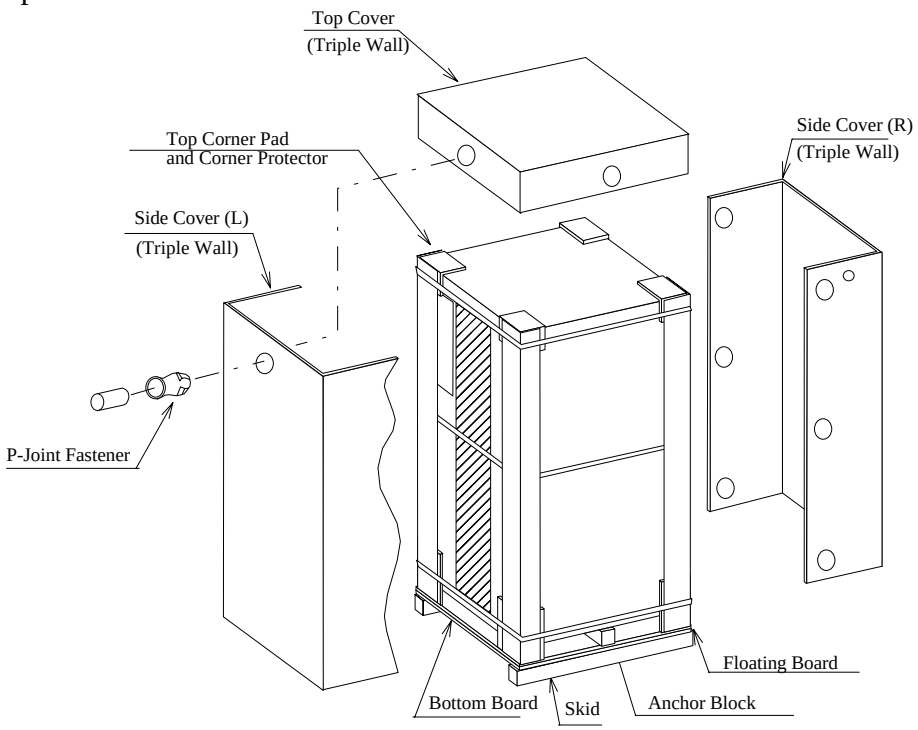

Fig. 3.2.1.1-2 Breakdown of CARD BOARD Crate

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5. Take the equipment down from FLOATER by lifting the equipment with forklift a minimum amount needed to remove the FLOATER/DECK/SKID assembly.
6. Gently lower the equipment onto floor.
7. Remove adhesive tape and corner protectors.

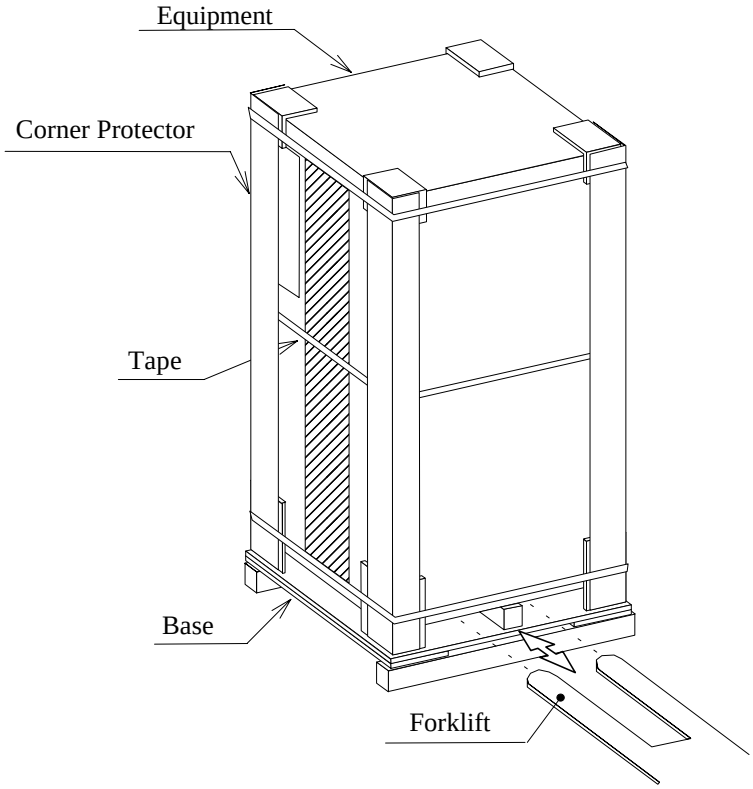

Fig. 3.2.1.1-3 Lift of Equipment

8. Remove the polyethylene bag and adhesive tape.

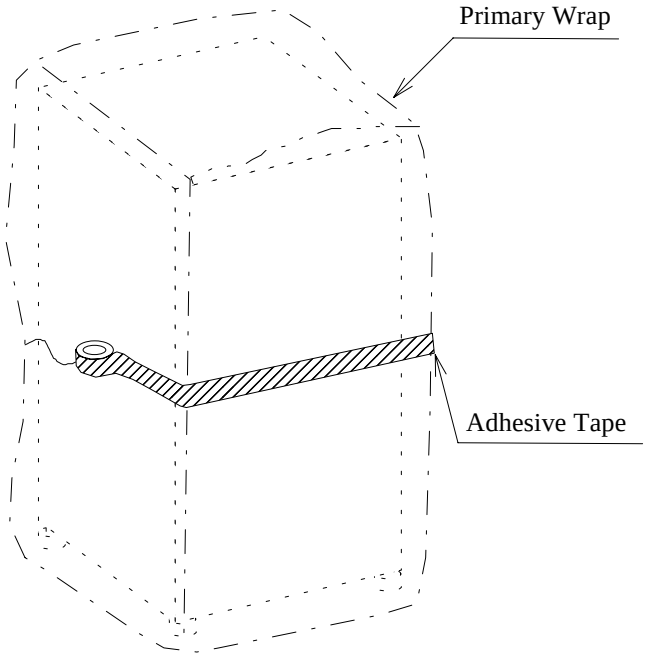

Fig. 3.2.1.1-4 Removal of Wrap Material

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9. Remove the band.
10. Remove the adhesive tape and cushions from Operator Panel Cover.

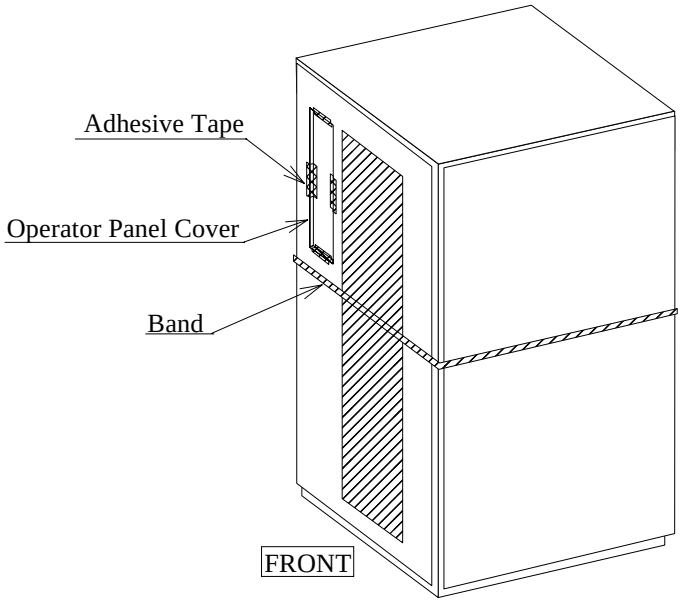

Fig. 3.2.1.1-5 Surface Unpacking

11. Open the front and rear door, remove the shipping cushions and tapes from the container.
12. Visually check the unit for any damage.

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3.2.1.2 Disk Unit (DKU305I)

1. The container overview is shown in Fig. 3.2.1.2-1.
2. Cut the polyester bands.
3. Remove the nails and washers on the lower part of the crate.
4. The container breakdown is shown in Fig. 3.2.1.2-2
5. Unfasten P-JOINT Fasteners.
6. Remove the cap by lifting.
7. Remove the sleeves.
8. Cut polypropylene tapes.
9. Remove the corner protectors.
10. Break the seal of polyethylene bag and open it.
11. Take the unit down from the FLOATER by lifting the unit with forklift a minimum amount needed to remove FLOATER/DECK/SKID assembly.
12. Gently lower the equipment onto floor.
13. Remove adhesive tape and cushions from the unit.
14. Visually check the unit for any damage.

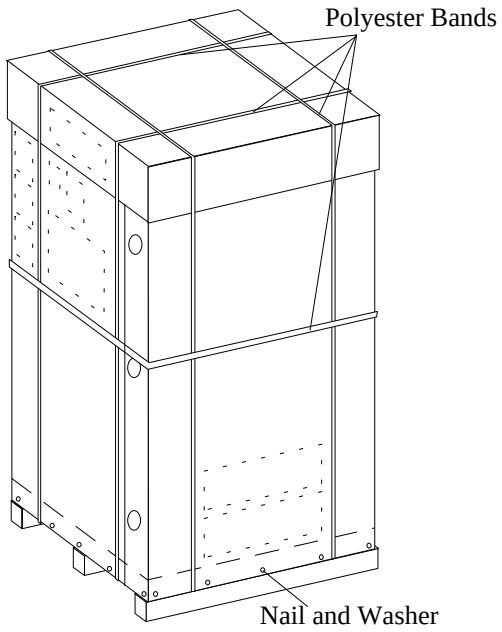

Fig. 3.2.1.2-1 Container Overview

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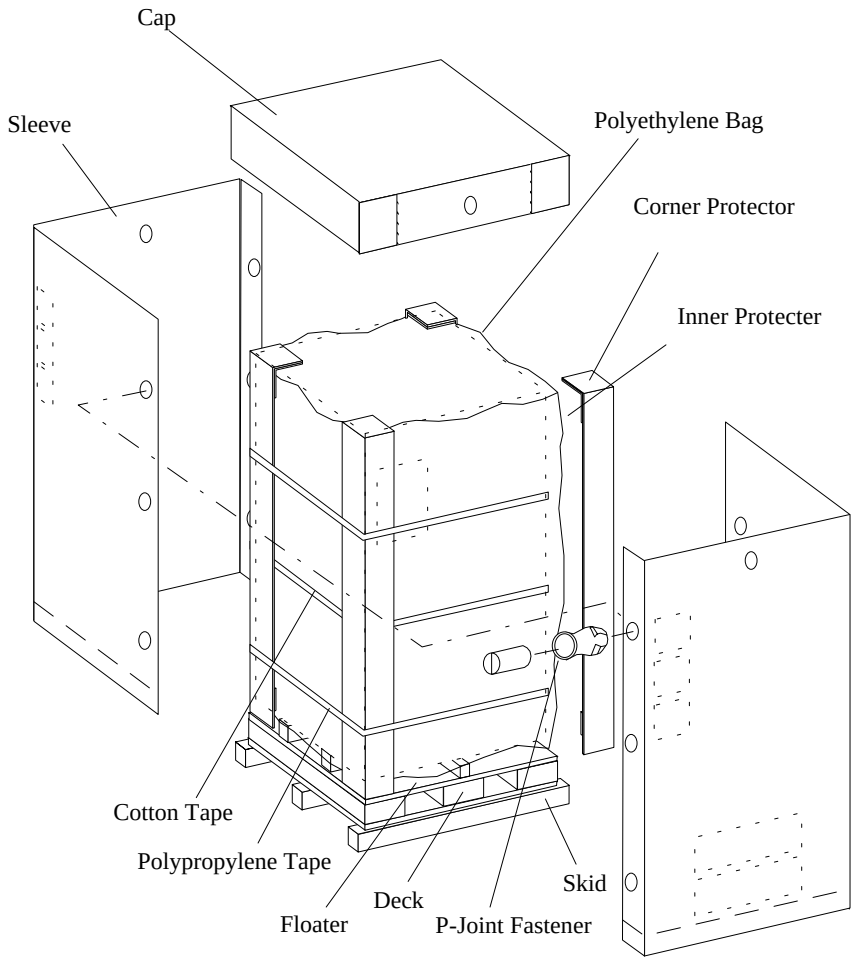

Fig. 3.2.1.2-2 Breakdown of Container

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3.2.1.3 Platform for Canister Mount (DKU-F305I-B4)

1. The container overview is shown in Fig. 3.2.1.4-1.
2. Cut the polyester bands.
3. Open the container.
4. Break the seal of polyethylene bag and open it.
5. Gently lower the equipment onto floor.
6. Visually check the unit for any damage.

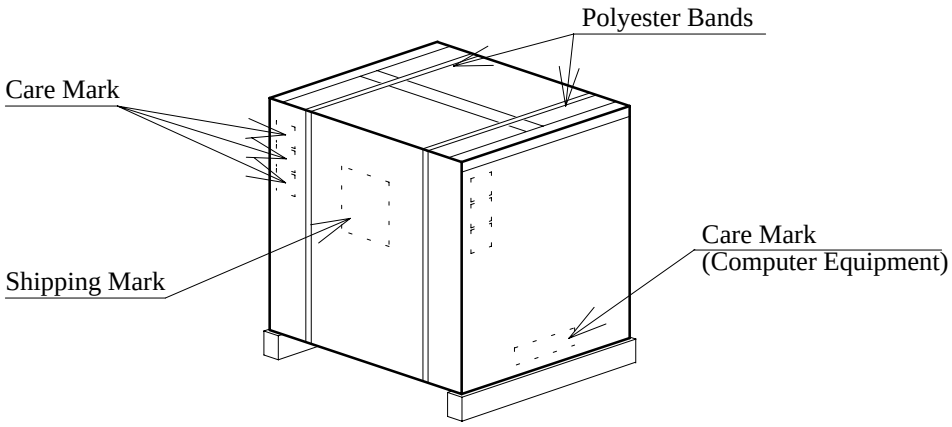

Fig. 3.2.1.4-1 Container Overview

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3.2.2 Inspection of Packaged Parts and Accessories

1. Match the unpacked parts against the parts lists in Tables 3.3.2.2-1 through 3.3.2.2-4 to verify that all parts are supplied.

DKC310I

Table 3.2.2-1 List of Packaged Parts and Accessories (Disk Controller)

(Basic)

No.	Name of parts	Parts number	Quantity/Unit	Remarks
1	Disk Controller	---------	1	
2	Kick Plate (Side)	3236815-1	2	
3	Kick Plate (F/R)	3236816-1	2	
4	Screw (Black)	5411531-2	4	
5	Jumper Connector	3250529-A	1	SH-D4
6	Jumper Connector	3250531-A	2	SD
7	Jumper Connector	5500576-A	2	AI
8	Side Cover	3236770-C	1	
9	Screw (M5×36)	SB536	4	
10	LL-Washer	2051001-532	4	

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DKC310I (CPX)

Table 3.2.2-2 List of Packaged Parts and Accessories (Disk Controller)

(Basic)

No.	Name of parts	Parts number	Quantity/Unit	Remarks
1	Disk Controller	---------	1	
2	Kick Plate (Side)	3236815-1	2	
3	Kick Plate (F/R)	3236816-1	2	
4	Screw (Black)	5411531-2	4	
5	Jumper Connector	3250529-A	1	SH-D4
6	Jumper Connector	3250531-A	2	SD
7	Jumper Connector	5500576-A	2	AI
8	Side Cover	3236770-C	1	
9	Screw (M5×36)	SB536	4	
10	LL-Washer	2051001-532	4	
11	DUMP (Floppy Disk)	PN5500214-35	10	

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DKU305IE/U

Table 3.2.2-3 List of Packaged Parts and Accessories (Disk Unit)

No.	Name of parts	Parts number	Quantity/Unit	Remarks
1	Disk Unit	---------	1	
2	Kick Plate	3239219-1	2	Note 1
3	Connecting Bolt Assy	5437962-A	4	
4	Screw (Black)	5409006-1	4	
5	Connecting Screw Assy	5487372-A	2	

Note 1: This is packed with drive unit.

2. Return to General Flow.
   New Installation : Go to INST02-10 step (2).
   Non-Disruptive Installation : Go to INST02-20 step (2).
   Disruptive Installation : Go to INST02-40 step (2).

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3.3 Basic Subsystem Installation

See SECTION 3.4 INSTALLATION OF DISK UNIT (DKU305I-14) when there are two or more Disk Units. [INST03-380]

3.3.1 Flowchart

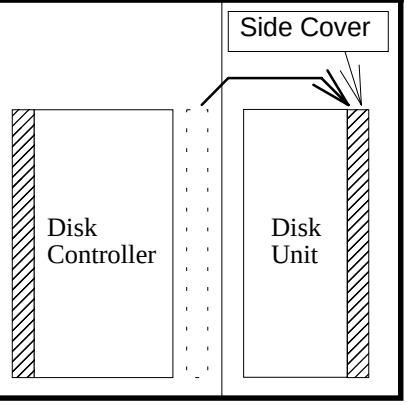
1.	Cabinet Setting	[INST03-170]
↓		
2.	Frame Connection	[INST03-210]
↓		
3.	Switch and Jumper Plug Installation	[INST03-250]
↓		
4.	Cabling	[INST03-290]
↓		
5.	Check of Jumper Settings	[INST03-370]

3.3.2 Cabinet Setting

- Refer to Table 3.3.2-1 when laying out the First Disk Unit with respect to the Disk Controller and relocating the side cover.

1. Place the Disk Controller and Disk Unit in the required position.

Table 3.3.2-1 Removal and Re-installation of Side Cover

Configuration	Disk Controller	First Disk Unit
Disk Controller (DKC310I) and Disk Unit (DKU305I-14)		

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2. Remove the fall proof adapters from the Disk Unit.

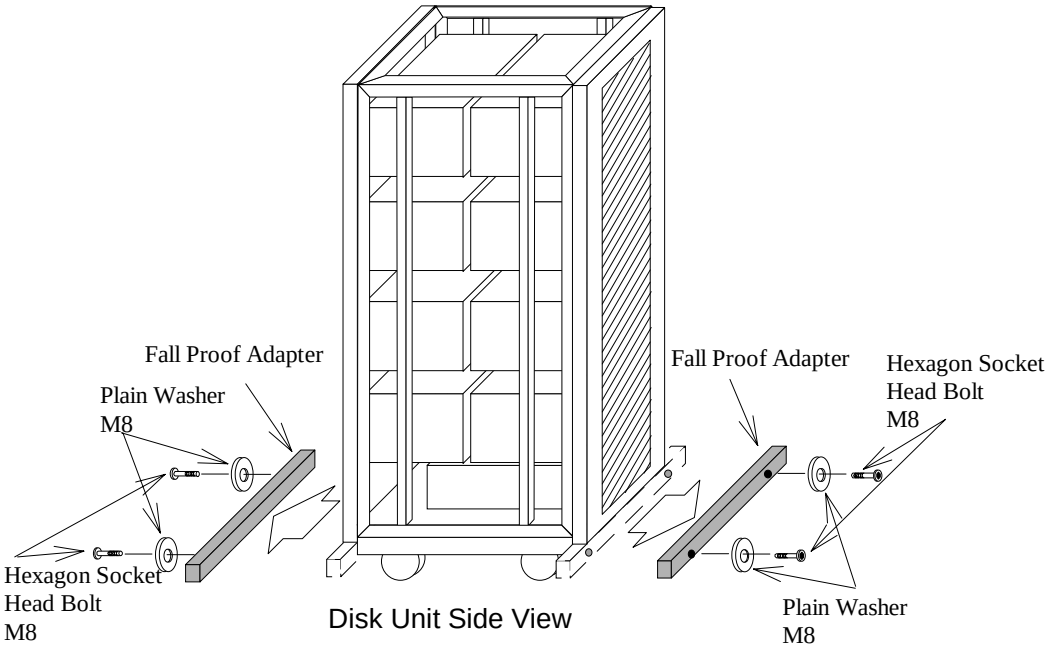

Fig. 3.3.2-1 Removal of Fall Proof Adapter

Note: The fall proof adapters, hexagon socket head bolt M8s, and plain washer M8s should be stored in the place of installation for future use in moving or taking out the unit.

3. Open the front and rear doors on the Disk Controller and the Disk Unit.
4. Remove the screw for transporting the movable rack.

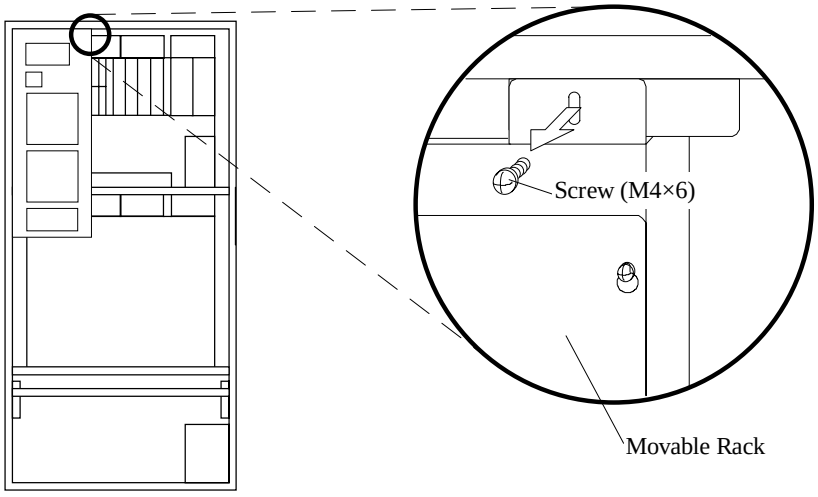

Fig. 3.3.2-2 Removal of Screw for Transporting the Movable Rack

Note: The screw for transporting the movable rack (screw M4×6) should be stored in the place of installation for future use in taking out and transporting the unit.

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5. Loosen the repeat binders which secure the DKUMN cables, the SCSI interface cables and the AC power cables for the Disk Controller

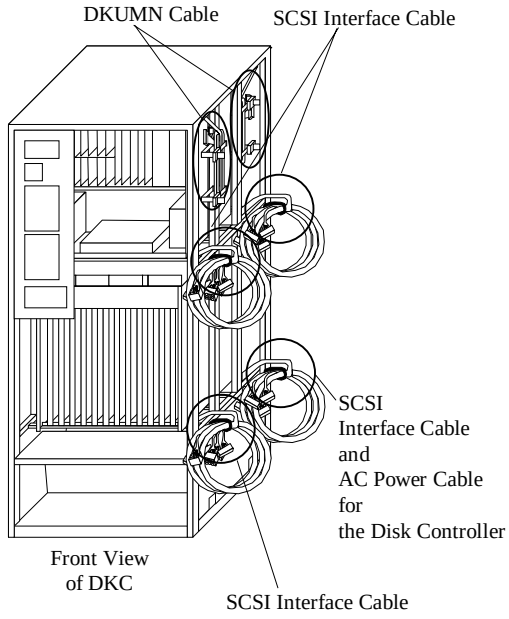

Fig. 3.3.2-3 Removal of Cables

6. Pass the DKUMN cables, the SCSI interface cables and the AC power cables for the Disk Controller through the Basic Disk Unit frame. Refer to Fig. 3.3.2-4. Be extremely careful not to pinch the inter-frame cable when coupling the frames to each other.

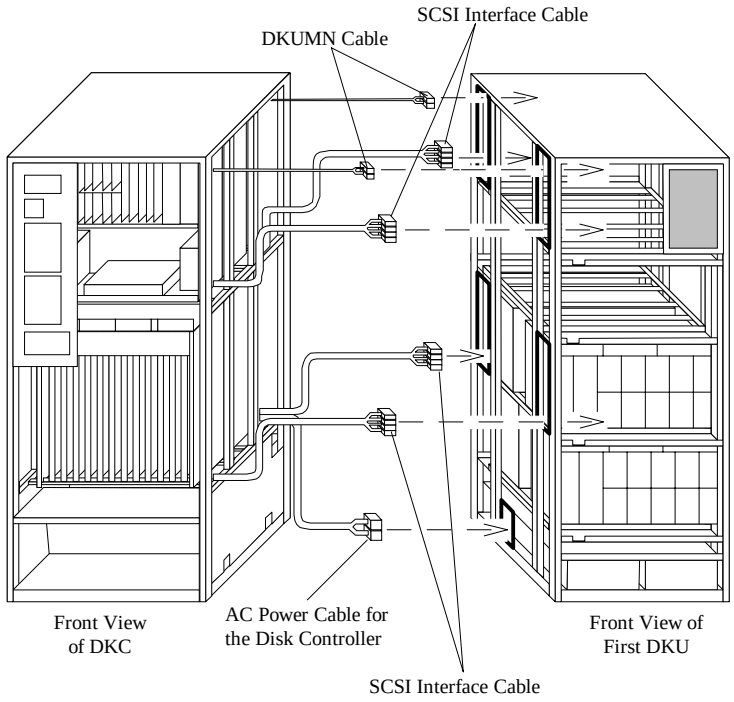

Fig. 3.3.2-4 Attachment of Cables

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7. Lower the screw jacks until frame is 57mm (2.25in.) from the floor before connecting frames.
8. Level the device as shown Fig. 3.3.3.2-5.

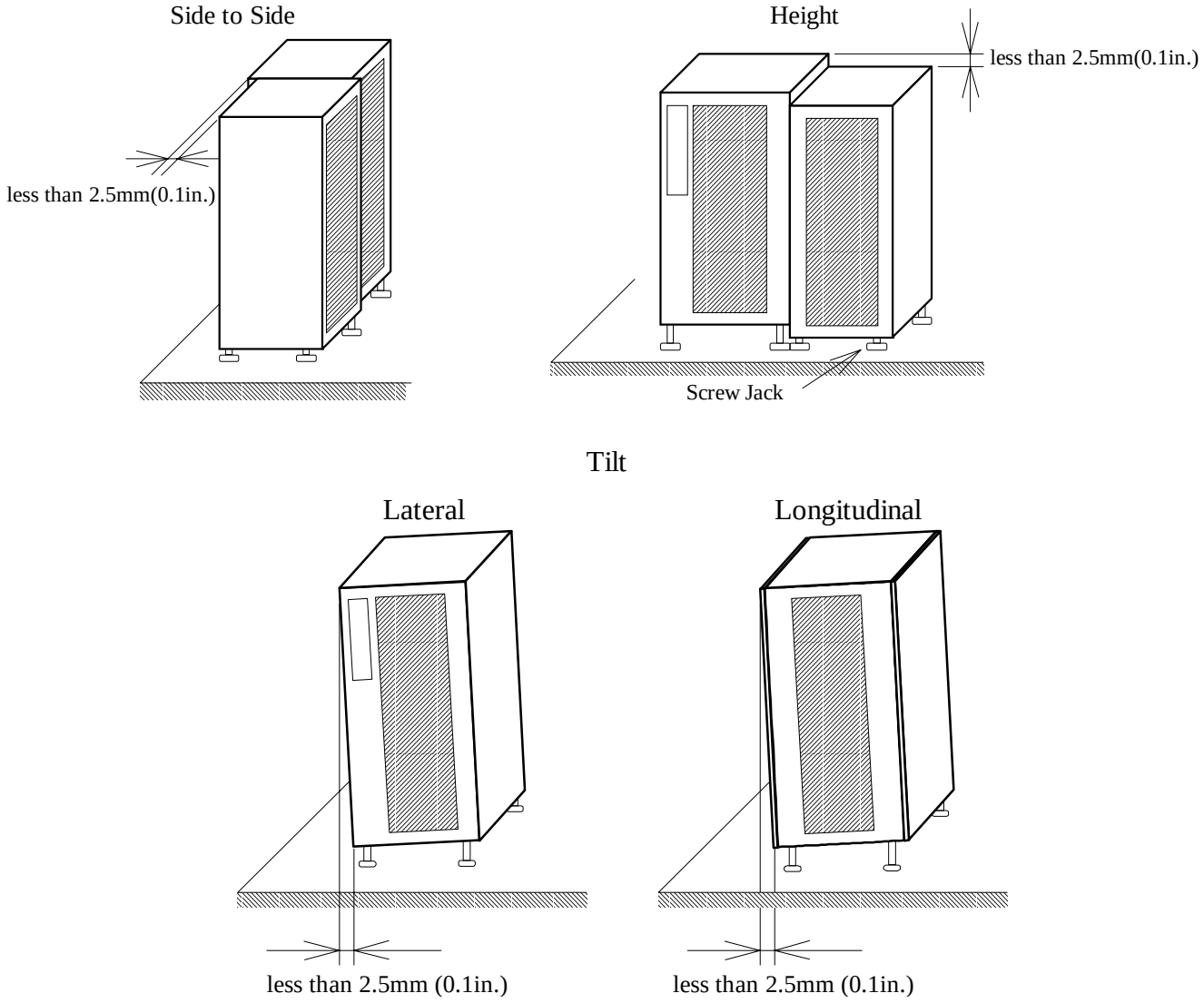

Fig. 3.3.2-5 Unit Layout, Height, and Tilt

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9. Loosen the four screws (M3) and the two screws (M4), remove the Front Logic Box Cover from the Disk Controller Unit.
10. Loosen the two screws (M3) and remove the cover (frame) 2.

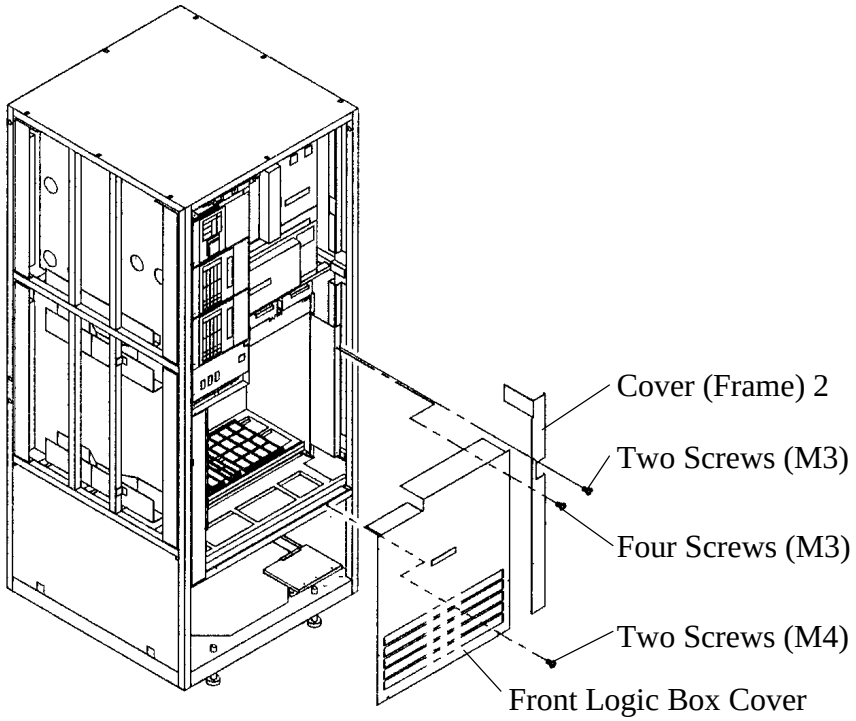

Fig. 3.3.2-6 Removal of Covers (DKC front side)

11. Loosen the four screws (M3) and the two screws (M4), remove the Rear Logic Box Cover.
12. Loosen the two screws (M3) and remove the cover (frame) 1.

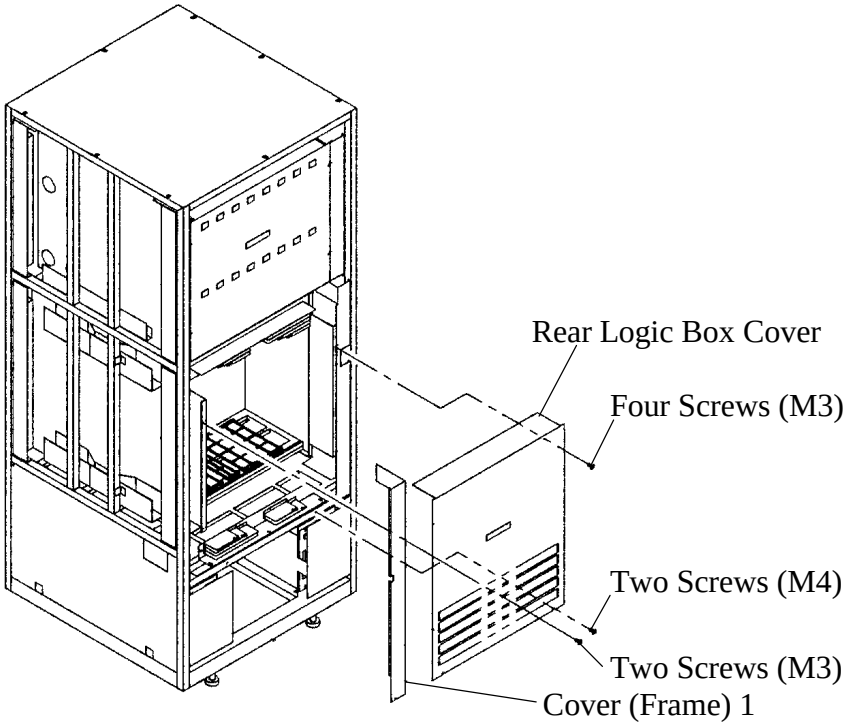

Fig. 3.3.2-7 Removal of Covers (DKC rear side)

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3.3.3 Frame Connection

3.3.3.1 Frame Connection

Connect the devices together using six of Connecting Bolt assemblies, three in front and three in rear. See Fig. 3.3.3.1-1.
The direction of hexagon socket head bolts, binding screws and connecting nuts must be the same as shown in the figure.

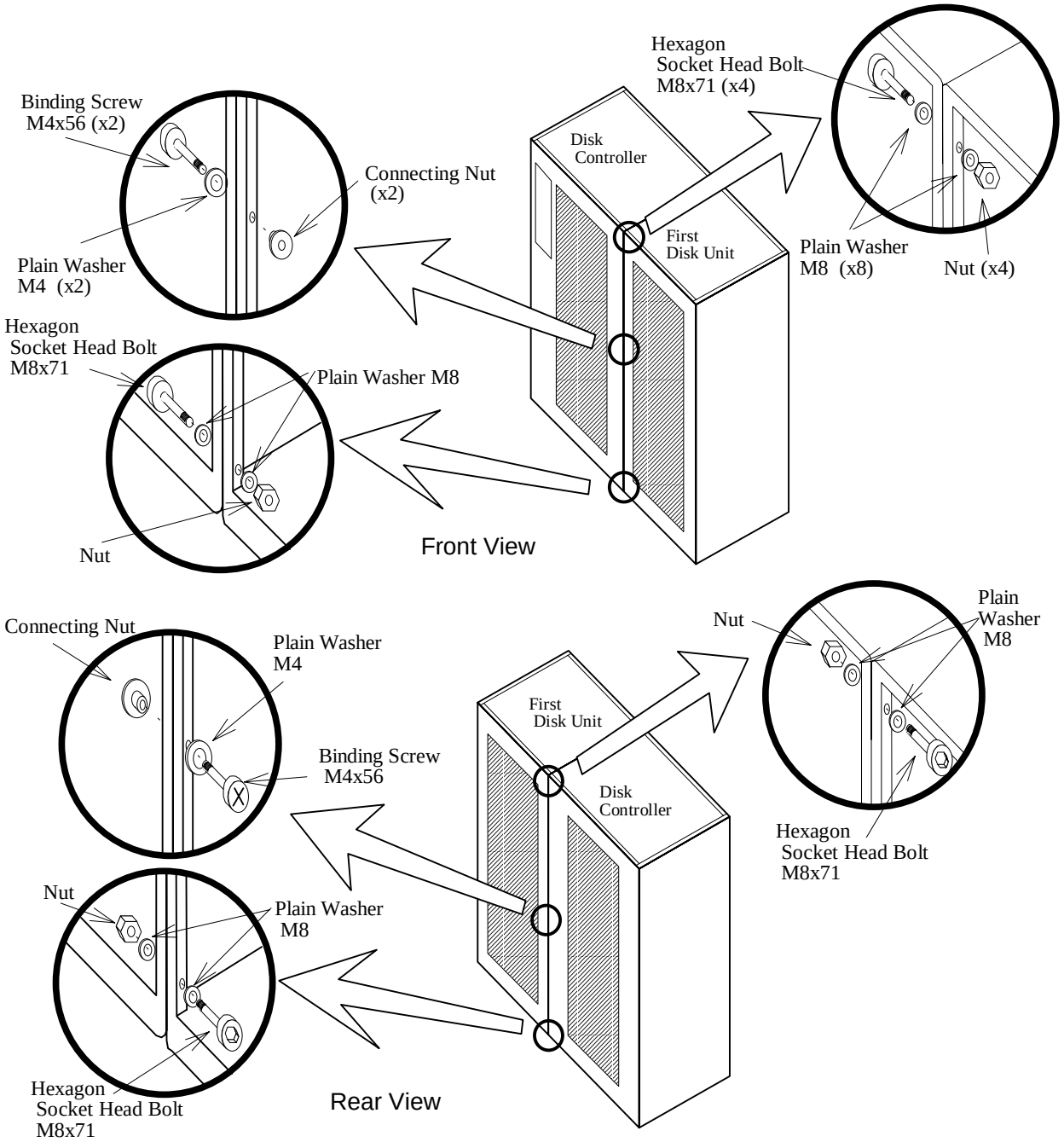

Fig. 3.3.3.1-1 Frame Connection

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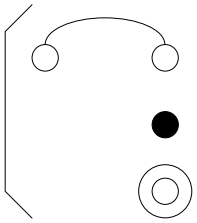
3.3.3.2 Frame Ground Cable Attachment

Note

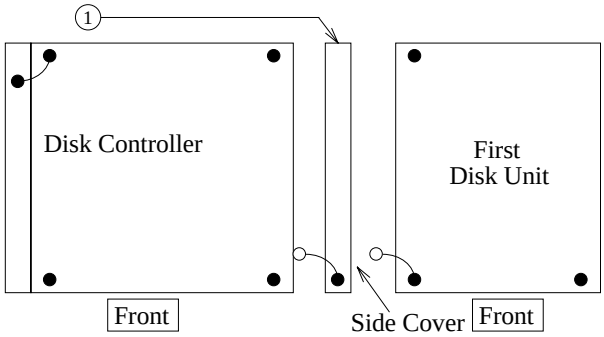


: Frame ground cable

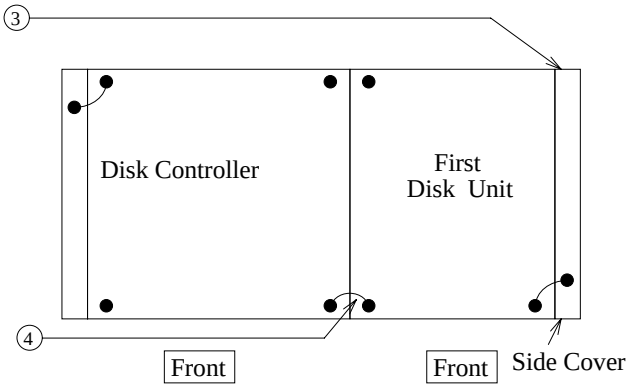
: Screw and washer (lock washer)

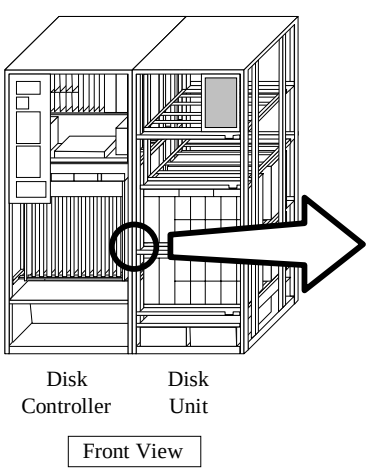
: Thread

1. Remove the right side cover of the Disk Controller.
2. Connect the cabinets.



3. Attach the side cover to the Disk Unit. Refer to SECTION 3.3.3.3.3 Side Cover Re-installation.
4. Attach the frame ground cable with the screw and lock washer.
5. Attach the Front and Rear Logic Box Covers to the Disk Controller Unit in the reverse order of SECTION 3.3.2 item 9 through 12 [INST03-201].





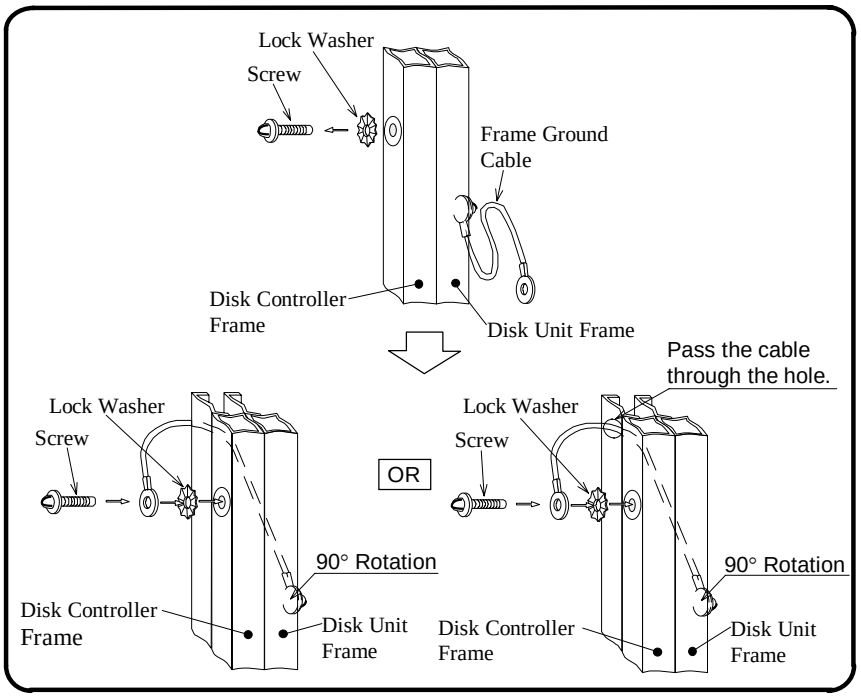


Fig. 3.3.3.2-1 Attachment of Frame Ground Cable

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3.3.3.3 Side Cover Re-installation

Attach the side cover to the end of the string with the four binding screws and washers.

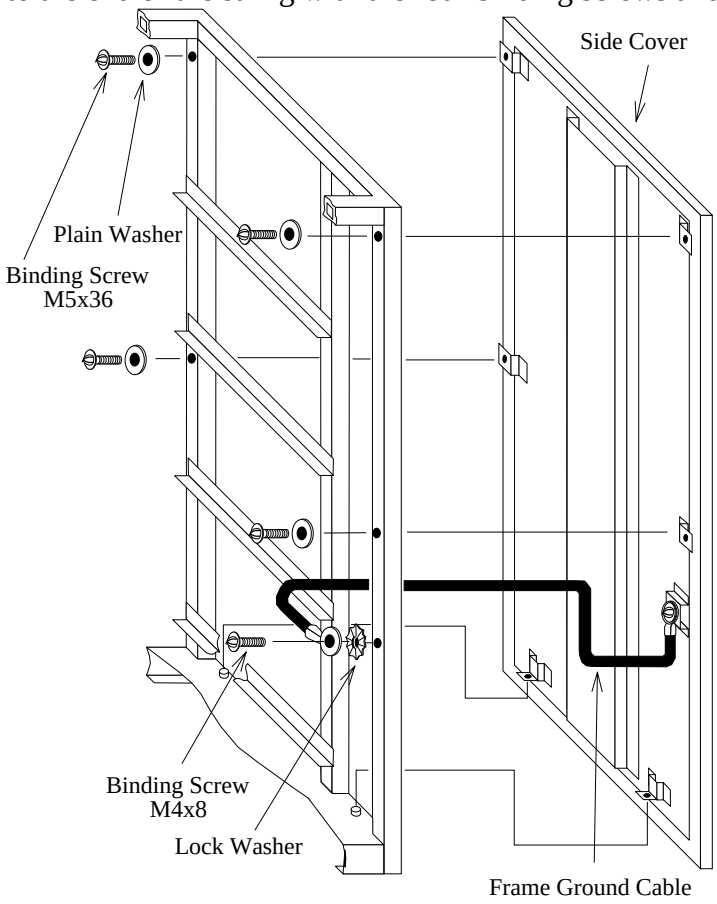

Fig. 3.3.3.3-1 Re-installation of Side Cover

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3.3.3.4 Installation of Kick Plate

Attach the kick plates with the binding screws. See Fig. 3.3.3.4-1.

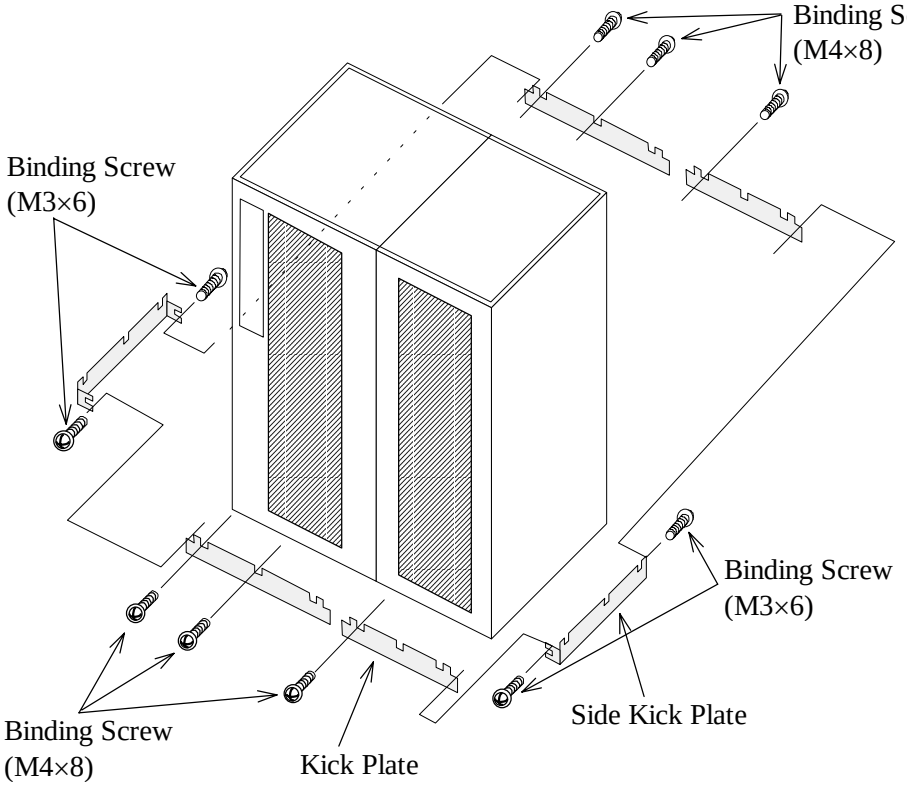

Fig. 3.3.3.4-1 Installation of Kick Plate

NOTICE: Contact the Kick Plate to the floor to prevent static electricity.

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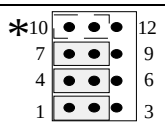
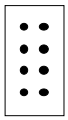
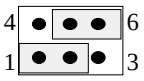
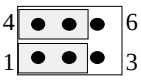
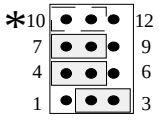
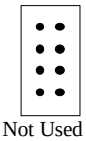
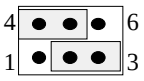
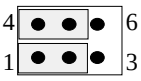
3.3.4 Installation of Switches and Jumper Plugs

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

3.3.4.1 Installation of Switches and Jumper Plugs in DKUMN PCB

Set the switches and install the jumper plugs in the DKUMN PCBs as indicated in the table below.

Table 3.3.4.2-1 SWITCH and JUMPER PLUG installation of the DKUMN PCB

Location No.	S1	JP1	JP2	JP3		Remarks
				Note 1	**Note 2**	
DKUMN-R1F	Enable					* #10 - #12 Reserved
DKUMN-R1R	Enable					* #10 - #12 Reserved

Note 1 : No Platform for Canister Mount (DKU-F305I-B4) Installed (Four HDU Boxes)
Note 2 : Platform for Canister Mount (DKU-F305I-B4) Installed (Eight HDU Boxes)

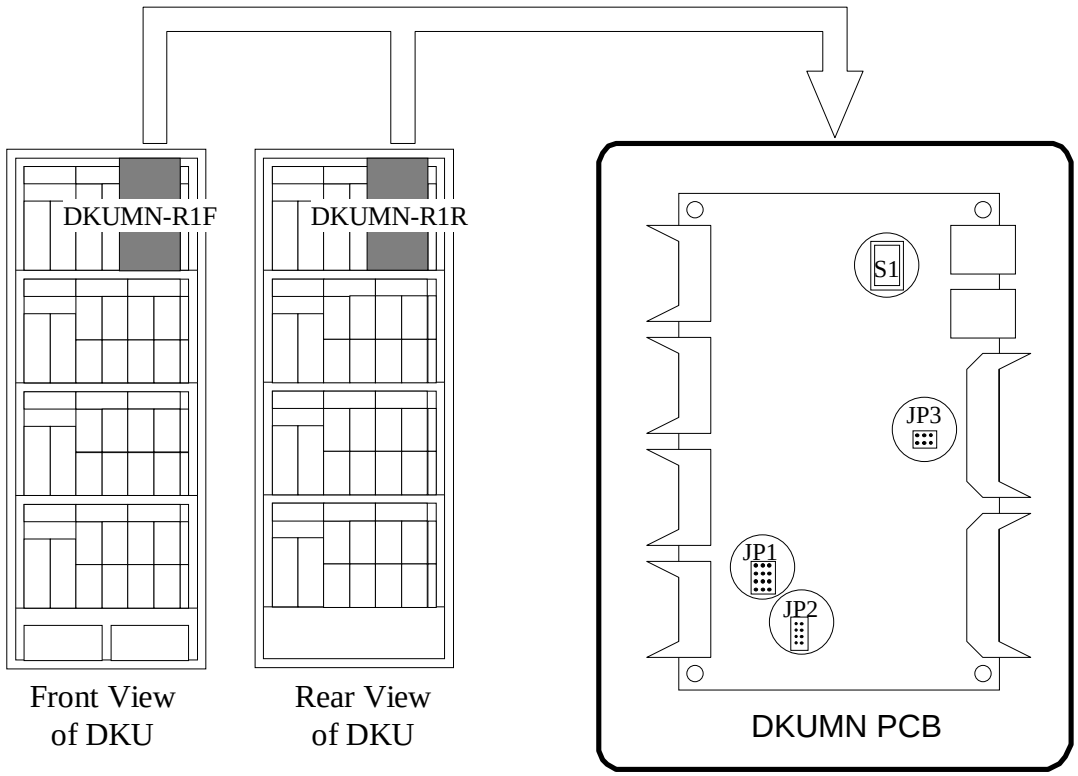


Fig. 3.3.4.1-1 Installation of Switches and Jumper Plugs in DKUMN PCB

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3.3.4.2 Installation of Jumper Plugs in CE PANEL PCB

Install the jumper plugs in the CE PANEL PCB as indicated in the table below.

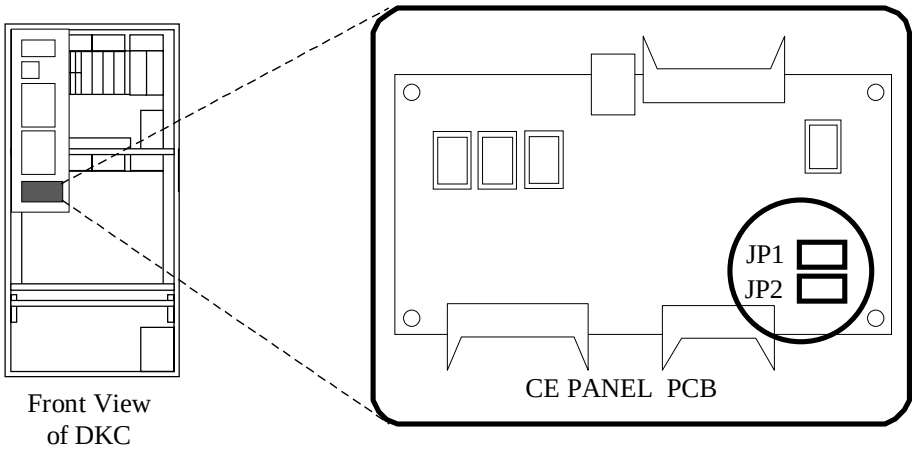
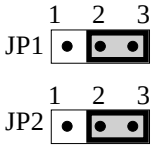
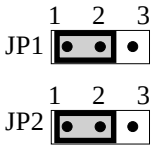


Fig. 3.3.4.2-1 Installation of Jumper Plugs in CE PANEL PCB

Table 3.3.4.2-1 Installation of Jumper Plugs in CE PANEL PCB

No.	Description	Installing status JP1 and JP2
1	When power is controlled from the host(at least one PCI cable attached to JP1-JP8 on PCI CONN PCB), set the jumpers as shown.	
2	When power is not controlled from the host, no PCI cable attached to JP1-JP8 PCI CONN PCB or to disable the EPO of host, set the jumpers as shown.	

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3.3.4.3 Installation of Jumper Plugs in RS CONN PCB

Install the jumper plugs in the RS CONN PCB as indicated in the table below.

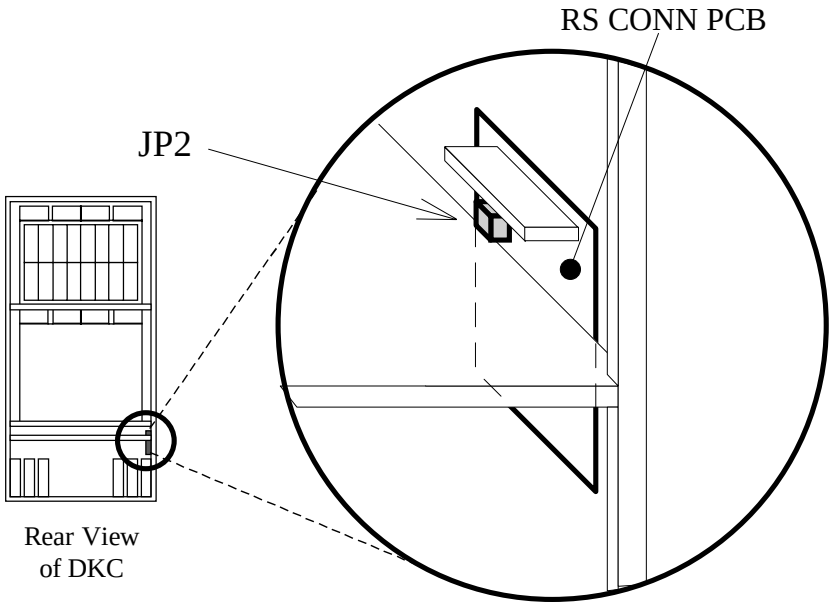
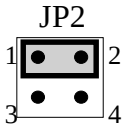
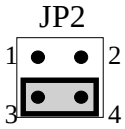


Fig. 3.3.4.3-1 Installation of Jumper Plugs in RS CONN PCB

Table 3.3.4.3-1 Installation of Jumper Plugs in RS CONN PCB

No.	Description	Installing status JP2
1	This setting attaches terminator to RS-422	
2	This setting detaches terminator to RS-422	

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3.3.4.4 Installation of Jumper Connectors in BATT CTR PCB

This following shows the settings for the unit containing no Additional Cache Board (DKC-F310I-20). For the settings for the unit containing the Additional Cache Board (DKC-F310I-20), see [INST03-1280].

1. Open the four locking clamps on the Front PS Box Cover 2 and remove the four jumper connectors.

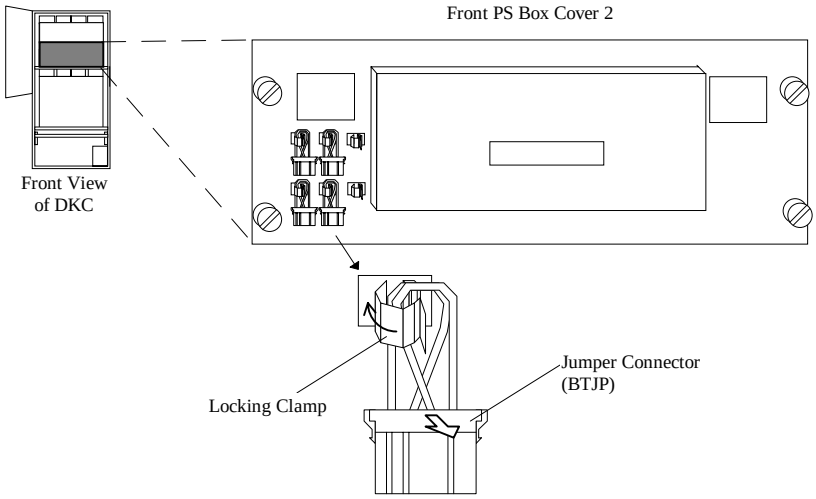
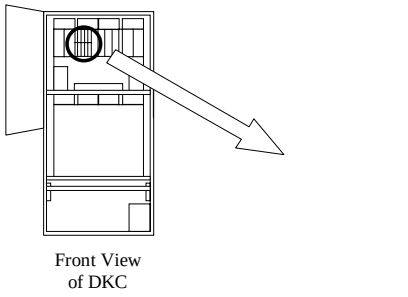


Fig. 3.3.4.4-1 Removal of Jumper Connectors

2. Install the jumper connectors in the BATT CTR PCBs as indicated in the figure below.



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BATT CTR 10	BATT CTR 11	BATT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BATT CTR 20	BATT CTR 21	BATT CTR 22						
		KL	JL	HL	GL						

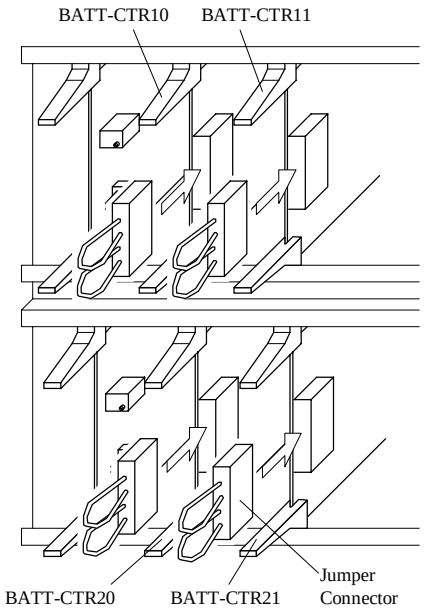


Fig. 3.3.4.4-2 Installation of Jumper Connectors in BATT CTR PCB

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3.3.5 Cabling

Table 3.3.5-1 Cabling Index

No.	Description	Reference Page	Remarks
1	AC Power Cable for Disk Controller	INST03-290	First Disk Unit only
2	DKUMN cable	INST03-340	
3	SCSI Interface cable	INST03-360	

3.3.5.1 Cabling Procedure of AC Power Cables for Disk Controller

Connect the AC Power cables for Disk Controller. Refer to Table 3.3.5.1-1 and Fig. 3.3.5.1-1.

Table 3.3.5.1-1 Connection of AC Power Cables

No.	First Disk Unit			Disk Controller			Remarks
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	AC Box-R10	J103	P103-1	Breaker Box-1	J200	P200-1	
2	AC Box-R11	J103	P103-2	Breaker Box-2	J200	P200-2	

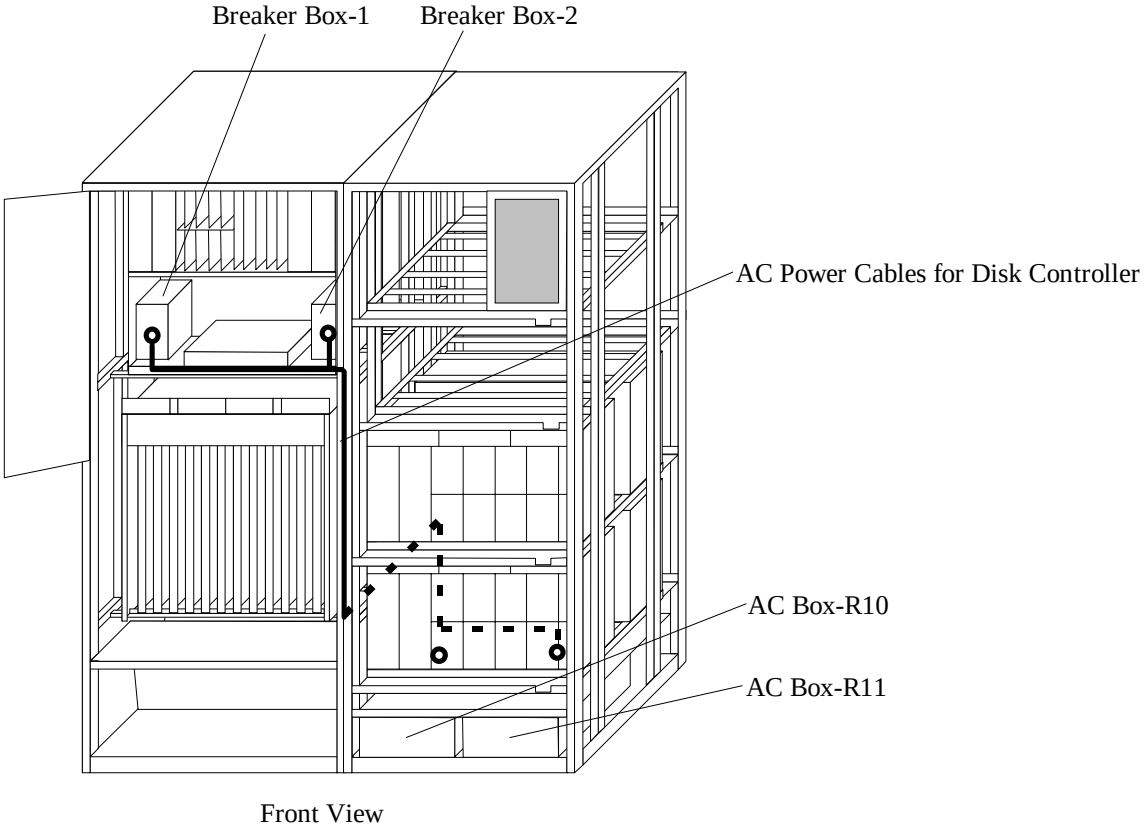

Fig. 3.3.5.1-1 Connection of AC Power Cables for Disk Controller

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1. Remove the plate. Refer to Fig. 3.3.5.1-2.

a. Loosen the two screws.

b. Remove the plate.

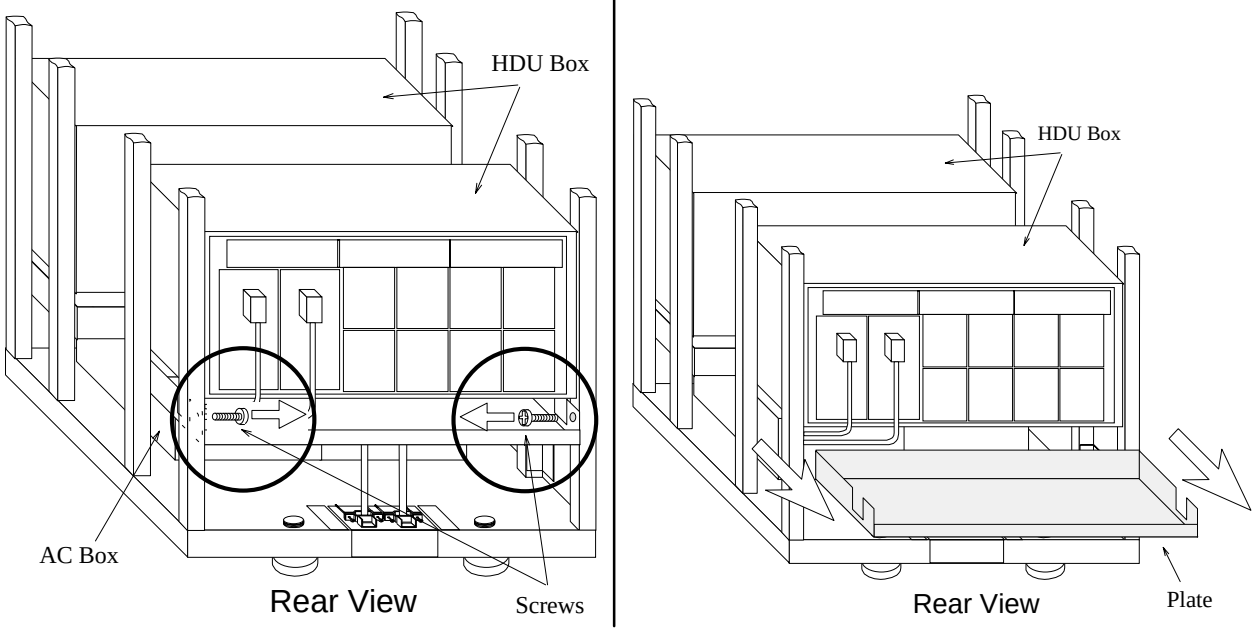

Fig. 3.3.5.1-2 Removal of Plate

2. Fix the Power Cable Assy.
   a. Loose the four screws

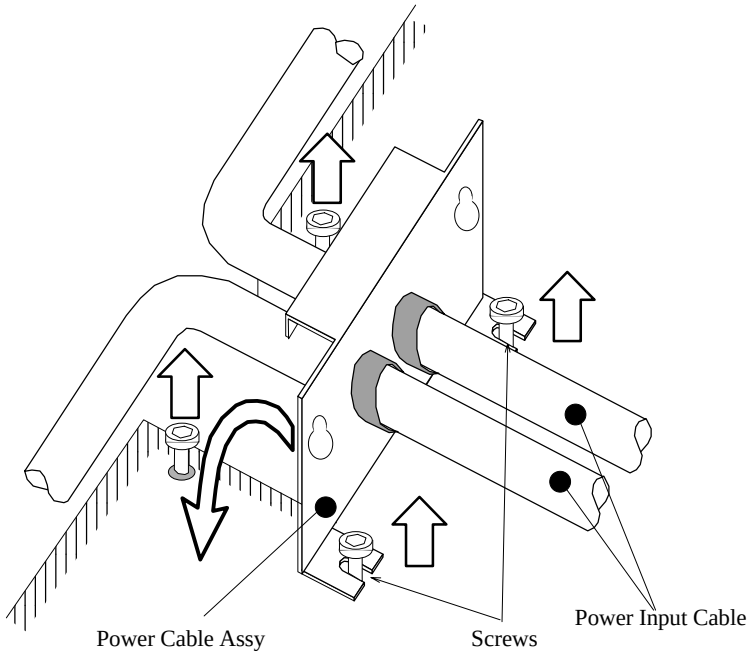

Fig. 3.3.5.1-3 Fixation of Power Cable Assy

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b. Fix the power cable Assy with screws.

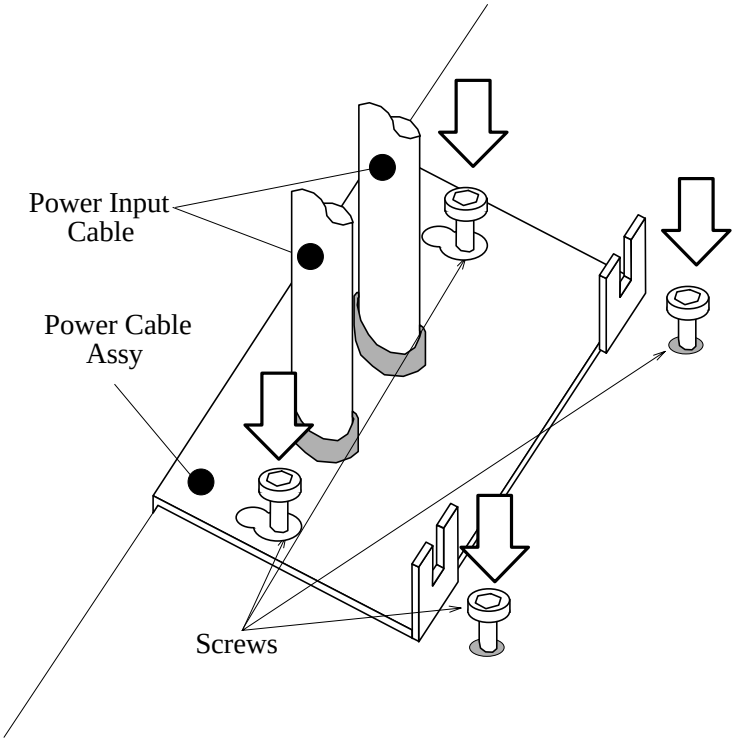

Fig. 3.3.5.1-4 Fixation of Power Cable Assy

3. Connect the AC Power Cables for Disk Controller Refer to Fig. 3.3.5.1-5

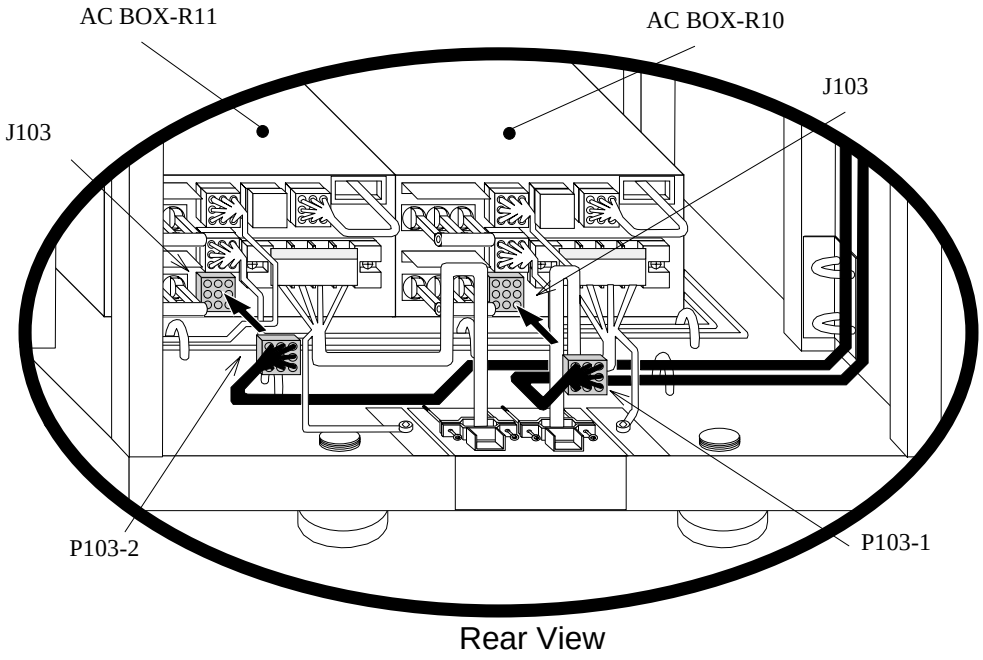

Fig. 3.3.5.1-5 Connection of AC Power Cables for Disk Controller

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4. Bind the cables with the repeat binders. Refer to Fig. 3.3.5.1-6.

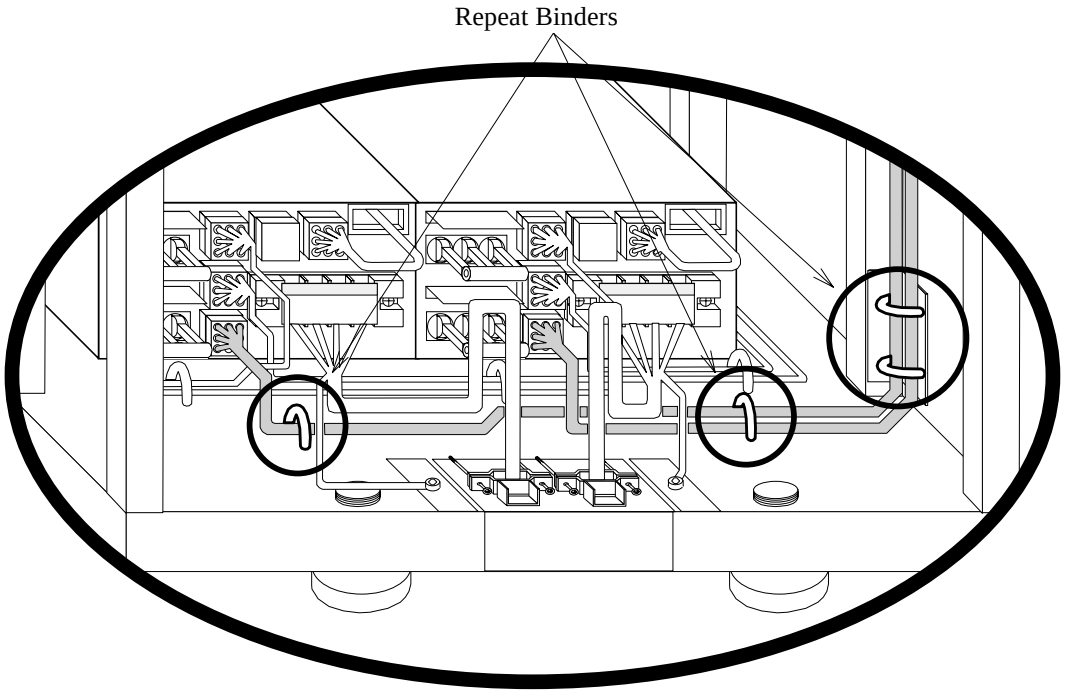

Fig. 3.3.5.1-6 Fastening of AC Power Cables for the Disk Controller

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5. Re-Install the plate. Refer to Fig. 3.3.5.1-7

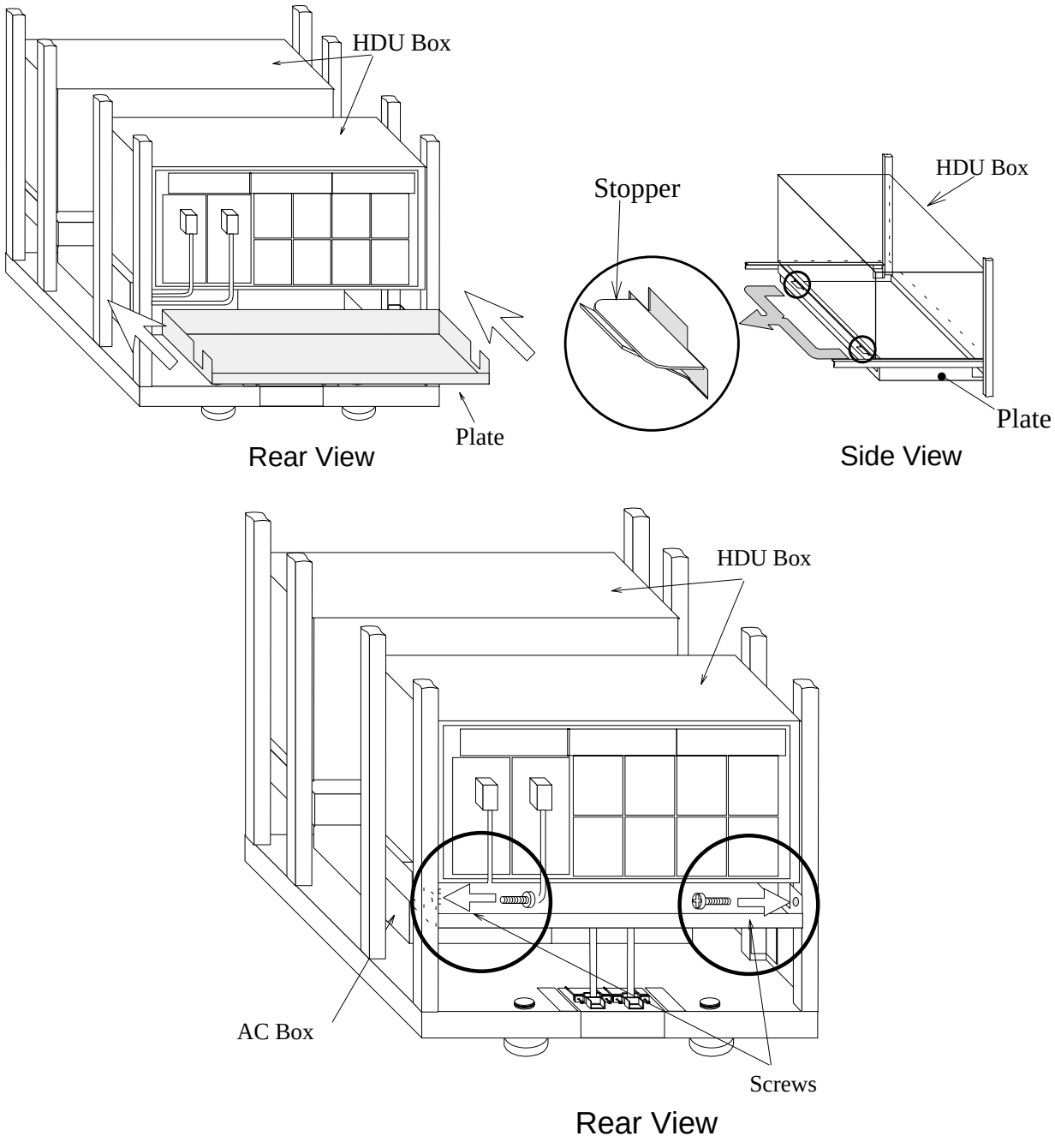

Fig. 3.3.5.1-7 Re-Installation of Plate

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3.3.5.2 Cabling Procedure of the DKUMN Cables

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Connect the PWRCTL PCBs or MPS Back Board (PL) and the DKUMN PCBs as summarized in the table below.

Table 3.3.5.2-1 Connection of DKUMN Cables

No.	Disk Controller			First Disk Unit			Remarks
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	PWRCTL-1	J11	SH-F21	DKUMN-R1F	J04	P4-1R	
2	MPS BB (PL)	N10	SH-N10	DKUMN-R1F	J02	P2-1R	
3	PWRCTL-2	J11	SH-C21	DKUMN-R1R	J04	P4-2R	
4	MPS BB (PL)	A10	SH-A10	DKUMN-R1R	J02	P2-2R	

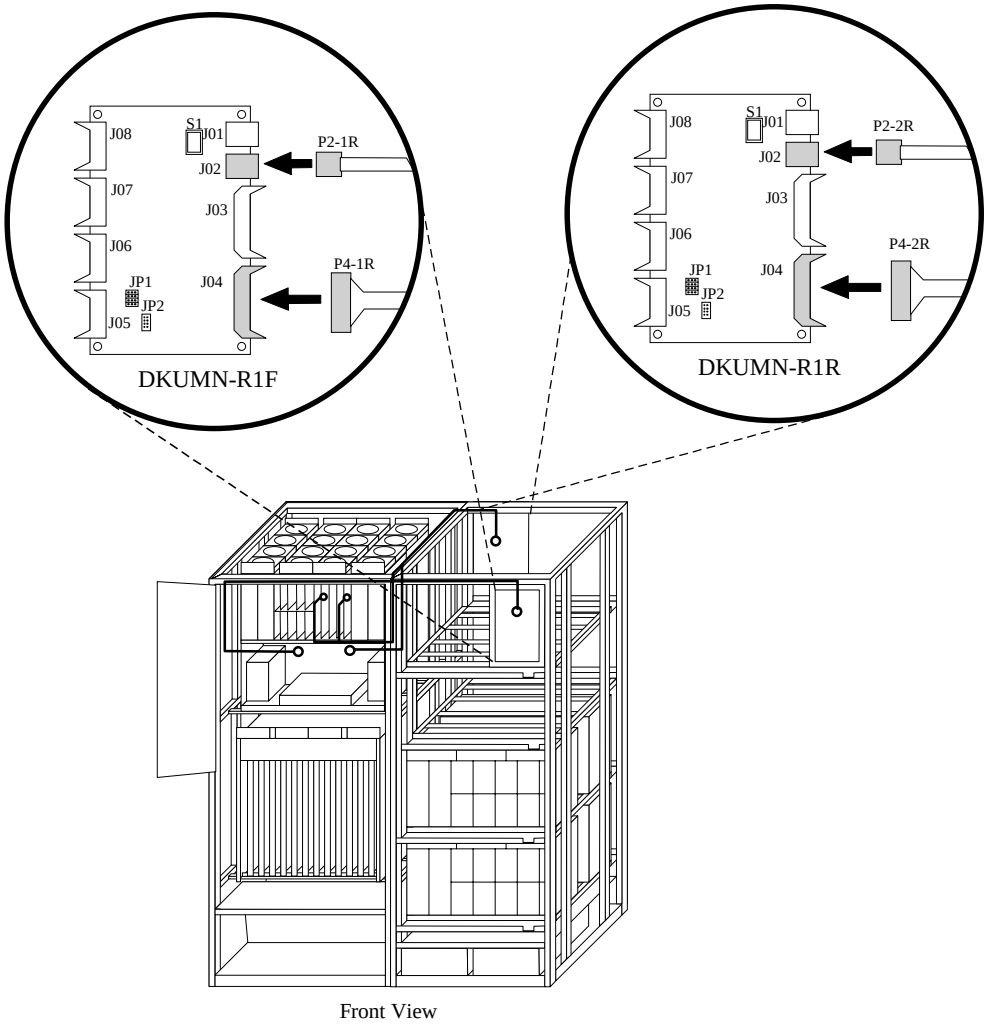

Fig. 3.3.5.2-1 Connection of DKUMN Cables

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2. Before binding the DKUMN cables. Secure the DKUMN PCB. Refer to Fig. 3.3.5.2-3
   a. Loosen the four screws.
   b. Lift the DKUMN PCB.
   c. Slide and secure the DKUMN PCB

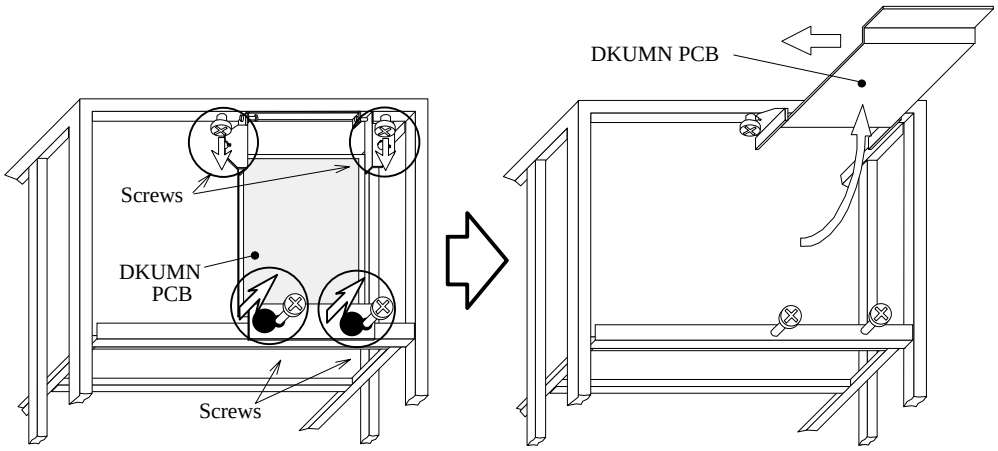

Fig. 3.3.5.2-2 Lift of DKUMN PCB

3. Bind the cables with binders to prevent them from sagging.

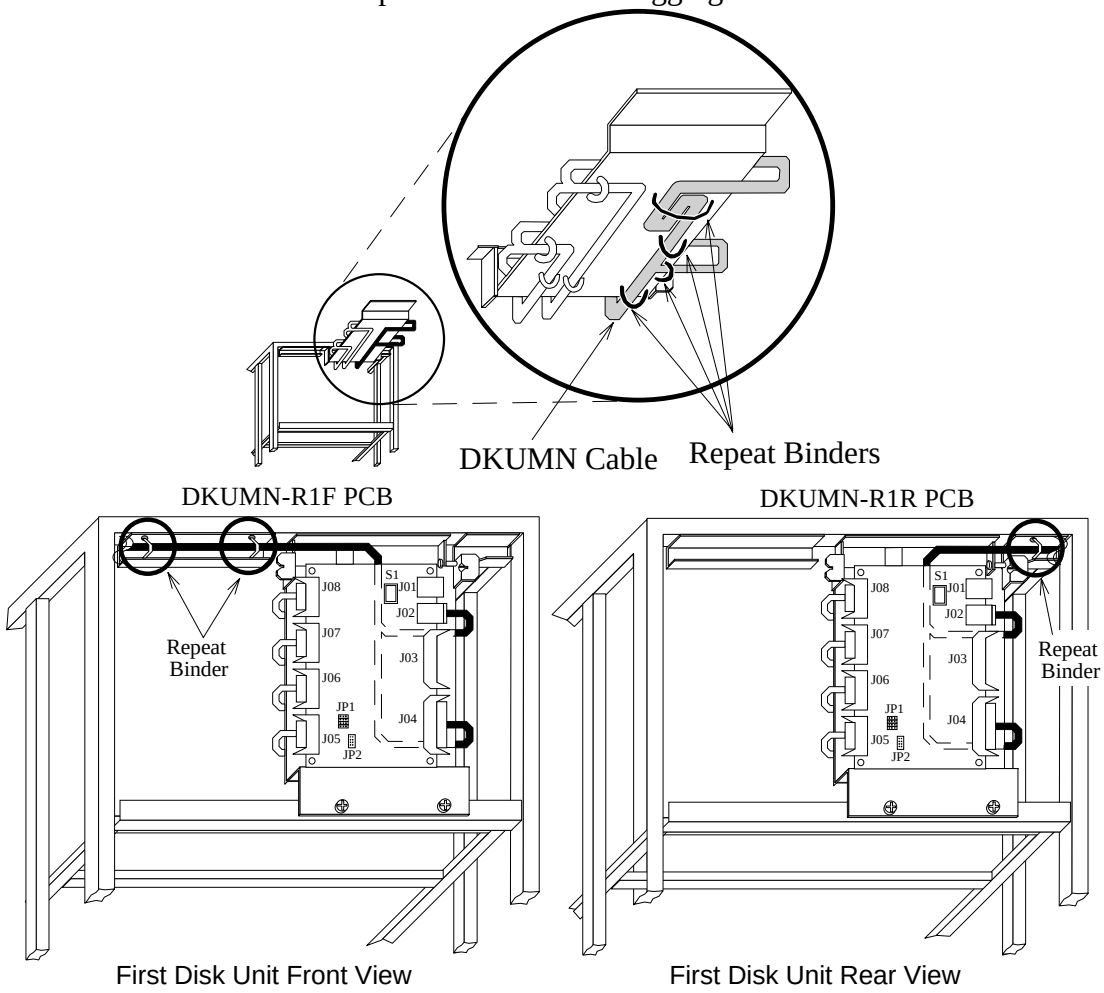

Fig. 3.3.5.2-3 Binding of DKUMN Cables

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3.3.5.3 Cabling Procedure of SCSI Interface Cables

1. Connect the SCSI interface cables to the sub-edges on the SCSI BFR PCBs located in the HDU box.

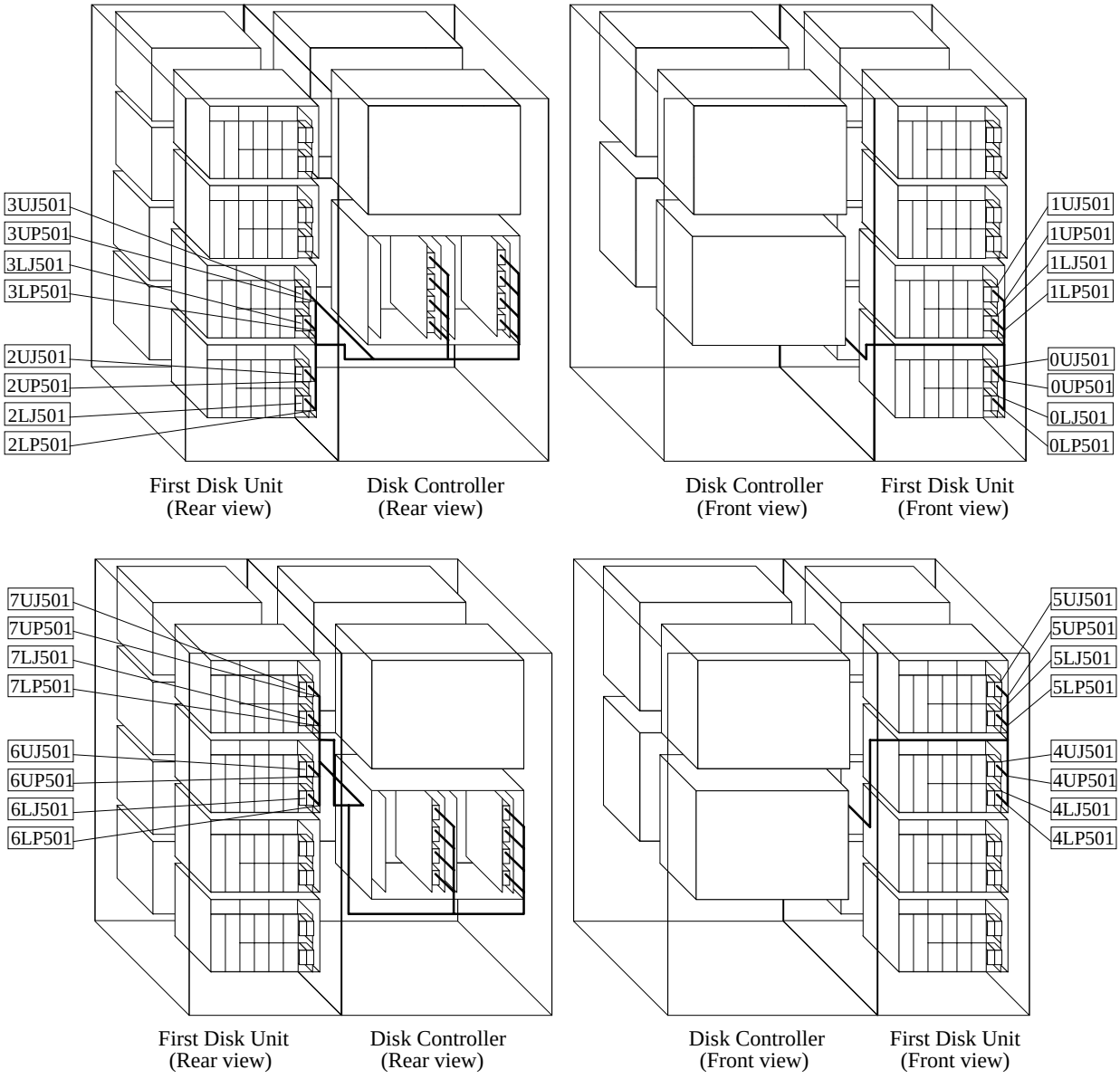

Fig. 3.3.5.3-1 SCSI Interface Cabling Diagram (SCSI BFR PCB Side)

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2. Secure the SCSI interface cables to the cable conduit with cable fixing wire and repeat binder. If the SCSI interface cables are too long, fold them over inside the cable conduit and secure them with cable fixing wire and repeat binder.

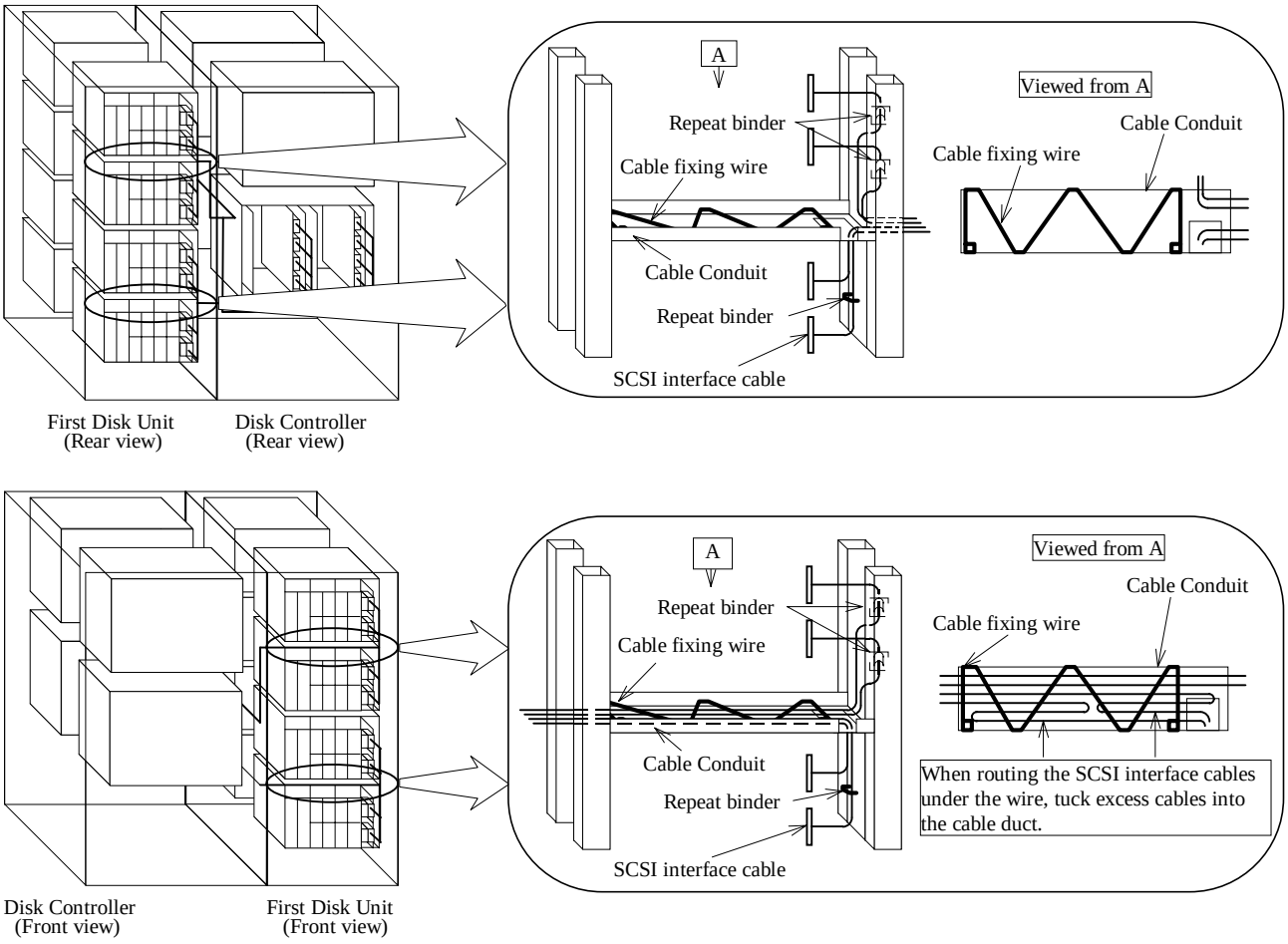

Fig. 3.3.5.3-2 Fixing of SCSI Interface Cables

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3.3.6 Check of Jumper Settings

1. Check the jumper settings (JP1, JP2 and JP3) on the DKUMN PCBs. Refer to Section 3.3.4.1 Installation of Switches and Jumper Plugs in DKUMN PCB [INST03-250].
   When the jumper plugs are not installed to the correct sockets, install the jumper plugs to the correct sockets.

2. Check the SCSI ID jumpers on the HDD back boards. Refer to Fig. 3.3.6-1.
   When the SCSI ID jumpers are not installed to the correct sockets, install the SCSI ID jumpers to the correct sockets.

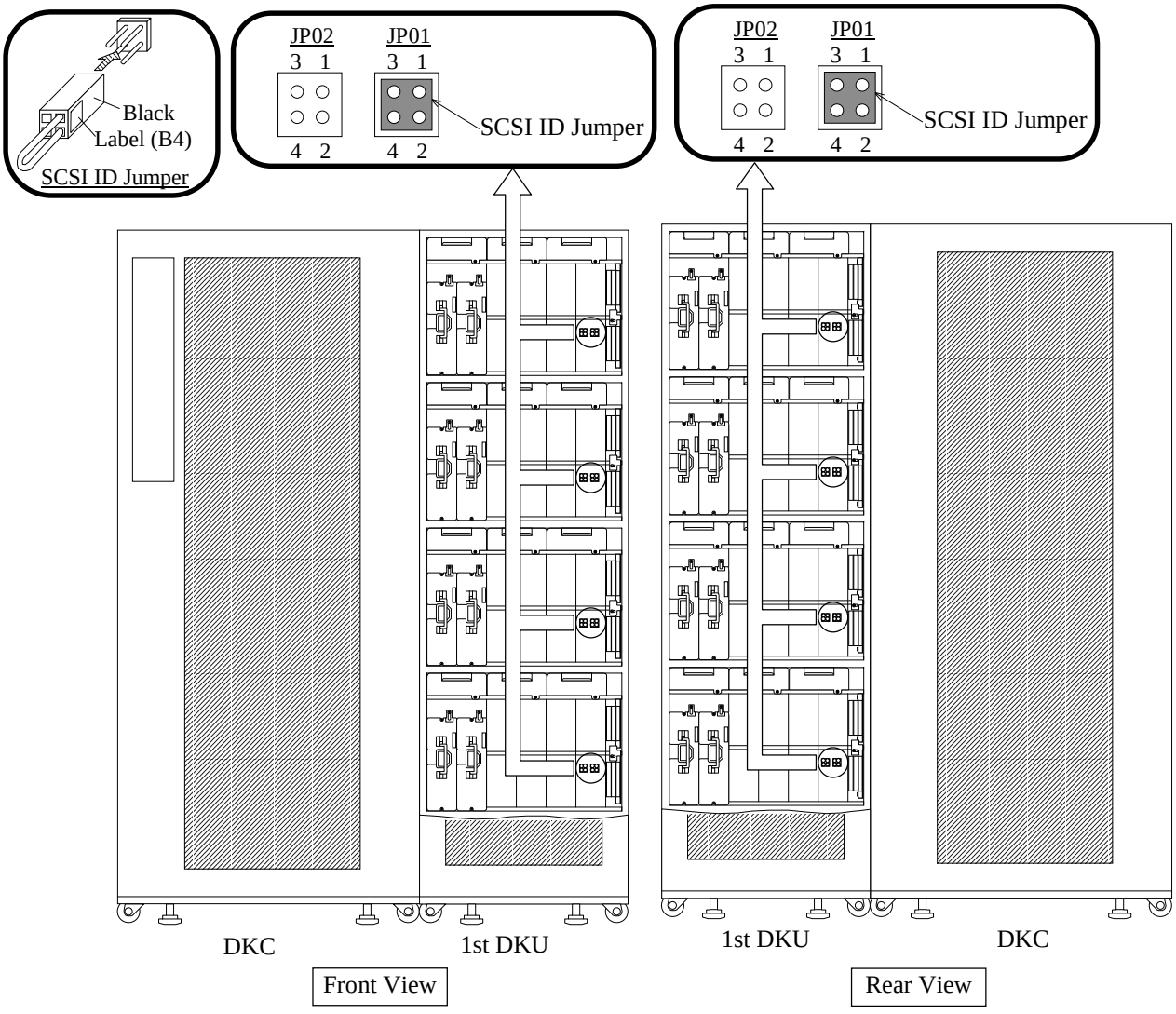

Fig. 3.3.6-1 Setting the SCSI ID Jumpers

3. Return to General Flow.
   New Installation : Go to INST02-10 step (3).

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3.4 Installation of Disk Unit (DKU305I-14)

3.4.1 Flowchart

1.	Cabinet Setting	[INST03-390]
↓		
2.	Frame Connection	[INST03-420]
↓		
3.	Switch and Jumper Plug Installation	[INST03-500]
↓		
4.	Cabling	[INST03-550]
↓		
5.	Check of Jumper Settings	[INST03-610]
↓		
6.	Check and Testing	[INST03-610]

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3.4.2 Cabinet Setting (Adjusting the Cabinet Height)

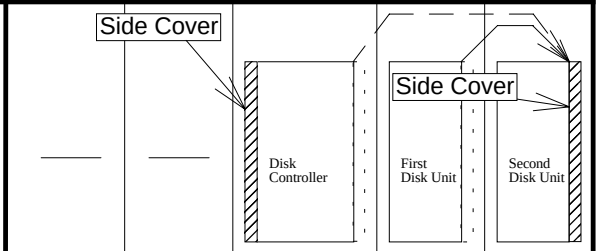
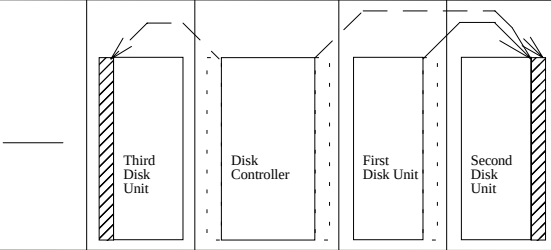
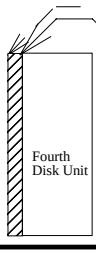
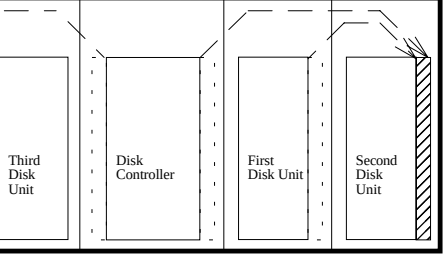
3.4.2.1 Flowchart

Place the Disk Unit in the required position.
↓
Remove the side cover.
↓
Adjust level and height of the cabinet.

3.4.2.2 Disk Unit(s) Layout

Refer to Table 3.3.2-1 when laying out the First Disk Unit with respect to the Disk Controller and relocating the side cover.
Install the Disk Unit(s) in one of the locations shown in Table 3.4.2.2-1.

Table 3.4.2.2-1 Removal and Re-installation of Side Cover

Configuration	Fourth Disk Unit	Third Disk Unit	Disk Controller	First Disk Unit	Second Disk Unit
Disk Controller and Two Disk Units					
Disk Controller and Three Disk Units					
Disk Controller and Four Disk Units					

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3.4.2.3 Side Cover Removal

Remove the side covers shown in Table 3.4.2.2-1 from the installed Disk Controller or Disk Unit(s).

Note: When the left side cover is removed from the Disk Controller Unit, must be removed the Front and Rear Logic Box Covers beforehand. Refer to SECTION 3.4.2.6 Logic Box Covers Removal.

3.4.2.4 Remove the Fall Proof Adapter

Remove the fall proof adapters form the Disk Unit(s).

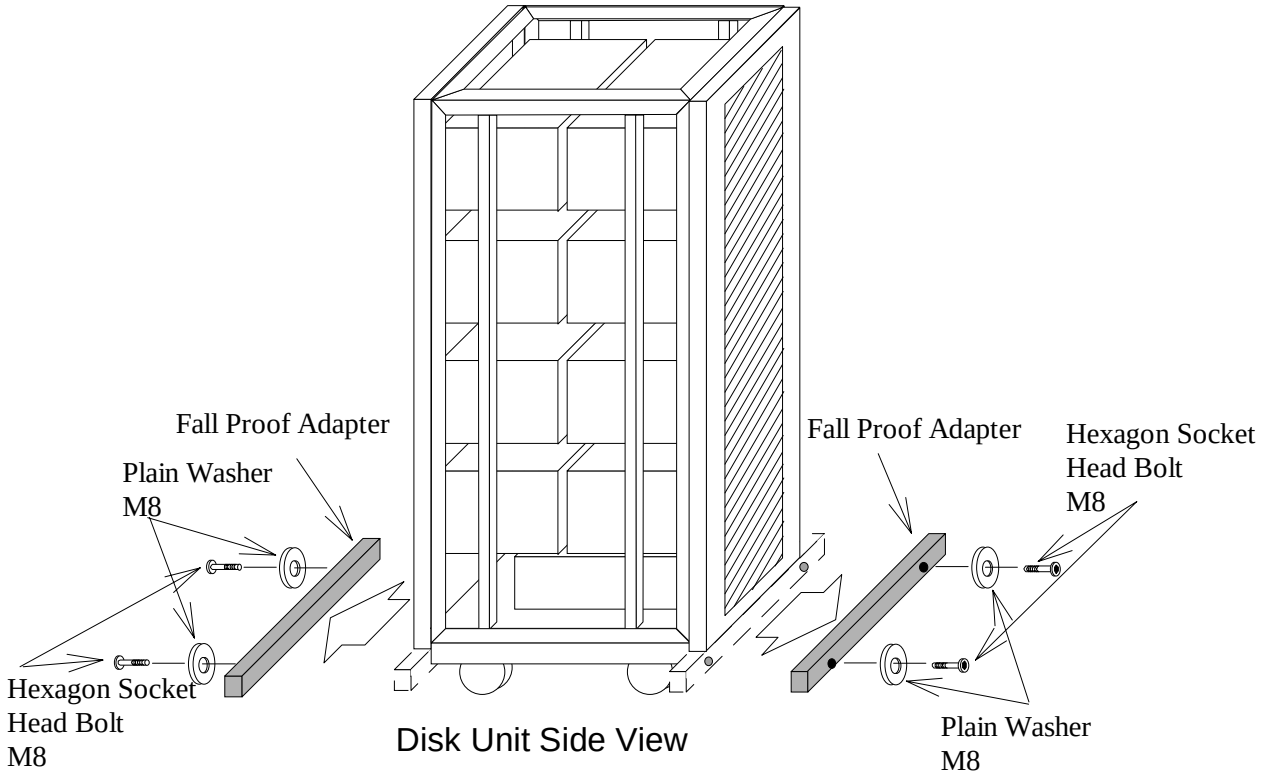

Fig. 3.4.2.4-1 Removal of Fall Proof Adapter

Note: The fall proof adapters, hexagon socket head bolt M8s, and plain washer M8s should be stored in the place of installation for future use in moving or taking out the unit.

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3.4.2.5 Adjusting the Cabinet Height and Level

1. Lower the screw jacks until the frame is 57 mm (2.25 in.) from the floor before connecting the frames.
2. Level the device as shown on Fig. 3.4.2.5-1.
3. When adjusting the cabinet height, make sure that there is a clearance of approximately 2.5 mm (0.1 in.) between the casters and the floor.

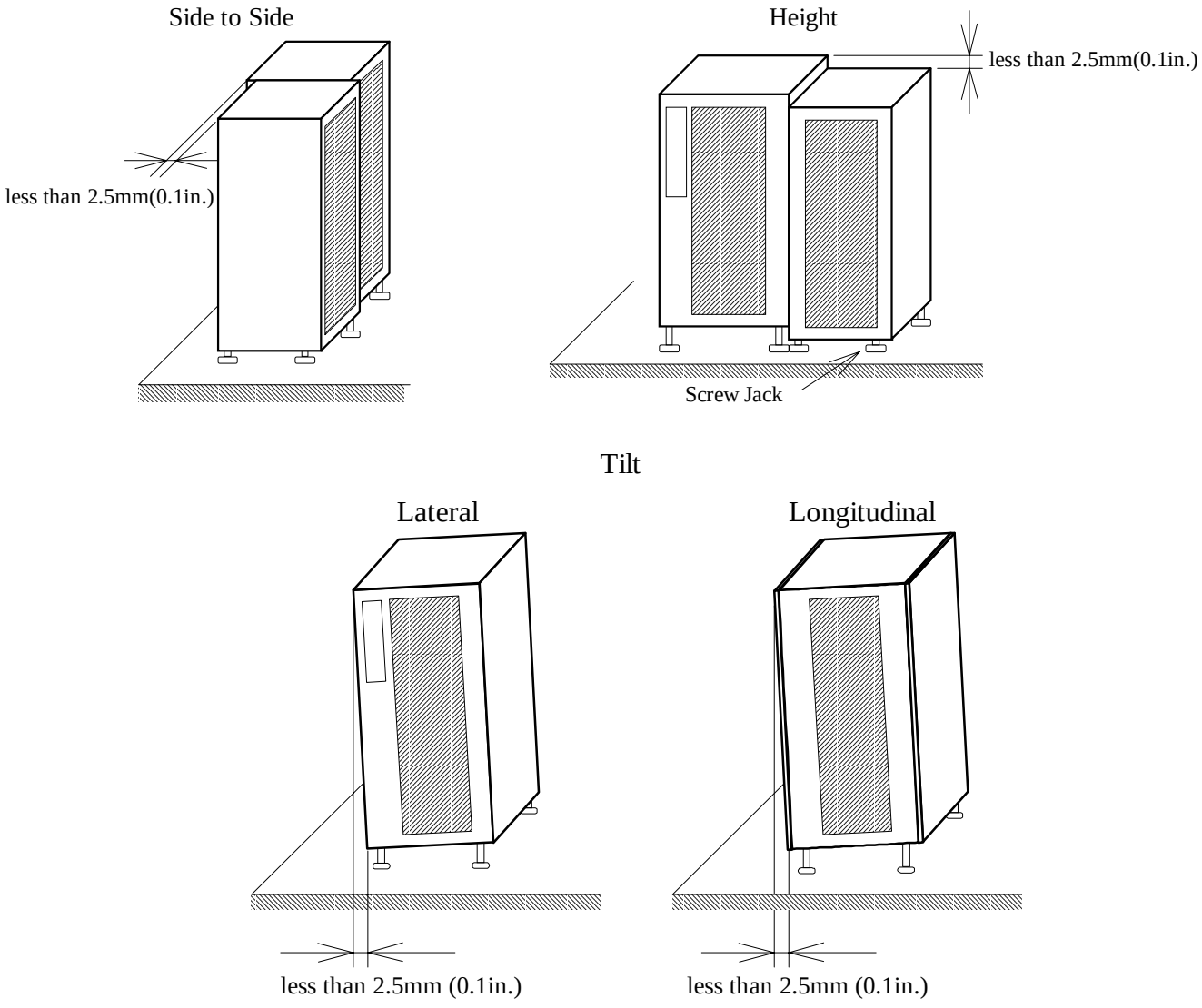

Fig. 3.4.2.5-1 Cabinet Setting

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3.4.2.6 Logic Box Covers Removal

Note: When the third Disk Unit is connected to the Disk Controller Unit, must be removed the following covers.

1. Loosen the four screws (M3) and the two screws (M4), remove the Front Logic Box Cover from the Disk Controller Unit.
2. Loosen the two screws (M3) and remove the cover (frame) 4.

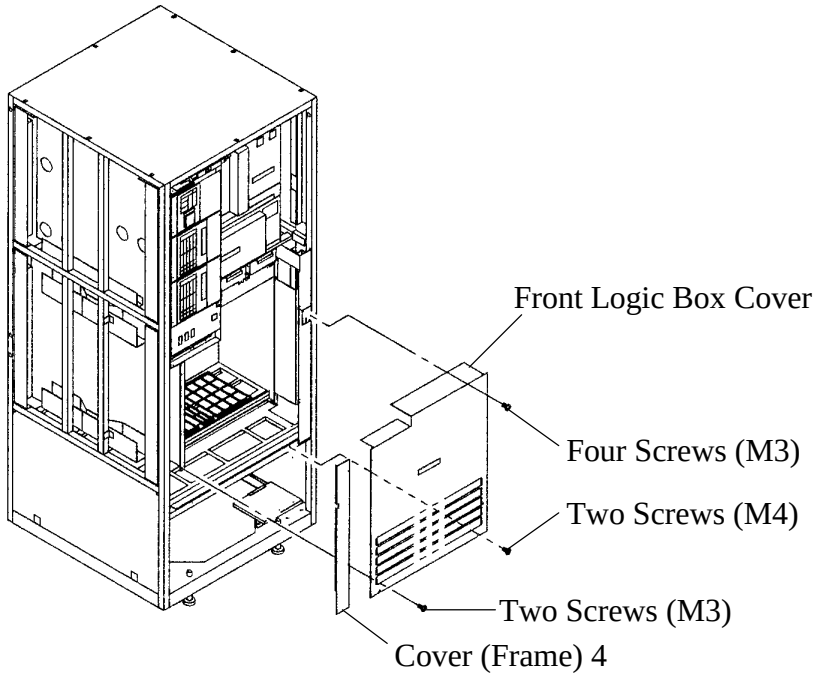

Fig. 3.4.2.6-1 Removal of Covers (DKC front side)

3. Loosen the four screws (M3) and the two screws (M4), remove the Rear Logic Box Cover.
4. Loosen the two screws (M3) and remove the cover (frame) 1.

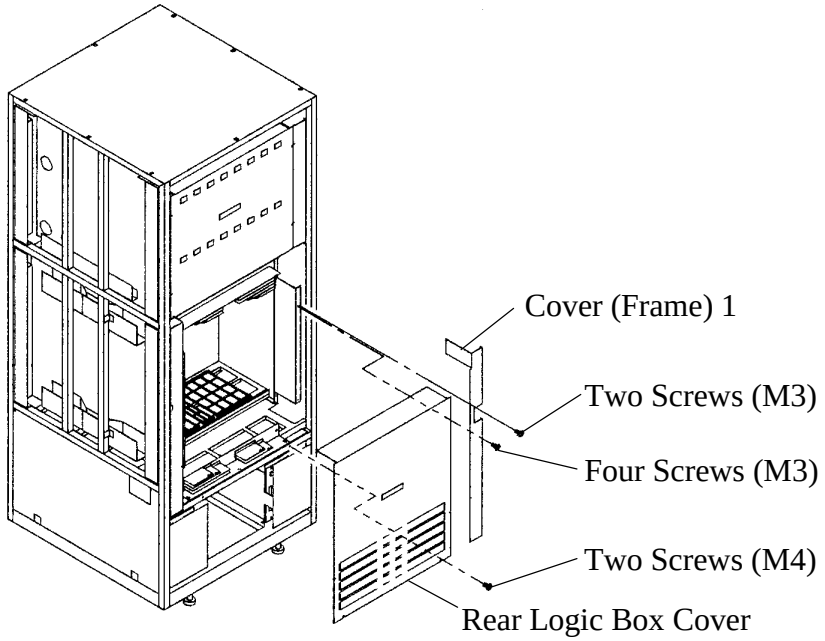

Fig. 3.4.2.6-2 Removal of Covers (DKC rear side)

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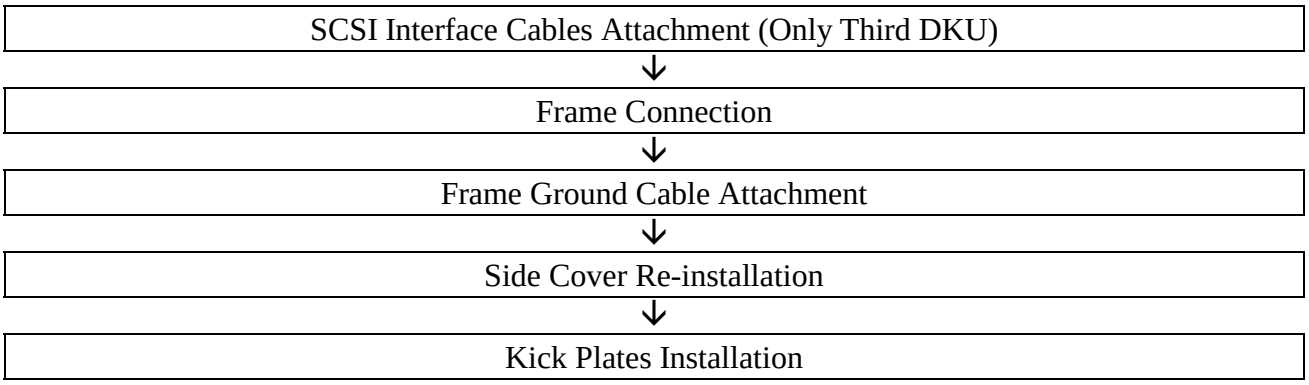
3.4.3 Frame Connection

3.4.3.1 Flowchart



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3.4.3.2 Frame Connection

Connect the devices together using four of the Connecting Bolt Assy. Place two at the front and two at the rear . See figures 3.4.3.2-1 and 3.4.3.2-2. The direction of the hexagon socket head bolts must be the same as shown in the figure.

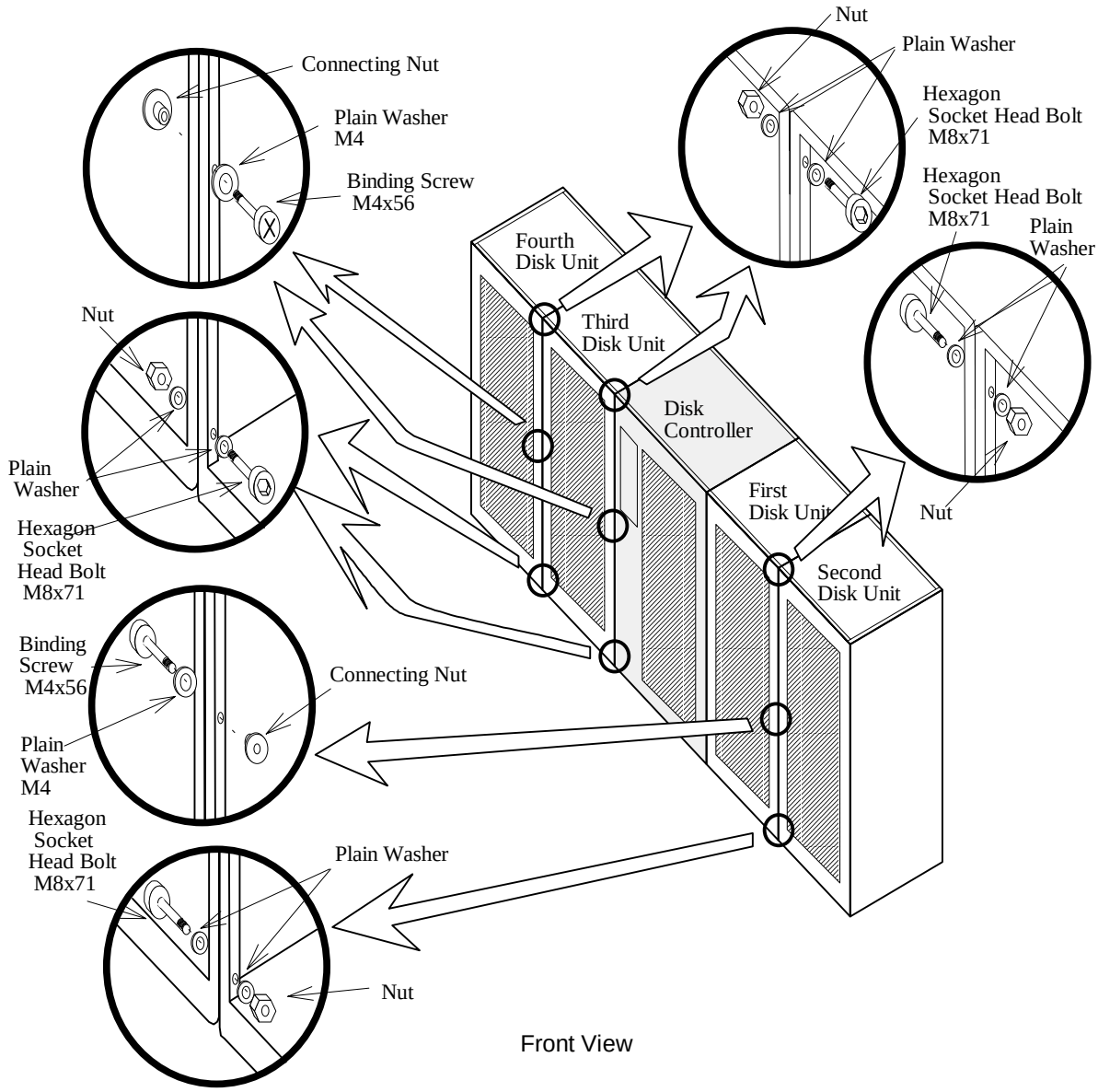

Fig. 3.4.3.2-1 Connection of Frame

Copyright ©1997, Hitachi, Ltd.

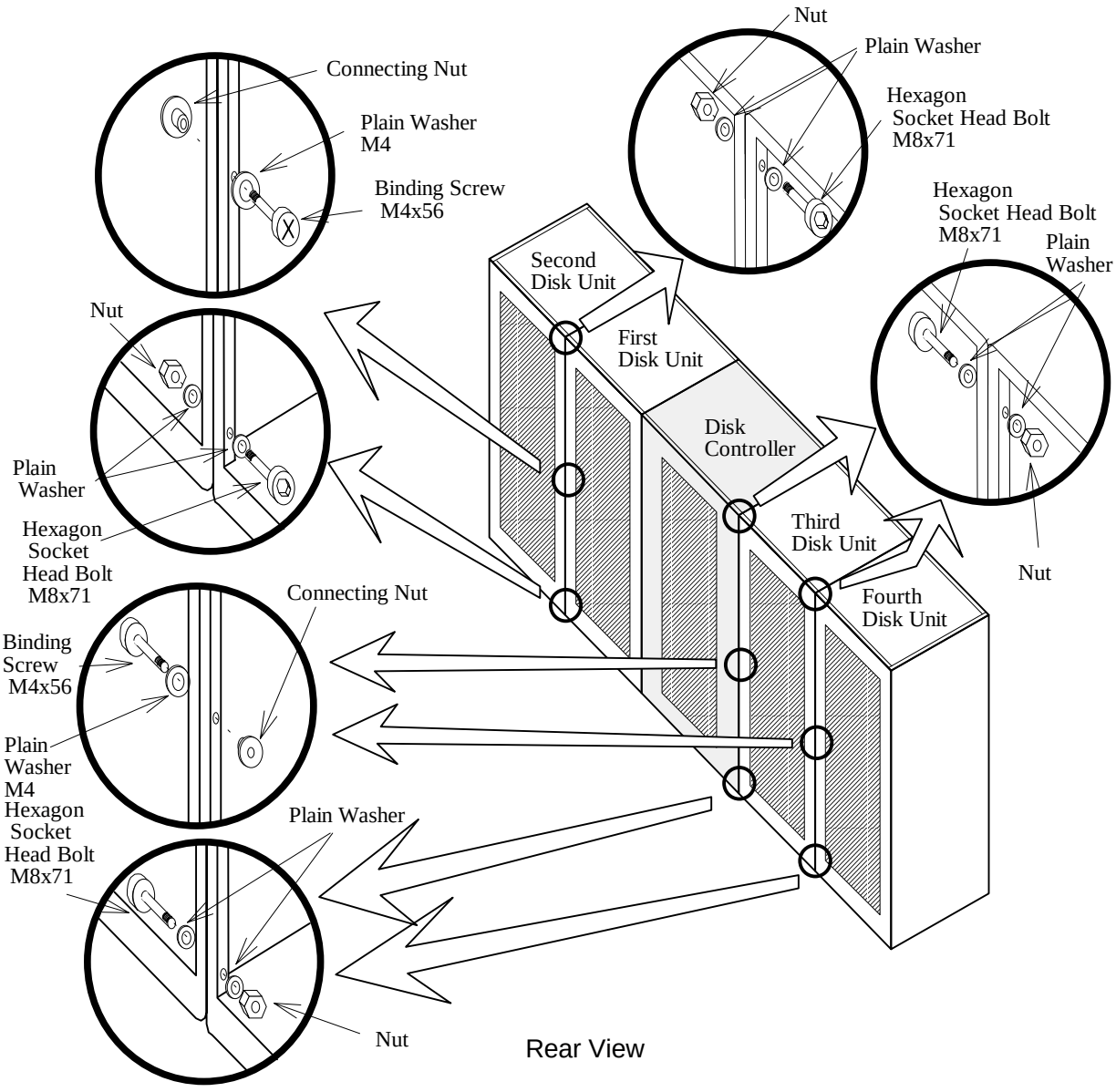

Fig. 3.4.3.2-2 Connection of Frame

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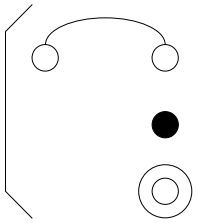
3.4.3.3 Frame Ground Cable Attachment

Note



Frame ground cable

: Screw and washer (lock washer)

: Thread

Second Disk Unit

1. Remove the right side cover together with the frame ground cable from the Disk Controller or First Disk Unit.
2. Connect the cabinet.
3. Attach the side cover to the Second Disk Unit. Refer to SECTION 3.4.3.4 Side Cover Re-Installation [INST03-470].
4. Attach the frame ground cable with the screw and lock washer.

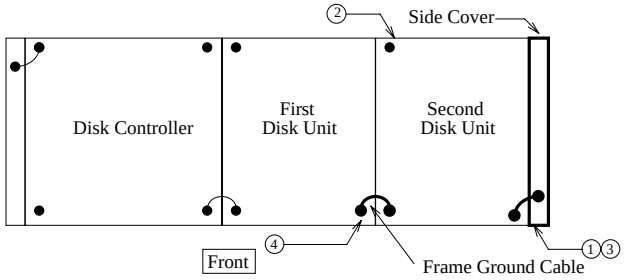


Fig. 3.4.3.3-1 Attachment of Frame Ground Cable

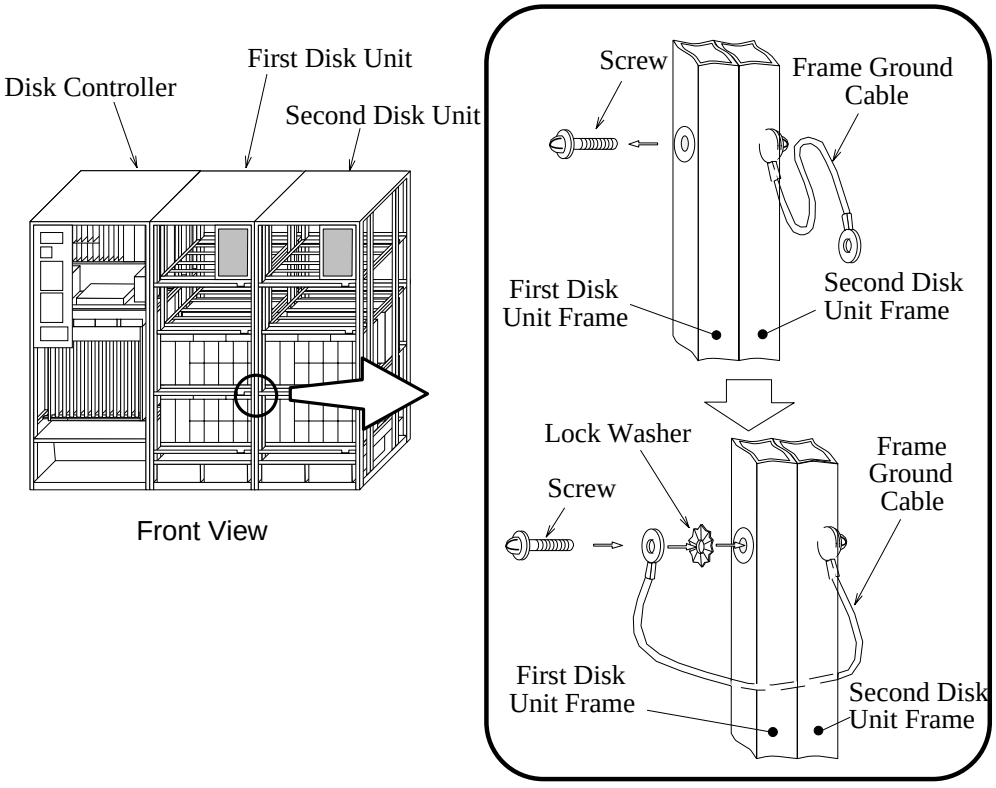


Fig. 3.4.3.3-2 Attachment of Frame Ground Cable

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Third Disk Unit

1. Remove the left side cover of the Disk Controller with the frame ground cable.
2. Attach the four SCSI Interface Cables to the Disk Controller. Refer to Section 3.12.1.3 Connection Procedure of Additional SCSI Interface Cables (In case of HDU-L13 from L10) step 1 [INST03-1900 through 1910].
3. Remove the frame ground cable from the Third Disk Unit.
4. Connect the cabinets.
5. Attach the side cover to the Third Disk Unit. Refer to Section 3.4.3.4 Side Cover Re-Installation [INST03-470].
6. Attach frame ground cable with the screw and lock washer.

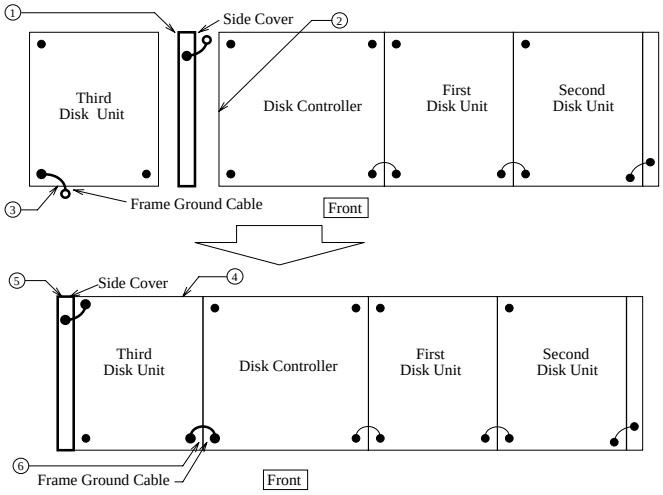

Fig. 3.4.3.3-3 Attachment of Frame Ground Cable

7. Attach the Front and Rear Logic Box Covers to the Disk Controller Unit in the reverse order of SECTION 3.4.2.6 Logic Box Covers Removal [INST03-411].

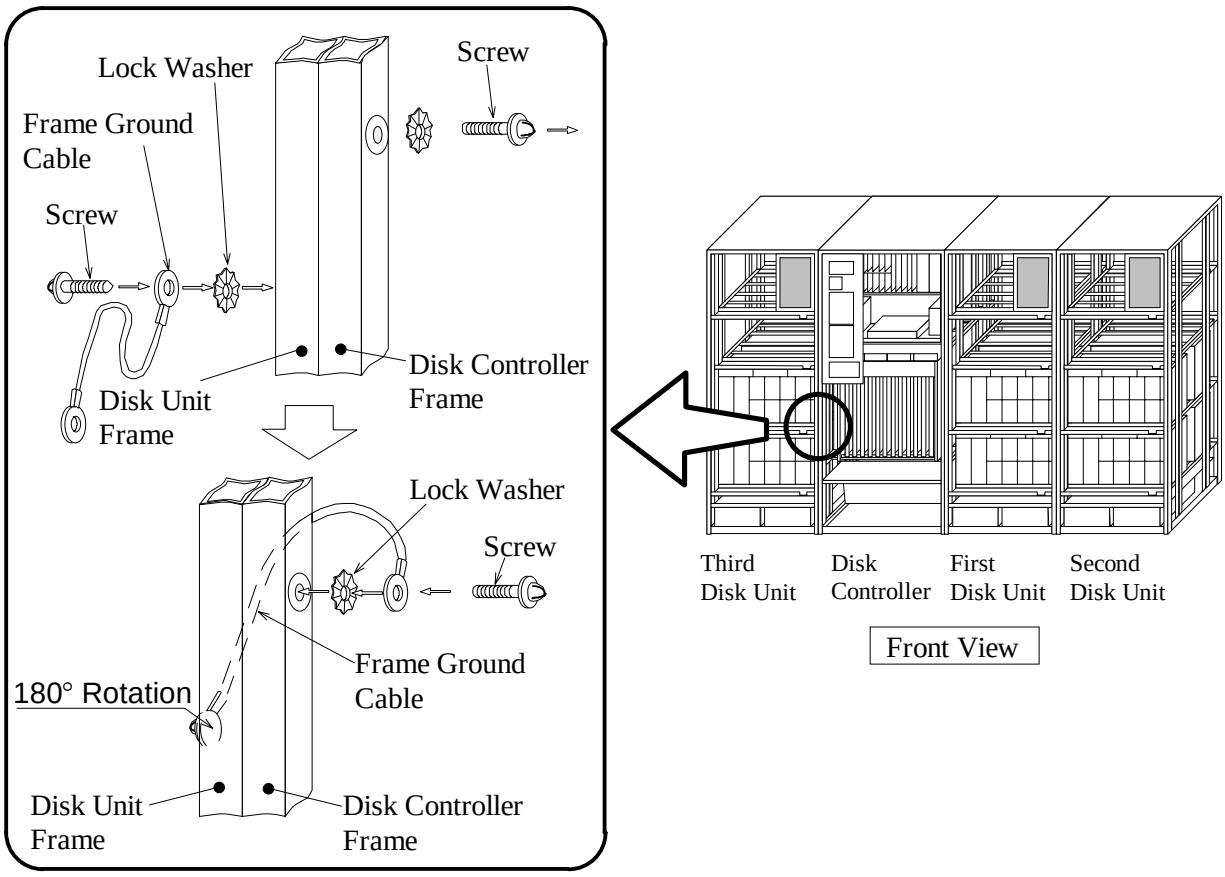

Fig. 3.4.3.3-4 Attachment of Frame Ground Cable

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Fourth Disk Unit

1. Remove the left side cover together with the frame ground cable from the Disk Controller or Third Disk Unit.
2. Remove the frame ground cable from the Fourth Disk Unit.
3. Connect the cabinet.
4. Attach the side cover to the Fourth Disk Unit. Refer To Section 3.4.3.4 Side Cover Re-Installation [INST03-470].
5. Attach the frame ground cable with the screw and lock washer.

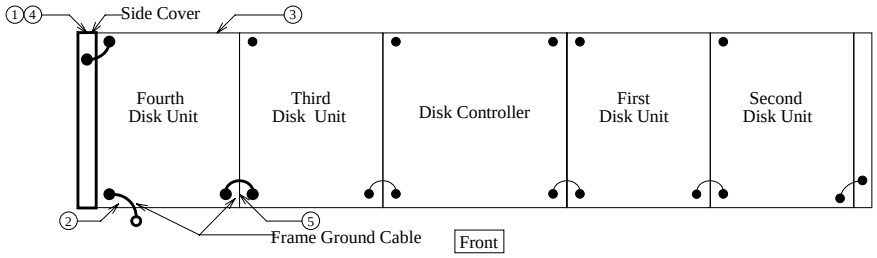

Fig. 3.4.3.3-5 Attachment of Frame Ground Cable

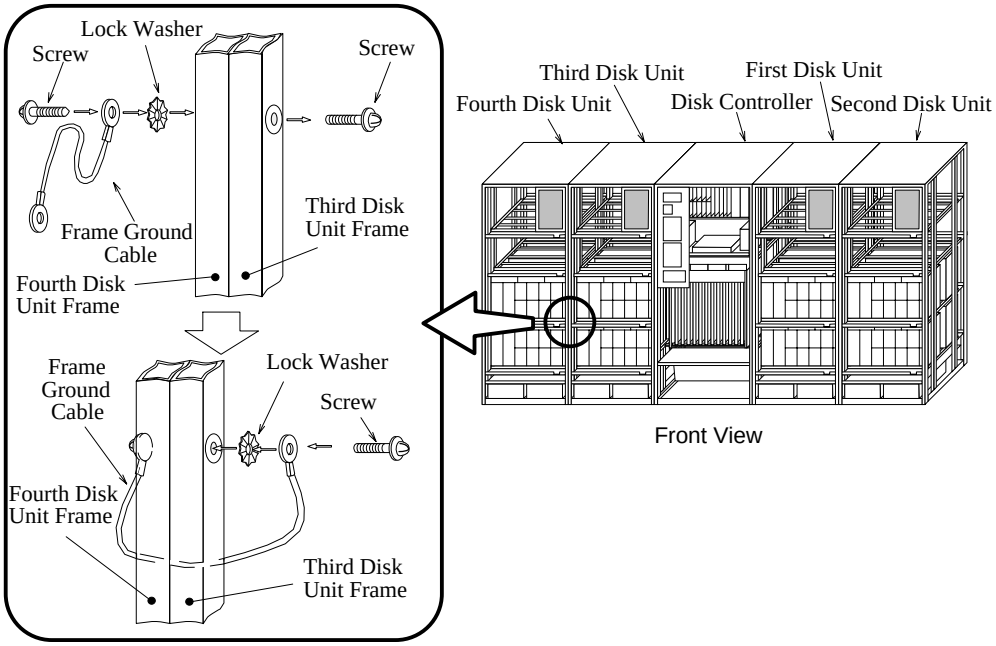

Fig. 3.4.3.3-6 Attachment of Frame Ground Cable

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3.4.3.4 Side Cover Re-Installation

Attach the side cover to the end of the string with the four binding screws and washers. See Fig. 3.4.3.4-1 and Table 3.4.2.2-1.

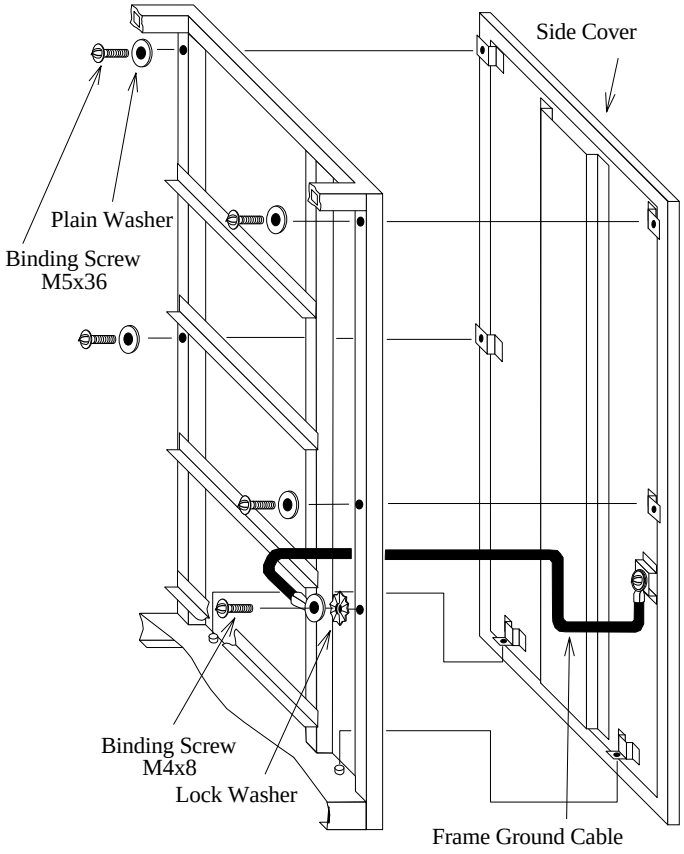

Fig. 3.4.3.4-1 Re-Installation of Side Cover

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3.4.3.5 Kick Plate Installation

Secure the kick plates with screws, as shown in figures. 3.4.3.5-1, 3.4.3.5-2, and 3.4.3.5-3.
Remove the side kick plates from the Disk Controller and replace them on the cabinets at both ends.

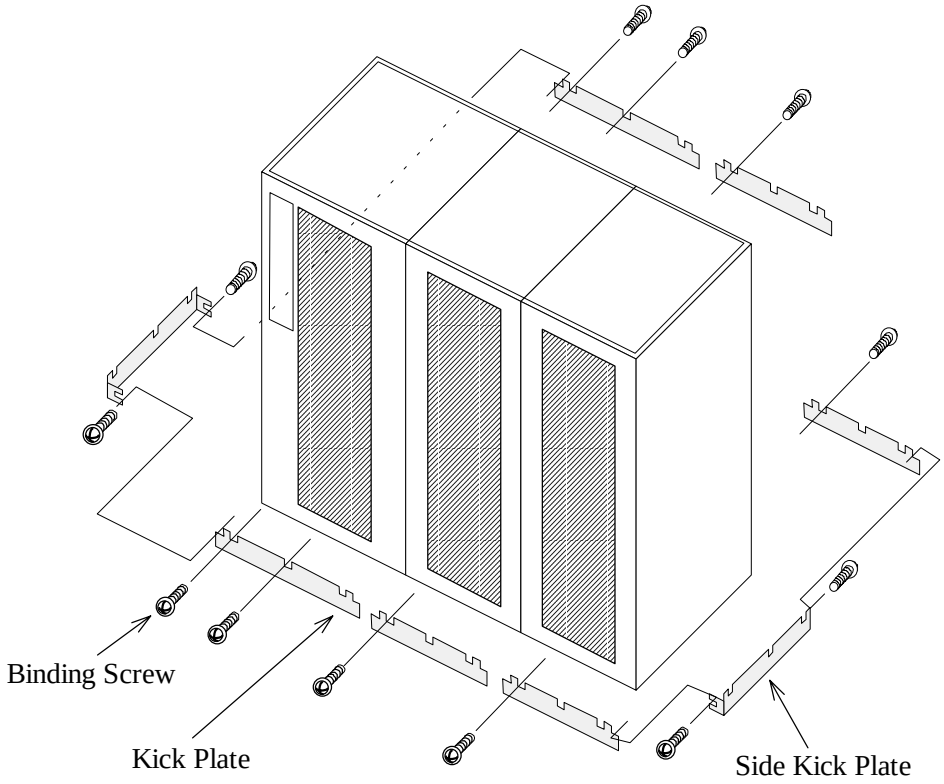

Fig. 3.4.3.5-1 Installation of Kick Plate (Two Disk Units)

NOTICE: Contact the Kick Plate to the floor to prevent static electricity.

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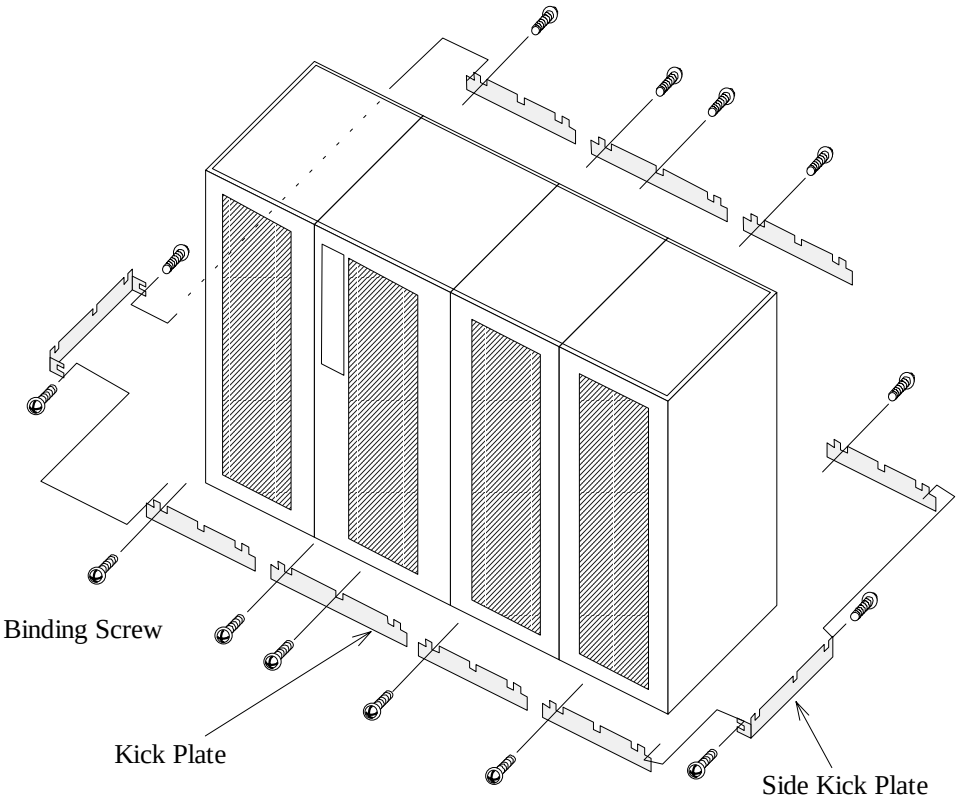

Fig. 3.4.3.5-2 Installation of Kick Plate(Three Disk Units)

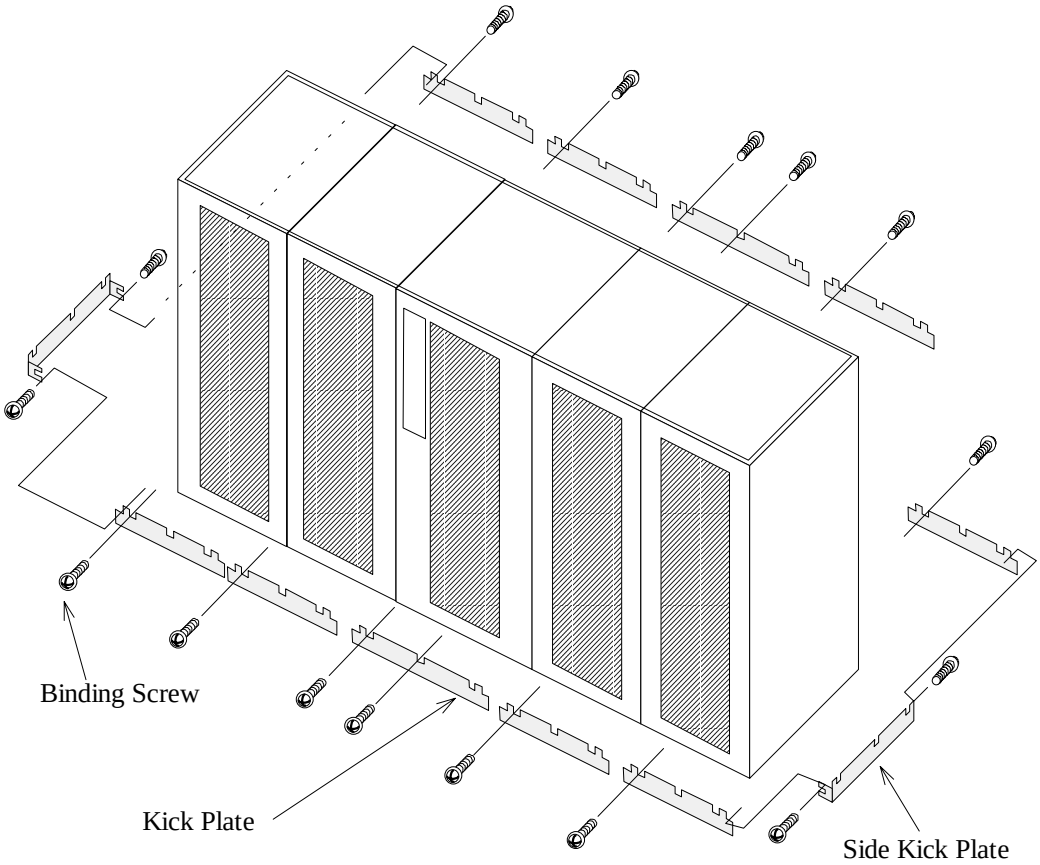

Fig. 3.4.3.5-3 Installation of Kick Plate (Four Disk Units)

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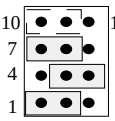
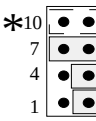
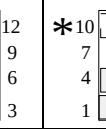
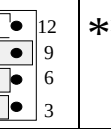
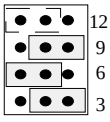
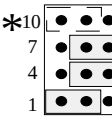
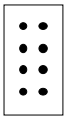
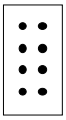
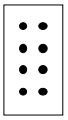
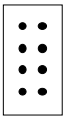
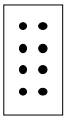
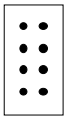
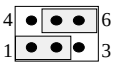
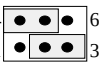
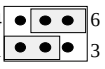
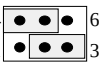
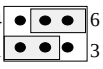
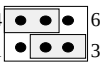
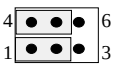
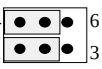
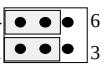
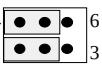
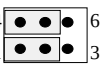
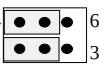
3.4.4 Switch and Jumper Plug Installation

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

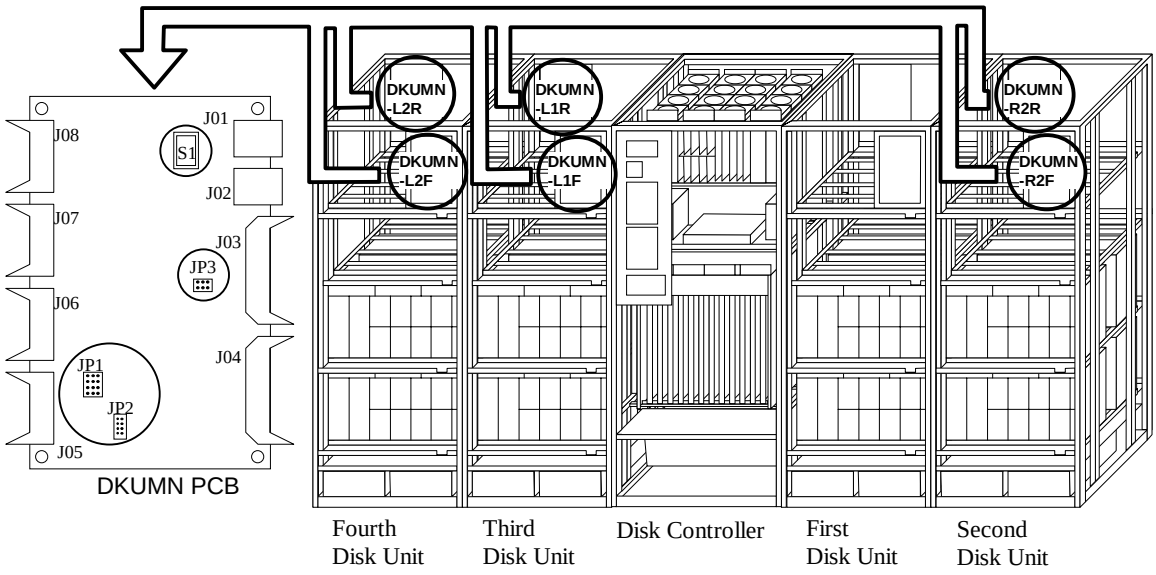
3.4.4.1 DKUMN Setting

Set the switches and install the jumper plugs in the DKUMN PCBs as indicated in the table below.

Table 3.4.4.1-1 DKUMN PCB Jumper Plug Positions

	1	2	3	4	5	6	Remarks
	DKUMN-R2F	DKUMN-R2R	DKUMN-L1F	DKUMN-L1R	DKUMN-L2F	DKUMN-L2R	
	Front	Rear	Front	Rear	Front	Rear	
S1	DISABLE	DISABLE	DISABLE	DISABLE	DISABLE	DISABLE	
JP1							* #10 - #12 Reserved
JP2	 Not Used	 Not Used	 Not Used	 Not Used	 Not Used	 Not Used	
JP3 **Note 1**							
JP3 **Note 2**							
	Second Disk Unit		Third Disk Unit		Fourth Disk Unit		

Note 1 : No Platform for Canister Mount (DKU-F305I-B4) Installed (Four HDU Boxes)
Note 2 : Platform for Canister Mount (DKU-F305I-B4) Installed (Eight HDU Boxes)



Front View

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3.4.4.2 SCSI ID Setting

1. If a HDD Canister has been installed when setting SCSI ID jumpers, move the HDD canister from ① to ② seeing Figs. 3.4.4.2-1 and 3.4.4.2-2.

(1) For de-installation of the HDD canister, see 4.5 De-installation of HDD Canister (Pages INST04-980 through 990).

(2) For installation of the HDD canister, see 3.10 Installation of HDD Canister (Pages INST03-1680 through 1690).

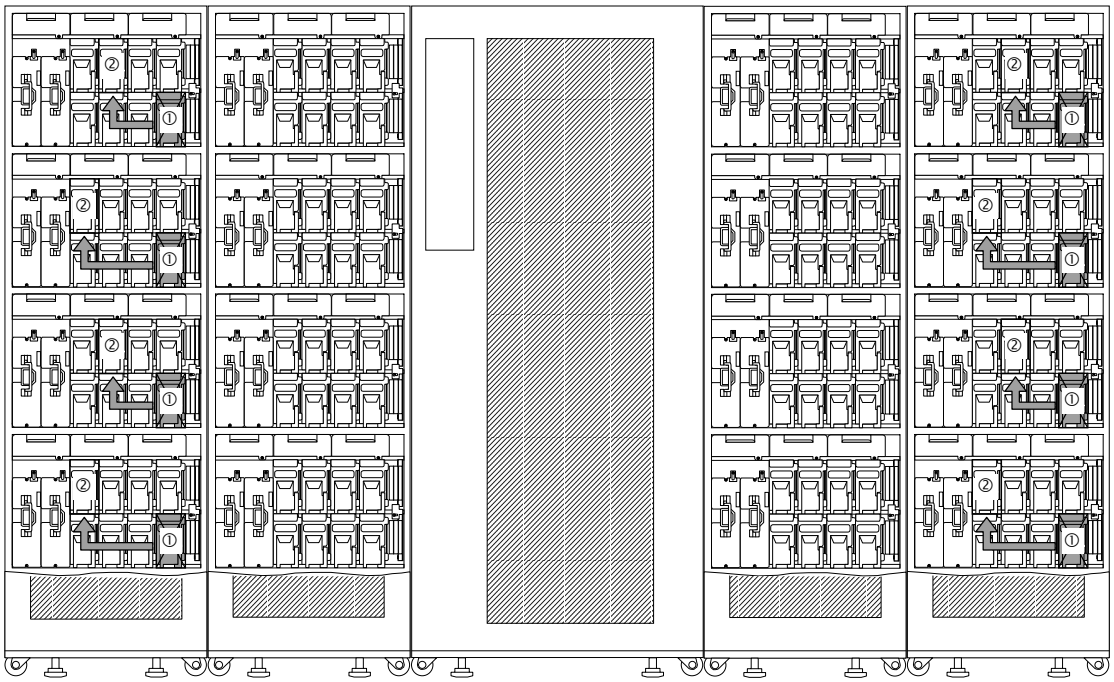

Fig. 3.4.4.2-1 Moving HDD Canister

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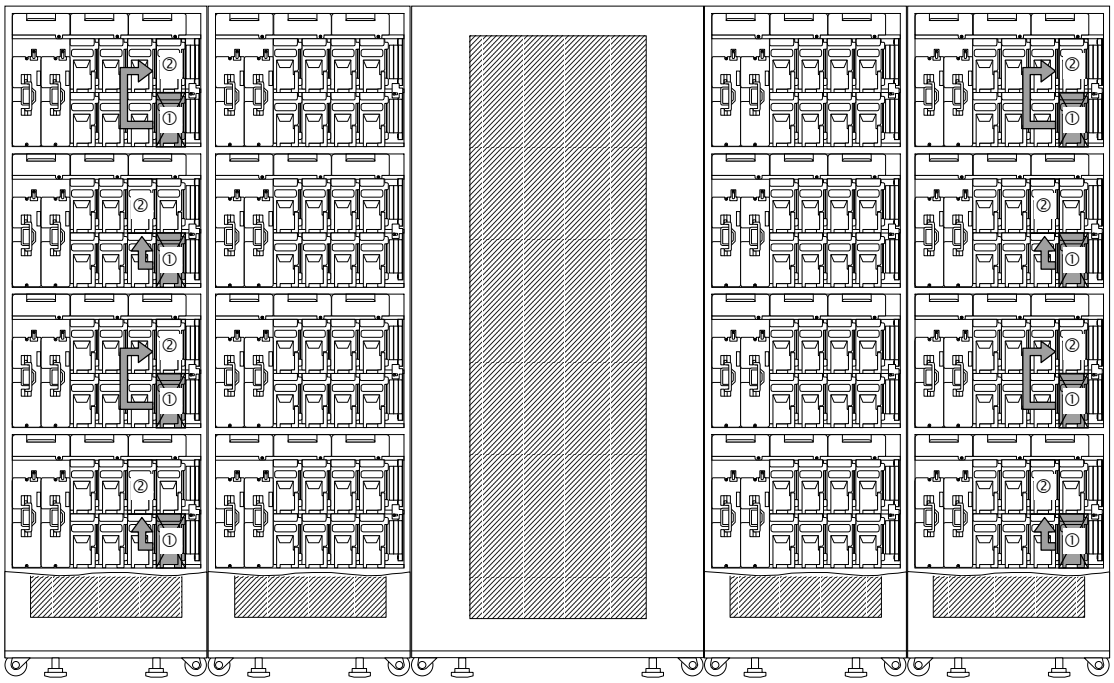

Fig. 3.4.4.2-2 Moving HDD Canister

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NOTICE:
Wrong setting of SCSI ID jumpers may cause DKU failures during operation. Be extremely careful in setting the SCSI ID jumpers.

2. Seeing Figs. 3.4.4.2-3 and 3.4.4.2-4, set the SCSI ID Jumpers on HDU box.

Fig. 3.4.4.2-3 Setting the SCSI ID Jumpers

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NOTICE:
Wrong setting of SCSI ID jumpers may cause DKU failures during operation. Be extremely careful in setting the SCSI ID jumpers.

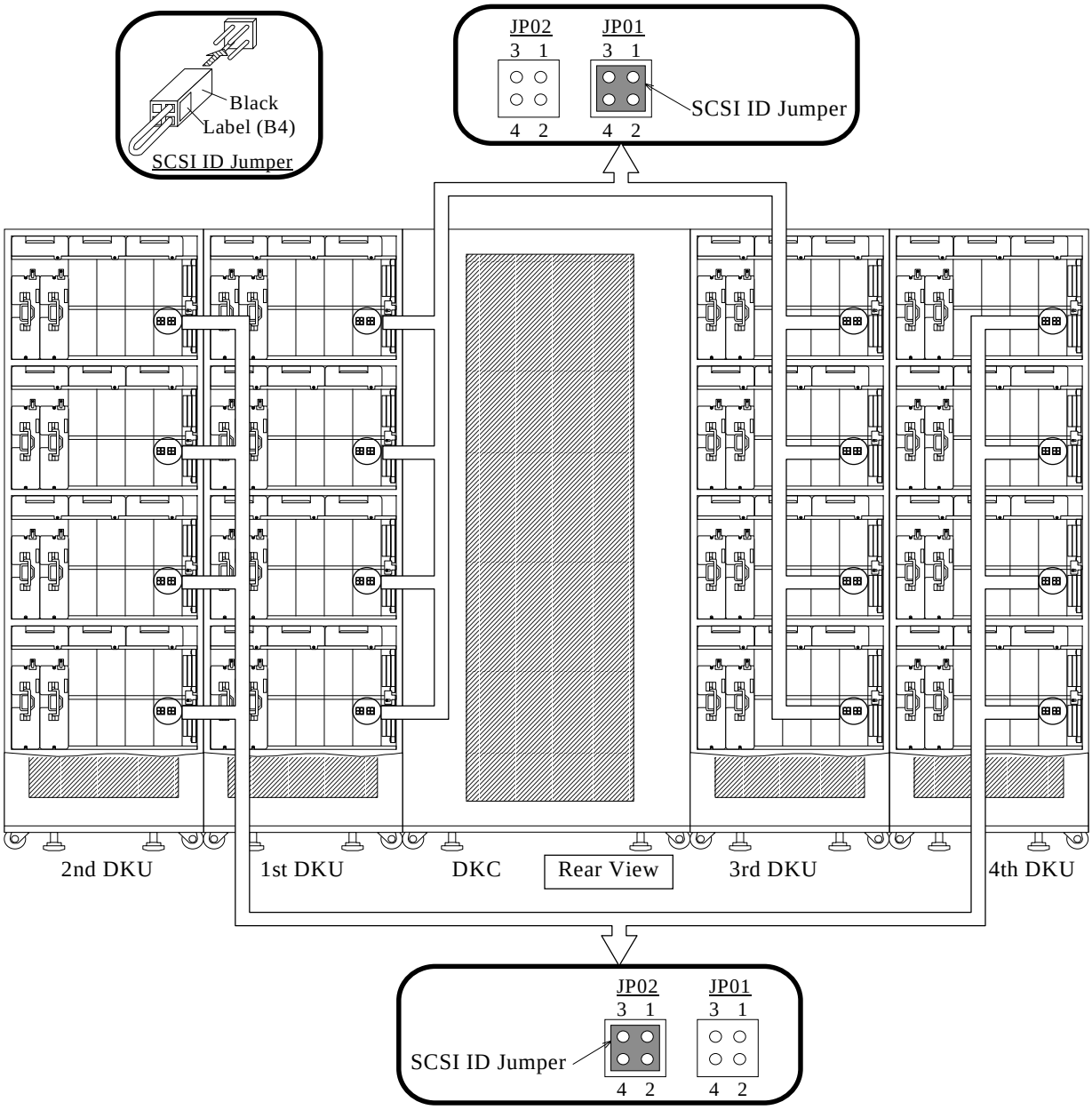

Fig. 3.4.4.2-4 Setting the SCSI ID Jumpers

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3.4.5 Cabling

3.4.5.1 Connection of DKUMN Cable

1. Loosen the repeat binders which secure the DKUMN cables.

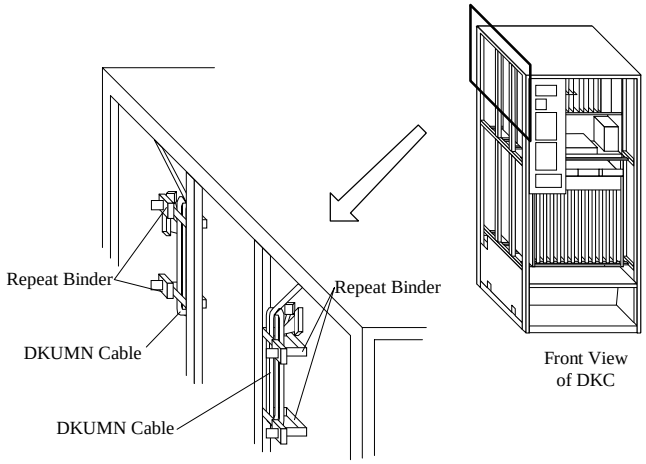

Fig. 3.4.5.1-1 Binding of DKUMN Cables

2. Before binding the DKUMN cables, secure the DKUMN PCB. Refer to Fig. 3.4.5.1-2.
   a. Loosen the screws.
   b. Lift the DKUMN PCB.
   c. Slide and secure the DKUMN PCB.

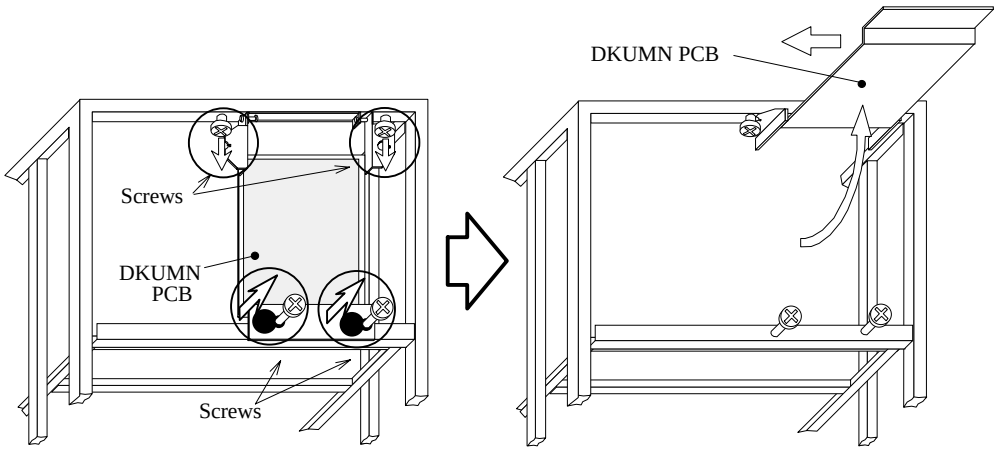

Fig. 3.4.5.1-2 Lift of DKUMN PCB

3. Bind the cables with repeat binders to prevent them from sagging.

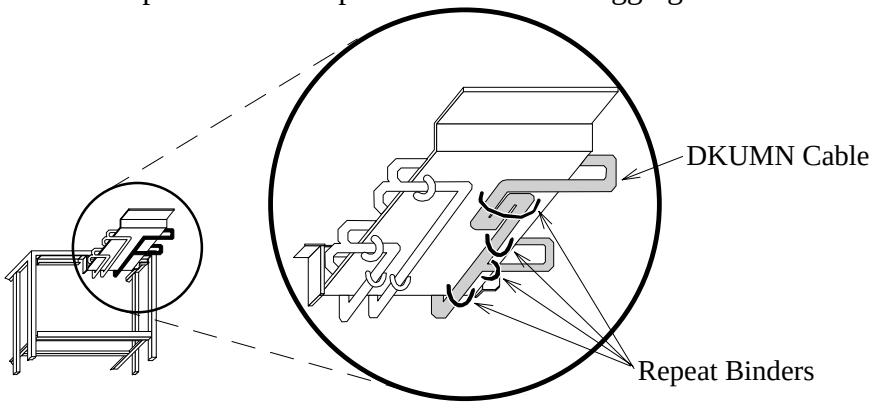

Fig. 3.4.5.1-3 Binding of DKUMN Cables

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Second Disk Unit

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Connect the DKUMN cables between the First Disk Unit and the second Disk Unit as indicated in the table below.
2. Bind the cables with repeat binders to prevent them from sagging.

Table 3.4.5.1-1 Connection of DKUMN Cables

No.	First Disk Unit			Second Disk Unit			Remarks
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	DKUMN-R1F	J03	P3-1	DKUMN-R2F	J04	P4-1	
2	DKUMN-R1F	J01	P1-1	DKUMN-R2F	J01	P1-1	
3	DKUMN-R1R	J03	P3-2	DKUMN-R2R	J04	P4-2	
4	DKUMN-R1R	J01	P1-2	DKUMN-R2R	J01	P1-2	

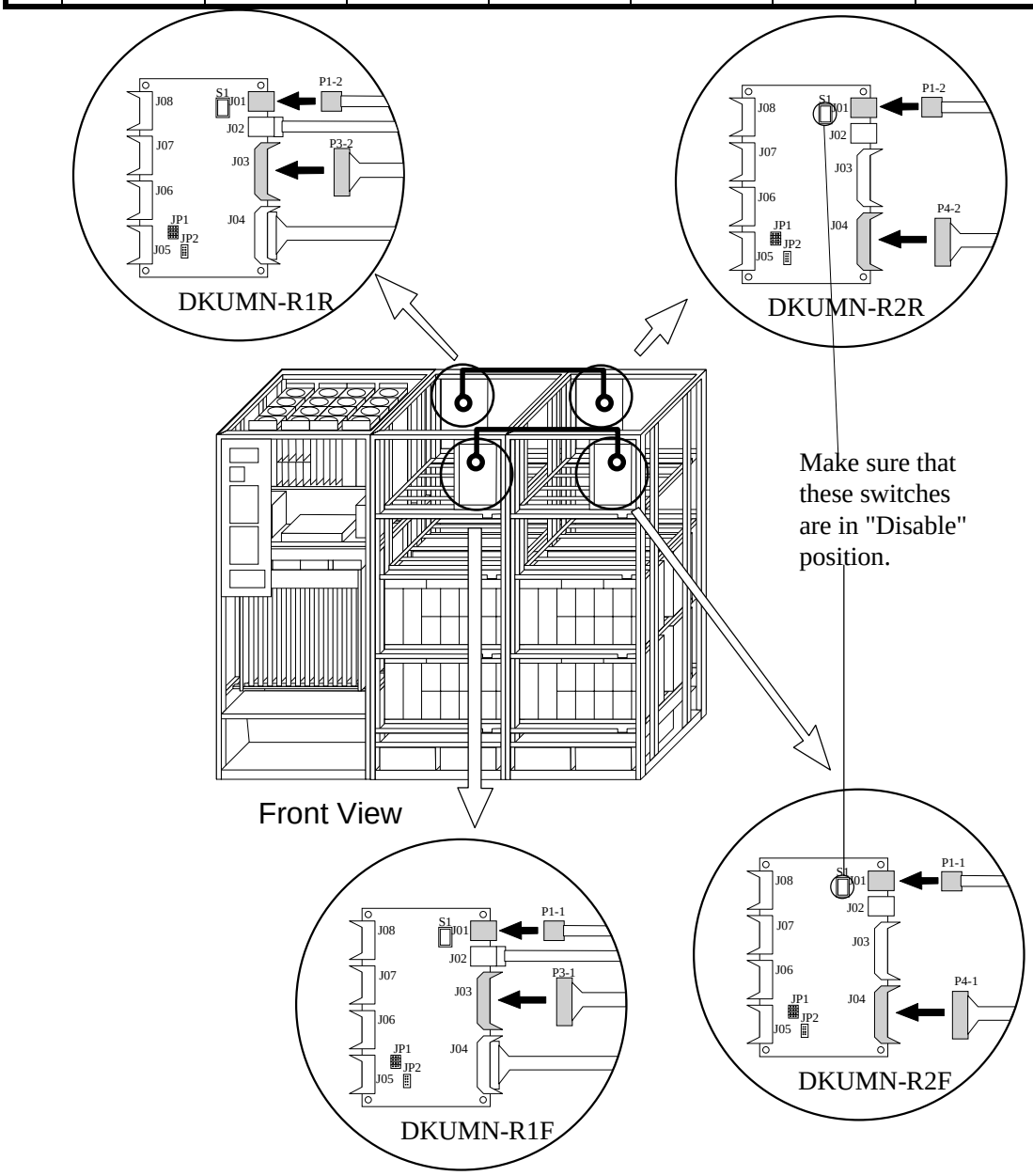

Fig. 3.4.5.1-4 Connection of DKUMN Cables

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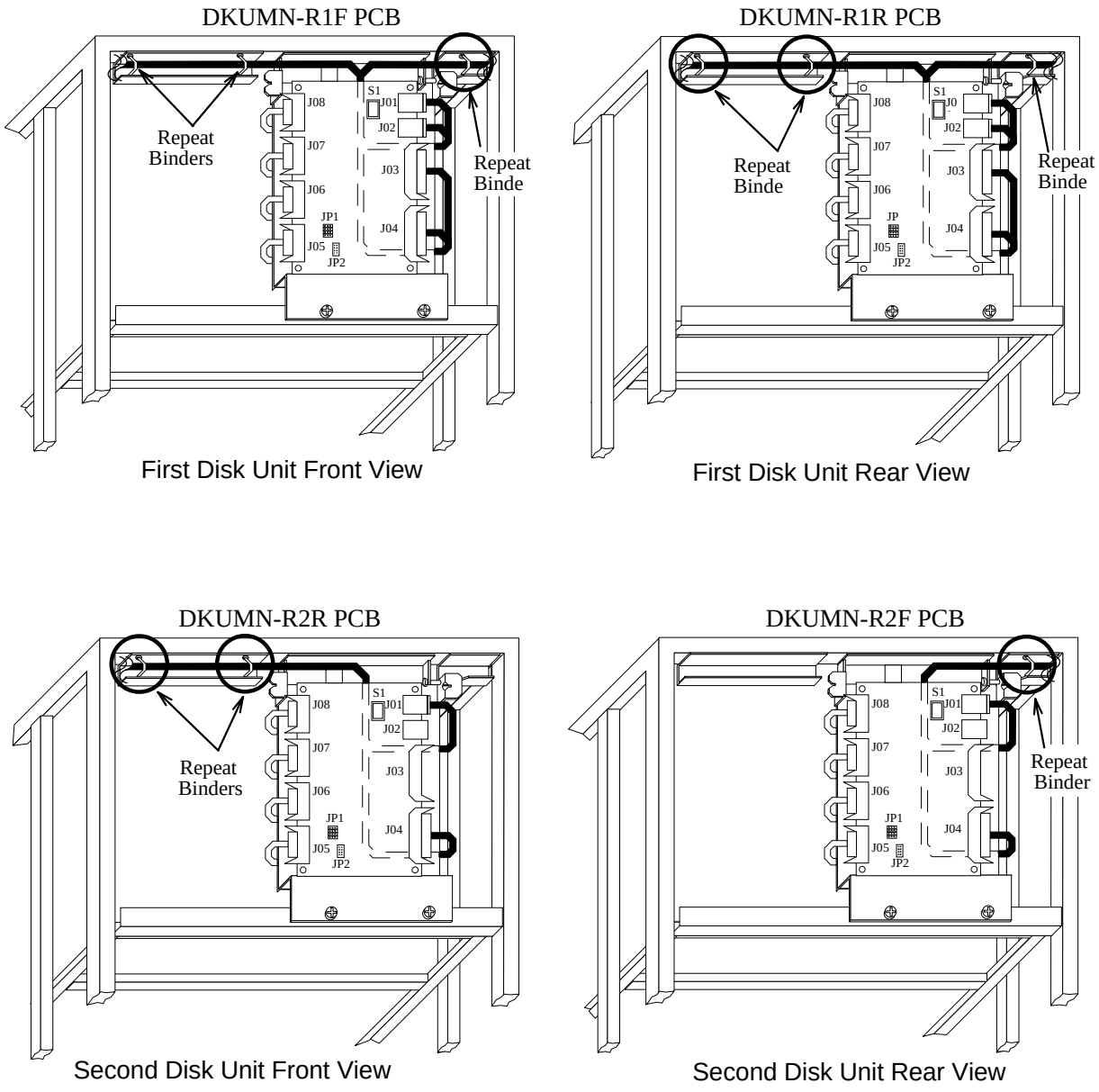

Fig. 3.4.5.1-5 Binding of DKUMN Cables

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Third Disk Unit

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Connect the PWRCTL PCBs or MPS Back Board (PL) and DKUMN PCBs as summarized in the table below.
2. Bind the cables with repeat binders to prevent them from sagging.

Table 3.4.5.1-2 Connection of DKUMN Cable

No.	Disk Controller			Third Disk Unit			REMARKS
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	PWRCTL-1	J11	SH-F22	DKUMN-L1F	J04	P4-1L	
2	MPS BB (PL)	N10	SH-N10	DKUMN-L1F	J02	P2-1L	
3	PWRCTL-2	J11	SH-C22	DKUMN-L1R	J04	P4-2L	
4	MPS BB (PL)	A10	SH-A10	DKUMN-L1R	J02	P2-2L	

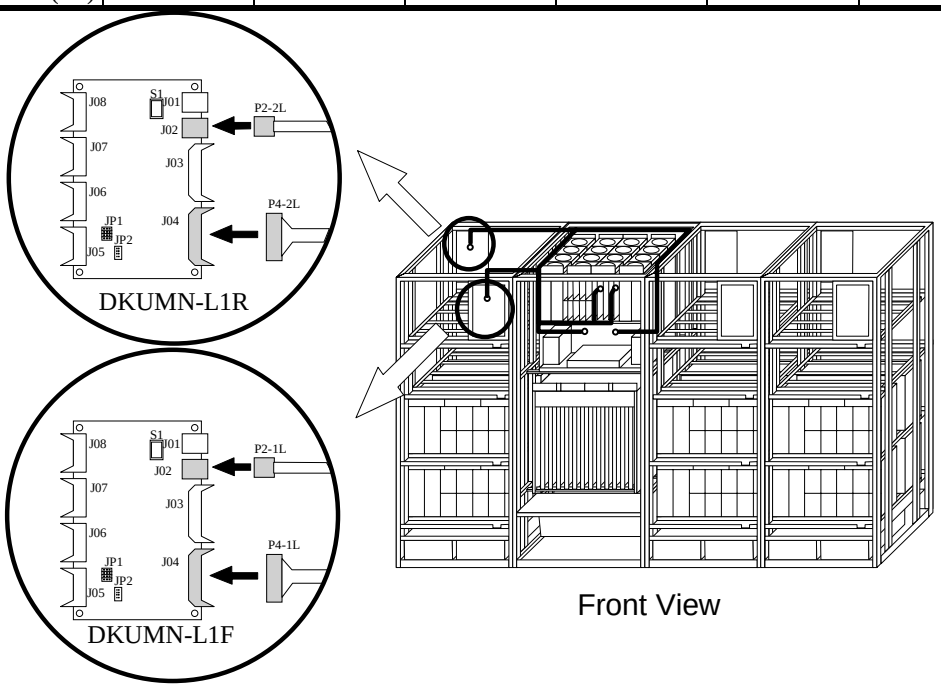

Fig. 3.4.5.1-6 Connection of DKUMN Cables

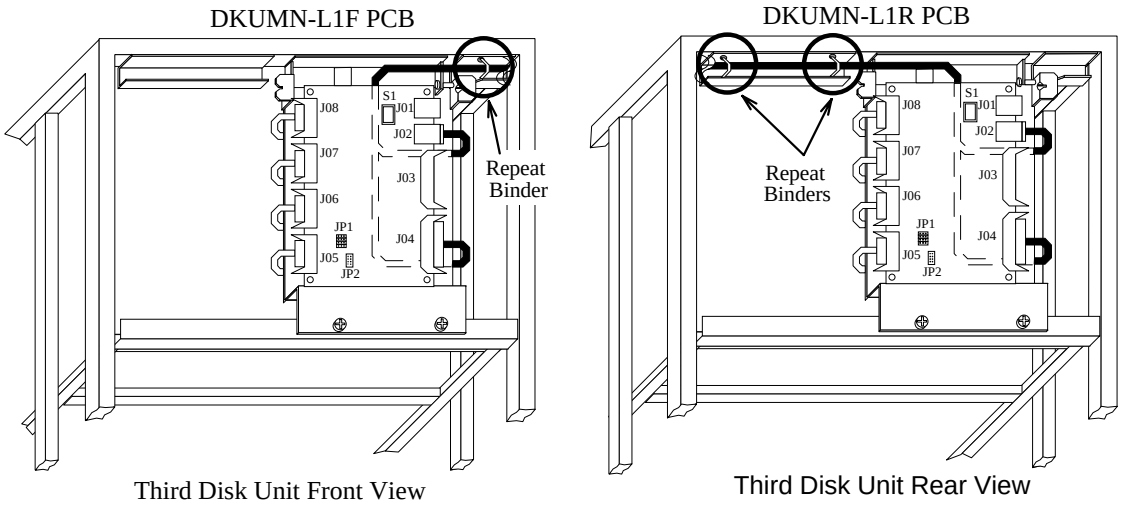

Fig. 3.4.5.1-7 Binding of DKUMN Cables

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Fourth Disk Unit

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Connect the DKUMN cables between the Third Disk Unit and the Fourth Disk Unit as indicated in the table below.
2. Bind the cables with repeat binders to prevent them from sagging.

Table 3.4.5.1-3 Connection of DKUMN Cables

No.	Third Disk Unit			Fourth Disk Unit			REMARKS
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	DKUMN-L1F	J03	P3-1	DKUMN-L2F	J04	P4-1	
2	DKUMN-L1F	J01	P1-1	DKUMN-L2F	J01	P1-1	
3	DKUMN-L1R	J03	P3-2	DKUMN-L2R	J04	P4-2	
4	DKUMN-L1R	J01	P1-2	DKUMN-L2R	J01	P1-2	

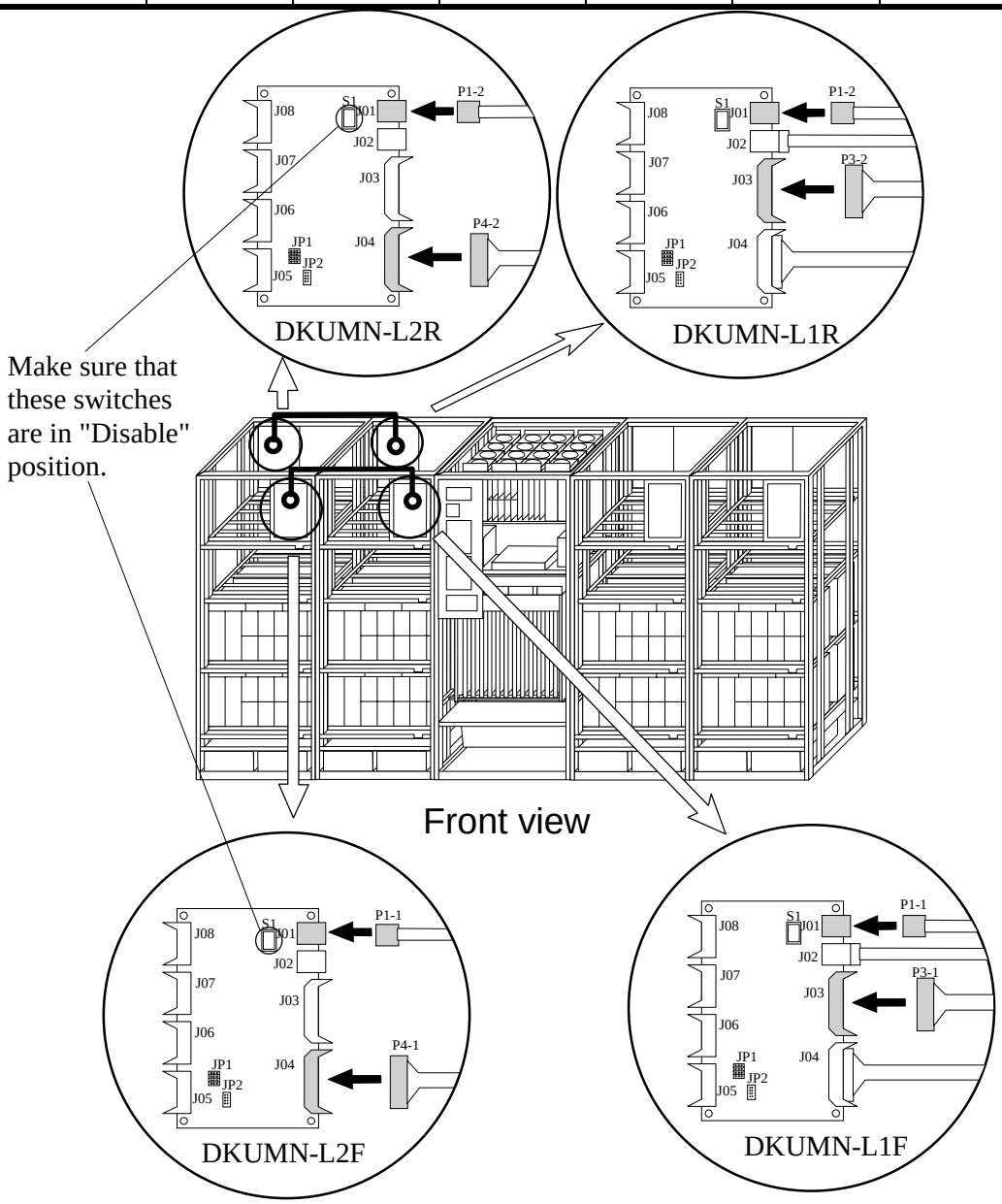

Fig. 3.4.5.1-8 Connection of DKUMN cables

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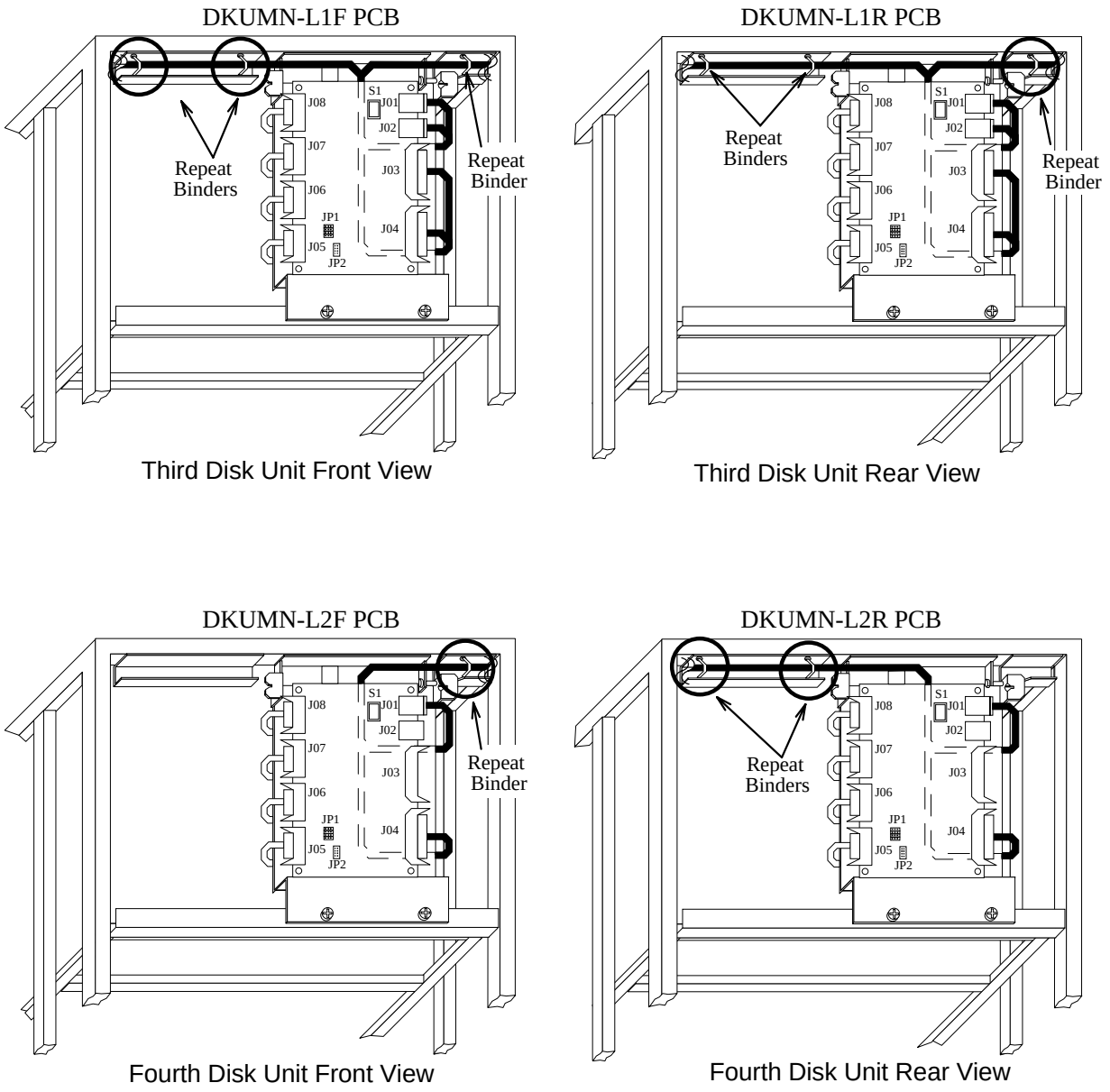

Fig. 3.4.5.1-9 Binding of DKUMN Cables

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3.4.6 Check of Jumper Settings

1. Check the jumper settings (JP1, JP2 and JP3) on the DKUMN PCBs. Refer to Section 3.4.4.1 DKUMN Setting [INST03-500].
   When the jumper plugs are not installed to the correct sockets, install the jumper plugs to the correct sockets.

2. Check the SCSI ID jumpers on the HDD back boards. Refer to Section 3.4.4.2 SCSI ID Setting step 2 [INST03-530 through 540].
   When the SCSI ID jumpers are not installed to the correct sockets, install the SCSI ID jumpers to the correct sockets.

3.4.7 Check and Testing

3.4.7.1 AC Input Voltage Check

⚠WARNING

Do not touch the internal parts of the AC power cable, the AC Box, or the Breaker Box.
Line voltage is present even if the circuit breaker is off.

1. Check the AC input voltage using a voltmeter at the customer's AC power source (at the distribution board or receptacle for R & S connectors).

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3.4.7.2 Checking the AC Input Cable, and AC Input Voltage Select Jumper Cable

1. Check the input power cable and jumper cable (P104) at the AC Boxes in Disk Units. See Table 3.4.7.2-1, Fig. 3.4.7.2-1, and Fig. 3.4.7.2-2 for items.

Table 3.4.7.2-1 AC Input Cable Conditions and Jumper Cable (P104) Positions

Input Voltage	AC Input Cable Conditions	Jumper Cable (P104) Position	Remarks
200-240Vac	4 conductors (R,S,T,FG)	J104-1	J104-2 dummy connector
380-415Vac	5 conductors (R,S,T,N,FG)	J104-2	J104-1 dummy connector

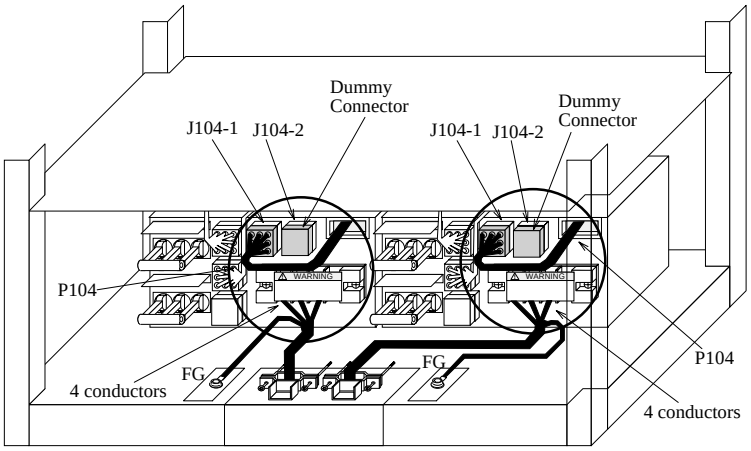

Fig. 3.4.7.2-1 AC Input Cable Conductors and Jumper Cable (P104) Positions 200-240Vac

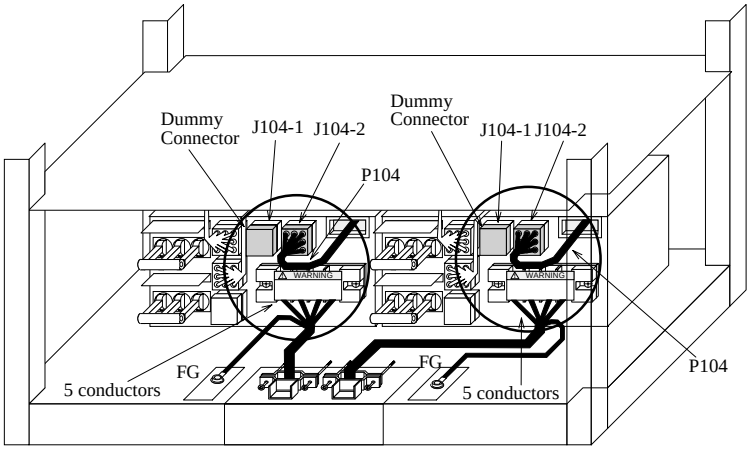

Fig. 3.4.7.2-2 AC Input Cable Conductors and Jumper Cable (P104) Positions 380-415Vac

2. Return to General Flow.
   New Installation : Go to INST02-11 step(7)-3.
   Non-Disruptive Installation : Go to INST02-21 step(7)-3.
   Disruptive Installation : Go to INST02-42 step(11)-3.

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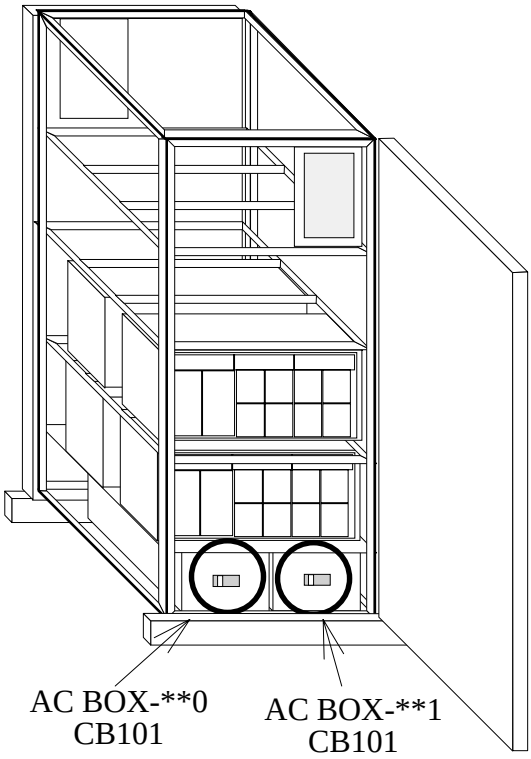
3.5 Installation of Hz Conversion Kit

3.5.1 Installation of Hz Conversion Kit for Disk Unit (DKU-F305I-56, DKU-F305I-65)

DKU-F305I-56	DKU305IE-14 (50Hz) to DKU305IU-14 (60Hz)
DKU-F305I-65	DKU305IU-14 (60Hz) to DKU305IE-14 (50Hz)

⚠ CAUTION

Perform The Hz Conversion with care.
This Hz Conversion is concerned with Primary Circuit.
Perform this procedure before connecting the Power Cable Assy.
(Turn off the circuit breakers on the power distribution panel)
Turn off the main circuit breaker CB101 located in the AC Box.



Front View

Fig. 3.5.1-1 Location of the Disk Unit Circuit Breakers

Table 3.5.1-1 Disk Unit Circuit Breakers

No.	Location No.	Breaker No.	Remarks
1	AC BOX-**0	CB101	
2	AC BOX-**1	CB101	

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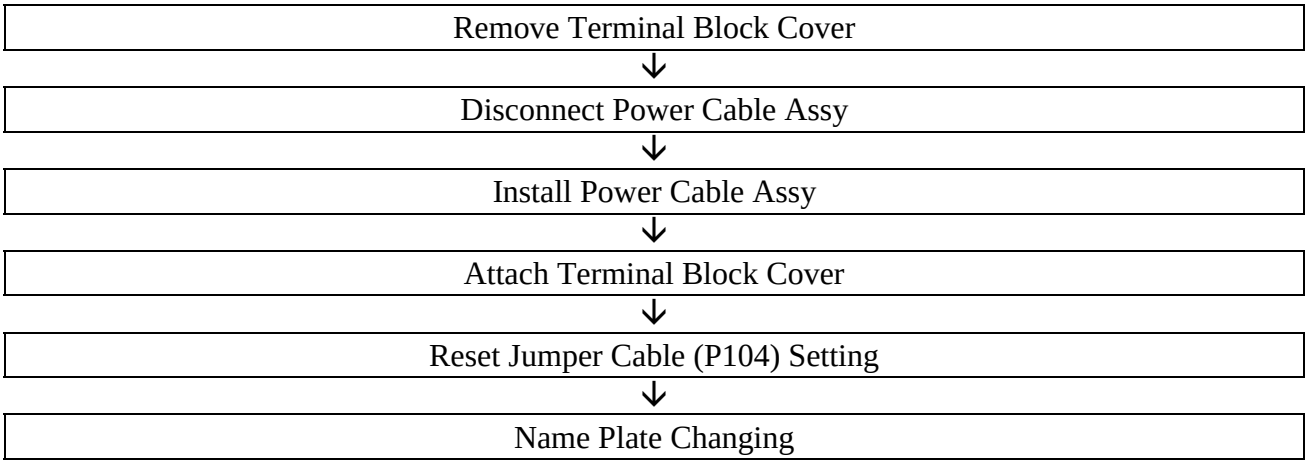
3.5.1.1 Flowchart



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3.5.1.2 Parts List

DKU-F305I-56 DKU305IE-14(50Hz) to DKU305IU-14(60Hz)

No.	Name of Part	Part number	Quantity/Unit	Remarks
1	Power Cable Assy (IU type)	3239396-A	1	
2	Nameplate (IU)	2099649-12	1	
3	Label (V. Hz)	3213180-1	1	
4	Label (CSA)	5409086-1	1	
5	Label Noise (FCC/CSA)	3183097-1	1	
6	Label (UL/CUL)	3243606-3	1	

DKU-F305I-65 DKU305IU-14(60Hz) to DKU305IE-14(50Hz)

No.	Name of Part	Part number	Quantity/Unit	Remarks
1	Power Cable Assy (IE type)	3239396-B	1	
2	Nameplate (IE)	2099649-13	1	
3	Label (V. Hz)	3213180-1	1	
4	Label (CSA)	5409086-1	1	
5	Label (IN)	3228038-1	1	
6	Label (UL3)	5466323-1	1	
7	Label (CE Mark)	3240543-1	1	

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3.5.1.3 Changing Input Power Cables

1. Remove the fall proof adapter (only for rear side).

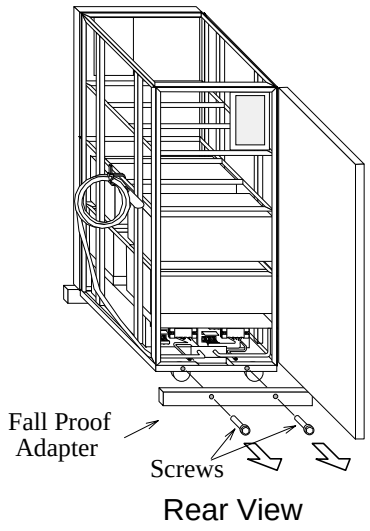

Fig. 3.5.1.3-1 Removal of Fall Proof Adapter

2. Remove the plate of the back side of the Disk Unit as illustrated in fig. 3.5.1.3-2.
   a. Remove the two screws. b. Slide the plate toward the rear side to remove.

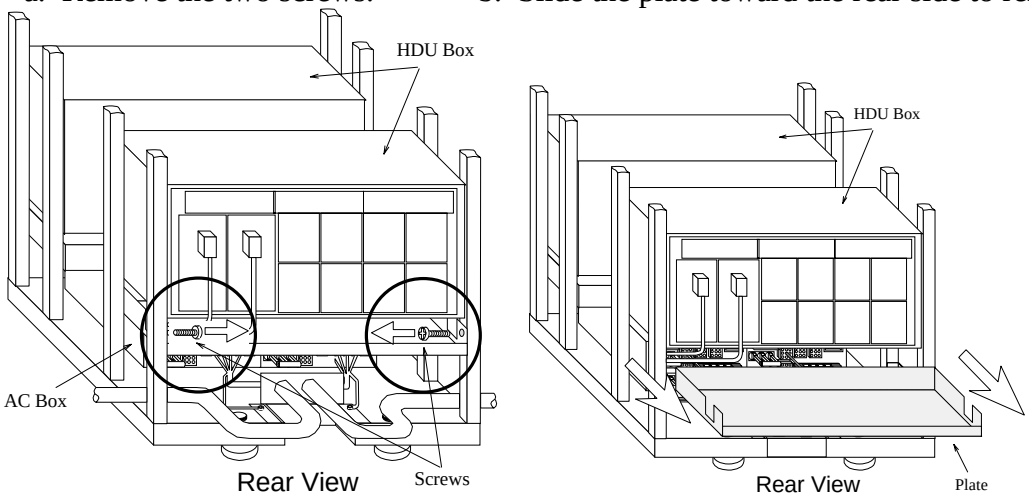

Fig. 3.5.1.3-2 Removal of Plate

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3. Remove the terminal block cover and disconnect the power cable Assy.

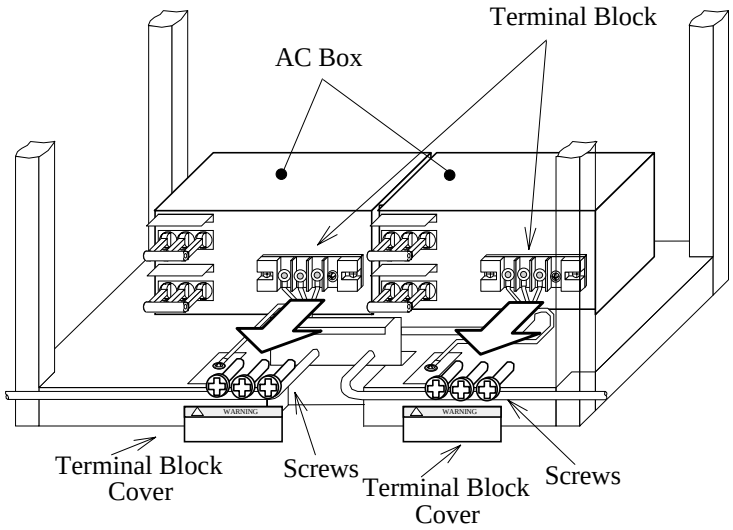

Fig. 3.5.1.3-3 Removal of Power Cable Assy (DKU-F305I-65)

4. Remove the frame ground cable for each input power cable from the frame.

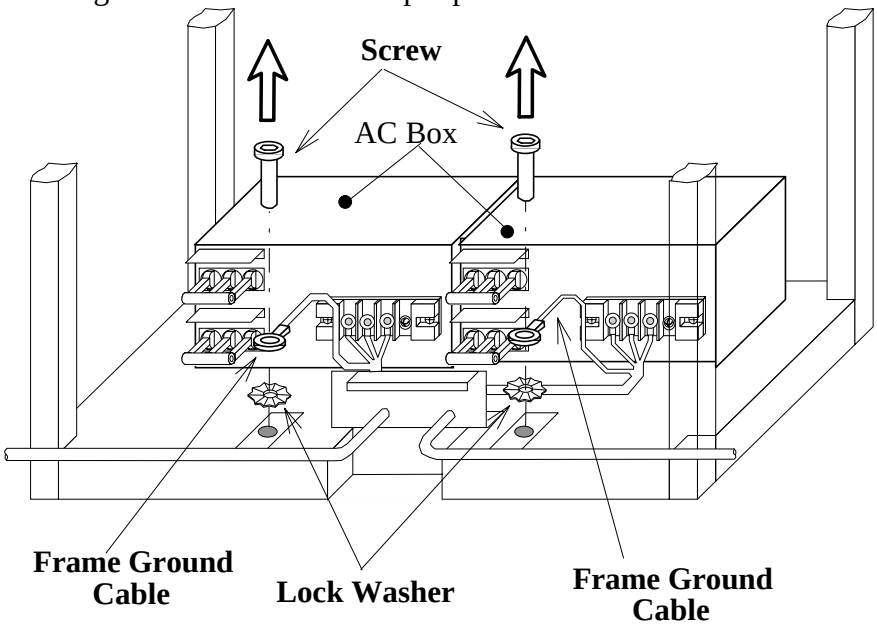

Fig. 3.5.1.3-4 Removal of Frame Ground Cable (DKU-F305I-65)

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5. Loosen the screws and remove the Power Cable Assy.

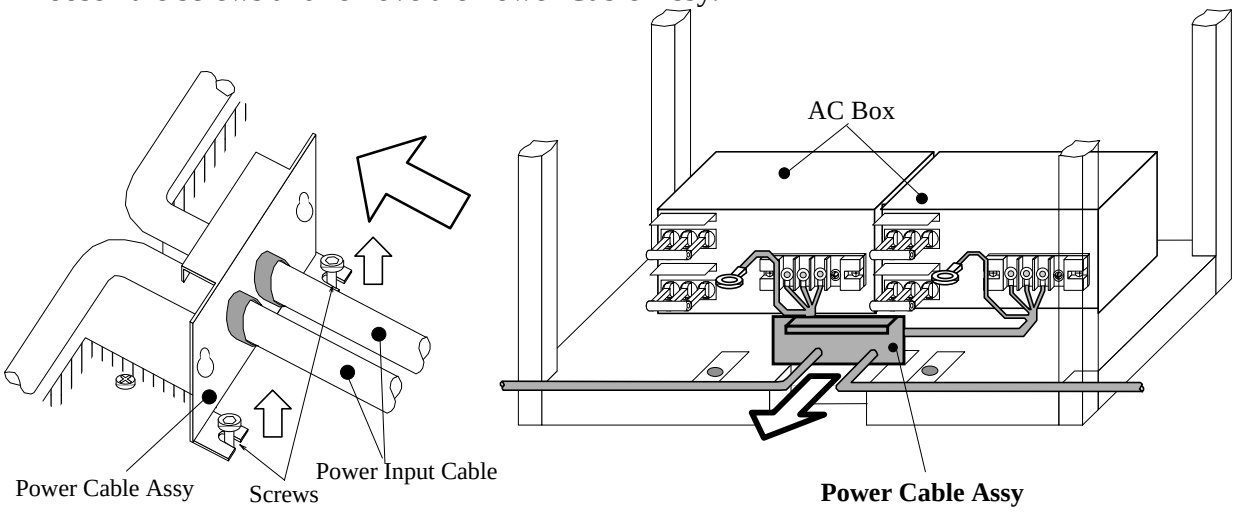

Fig. 3.5.1.3-5 Removal of Power Cable Assy (DKU-F305I-65)

6. Attach the Power Cable Assy and secure two screws.

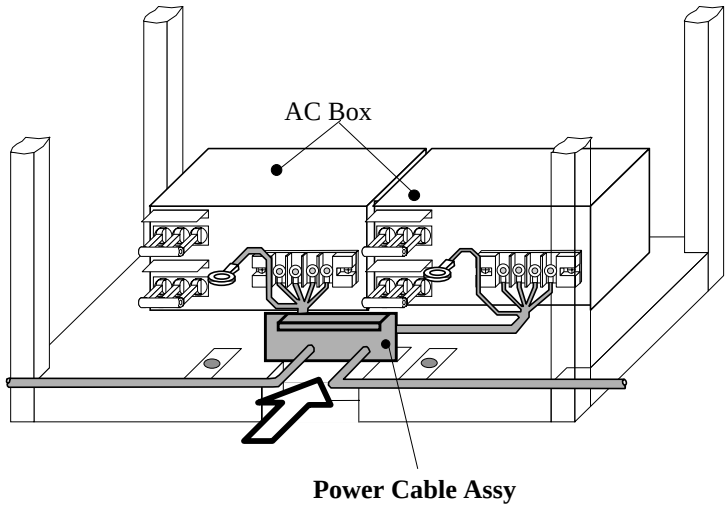

Fig. 3.5.1.3-6 Installation of Power Cable Assy (DKU-F305I-65)

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7. Attach frame ground cable with the screw and lock washer.

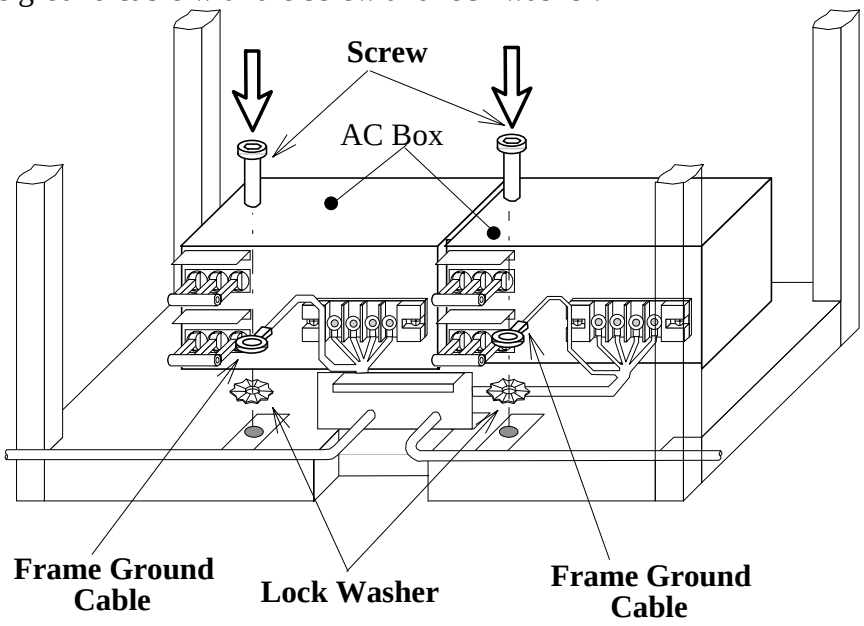

Fig. 3.5.1.3-7 Attachment of Frame Ground Cable (DKU-F305I-65)

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8. Connect the input power cables to the terminal block and attach terminal block cover.

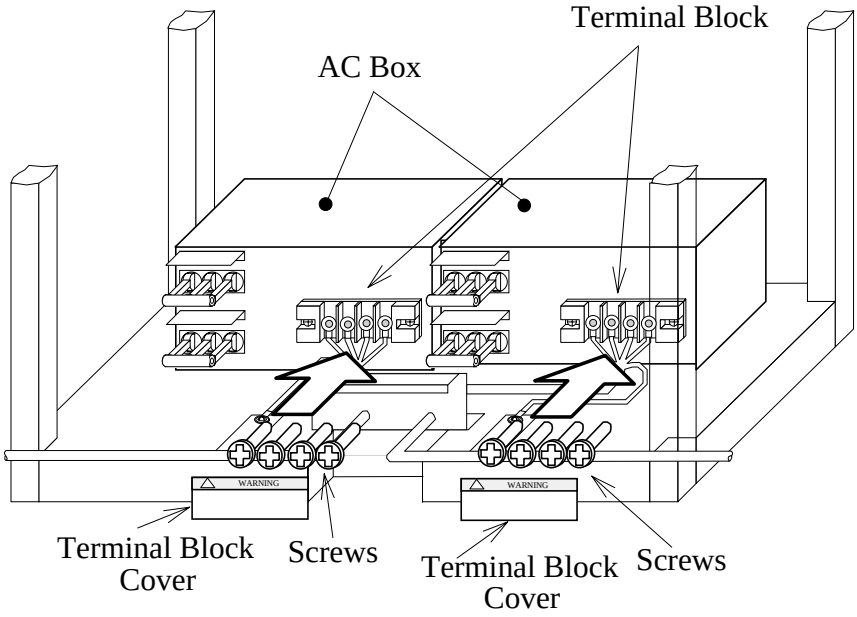
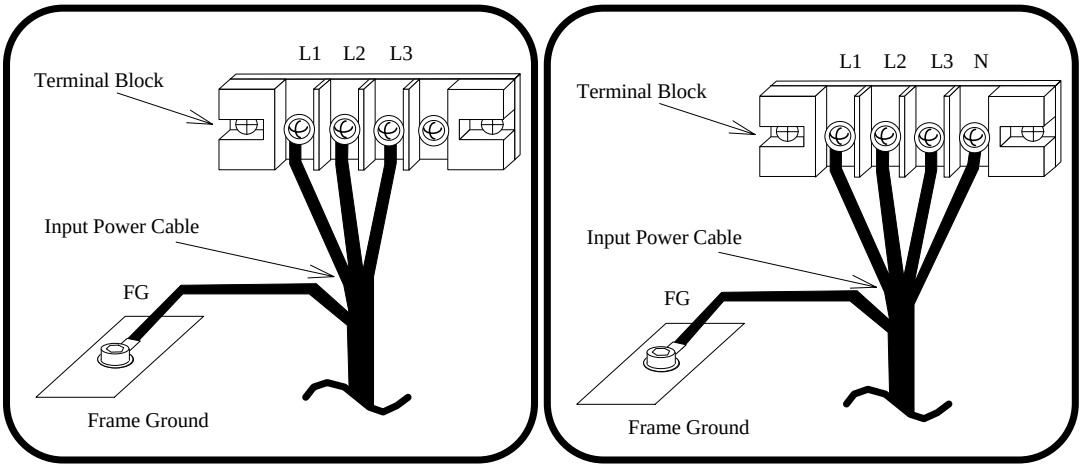


Fig. 3.5.1.3-8 Connection of Power Cable Assy (DKU-F305I-65)

Table 3.5.1.3-2 Input Power Cable Conductors Numbers

No.	Model Number	Input Voltage	Input Power Cable Conductors	Remarks
1	DKU-F305I-56	200-240Vac	4 conductors (L1, L2, L3, FG)	
2	DKU-F305I-65	380-415Vac	5 conductors (L1, L2, L3, N. FG)	



DKU-F305I-56 DKU-F305I-65

Fig. 3.5.1.3-9 Connection of Input Power Cables to the Terminal Block

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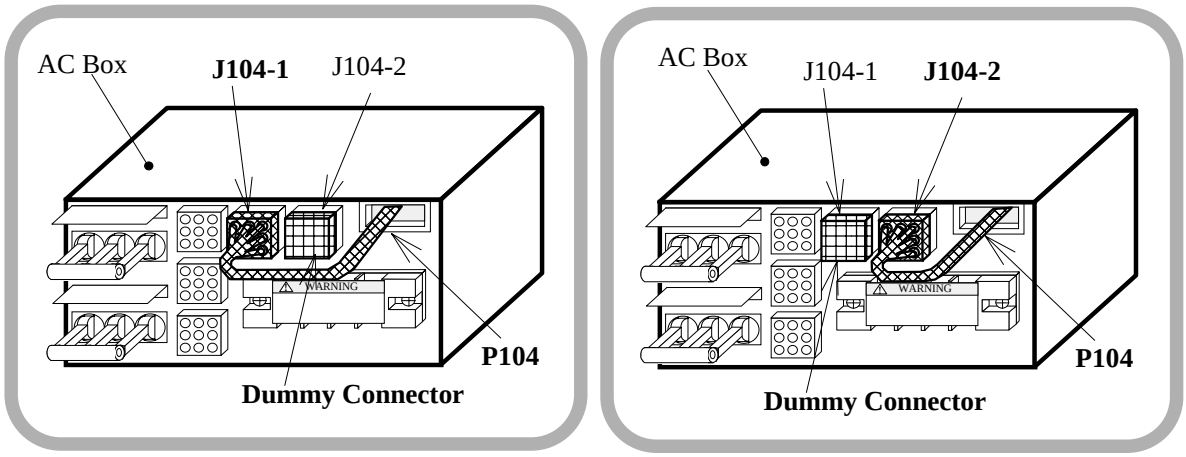
9. Install the jumper cable (P104) as indicated in the table below.

Table 3.5.1.3-3 Jumper Cable (P104) Locations

No.	Model Number	Input Voltage	Jumper Cable (P104) Location	Remarks
1	DKU-F305I-56	200-240Vac	J104-1	(J104-2: Dummy Connector)
2	DKU-F305I-65	380-415Vac	J104-2	(J104-1: Dummy Connector)



DKU-F305I-56 DKU-F305I-65

Fig. 3.5.1.3-10 Jumper Cable P104 Setting

10. Re-Install the plate.

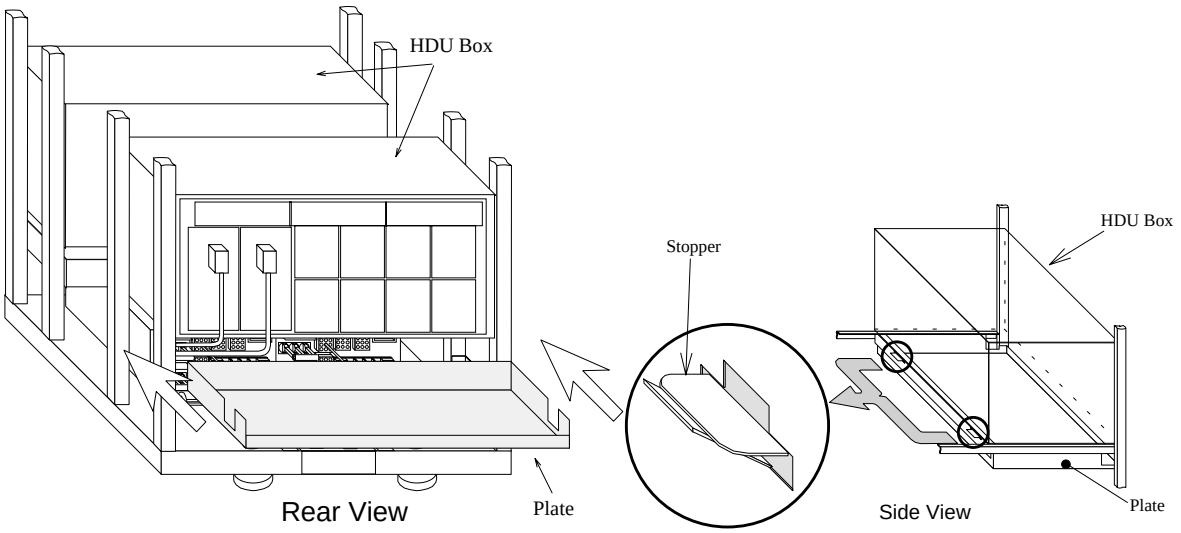


Fig. 3.5.1.3-11 Attachment of Plate

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11. Secure the plate with screws.

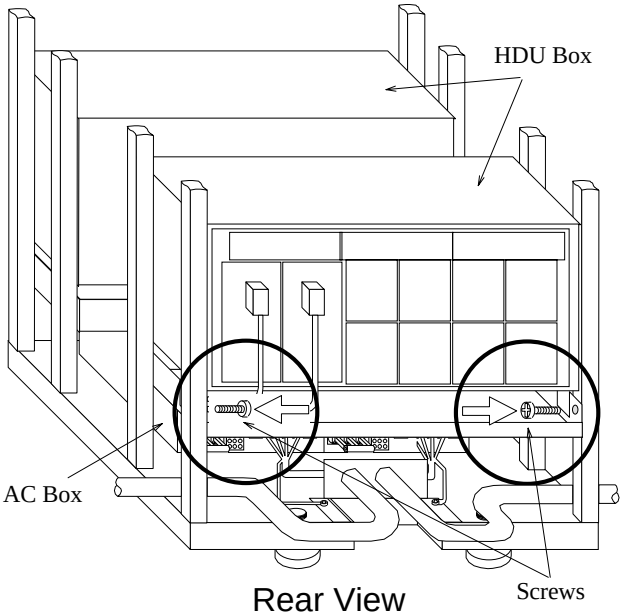

Fig. 3.5.1.3-12 Attachment of Plate

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12. Change the Nameplate.
    Refer to Fig. 3.5.1.3-13 and Fig. 3.5.1.3-14 “Location of Nameplate and Labels”.

DKU-F305I-56

a. Change the Nameplate , Label (V. Hz) and Label (CSA).
   Engrave the manufacturing number and so forth on the new nameplate and labels.
b. Remove the Label (IN), Label (CE Mark) and Label (UL3).
c. Put the Label (UL/CUL) and Label Noise (FCC/CSA).

DKU-F305I-65

a. Change the Nameplate , Label (V. Hz) and Label (CSA).
   Engrave the manufacturing number and so forth on the new nameplate and labels.
b. Remove the Label (UL/CUL) and Label Noise (FCC/CSA).
c. Put the Label (IN), Label (CE Mark) and Label (UL3).

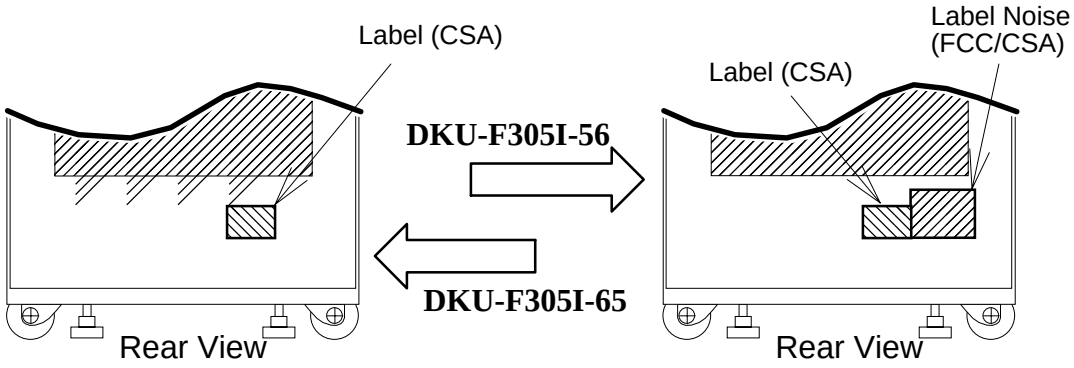

Fig. 3.5.1.3-13 Location of Nameplate and Labels

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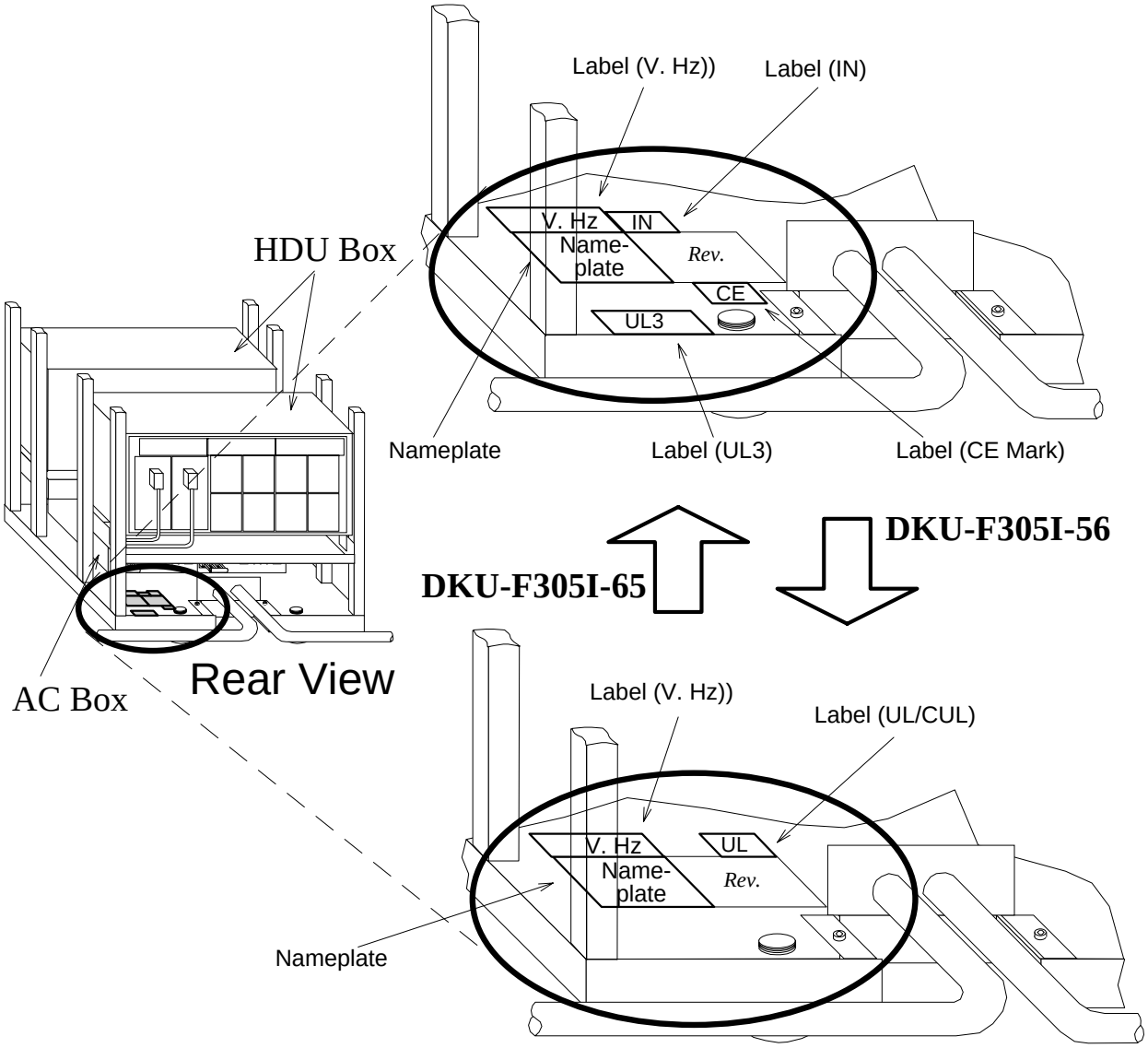

Fig. 3.5.1.3-14 Location of Nameplate and Labels

13. Return to General Flow.
    New Installation
        Basic Disk Unit Installation : Go to INST02-10 step (2)-4.
        Additional Disk Units : Go to INST02-11 step (7)-2.
    Non-Disruptive Installation : Go to INST02-21 step(7)-2.
    Disruptive Installation : Go to INST02-42 step(11)-2.

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3.6 Installation of Channel Adapter

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.1 Installation of Parallel 8-channel Switch (DKC-F310I-8P)

3.6.1.1 Parts list

Table 3.6.1-1 Parts List for Parallel 8-channel Switch

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8P	Parallel 4-channel Switch PCB	3252510-A	2	
		I/F Connector Panel (CH A)	2102090-A	2	For CH A
		I/F Connector Panel (CH B)	2102090-B	2	For CH B
		I/F Connector Panel (CH C)	2102090-C	2	For CH C
		I/F Connector Panel (CH D)	2102090-D	2	For CH D
		Screw	SB408	32	
		Label	5500246-1	4	Parallel
		Nameplate	3252542-5	1	For DKC-F310I-8P
		Bypass Connector	5430027-8	8	For removal of CHA

3.6.1.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panels.
↓
(3) Connect the CH cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.1.3 Installation Procedure of Parallel 8-channel Switch

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.1-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Set the jumper sockets (JP1 to JP4) referring to Fig. 3.6.1-2A.
   c. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.1-2.
   d. Fasten the two screws referring to Fig. 3.6.1-2B.

Table 3.6.1-2 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Only one Parallel 8-channel Switch can be installed in the slot no. P and V (Basic) in the subsystem.

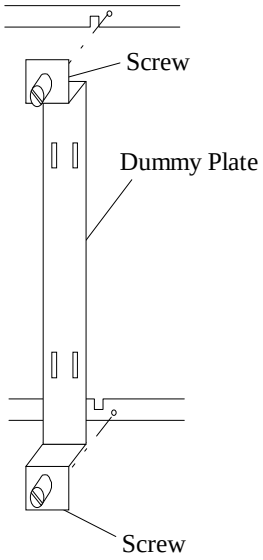
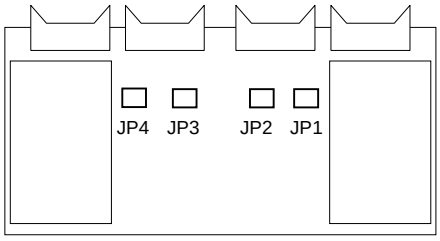


Fig. 3.6.1-1 Removal of Dummy Plate.



	Setting (JP1-JP4)
Selected by SELECT OUT	2 1 8 7
Selected by SELECT IN	2 1 8 7

Fig. 3.6.1-2A Setting of Jumpers

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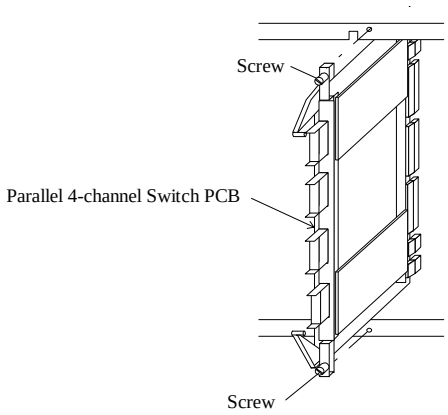

Fig. 3.6.1-2B Insertion of PCB

2. Installation of the I/F connector panel
   Install the I/F connector panel of the CL1, CL2 to the location number ①, ② respectively referring to Fig. 3.6.1-3.

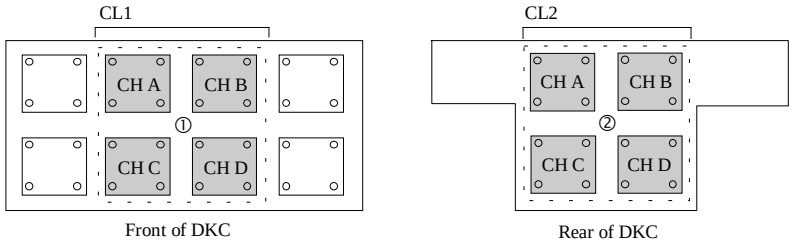

Fig. 3.6.1-3 Location of I/F Connector Panel (Front)

   a. Remove the dummy plate referring to Fig. 3.6.1-4.
   b. Wire the CH cables to the front of DKC and then install the I/F connector panel referring to Fig. 3.6.1-5.
      (Note): Dummy plates should be stored for future use in de-installation.

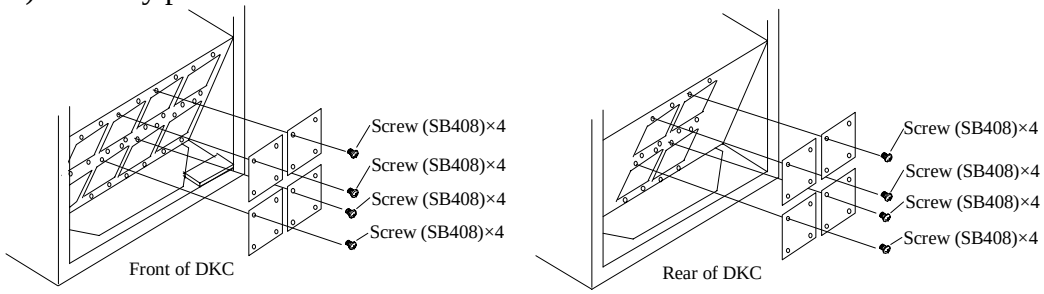

Fig. 3.6.1-4 Removal of Dummy Plate

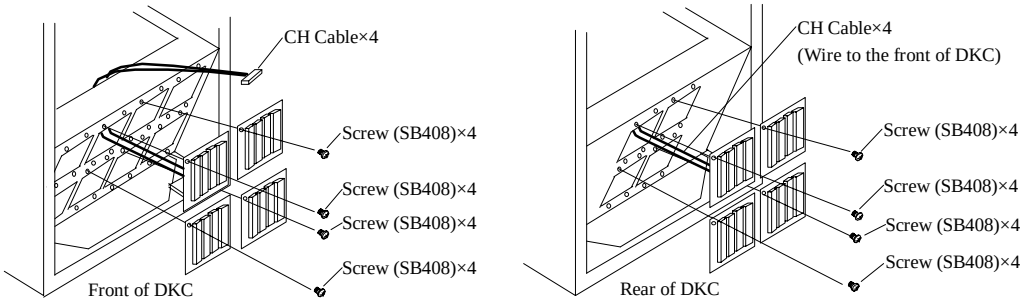

Fig. 3.6.1-5 Installation of I/F Connector Panel

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3. Connection of the CH cables
   a. Connect the CH cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.1-6 and Table 3.6.1-3.

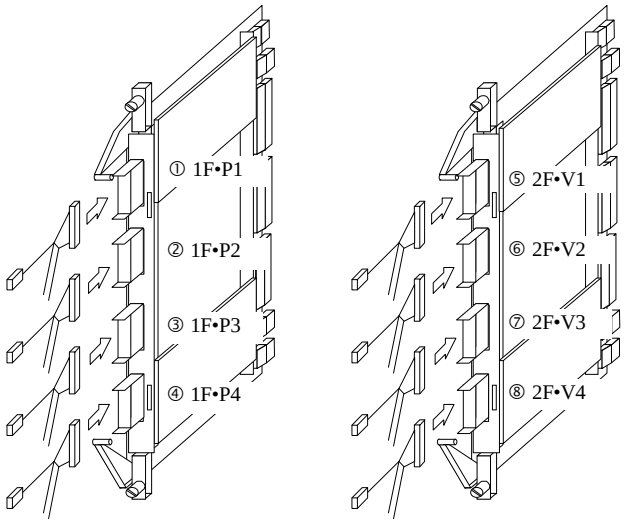

Fig. 3.6.1-6 Connection of CH Cables

Table 3.6.1-3 CH Cable Connection

No.	CH cable	Sub-edge connector on PCB
1	1F･P1/2F･V1	1F･P1
2	1F･P2/2F･V2	1F･P2
3	1F･P3/2F･V3	1F･P3
4	1F･P4/2F･V4	1F･P4
5	1F･P1/2F･V1	2F･V1
6	1F･P2/2F･V2	2F･V2
7	1F･P3/2F･V3	2F･V3
8	1F･P4/2F･V4	2F･V4

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4. Labeling
   a. Attach the labels "PARALLEL PORT" to ① and ② referring to Table. 3.6.1-4 and Fig. 3.6.1-7.

Table 3.6.1-4 Attachment of Labels

Order of addition	Basic
Labeling position	① and ②
Channel No.	A,B,C,D

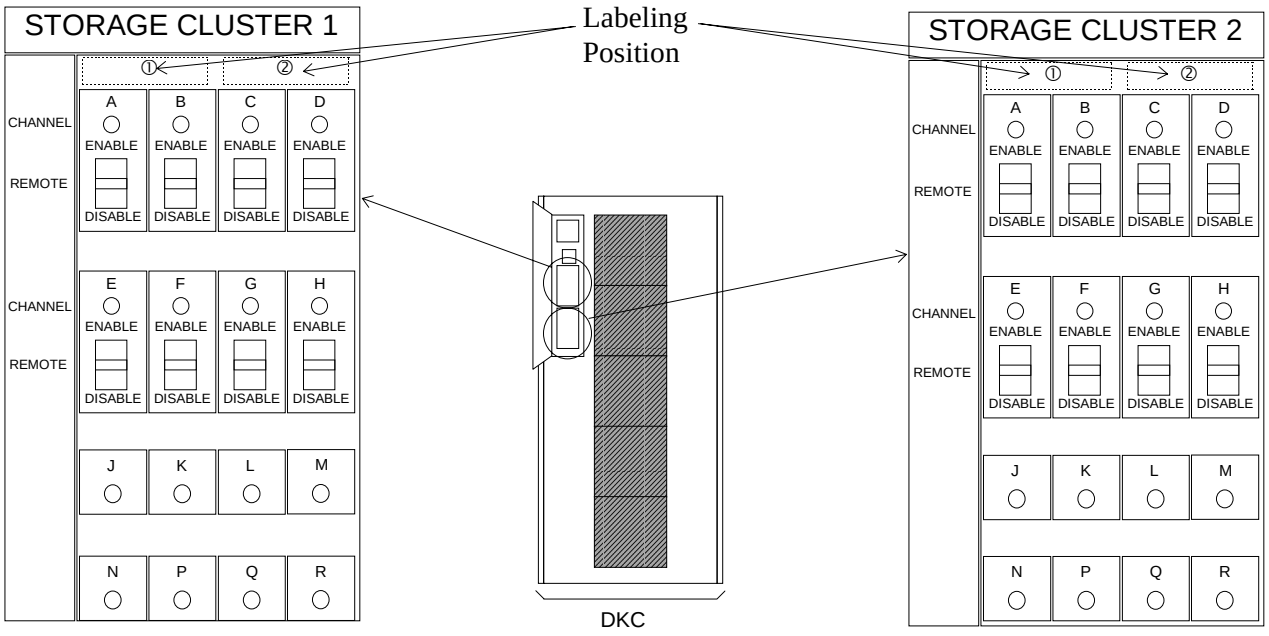

Fig. 3.6.1-7 Attachment of Labels

5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.1-8.

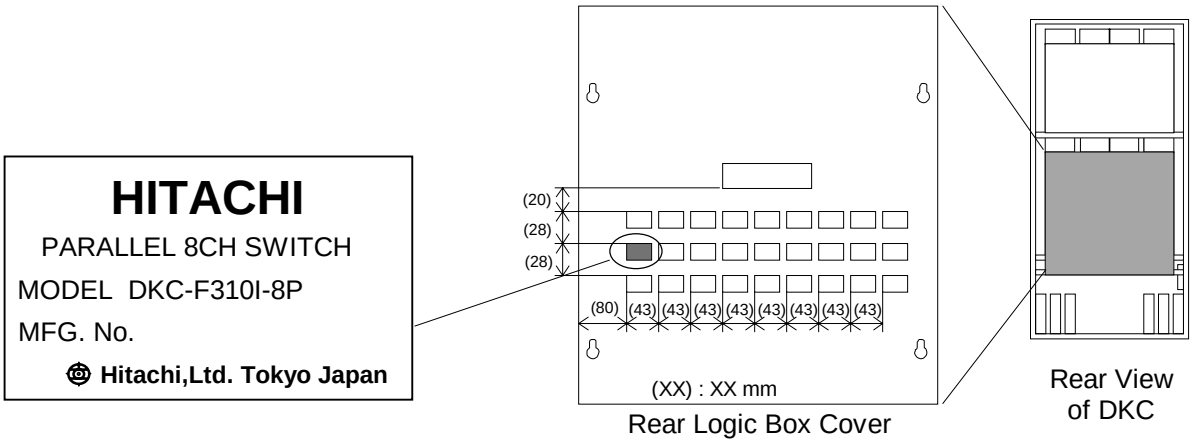

Fig. 3.6.1-8 Attachment of Nameplate

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6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.6.2 Installation of Parallel 8-channel Switch (DKC-F310I-8PS)

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.2.1 Parts list

Table 3.6.2-1 Parts List for Parallel 8-channel Switch

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8PS	Parallel 4-channel Switch PCB	3252510-A	2	
		I/F Connector Panel	2102073-A	1	For CL1(CH A,B/E,F)
		I/F Connector Panel	2102073-B	1	For CL1(CH C,D/G,H)
		I/F Connector Panel	2102073-C	1	For CL2(CH A,B/E,F)
		I/F Connector Panel	2102073-D	1	For CL2(CH C,D/G,H)
		Screw	SB408	16	
		Label	5500246-1	4	Parallel
		Nameplate	3252542-16	1	For DKC-F310I-8PS
		Bypass Connector	5430027-8	8	For removal of CHA

3.6.2.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panels.
↓
(3) Connect the CH cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.2.3 Installation Procedure of Parallel 8-channel Switch

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.2-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Set the jumper sockets (JP1 to JP4) referring to Fig. 3.6.2-2A.
   c. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.2-2.
   d. Fasten the two screws referring to Fig. 3.6.2-2B.

Table 3.6.2-2 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Up to 2 Parallel 8-channel Switches can be installed in the slot no. P and V (Basic), or Q and W (Add.1) in the subsystem.

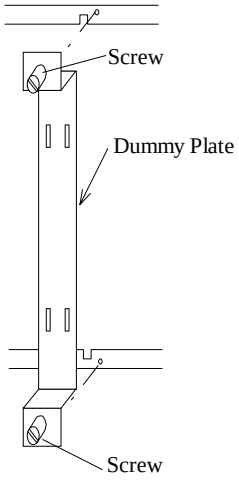
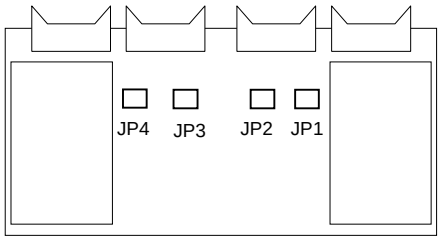


Fig. 3.6.2-1 Removal of Dummy Plate



	Setting (JP1-JP4)
Selected by SELECT OUT	2 1 8 7
Selected by SELECT IN	2 1 8 7

Fig. 3.6.2-2A Setting of Jumpers

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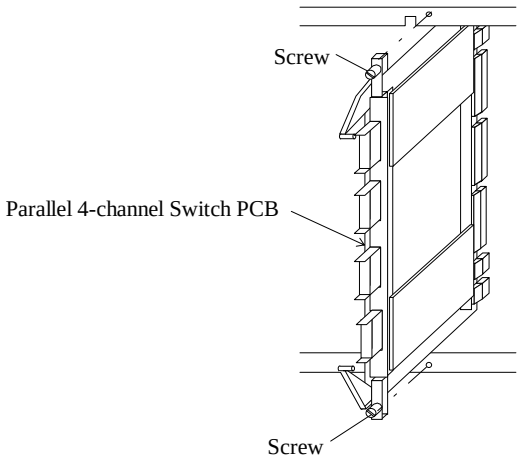

Fig. 3.6.2-2B Insertion of PCB

2. Installation of the I/F connector panel
   Install the I/F connector panel in the installation at Basic, Add.1 to the location number ① and ②, ③ and ④ respectively referring to Fig. 3.6.2-3. However, when a mixture of DKC-F310I-8P is installed, referring to [LOCATION04-40,50] in a LOCATION Section.

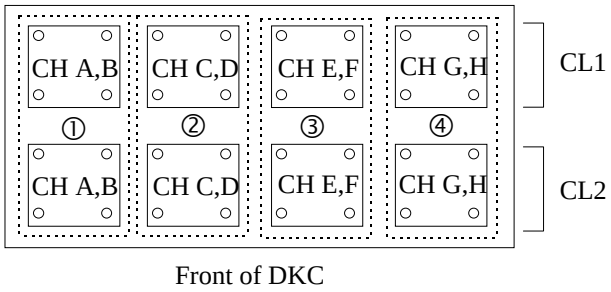

Fig. 3.6.2-3 Location of I/F Connector Panel (Front)

a. Remove the dummy plate referring to Fig. 3.6.2-4.
b. Wire the CH cables to the front of DKC and then install the I/F connector panel referring to Fig. 3.6.2-5.
   (Note): Dummy plates should be stored for future use in de-installation.

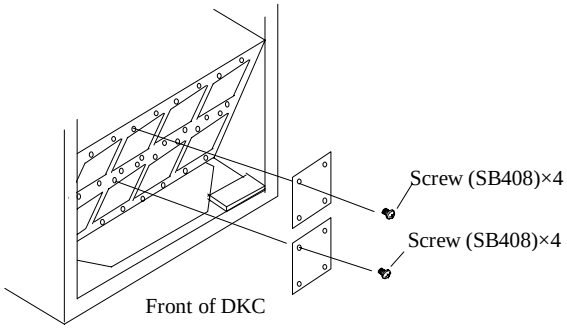

Fig. 3.6.2-4 Removal of Dummy Plate

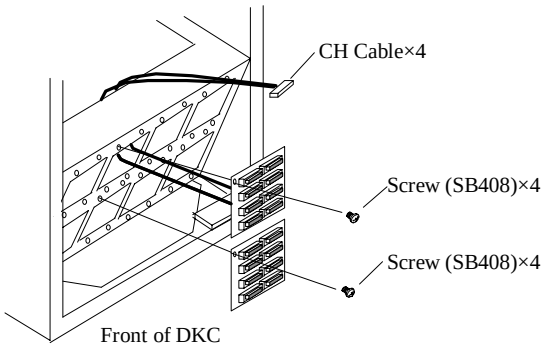

Fig. 3.6.2-5 Installation of I/F Connector Panel

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3. Connection of the CH cables

In case of Basic

a. Connect the CH cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.2-6 and Table 3.6.2-3.

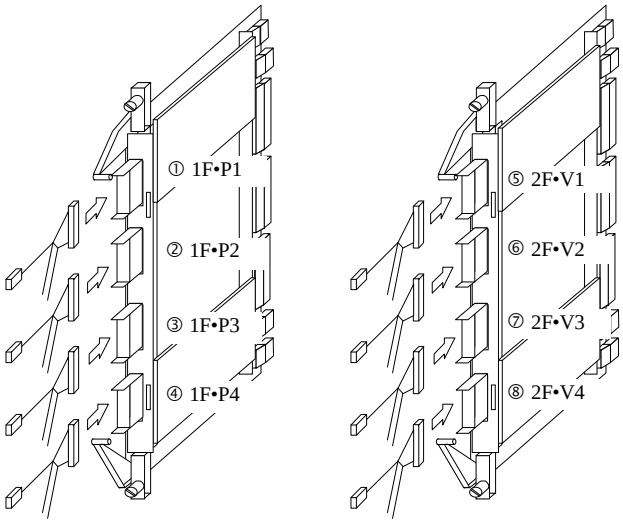

Fig. 3.6.2-6 Connection of CH Cables (Basic)

Table 3.6.2-3 CH Cable Connection

No.	CH cable	Sub-edge connector on PCB
1	1F·P1/1F·Q1	1F·P1
2	1F·P2/1F·Q2	1F·P2
3	1F·P3/1F·Q3	1F·P3
4	1F·P4/1F·Q4	1F·P4
5	2F·V1/2F·W1	2F·V1
6	2F·V2/2F·W2	2F·V2
7	2F·V3/2F·W3	2F·V3
8	2F·V4/2F·W4	2F·V4

In case of Add.1

a. Connect the CH cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.2-7 and Table 3.6.2-4.

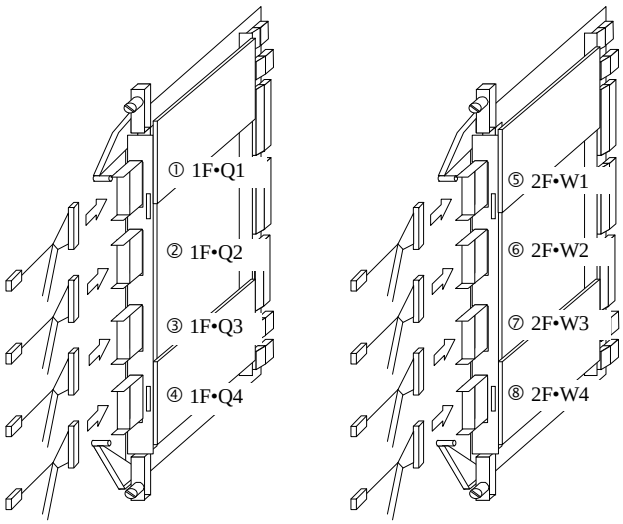

Fig. 3.6.2-7 Connection of CH Cables (Add.1)

Table 3.6.2-4 CH Cable Connection

No.	CH cable	Sub-edge connector on PCB
1	1F·P1/1F·Q1	1F·Q1
2	1F·P2/1F·Q2	1F·Q2
3	1F·P3/1F·Q3	1F·Q3
4	1F·P4/1F·Q4	1F·Q4
5	2F·V1/2F·W1	2F·W1
6	2F·V2/2F·W2	2F·W2
7	2F·V3/2F·W3	2F·W3
8	2F·V4/2F·W4	2F·W4

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4. Labeling
   a. Attach the labels "PARALLEL PORT" to ① through ④ referring to Table. 3.6.2-5 and Fig. 3.6.2-8.

Table 3.6.2-5 Attachment of Labels

Order of addition	Basic	Add.1
Labeling position	① and ②	③ and ④
Channel No.	A,B,C,D	E,F,G,H

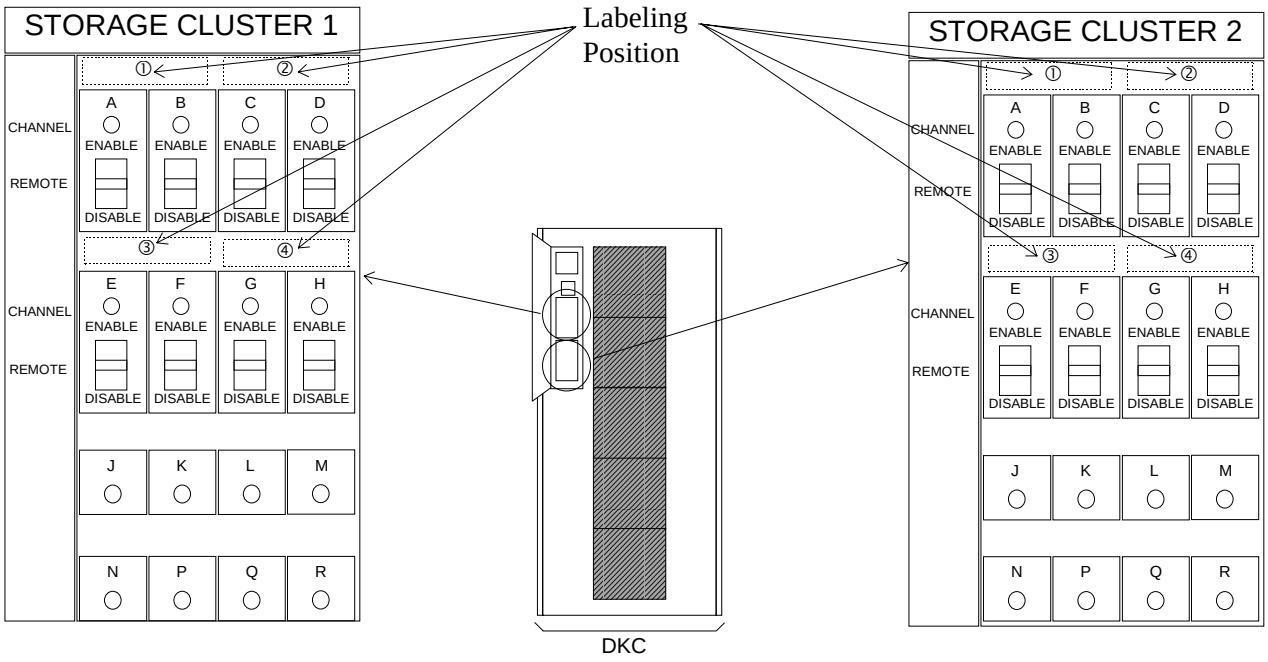

Fig. 3.6.2-8 Attachment of Labels

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5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.2-9.

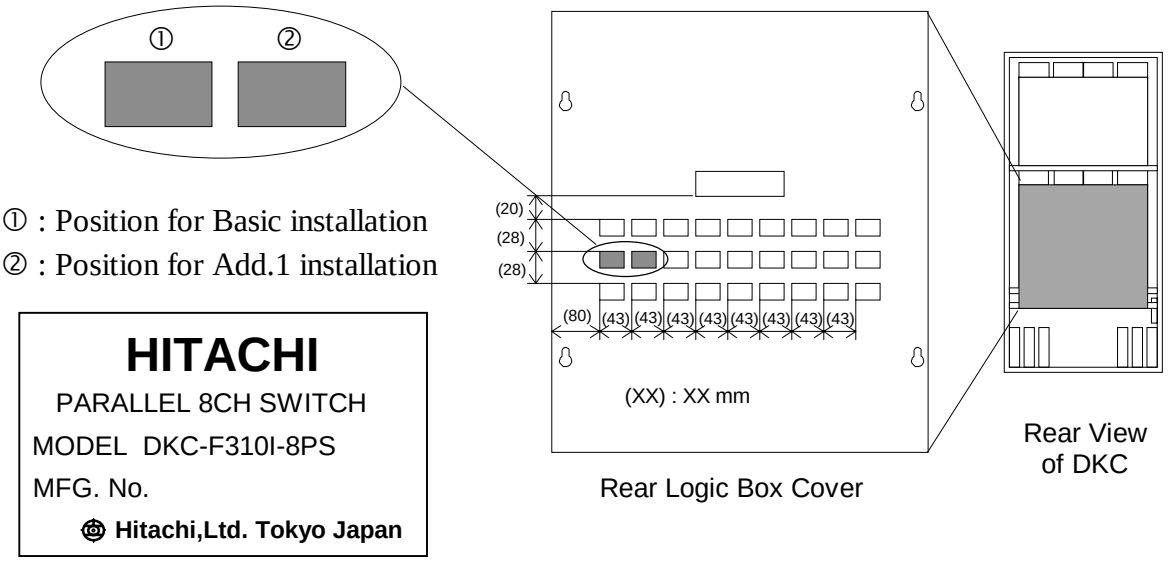

Fig. 3.6.2-9 Attachment of Nameplate

6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.6.3 Installation of Serial 4-port Adapter (DKC-F310I-4S)

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.3.1 Parts list

Table 3.6.3-1 Parts List for Serial 4-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-4S	Serial 2-port Adapter PCB	3252509-B	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500245-1	4	For Serial
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Holder	2084816-1	4	
		Nameplate	3252542-3	1	For DKC-F310I-4S

3.6.3.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panel.
↓
(3) Connect the optical fiber cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.3.3 Installation Procedure of Serial 4-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.3-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.3-2.
   c. Fasten the two screws referring to Fig. 3.6.3-2.

Table 3.6.3-2 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Up to 4 serial 4 port adapters can be installed in the subsystem.

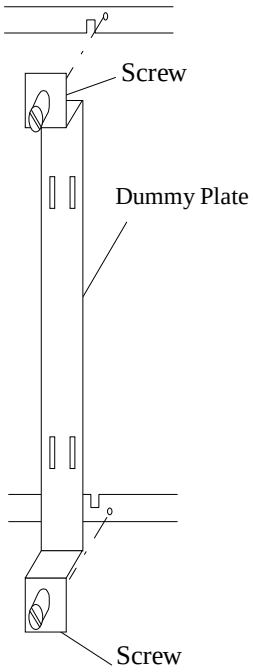

Fig. 3.6.3-1 Removal of Dummy Plate

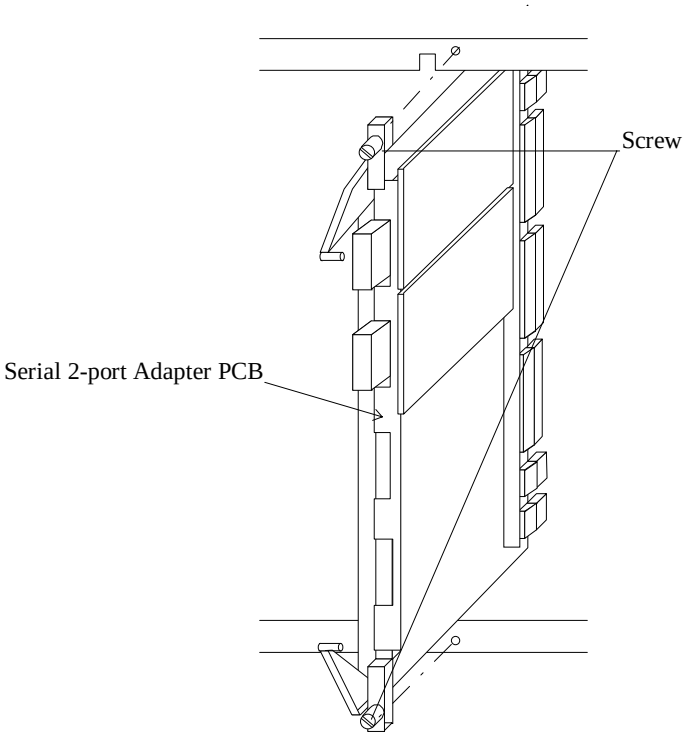

Fig. 3.6.3-2 Insertion of PCB

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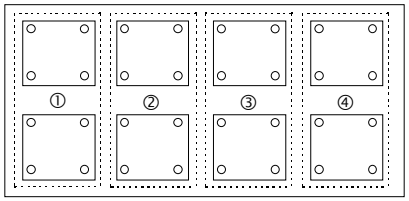
2. Installation of the I/F connector panel
   Install the I/F connector panel in the order of the location number ①②③④ shown in Fig. 3.6.3-3. When the I/F connector panel is installed to the location ④ in the DKC which installs the OUTLET BOX (maintenance tool), remove the OUTLET BOX referring to Fig. 3.6.3-4 before installation of the I/F connector panel. However, when a mixture of parallel channel is installed, referring to [LOCATION04-40] in a LOCATION Section.



①: Position for Basic installation
②: Position for Add.1 installation
③: Position for Add.2 installation
④: Position for Add.3 installation

Fig. 3.6.3-3 Location of I/F Connector Panel (Front)

a. When the I/F connector panel is installed to the location ④, remove the OUTLET BOX referring to Fig. 3.6.3-4.
b. Remove the dummy plate referring to Fig. 3.6.3-5.
c. Install the I/F connector panel referring to Fig. 3.6.3-6.
   (Note): Dummy plates should be stored for future use in de-installation.
d. When the OUTLET BOX was removed, install the OUTLET BOX to the original position after installing the I/F connector panel.

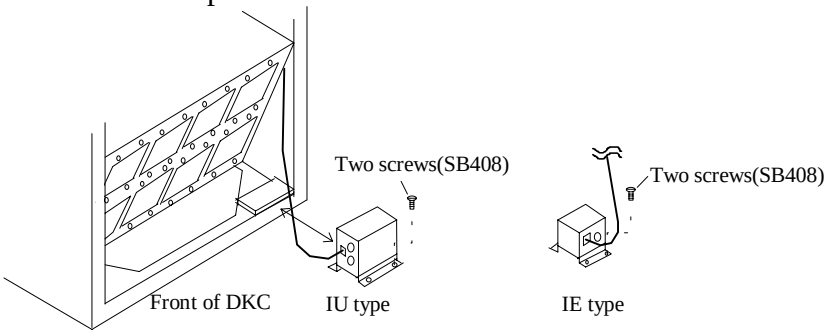


Fig. 3.6.3-4 Removal of OUTLET BOX

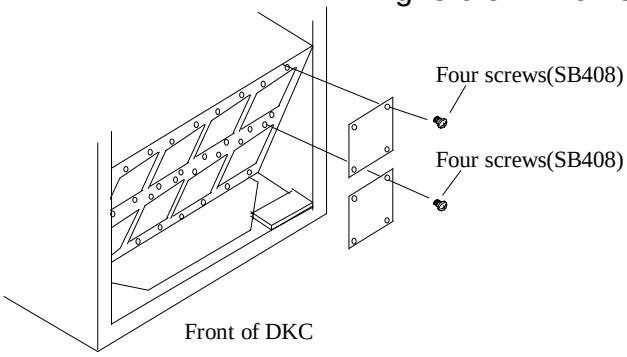


Fig. 3.6.3-5 Removal of Dummy Plate

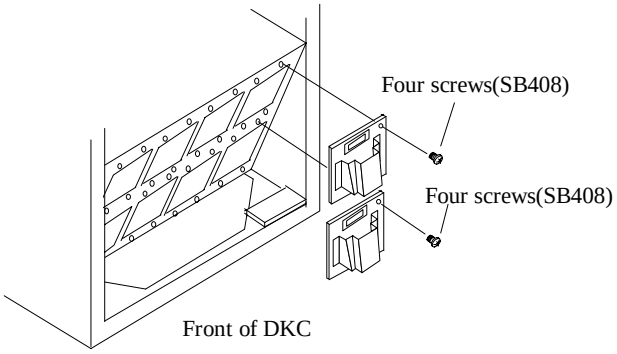


Fig. 3.6.3-6 Installation of I/F Connector Panel

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3. Connection of the optical fiber cable
   a. Pull the optical fiber cable into the DKC through the I/F connector panel. Connect the optical fiber cable to the PCB referring to Serial Channel Interface [LOCATION04-60] in LOCATION section.
   b. Fix the cable with Holder① referring to Fig. 3.6.3-7.
   c. Fix the cable to Lower Strain Relief② and attach Upper Strain Relief③ and Bracket④ referring to Fig. 3.6.3-8.

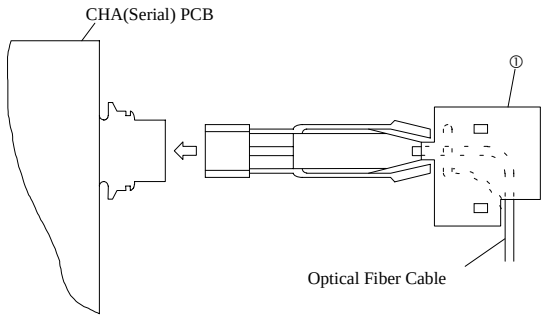

Fig. 3.6.3-7 Connection of Optical Fiber Cable

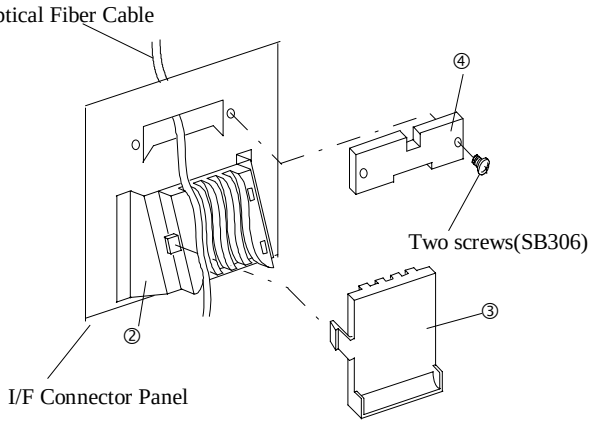

Fig. 3.6.3-8 Installation of Optical Fiber Cable

4. Labeling
   a. Attach the labels "SERIAL PORT" to ①,③,⑤, or ⑦ referring to Table. 3.6.3-3.

Table 3.6.3-3 Attachment of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	①	③	⑤	⑦
Channel No.	A,B	E,F	J,K	N,P

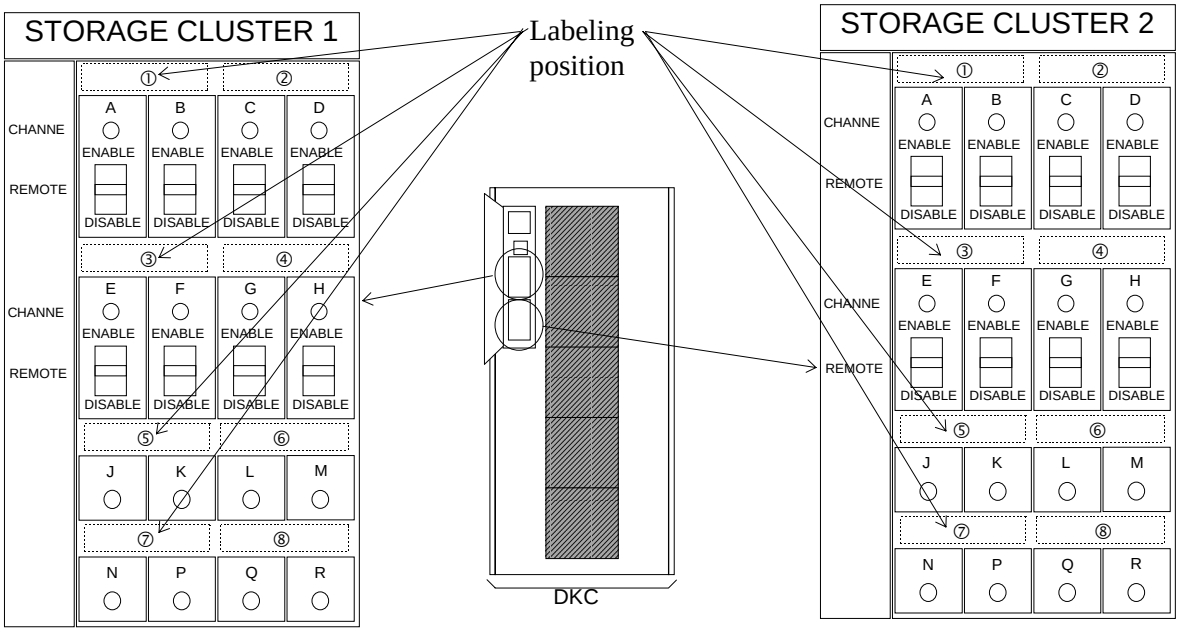

Fig. 3.6.3-9 Attachment of Labels

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5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.3-10.

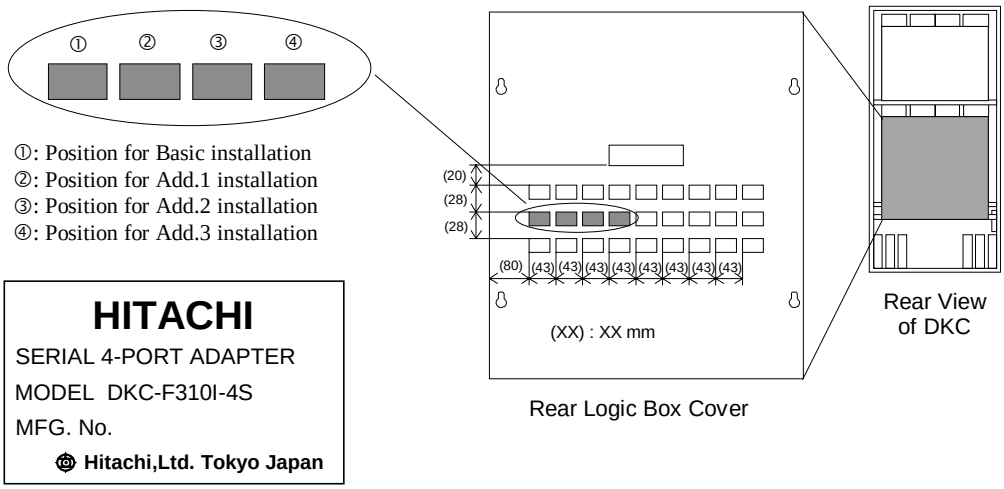

Fig. 3.6.3-10 Attachment of Nameplate

6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.6.4 Installation of Serial 8-port Adapter (DKC-F310I-8S)

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.4.1 Parts list

Table 3.6.4-1 Parts List for Serial 8-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8S	Serial 4-port Adapter PCB	3252509-A	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500245-1	4	For Serial
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Holder	2084816-1	8	
		Nameplate	3252542-4	1	For DKC-F310I-8S

3.6.4.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panel.
↓
(3) Connect the optical fiber cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.4.3 Installation Procedure of Serial 8-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.4-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.4-2.
   c. Fasten the two screws referring to Fig. 3.6.4-2.

Table 3.6.4-2 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Up to 4 serial 8-port adapters can be installed in the subsystem.

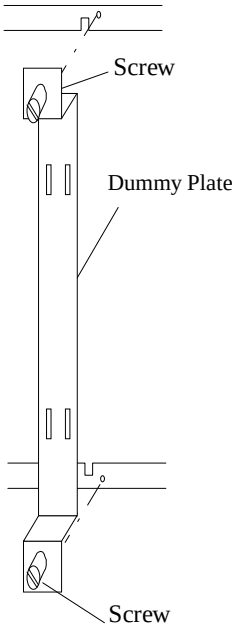

Fig. 3.6.4-1 Removal of Dummy Plate

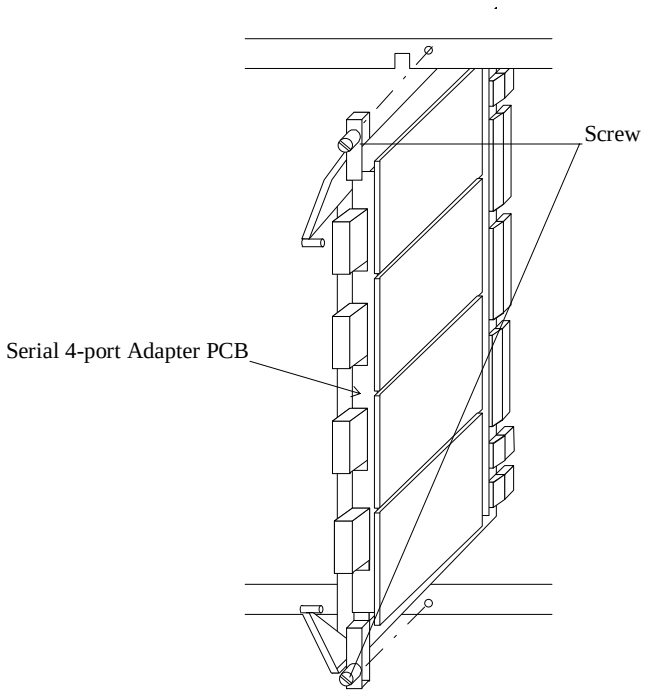

Fig. 3.6.4-2 Insertion of PCB

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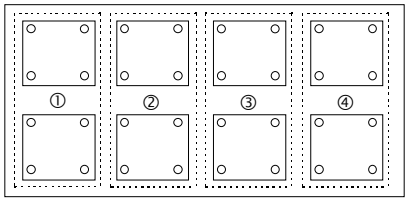
2. Installation of the I/F connector panel
   Install the I/F connector panel in the order of the location number ①②③④ shown in Fig. 3.6.4-3. When the I/F connector panel is installed to the location ④ in the DKC which installs the OUTLET BOX (maintenance tool), remove the OUTLET BOX referring to Fig. 3.6.4-4 before installation of the I/F connector panel. However, when a mixture of parallel channel is installed, referring to [LOCATION04-40] in a LOCATION Section.



①: Position for Basic installation
②: Position for Add.1 installation
③: Position for Add.2 installation
④: Position for Add.3 installation

Fig. 3.6.4-3 Location of I/F Connector Panel (Front)

a. When the I/F connector panel is installed to the location ④, remove the OUTLET BOX referring to Fig. 3.6.4-4.
b. Remove the dummy plate referring to Fig. 3.6.4-5.
c. Install the I/F connector panel referring to Fig. 3.6.4-6.
   (Note): Dummy plates should be stored for future use in de-installation.
d. When the OUTLET BOX was removed, install the OUTLET BOX to the original position after installing the I/F connector panel.

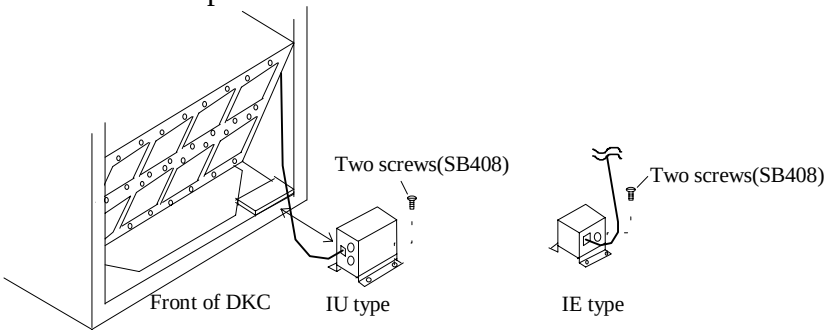


Fig. 3.6.4-4 Removal of OUTLET BOX

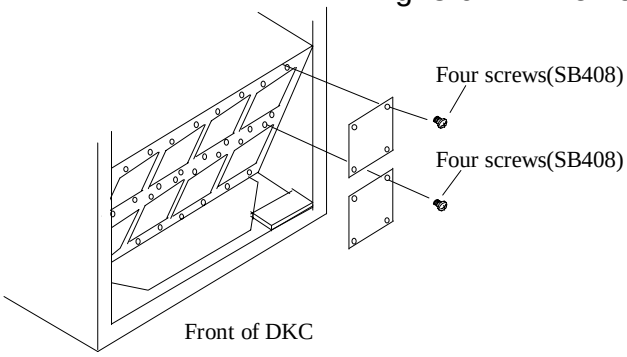


Fig. 3.6.4-5 Removal of Dummy Plate

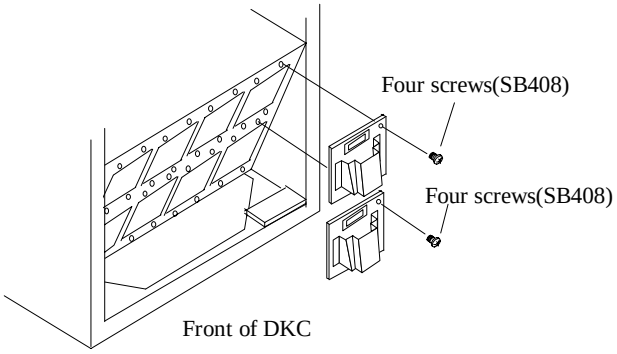


Fig. 3.6.4-6 Installation of I/F Connector Panel

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3. Connection of the optical fiber cable
   a. Pull the optical fiber cable into the DKC through the I/F connector panel. Connect the optical fiber cable to the PCB referring to Serial Channel Interface [LOCATION04-60] in LOCATION section.
   b. Fix the cable with Holder① referring to Fig. 3.6.4-7.
   c. Fix the cable to Lower Strain Relief② and attach Upper Strain Relief③ and Bracket④ referring to Fig. 3.6.4-8.

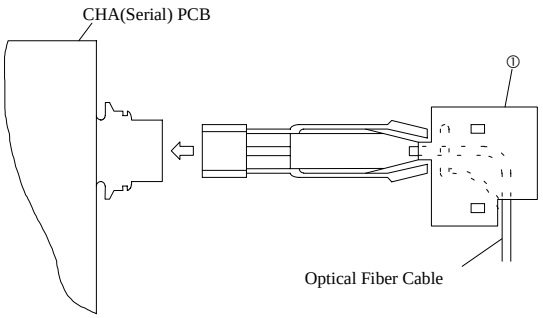

Fig. 3.6.4-7 Connection of Optical Fiber Cable

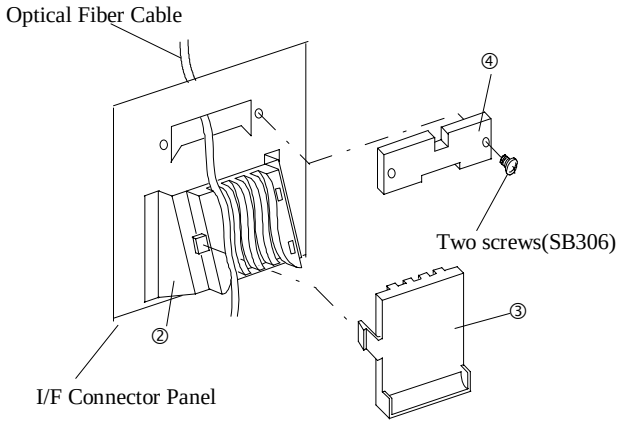

Fig. 3.6.4-8 Installation of Optical Fiber Cable

4. Labeling
   a. Attach the labels "SERIAL PORT" to ① through ⑧ referring to Table. 3.6.4-3.

Table 3.6.4-3 Attachment of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	① and ②	③ and ④	⑤ and ⑥	⑦ and ⑧
Channel No.	A,B,C,D	E,F,G,H	J,K,L,M	N,P,Q,R

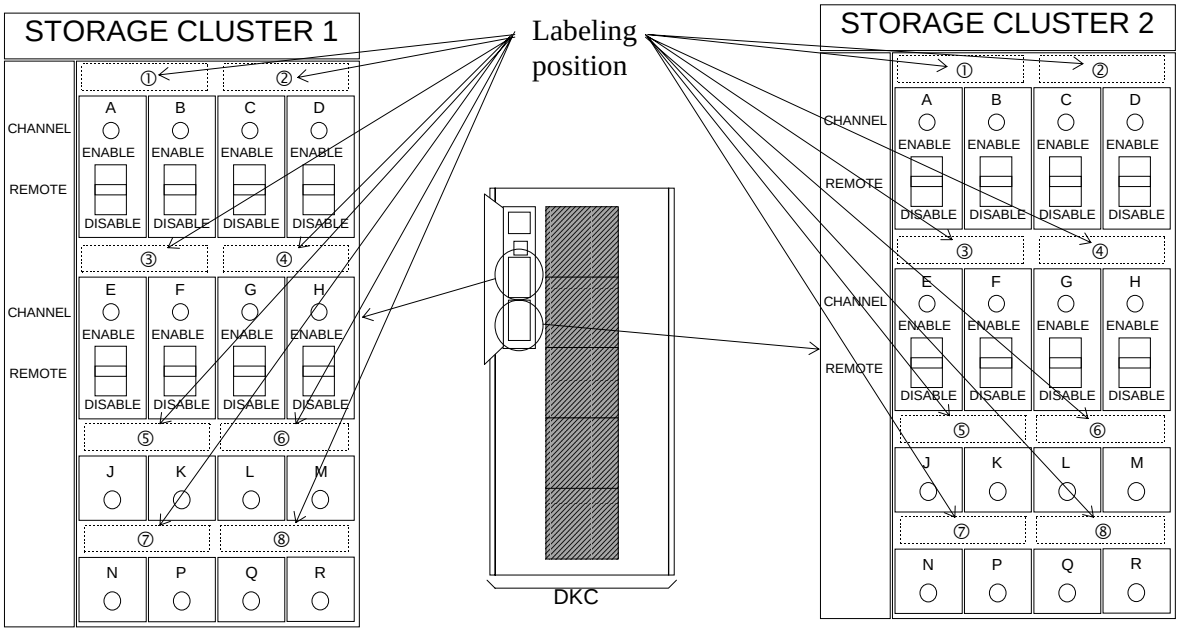

Fig. 3.6.4-9 Attachment of Labels

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5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.4-10.

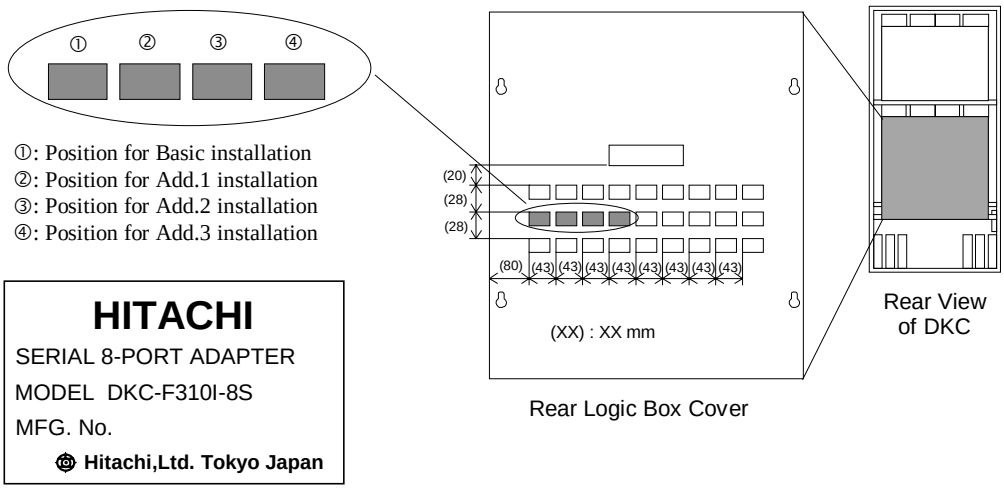

Fig. 3.6.4-10 Attachment of Nameplate

6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.6.5 Installation of SCSI 8-port Adapter (DKC-F310I-8C)

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.5.1 Parts list

Table 3.6.5-1 Parts List for SCSI 8-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8C	SCSI 4-port Adapter PCB	3252505-A	2	
		I/F Connector Panel	2102035-A	1	Cluster 1 side
		I/F Connector Panel	2102035-B	1	Cluster 2 side
		Screw	SB408	8	
		Label	5500247-1	4	SCSI
		Nameplate	3252542-6	1	For DKC-F310I-8C
		Connector (Terminator)	5486080-868	8	

3.6.5.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panels.
↓
(3) Connect the SCSI cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.5.3 Installation Procedure of SCSI 8-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.5-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.5-2.
   c. Fasten the two screws referring to Fig. 3.6.5-2.

Table 3.6.5-2 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Up to 4 SCSI 8-port adapters can be installed in the subsystem.

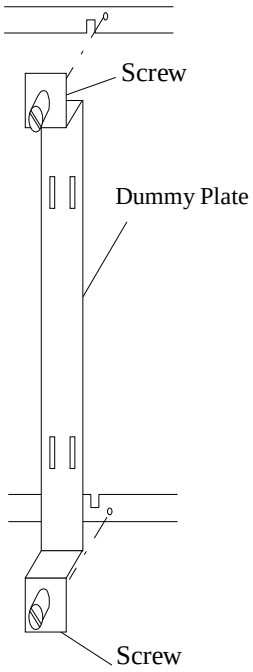

Fig. 3.6.5-1 Removal of Dummy Plate

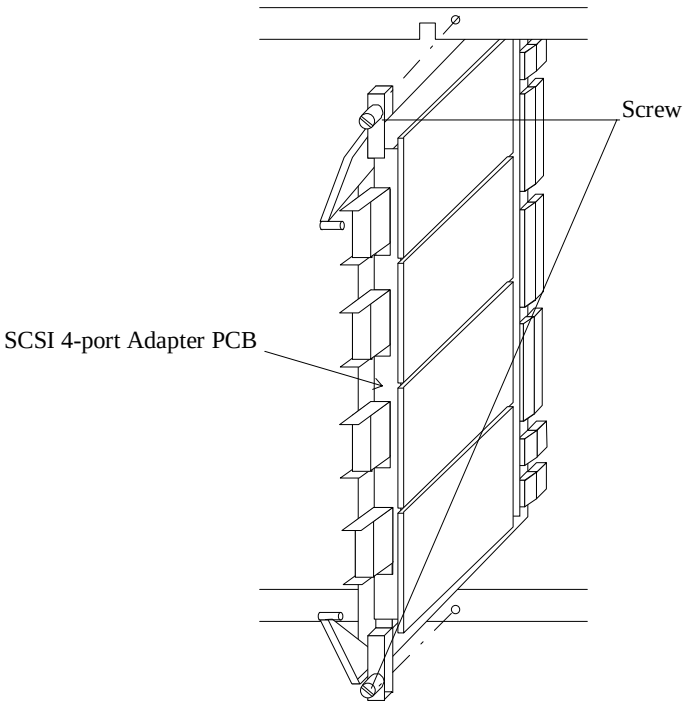

Fig. 3.6.5-2 Insertion of PCB

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2. Installation of the I/F connector panel
   Install the I/F connector panel in the order of the location number ①②③④ shown in Fig. 3.6.5-3. When the I/F connector panel is installed to the location ④ in the DKC which installs the OUTLET BOX (maintenance tool), remove the OUTLET BOX referring to Fig. 3.6.5-4 before installation of the I/F connector panel. However, when a mixture of parallel channel is installed, referring to [LOCATION04-40,70] in a LOCATION Section.

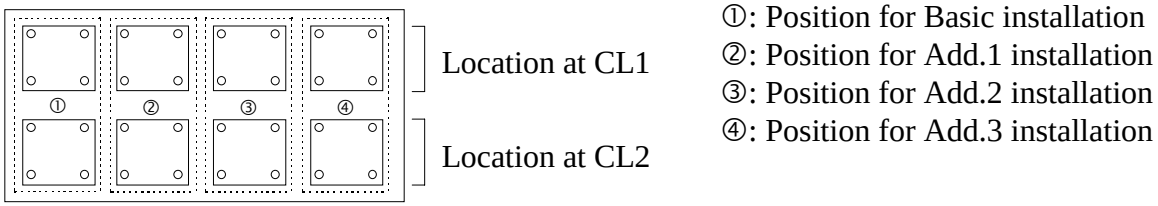

Fig. 3.6.5-3 Location of I/F Connector Panel (Front)

a. When the I/F connector panel is installed to the location ④, remove the OUTLET BOX referring to Fig. 3.6.5-4.
b. Remove the dummy plate referring to Fig. 3.6.5-5.
c. Wire the SCSI cables to the front of DKC and then install the I/F connector panel referring to Fig. 3.6.5-6.
   (Note): Dummy plates should be stored for future use in de-installation.
d. When the OUTLET BOX was removed, install the OUTLET BOX to the original position after installing the I/F connector panel.

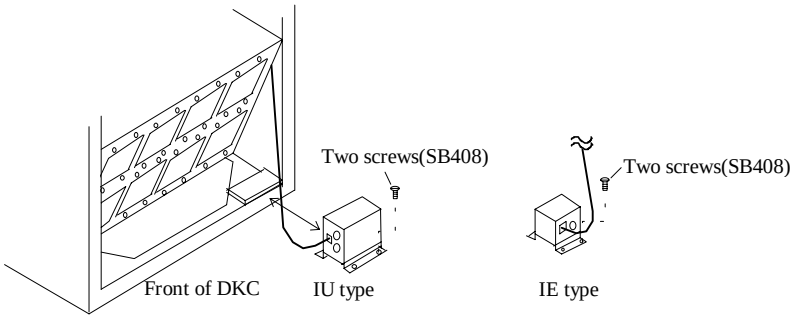

Fig. 3.6.5-4 Removal of OUTLET BOX

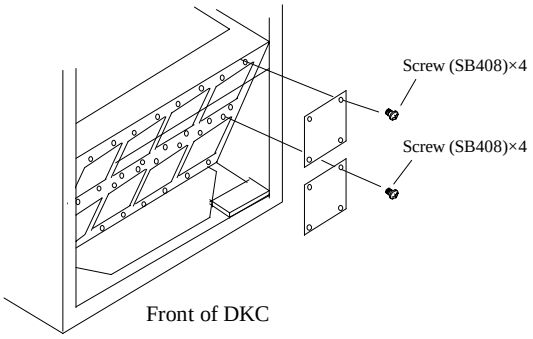

Fig. 3.6.5-5 Removal of Dummy Plate

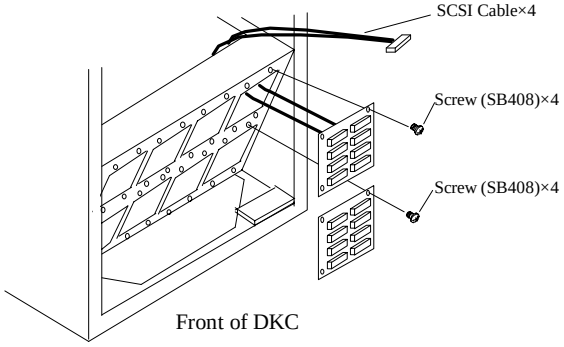

Fig. 3.6.5-6 Installation of I/F Connector Panel

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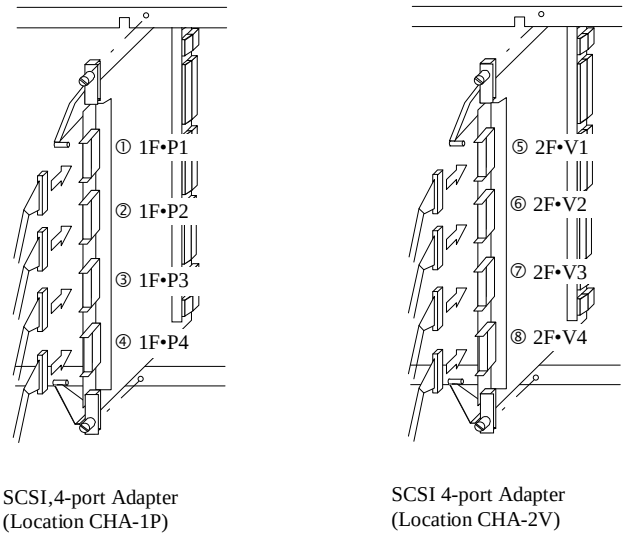
3. Connection of the SCSI cables

In case of Basic

a. Connect the SCSI cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.5-7 and Table 3.6.5-3.



SCSI,4-port Adapter (Location CHA-1P)

SCSI 4-port Adapter (Location CHA-2V)

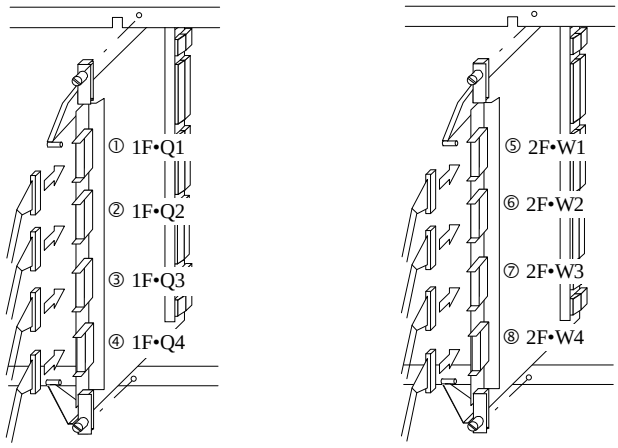
Fig. 3.6.5-7 Connection of SCSI Cables (Basic)

Table 3.6.5-3 SCSI Cable Connection

No.	SCSI cable	Sub-edge connector on PCB
1	1F·SC1	1F·P1
2	1F·SC2	1F·P2
3	1F·SC3	1F·P3
4	1F·SC4	1F·P4
5	2F·SC1	2F·V1
6	2F·SC2	2F·V2
7	2F·SC3	2F·V3
8	2F·SC4	2F·V4

In case of Add.1

a. Connect the SCSI cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.5-8 and Table 3.6.5-4.



SCSI,4-port Adapter (Location CHA-1Q)

SCSI 4-port Adapter (Location CHA-2W)

Fig. 3.6.5-8 Connection of SCSI Cables (Add.1)

Table 3.6.5-4 SCSI Cable Connection

No.	SCSI cable	Sub-edge connector on PCB
1	1F·SC1	1F·Q1
2	1F·SC2	1F·Q2
3	1F·SC3	1F·Q3
4	1F·SC4	1F·Q4
5	2F·SC1	2F·W1
6	2F·SC2	2F·W2
7	2F·SC3	2F·W3
8	2F·SC4	2F·W4

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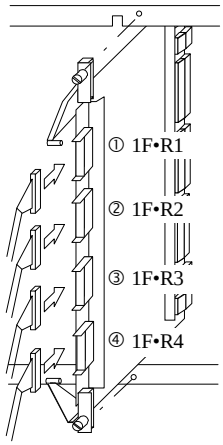
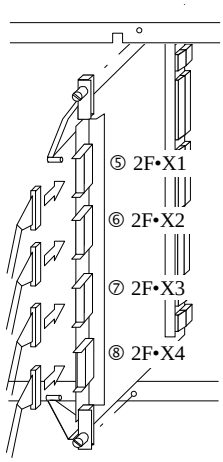
In case of Add.2

a. Connect the SCSI cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.5-9 and Table 3.6.5-5.



SCSI,4-port Adapter
(Location CHA-1R)



SCSI 4-port Adapter
(Location CHA-2X)

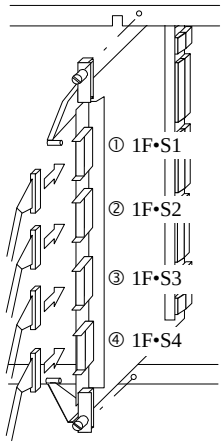
Table 3.6.5-5 SCSI Cable Connection

No.	SCSI cable	Sub-edge connector on PCB
1	1F･SC1	1F･R1
2	1F･SC2	1F･R2
3	1F･SC3	1F･R3
4	1F･SC4	1F･R4
5	2F･SC1	2F･X1
6	2F･SC2	2F･X2
7	2F･SC3	2F･X3
8	2F･SC4	2F･X4

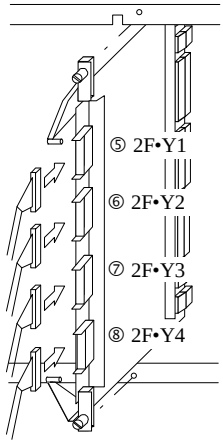
Fig. 3.6.5-9 Connection of SCSI Cables (Add.2)

In case of Add.3

a. Connect the SCSI cables to the sub-edge connectors on PCB. Refer to Fig. 3.6.5-10 and Table 3.6.5-6.



SCSI 4-port Adapter
(Location CHA-1S)



SCSI 4-port Adapter
(Location CHA-2Y)

Table 3.6.5-6 SCSI Cable Connection

No.	SCSI cable	Sub-edge connector on PCB
1	1F･SC1	1F･S1
2	1F･SC2	1F･S2
3	1F･SC3	1F･S3
4	1F･SC4	1F･S4
5	2F･SC1	2F･Y1
6	2F･SC2	2F･Y2
7	2F･SC3	2F･Y3
8	2F･SC4	2F･Y4

Fig. 3.6.5-10 Connection of SCSI Cables (Add.3)

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4. Labeling
   a. Attach the labels "SCSI PORT" to ① through ⑧ referring to Table. 3.6.5-7.

Table 3.6.5-7 Attachment of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	① and ②	③ and ④	⑤ and ⑥	⑦ and ⑧
Channel No.	A,B,C,D	E,F,G,H	J,K,L,M	N,P,Q,R

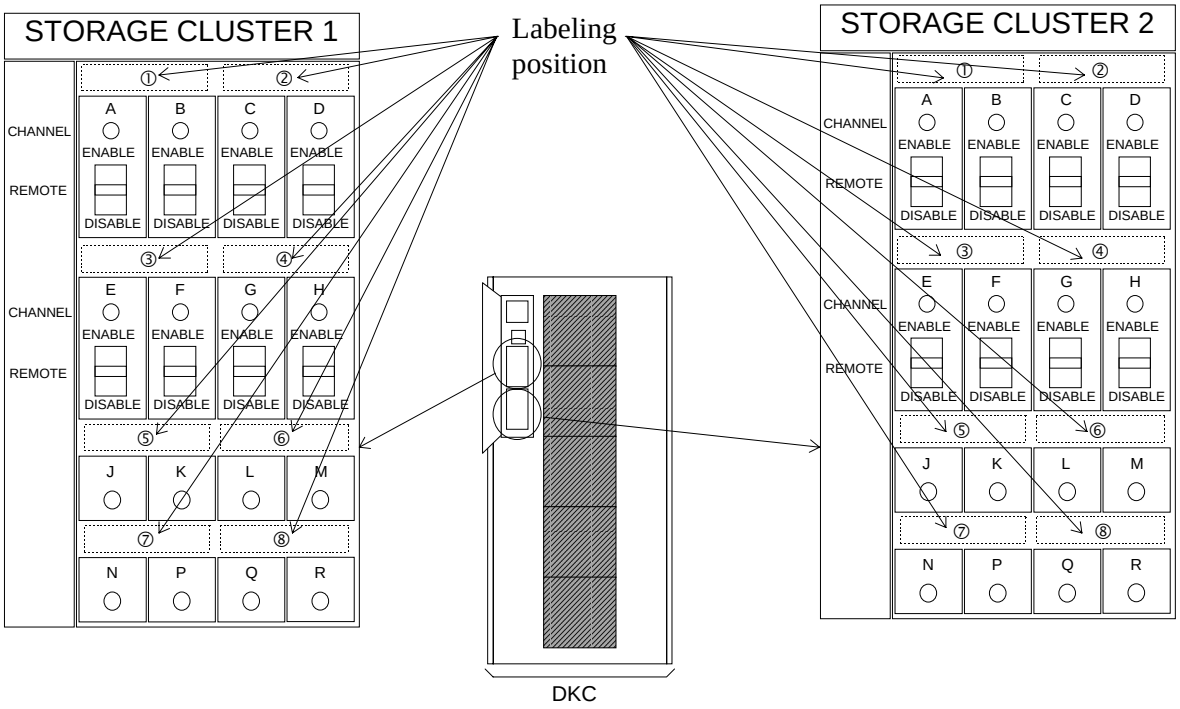

Fig. 3.6.5-11 Attachment of Labels

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5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.5-12.

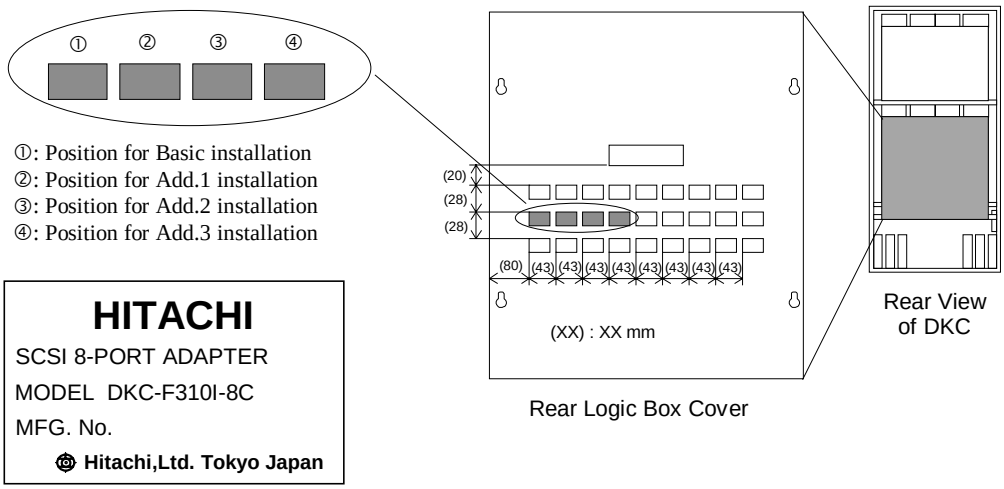

Fig. 3.6.5-12 Attachment of Nameplate

6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.6.6 Installation of Fibre 4-port Adapter for Optical Cable (DKC-F310I-4F/4FE)

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.6.1 Parts list

Table 3.6.6-1 Parts List for Fibre 4-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-4F	Fibre 2-port Adapter PCB	3252506-A	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	4	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-7	1	For DKC-F310I-4F
2	DKC-F310I-4FE	Fibre 2-port Adapter PCB	3252506-C	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	4	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-75	1	For DKC-F310I-4FE

3.6.6.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panel.
↓
(3) Connect the optical fiber cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.6.3 Installation Procedure of Fibre 4-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.6-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.6-2.
   c. Fasten the two screws referring to Fig. 3.6.6-2.

Table 3.6.6-2 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Up to 4 Fibre 4-port adapters can be installed in the subsystem.

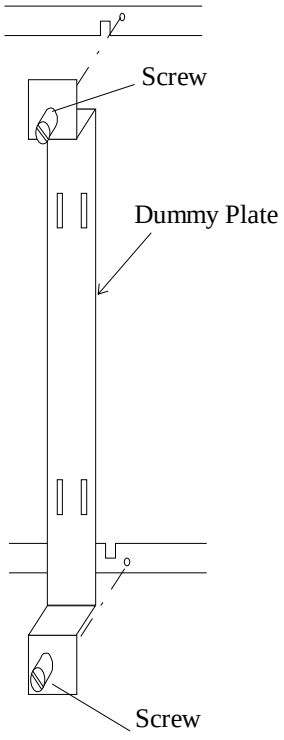

Fig. 3.6.6-1 Removal of Dummy Plate

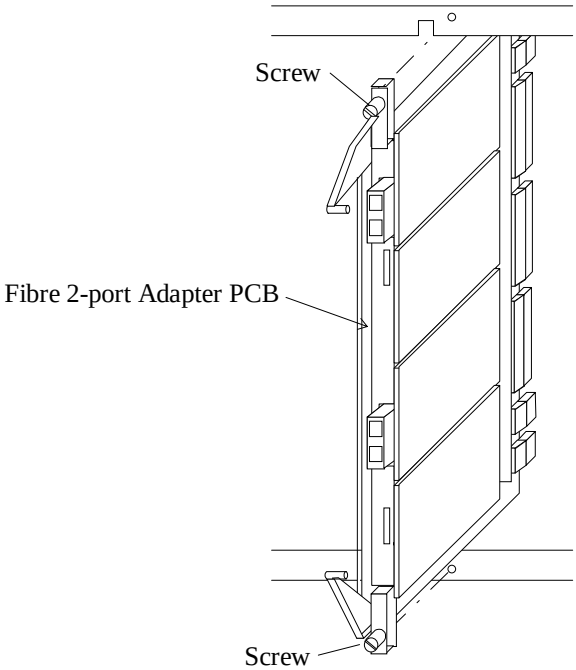

Fig. 3.6.6-2 Insertion of PCB

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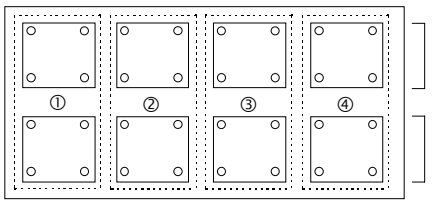
2. Installation of the I/F connector panel
   Install the I/F connector panel in the order of the location number ①②③④ shown in Fig. 3.6.6-3. When the I/F connector panel is installed to the location ④ in the DKC which installs the OUTLET BOX (maintenance tool), remove the OUTLET BOX referring to Fig. 3.6.6-4 before installation of the I/F connector panel. However, when a mixture of parallel channel is installed, referring to [LOCATION04-40] in a LOCATION Section.



①: Position for Basic installation
②: Position for Add.1 installation
③: Position for Add.2 installation
④: Position for Add.3 installation

Fig. 3.6.6-3 Location of I/F Connector Panel (Front)

a. When the I/F connector panel is installed to the location ④, remove the OUTLET BOX referring to Fig. 3.6.6-4.
b. Remove the dummy plate referring to Fig. 3.6.6-5.
c. Install the I/F connector panel referring to Fig. 3.6.6-6.
   (Note): Dummy plates should be stored for future use in de-installation.
d. When the OUTLET BOX was removed, install the OUTLET BOX to the original location after installing the I/F connector panel.

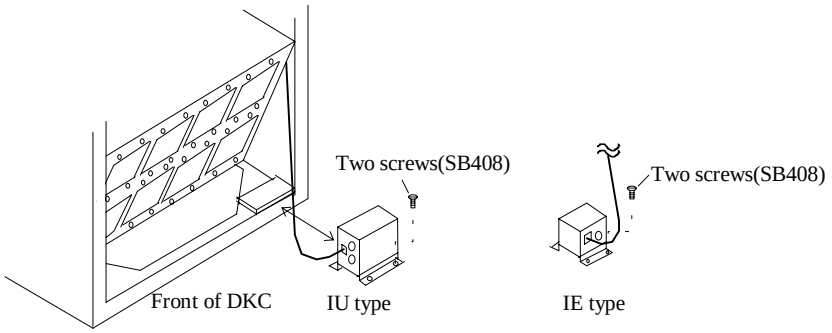


Fig. 3.6.6-4 Removal of OUTLET BOX

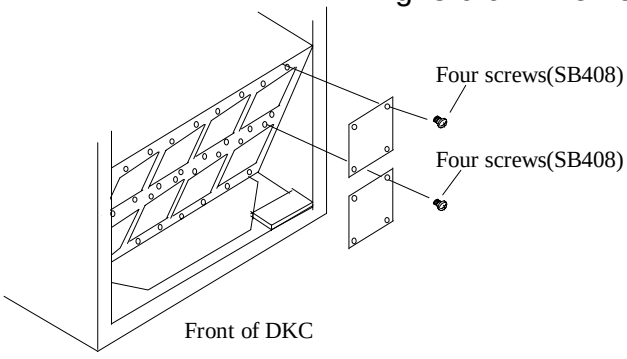


Fig. 3.6.6-5 Removal of Dummy Plate

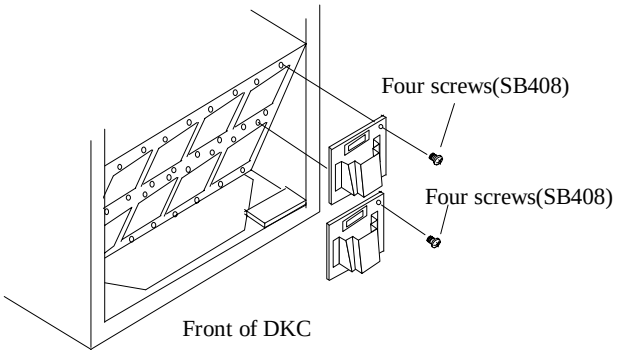


Fig. 3.6.6-6 Installation of I/F Connector Panel

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3. Connection of the optical fiber cable
   a. Pull the optical fiber cable into the DKC through the I/F connector panel referring to Fig. 3.6.6.7. Connect the optical fiber cable to the PCB. Refer to Fibre Channel Interface [LOCATION04-80] in LOCATION section.
   b. Fix the cable to Lower Strain Relief① and attach Upper Strain Relief② and Bracket③ referring to Fig. 3.6.6-8.

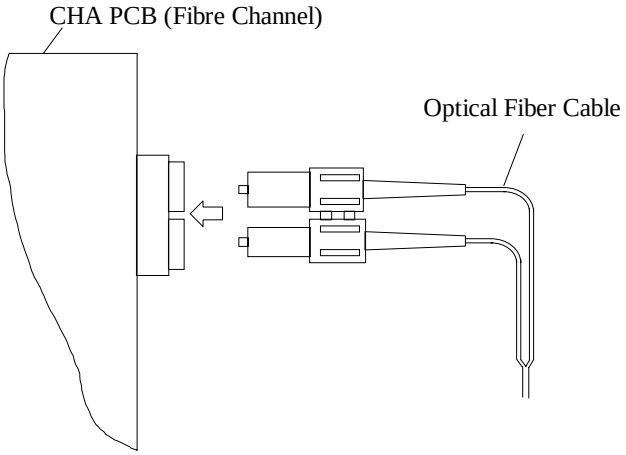

Fig. 3.6.6-7 Connection of Optical Fiber Cable

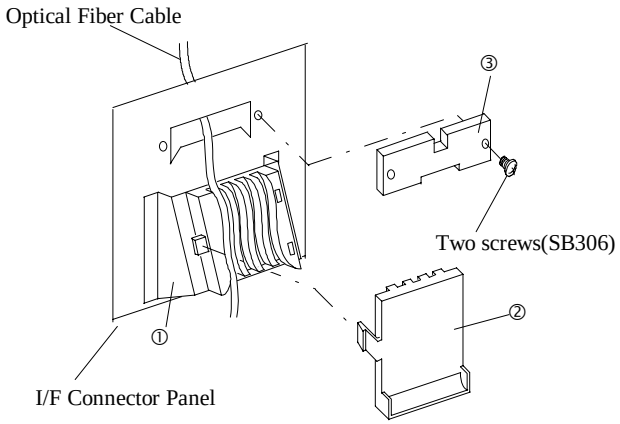

Fig. 3.6.6-8 Installation of Optical Fiber Cable

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4. Labeling
   a. Attach the labels "FIBRE PORT" to ①,③,⑤, or ⑦ referring to Table. 3.6.6-3 and Fig. 3.6.6-9.

Table 3.6.6-3 Attachment of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	①	③	⑤	⑦
Channel No.	A,B	E,F	J,K	N,P

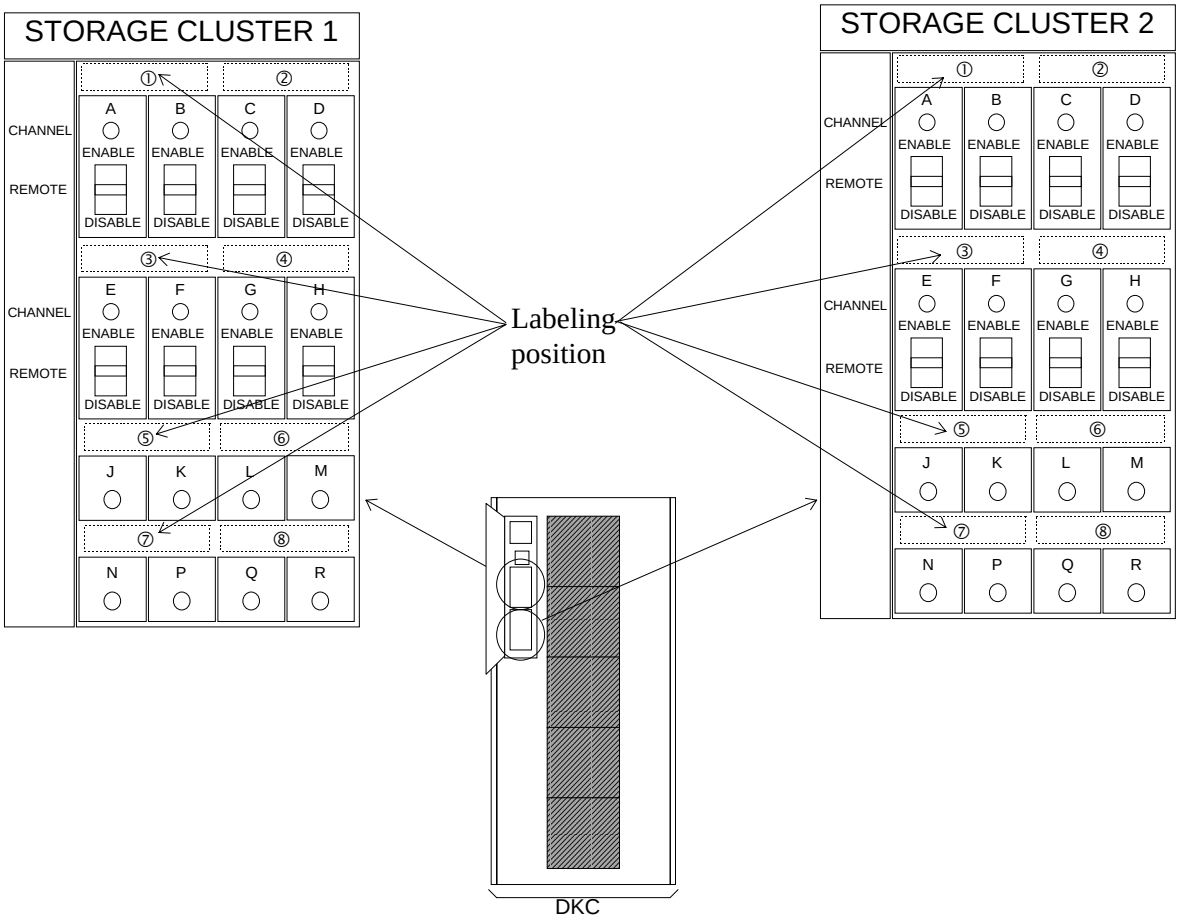

Fig. 3.6.6-9 Attachment of Labels

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5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.6-10.

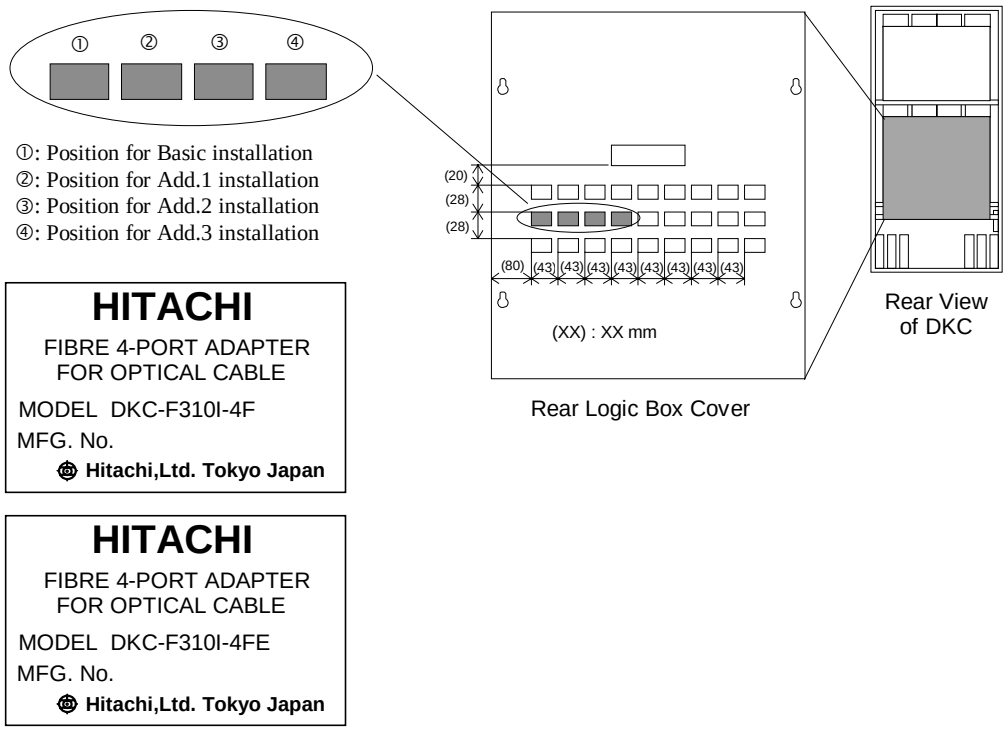

Fig. 3.6.6-10 Attachment of Nameplate

6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.6.7 Installation of Fibre 4-port Adapter for Optical Cable (DKC-F310I-4GS/4GL)

Note : When installing three or more channel options,
the CL Additional Power Supply (DKC-F310I-80) must be installed.
In such a case, be sure to add the channel option(s) after the CL Additional Power Supply is added.

3.6.7.1 Parts list

Table 3.6.7-1 Parts List for Fibre 4-port Adapter (Short Wavelength)

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-4GS (Short Wavelength)	Fibre 2-port Adapter PCB	3254519-A	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	4	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-63	1	

Table 3.6.7-2 Parts List for Fibre 4-port Adapter (Long Wavelength)

No.	Model Number	Part Name	Part No.	Quantity	Remarks
2	DKC-F310I-4GL (Long Wavelength)	Fibre 2-port Adapter PCB	3254519-B	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	2	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-64	1	

3.6.7.2 Flowchart

(1) Insert the PCBs.
↓
(2) Install the I/F connector panel.
↓
(3) Connect the optical fiber cables.
↓
(4) Attach the labels.
↓
(5) Attach the nameplate.

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3.6.7.3 Installation Procedure of Fibre 4-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.6.7-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.6.7-3.
   c. Fasten the two screws referring to Fig. 3.6.7-2.

Table 3.6.7-3 Inserting Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM-1N	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CACHE-1T	CACHE-2U	CHA-2V	CHA-2W	CHA-2X	CHA-2Y	TM-1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

Up to 4 Fibre 4-port adapters can be installed in the subsystem.

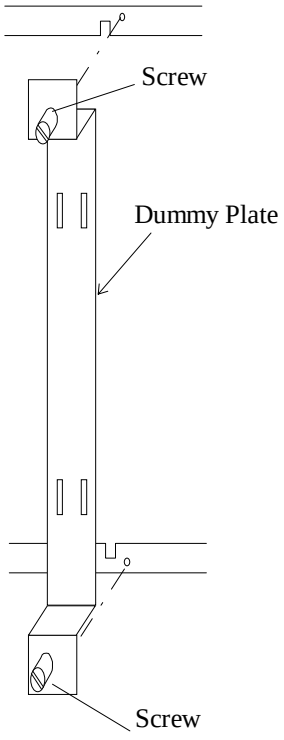

Fig. 3.6.7-1 Removal of Dummy Plate

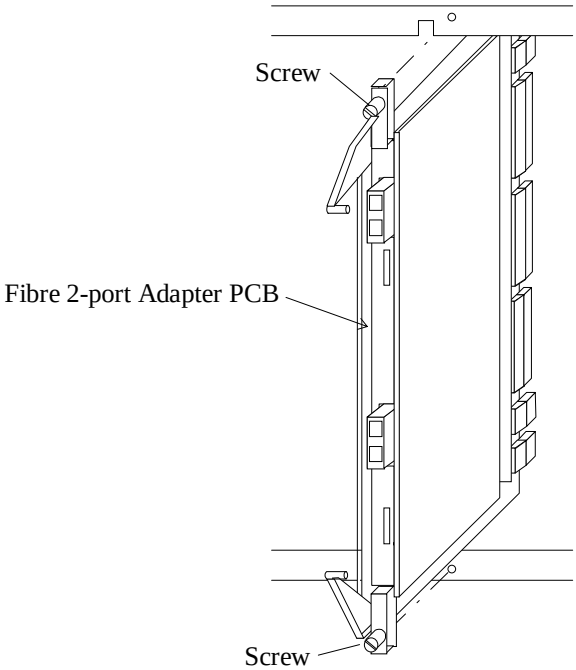

Fig. 3.6.7-2 Insertion of PCB

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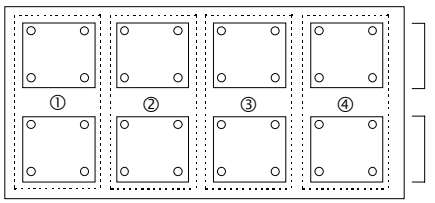
2. Installation of the I/F connector panel
   Install the I/F connector panel in the order of the location number ①②③④ shown in Fig. 3.6.7-3. When the I/F connector panel is installed to the location ④ in the DKC which installs the OUTLET BOX (maintenance tool), remove the OUTLET BOX referring to Fig. 3.6.7-4 before installation of the I/F connector panel. However, when a mixture of parallel channel is installed, referring to [LOCATION04-40] in a LOCATION Section.



①: Position for Basic installation
②: Position for Add.1 installation
③: Position for Add.2 installation
④: Position for Add.3 installation

Fig. 3.6.7-3 Location of I/F Connector Panel (Front)

a. When the I/F connector panel is installed to the location ④, remove the OUTLET BOX referring to Fig. 3.6.7-4.
b. Remove the dummy plate referring to Fig. 3.6.7-5.
c. Install the I/F connector panel referring to Fig. 3.6.7-6.
   (Note): Dummy plates should be stored for future use in de-installation.
d. When the OUTLET BOX was removed, install the OUTLET BOX to the original location after installing the I/F connector panel.

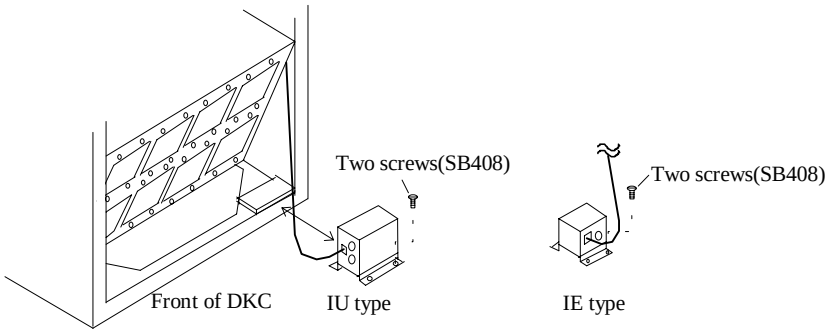


Fig. 3.6.7-4 Removal of OUTLET BOX

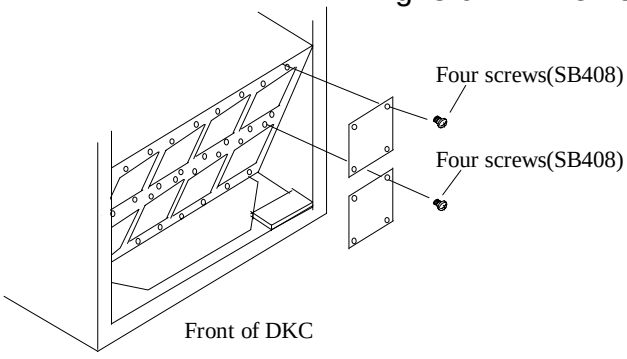


Fig. 3.6.7-5 Removal of Dummy Plate

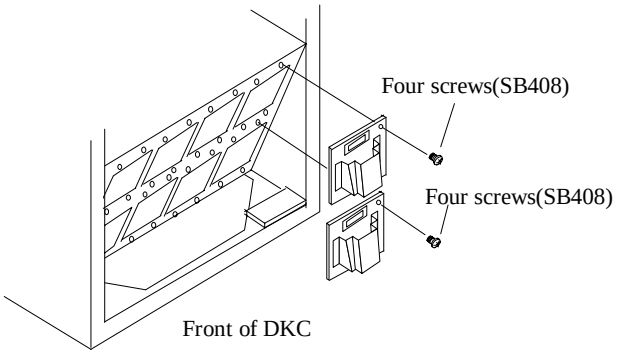


Fig. 3.6.7-6 Installation of I/F Connector Panel

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3. Connection of the optical fiber cable
   a. Pull the optical fiber cable into the DKC through the I/F connector panel referring to Fig. 3.6.7-7. Connect the optical fiber cable to the PCB. Refer to Fibre Channel Interface [LOCATION04-80] in LOCATION section.
   b. Fix the cable to Lower Strain Relief① and attach Upper Strain Relief② and Bracket③ referring to Fig. 3.6.7-8.

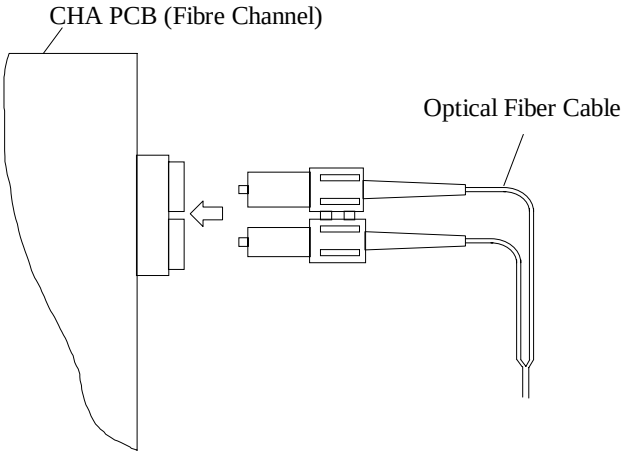

Fig. 3.6.7-7 Connection of Optical Fiber Cable

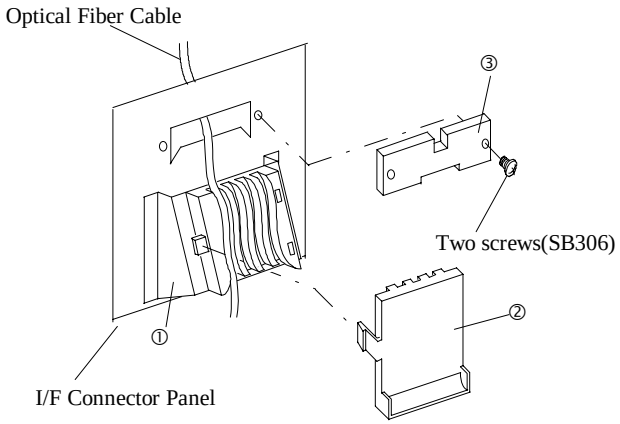

Fig. 3.6.7-8 Installation of Optical Fiber Cable

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4. Labeling
   a. Attach the labels "FIBRE PORT" to ①,③,⑤, or ⑦ referring to Table. 3.6.7-4 and Fig. 3.6.7-9.

Table 3.6.7-4 Attachment of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	①	③	⑤	⑦
Channel No.	A,B	E,F	J,K	N,P

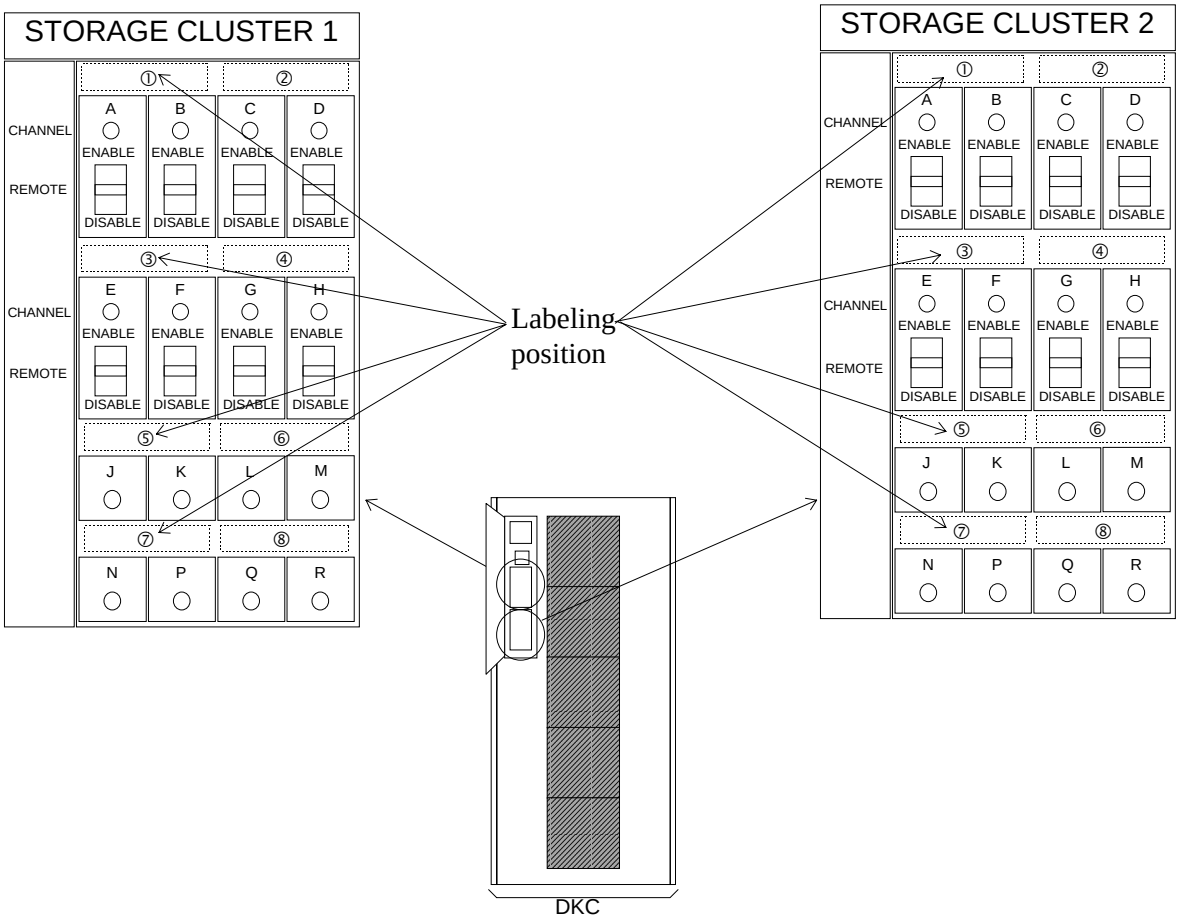

Fig. 3.6.7-9 Attachment of Labels

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5. Attachment of the nameplate
   a. Attach the nameplate referring to Fig. 3.6.7-10.

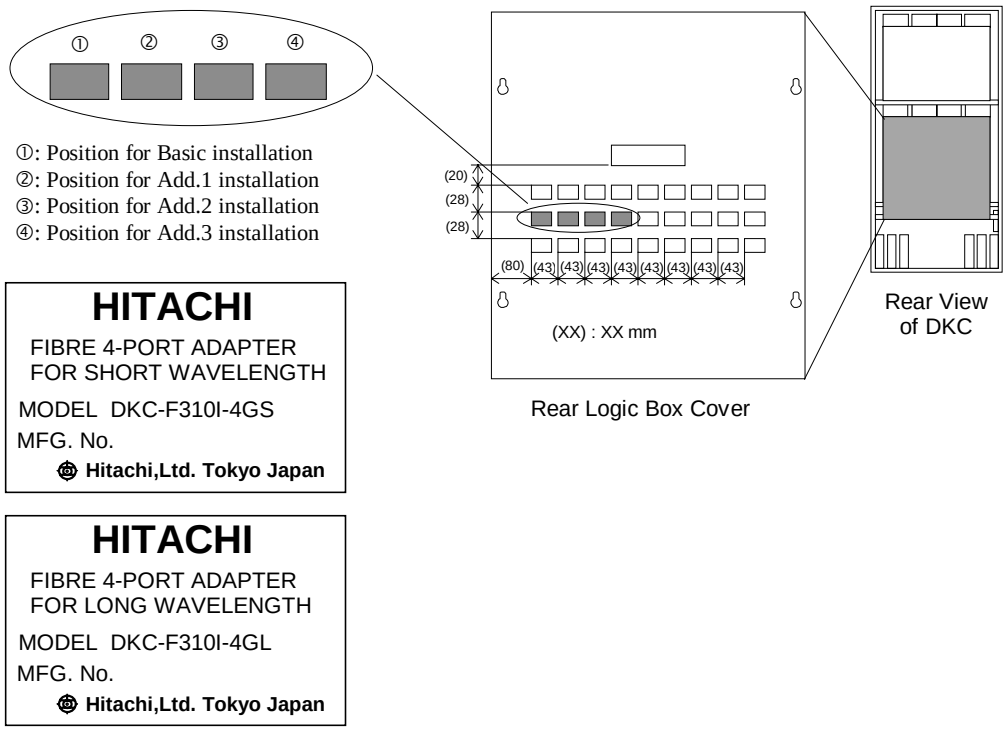

Fig. 3.6.7-10 Attachment of Nameplate

6. Return to General Flow.
   New Installation: Go to INST02-11 Step (6).
   Non-disruptive Installation: Go to INST02-21 Step (4)-2.
   Disruptive Installation: Go to INST02-40 Step (5).

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3.7 Installation of Shared Memory and Cache Memory

a. When only Shared Memory is to be installed,
go to “3.7.1 Installation of Additional Shared Memory (DKC-F310I-32/128)”.
b. When only Cache Memory is to be installed or when Shared Memory and Cache Memory are to be installed at the same time,
go to “3.7.2 Installation of Additional Cache Memory (DKC-F310I-20/256/1024)”. (INST03-1260)

3.7.1 Installation of Additional Shared Memory (DKC-F310I-32/128)

3.7.1.1 Flowchart

(1) When the subsystem is powered on, blockade the Shared Memory on the cluster 1 from SVP.
When powered off, go to step (2).

↓

(2) Install the Shared Memory on the cluster 1.

↓

(3) When the subsystem is powered on, restore the Shared Memory on the cluster 1 and blockade the Shared Memory on the cluster 2 from SVP.
When powered off, go to step (4).

↓

(4) Install the Shared Memory on the cluster 2.

↓

(5) When the subsystem is powered on, restore the Shared Memory on the cluster 2 from SVP.
When powered off, go to step (6).

↓

(6) Change the nameplate.

3.7.1.2 Parts List

Table 3.7.1.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-32	SH024-B	1505404-B	2	Shared Memory Module (16MB)
		Nameplate	3252736-1	1	Not used
2	DKC-F310I-128	SH100-B	1501164-B	2	Shared Memory Module (64MB)

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3.7.1.3 Installation Procedure of Additional Shared Memory

1. When the subsystem is powered on, blockade the Shared Memory on the cluster 1 from SVP. When powered off, go to step 2.
   a. Go to INST02-59B step ⑨.

2. Install the Shared Memory on the Cluster 1.
   Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

2-1. Remove the PCBs.
   a. While referring to Fig. 3.7.1.3-1 and Table 3.7.1.3-1, check the Shut Down LED on the Cache Memory PCB in the Rear Logic Box. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on. (This procedure [2-1. a.] is not valid for a New Installation.)

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is a PCB to be added.

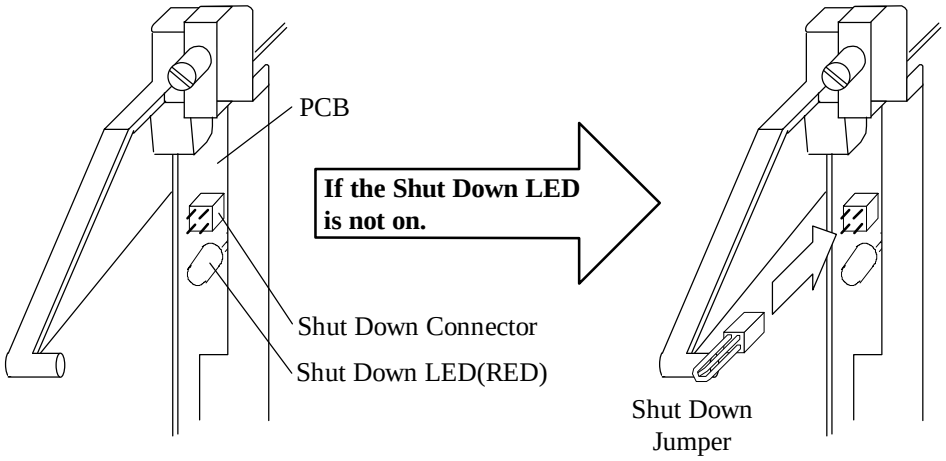

Fig. 3.7.1.3-1 Location of the Shut Down LED

Table 3.7.1.3-1 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB

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b. Remove the two screws and remove the Cache Memory PCB.

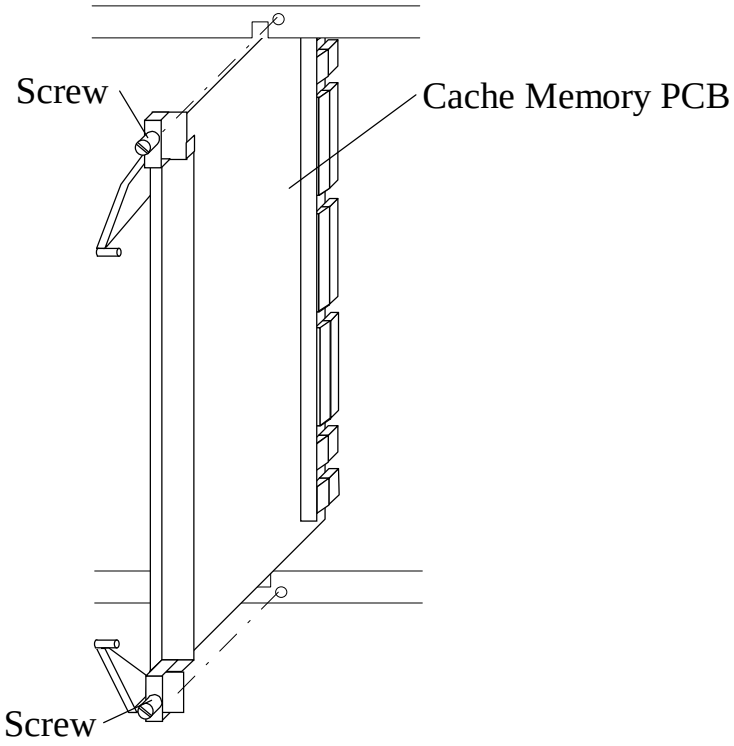

Fig. 3.7.1.3-2 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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2-2. Insert the Shared Memory Modules.

a. Insert the Shared Memory Modules that match the required Shared Memory capacity referring to Fig. 3.7.1.3-3 and Table 3.7.1.3-2 or 3.

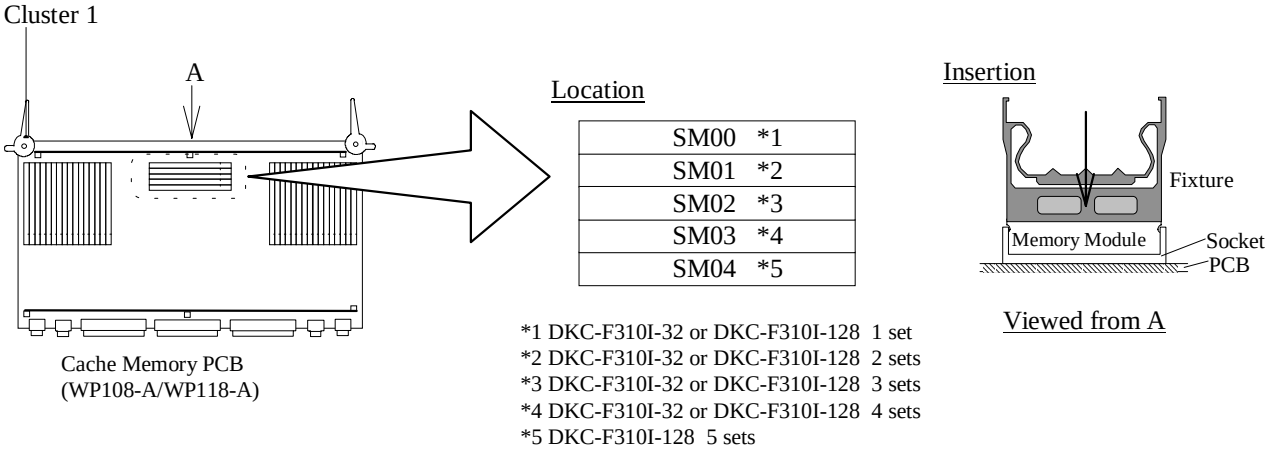

Fig. 3.7.1.3-3 Inserting Location of the Shared Memory Module

Table 3.7.1.3-2 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed of DKC-F310I-32 and DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	16 MB	DKC-F310I-32 1 set	SH024-B	1
2	16 MB	32 MB	DKC-F310I-32 2 sets	SH024-B	1
3	32 MB	48 MB	DKC-F310I-32 3 sets	SH024-B	1
4	48 MB	64 MB	DKC-F310I-32 4 sets	SH024-B	1
5	64 MB	128 MB	DKC-F310I-128 1 set	SH100-B	1

Note: This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

Table 3.7.1.3-3 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed only of DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	64 MB	DKC-F310I-128 1 set	SH100-B	1
2	64 MB	128 MB	DKC-F310I-128 2 sets	SH100-B	1
3	128 MB	192 MB	DKC-F310I-128 3 sets	SH100-B	1
4	192 MB	256 MB	DKC-F310I-128 4 sets	SH100-B	1

Note: This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

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2-3. Insert the PCB.

a. Insert the Cache Memory PCB into the Rear Logic Box referring to Table 3.7.1.3-4.

b. Fasten the two screws.

Table 3.7.1.3-4 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB

c. Go to INST02-59B step ⑪.

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3. When the subsystem is powered on, restore the Shared Memory on the cluster 1 and blockade the Shared Memory on the cluster 2 from SVP. When powered off, go to step 4.
   a. Go to INST02-59B step ⑪.

4. Install the Shared Memory on the Cluster 2.
   Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

4-1. Remove the PCBs.
   a. While referring to Fig. 3.7.1.3-4 and Table 3.7.1.3-5, check the Shut Down LED on the Cache Memory PCB in the Rear Logic Box. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on. (This procedure [4-1. a.] is not valid for a New Installation.)

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is a PCB to be added.

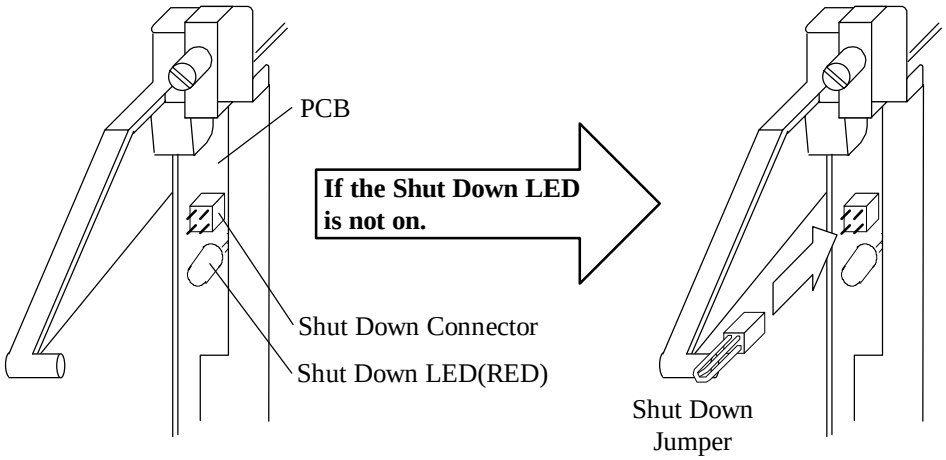

Fig. 3.7.1.3-4 Location of the Shut Down LED

Table 3.7.1.3-5 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB

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b. Remove the two screws and remove the Cache Memory PCB.

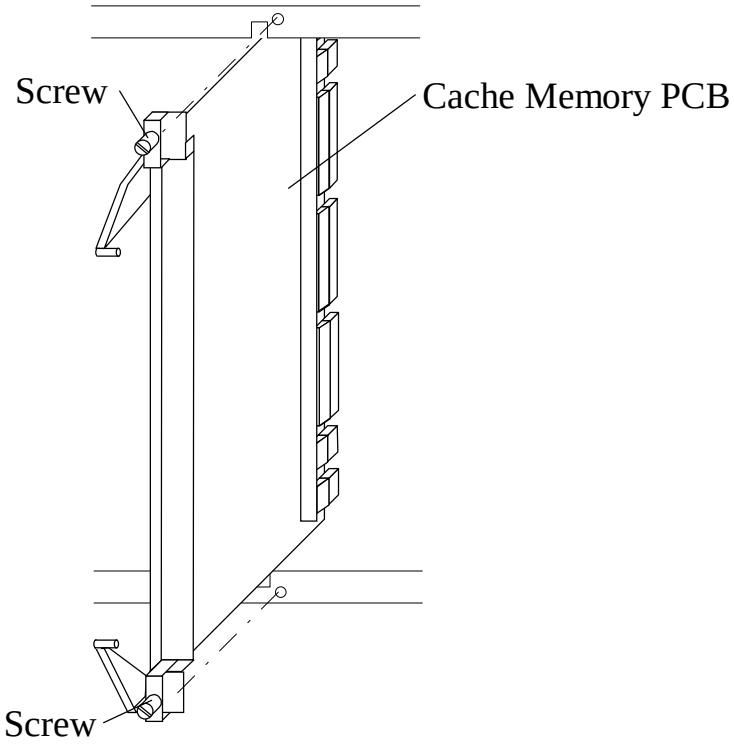

Fig. 3.7.1.3-5 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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4-2. Insert the Shared Memory Modules.

a. Insert the Shared Memory Modules that match the required Shared Memory capacity referring to Fig. 3.7.1.3-6 and Table 3.7.1.3-6 or 7.

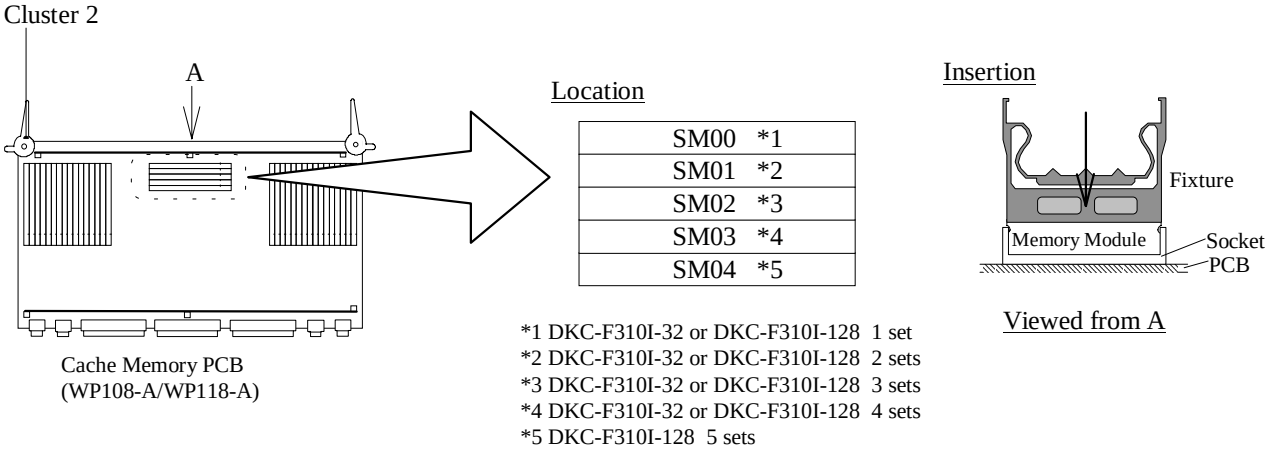

Fig. 3.7.1.3-6 Inserting Location of the Shared Memory Module

Table 3.7.1.3-6 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed of DKC-F310I-32 and DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	16 MB	DKC-F310I-32 1 set	SH024-B	1
2	16 MB	32 MB	DKC-F310I-32 2 sets	SH024-B	1
3	32 MB	48 MB	DKC-F310I-32 3 sets	SH024-B	1
4	48 MB	64 MB	DKC-F310I-32 4 sets	SH024-B	1
5	64 MB	128 MB	DKC-F310I-128 1 set	SH100-B	1

Note: This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

Table 3.7.1.3-7 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed only of DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	64 MB	DKC-F310I-128 1 set	SH100-B	1
2	64 MB	128 MB	DKC-F310I-128 2 sets	SH100-B	1
3	128 MB	192 MB	DKC-F310I-128 3 sets	SH100-B	1
4	192 MB	256 MB	DKC-F310I-128 4 sets	SH100-B	1

Note: This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

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4-3. Insert the PCB.

a. Insert the Cache Memory PCB into the Rear Logic Box referring to Table 3.7.1.3-8.

b. Fasten the two screws.

Table 3.7.1.3-8 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB

c. Go to INST02-59B step ⑬.

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5. When the subsystem is powered on, restore the Shared Memory on the cluster 2 from SVP. When powered off, go to step 6.
   a. Go to INST02-59B step ⑬.

6. Change the nameplate.
   a. Refer to Fig. 3.7.1.3-7 and Table 3.7.1.3-9 to paint out unnecessary numbers and wipe off a necessary number painted previously so that the "Qt." marking for the corresponding nameplate can be seen.

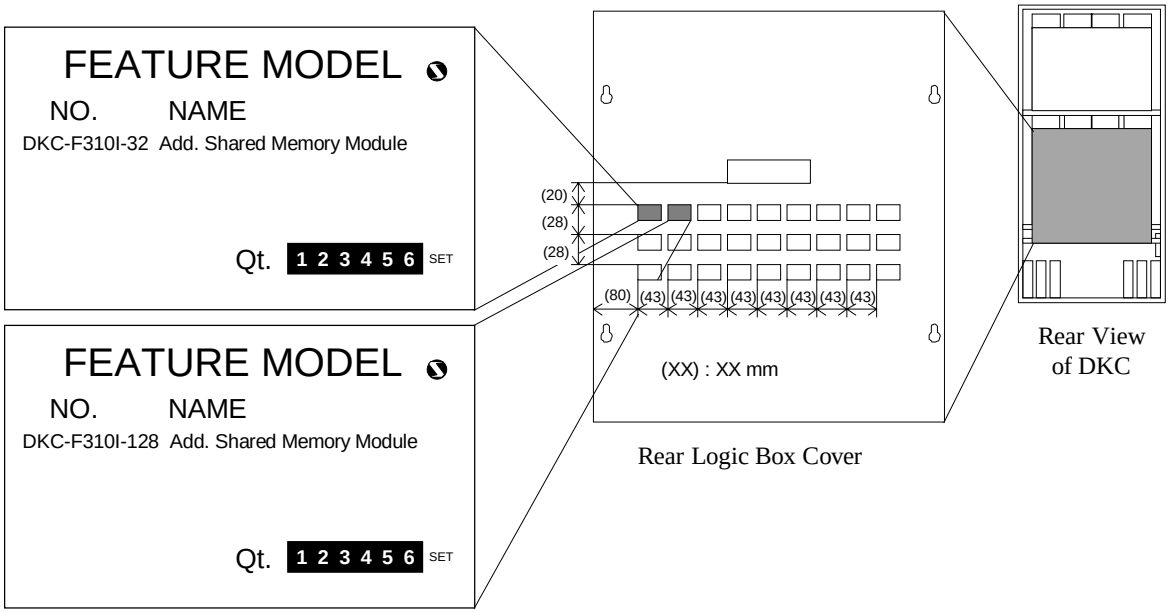

Fig. 3.7.1.3-7 Location of the Nameplate

Table 3.7.1.3-9 Quantity Marking

No.	Quantity Marking	
	Number of DKC-F310I-32/128 sets	Qt.
1	1 set	1
2	2 sets	2
3	3 sets	3
4	4 sets	4
5	5 sets	5
6	6 sets	6

7. Return to General Flow.
   Go to INST02-59B step ⑮.

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3.7.2 Installation of Additional Cache Memory (DKC-F310I-20/256/1024)

3.7.2.1 Flowchart

(1) When the Additional Cache Board (DKC-F310I-20) is installed, install the Battery Boxes and BATT CTR PCBs.
When the Additional Cache Board (DKC-F310I-20) is not installed, go to step (2).

↓

(2) When the subsystem is powered on, blockade the Cache Memory on the cluster 1 from SVP.
When powered off, go to step (3).

↓

(3) Install the Cache Memory and Shared Memory on the cluster 1.

↓

(4) When the subsystem is powered on, restore the Cache Memory on the cluster 1 and blockade the Cache Memory on the cluster 2 from SVP.
When powered off, go to step (5).

↓

(5) Install the Cache Memory and Shared Memory on the cluster 2.

↓

(6) When the subsystem is powered on, restore the Cache Memory on the cluster 2 from SVP.
When powered off, go to step (7).

↓

(7) Change the nameplate.

3.7.2.2 Parts List

Table 3.7.2.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-20	WP108-B	1505482-B	2	Cache Memory PCB
		WP118-B	1505847-B		
		Battery Box	3236759-A	2	
		BATT CTR PCB	1514192-A	2	
		Jumper (Battery)	3250530-A	2	Jumper Connector (BTJP)
		Nameplate	3252542-1	1	
2	DKC-F310I-256	SH024-A	1505404-A	8	Cache Memory Module (32MB)
		Nameplate	3252543-1	1	Not used
3	DKC-F310I-1024	SH100-A	1501164-A	8	Cache Memory Module (128MB)

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3.7.2.3 Installation Procedure of Additional Cache Memory

Notice : Confirm the quantity of the options to be installed prior to installing the cache memory. Refer to Table 1.1.2-1 and Table 1.1.2-2 (INST01-40 through 50) for the required quantity of options.

1. When the Additional Cache Board (DKC-F310I-20) is installed, install Battery Boxes and the BATT CTR PCBs.
   When the Additional Cache Board (DKC-F310I-20) is not installed, go to step 2.

   a. Remove the two screws and open the covers.

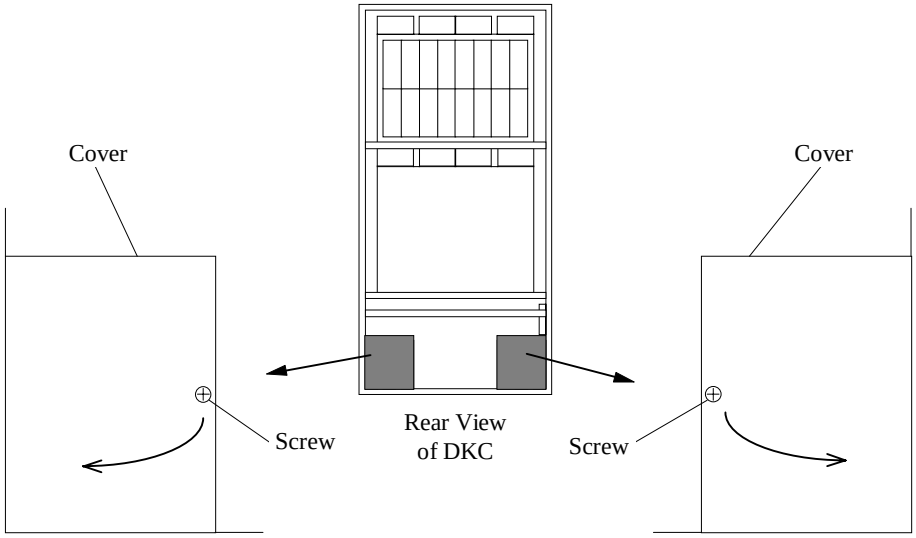

Fig. 3.7.2.3-1 Opening of the Cover

   b. Insert the Battery Boxes (BATTERY-12 and BATTERY-22) and fasten the four screws. Connect the cables to the Battery Boxes.

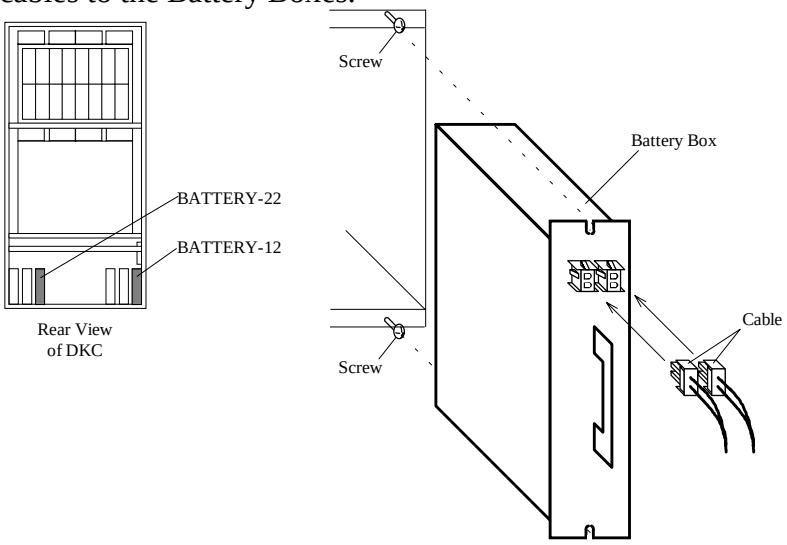

Fig. 3.7.2.3-2 Insertion of the Battery Box

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c. Insert the BATT CTR PCBs (BATT CTR-12 and BATT CTR-22). Rotate the stoppers and fasten the screws. Insert the Jumper Connectors to BATT CTR PCBs.

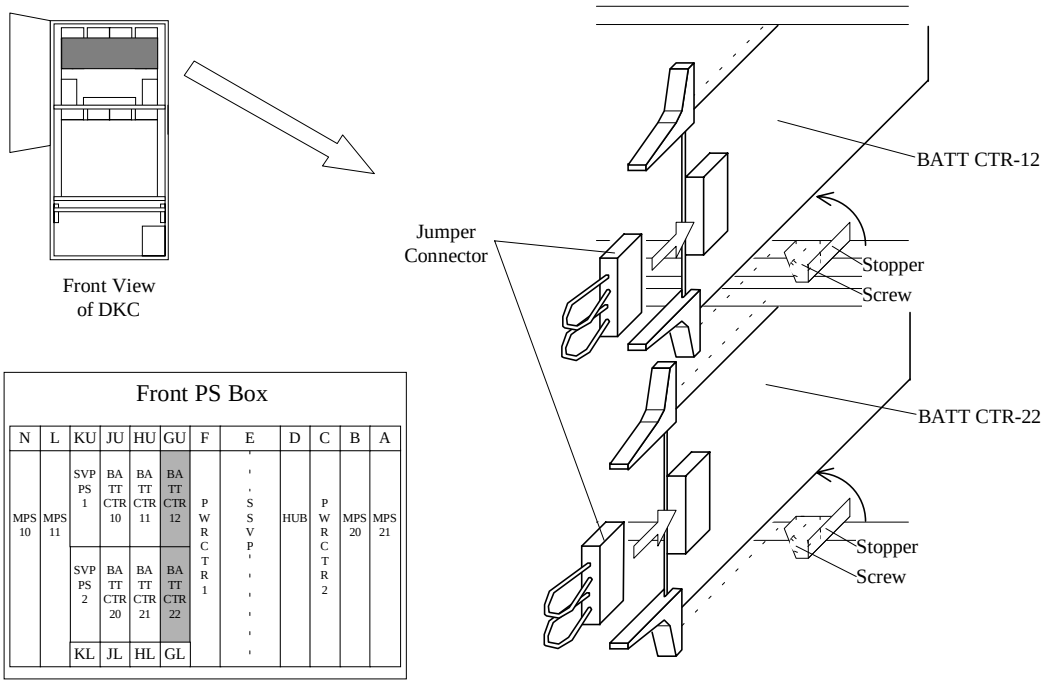

Fig. 3.7.2.3-3 Insertion of the BATT CTR

d. Close the covers and fasten the screws.

e. Go to INST02-59A step ②.

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2. When the subsystem is powered on, blockade the Cache Memory on the cluster 1 from SVP. When powered off, go to step 3.
   a. Go to INST02-59A step ②.

3. Install the Cache Memory and Shared Memory on the cluster 1.
   Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

3-1. Remove the PCBs.
   a. While referring to Fig. 3.7.2.3-4 and Table 3.7.2.3-1, check the Shut Down LED on the Cache Memory PCB. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on. (This procedure [3-1 a.] is not valid for a New Installation.)

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is a PCB to be added.

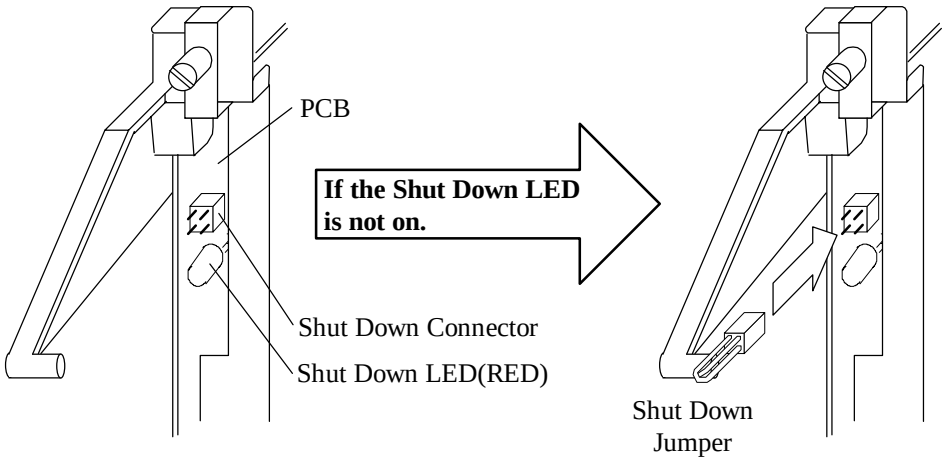

Fig. 3.7.2.3-4 Location of the Shut Down LED

Table 3.7.2.3-1 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/ WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB (Note 1)
	WP108-B/ WP118-B	Front Logic Box	T	CACHE-1T	Cache Memory PCB (Note 2)

Note 1: No PCB needs to be removed if 8 or more DKC-F310I-256 or DKC-F310I-1024 sets are installed, except when installing DKC-F310I-32 or DKC-F310I-128 sets.
Note 2: Remove the PCB only when it is installed.

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b. Remove the two screws and remove the Cache Memory PCB.

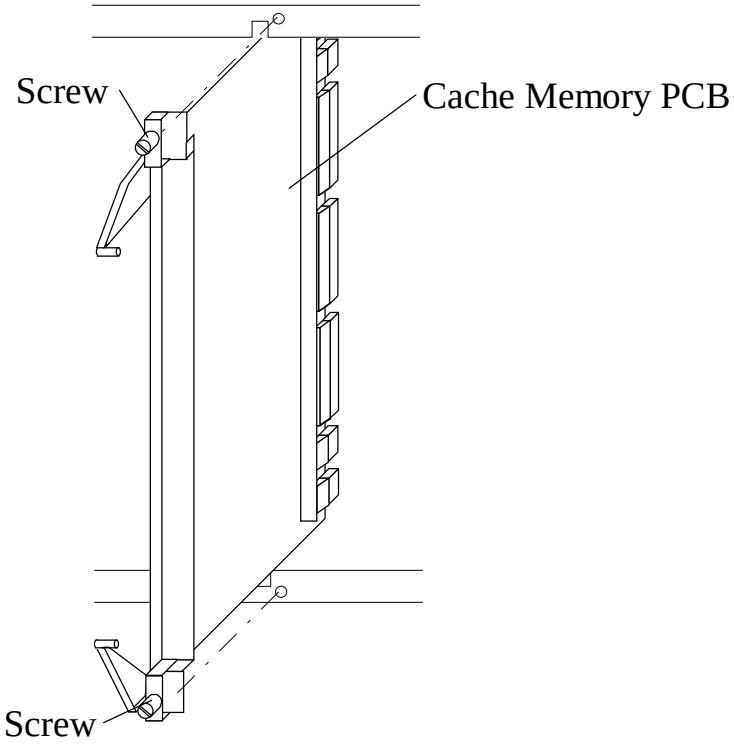

Fig. 3.7.2.3-5 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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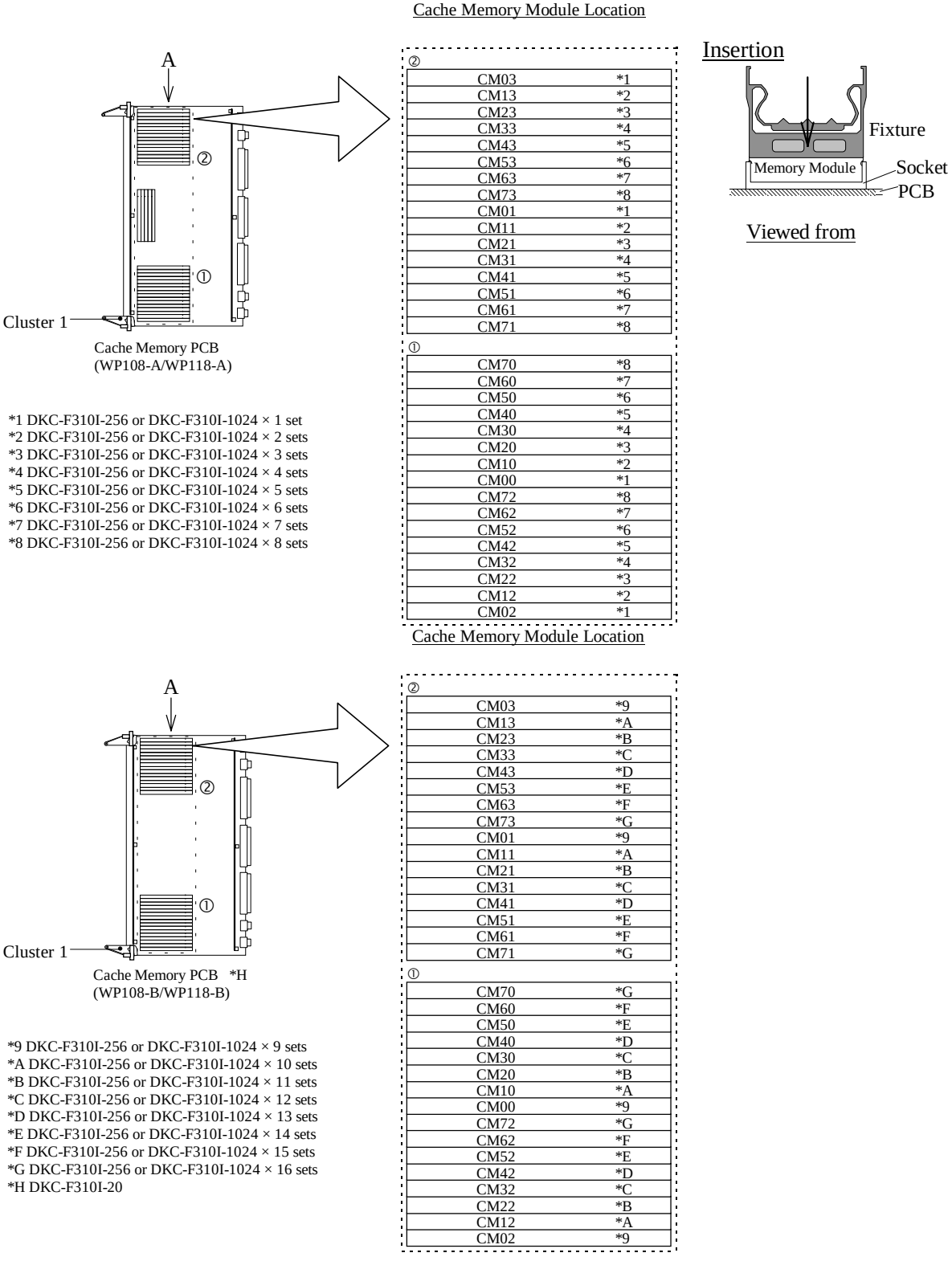
3-2. Insert the Cache Memory Modules.

a. Insert the Cache Memory Modules that match the required Cache Memory capacity referring to Fig. 3.7.2.3-6 and Table 3.7.2.3-2 or 3.



②	
CM03	*1
CM13	*2
CM23	*3
CM33	*4
CM43	*5
CM53	*6
CM63	*7
CM73	*8
CM01	*1
CM11	*2
CM21	*3
CM31	*4
CM41	*5
CM51	*6
CM61	*7
CM71	*8

①	
CM70	*8
CM60	*7
CM50	*6
CM40	*5
CM30	*4
CM20	*3
CM10	*2
CM00	*1
CM72	*8
CM62	*7
CM52	*6
CM42	*5
CM32	*4
CM22	*3
CM12	*2
CM02	*1

*1 DKC-F310I-256 or DKC-F310I-1024 × 1 set
*2 DKC-F310I-256 or DKC-F310I-1024 × 2 sets
*3 DKC-F310I-256 or DKC-F310I-1024 × 3 sets
*4 DKC-F310I-256 or DKC-F310I-1024 × 4 sets
*5 DKC-F310I-256 or DKC-F310I-1024 × 5 sets
*6 DKC-F310I-256 or DKC-F310I-1024 × 6 sets
*7 DKC-F310I-256 or DKC-F310I-1024 × 7 sets
*8 DKC-F310I-256 or DKC-F310I-1024 × 8 sets

②	
CM03	*9
CM13	*A
CM23	*B
CM33	*C
CM43	*D
CM53	*E
CM63	*F
CM73	*G
CM01	*9
CM11	*A
CM21	*B
CM31	*C
CM41	*D
CM51	*E
CM61	*F
CM71	*G

①	
CM70	*G
CM60	*F
CM50	*E
CM40	*D
CM30	*C
CM20	*B
CM10	*A
CM00	*9
CM72	*G
CM62	*F
CM52	*E
CM42	*D
CM32	*C
CM22	*B
CM12	*A
CM02	*9

*9 DKC-F310I-256 or DKC-F310I-1024 × 9 sets
*A DKC-F310I-256 or DKC-F310I-1024 × 10 sets
*B DKC-F310I-256 or DKC-F310I-1024 × 11 sets
*C DKC-F310I-256 or DKC-F310I-1024 × 12 sets
*D DKC-F310I-256 or DKC-F310I-1024 × 13 sets
*E DKC-F310I-256 or DKC-F310I-1024 × 14 sets
*F DKC-F310I-256 or DKC-F310I-1024 × 15 sets
*G DKC-F310I-256 or DKC-F310I-1024 × 16 sets
*H DKC-F310I-20

Fig. 3.7.2.3-6 Inserting Location of the Cache Memory Module

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Table 3.7.2.3-2 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-256)

No.	Cache Memory capacity (×2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	128 MB	DKC-F310I-256 1 set	SH024-A	4
2	128 MB	256 MB	DKC-F310I-256 2 sets	SH024-A	4
3	256 MB	384 MB	DKC-F310I-256 3 sets	SH024-A	4
4	384 MB	512 MB	DKC-F310I-256 4 sets	SH024-A	4
5	512 MB	640 MB	DKC-F310I-256 5 sets	SH024-A	4
6	640 MB	768 MB	DKC-F310I-256 6 sets	SH024-A	4
7	768 MB	896 MB	DKC-F310I-256 7 sets	SH024-A	4
8	896 MB	1024 MB	DKC-F310I-256 8 sets	SH024-A	4
9	1024 MB	1152 MB	DKC-F310I-256 9 sets	SH024-A	4
10	1152 MB	1280 MB	DKC-F310I-256 10 sets	SH024-A	4
11	1280 MB	1408 MB	DKC-F310I-256 11 sets	SH024-A	4
12	1408 MB	1536 MB	DKC-F310I-256 12 sets	SH024-A	4
13	1536 MB	1664 MB	DKC-F310I-256 13 sets	SH024-A	4
14	1664 MB	1792 MB	DKC-F310I-256 14 sets	SH024-A	4
15	1792 MB	1920 MB	DKC-F310I-256 15 sets	SH024-A	4
16	1920 MB	2048 MB	DKC-F310I-256 16 sets	SH024-A	4

Note : This value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

Table 3.7.2.3-3 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-1024)

No.	Cache Memory capacity (×2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	512 MB	DKC-F310I-1024 1 set	SH100-A	4
2	512 MB	1024 MB	DKC-F310I-1024 2 sets	SH100-A	4
3	1024 MB	1536 MB	DKC-F310I-1024 3 sets	SH100-A	4
4	1536 MB	2048 MB	DKC-F310I-1024 4 sets	SH100-A	4
5	2048 MB	2560 MB	DKC-F310I-1024 5 sets	SH100-A	4
6	2560 MB	3072 MB	DKC-F310I-1024 6 sets	SH100-A	4
7	3072 MB	3584 MB	DKC-F310I-1024 7 sets	SH100-A	4
8	3584 MB	4096 MB	DKC-F310I-1024 8 sets	SH100-A	4
9	4096 MB	4608 MB	DKC-F310I-1024 9 sets	SH100-A	4
10	4608 MB	5120 MB	DKC-F310I-1024 10 sets	SH100-A	4
11	5120 MB	5632 MB	DKC-F310I-1024 11 sets	SH100-A	4
12	5632 MB	6144 MB	DKC-F310I-1024 12 sets	SH100-A	4
13	6144 MB	6656 MB	DKC-F310I-1024 13 sets	SH100-A	4
14	6656 MB	7168 MB	DKC-F310I-1024 14 sets	SH100-A	4
15	7168 MB	7680 MB	DKC-F310I-1024 15 sets	SH100-A	4
16	7680 MB	8192 MB	DKC-F310I-1024 16 sets	SH100-A	4

Note : This value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

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b. When the Additional Shared Memory Module (DKC-F310I-32) is installed, insert the Shared Memory Modules. Refer to Section 3.7.1.3 Installation Procedure of Additional Shared Memory step 2-2 Insert the Shared Memory Modules (INST03-1190).
When the Additional Shared Memory Module (DKC-F310I-32) is not installed, go to step 3-3.

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3-3. Insert the PCBs.

a. If the Additional Cache Board (DKC-F310I-20) is installed, remove the two screws and remove the dummy plate. Refer to Fig. 3.7.2.3-7.
   If the Additional Cache Board (DKC-F310I-20) is not installed, go to step b.
b. Install the Cache Memory PCB referring to Table 3.7.2.3-5.
c. Fasten the two screws.

Note : Dummy plate should be stored for future use in De-installation.

Table 3.7.2.3-5 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/ WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB
	WP108-B/ WP118-B	Front Logic Box	T	CACHE-1T	Cache Memory PCB (Note)

Note : Insert the PCB when DKC-F310I-20 is installed.

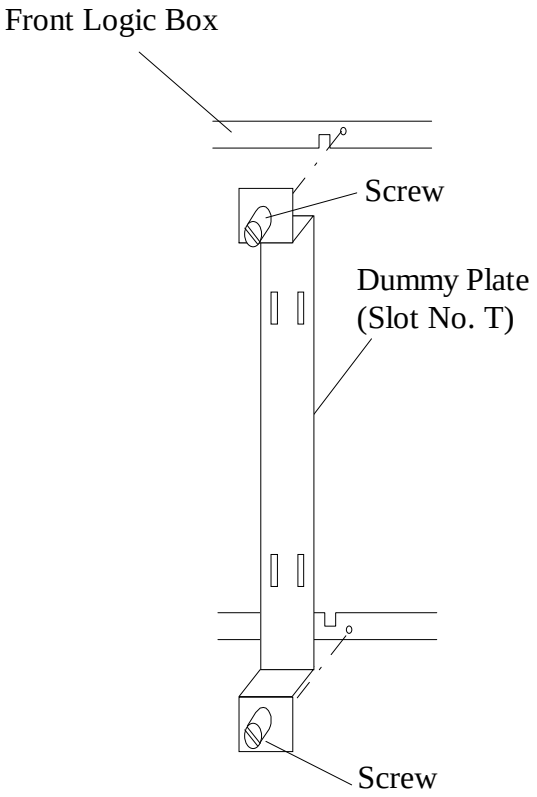

Fig. 3.7.2.3-7 Removal of the Dummy Plate

d. Go to INST02-59A step ④.

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4. When the subsystem is powered on, restore the Cache Memory on the cluster 1 and blockade the Cache Memory on the cluster 2 from SVP. When powered off, go to step 5.
   a. Go to INST02-59A step ④.

5. Install the Cache Memory and Shared Memory on the cluster 2.
   Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

5-1. Remove the PCBs.
   a. While referring to Fig. 3.7.2.3-8 and Table 3.7.2.3-6, check the Shut Down LED on the Cache Memory PCB. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on. (This procedure [5-1. a.] is not valid for a New Installation.)

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is a PCB to be added.

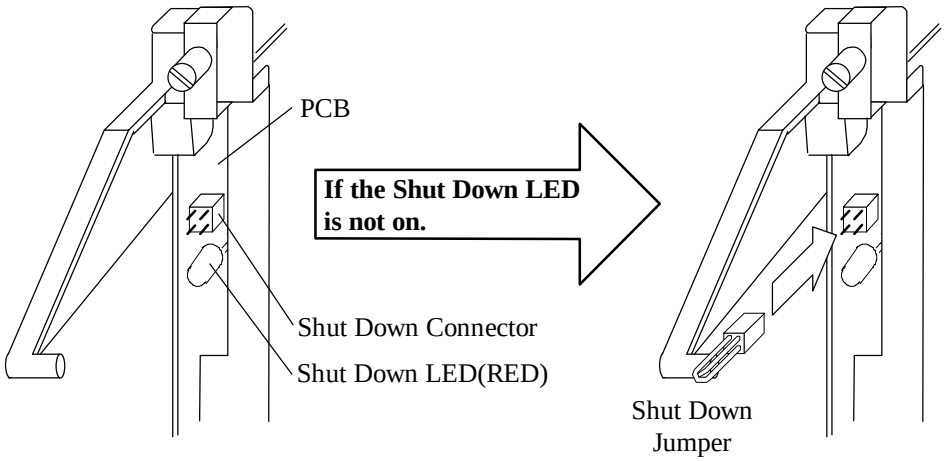

Fig. 3.7.2.3-8 Location of the Shut Down LED

Table 3.7.2.3-6 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/ WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB (Note 1)
	WP108-B/ WP118-B	Front Logic Box	U	CACHE-2U	Cache Memory PCB (Note 2)

Note 1: No PCB needs to be removed if 8 or more DKC-F310I-256 or DKC-F310I-1024 sets are installed, except when installing DKC-F310I-32 or DKC-F310I-128 sets.
Note 2: Remove the PCB only when it is installed.

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b. Remove the two screws and remove the Cache Memory PCB.

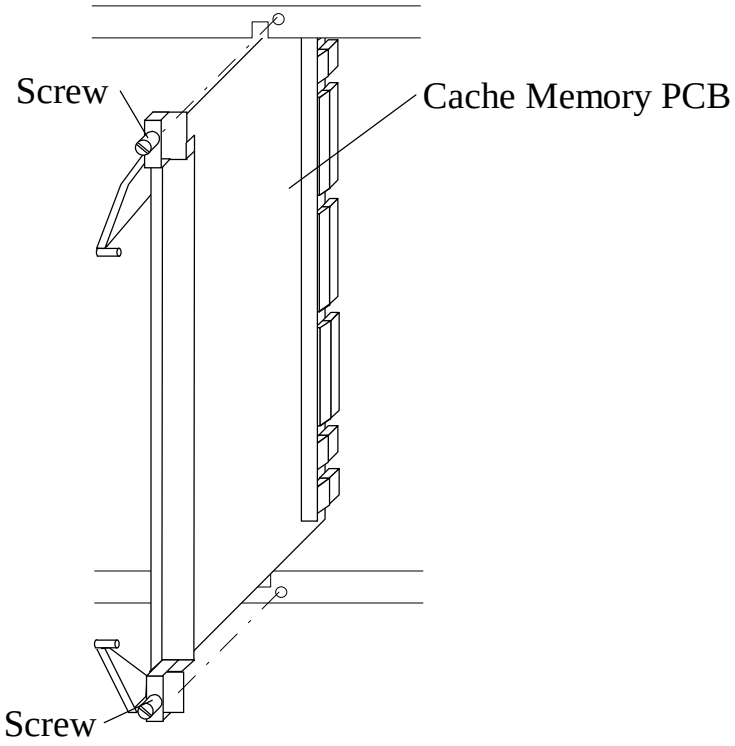

Fig. 3.7.2.3-9 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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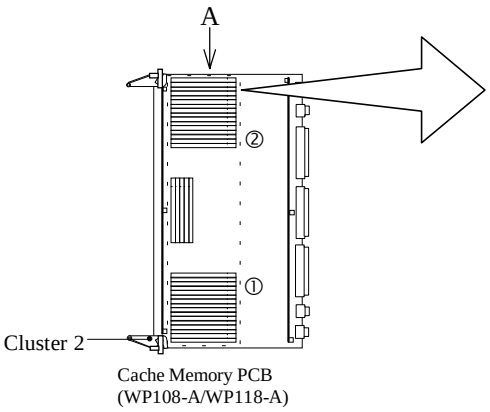
5-2. Insert the Cache Memory Modules.

a. Insert the Cache Memory Modules that match the required Cache Memory capacity referring to Fig. 3.7.2.3-10 and Table 3.7.2.3-7 or 8.



Cache Memory PCB
(WP108-A/WP118-A)

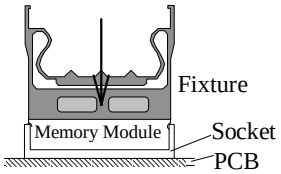
*1 DKC-F310I-256 or DKC-F310I-1024 × 1 set
*2 DKC-F310I-256 or DKC-F310I-1024 × 2 sets
*3 DKC-F310I-256 or DKC-F310I-1024 × 3 sets
*4 DKC-F310I-256 or DKC-F310I-1024 × 4 sets
*5 DKC-F310I-256 or DKC-F310I-1024 × 5 sets
*6 DKC-F310I-256 or DKC-F310I-1024 × 6 sets
*7 DKC-F310I-256 or DKC-F310I-1024 × 7 sets
*8 DKC-F310I-256 or DKC-F310I-1024 × 8 sets

Cache Memory Module Location

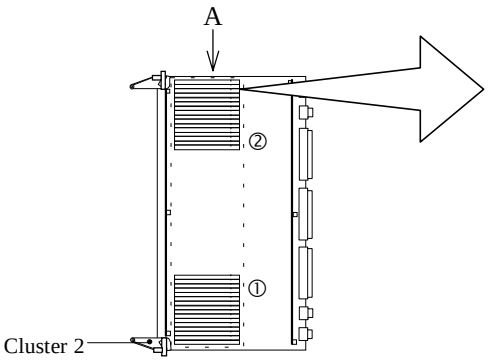
② / ①

②		①	
CM03	*1	CM70	*8
CM13	*2	CM60	*7
CM23	*3	CM50	*6
CM33	*4	CM40	*5
CM43	*5	CM30	*4
CM53	*6	CM20	*3
CM63	*7	CM10	*2
CM73	*8	CM00	*1
CM01	*1	CM72	*8
CM11	*2	CM62	*7
CM21	*3	CM52	*6
CM31	*4	CM42	*5
CM41	*5	CM32	*4
CM51	*6	CM22	*3
CM61	*7	CM12	*2
CM71	*8	CM02	*1

Insertion



Viewed from



Cache Memory PCB *H
(WP108-B/WP118-B)

*9 DKC-F310I-256 or DKC-F310I-1024 × 9 sets
*A DKC-F310I-256 or DKC-F310I-1024 × 10 sets
*B DKC-F310I-256 or DKC-F310I-1024 × 11 sets
*C DKC-F310I-256 or DKC-F310I-1024 × 12 sets
*D DKC-F310I-256 or DKC-F310I-1024 × 13 sets
*E DKC-F310I-256 or DKC-F310I-1024 × 14 sets
*F DKC-F310I-256 or DKC-F310I-1024 × 15 sets
*G DKC-F310I-256 or DKC-F310I-1024 × 16 sets
*H DKC-F310I-20

Cache Memory Module Location

② / ①

②		①	
CM03	*9	CM70	*G
CM13	*A	CM60	*F
CM23	*B	CM50	*E
CM33	*C	CM40	*D
CM43	*D	CM30	*C
CM53	*E	CM20	*B
CM63	*F	CM10	*A
CM73	*G	CM00	*9
CM01	*9	CM72	*G
CM11	*A	CM62	*F
CM21	*B	CM52	*E
CM31	*C	CM42	*D
CM41	*D	CM32	*C
CM51	*E	CM22	*B
CM61	*F	CM12	*A
CM71	*G	CM02	*9

Fig. 3.7.2.3-10 Inserting Location of the Cache Memory Module

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Table 3.7.2.3-7 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-256)

No.	Cache Memory capacity (×2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	128 MB	DKC-F310I-256 1 set	SH024-A	4
2	128 MB	256 MB	DKC-F310I-256 2 sets	SH024-A	4
3	256 MB	384 MB	DKC-F310I-256 3 sets	SH024-A	4
4	384 MB	512 MB	DKC-F310I-256 4 sets	SH024-A	4
5	512 MB	640 MB	DKC-F310I-256 5 sets	SH024-A	4
6	640 MB	768 MB	DKC-F310I-256 6 sets	SH024-A	4
7	768 MB	896 MB	DKC-F310I-256 7 sets	SH024-A	4
8	896 MB	1024 MB	DKC-F310I-256 8 sets	SH024-A	4
9	1024 MB	1152 MB	DKC-F310I-256 9 sets	SH024-A	4
10	1152 MB	1280 MB	DKC-F310I-256 10 sets	SH024-A	4
11	1280 MB	1408 MB	DKC-F310I-256 11 sets	SH024-A	4
12	1408 MB	1536 MB	DKC-F310I-256 12 sets	SH024-A	4
13	1536 MB	1664 MB	DKC-F310I-256 13 sets	SH024-A	4
14	1664 MB	1792 MB	DKC-F310I-256 14 sets	SH024-A	4
15	1792 MB	1920 MB	DKC-F310I-256 15 sets	SH024-A	4
16	1920 MB	2048 MB	DKC-F310I-256 16 sets	SH024-A	4

Note: This value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

Table 3.7.2.3-8 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-1024)

No.	Cache Memory capacity (×2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	512 MB	DKC-F310I-1024 1 set	SH100-A	4
2	512 MB	1024 MB	DKC-F310I-1024 2 sets	SH100-A	4
3	1024 MB	1536 MB	DKC-F310I-1024 3 sets	SH100-A	4
4	1536 MB	2048 MB	DKC-F310I-1024 4 sets	SH100-A	4
5	2048 MB	2560 MB	DKC-F310I-1024 5 sets	SH100-A	4
6	2560 MB	3072 MB	DKC-F310I-1024 6 sets	SH100-A	4
7	3072 MB	3584 MB	DKC-F310I-1024 7 sets	SH100-A	4
8	3584 MB	4096 MB	DKC-F310I-1024 8 sets	SH100-A	4
9	4096 MB	4608 MB	DKC-F310I-1024 9 sets	SH100-A	4
10	4608 MB	5120 MB	DKC-F310I-1024 10 sets	SH100-A	4
11	5120 MB	5632 MB	DKC-F310I-1024 11 sets	SH100-A	4
12	5632 MB	6144 MB	DKC-F310I-1024 12 sets	SH100-A	4
13	6144 MB	6656 MB	DKC-F310I-1024 13 sets	SH100-A	4
14	6656 MB	7168 MB	DKC-F310I-1024 14 sets	SH100-A	4
15	7168 MB	7680 MB	DKC-F310I-1024 15 sets	SH100-A	4
16	7680 MB	8192 MB	DKC-F310I-1024 16 sets	SH100-A	4

Note: This value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

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b. When the Additional Shared Memory Module (DKC-F310I-32) is installed, insert the Shared Memory Modules. Refer to Section 3.7.1.3 Installation Procedure of Additional Shared Memory step 4-2 Insert the Shared Memory Modules (INST03-1230).
When the Additional Shared Memory Module (DKC-F310I-32) is not installed, go to step 5-3.

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5-3. Insert the PCBs.

a. If the Additional Cache Board (DKC-F310I-20) is installed, remove the two screws and remove the dummy plate. Refer to Fig. 3.7.2.3-11.
   If the Additional Cache Board (DKC-F310I-20) is not installed, go to step b.
b. Install the Cache Memory PCB referring to Table 3.7.2.3-10.
c. Fasten the two screws.

Note : Dummy plate should be stored for future use in De-installation.

Table 3.7.2.3-10 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/ WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB
	WP108-B/ WP118-B	Front Logic Box	U	CACHE-2U	Cache Memory PCB (Note)

Note : Insert the PCB when DKC-F310I-20 is installed.

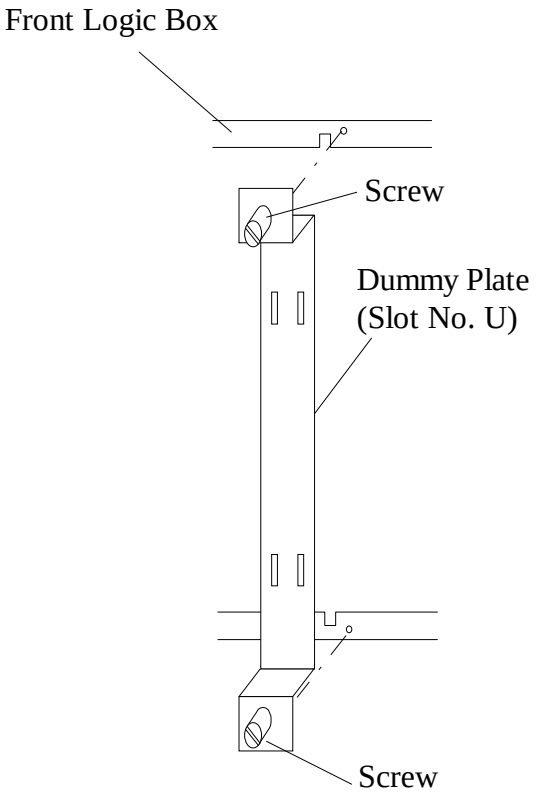

Fig. 3.7.2.3-11 Removal of the Dummy Plate

d. Go to INST02-59A step ⑥.

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6. When the subsystem is powered on, restore the Cache Memory on the cluster 2 from SVP. When powered off, go to step 7.
   a. Go to INST02-59A step ⑥.

7. Change the nameplate.
   a. Refer to Fig. 3.7.2.3-12 and Table 3.7.2.3-11 to paint out unnecessary numbers and wipe off a necessary number painted previously so that the "Qt." marking for the corresponding nameplate can be seen. Indicate the number which is added the number installed previously on the number of options added newly.

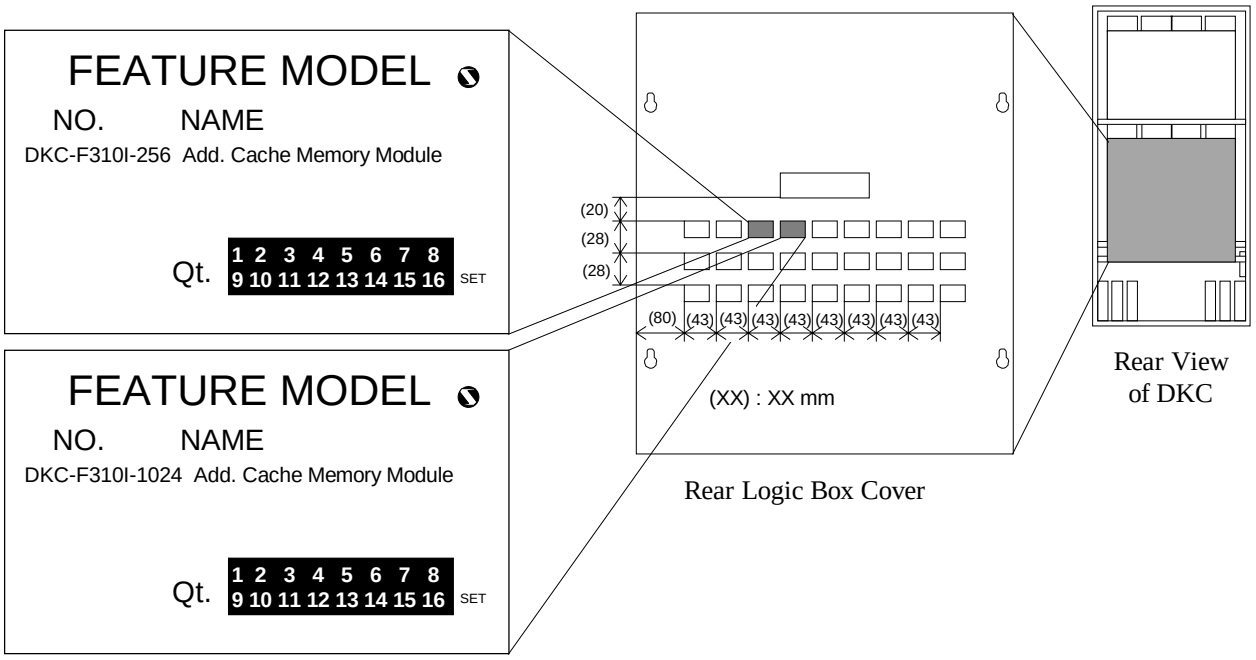

Fig. 3.7.2.3-12 Location of the Nameplate

Table 3.7.2.3-11 Quantity Marking

No.	Quantity Marking	
	Number of DKC-F310I-256/1024 sets	Qt.
1	1 set	1
2	2 sets	2
3	3 sets	3
4	4 sets	4

(To be continued)

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(Continued from the preceding page)

No.	Quantity Marking	
	Number of DKC-F310I-256/1024 sets	Qt.
5	5 sets	[redacted] 5
6	6 sets	[redacted] 6
7	7 sets	[redacted] 7
8	8 sets	[redacted] 8
9	9 sets	[redacted] 9
10	10 sets	[redacted] 10
11	11 sets	[redacted] 11
12	12 sets	[redacted] 12
13	13 sets	[redacted] 13
14	14 sets	[redacted] 14
15	15 sets	[redacted] 15
16	16 sets	[redacted] 16

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b. When the Additional Shared Memory Module (DKC-F310I-32) is installed, change the nameplate. Refer to Section 3.7.1.3 Installation Procedure of Additional Shared Memory step 6 Change the nameplate (INST03-1250).
When the Additional Shared Memory Module (DKC-F310I-32) is not installed, go to step c.

c. When the Additional Cache Board (DKC-F310I-20) is installed, attach the nameplate. Refer to Fig. 3.7.2.3-13.
When the Additional Cache Board (DKC-F310I-20) is not installed, go to step 8.

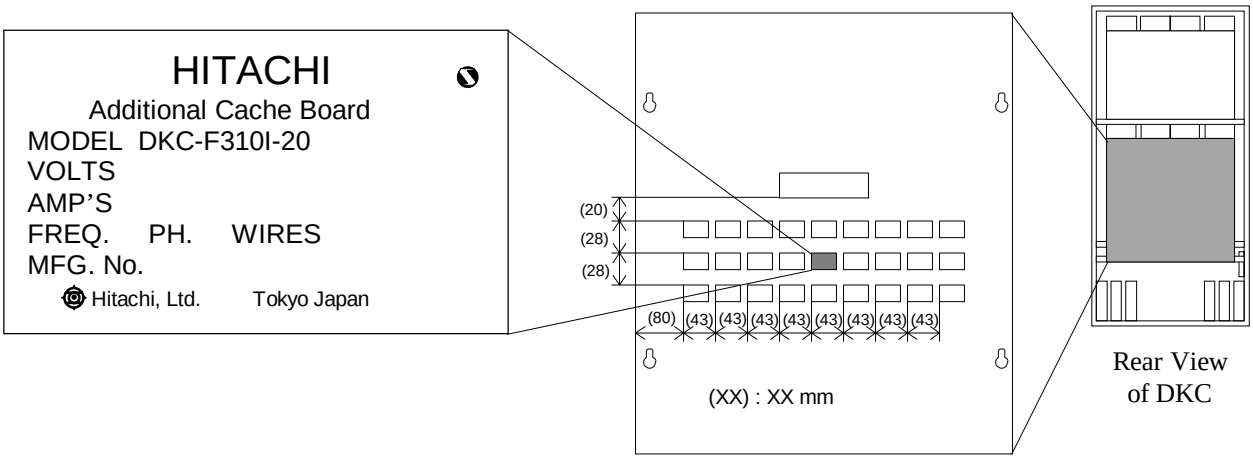

Fig. 3.7.2.3-13 Location of the Nameplate

8. Return to General Flow.
Go to INST02-59A step ⑧.

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3.8 Installation of Redundant Power Supply

3.8.1 Flowchart

3.8.1.1 Installation of the CL Additional Power Supply (DKC-F310I-80).....[INST03-1460]

1. Confirm the PS Enable/Disable Switch.
↓
2. Install the Additional Power Supply (5V and 3V PS).
↓
3. Connect the inlet cable.
↓
4. Turn on the Additional Power Supply.
↓
5. Attach the nameplate.
↓
6. Check the DC voltage.

3.8.1.2 Installation of the CL Redundant Power Supply (DKC-F310I-81).....[INST03-1500]

1. Confirm the PS Enable/Disable Switch.
↓
2. Install the Redundant Power Supply (5V, 3V, and Multi PS).
↓
3. Connect the inlet cable.
↓
4. Turn on the Redundant Power Supply.
↓
5. Attach the nameplate.
↓
6. Check the DC voltage.

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3.8.1.3 Installation of the CL Additional Redundant Power Supply (DKC-F310I-82) .....[INST03-1540]

1. Confirm the PS Enable/Disable Switch.
↓
2. Install the Redundant Power Supply (5V and 3V PS).
↓
3. Connect the inlet cable.
↓
4. Turn on the Redundant Power Supply.
↓
5. Attach the nameplate.
↓
6. Check the DC voltage.

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3.8.2 Installation of the CL Additional Power Supply (DKC-F310I-80)

3.8.2.1 Parts List

Table 3.8.2.1-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-80	5V power supply	5500003-A	2	HS05065C-S
					TAH-325HSA
					HS05065C-W
		3V power supply	5500003-B	2	HS03075C-S
					TAH-264HSA
					HS03075C-W
		Nameplate	3252542-9	1	

3.8.2.2 Installation Procedure of the CL Additional Power Supply

1. Confirmation of the PS Enable/Disable Switch
   a. Confirm the PS Enable/Disable Switch is turned to (DOWN) **Disable**. Refer to Fig. 3.8.2.2-1.

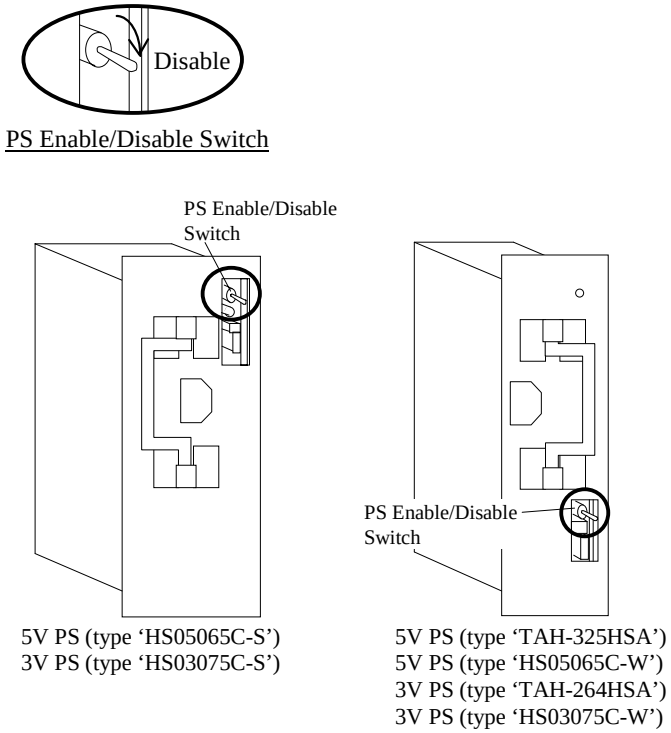

Fig. 3.8.2.2-1 Switch

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2. Installation of the additional power supply
   a. Open the locking clamps and remove the inlet cables from the inserting locations. Refer to Table 3.8.2.2-1, Fig. 3.8.2.2-2, and Fig. 3.8.2.2-3.
   b. Loosen the screws and remove the dummy plates.
   c. Install the additional power supplies in the correct locations and fasten the screws. Refer to Table 3.8.2.2-1, Fig. 3.8.2.2-2, and Fig. 3.8.2.2-4.

   Note: Dummy plates should be stored for future use in De-installation.

Table 3.8.2.2-1 Inserting Location

No.	Part Name	PS Location		Remarks
		Cluster 1	Cluster 2	
1	5V Power Supply	5VPS12	5VPS22	
2	3V Power Supply	3VPS12	3VPS22	

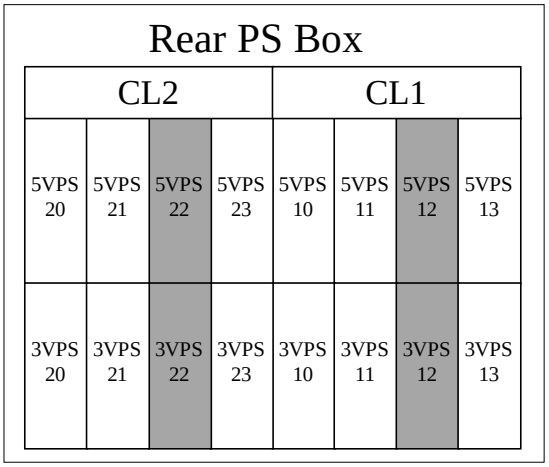

Fig. 3.8.2.2-2 Inserting Location

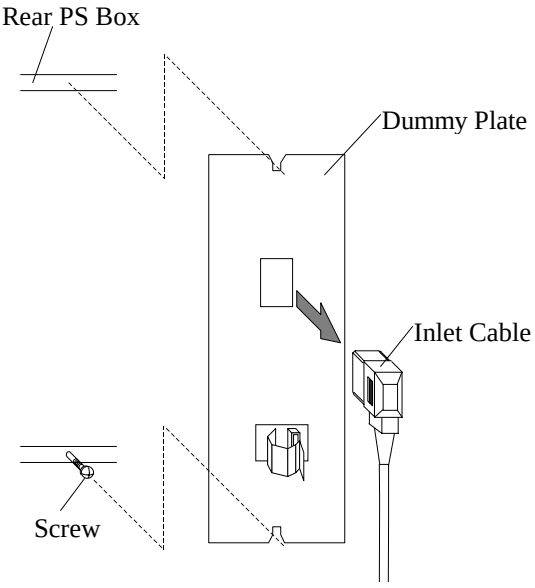

Fig. 3.8.2.2-3 Removal of Dummy Plate

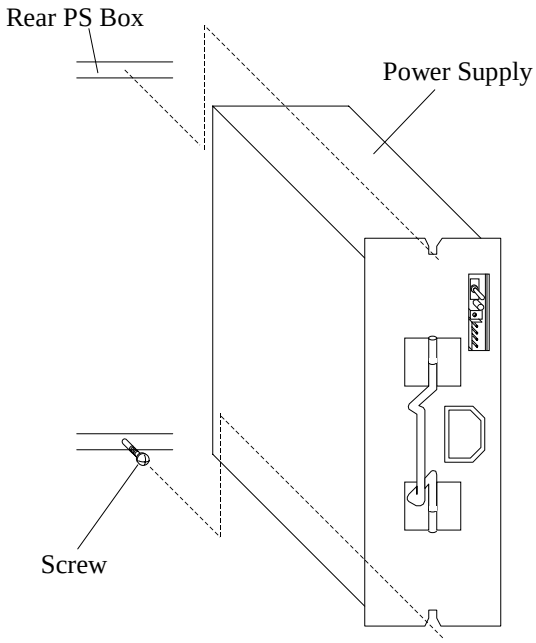

Fig. 3.8.2.2-4 Installation of Power Supply

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3. Connection of the inlet cable
   a. Connect the inlet cables to the power supply and fix them with the lever. Refer to Fig. 3.8.2.2-5.

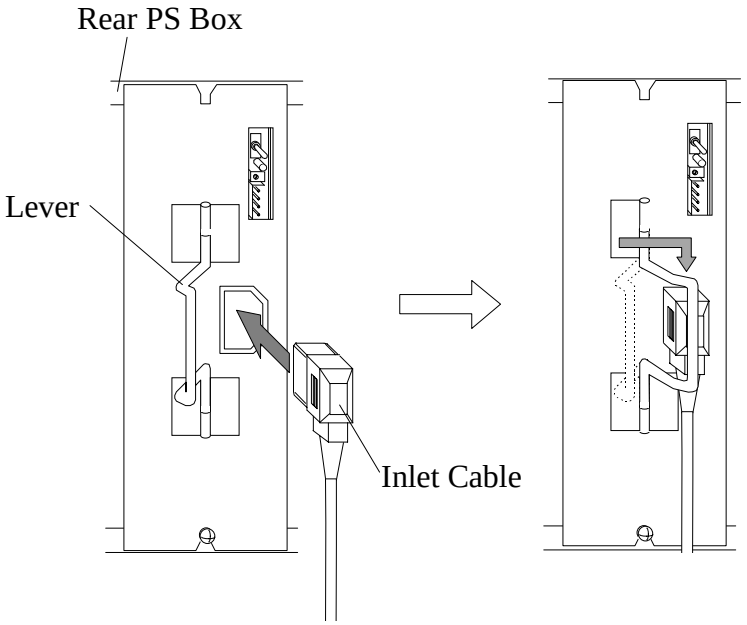

Fig. 3.8.2.2-5 Connection of Inlet Cable

4. Turn on the Additional Power Supply
   a. Turn the PS Enable/Disable Switch to (UP) **Enable**. Refer to Fig. 3.8.2.2-6.

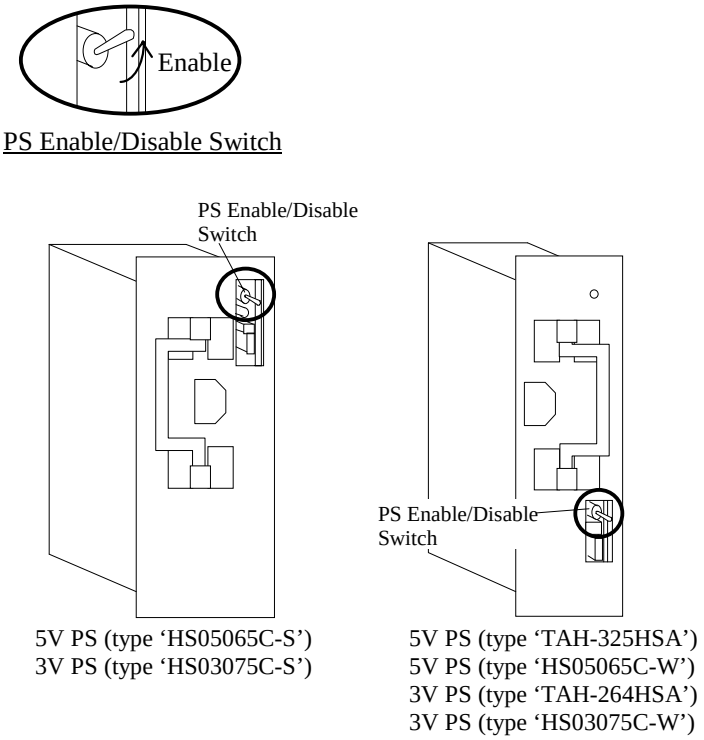

Fig. 3.8.2.2-6 Switch

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5. Attachment of the nameplate
   a. Attach the nameplate of DKC-F310I-80 referring to Fig. 3.8.2.2-7.

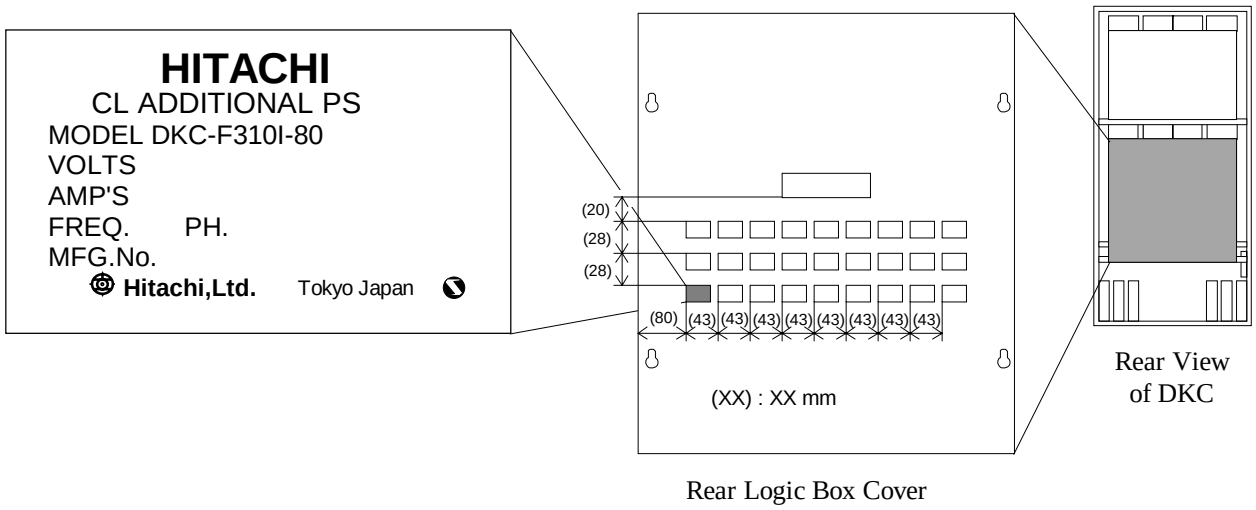

Fig. 3.8.2.2-7 Attachment of Nameplate

6. Check of DC voltage
   a. See CHECK OF DC VOLTAGE in PERIODIC SECTION.

7. Return to General Flow.
   New Installation: Go to INST02-10 step (4A).
   Non-disruptive Installation: Go to INST02-20 Step (2)-2.
   Disruptive Installation: Go to INST02-40 Step (3A).

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3.8.3 Installation of the CL Redundant Power Supply (DKC-F310I-81)

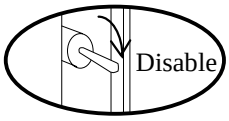
3.8.3.1 Parts List

Table 3.8.3.1-1 Parts List

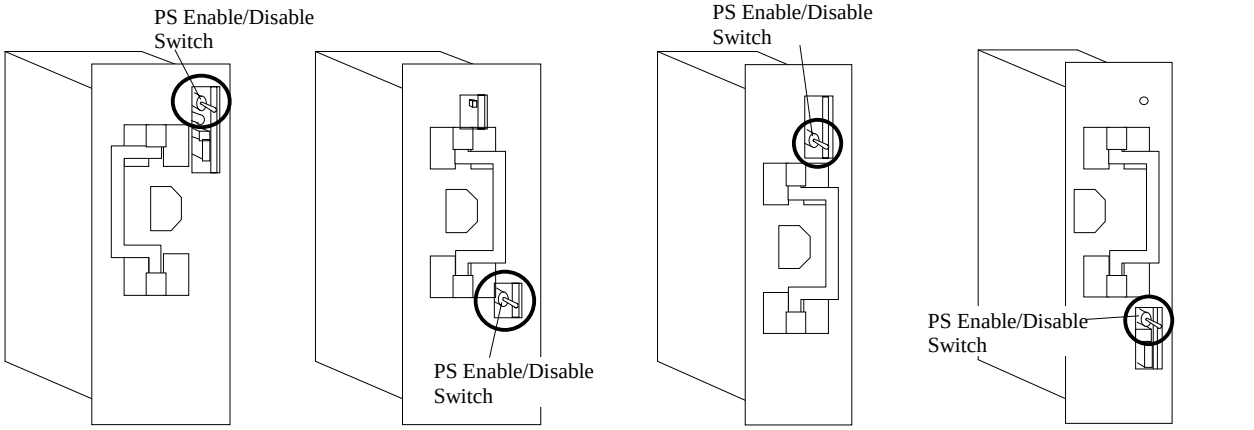
No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-81	5V power supply	5500003-A	2	HS05065C-S
					TAH-325HSA
					HS05065C-W
		3V power supply	5500003-B	2	HS03075C-S
					TAH-264HSA
					HS03075C-W
		Multi power supply	5479654-C	2	HS300-04C-R, V
			5491916-2		TSG-370HS-C
			EC5000367-A		HS400-08GR
		Nameplate	3252542-10	1	

3.8.3.2 Installation Procedure of the CL Redundant Power Supply

1. Confirmation of the PS Enable/Disable Switch
   a. Confirm the PS Enable/Disable Switch is turned to (DOWN) **Disable**. Refer to Fig. 3.8.3.2-1.



PS Enable/Disable Switch



5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')
Multi PS (type 'HS300-04C-R')

Multi PS (type 'HS300-04C-V')
Multi PS (type 'TSG-370HS-C')

Multi PS (type 'HS400-08GR')

5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

Fig. 3.8.3.2-1 Switch

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2. Installation of the redundant power supply
   a. Open the locking clamps and remove the inlet cables from the inserting locations. Refer to Table 3.8.3.2-1, Fig. 3.8.3.2-2, and Fig. 3.8.3.2-3.
   b. Loosen the screws and remove the dummy plates.
   c. Install the redundant power supplies in the correct locations and fasten the screws. Refer to Table 3.8.3.2-1, Fig. 3.8.3.2-2, and Fig. 3.8.3.2-4.

   Note: Dummy plates should be stored for future use in De-installation.

Table 3.8.3.2-1 Inserting Location

No.	Part Name	PS Location		Remarks
		Cluster 1	Cluster 2	
1	5V power supply	5VPS11	5VPS21	
2	3V power supply	3VPS11	3VPS21	
3	Multi power supply	MPS11	MPS21	

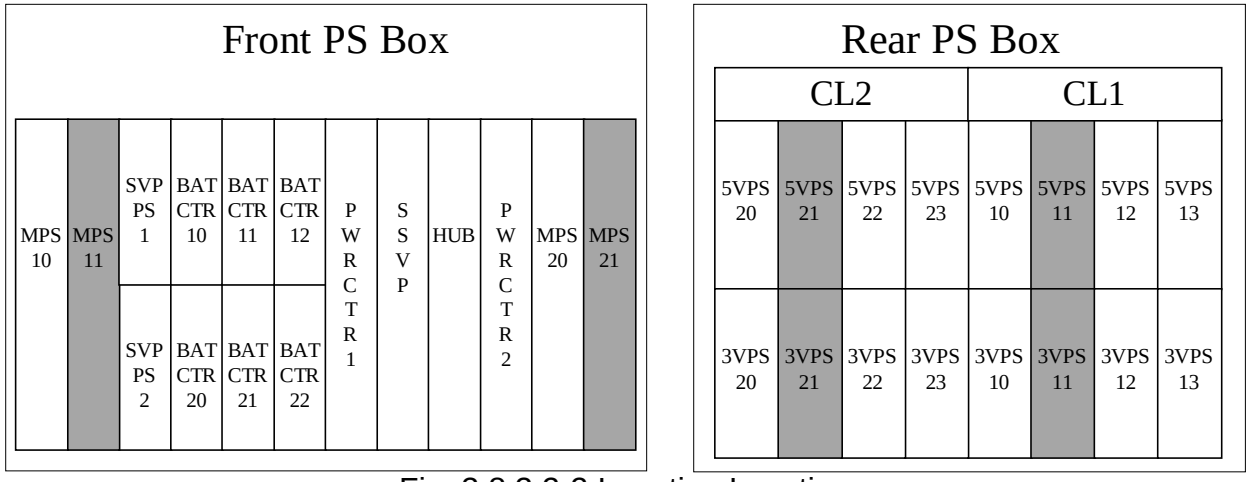

Fig. 3.8.3.2-2 Inserting Location

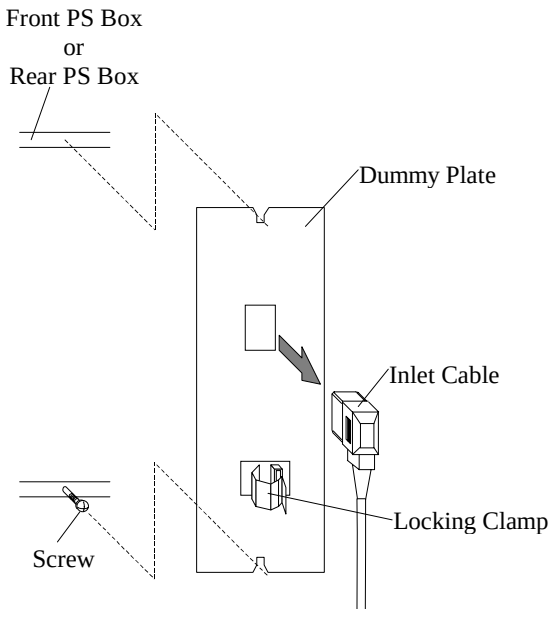

Fig. 3.8.3.2-3 Removal of Dummy Plate

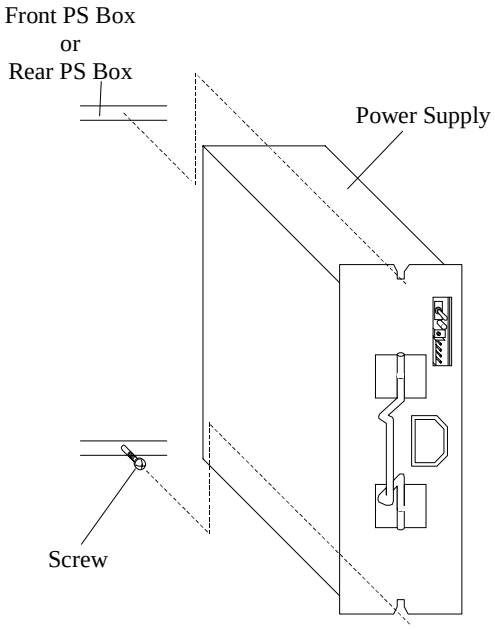

Fig. 3.8.3.2-4 Installation of Power Supply

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3. Connection of the inlet cable
   a. Connect the inlet cables to the power supply and fix them with the lever. Refer to Fig. 3.8.3.2-5.

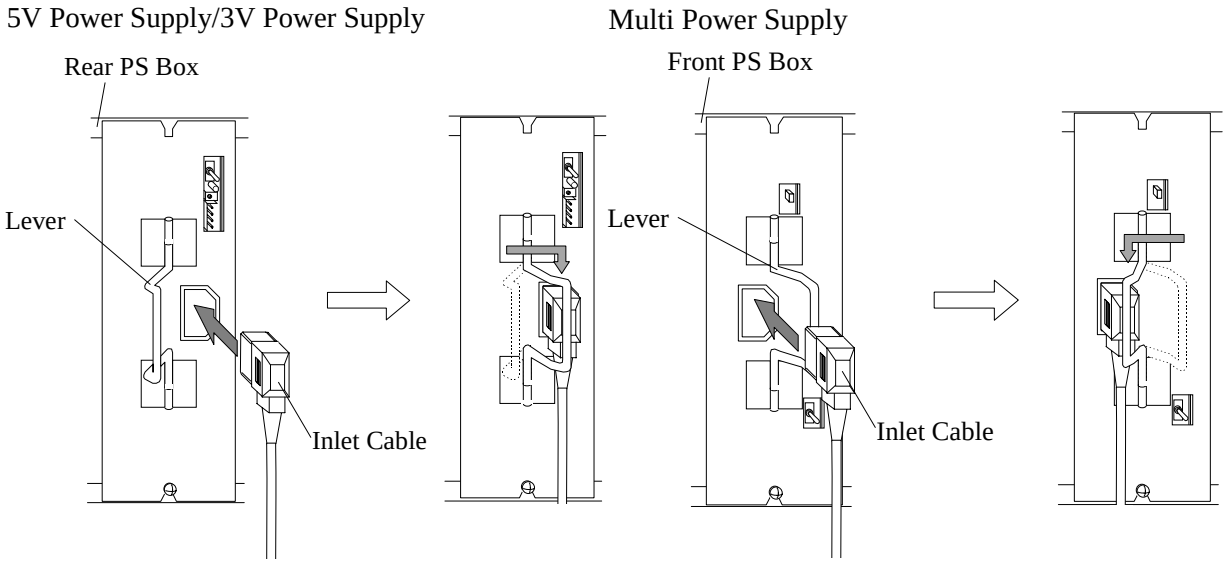
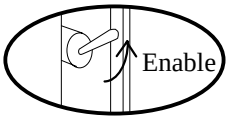
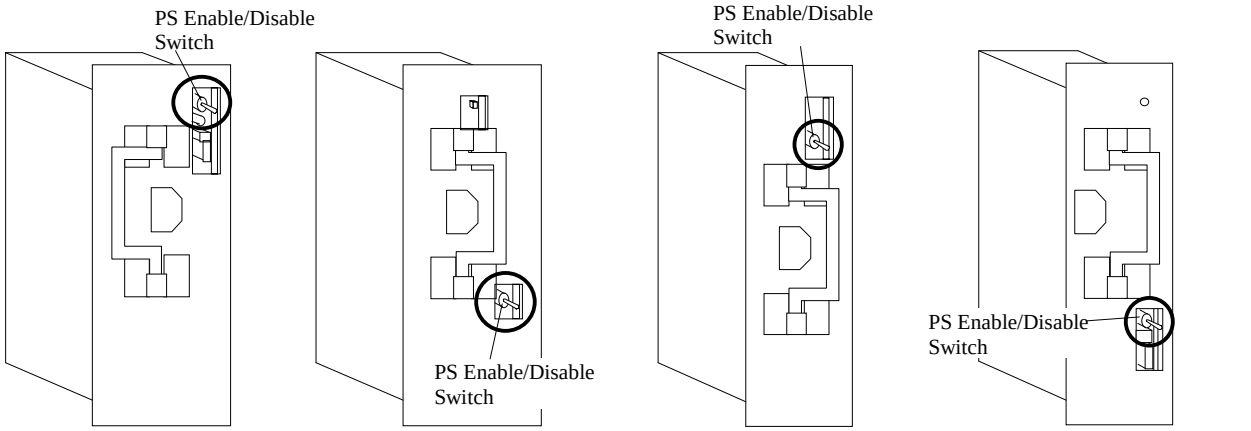


Fig. 3.8.3.2-5 Connection of Inlet Cable

4. Turn on the Redundant Power Supply
   a. Turn the PS Enable/Disable Switch to (UP) **Enable**. Refer to Fig. 3.8.3.2-6.



PS Enable/Disable Switch



5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')
Multi PS (type 'HS300-04C-R')

Multi PS (type 'HS300-04C-V')
Multi PS (type 'TSG-370HS-C')

Multi PS (type 'HS400-08GR')

5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

Fig. 3.8.3.2-6 Switch

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5. Attachment of the nameplate
   a. Attach the nameplate of DKC-F310I-81 referring to Fig. 3.8.3.2-7.

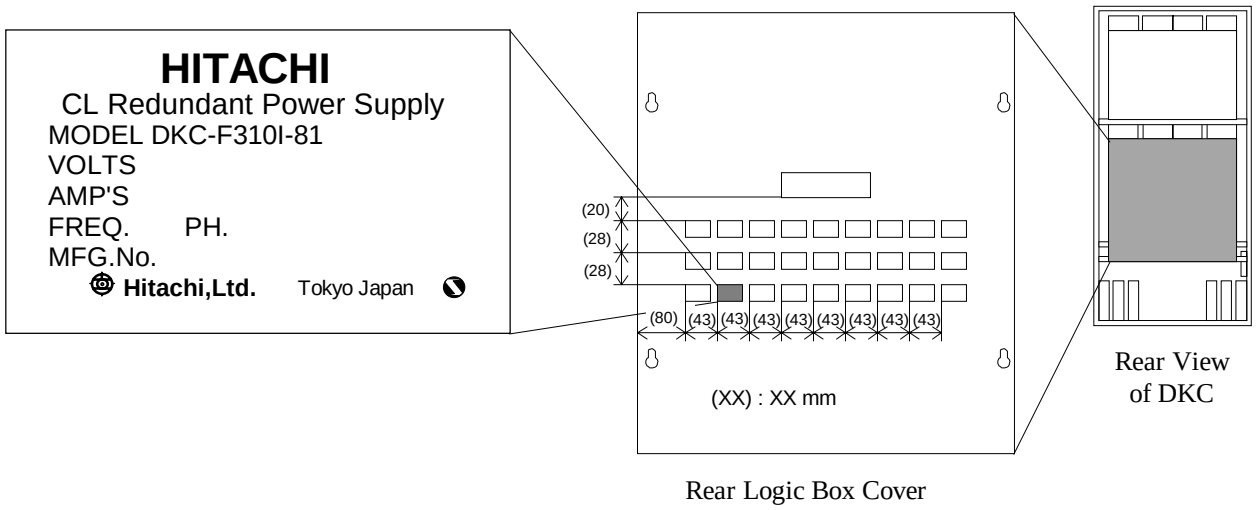

Fig. 3.8.3.2-7 Attachment of Nameplate

6. Check of DC voltage
   a. See CHECK OF DC VOLTAGE in PERIODIC SECTION.

7. Return to General Flow.
   New Installation: Go to INST02-10 step (4A)-2.
   Non-Disruptive Installation : Go to INST02-20 step(3)-2.
   Disruptive Installation : Go to INST02-40 step(3A)-2.

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3.8.4 Installation of the CL Additional Redundant Power Supply (DKC-F310I-82)

3.8.4.1 Parts List

Table 3.8.4.1-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-82	5V power supply	5500003-A	2	HS05065C-S
					TAH-325HSA
					HS05065C-W
		3V power supply	5500003-B	2	HS03075C-S
					TAH-264HSA
					HS03075C-W
		Nameplate	3252542-11	1	

3.8.4.2 Installation Procedure of the CL Additional Redundant Power Supply

1. Confirmation of the PS Enable/Disable Switch
   a. Confirm the PS Enable/Disable Switch is turned to (DOWN) **Disable**. Refer to Fig. 3.8.4.2-1.

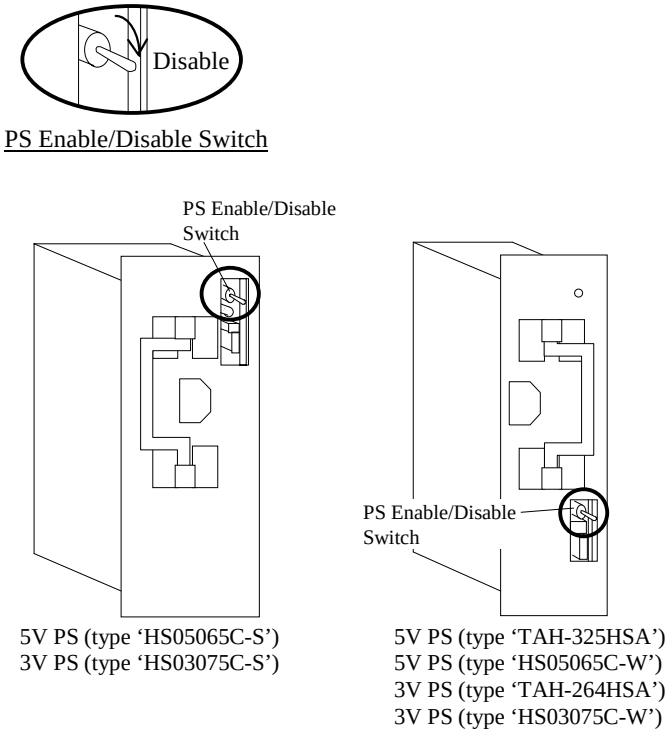

Fig. 3.8.4.2-1 Switch

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2. Installation of the redundant power supply
   a. Open the locking clamps and remove the inlet cables from the inserting locations. Refer to Table 3.8.4.2-1, Fig. 3.8.4.2-2, and Fig. 3.8.4.2-3.
   b. Loosen the screws and remove the dummy plates.
   c. Install the redundant power supplies in the correct locations. Refer to Table 3.8.4.2-1, Fig. 3.8.4.2-2, and Fig. 3.8.4.2-4.

   Note: Dummy plates should be stored for future use in De-installation.

Table 3.8.4.2-1 Inserting Location

No.	Part Name	PS Location		Remarks
		Cluster 1	Cluster 2	
1	5V power supply	5VPSC13	5VPSC23	
2	3V power supply	3VPSC13	3VPSC23	

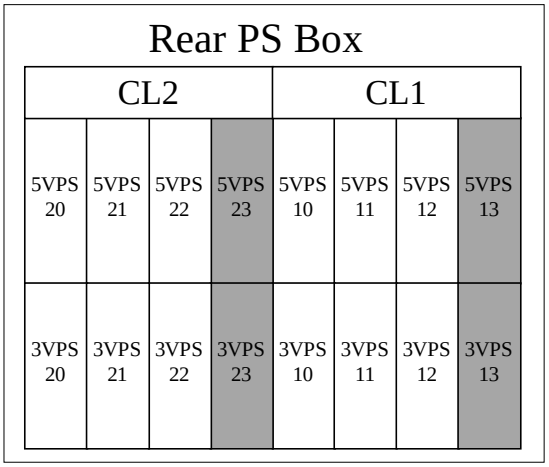

Fig. 3.8.4.2-2 Inserting Location

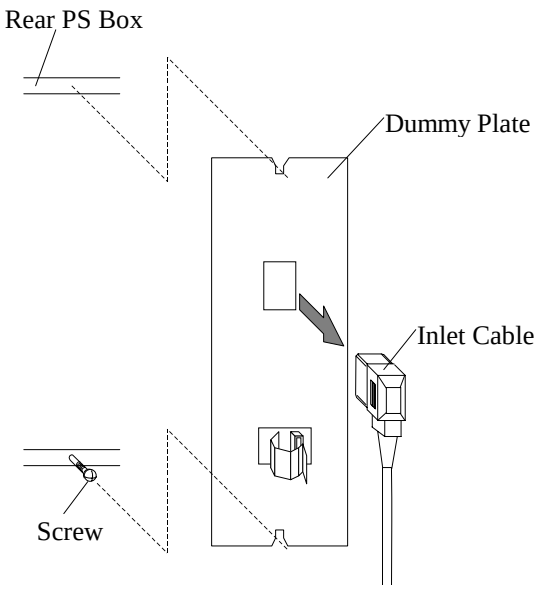

Fig. 3.8.4.2-3 Removal of Dummy Plate

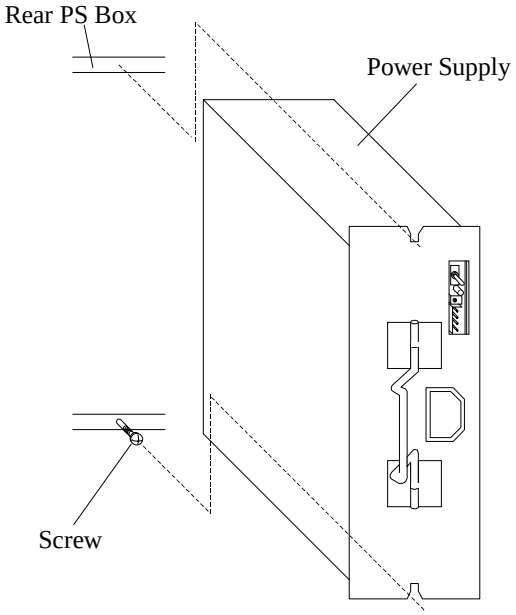

Fig. 3.8.4.2-4 Installation of Power Supply

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3. Connection of the inlet cable
   a. Connect the inlet cables to the power supply and fix them with the lever. Refer to Fig. 3.8.4.2-5.

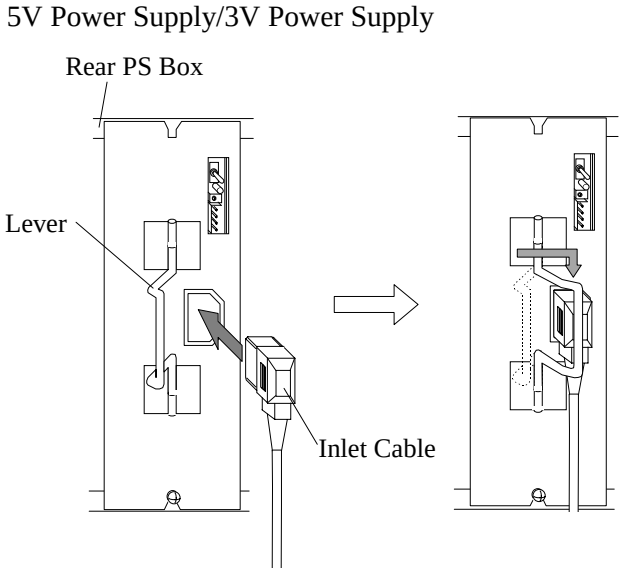
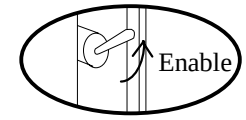
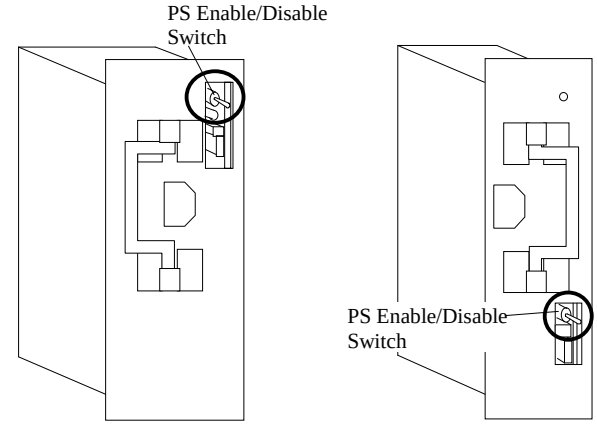


Fig. 3.8.4.2-5 Connection of Inlet cable

4. Turn on the Redundant Power Supply
   a. Turn the PS Enable/Disable Switch to (UP) **Enable**. Refer to Fig. 3.8.4.2-6.



PS Enable/Disable Switch



5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')

5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

Fig. 3.8.4.2-6 Switch

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5. Attachment of the nameplate
   a. Attach the nameplate of DKC-F310I-82 referring to Fig. 3.8.4.2-7.

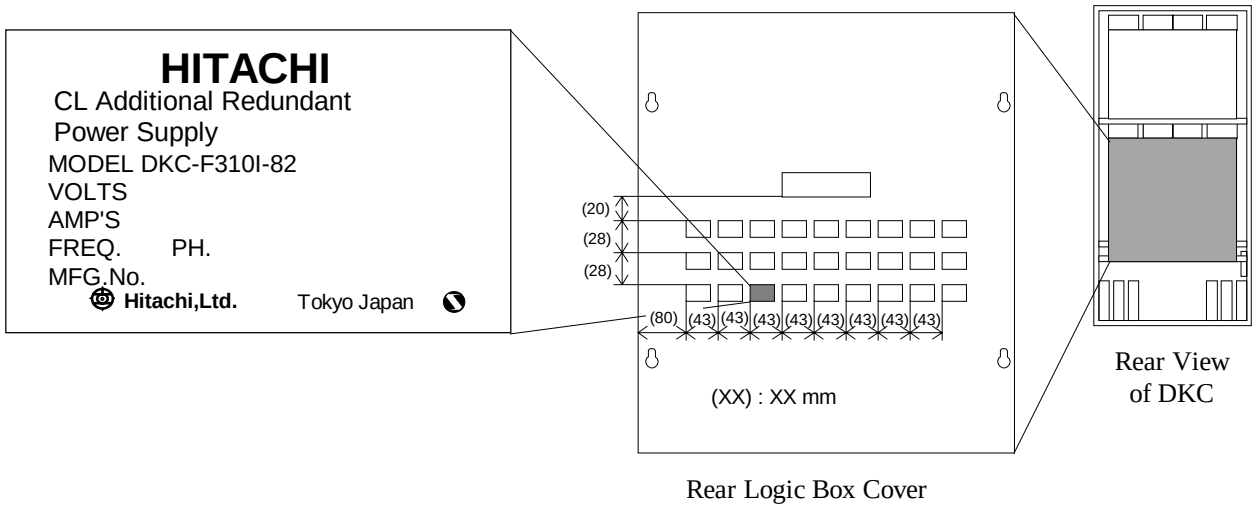

Fig. 3.8.4.2-7 Attachment of Nameplate

6. Check of DC voltage
   a. See CHECK OF DC VOLTAGE in PERIODIC SECTION.

7. Return to General Flow.
   New Installation: Go to INST02-10 step (5).
   Non-Disruptive Installation : Go to INST02-20 step(3)-3.
   Disruptive Installation : Go to INST02-40 step(4).

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3.9 Installation of the Platform for Canister Mount (DKU-F305I-B4)

3.9.1 Flowchart

The procedure for expanding the platform for the canister mount is shown below.

(1) Confirmation of installation position of platform for the canister mount.	[INST03-1590]
↓	
(2) Removal of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate.	[INST03-1590]
↓	
(3) Removal of the side plate.	[INST03-1610]
↓	
(4) Installation of the HDU box.	[INST03-1610]
↓	
(5) Connection of the DKUMN cable.	[INST03-1620]
↓	
(6) Address setting of the HDU box.	[INST03-1630]
↓	
(7) Attachment of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate.	[INST03-1630]
↓	
(8) Attachment of the side plate.	[INST03-1630]
↓	
(9) Connection of the INLET cable.	[INST03-1640]
↓	
(10) Attachment of the nameplate and label (REV).	[INST03-1650]
↓	
(11) Setting of the PS enable switch on the multi power supply.	[INST03-1660]
↓	
(12) Installation of the Jumper plug in the DKUMN PCB.	[INST03-1670]
↓	
(13) Check of the SCSI ID Jumpers	[INST03-1670]

3.9.2 Parts List

Table 3.9.2-1 Parts List for Platform for Canister Mount

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKU-F305I-B4	HDU Box	1505534-A	4	
		Multi Power Supply	5497470-A/B/C	8	
		SCSI BFR PCB	5497468-A	8	
		HDD FAN Assembly	5497471-A	12	
		Nameplate E (DKU-F305I)	2099650-57	1	
		Label (REV)	5497283-1	1	

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3.9.3 Installation Procedure of the Platform for Canister Mount

1. Refer to Chapter 1.2 Subsystem Frame Configuration (INST01-250). Confirm a position to install platform for the canister mount.

2. Removal of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate.

   a. Remove the acrylic cover①.

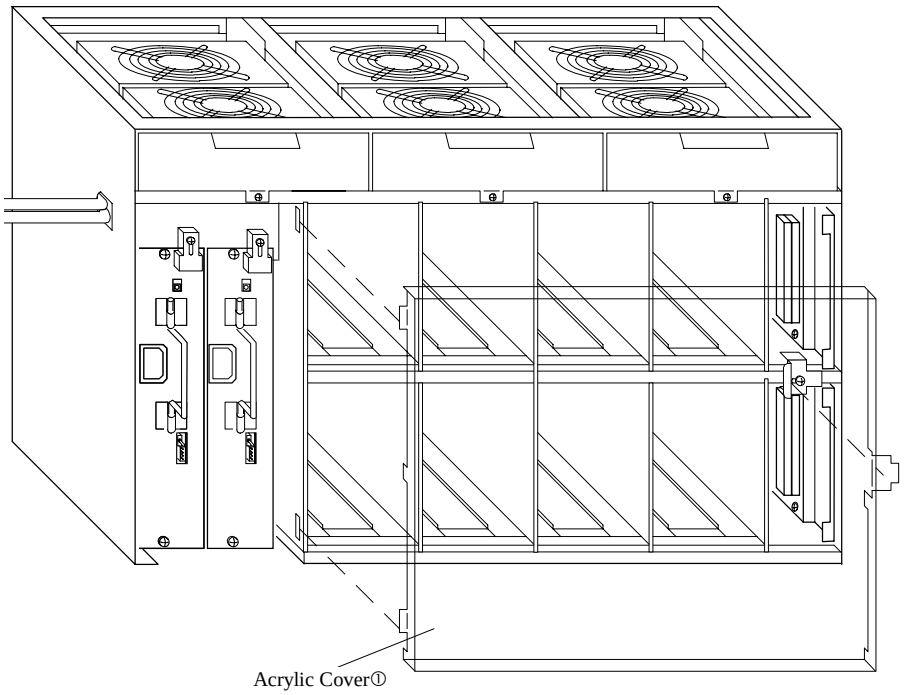

Fig. 3.9.3-1 Removal of the Acrylic Cover

   b. Loosen screw ① on stopper ② securing the SCSI BFR PCB ③ in the HDU box to be installed, slide stopper ② to the left, and pull out the SCSI BFR PCB ③.

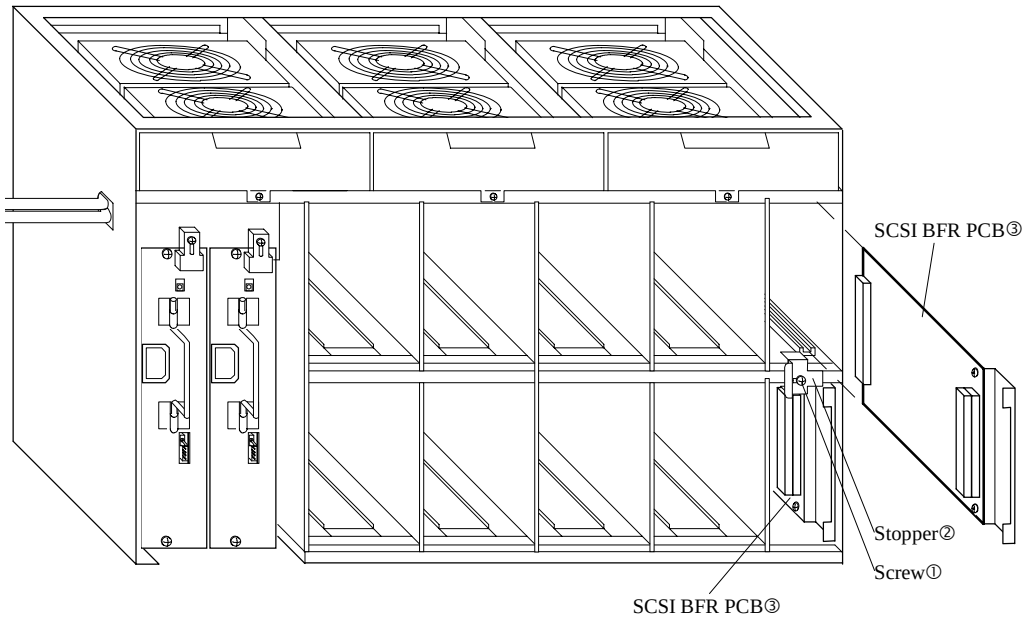

Fig. 3.9.3-2 Removal of the SCSI BFR PCB

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c. Remove screws ① securing the multi power supply ② in the HDU box to be installed, flip up the buffering rubbers ③, and pull out the multi power supply ②.

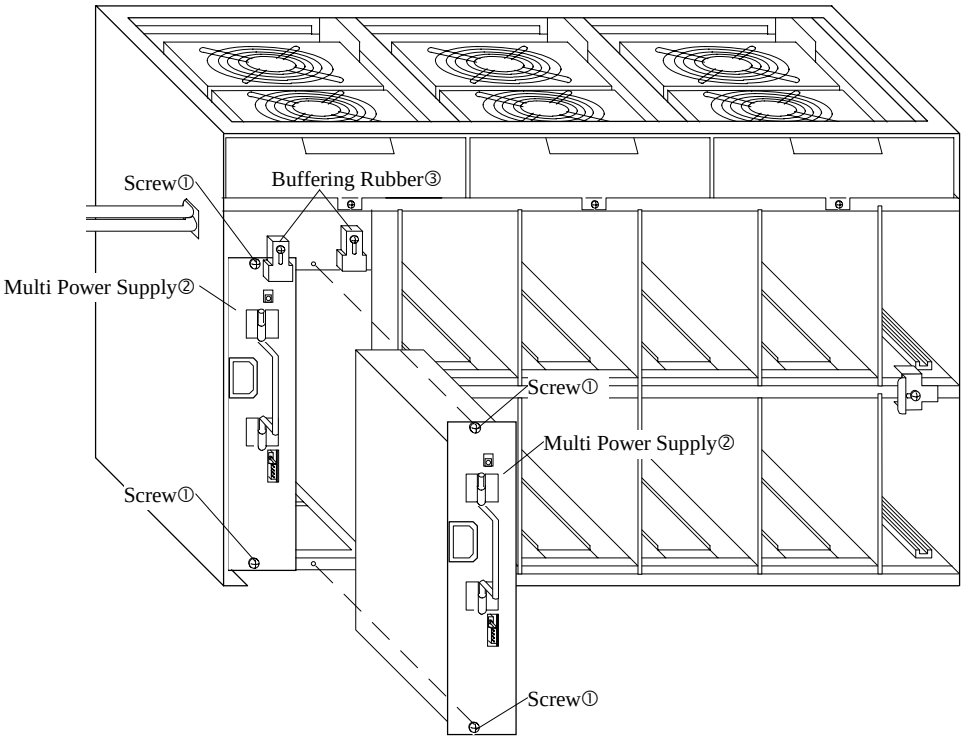

Fig. 3.9.3-3 Removal of the Multi Power Supply

d. Pull out the partition plates ①.

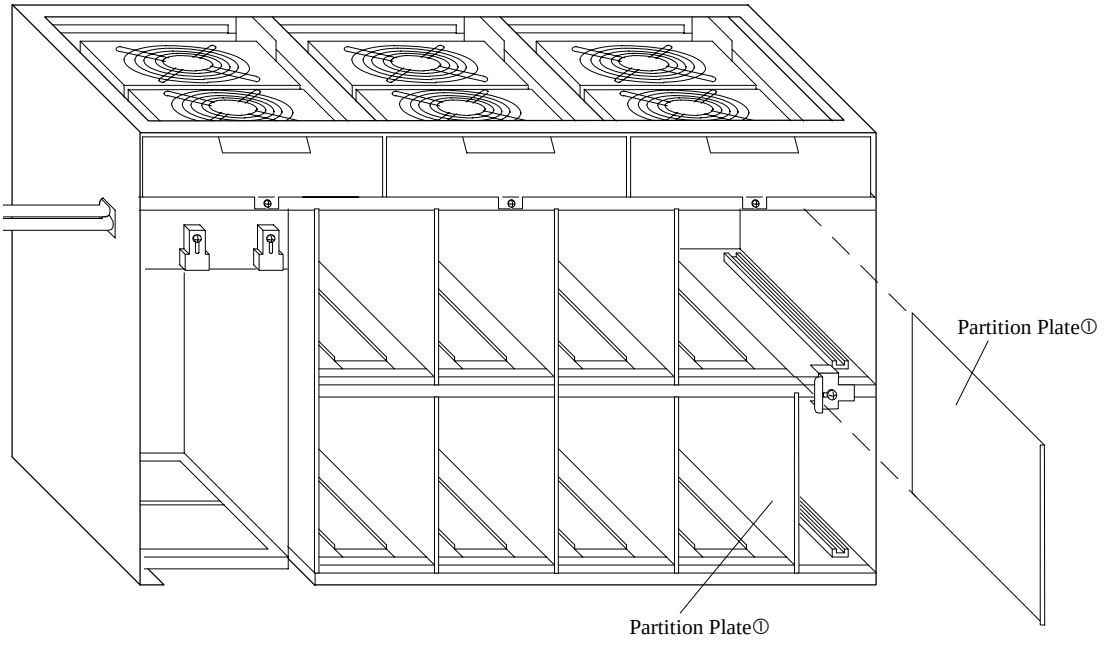

Fig. 3.9.3-4 Removal of the Partition Plate

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3. Removal of the side plate.

a. Loosen screws ① and raise DKUMN PCBs ② and secure DKUMN PCBs ② with screws ③.
b. Remove screws ④ and side plates ⑤.
c. Loosen screws ⑥ and raise cable ducts ⑦ when installing a new HDU box.

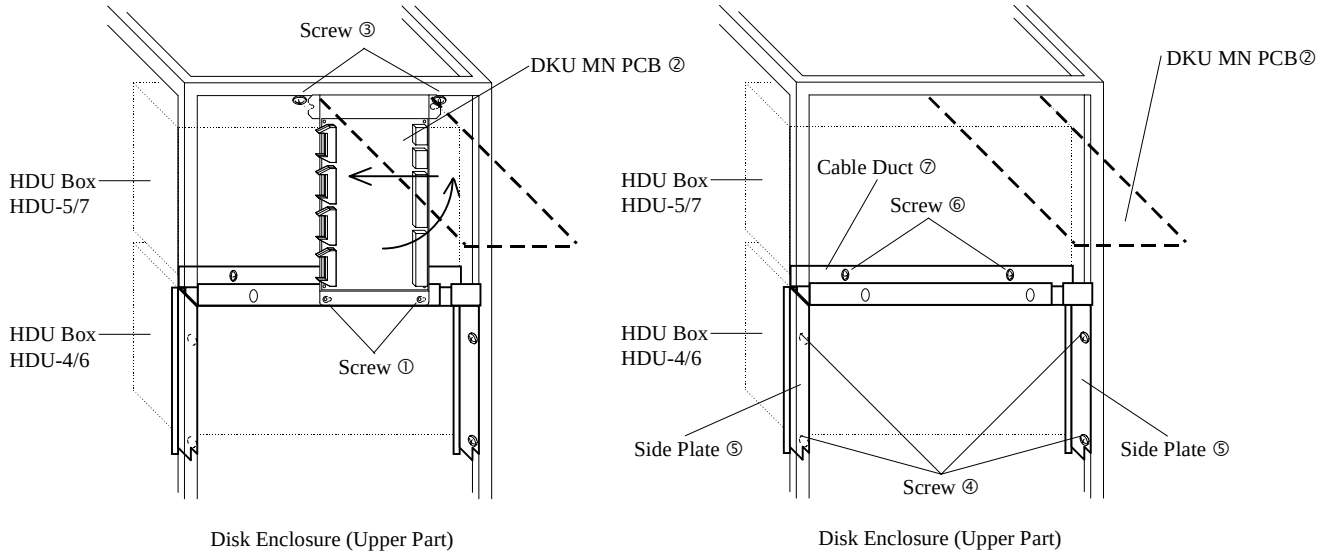

Fig. 3.9.3-5 Removal of the Side Plate

4. Installation of the HDU Box.

a. Install the HDU box on the disk unit and secure it with screws ① and plastic washers ②.

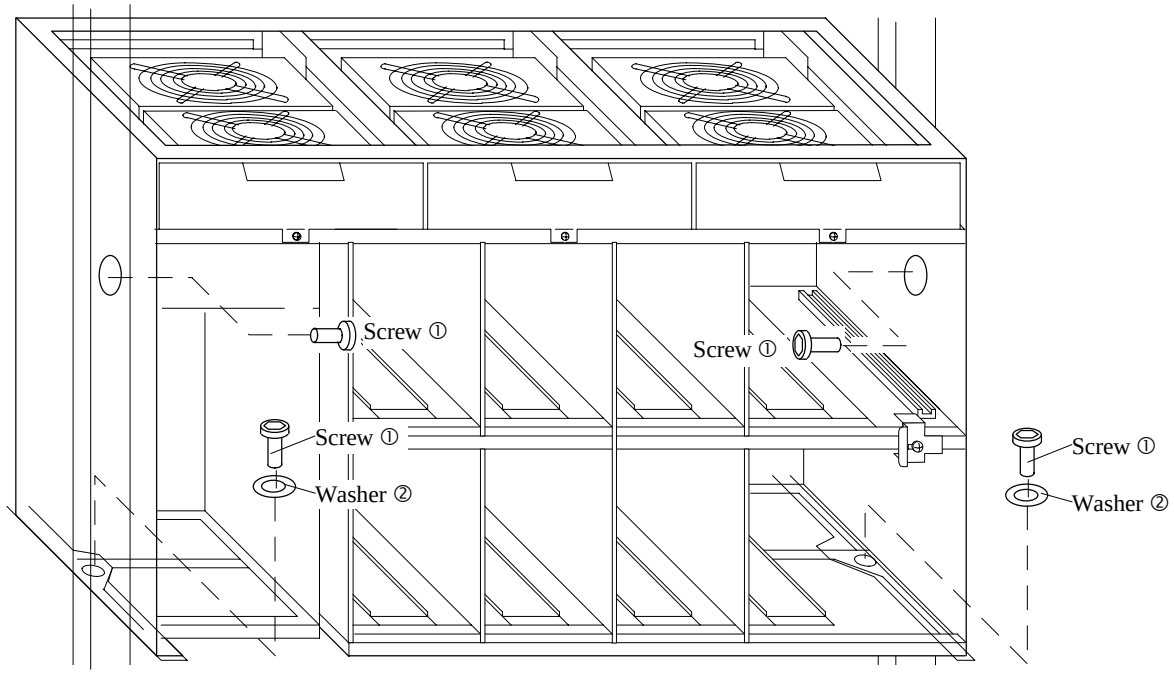

Fig. 3.9.3-6 Installation of the HDU Box

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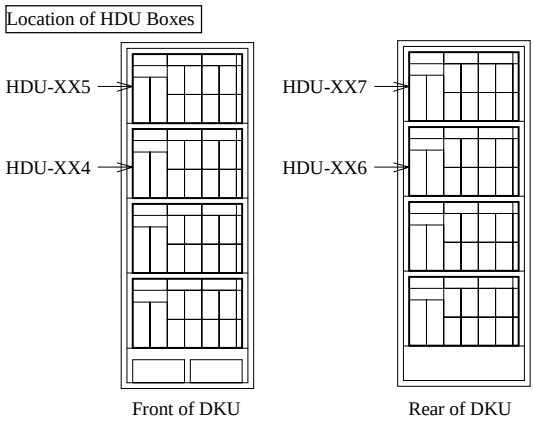
5. Connection of the DKUMN cable.

a. Connect the DKUMN cables ① referring to Table 3.9.3-1 and Fig. 3.9.3-7.

Table 3.9.3-1 DKUMN Cables and Matching Connectors

Location of HDU Box	No.	DKUMN Cable ①	Connector
XX4	1	4-P301	4-J301
	2	4-P302	4-J302
XX5	1	5-P301	5-J301
	2	5-P302	5-J302
XX6	1	6-P301	6-J301
	2	6-P302	6-J302
XX7	1	7-P301	7-J301
	2	7-P302	7-J302



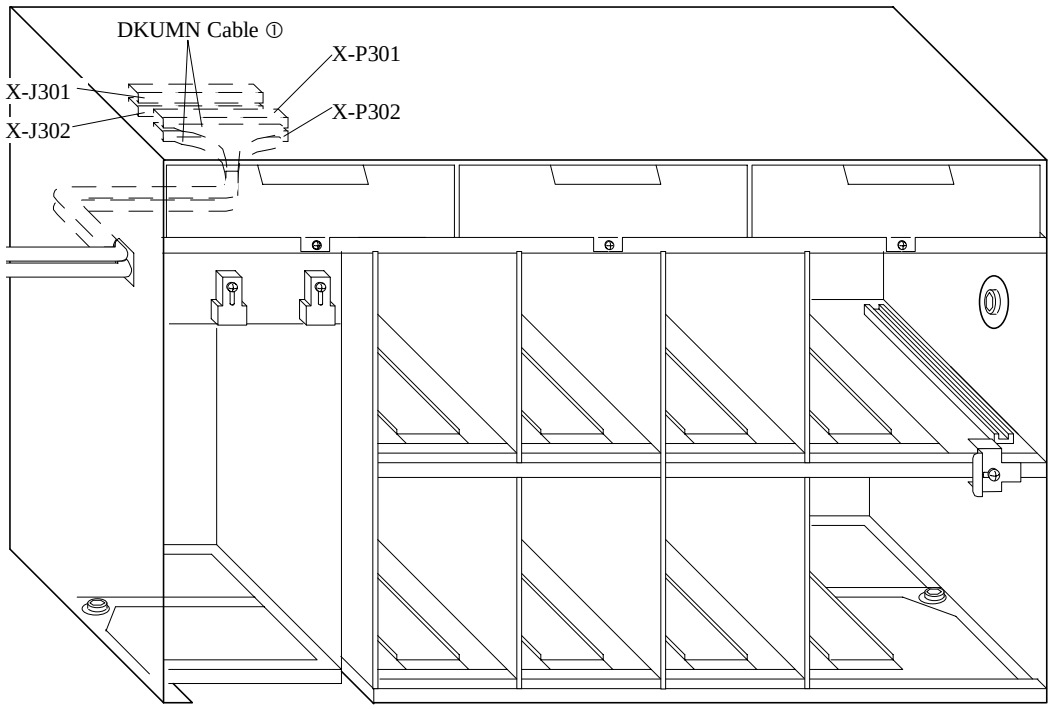


Fig. 3.9.3-7 Connection of the DKUMN Cables

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6. Address setting of the HDU Box.
   a. For the first and third disk units, install a SCSI ID jumper to socket JP01 on the HDD back board.
   b. For the second and fourth disk units, install a SCSI ID jumper to socket JP02 on the HDD back board.

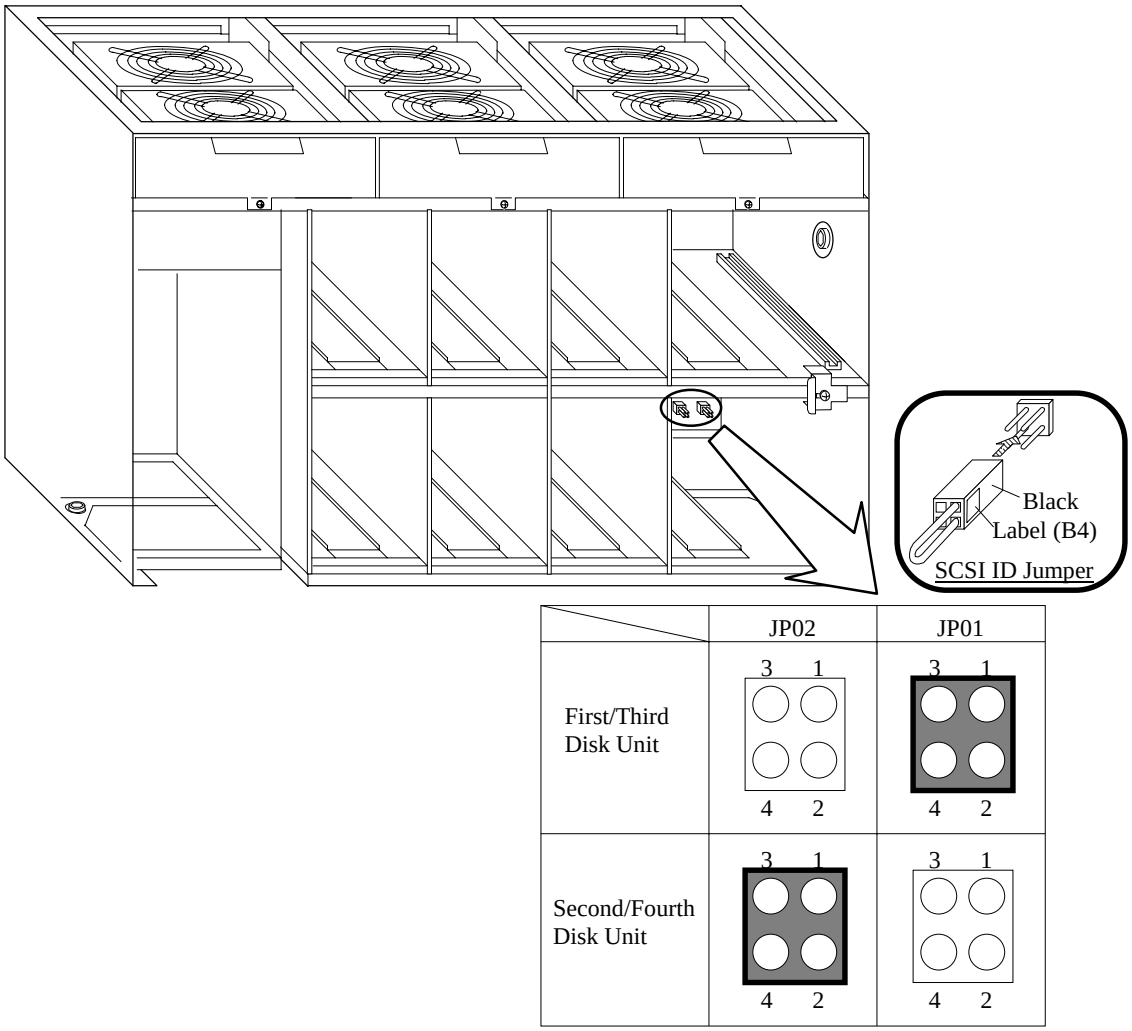

Fig. 3.9.3-8 Address Setting of the HDU Box

7. Attachment of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate.
   a. Attach the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate in the HDU box in the reverse order of Step 2.

8. Attachment of the side plate.
   a. Attach the side plates in the reverse order of Step 3.

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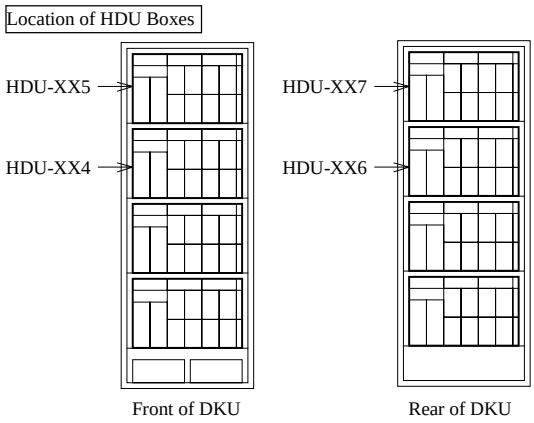
9. Connection of the INLET cable.

a. Connect the INLET cables ① referring to Table 3.9.3-2 and Fig. 3.9.3-9.

Table 3.9.3-2 INLET Cables and Matching Connectors

Location of HDU Box	No.	INLET Cable ①	Connector
XX4	1	4-P601-1	4-J601-1
	2	4-P601-2	4-J601-2
XX5	1	5-P601-1	5-J601-1
	2	5-P601-2	5-J601-2
XX6	1	6-P601-1	6-J601-1
	2	6-P601-2	6-J601-2
XX7	1	7-P601-1	7-J601-1
	2	7-P601-2	7-J601-2



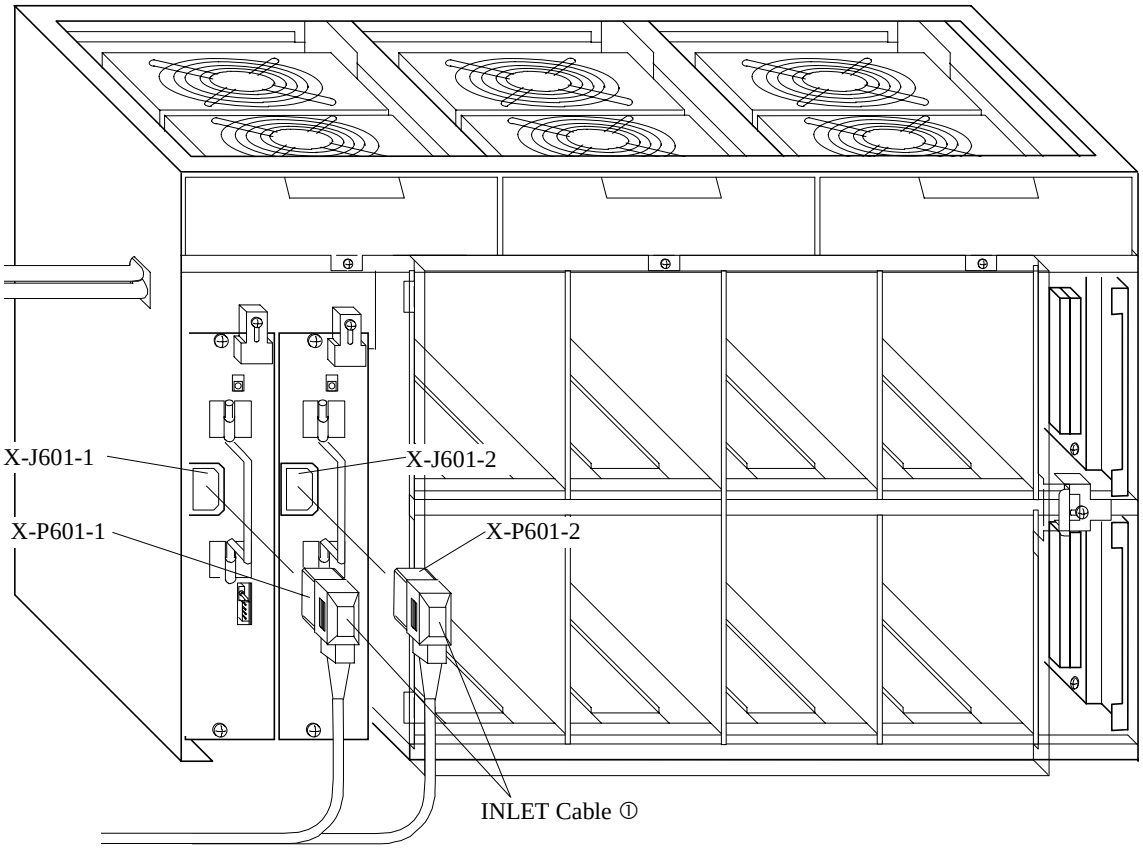


Fig. 3.9.3-10 Connection of the INLET Cable

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10. Attachment of the nameplate and label (REV).

a. Attach the nameplate ① and label (REV) ② of additional HUD box, referring to Fig. 3.9.3-10.

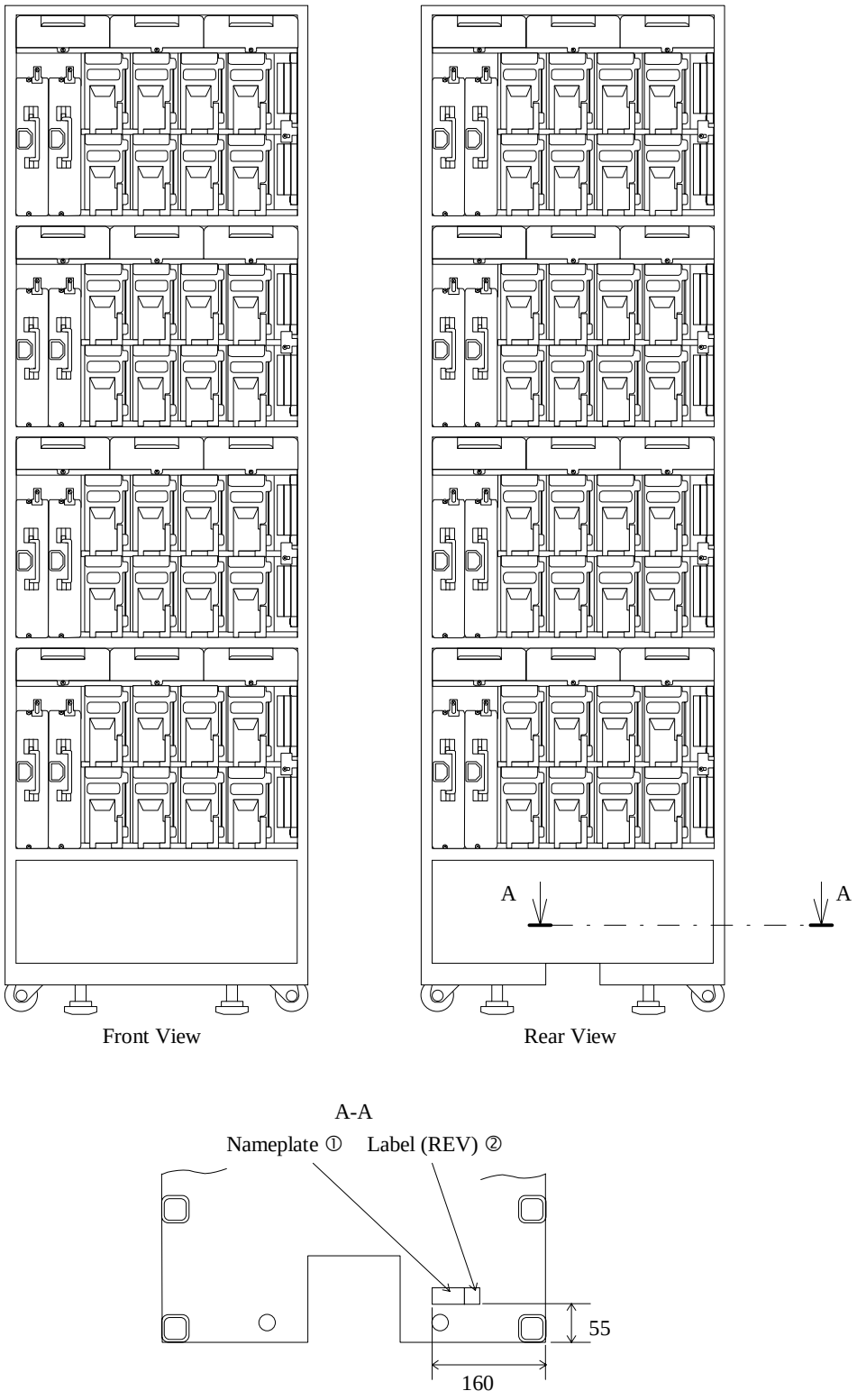

Fig. 3.9.3-10 Attachment of the Nameplate and Label (REV)

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11. Setting of the PS enable switch on the multi power supply.

a. Set the PS enable switch ① on the multi power supply ② to Enable and make sure that the PS enable LED ③ goes on.

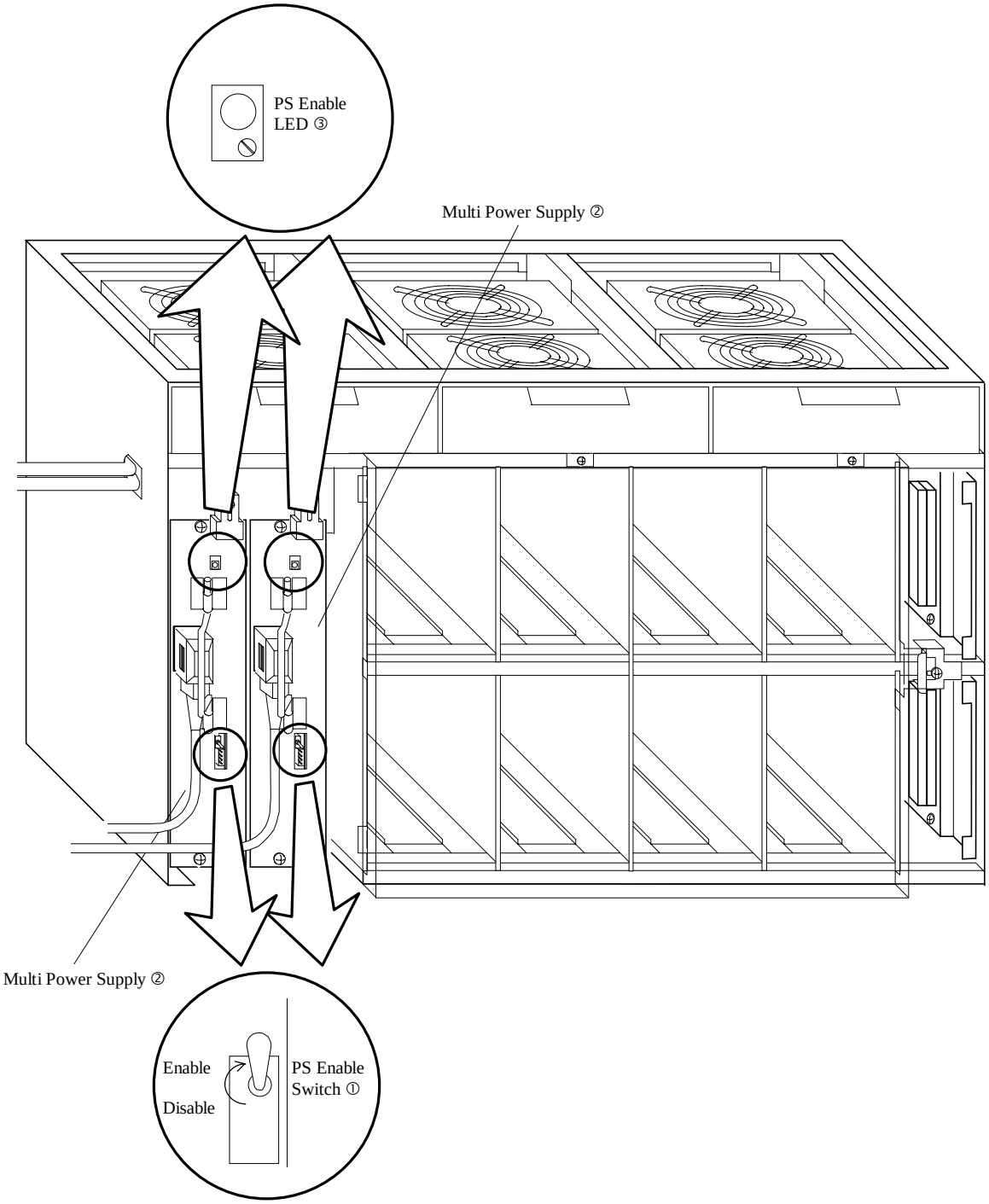

Fig. 3.9.3-11 Setting of the PS Enable Switch on the Multi Power Supply

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12. Installation of the jumper plug on the DKUMN PCB.

a. Install the jumper plugs for JP3 ① on the DKUMN PCBs ②, referring to Fig. 3.9.3-12.

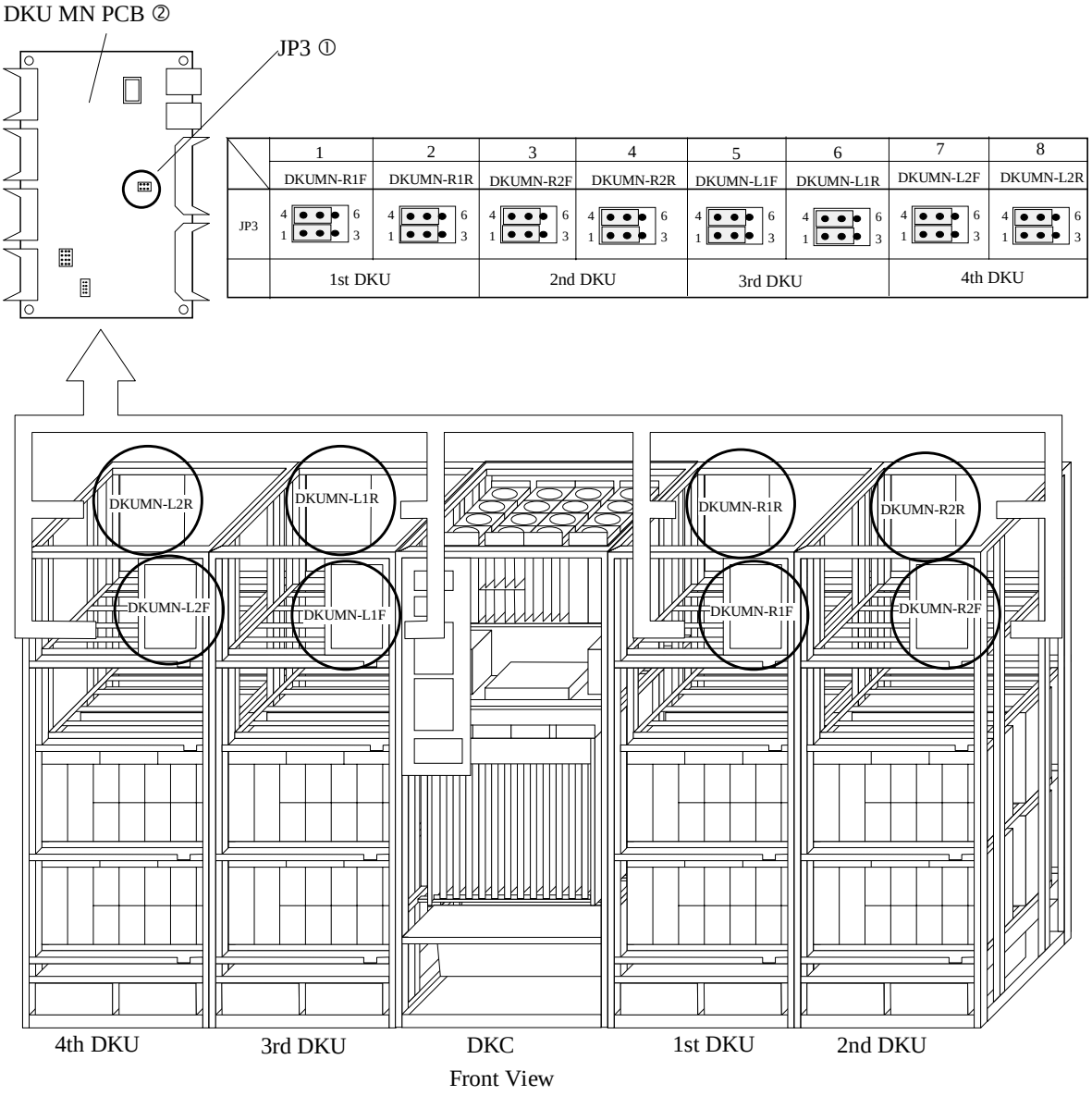

Fig. 3.9.3-12 DKUMN PCB Jumper Plug Positions

13. Check of the SCSI ID Jumpers

a. Check the SCSI ID jumpers on the HDD back boards. Refer to step 6 Address setting of the HDD box [INST03-1630].

When the SCSI ID jumpers are not installed to the correct sockets, install the SCSI ID jumpers to the correct sockets.

14. Return to General Flow.

New Installation : Go to INST02-11 step (8)-3.

Non-Disruptive Installation : Go to INST02-22 step (8)-4.

Disruptive Installation : Go to INST02-42 step (12)-4.

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3.10 Installation of HDD Canister (DKU-F305I-6F4/6F1/907/904/901/1804/1801/ 9F4/9F1/15F4/15F1/3604/3601/18J4/18J1/47J4/47J1)

3.10.1 Flowchart

(1) Confirmation of installation position of HDD canister. [INST03-1690]
↓
(2) Removal of the acrylic cover. [INST03-1690]
↓
(3) Installation of the HDD Canister. [INST03-1690]
↓
(4) Attachment of the acrylic cover. [INST03-1690]
↓
(5) Attachment of the nameplate. [INST03-1700]

3.10.2 Parts List

Table 3.10.2-1 Parts List for HDD Canister

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
1	DKU-F305I-6F4	HDU-6F1(60)	5497472-A	4	DK3F1-60×4
		Nameplate	2102118-7	1	
2	DKU-F305I-6F1	HDU-6F1(60)	5497472-A	1	DK3F1-60×1
		Nameplate	2102118-10	1	
3	DKU-F305I-907	HDU-901(90)	5491618-A	7	DK308/309-90×7
		Nameplate	2102118-13	1	
4	DKU-F305I-904	HDU-901(90)	5491618-A	4	DK308/309-90×4
		Nameplate	2102118-16	1	
5	DKU-F305I-901	HDU-901(90)	5491618-A	1	DK308/309-90×1
		Nameplate	2102118-19	1	
6	DKU-F305I-1804	HDU-1801(180)	5497473-A	4	DK309/30A-180×4
		Nameplate	2102118-4	1	
7	DKU-F305I-1801	HDU-1801(180)	5497473-A	1	DK309/30A-180×1
		Nameplate	2102118-1	1	
8	DKU-F305I-9F4	HDU-9F1(90)	5502138-A	4	DK3F2-90×4
		Nameplate	2102118-34	1	
9	DKU-F305I-9F1	HDU-9F1(90)	5502138-A	1	DK3F2-90×1
		Nameplate	2102118-37	1	
10	DKU-F305I-15F4	HDU-15F1(150)	5502085-A	4	DK3F2-150×4
		Nameplate	2102118-22	1	
11	DKU-F305I-15F1	HDU-15F1(150)	5502085-A	1	DK3F2-150×1
		Nameplate	2102118-25	1	

(To be continued.)

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(Continued from preceding sheet.)

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
12	DKU-F305I-3604	HDU-3601(360)	5502084-A	4	DK30A-360×4
		Nameplate	2102118-28	1	
13	DKU-F305I-3601	HDU-3601(360)	5502084-A	1	DK30A-360×1
		Nameplate	2102118-31	1	
14	DKU-F305I-18J4	HDU-18J1SC(180)	5502372-A	4	DKR2B-J18SC×4
		Nameplate	2102118-53	1	
15	DKU-F305I-18J1	HDU-18J1SC(180)	5502372-A	1	DKR2B-J18SC×1
		Nameplate	2102118-54	1	
16	DKU-F305I-47J4	HDU-47J1SC(470)	5502373-A	4	DKR1B-J47SC×4
		Nameplate	2102118-55	1	
17	DKU-F305I-47J1	HDU-47J1SC(470)	5502373-A	1	DKR1B-J47SC×1
		Nameplate	2102118-56	1	

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3.10.3 Installation Procedure of HDD Canister

1. Installation of the HDD Canister.
   a. Refer to Chapter 1.4 Drive Expansion Sequence (INST01-260 through INST01-300). Confirm a position to install HDD canister.

Notice!
The position to be installed in the 2nd or 4th DKU is different from one in the 1st or 3rd DKU. Be sure to set the HDDs in the right position. Wrong setting in the 2nd or 4th DKU may cause DKU failure on the same SCSI path.

   b. Remove the acrylic cover ①.
   c. Remove connector ② from the HDD canister ③.
   d. Insert the HDD canister ③ into the HDU Box ④ and secure it with screw ⑤.
   e. Insert connector ② into Jxxx ⑥.
   f. Attach the acrylic cover ①.

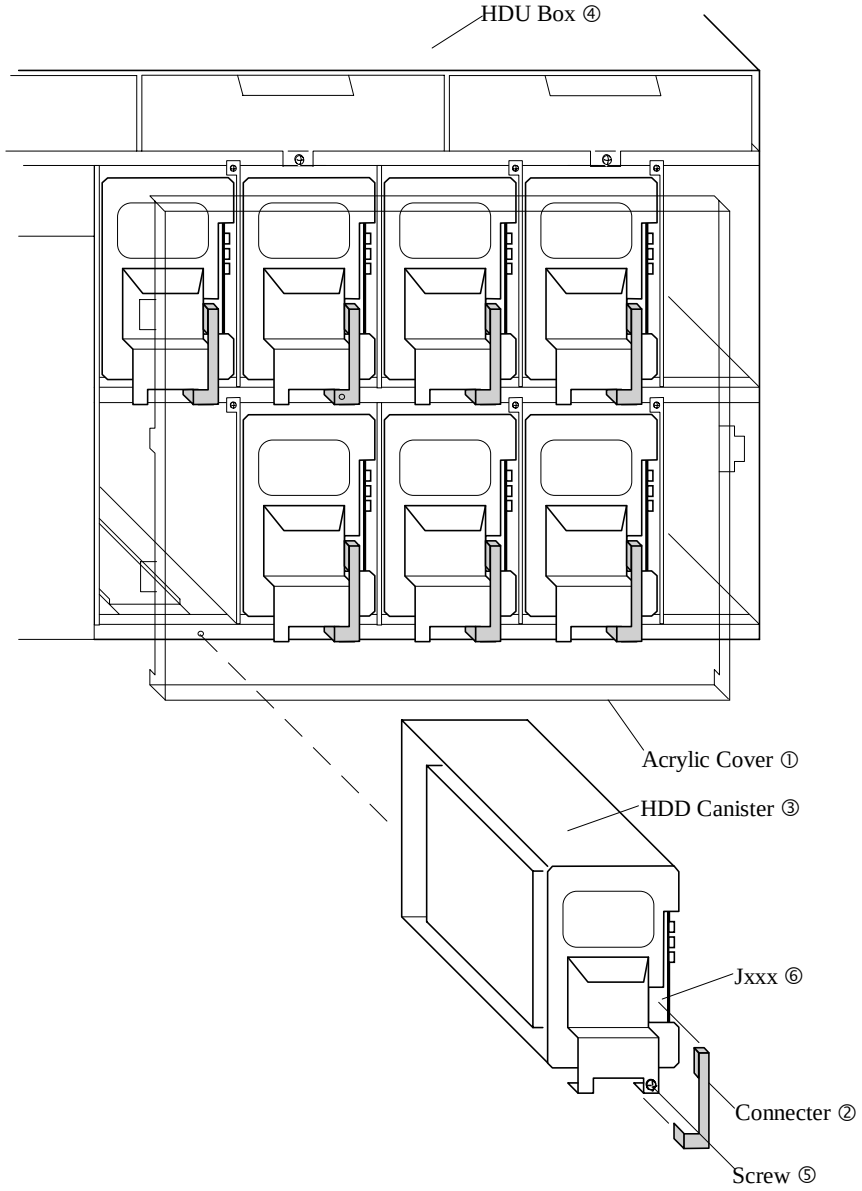

Fig. 3.10.3-1 Installation of HDD Canister

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2. Attachment of the nameplate.

a. Attach the nameplate to any locations of 24 parts/DKU regardless of the model number and location of the added HDD canister(s). (Fig. 3.10.3-2)

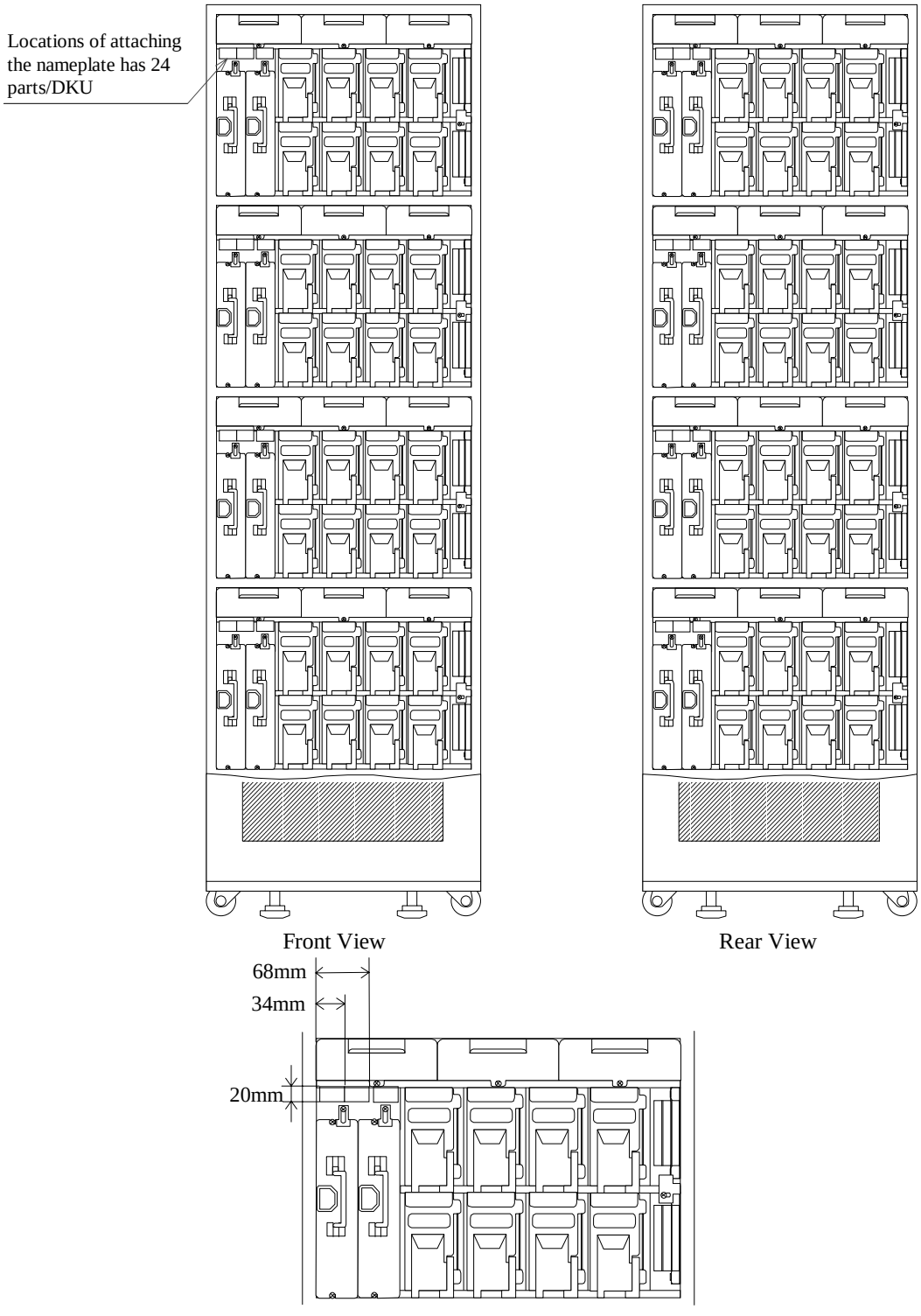

Fig. 3.10.3-2 Attachment of Nameplate

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3. Return to General Flow.

   New Installation : Go to INST02-11 step (10).

   Non-Disruptive Installation : Go to INST02-23 step (10)-2.

   Disruptive Installation : Go to INST02-43 step (14).

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3.11 Installation of Additional Disk Adapter (DKC-F310I-50/50E)

3.11.1 Parts list

Table 3.11-1 Parts List for Additional Disk Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-50	Disk Adapter PCB	1505479-A	2	
		Nameplate	3252542-2	1	For DKC-F310I-50
2	DKC-F310I-50E	Disk Adapter PCB	1505479-B/ 1505871-B	2	Support of HMRCF
		Nameplate	3253835-1	1	For DKC-F310I-50E

3.11.2 Flowchart

(1) Insert the PCBs.

↓

(2) Connect the SCSI cables.

↓

(3) Bind the SCSI cables

↓

(4) Attach the nameplate.

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3.11.3 Installation Procedure of Additional Disk Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Insertion of the PCBs
   a. Remove the dummy plate installed in the installation location referring to the Fig. 3.11-1. (Note) Dummy plates should be stored for future use in De-installation.
   b. Insert the PCBs to the correct locations in the Logic Box. Refer to Table 3.11-2.
   c. Fasten the two screws referring to Fig. 3.11-2.

Table 3.11-2 Inserting Location (Rear of the unit)

Cluster	CL2						CL1					CL2
Slot No.	M	L	K	J	H	G	F	E	D	C	B	A
Function	TM	DKA	DKA	DKA	DKA	CACHE	CACHE	DKA	DKA	DKA	DKA	TM
Location No.	TM -2M	DKA -2L	DKA -2K	DKA -2J	DKA -2H	CACHE -2G	CACHE -1F	DKA -1E	DKA -1D	DKA -1C	DKA -1B	TM -2A
Order of addition		Add.3	Add.2	Add.1	Basic			Add.3	Add.2	Add.1	Basic	

Up to 4 disk adapters can be installed in the subsystem.

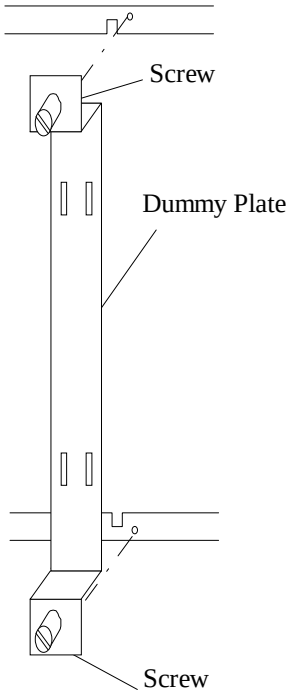

Fig. 3.11-1 Removal of Dummy Plate

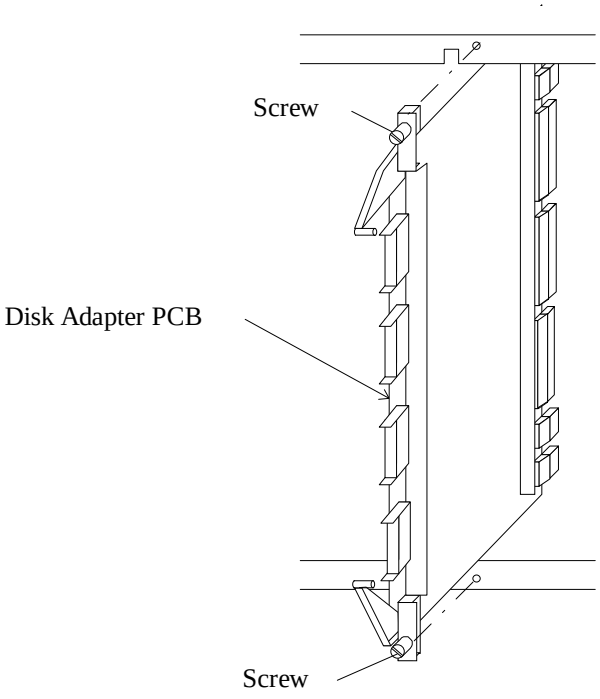

Fig. 3.11-2 Insertion of PCB

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2. Connection of SCSI cables

In case of Add.1

a. Connect the SCSI cable to the sub-edge of PCB. (Refer to Fig. 3.11-3.)

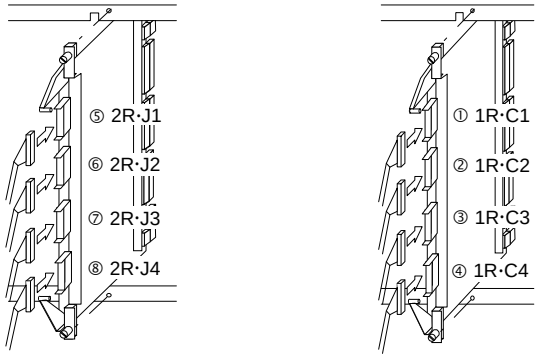

Fig.3.11-3 Connection of SCSI cable (Add.1)

In case of Add.2

a. Connect the SCSI cable to the sub-edge of PCB. (Refer to Fig. 3.11-4.)

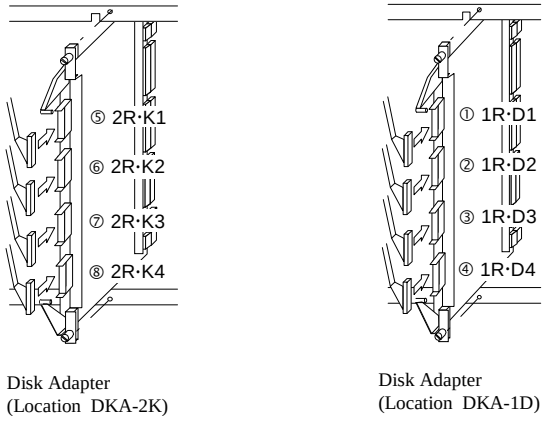

Fig.3.11-4 Connection of SCSI cable (Add.2)

In case of Add.3

a. Connect the SCSI cable to the sub-edge of PCB. (Refer to Fig. 3.11-5.)

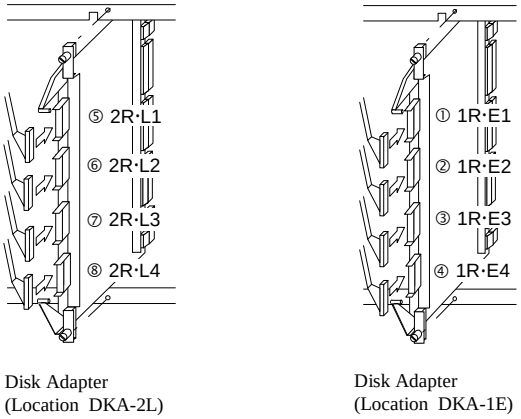

Fig.3.11-5 Connection of SCSI cable (Add.3)

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3. Binding of the SCSI cables

In case of Add.1

a. Bind the SCSI cables referring to Fig. 3.11-6.

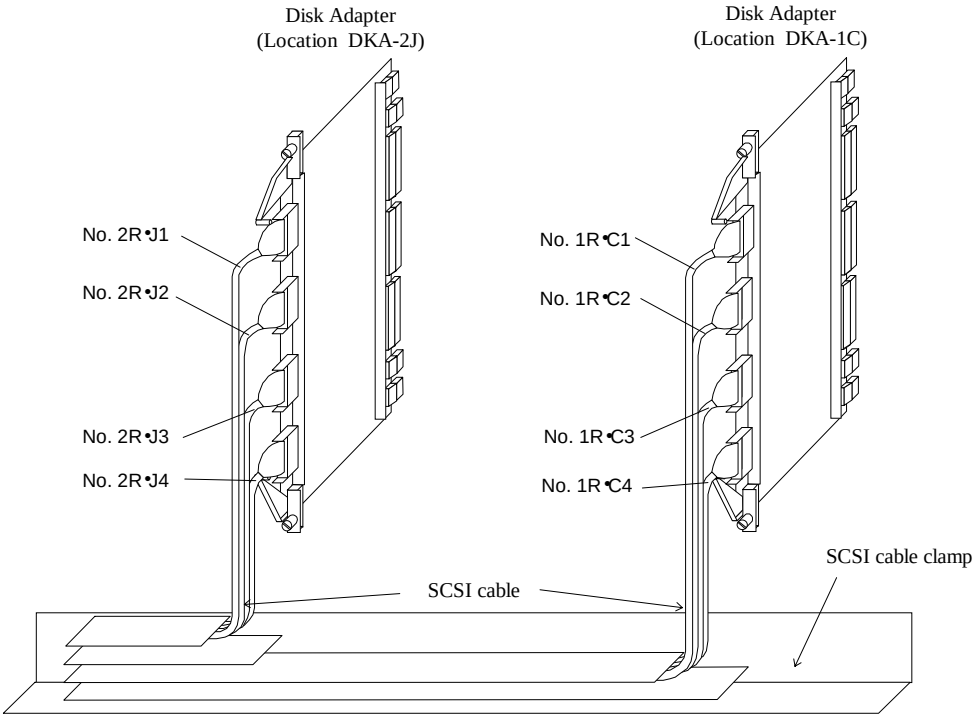

Fig.3.11-6 Binding of the SCSI cables (Add.1)

In case of Add.2

a. Bind the SCSI cables referring to Fig. 3.11-7.

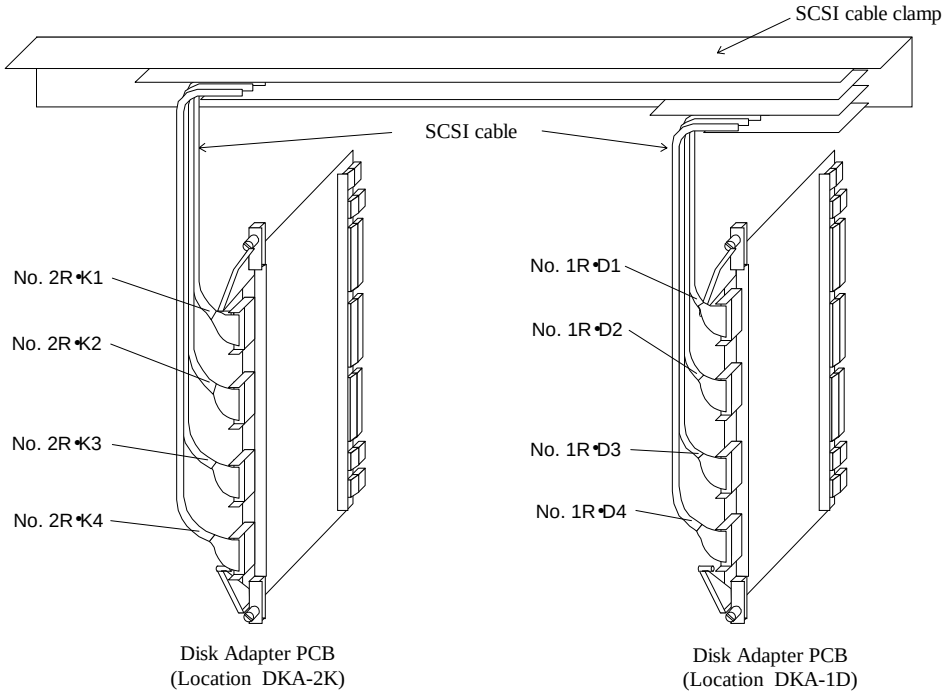

Fig. 3.11-7 Binding of the SCSI cables (Add.2)

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In case of Add.3

a. Bind the SCSI cables referring to Fig. 3.11-8.

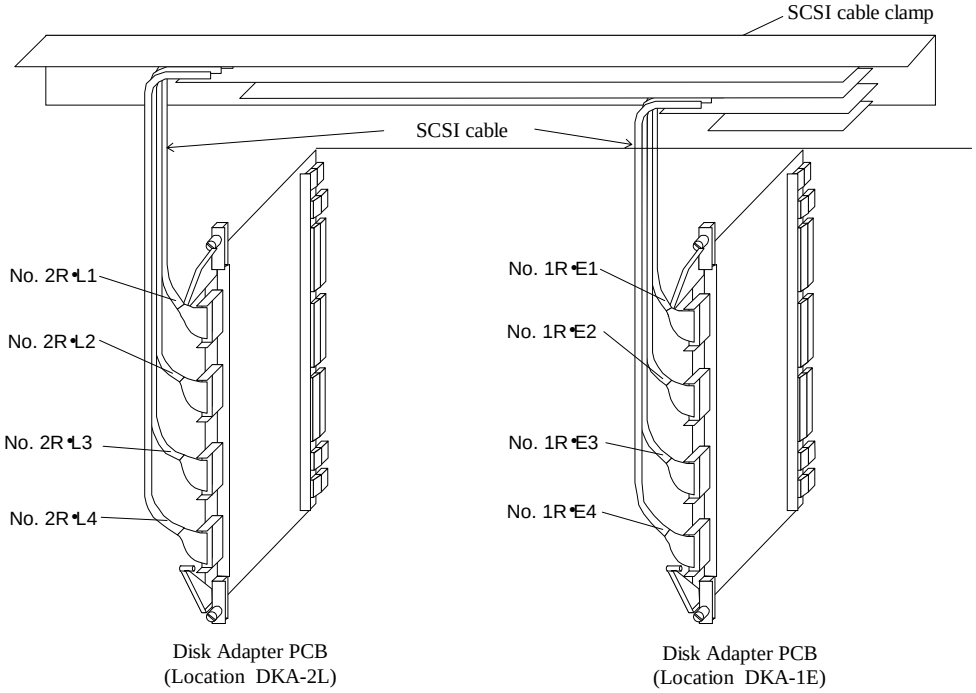

Fig. 3.11-8 Binding of the SCSI cables (Add.3)

4. Attachment of the nameplate

a. Attach the nameplate referring to Fig. 3.11-9.

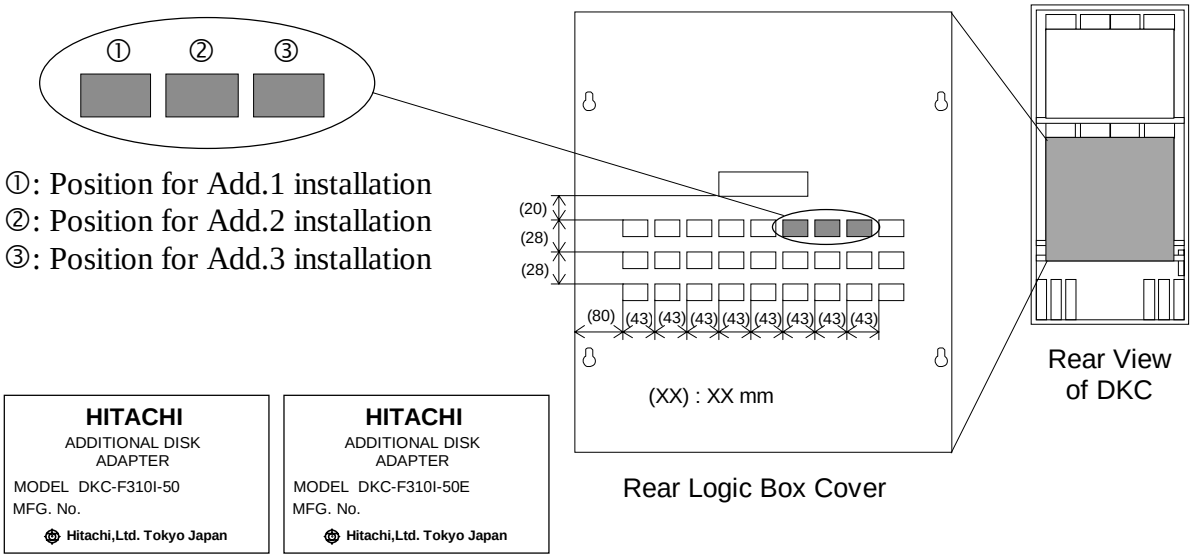

Fig. 3.11-9 Attachment of Nameplate

5. Return to General Flow.
   New Installation: Go to INST02-11 step (7).
   Non-disruptive Installation: Go to INST02-22 step (9)-2.
   Disruptive Installation: Go to INST02-41 step (6).

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3.12 Connection of SCSI Interface Cables

3.12.1 Connection of Additional SCSI Interface Cables (DKU-F305I-3C)

3.12.1.1 Flowchart

1. Connection Procedure of SCSI Interface Cables between DKC and Third DKU (HDU-L10-L13) Chassises

1 Attachment of the SCSI Interface Cables (Before attachment of Third DKU(DKU305I-14)) [INST03-1900]

(1) Remove the cable duct cover. [INST03-1900]
↓
(2) Attach the four SCSI interface cables to DKC. [INST03-1910]

2 Connection of the SCSI Interface Cables (After attachment of Third DKU(DKU305I-14)) [INST03-1920]

(1) Connect the SCSI interface cables. [INST03-1920]
↓
(2) Fix the SCSI interface cables. [INST03-1930]
↓
(3) Attach the nameplate. [INST03-1940]
↓
(4) Attach the covers. [INST03-1940]

2. Connection Procedure of SCSI Interface Cables between DKC and Third DKU (HDU-L14-L17) Chassises

1 Attachment of the SCSI Interface Cables (Before attachment of HDD Boxes(DKU-F305I-B4)) [INST03-1950]

(1) Remove the cable duct cover. [INST03-1950]
↓
(2) Attach the four SCSI interface cables to DKC. [INST03-1960

2 Connection of the SCSI Interface Cables (After attachment of HDD Boxes(DKU-F305I-B4)) [INST03-1970]

(1) Connect the SCSI interface cables. [INST03-1970]
↓
(2) Fix the SCSI interface cables. [INST03-1980]
↓
(3) Attach the covers. [INST03-1980]

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3.12.1.2 Parts List

Table 3.12.1.2-1 Parts List for Additional SCSI Interface Cable

No.	Model Number	Parts Name	Parts No. (Spare Parts No.)	Quantity	Remarks
1	DKU-F305I-3C	SCSI Interface Cable	2101654-A through R (5500004-A through R)	16	HDU-L10-L17
		Nameplate	2099650-75	1	

3.12.1.3 Connection Procedure of Additional SCSI Interface Cables (In case of HDU-L13 from L10)

1. Attachment of the SCSI Interface Cables (Before attachment of Third DKU(DKU305I-14))
   a. Open the front and rear doors from the disk controller and Third Disk Unit.
   b. Remove the Rear Logic Box cover. Refer to INST03-40.
   c. Loosen the two screws and remove the cable duct cover.

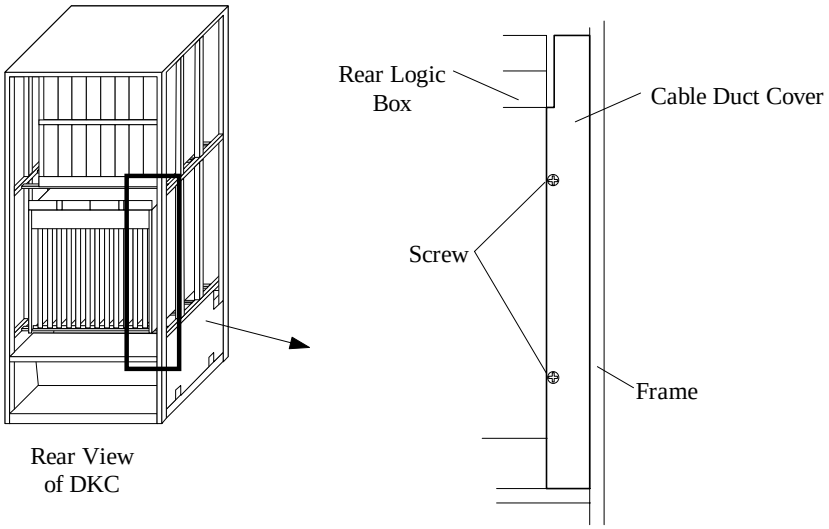

Fig. 3.12.1.3-1 Removal of Cable Duct Cover

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d. Refer to Fig. 3.12.1.3-2. Route the four SCSI interface cables listed in Table 3.12.1.3-1 from the front to the rear of the disk controller.

Table 3.12.1.3-1 Parts List for Additional SCSI Interface Cable

No.	Connector No.		Parts No. (Spare Parts No.)
	Source	Destination	
1	1R▪D1	0U▪P501	2101654-A (5500004-A)
2	1R▪D2	1U▪P501	2101654-C (5500004-C)
3	2R▪K1	0L▪P501	2101654-B (5500004-B)
4	2R▪K2	1L▪P501	2101654-D (5500004-D)

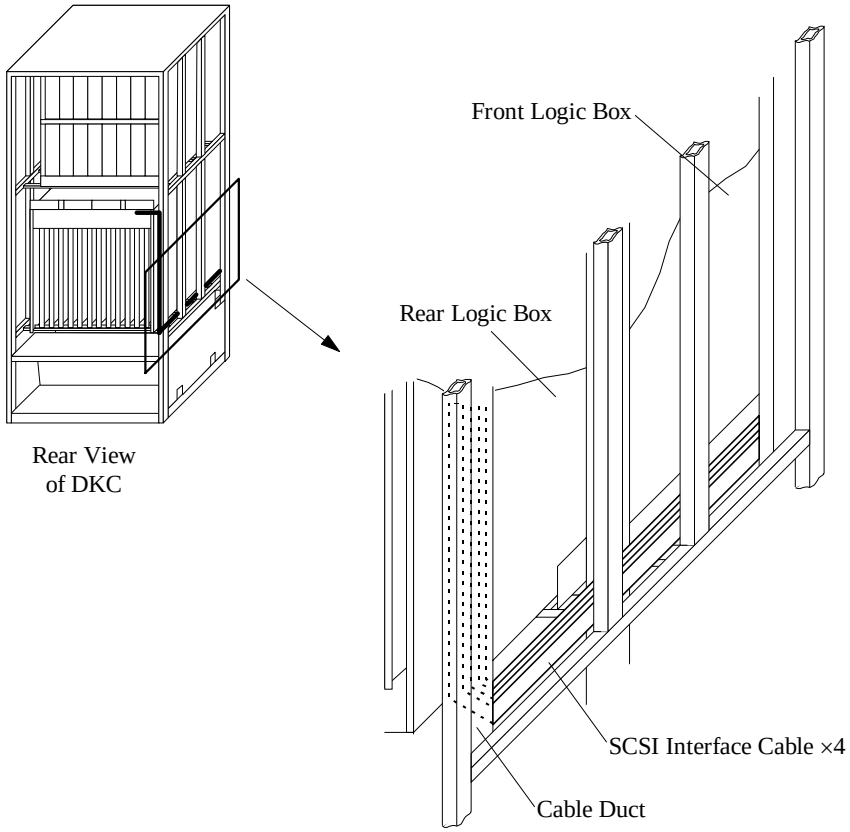

Fig. 3.12.1.3-2 Attachment of SCSI Interface Cable

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2. Connection of the SCSI Interface Cables (After attachment of Third DKU(DKU305I-14))

a. Refer to Fig. 3.12.1.3-3. Connect the SCSI interface cables to the sub-edges on the disk adapter PCBs, that are installed in locations Nos. D and K in the Rear Logic Box.

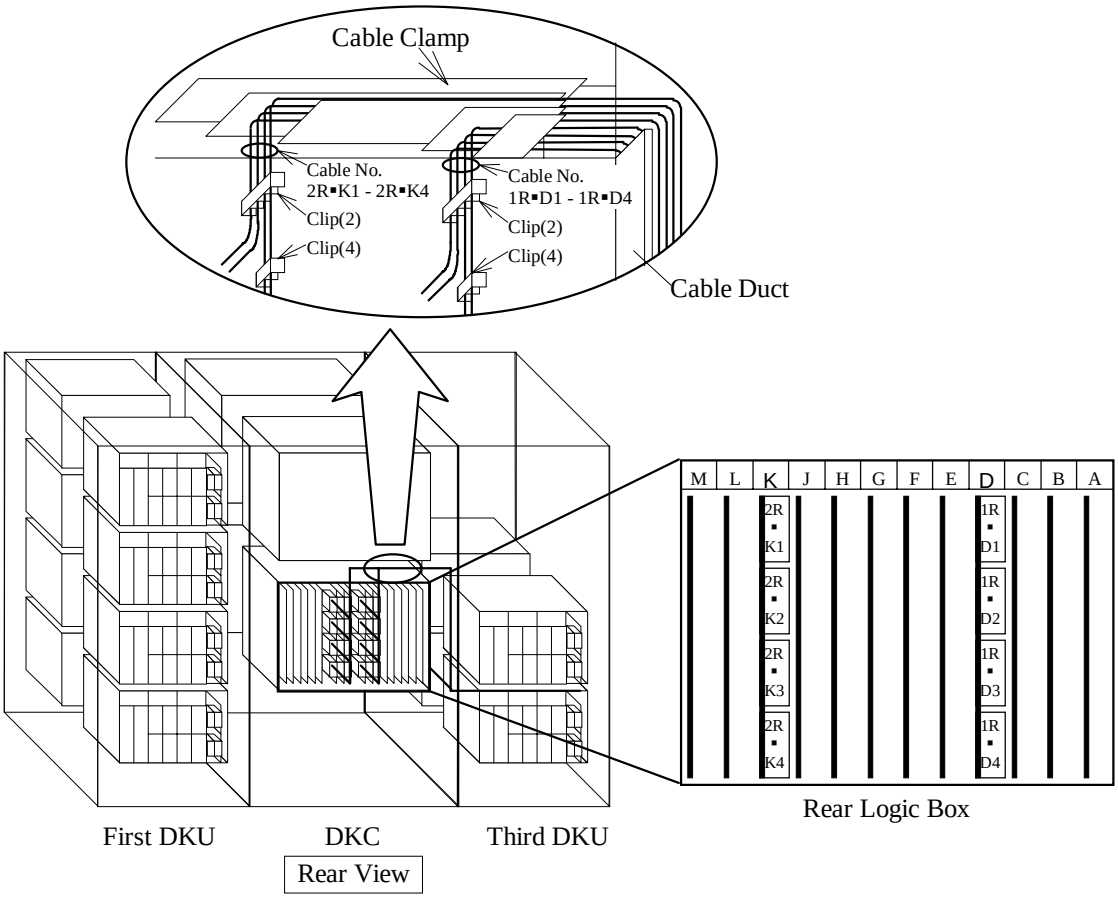

Fig. 3.12.1.3-3 SCSI Interface Cabling Diagram (Disk Adapter PCB Side)

b. Refer to Fig. 3.12.1.3-4. Connect the SCSI interface cables to the sub-edges on the SCSI BFR PCBs in the HDU box.

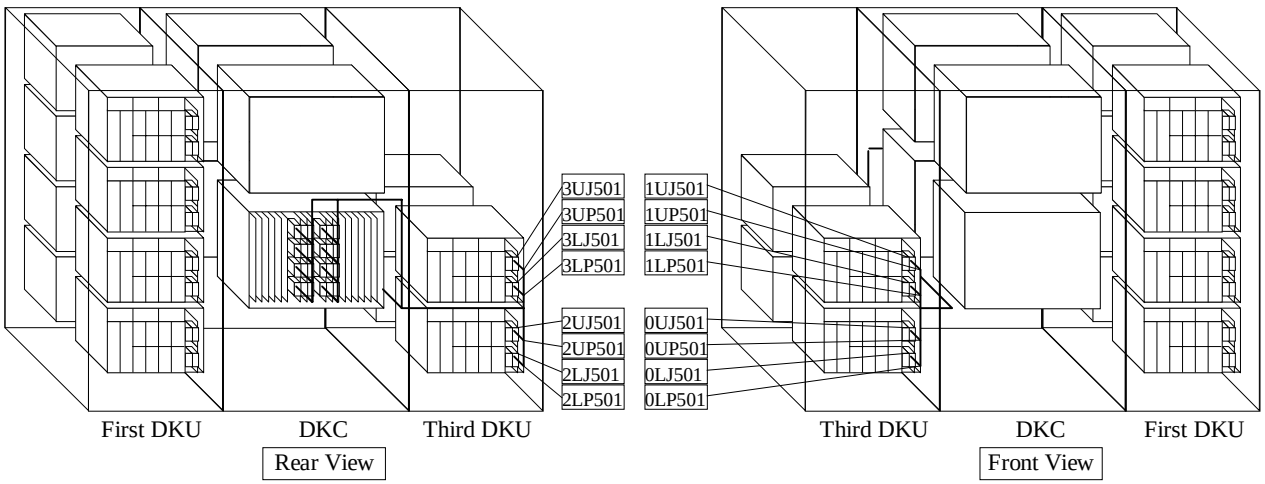

Fig. 3.12.1.3-4 SCSI Interface Cabling Diagram (SCSI BFR PCB Side)

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c. Refer to Fig. 3.12.1.3-5. Secure the SCSI interface cables to the cable duct with the cable fixing wire and repeat binder. If the SCSI interface cables are too long, fold them over inside the cable duct and secure them with the cable fixing wire and repeat binder.

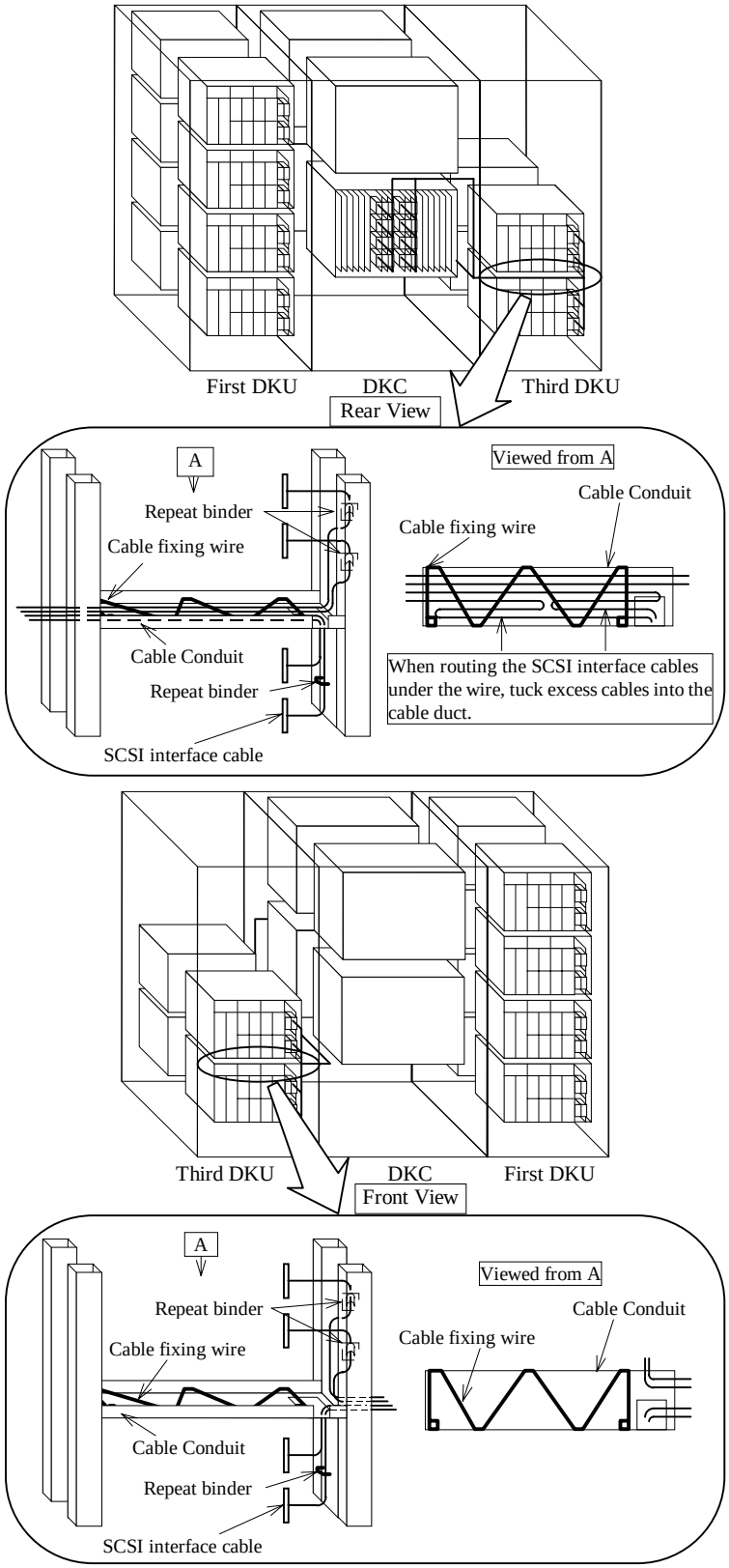

Fig. 3.12.1.3-5 Fixing of SCSI Interface Cables

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d. When assembling the Third Disk Unit in the 4-HDU configuration, secure the remaining 8 SCSI interface cables inside the Third Disk Unit with the tie wraps. Refer to Fig. 3.12.1.3-6. When assembling the Third Disk Unit in the 8-HDU configuration, refer to INST03-1970 through 1980.

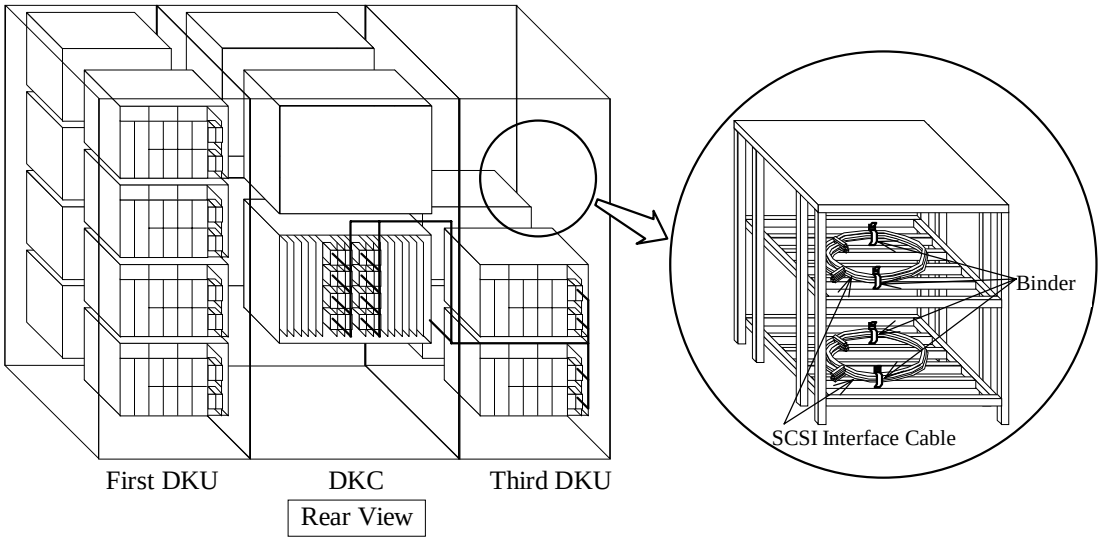

Fig. 3.12.1.3-6 Fixing of SCSI Interface Cables

e. Refer to Fig. 3.12.1.3-7 Attach the nameplate.

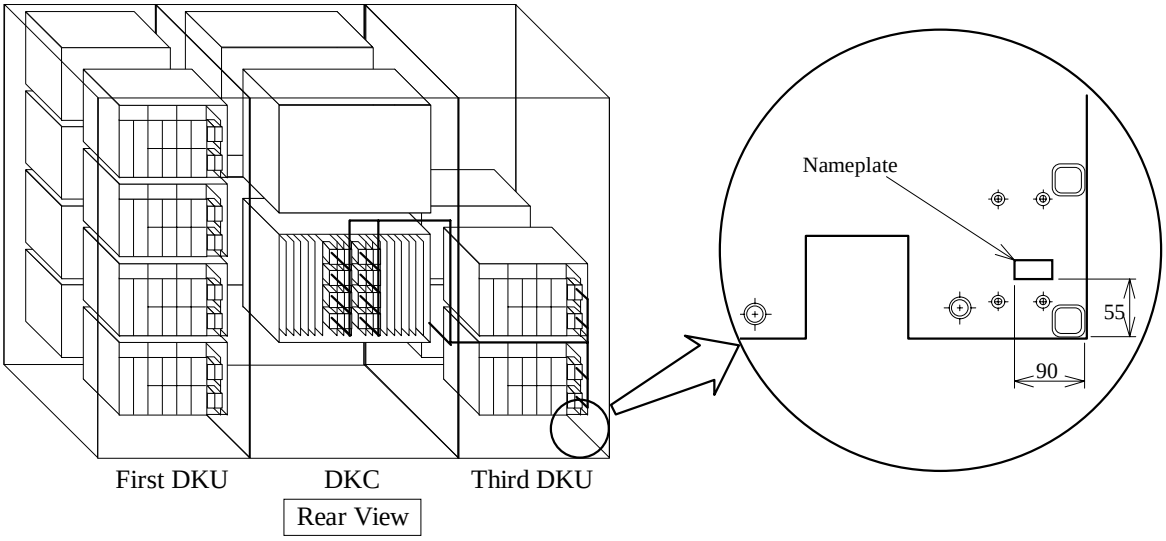

Fig. 3.12.1.3-7 Attachment of Nameplate

f. Attach the cable duct cover and fasten the two screws.
g. Replace the Rear Logic Box cover.
h. Close the front and rear doors on the disk controller and Third Disk Unit.
i. Return to General Flow.
New Installation : Go to INST02-11 step (7)-4.
Non-Disruptive Installation : Go to INST02-22 step (9)-3.
Disruptive Installation : Go to INST02-42 step (11)-5.

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3.12.1.4 Connection Procedure of Additional SCSI Interface Cables (In case of HDU-L17 from L14)

1. Attachment of the SCSI Interface Cables (Before attachment of HDU Boxes (DKU-F305I-B4))
   a. Open the front and rear doors from the disk controller and Third Disk Unit.
   b. Remove the Rear Logic Box cover. Refer to INST03-40.
   c. Loosen the two screws and remove the cable duct cover.

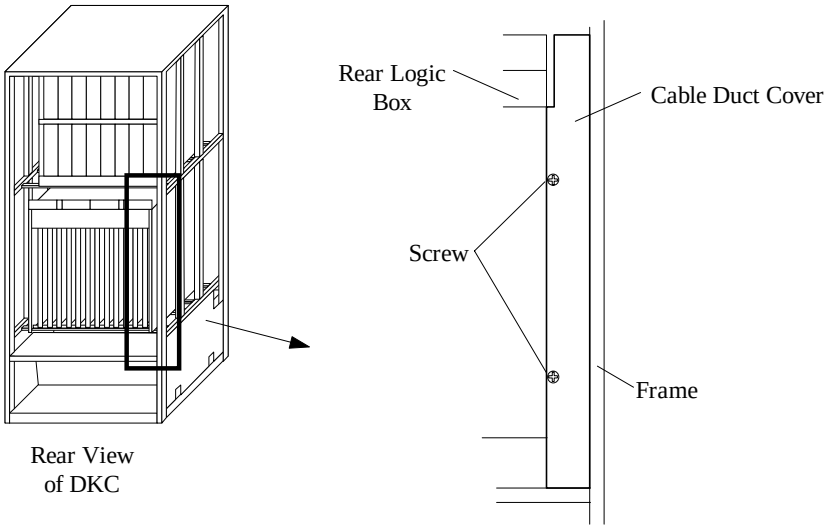

Fig. 3.12.1.4-1 Removal of Cable Duct Cover

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d. Refer to Fig. 3.12.1.4-2. Route the four SCSI interface cables listed in Table 3.12.1.4-2 from the front to the rear of the disk controller.

Table 3.12.1.4-2 Parts List for Additional SCSI Interface Cable

No.	Connector No.		Parts No. (Spare Parts No.)
	Source	Destination	
1	1R▪E1	4U▪P501	2101654-J (5500004-J)
2	1R▪E2	5U▪P501	2101654-L (5500004-L)
3	2R▪L1	4L▪P501	2101654-K (5500004-K)
4	2R▪L2	5L▪P501	2101654-M (5500004-M)

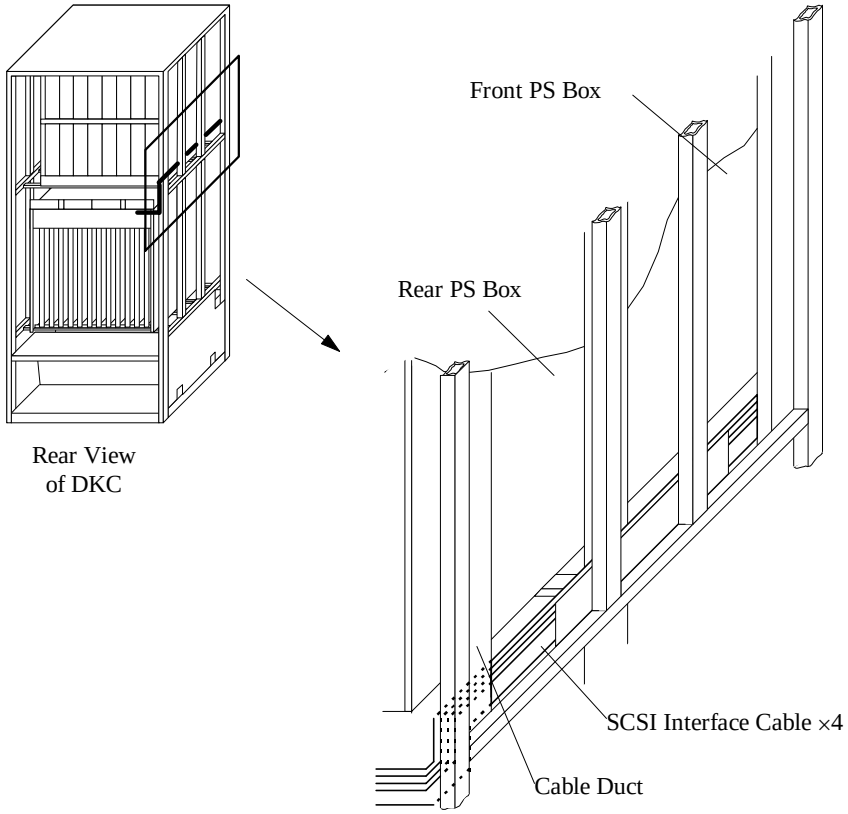

Fig. 3.12.1.4-2 Attachment of SCSI Interface Cables

e. Return to General Flow.

New Installation : Go to INST02-11 step (8)-2.

Non-Disruptive Installation : Go to INST02-22 step (8)-3.

Disruptive Installation : Go to INST02-42 step (12)-3.

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2. Connection of the SCSI Interface Cables (After attachment of HDU Boxes (DKU-F305I-B4))

a. Refer to Fig. 3.12.1.4-3. Connect the SCSI interface cables to the sub-edges on the disk adapter PCBs, that are installed in locations Nos. E and L in the Rear Logic Box. Secure the cables by inserting them in between the cable clamps on the Rear Logic Box.

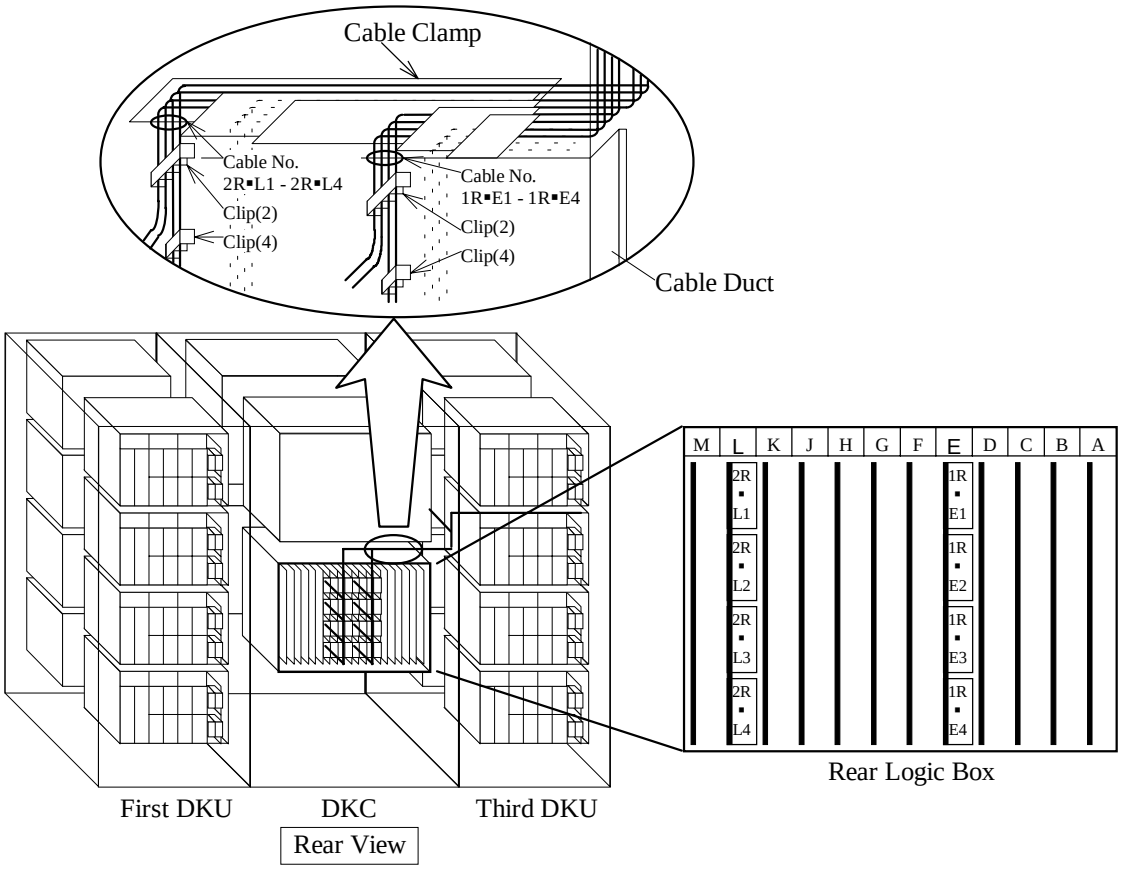

Fig. 3.12.1.4-3 SCSI Interface Cabling Diagram (Disk Adapter PCB Side)

b. Refer to Fig. 3.12.1.4-4. Connection of SCSI interface cables to the Sub-Edges on SCSI BFR PCBs in HDU Box.

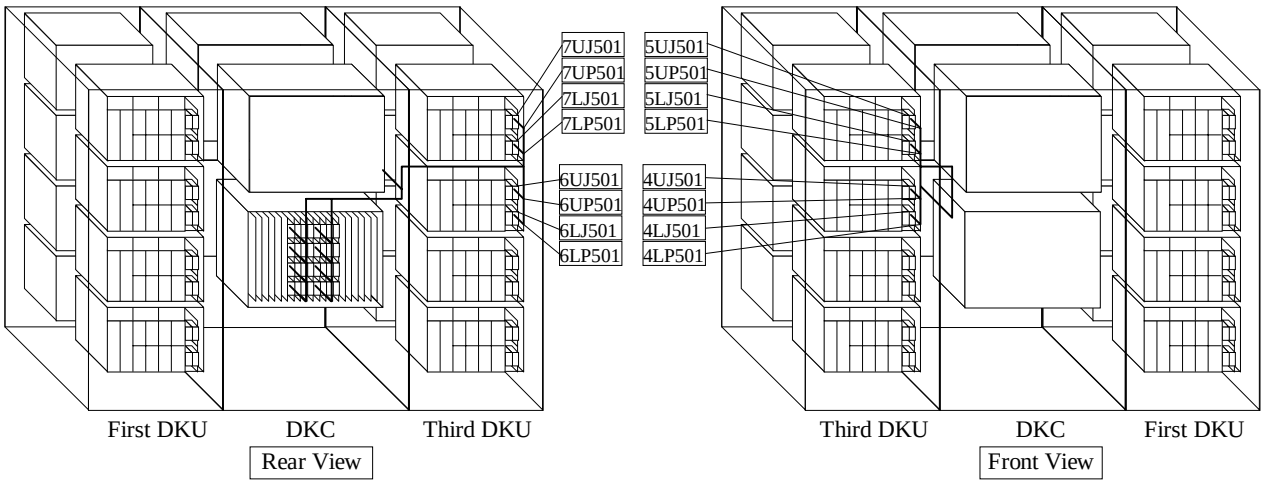

Fig. 3.12.1.4-4 SCSI Interface Cabling Diagram (SCSI BFR PCB Side)

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c. Refer to Fig. 3.12.1.4-5. Secure the SCSI interface cables on the cable duct with the cable fixing wire and repeat binder. If the SCSI interface cables are too long, fold them over inside the cable duct and secure them with the cable fixing wire and repeat binder.

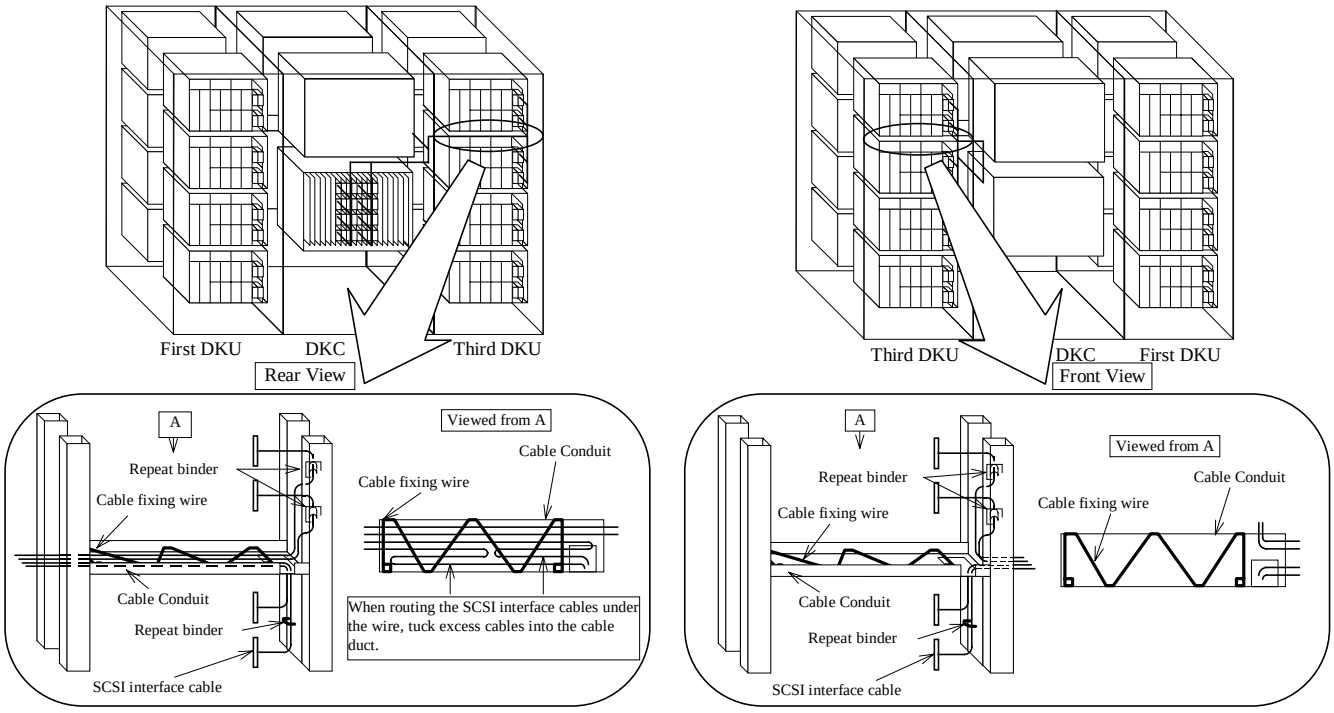

Fig. 3.12.1.4-5 Fixing of the SCSI Interface Cables

d. Replace the Rear Logic Box cover.

e. Attach the cable duct cover and fasten the two screws.

f. Close the front and rear doors on the disk controller and Third Disk Unit.

g. Return to General Flow.

New Installation : Go to INST02-11 step (8)-4.

Non-Disruptive Installation : Go to INST02-22 step (9)-3.

Disruptive Installation : Go to INST02-42 step (12)-6.

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3.12.2 Connection of Additional SCSI Interface Cables (DKU-F305I-24C)

3.12.2.1 Flowchart

The connection procedure of the extension SCSI interface cables (DKU-F305I-24C) is shown below. You must perform the operations actually after referring to the details of the procedure.
When connecting the SCSI interface cable with disk subsystem inactive, you don't have to check Shut Down LED on the SCSI BFR PCB and blocking/restoring both DKA PCB and SCSI BFR PCB through SVP.

1. Connection Procedure of SCSI Interface Cables between First (HDU-R10-R13) and Second DKU (HDU-R20-R23) Chassises---------- [INST03-1990]
2. Connection Procedure of SCSI Interface Cables between First (HDU-R14-R17) and Second DKU (HDU-R24-R27) Chassises---------- [INST03-2000]
3. Connection Procedure of SCSI Interface Cables between Third (HDU-L10-L13) and Fourth DKU (HDU-L20-L23) Chassises---------- [INST03-2010]
4. Connection Procedure of SCSI Interface Cables between Third (HDU-L14-L17) and Fourth DKU (HDU-L24-L27) Chassises---------- [INST03-2020]

1. Connection Procedure of SCSI Interface Cables between First (HDU-R10-R13) and Second DKU (HDU-R20-R23) Chassises

(1) Connect the SCSI interface cables to the SCSI BFR PCBs in the Second DKU chassis. [INST03-2030]

↓

(2) In the first DKU chassis, use the SVP to block the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2040]

↓

(3) In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2050]

↓

(4) Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis. [INST03-2060]

↓

(5) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST03-2070]

↓

(6) In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side to which the SCSI interface cables are to be connected. [INST03-2080]

↓

(7) Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis. [INST03-2090]

↓

(8) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. [INST03-2100]

↓

(9) Fix the SCSI interface cables in the DKU chassises. [INST03-2110]

↓

(10) Attach the nameplate to the Second DKU chassis. [INST03-2120]

↓

(11) When the Second DKU chassis consists of 4 HDU boxes, fix the rest of the SCSI interface cables in the Second DKU chassis. [INST03-2120]

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2. Connection Procedure of SCSI Interface Cables between First (HDU-R14-R17) and Second DKU (HDU-R24-R27) Chassises

(1) Connect the SCSI interface cables to the SCSI BFR PCBs in the Second DKU chassis. [INST03-2130]

↓

(2) In the first DKU chassis, use the SVP to block the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2140]

↓

(3) In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2150]

↓

(4) Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis. [INST03-2160]

↓

(5) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST03-2170]

↓

(6) In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side to which the SCSI interface cables are to be connected. [INST03-2180]

↓

(7) Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis. [INST03-2190]

↓

(8) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. [INST03-2200]

↓

(9) Fix the SCSI interface cables in the DKU chassises. [INST03-2210]

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3. Connection Procedure of SCSI Interface Cables between Third (HDU-L10-L13) and Fourth DKU (HDU-L20-L23) Chassises

(1) Connect the SCSI interface cables to the SCSI BFR PCBs in the fourth DKU chassis. [INST03-2220]

↓

(2) In the Third DKU chassis, use the SVP to block the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2230]

↓

(3) In the Third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2240]

↓

(4) Connect the SCSI interface cables to the SCSI BFR PCBs in the Third DKU chassis. [INST03-2250]

↓

(5) In the Third DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST03-2260]

↓

(6) In the Third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side to which the SCSI interface cables are to be connected. [INST03-2270]

↓

(7) Connect the SCSI interface cables to the SCSI BFR PCBs in the Third DKU chassis. [INST03-2280]

↓

(8) In the Third DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. [INST03-2290]

↓

(9) Fix the SCSI interface cables in the DKU chassises. [INST03-2300]

↓

(10) Attach the nameplate to the fourth DKU chassis. [INST03-2310]

↓

(11) When the fourth DKU chassis consists of 4 HDU boxes, fix the rest of the SCSI interface cables in the fourth DKU chassis. [INST03-2310]

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4. Connection Procedure of SCSI Interface Cables between Third (HDU-L14-L17) and Fourth DKU (HDU-L24-L27) Chassises

(1) Connect the SCSI interface cables to the SCSI BFR PCBs in the fourth DKU chassis. [INST03-2320]

↓

(2) In the Third DKU chassis, use the SVP to block the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2330]

↓

(3) In the Third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected. [INST03-2340]

↓

(4) Connect the SCSI interface cables to the SCSI BFR PCBs in the Third DKU chassis. [INST03-2350]

↓

(5) In the Third DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST03-2360]

↓

(6) In the Third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side to which the SCSI interface cables are to be connected. [INST03-2370]

↓

(7) Connect the SCSI interface cables to the SCSI BFR PCBs in the Third DKU chassis. [INST03-2380]

↓

(8) In the Third DKU chassis, use the SVP to restore the SCSI BFR PCBs to which the SCSI interface cables are connected. [INST03-2390]

↓

(9) Fix the SCSI interface cables in the DKU chassises. [INST03-2400]

3.12.2.2 Parts List

Table 3.12.2.2-1 Parts List of the SCSI Interface Cable

No.	Model Number	Part Name	Part No. (Spare Parts No.)	Quantity	Remarks
1	DKU-F305I-24C	SCSI Interface Cable	2098192-A-R (5487067-A-R)	16	HDU-R20-R27/L20-L27
		DKUMN Cable	3239256-A,B	2	Dynamic 6
		DKUMN Cable	2098190-A,B	2	MRP 100
		Nameplate	2099650-78	1	

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3.12.2.3 Connection Procedure of Additional SCSI Interface Cables(In case of HDU-R23 from R20)

1. Connect the SCSI interface cables to the SCSI BFR PCBs in the Second DKU chassis referring to figures 3.12.2.3-1 and 3.12.2.3-2.

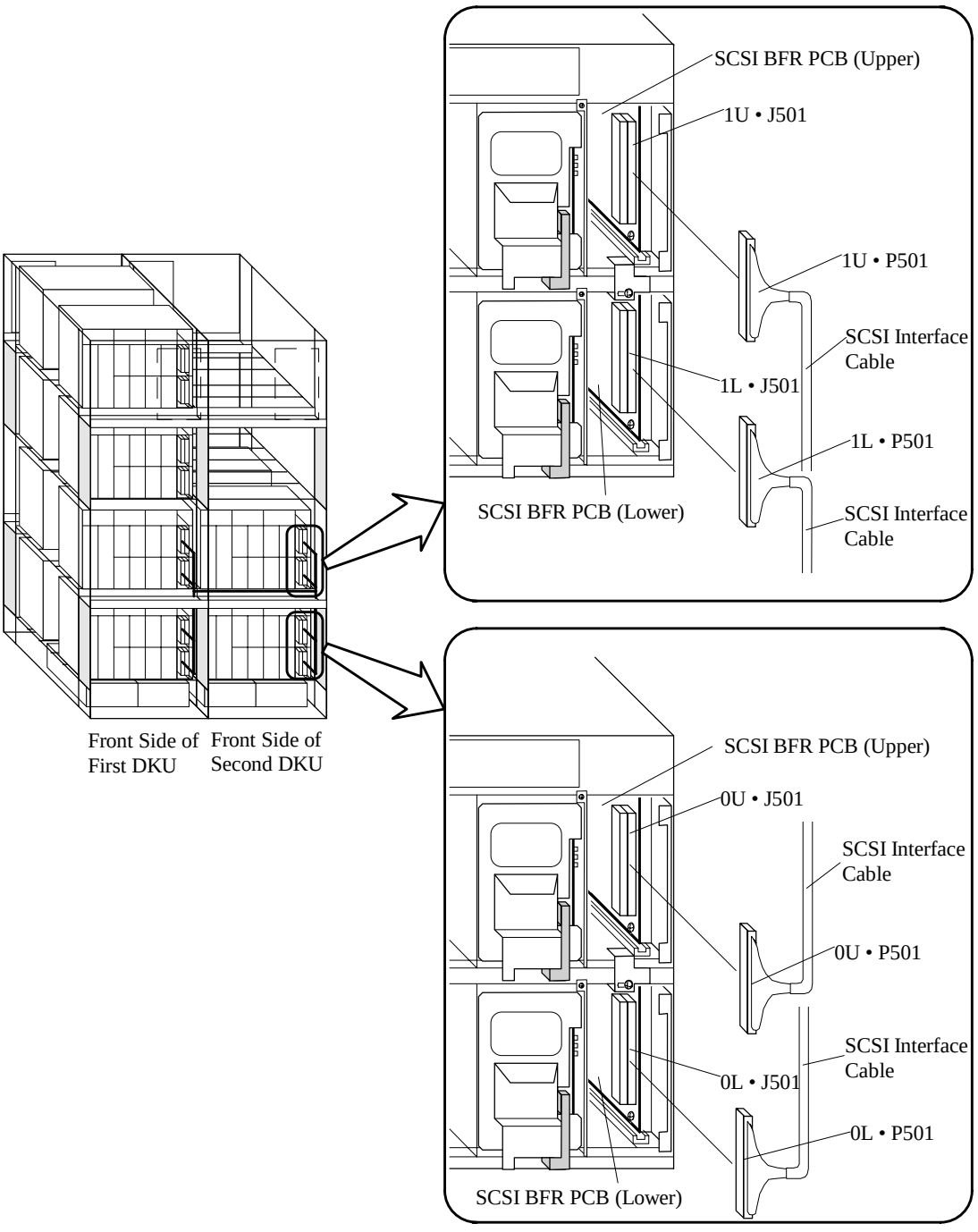

Fig. 3.12.2.3-1 Connection of the SCSI Interface Cables

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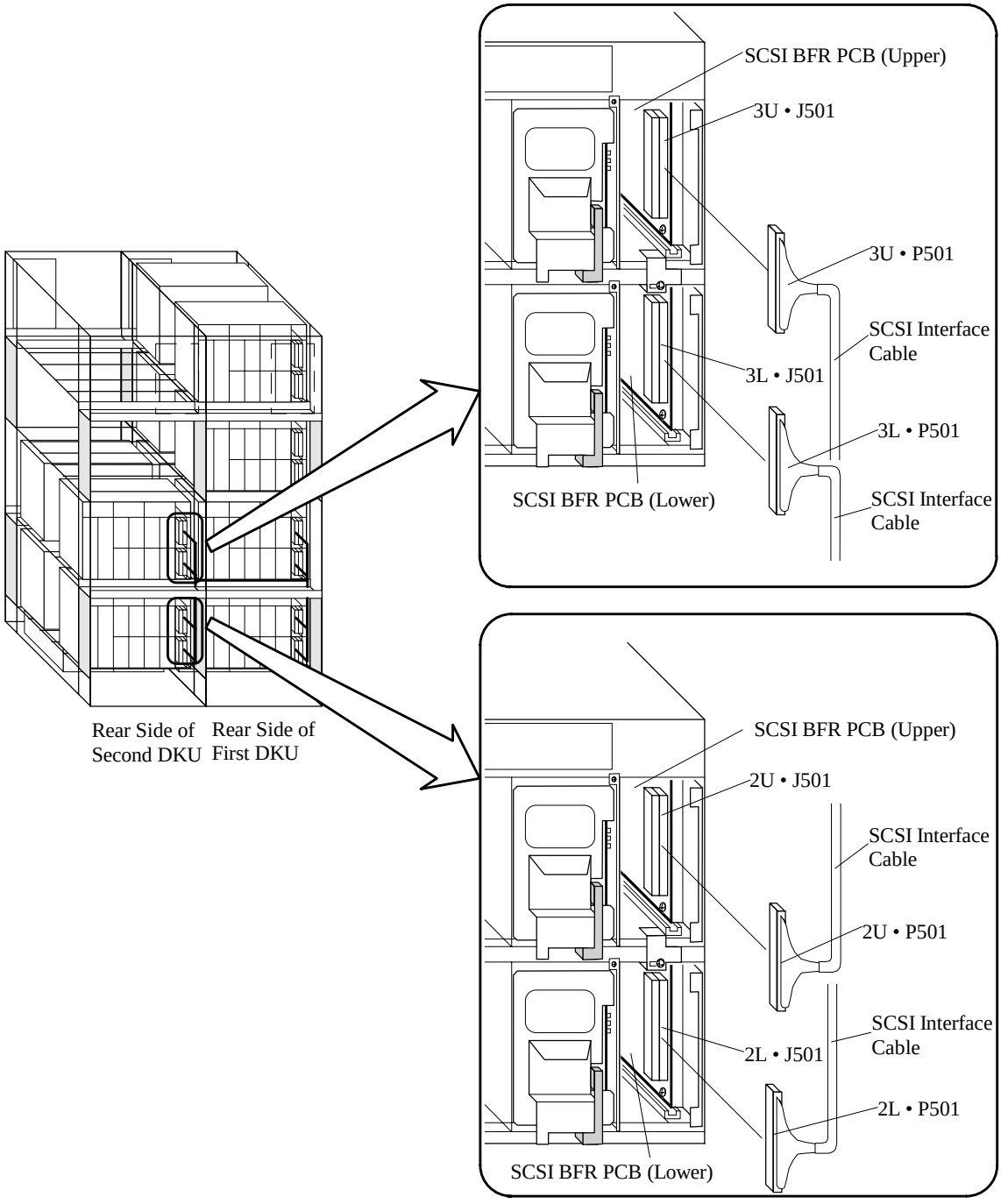

Fig. 3.12.2.3-2 Connection of the SCSI Interface Cables

2. Refer to INST02-56② when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2060 when connecting the additional SCSI interface cable with the sub-system switched off.

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3. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

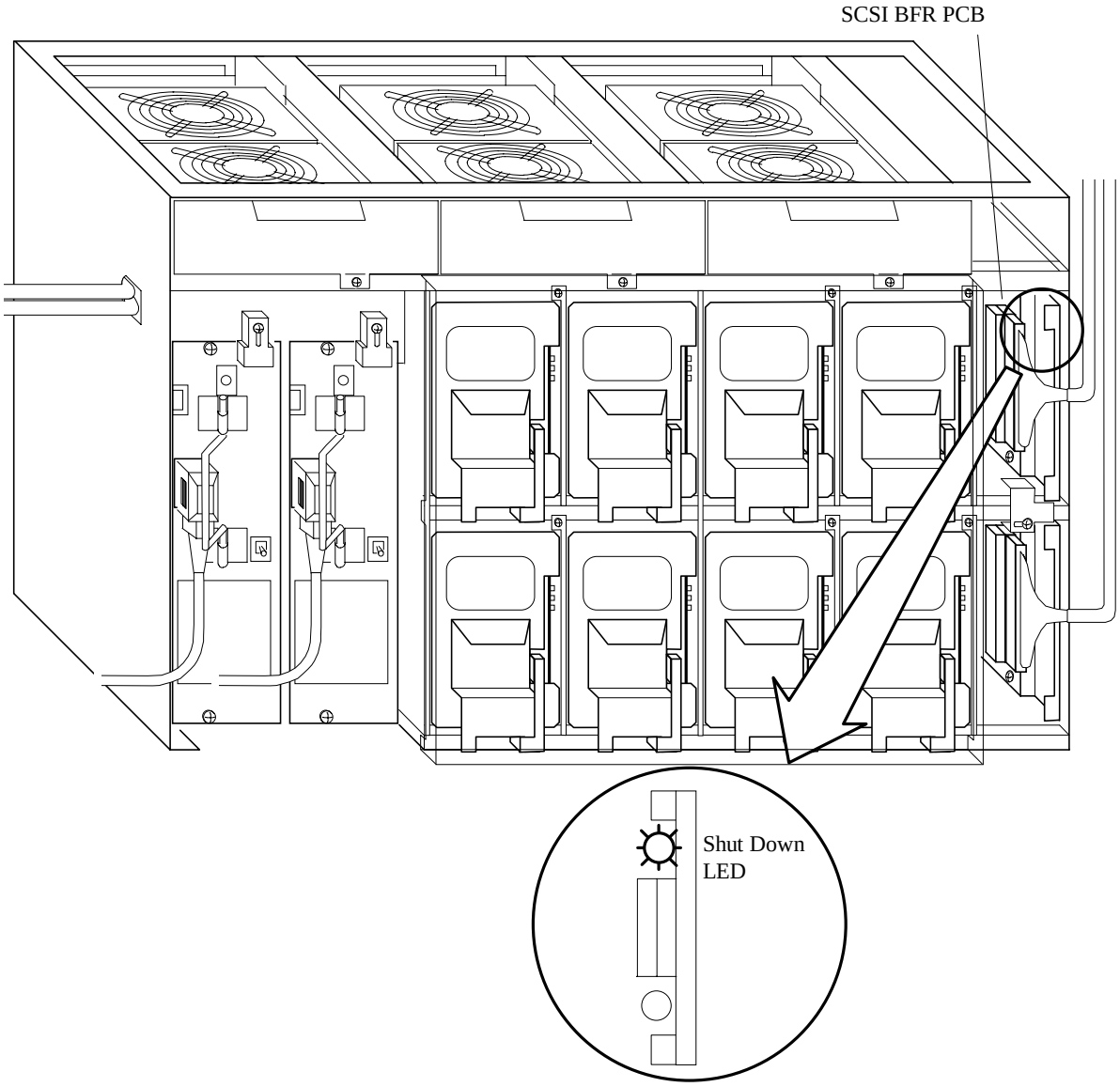

Fig. 3.12.2.3-3 Confirmation of the Shut Down LED Light

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4. Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis referring to figures 3.12.2.3-4 and 3.12.2.3-5.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

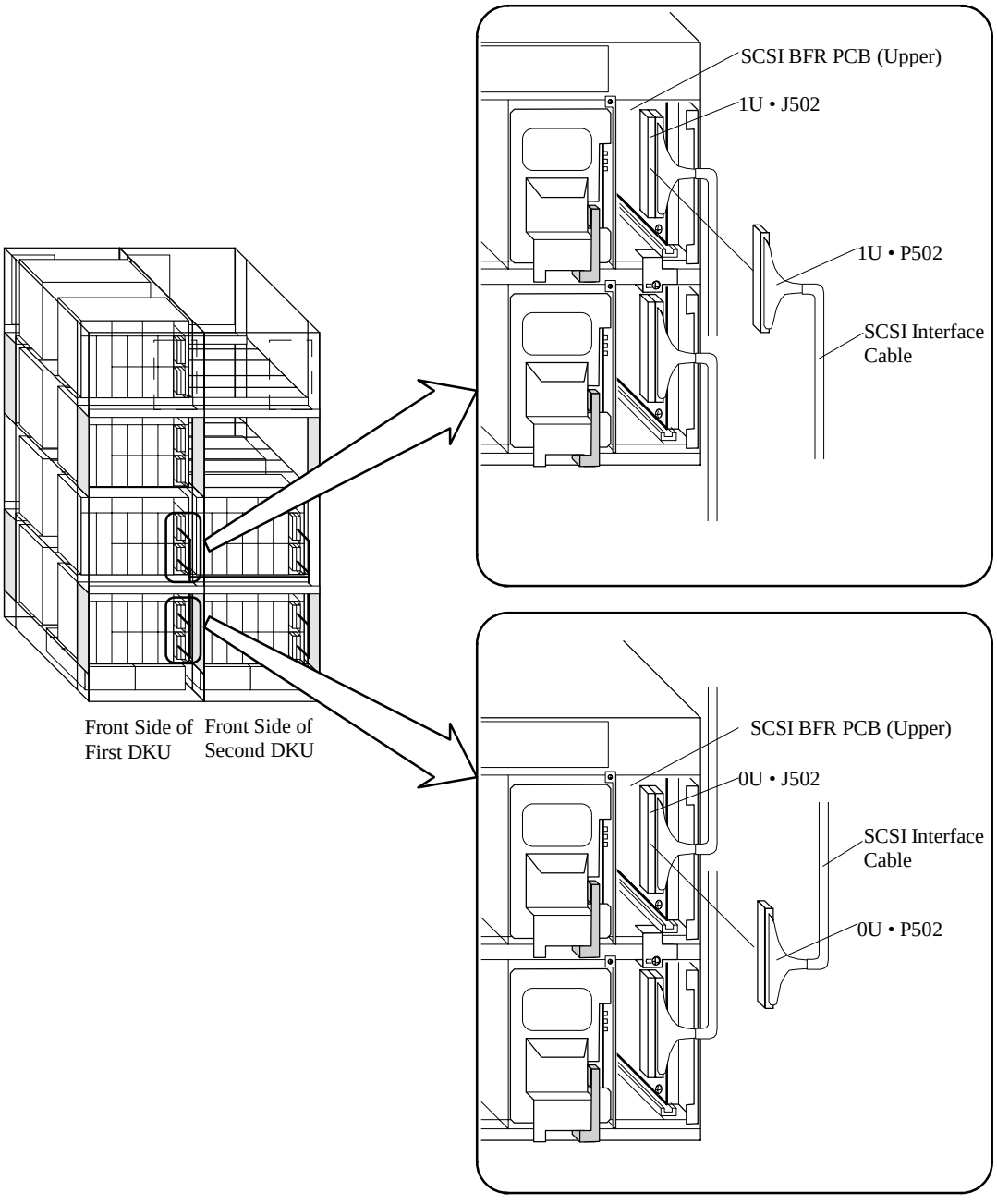

Fig. 3.12.2.3-4 Connection of the SCSI Interface Cables

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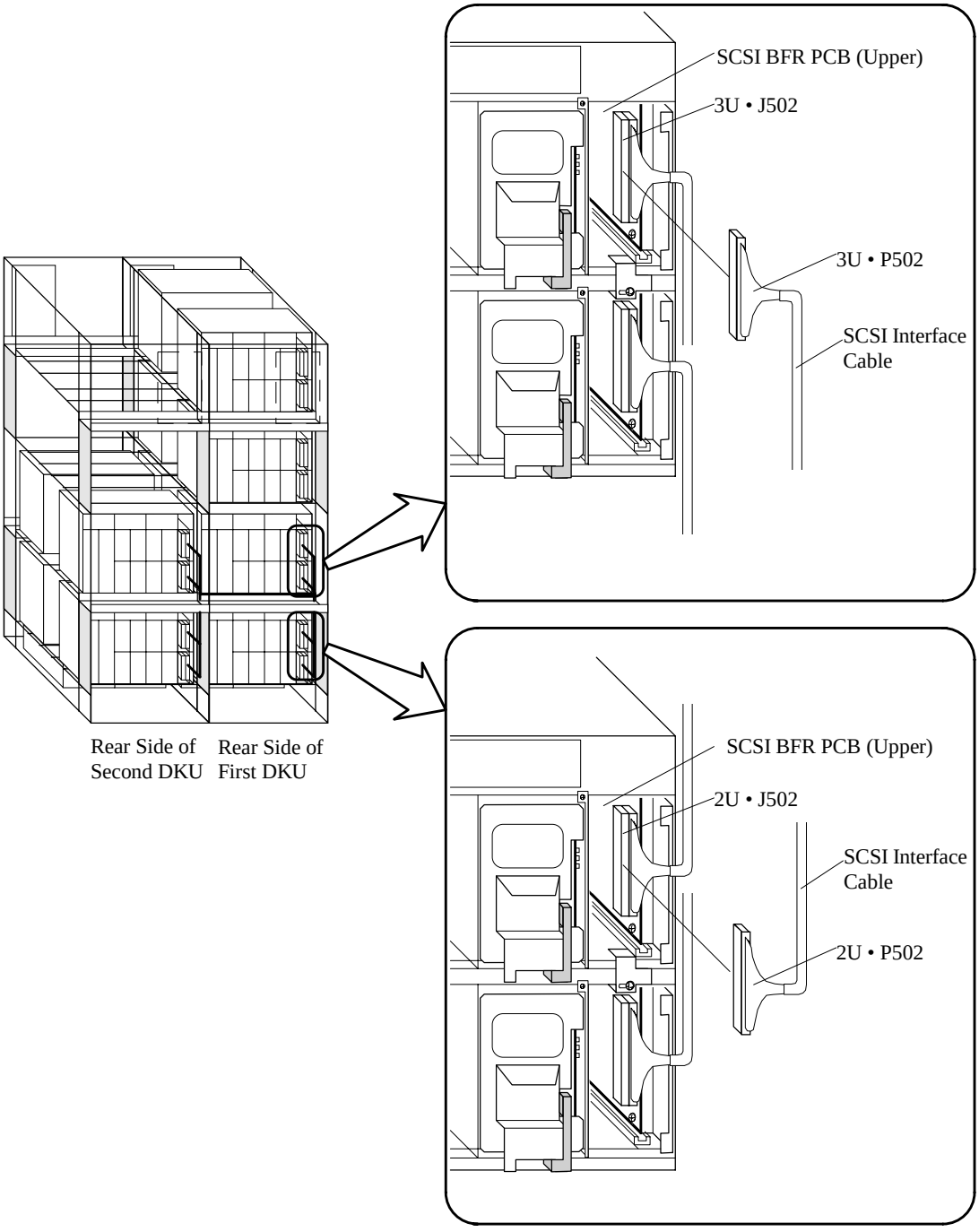

Fig. 3.12.2.3-5 Connection of the SCSI Interface Cables

5. Refer to INST02-57④ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2090 when connecting the additional SCSI interface cable with the sub-system switched off.

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6. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

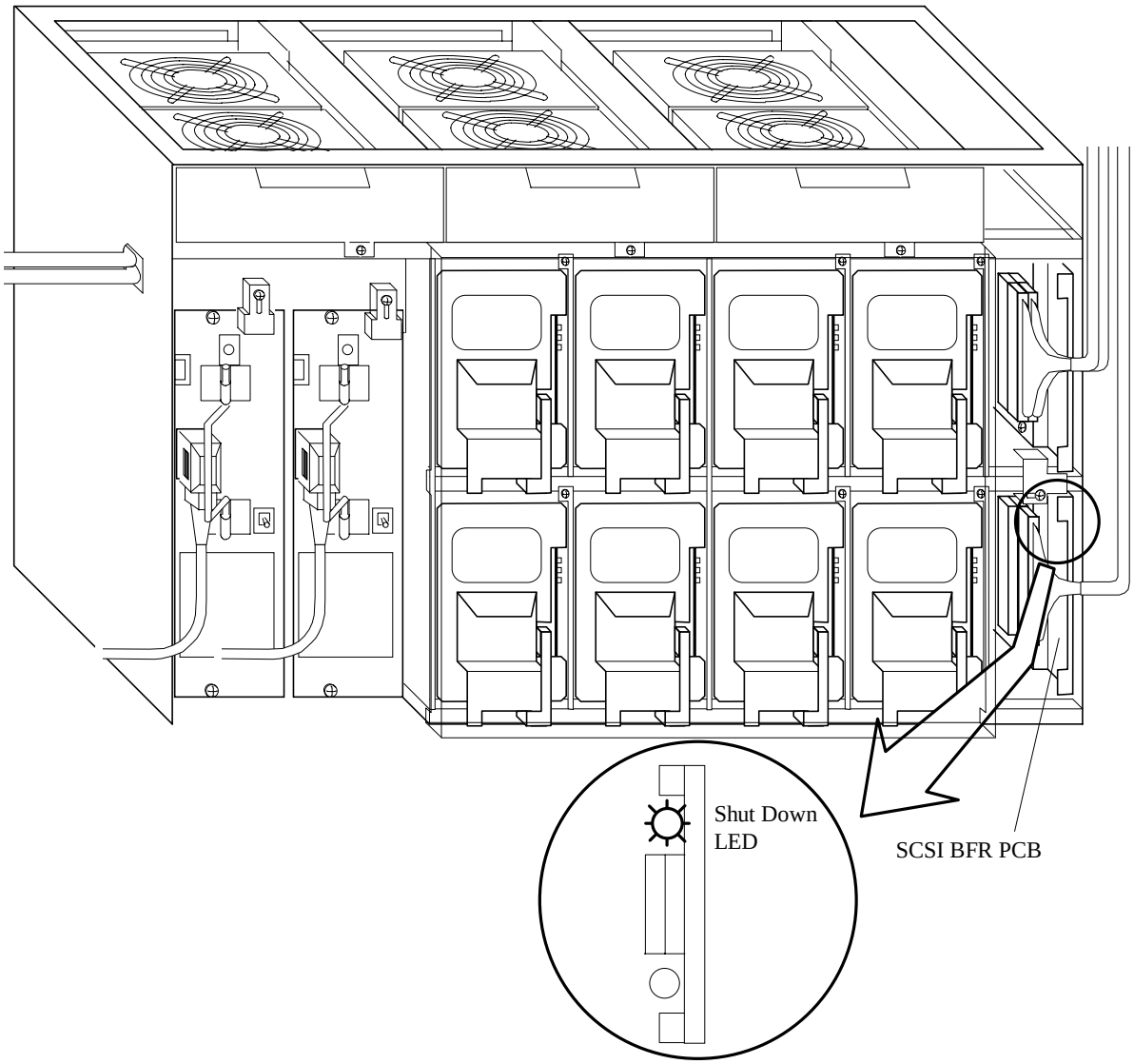

Fig. 3.12.2.3-6 Confirmation of the Shut Down LED Light

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7. Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis referring to figures 3.12.2.3-7 and 3.12.2.3-8.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

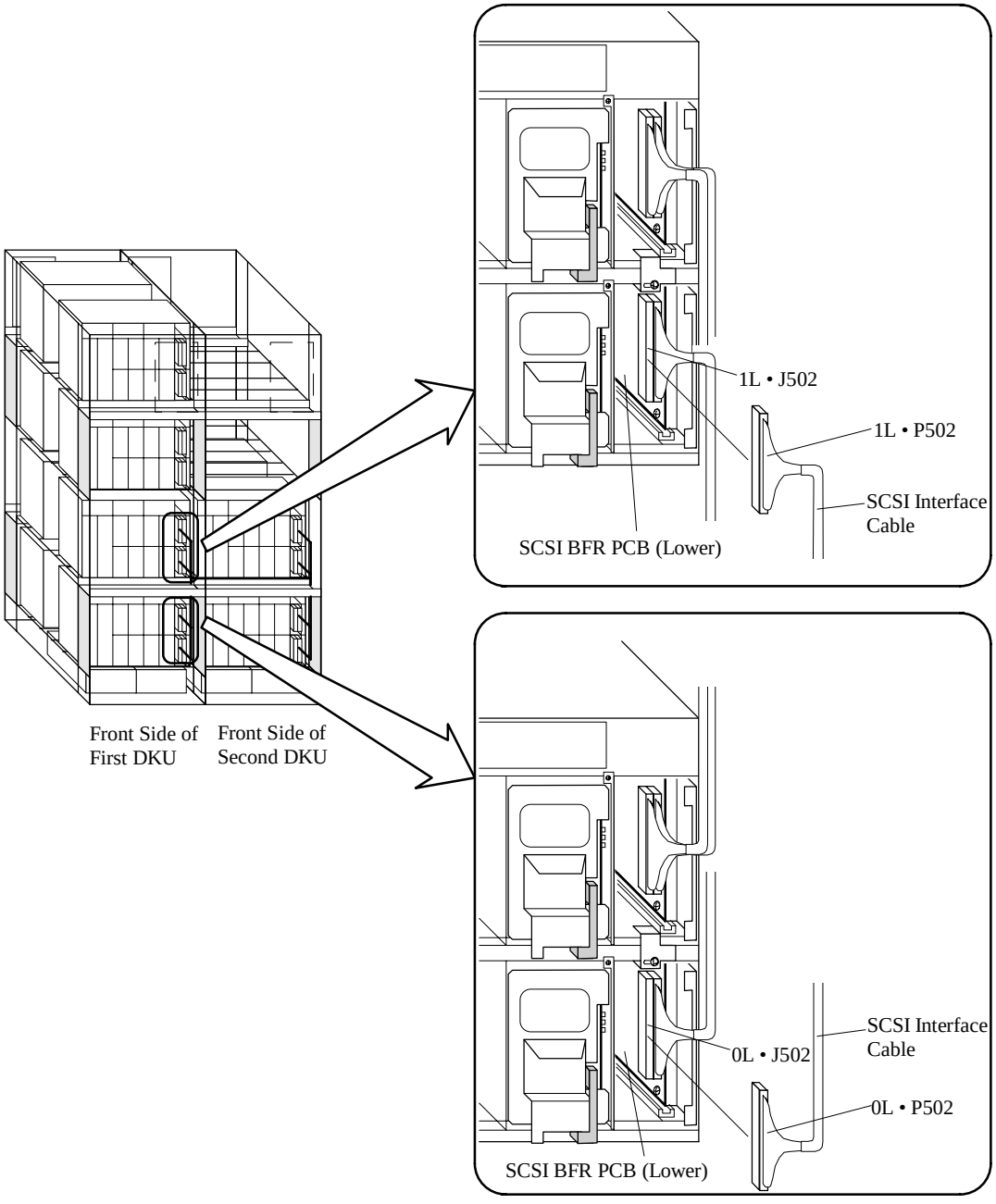

Fig. 3.12.2.3-7 Connection of the SCSI Interface Cables

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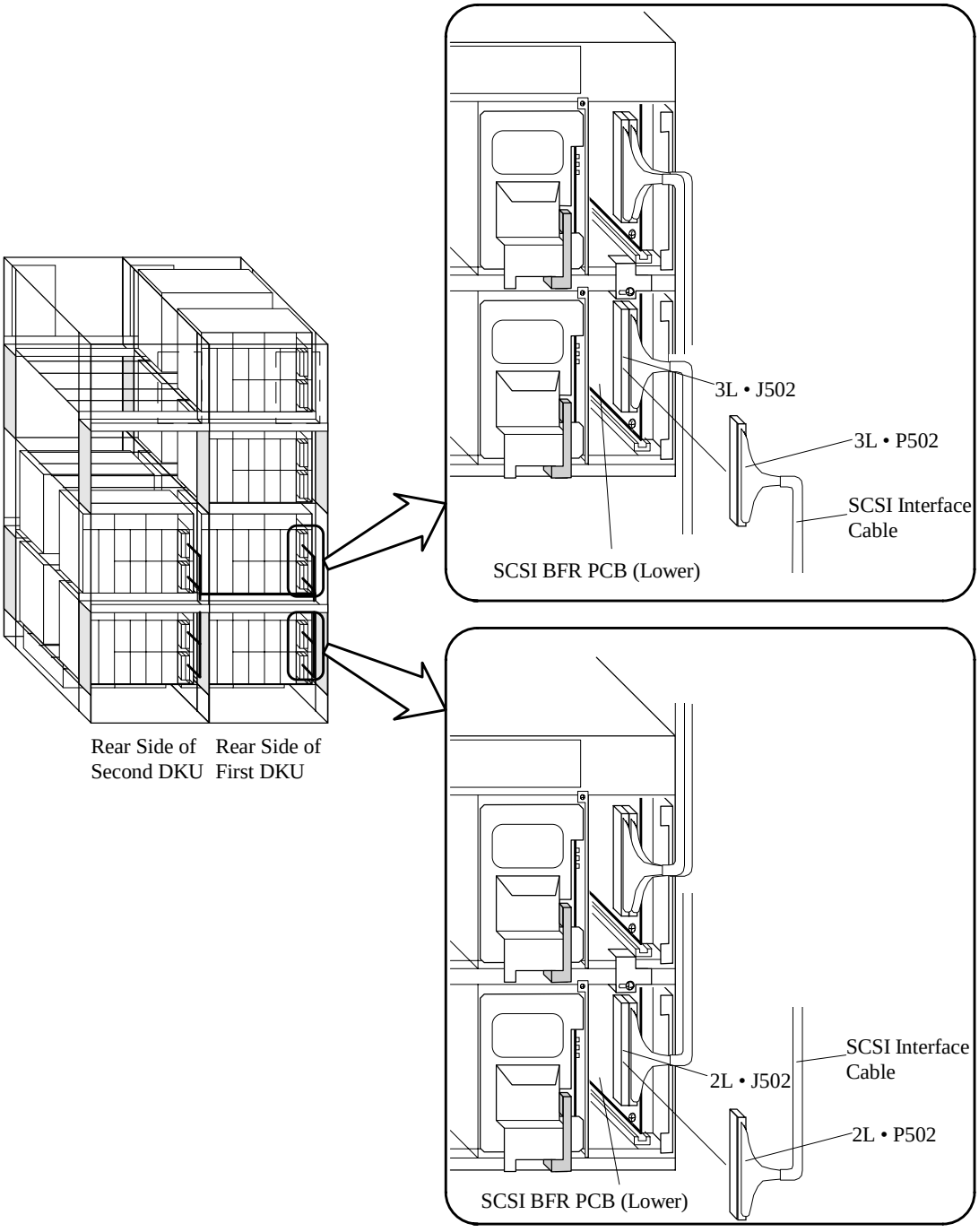

Fig. 3.12.2.3-8 Connection of the SCSI Interface Cables

8. Refer to INST02-57⑥ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2110 when connecting the additional SCSI interface cable with the sub-system switched off.

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9. Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

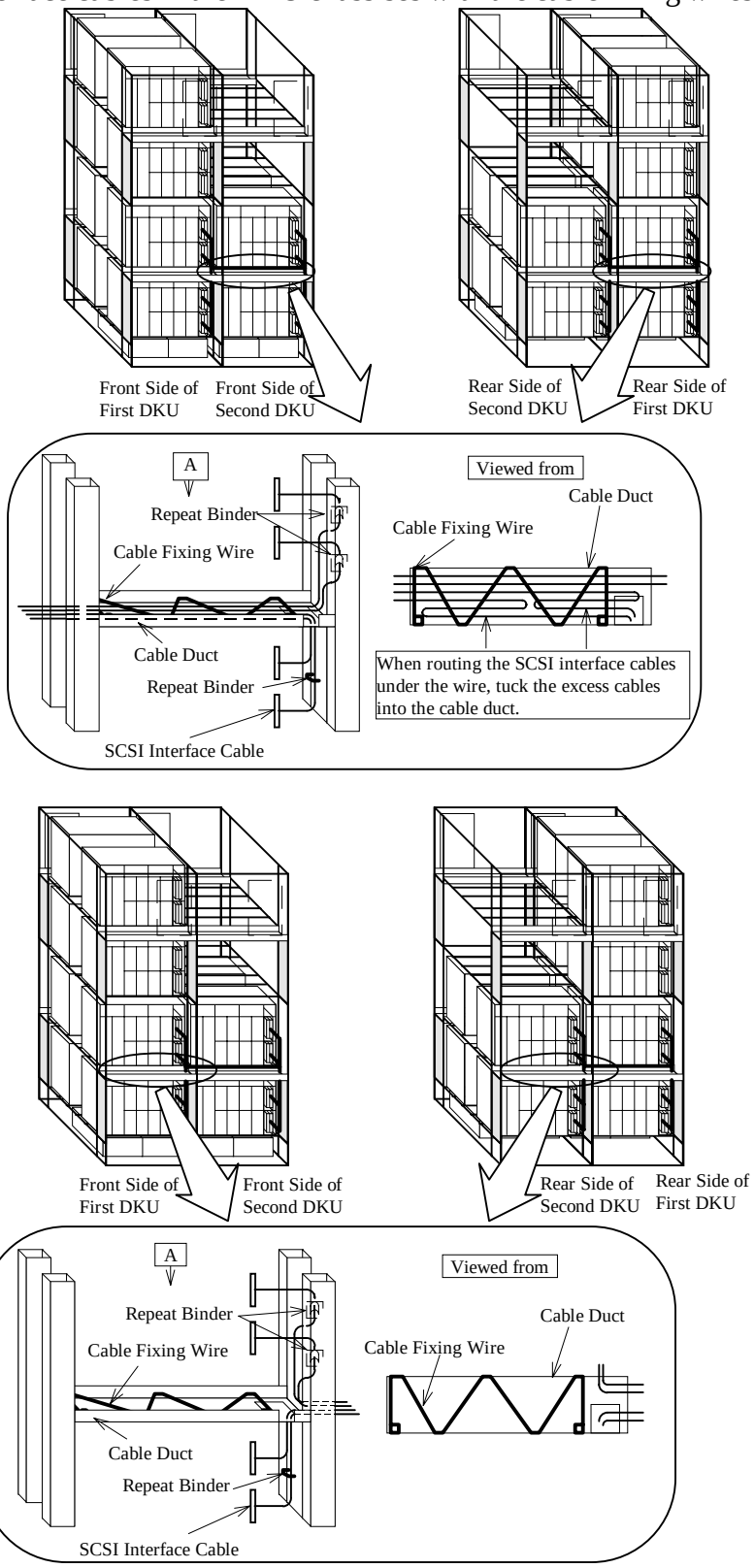

Fig. 3.12.2.3-9 Fixation of the SCSI Interface Cables

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10. Attach the nameplate to the Second DKU chassis.

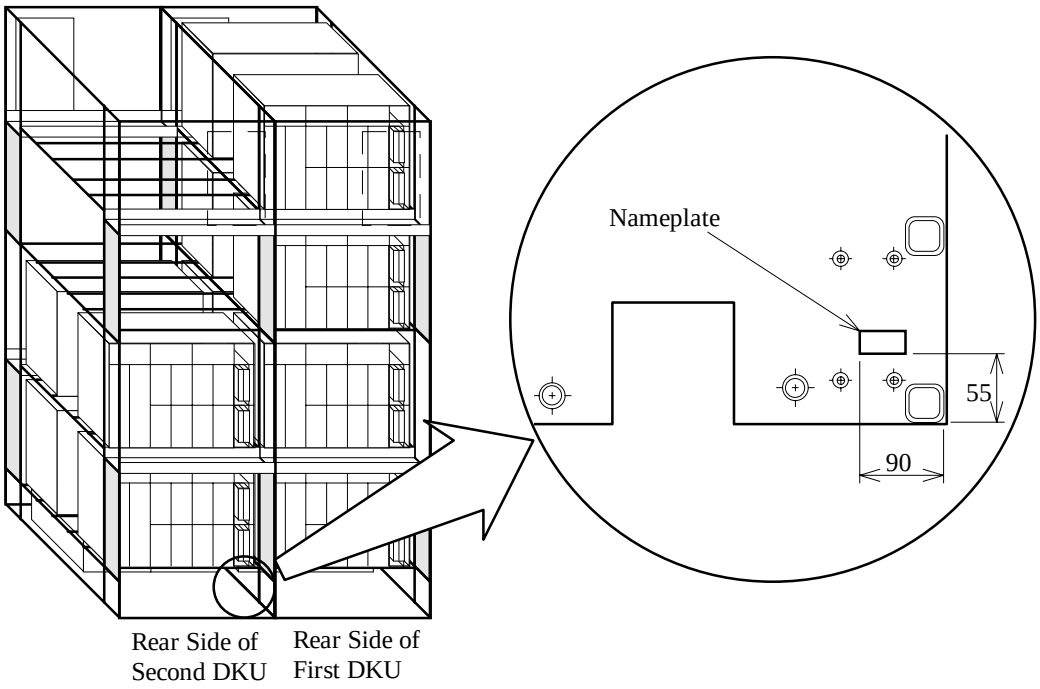

Fig. 3.12.2.3-10 Attachment of the Nameplate

11. When the Second DKU chassis consists of 4 HDU boxes, fix the rest of the SCSI interface cables in the third DKU chassis with the binders.

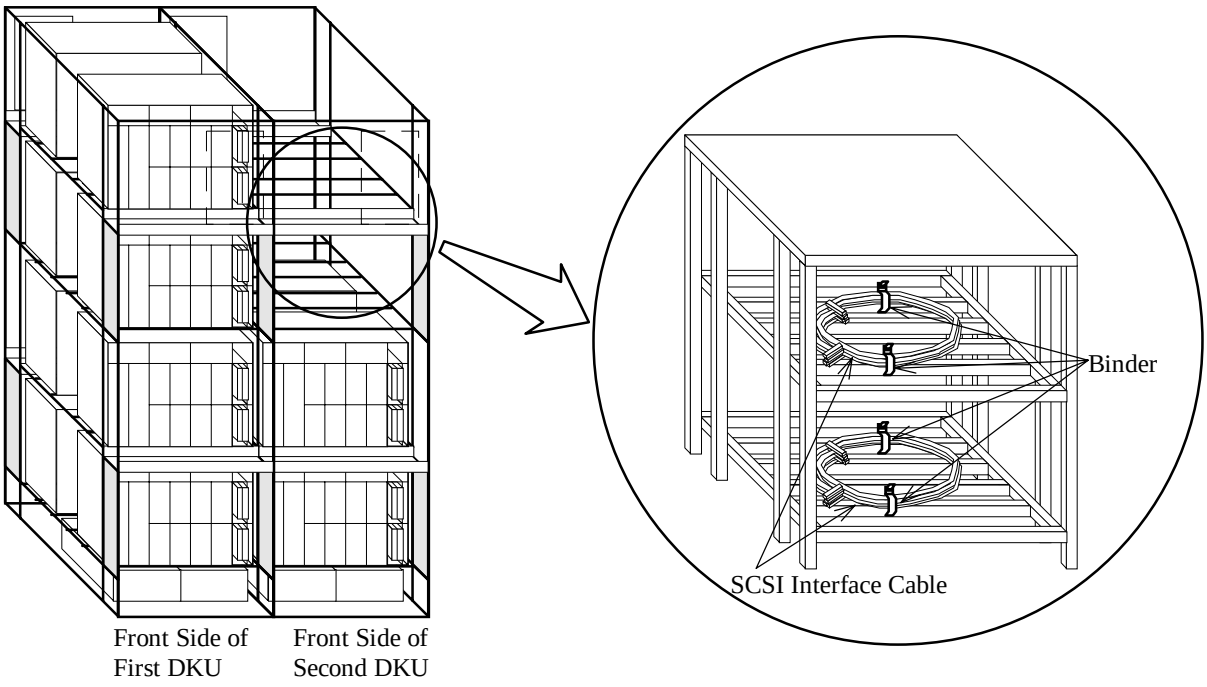

Fig. 3.12.2.3-11 Fixation of the SCSI Interface Cables

12. Go to INST02-57 Step ⑧.

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3.12.2.4 Connection Procedure of Additional SCSI Interface Cables(In case of HDU-R27 from R24)

1. Connect the SCSI interface cables to the SCSI BFR PCBs in the second DKU chassis referring to figures 3.12.2.4-1 and 3.12.2.4-2.

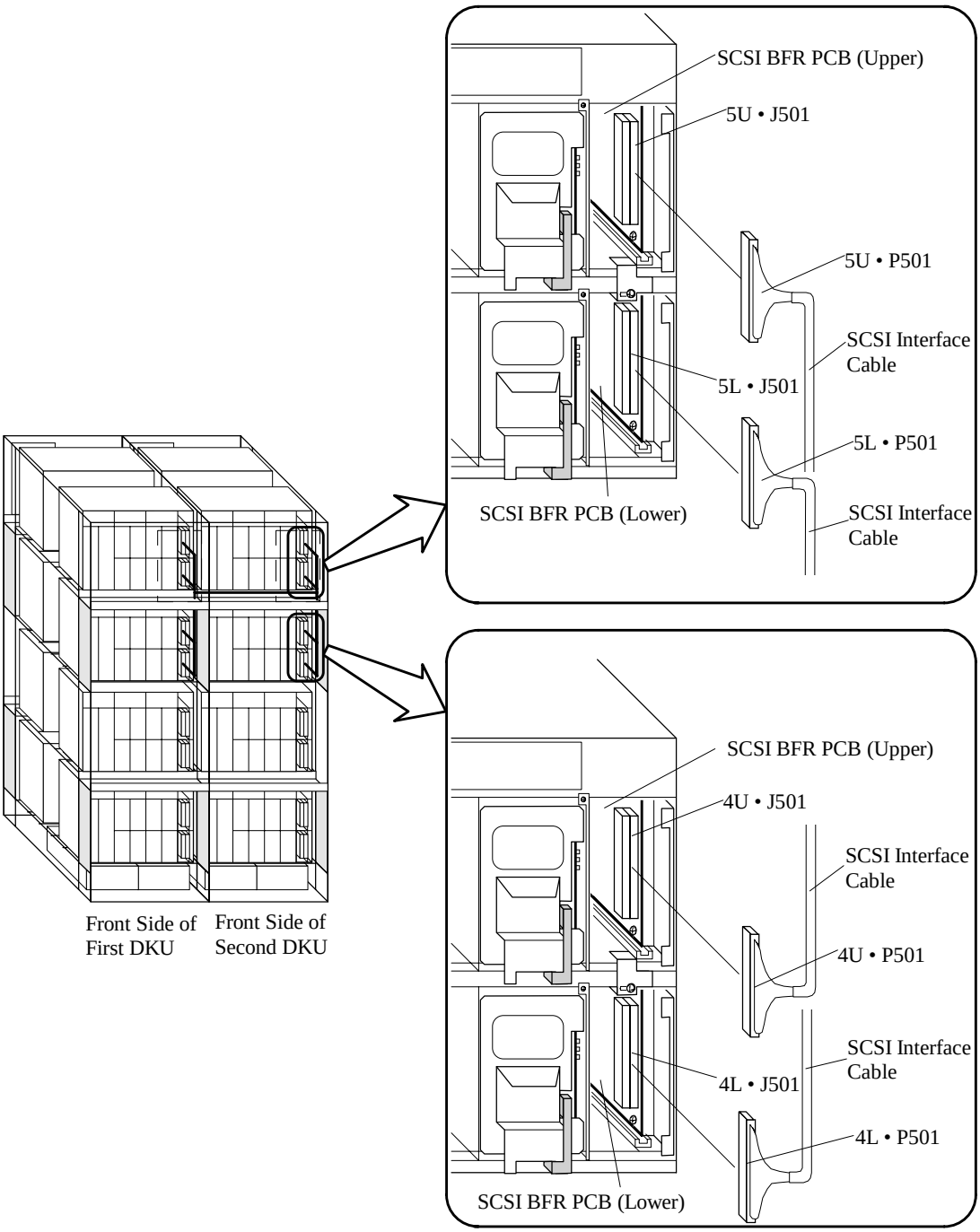

Fig. 3.12.2.4-1 Connection of the SCSI Interface Cables

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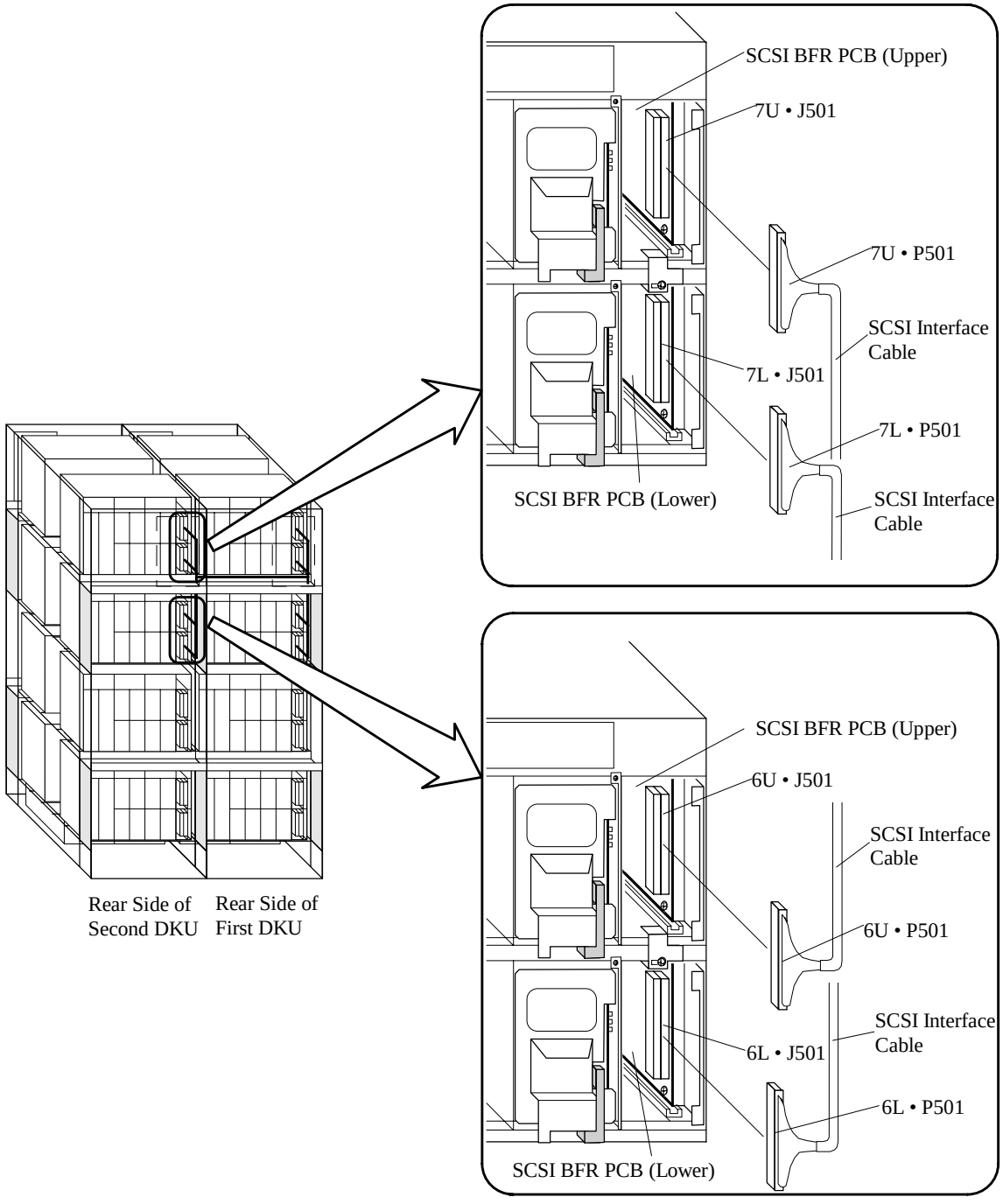

Fig. 3.12.2.4-2 Connection of the SCSI Interface Cables

2. Refer to INST02-56② when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2160 when connecting the additional SCSI interface cable with the sub-system switched off.

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3. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

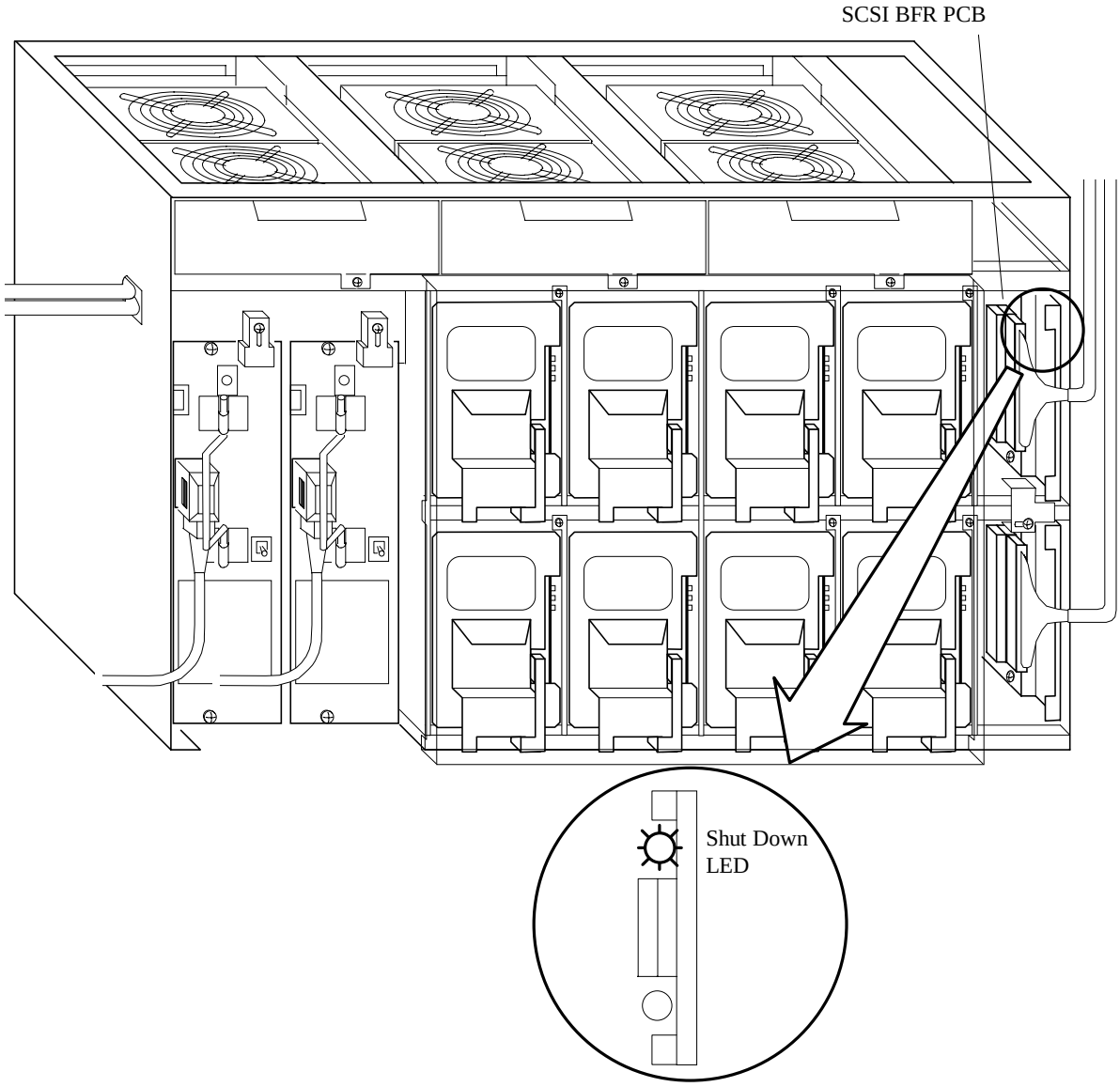

Fig. 3.12.2.4-3 Confirmation of the Shut Down LED Light

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4. Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis referring to figures 3.12.2.4-4 and 3.12.2.4-5.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

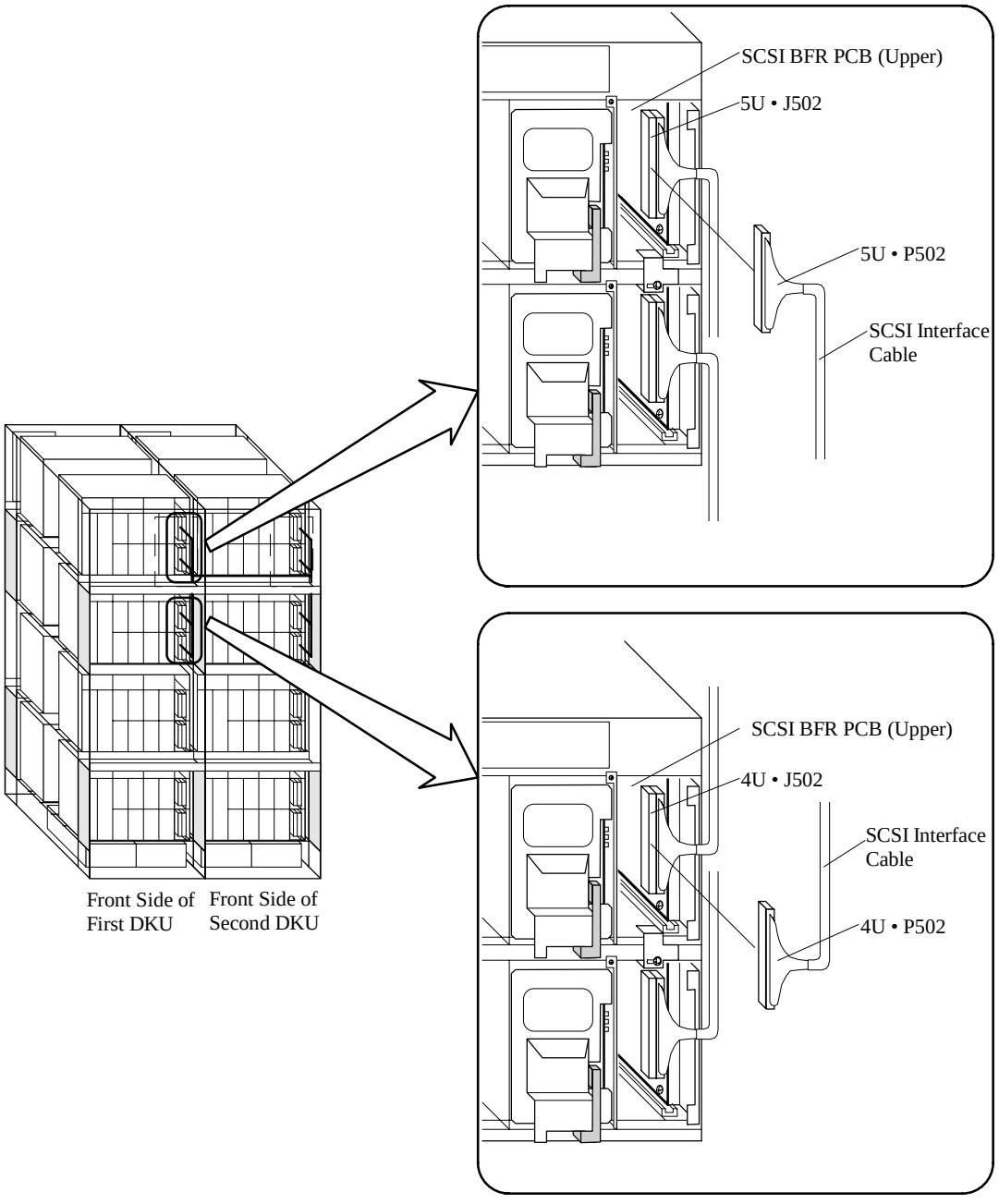

Fig. 3.12.2.4-4 Connection of the SCSI Interface Cables

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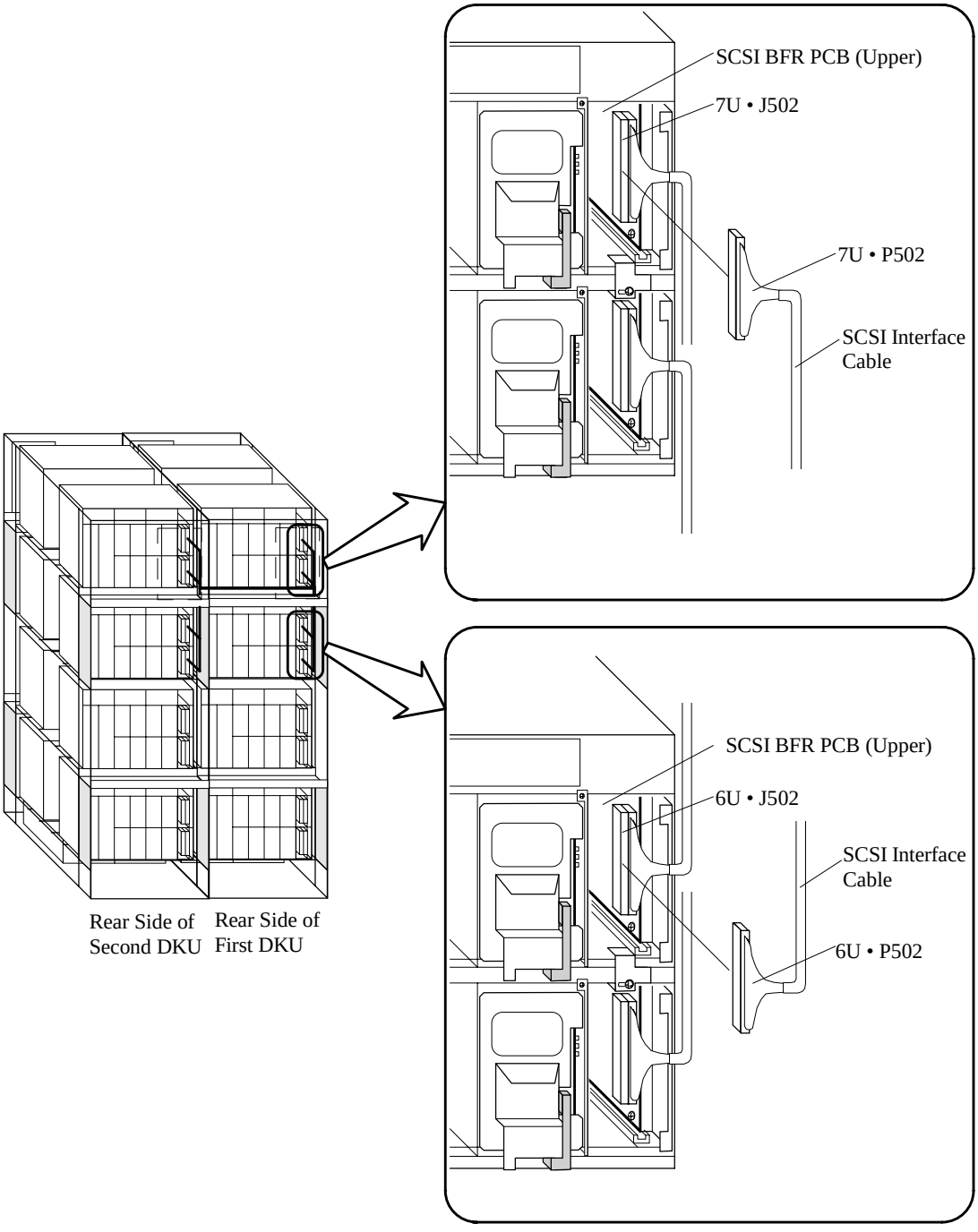

Fig. 3.12.2.4-5 Connection of the SCSI Interface Cables

5. Refer to INST02-57④ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2190 when connecting the additional SCSI interface cable with the sub-system switched off.

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6. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

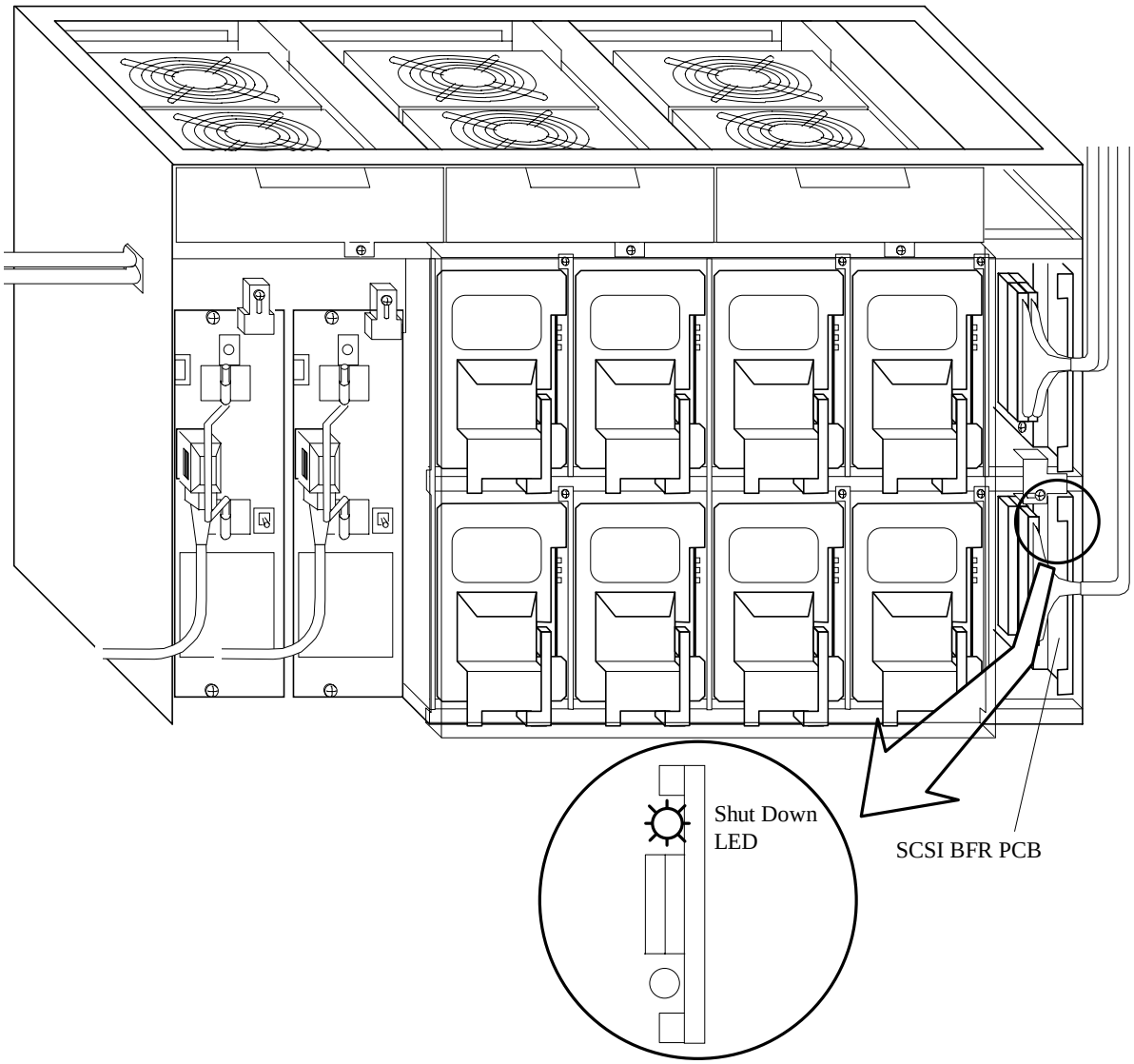

Fig. 3.12.2.4-6 Confirmation of the Shut Down LED Light

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7. Connect the SCSI interface cables to the SCSI BFR PCBs in the first DKU chassis referring to figures 3.12.2.4-7 and 3.12.2.4-8.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

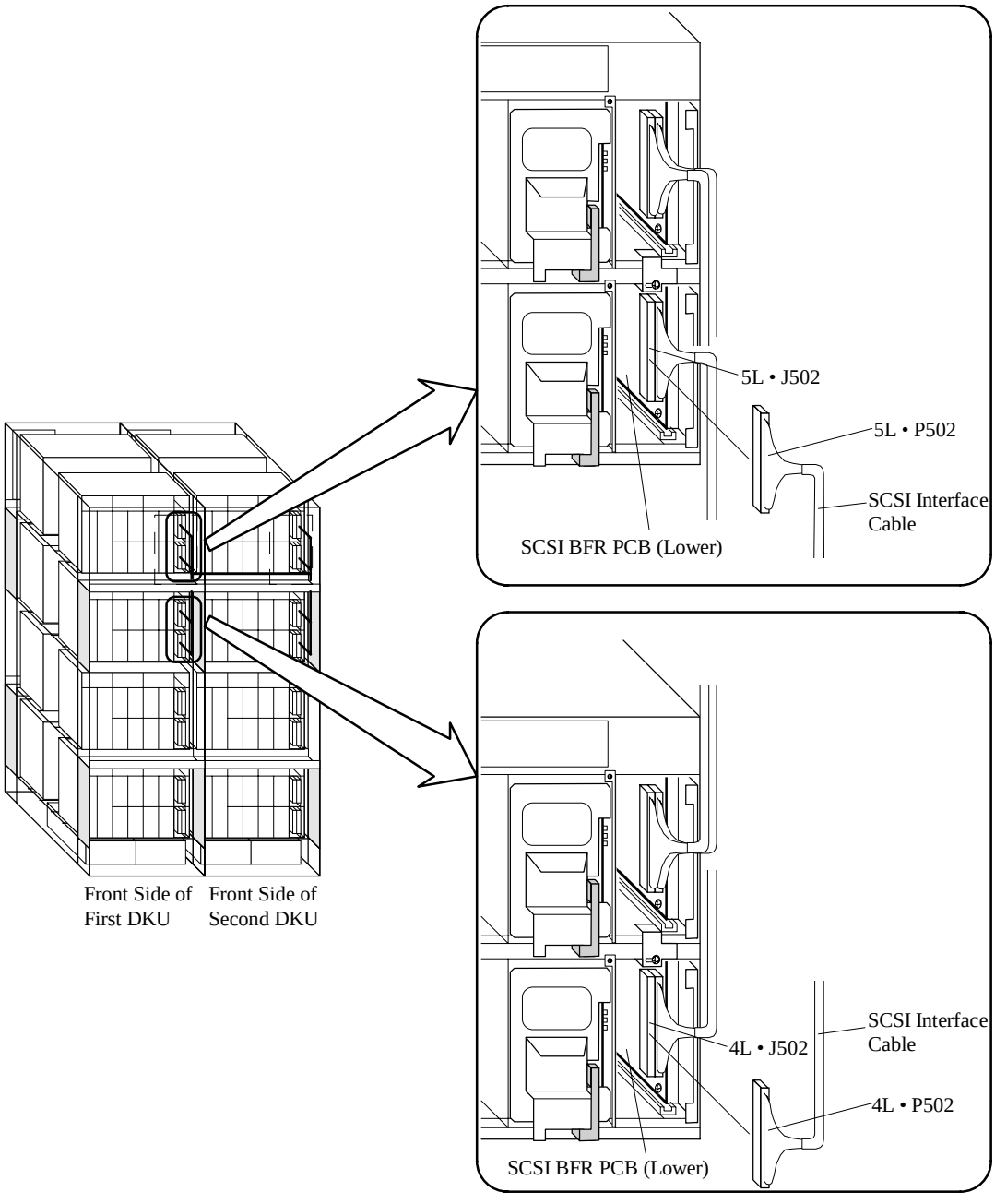

Fig. 3.12.2.4-7 Connection of the SCSI Interface Cables

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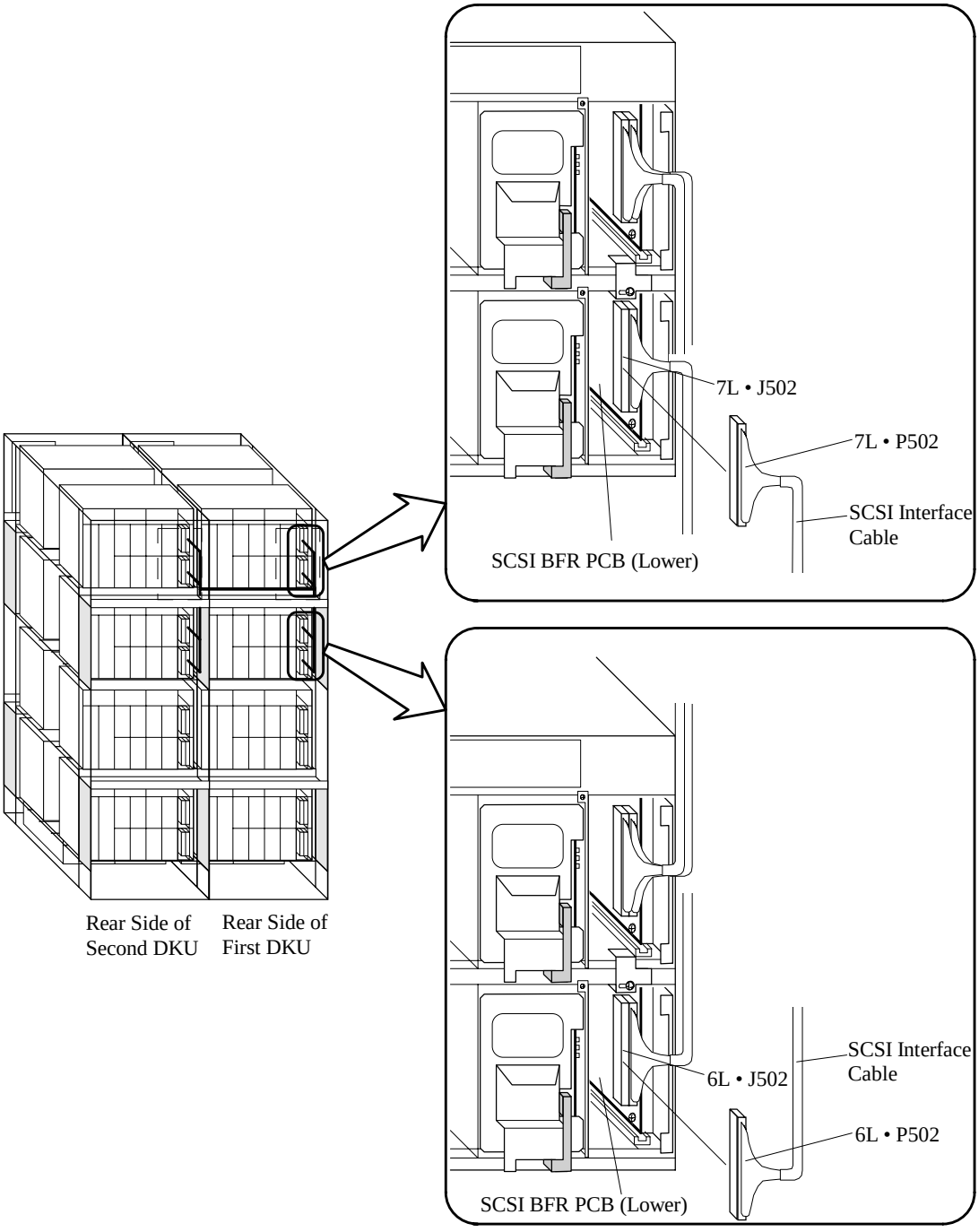

Fig. 3.12.2.4-8 Connection of the SCSI Interface Cables

8. Refer to INST02-57⑥ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2210 when connecting the additional SCSI interface cable with the sub-system switched off.

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9. Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

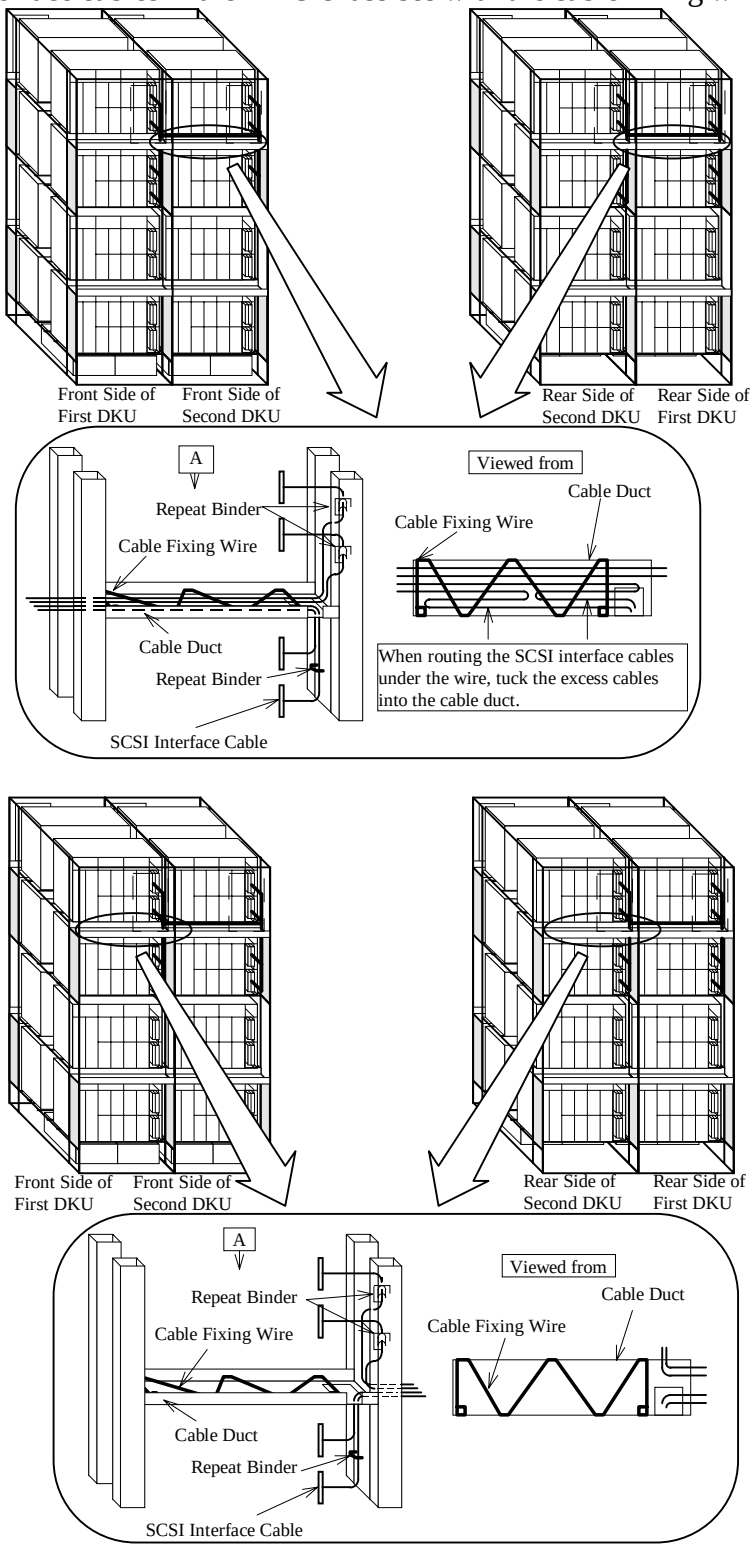

Fig. 3.12.2.4-9 Fixation of the SCSI Interface Cables

10. Go to INST02-57 Step ⑧.

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3.12.2.5 Connection Procedure of Additional SCSI Interface Cables (In case of HDU-L23 from L20)

1. Connect the SCSI interface cables to the SCSI BFR PCBs in the fourth DKU chassis referring to figures 3.12.2.5-1 and 3.12.2.5-2.

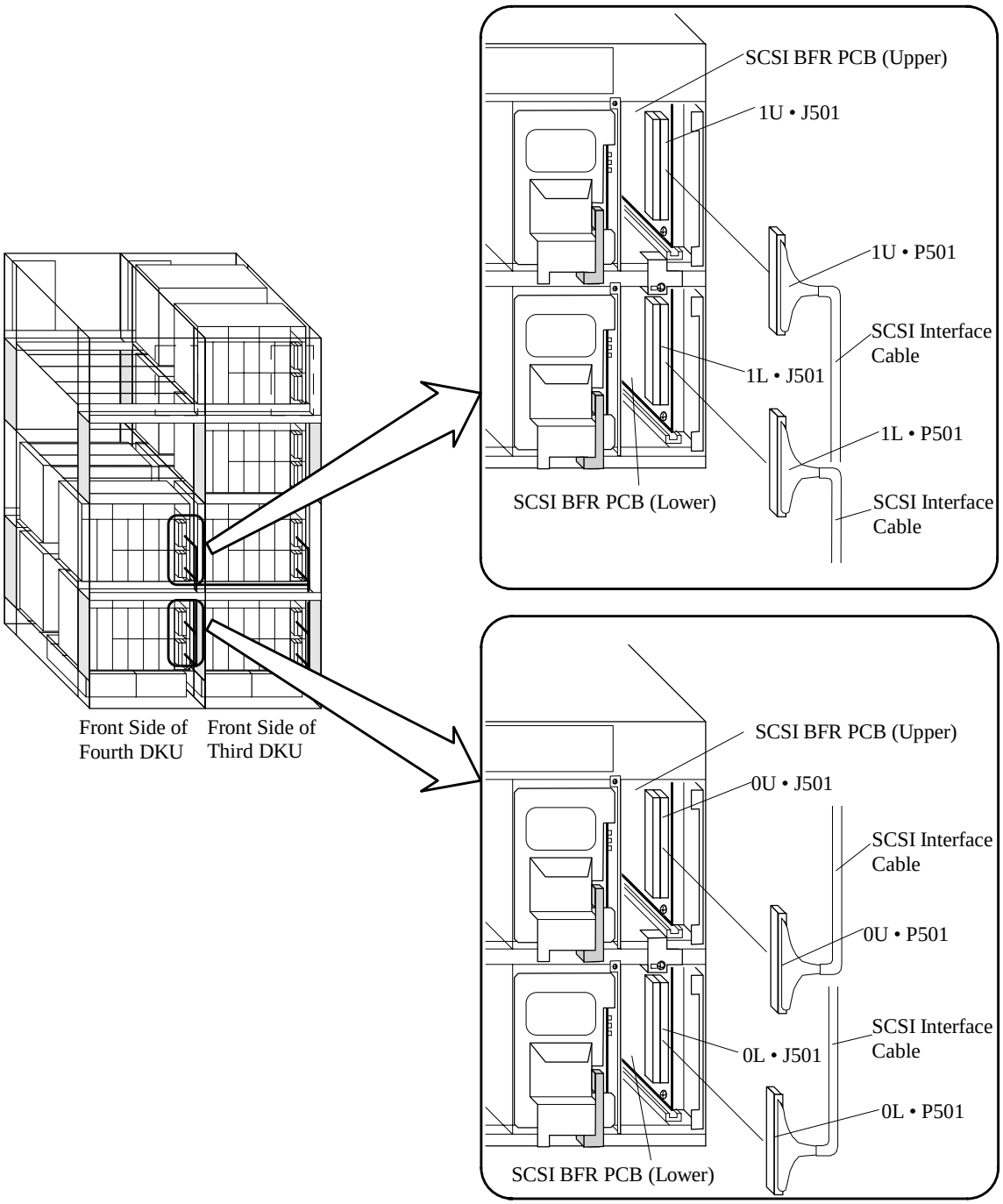

Fig. 3.12.2.5-1 Connection of the SCSI Interface Cables

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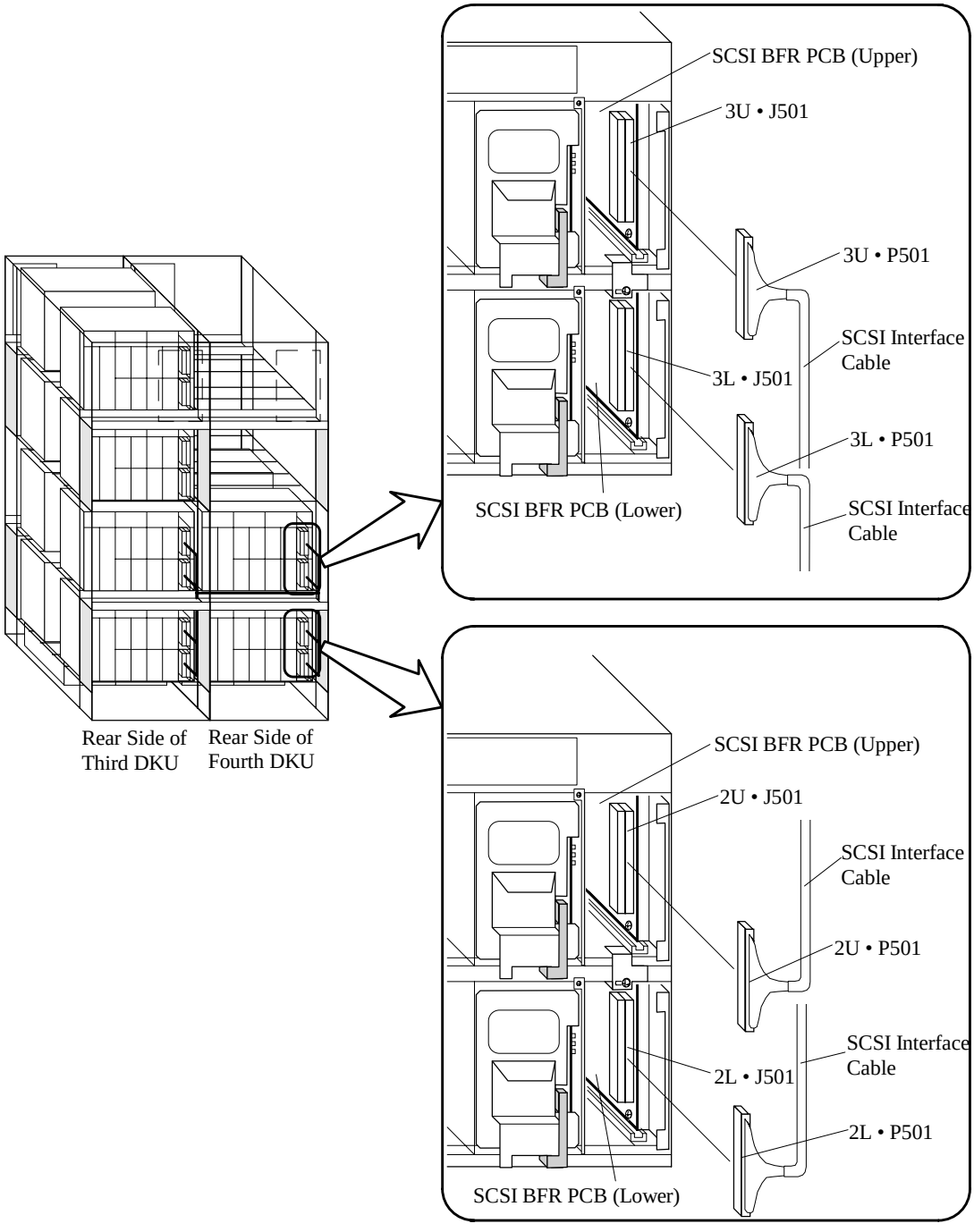

Fig. 3.12.2.5-2 Connection of the SCSI Interface Cables

2. Refer to INST02-56② when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2250 when connecting the additional SCSI interface cable with the sub-system switched off.

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3. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

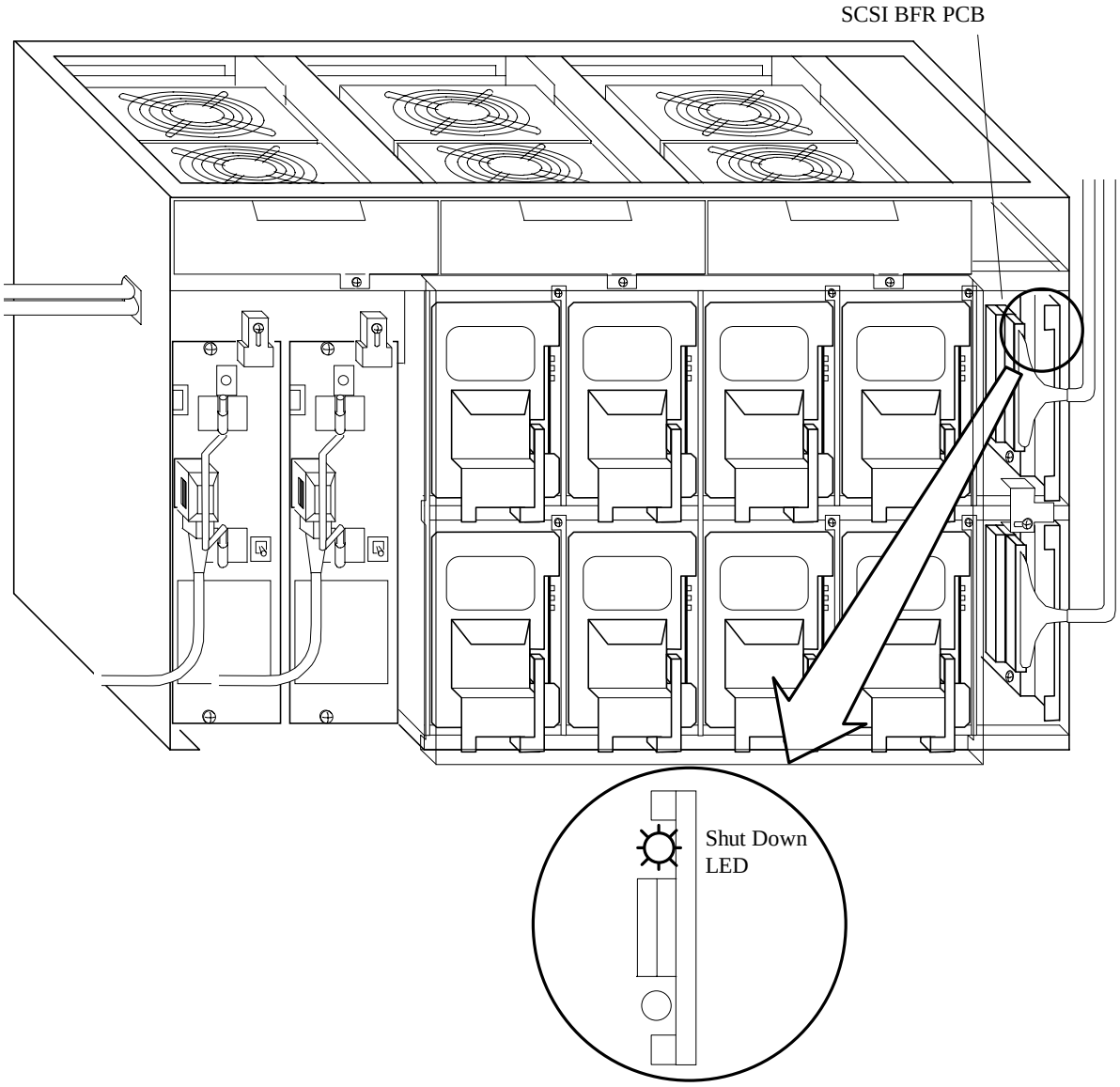

Fig. 3.12.2.5-3 onfirmation of the Shut Down LED Light

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4. Connect the SCSI interface cables to the SCSI BFR PCBs in the third DKU chassis referring to figures 3.12.2.5-4 and 3.12.2.5-5.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

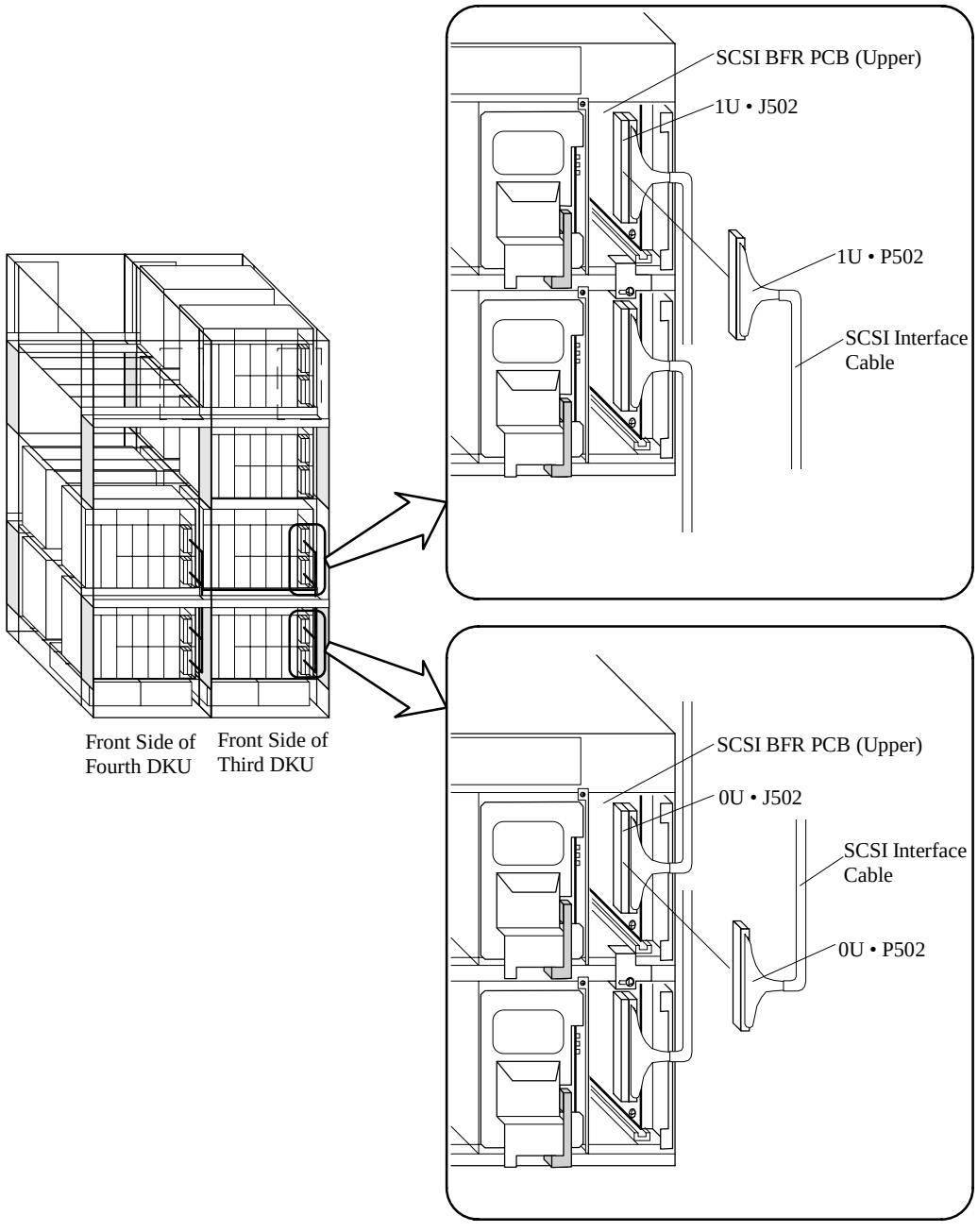

Fig. 3.12.2.5-4 Connection of the SCSI Interface Cables

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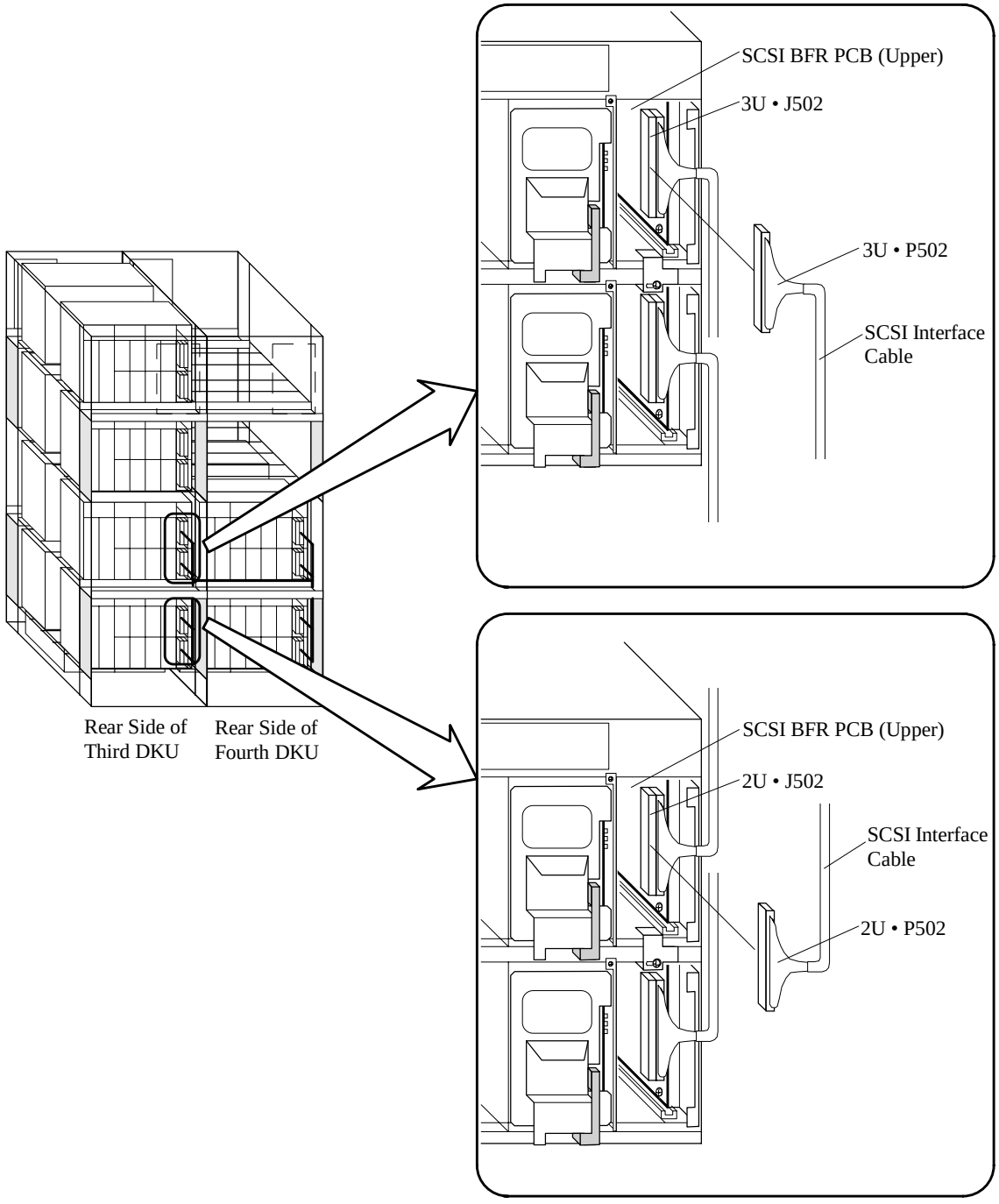

Fig. 3.12.2.5-5 Connection of the SCSI Interface Cables

5. Refer to INST02-57④ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2280 when connecting the additional SCSI interface cable with the sub-system switched off.

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6. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

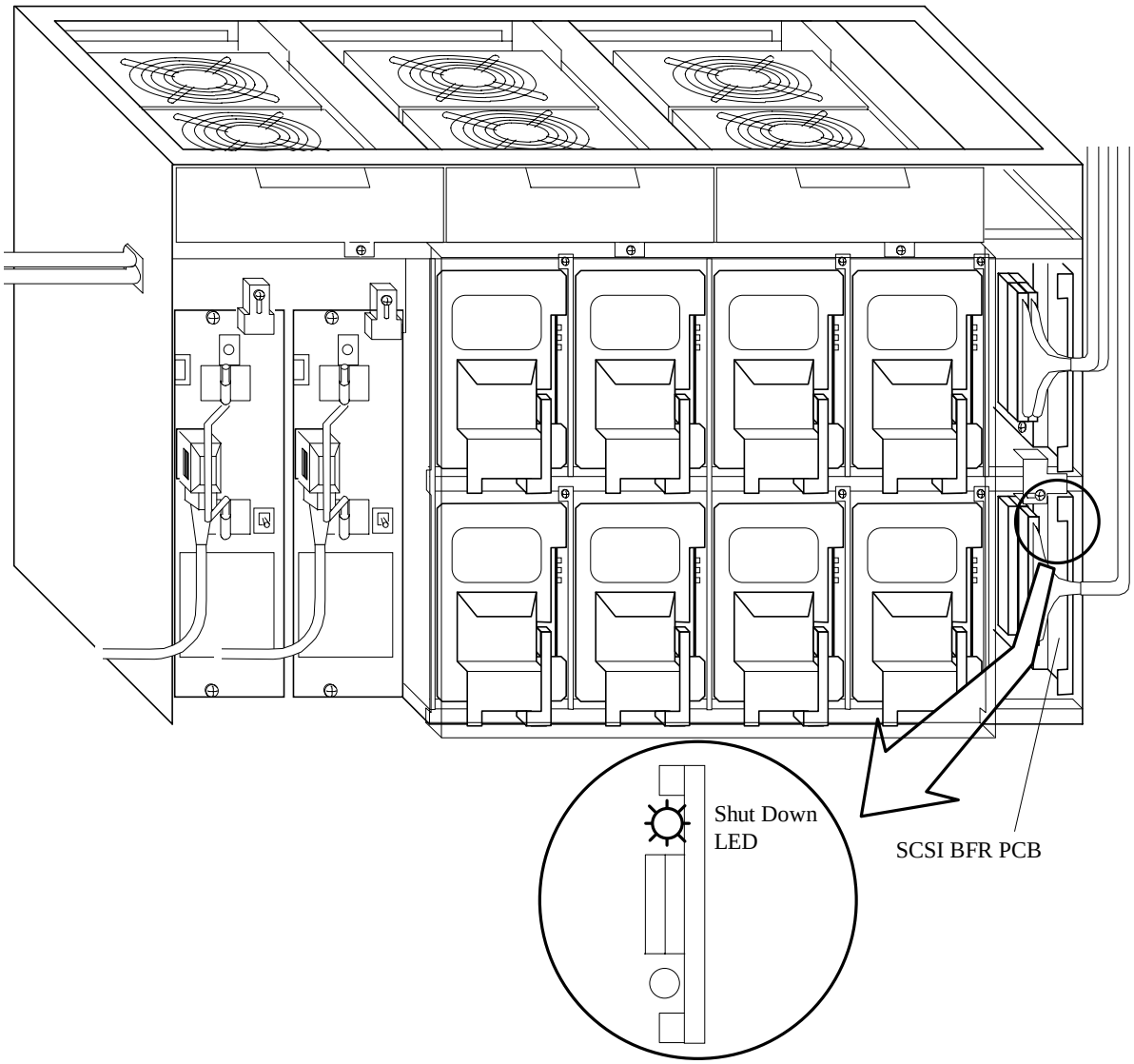

Fig. 3.12.2.5-6 Confirmation of the Shut Down LED Light

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7. Connect the SCSI interface cables to the SCSI BFR PCBs in the third DKU chassis referring to figures 3.12.2.5-7 and 3.12.2.5-8.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

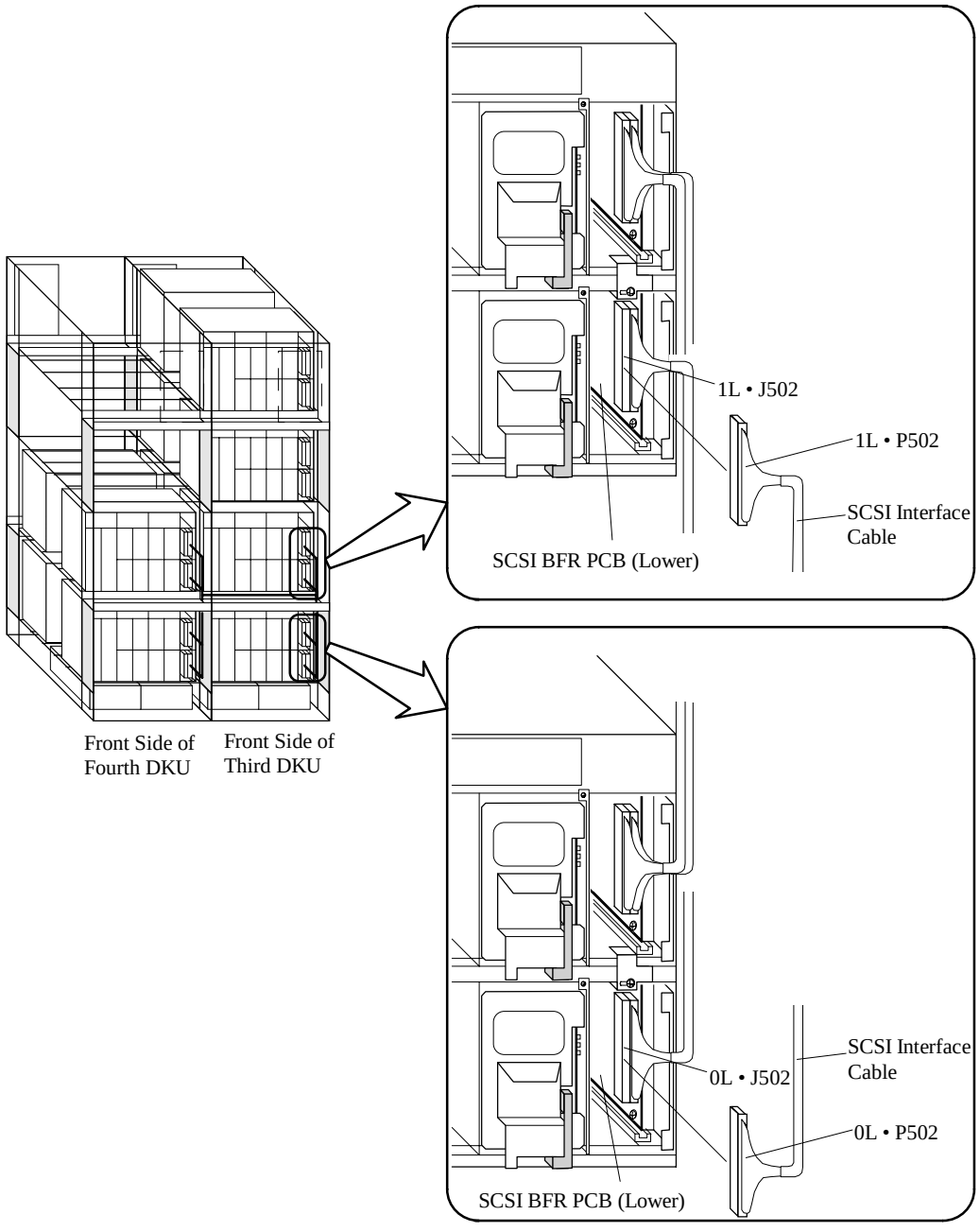

Fig. 3.12.2.5-7 Connection of the SCSI Interface Cables

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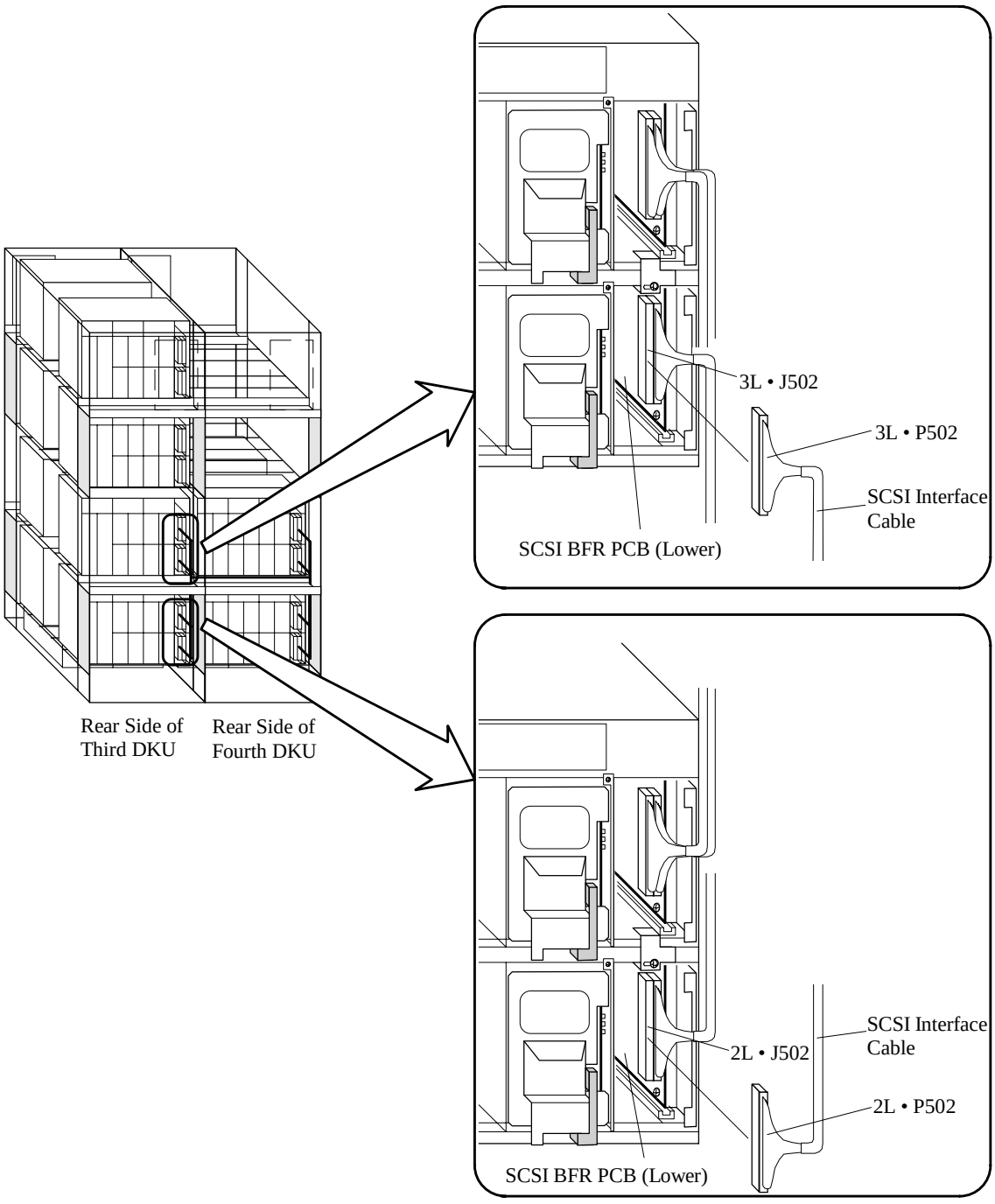

Fig. 3.12.2.5-8 Connection of the SCSI Interface Cables

8. Refer to INST02-57⑥ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2300 when connecting the additional SCSI interface cable with the sub-system switched off.

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9. Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

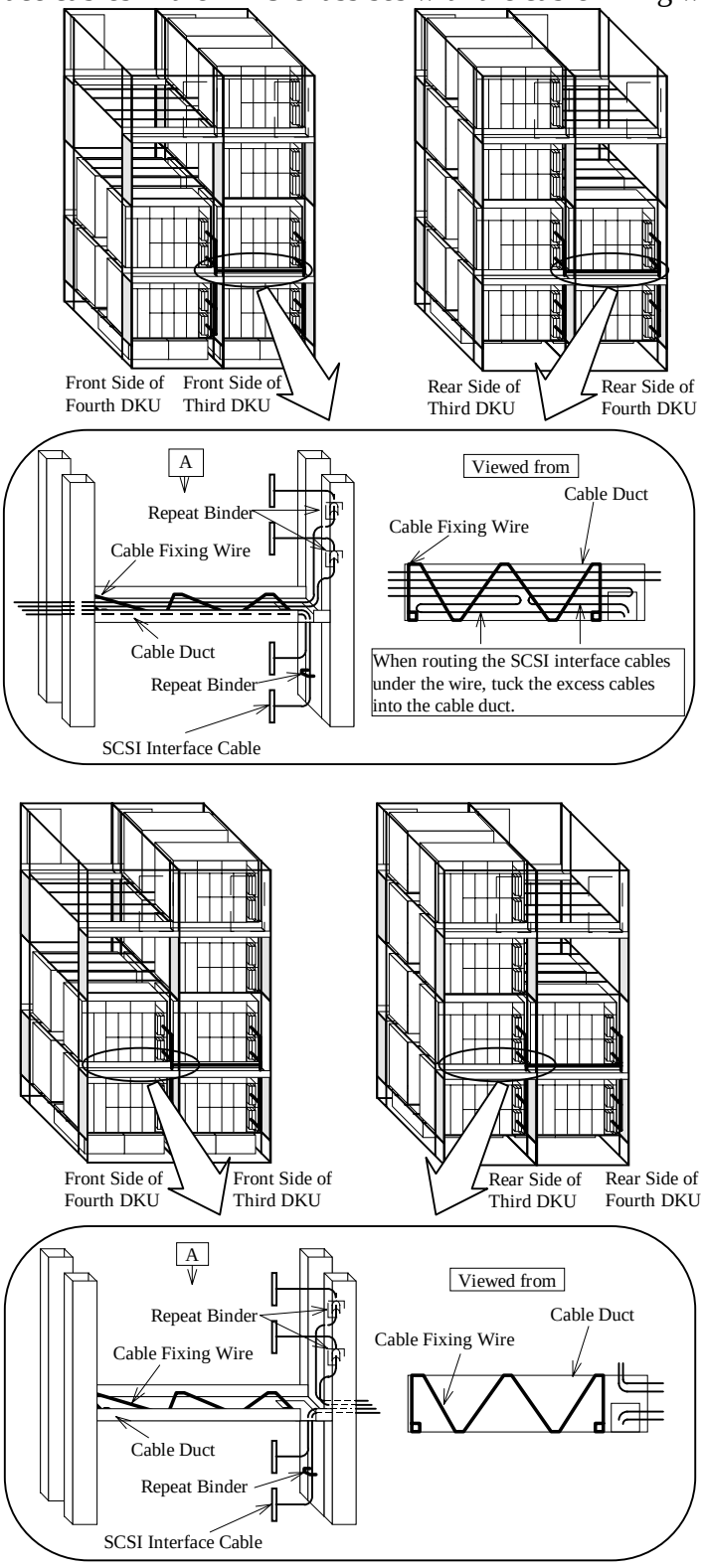

Fig. 3.12.2.5-9 Fixation of the SCSI Interface Cables

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10. Attach the nameplate to the fourth DKU chassis.

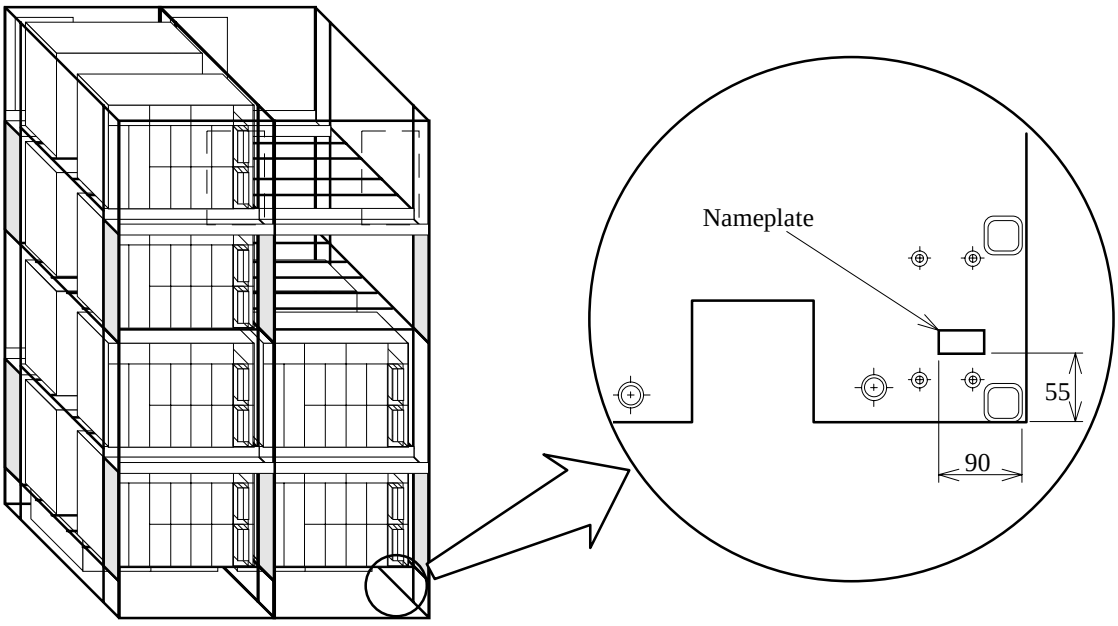

Fig. 3.12.2.5-10 Attachment of the Nameplate

11. When the fourth DKU chassis consists of 4 HDU boxes, fix the rest of the SCSI interface cables in the fourth DKU chassis with the binders.

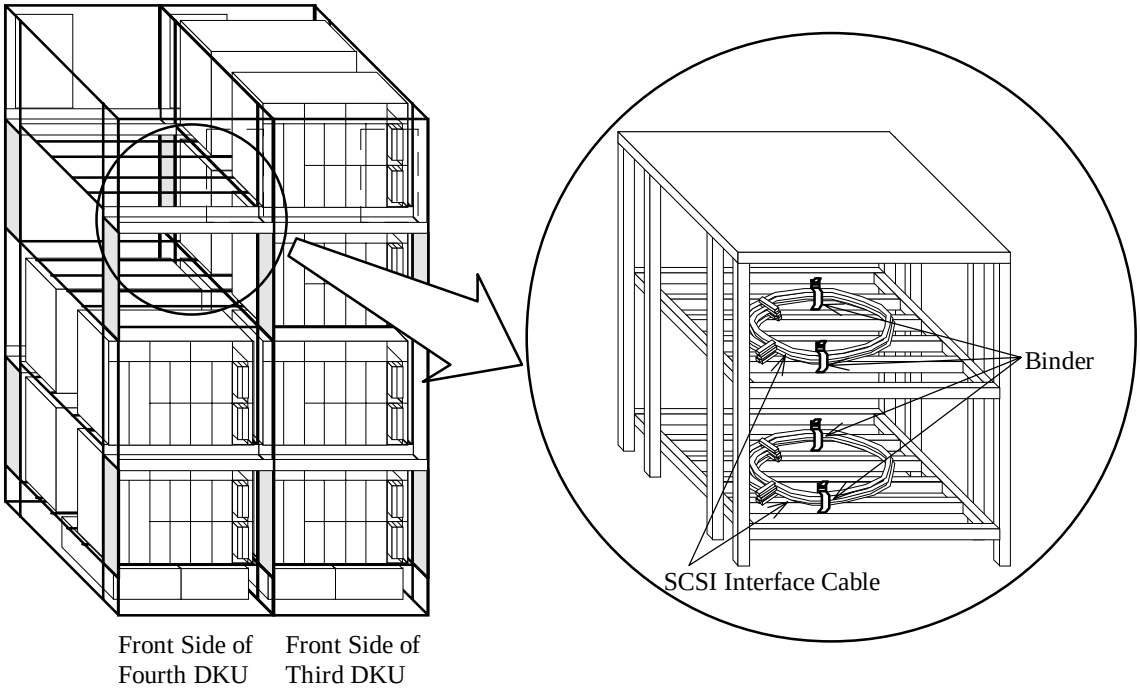

Fig. 3.12.2.5-11 Fixation of the SCSI Interface Cables

12. Go to INST02-57 Step ⑧.

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3.12.2.6 Connection Procedure of Additional SCSI Interface Cables(In case of HDU-L27 from L24)

1. Connect the SCSI interface cables to the SCSI BFR PCBs in the fourth DKU chassis referring to figures 3.12.2.6-1 and 3.12.2.6-2.

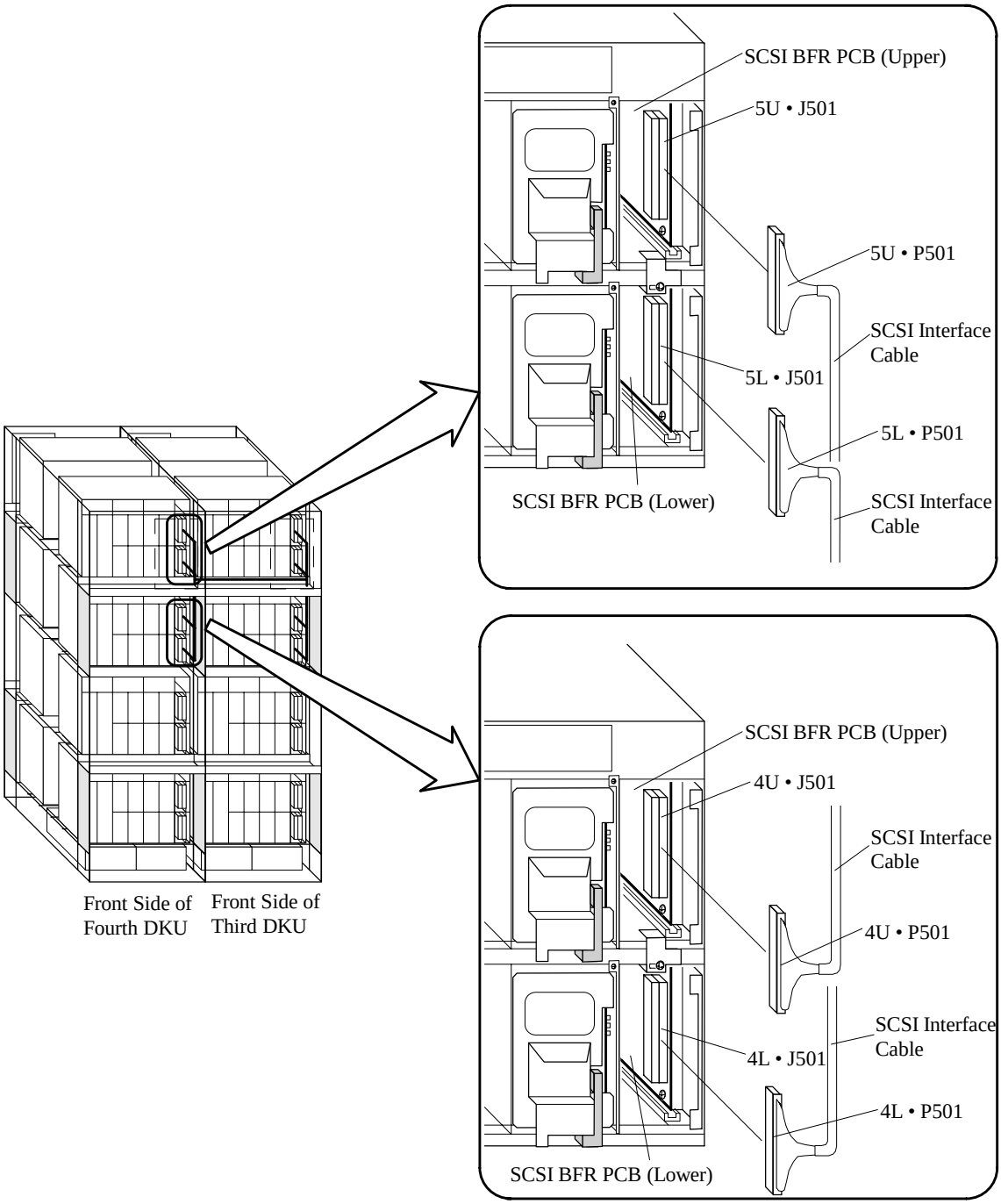

Fig. 3.12.2.6-1 Connection of the SCSI Interface Cables

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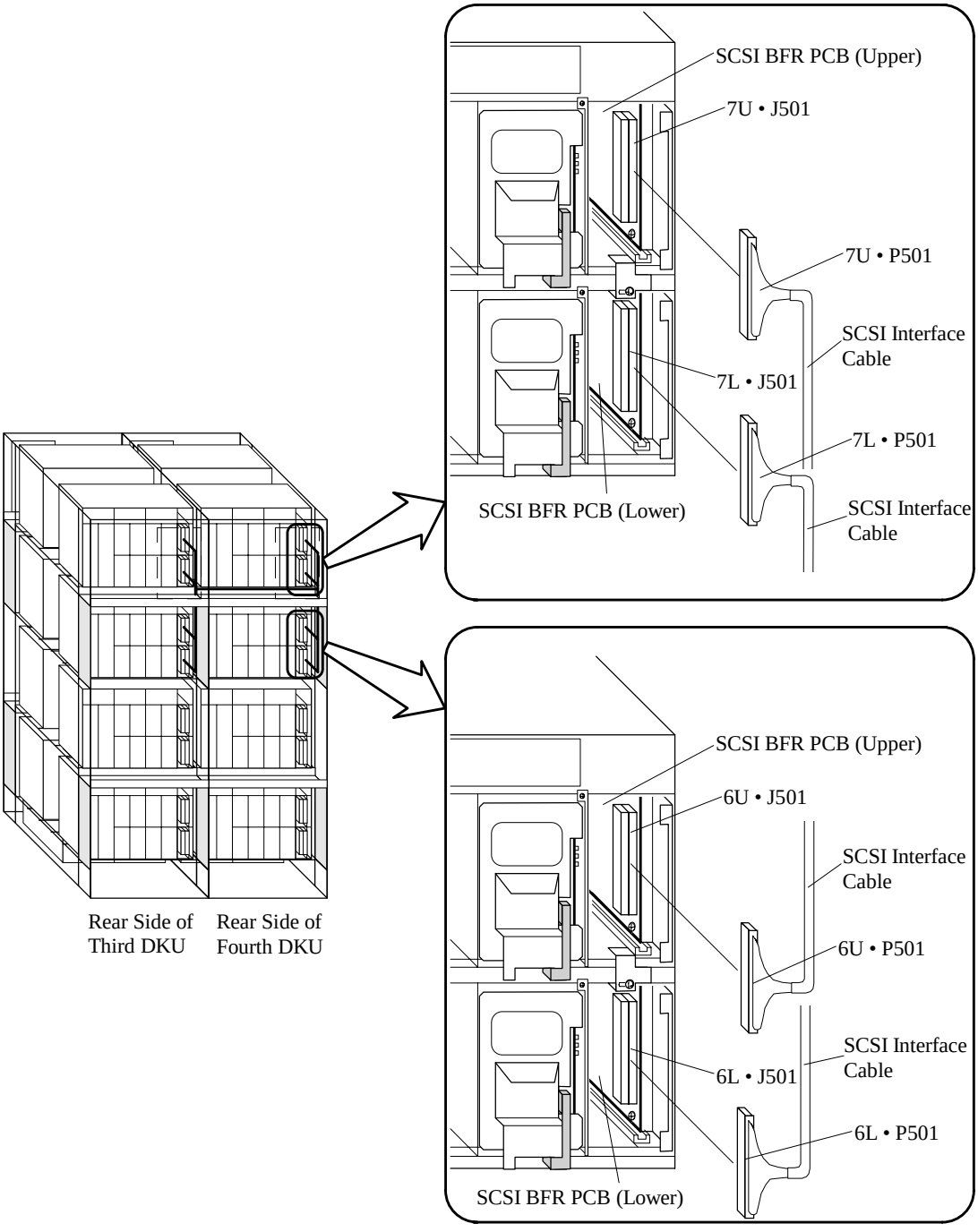

Fig. 3.12.2.6-2 Connection of the SCSI Interface Cables

2. Refer to INST02-56② when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2350 when connecting the additional SCSI interface cable with the sub-system switched off.

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3. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

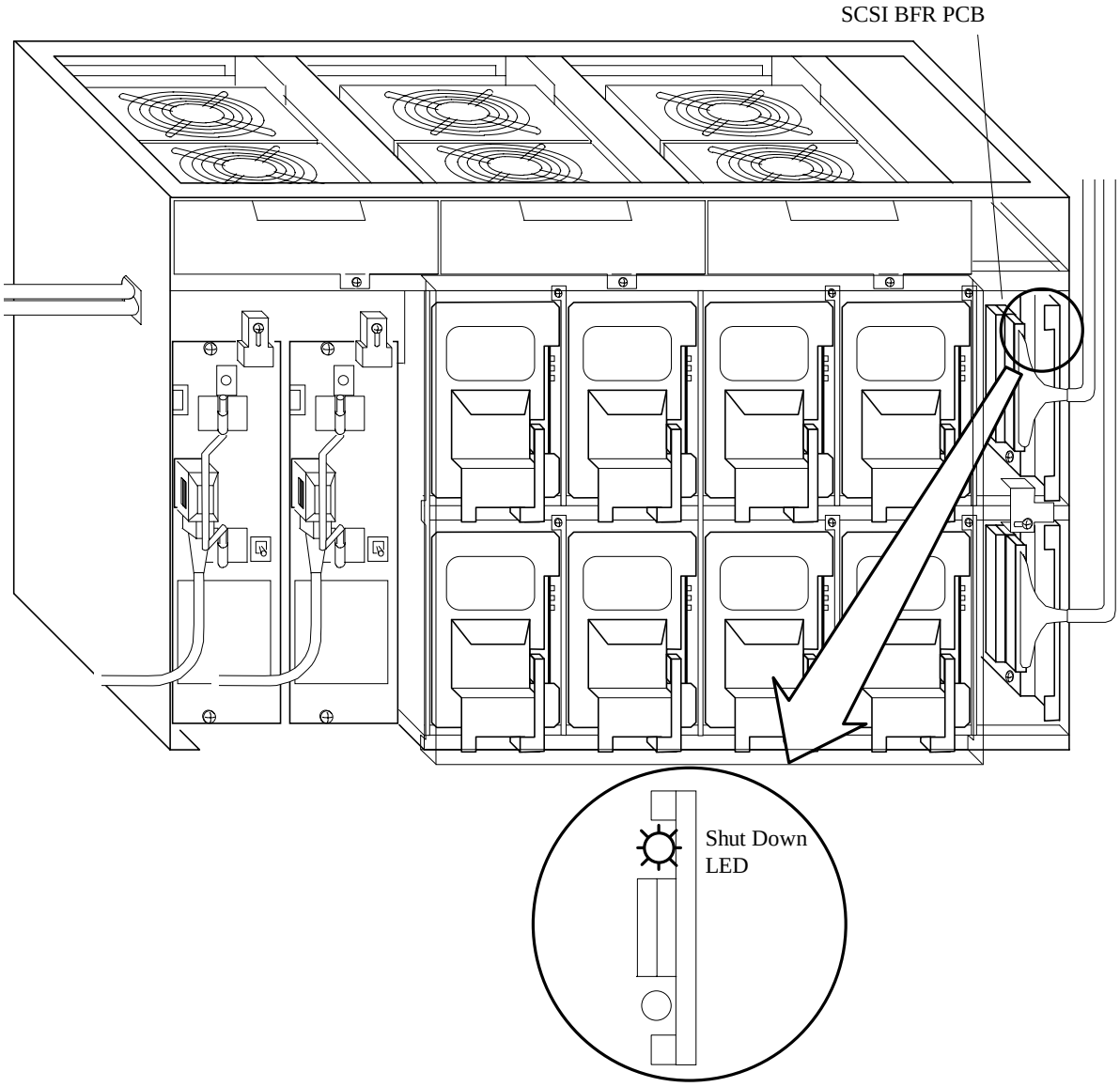

Fig. 3.12.2.6-3 Confirmation of the Shut Down LED Light

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4. Connect the SCSI interface cables to the SCSI BFR PCBs in the third DKU chassis referring to figures 3.12.2.6-4 and 3.12.2.6-5.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

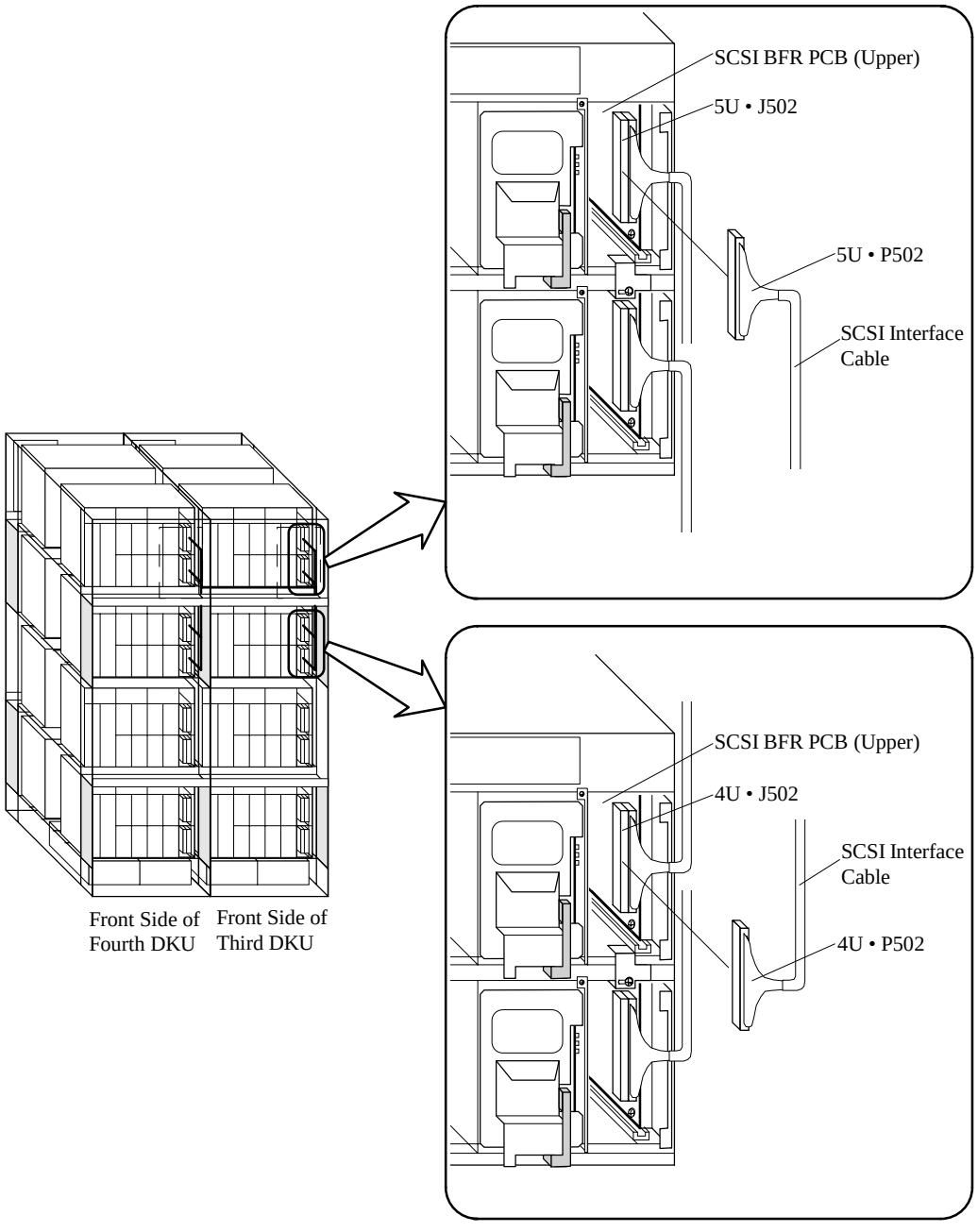

Fig. 3.12.2.6-4 Connection of the SCSI Interface Cables

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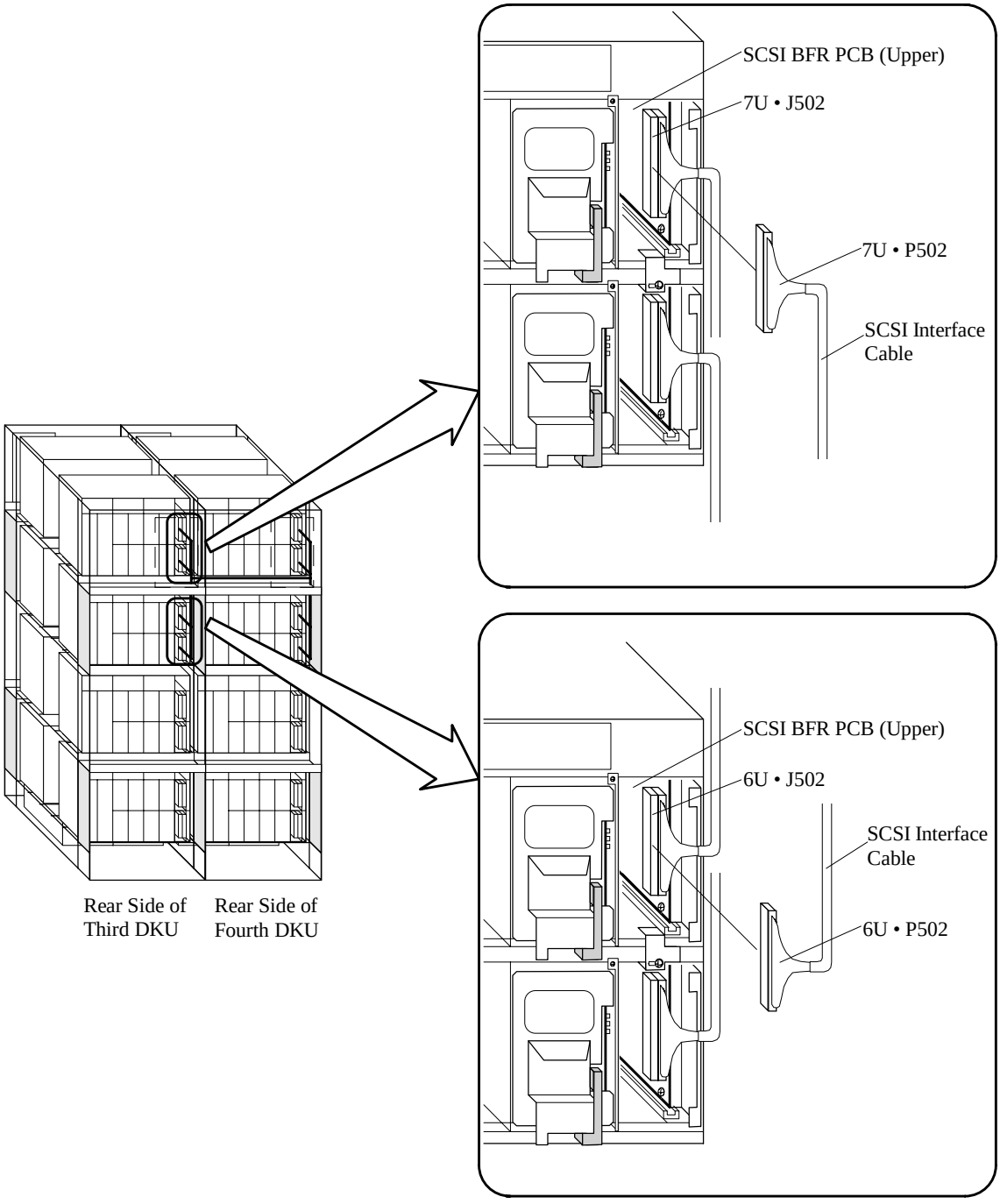

Fig. 3.12.2.6-5 Connection of the SCSI Interface Cables

5. Refer to INST02-57④ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2380 when connecting the additional SCSI interface cable with the sub-system switched off.

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6. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs to which the SCSI interface cables are to be connected.

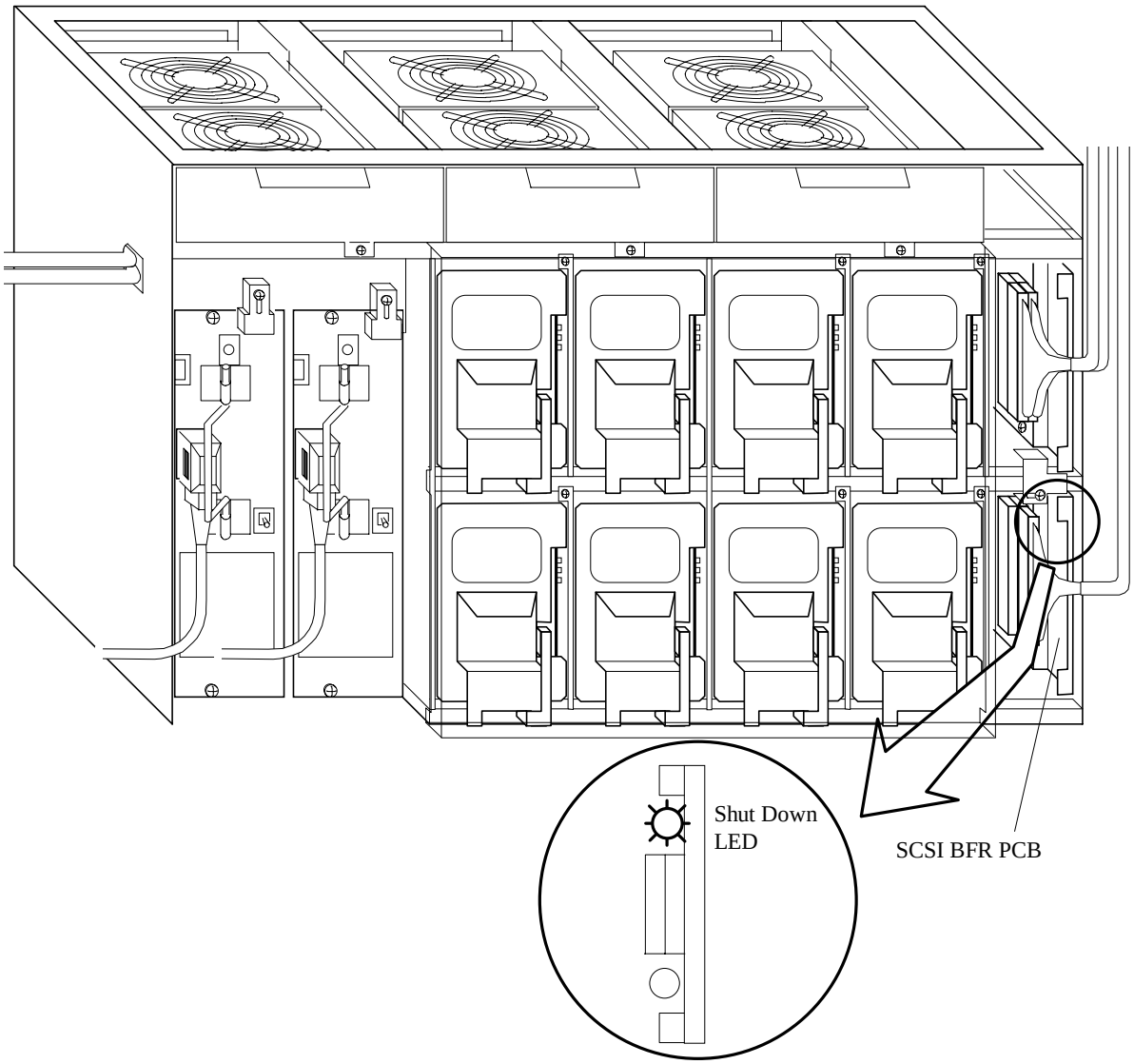

Fig. 3.12.2.6-6 Confirmation of the Shut Down LED Light

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7. Connect the SCSI interface cables to the SCSI BFR PCBs in the third DKU chassis referring to figures 3.12.2.6-7 and 3.12.2.6-8.

NOTICE:
When connecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow connection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus connecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

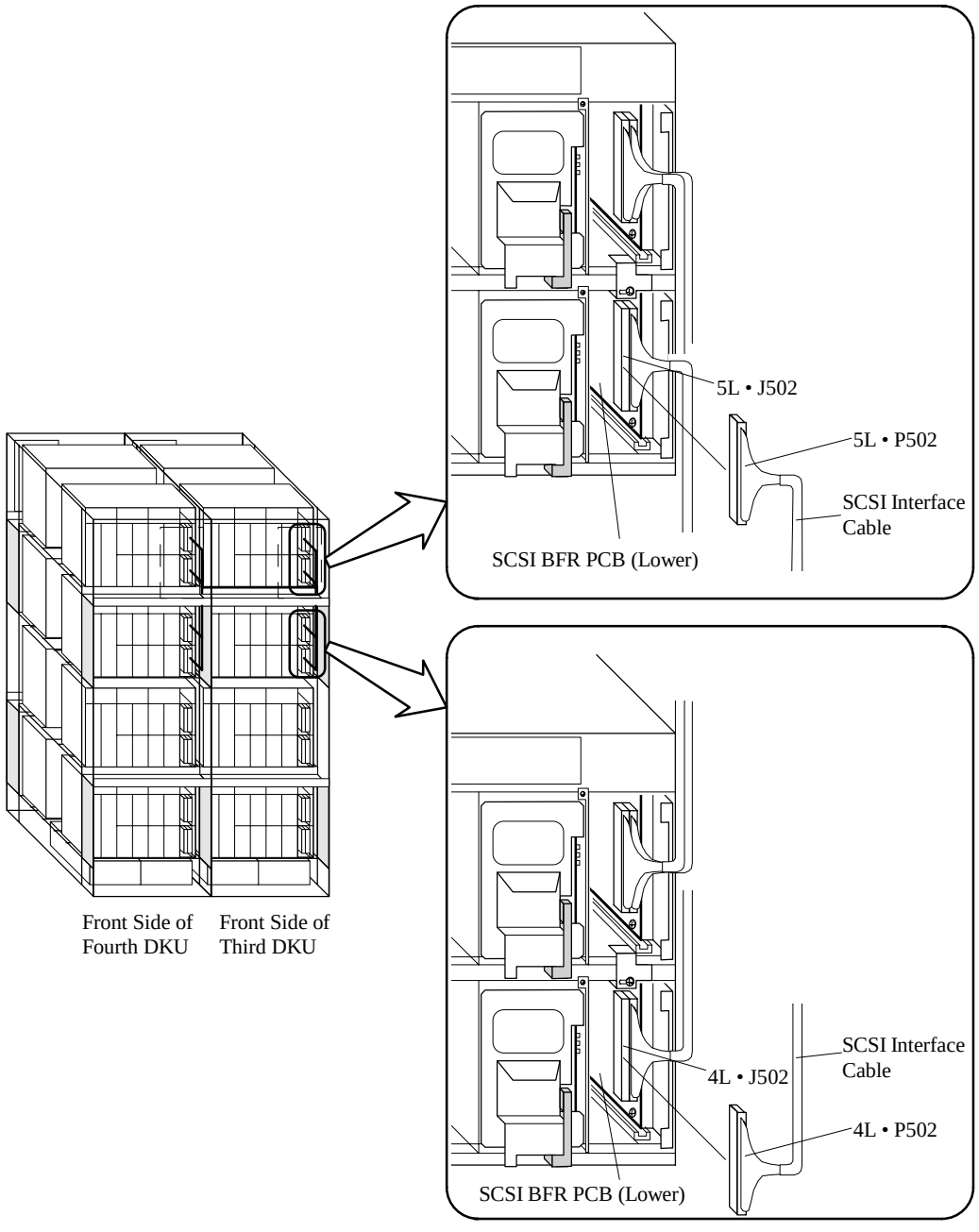

Fig. 3.12.2.6-7 Connection of the SCSI Interface Cables

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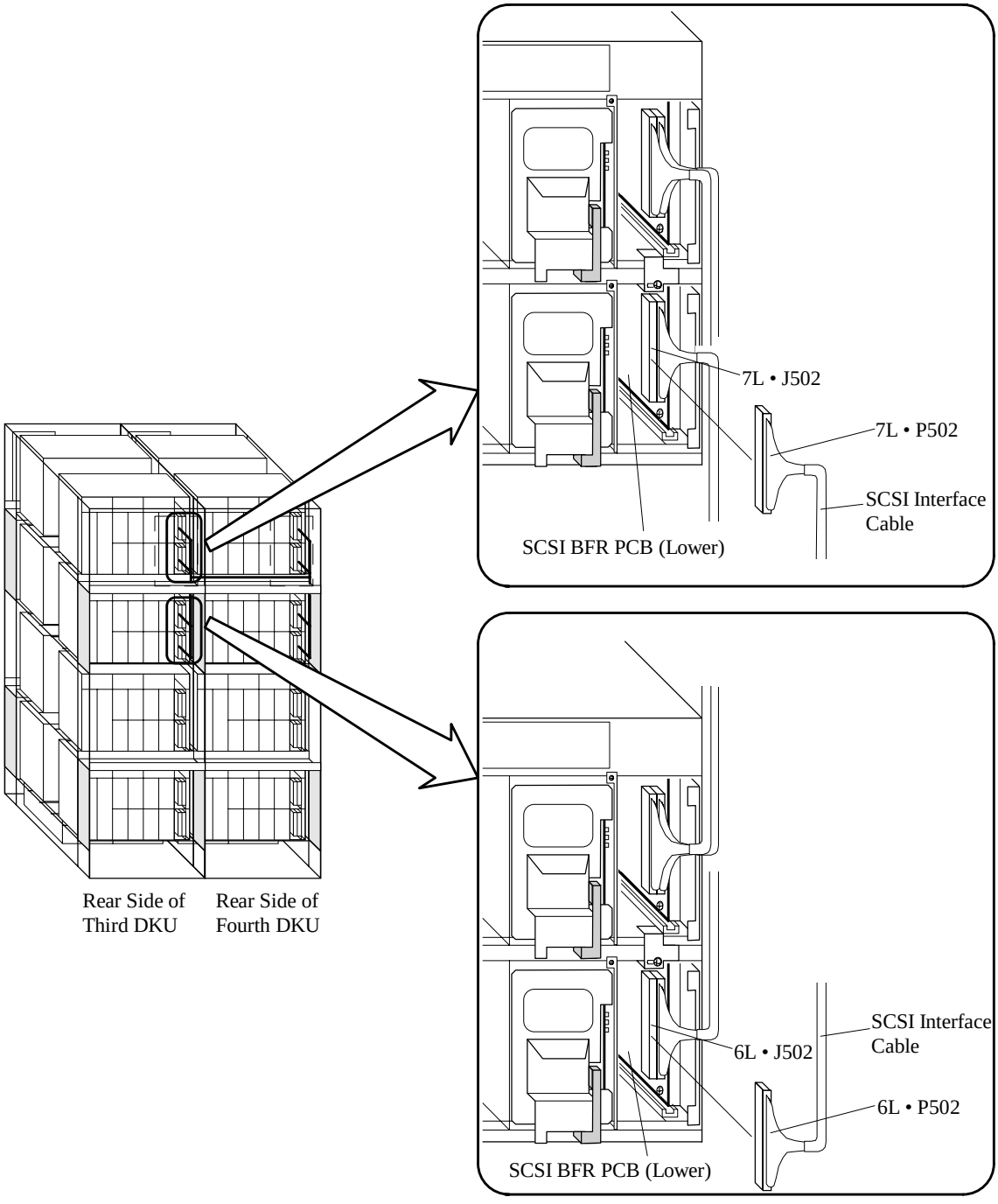

Fig. 3.12.2.6-8 Connection of the SCSI Interface Cables

8. Refer to INST02-57⑥ when connecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST03-2400 when connecting the additional SCSI interface cable with the sub-system switched off.

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9. Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

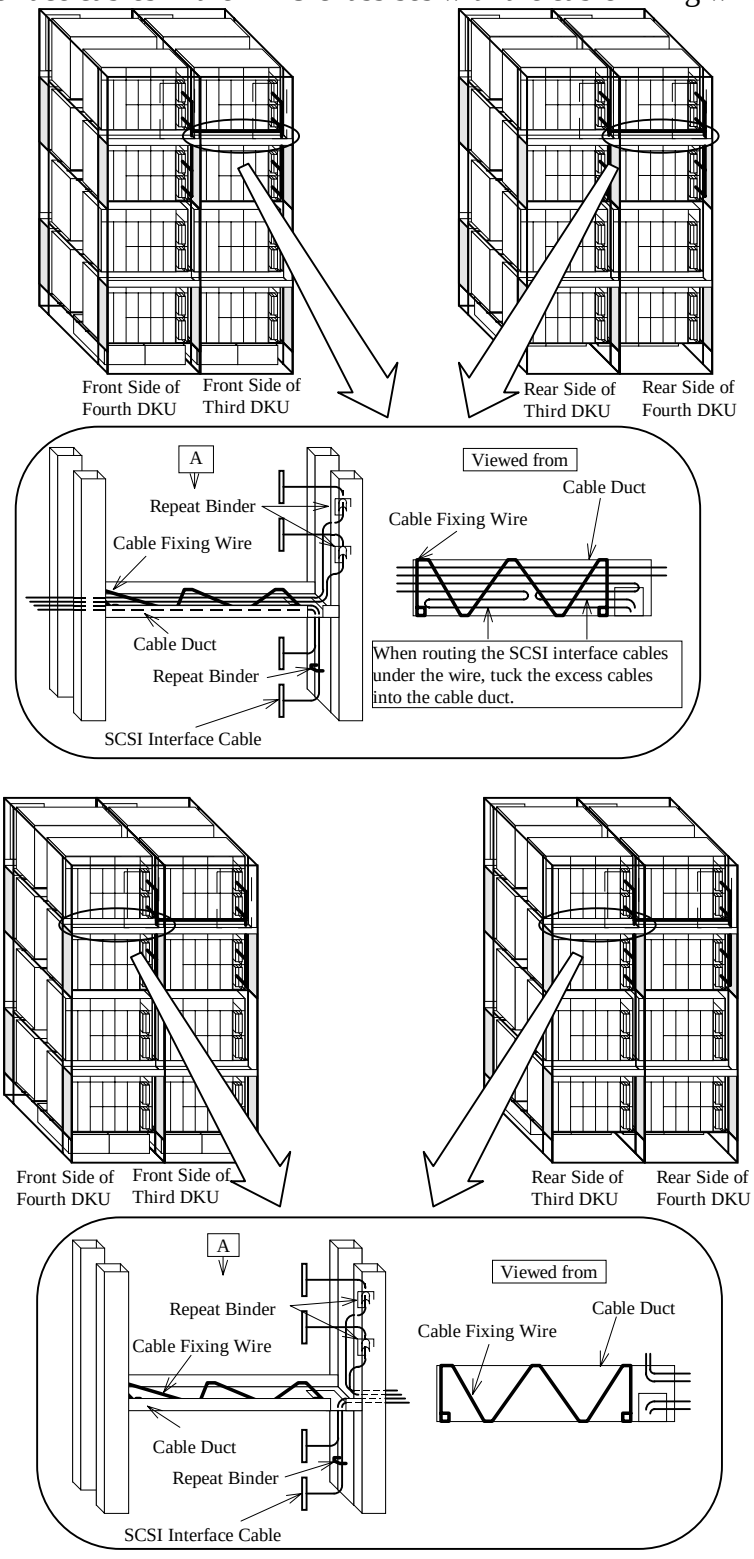

Fig. 3.12.2.6-9 Fixation of the SCSI Interface Cables

10. Go to INST02-57 Step ⑧.

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3.13 Installation of Interface Connector

3.13.1 Installation of PCI I/F Connector (DKC-F310I-18)

3.13.1.1 Flowchart

1. Confirm that the REMOTE/LOCAL Switch of CE Panel is set to LOCAL. If not, set the REMOTE/LOCAL Switch to LOCAL.

↓

2. Connect the "CE Panel INH" jumper plug to the sockets on the HUB.

↓

3. Set the jumper connectors(JP1 and JP2) of the CE Panel.

↓

4. Attach the PCI CONN PCB.

↓

5. Restore the REMOTE/LOCAL switch and jumpers (JP1 and JP2) on the CE panel.

↓

6. Disconnect the "CE Panel INH" jumper plug from the socket on the HUB.

↓

7. Attach the nameplate.

3.13.1.2 Parts List

Table 3.13.1.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-18	PCI CONN	3236713-A	1	
		Nameplate	3252542-14	1	

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3.13.1.3 Installation Procedure of PCI I/F Connector

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirm that the REMOTE/LOCAL Switch of CE Panel is set to LOCAL. If not, set the REMOTE/LOCAL Switch to LOCAL.

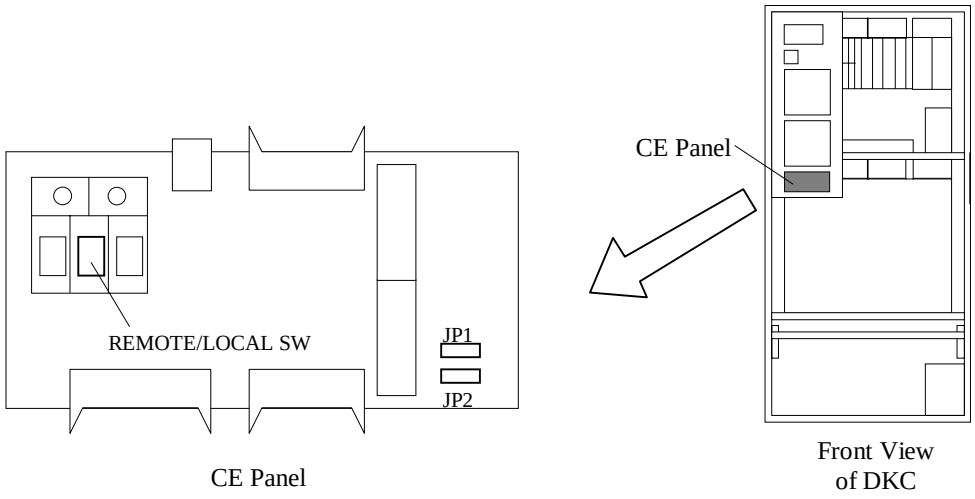

Fig. 3.13.1.3-1 Setting of REMOTE/LOCAL Switch

2. Connect the "CE Panel INH" jumper plug to the sockets on the HUB.

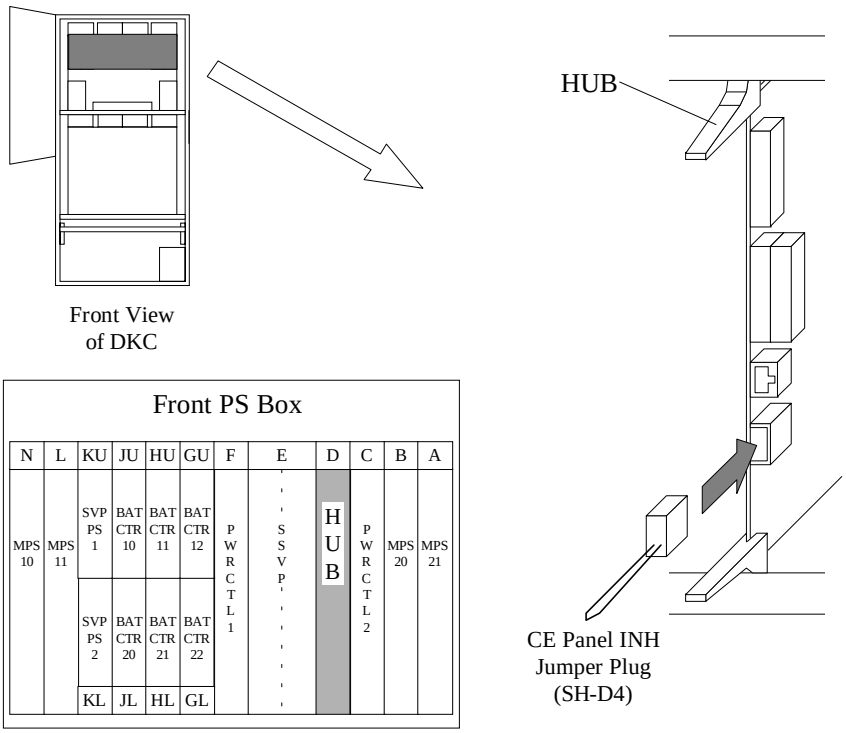

Fig. 3.13.1.3-2 Insertion of Jumper Plug

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3. Set the jumper connectors(JP1 and JP2) of the CE Panel.

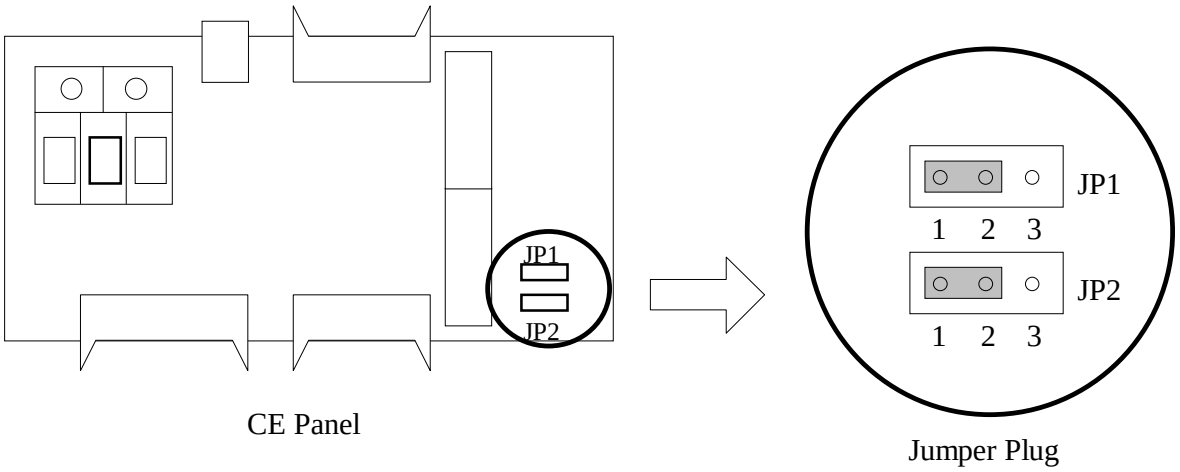

Fig. 3.13.1.3-3 Insertion of Jumper Plug

4. Attach the PCI CONN PCB.
   a. Remove the screw① and remove the plate.
   b. Attach the PCI CONN PCB and fasten the screw②.
   c. Attach the plate and fasten the screw①.
   d. Connect the cable.

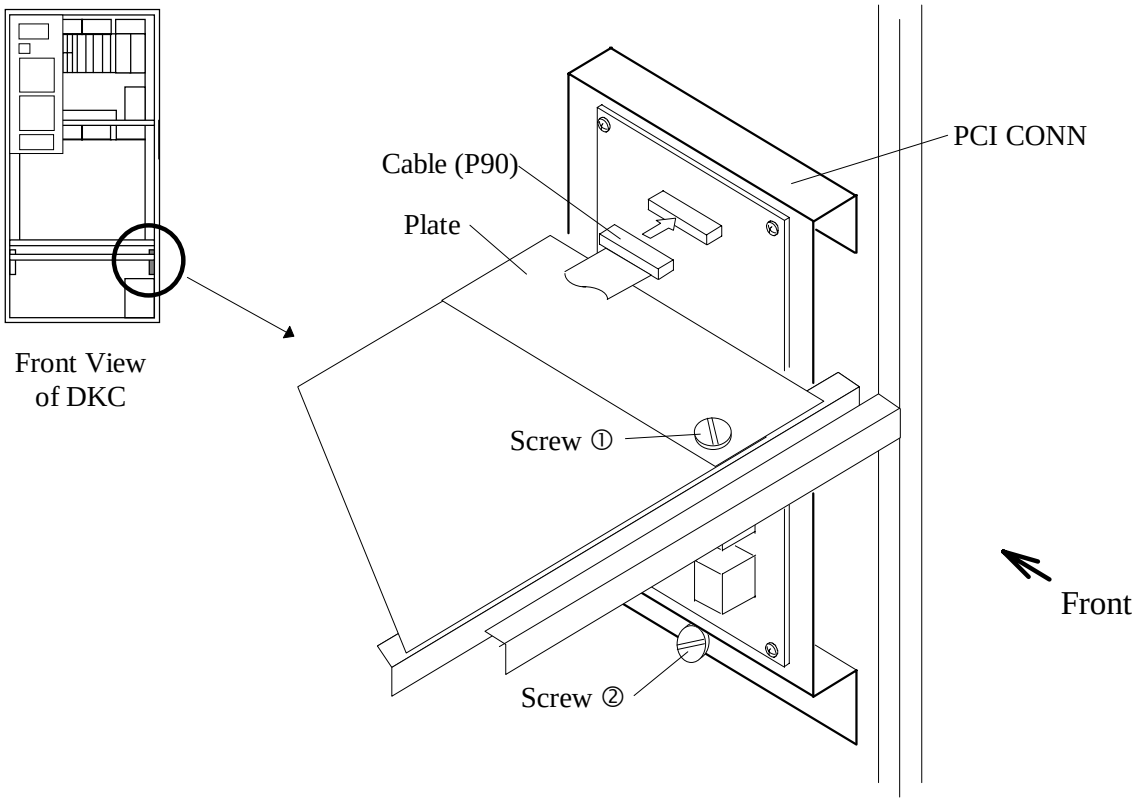

Fig. 3.13.1.3-4 Attachment of PCI CONN PCB

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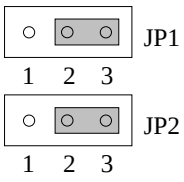
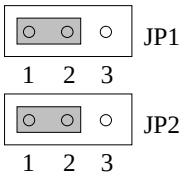
5. Restore the REMOTE/LOCAL switch and jumpers (JP1 and JP2) on the CE panel.
   a. Restore the REMOTE/LOCAL switch and jumpers (JP1 and JP2) on the CE panel set in step 1 and 2 to its previous setting. The relation between the REMOTE/LOCAL switch and the jumper settings are shown below.

Table 3.13.1.3-1 Jumper setting of CE Panel

No.	Description	JP1 and JP2 Setting
1	When power is controlled from the host (at least one PCI cable attached to JP1-JP8 on PCI CONN PCB), set the jumpers as shown.	
2	When power is not controlled from the host, no PCI Cable attached to JP1-JP8 PCI CONN PCB, to disable the EPO of host, set the jumpers as shown.	

6. Disconnect the "CE Panel INH" jumper plug from the socket on the HUB.

7. Attach the nameplate.
   a. Attach the nameplate of DKC-F310I-18.

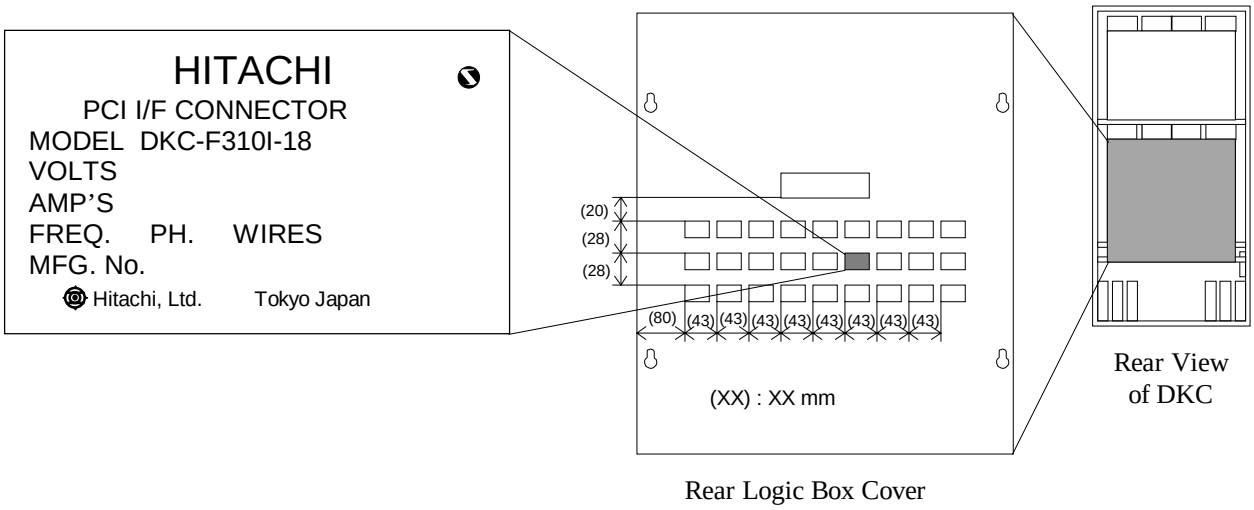


Fig. 3.13.1.3-5 Location of the Nameplate

8. Return to General Flow.
   New Installation : Go to INST02-10 step (2)-2. But if RCU I/F Connector must be installed, perform INST03-2450 through 2470.
   Non-Disruptive Installation : Go to INST02-24 step (11)-2.
   Disruptive Installation : Go to INST02-41 step (6)-2.

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3.13.2 Installation of RCU I/F Connector (DKC-F310I-19)

3.13.2.1 Flowchart

1. Attach the RCU CONN PCB.

↓

2. Attach the nameplate.

3.13.2.2 Parts List

Table 3.13.2.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-19	RCU CONN	3236713-B	1	
		Nameplate	3252542-15	1	

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3.13.2.3 Installation Procedure of RCU I/F Connector

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Attach the RCU CONN PCB.
   a. Remove the screw① and remove the plate.
   b. Attach the RCU CONN and fasten the screw②.
   c. Attach the plate and fasten the screw①.
   d. Connect the cables(P70, 71).

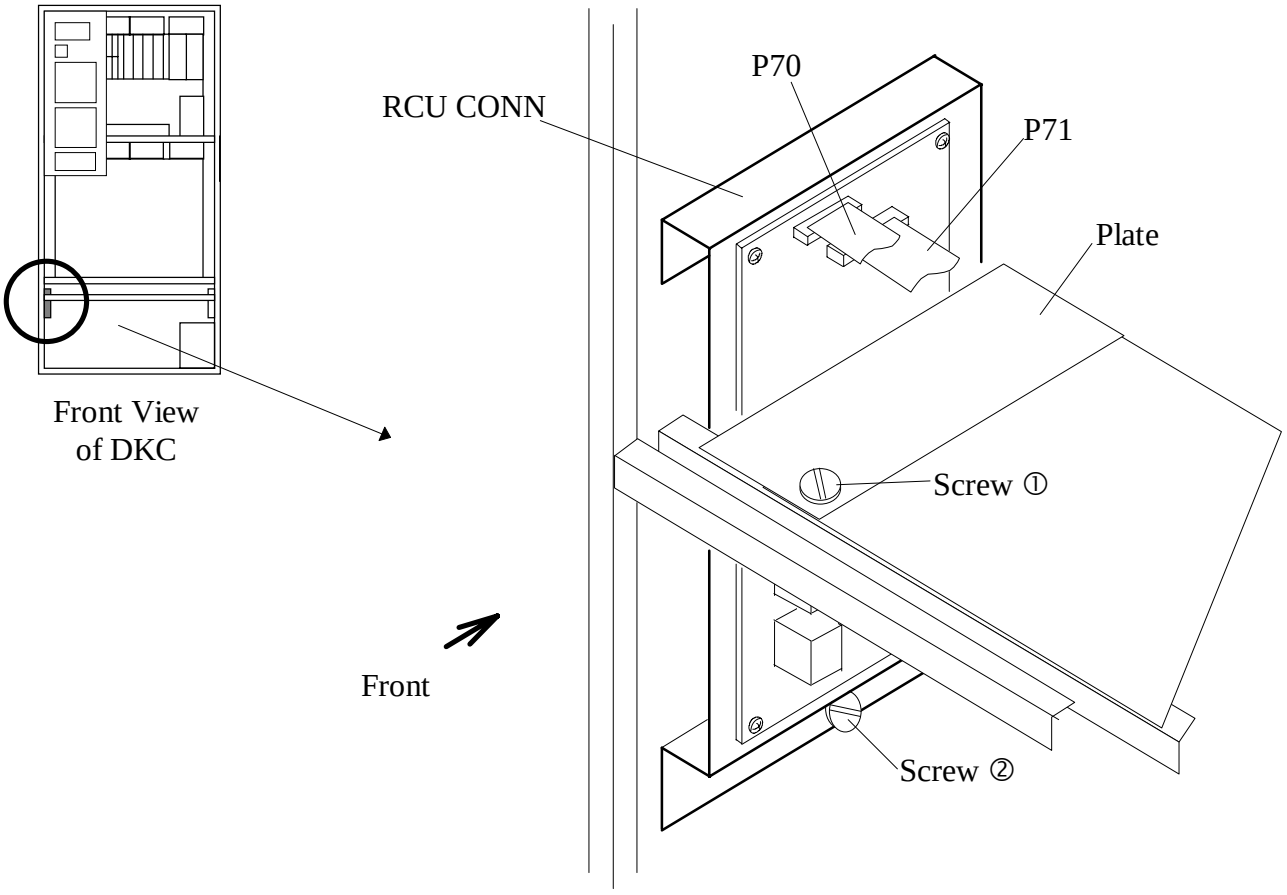

Fig. 3.13.2.3-1 Attachment of RCU CONN PCB

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2. Attach the nameplate.
   a. Attach the nameplate of DKC-F310I-19.

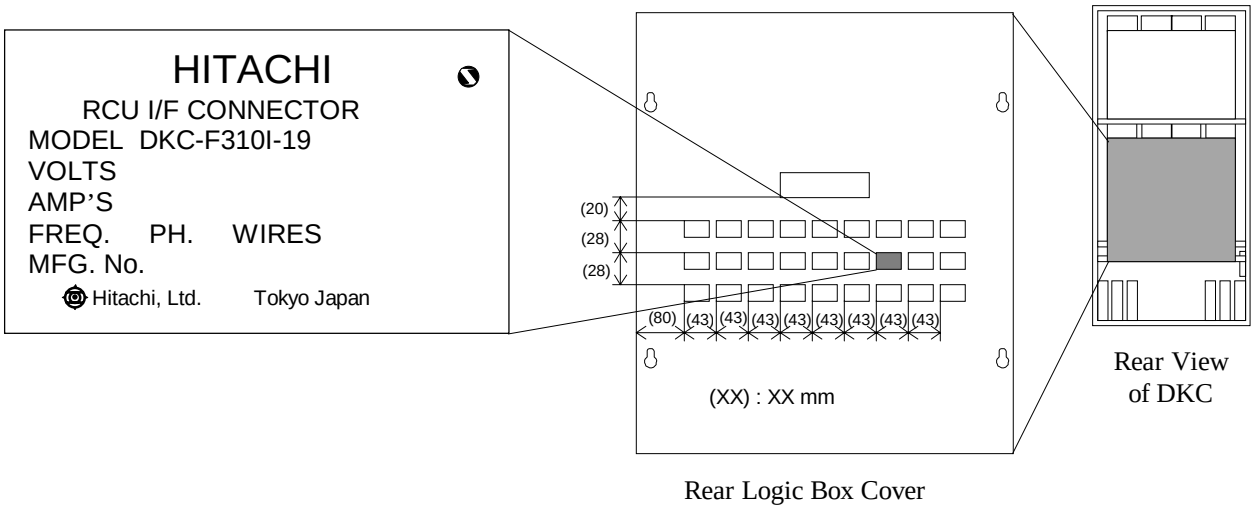

Fig. 3.13.2.3-2 Location of the Nameplate

3. Return to General Flow.
   New Installation : Go to INST02-10 step (2)-2.
   Non-Disruptive Installation : Go to INST02-24 step (11)-3.
   Disruptive Installation : Go to INST02-41 step (7).

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3.14 Installation of Outlet Box

3.14.1 Installation of Outlet Box(IU)

⚠ CAUTION

Perform The Outlet Box with care.
This Outlet Box is concerned with Primary Circuit.
Perform this procedure before connecting the Disk Unit to the frame and the Power Cable Assy.
Be sure to mind your head during operation, or you might hit your head against the movable rack, which causes injury.

3.14.1.1 Flowchart

Cover Removal
↓
Outlet Box Attachment
↓
Cover Attachment

3.14.1.2 Parts List

Table 3.14.1.2-1 Parts List

No.	Name of Part	Part Number	Quantity/Unit	Remarks
1	Outlet Box (IU type)	5497351-A	1	
2	Jumper Plug (P311:208V)	3250946-B	1	
3	Jumper Plug (P311:230/400V)	3250946-D	1	
4	Jumper Plug (P312:115V)	3250946-G	1	
5	OLB BASE ASM	3252602-A	1	

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3.14.1.3 Procedure of Outlet Box(IU) Installation

1. Cover removal
   a. Remove the Front PS Box Cover 2. Refer to INST03-10.
   b. Loosen the two screws and remove the cable duct cover.

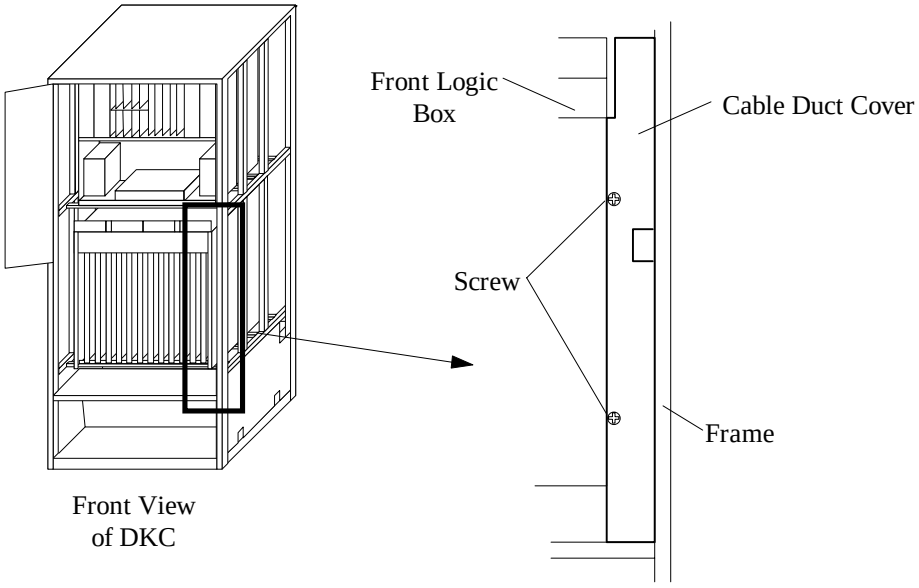

Fig. 3.14.1.3-1 Removal of Cable Duct Cover

2. Outlet Box attachment
   a. Loosen the screw① and attach the OLB BASE ASM with three screws.

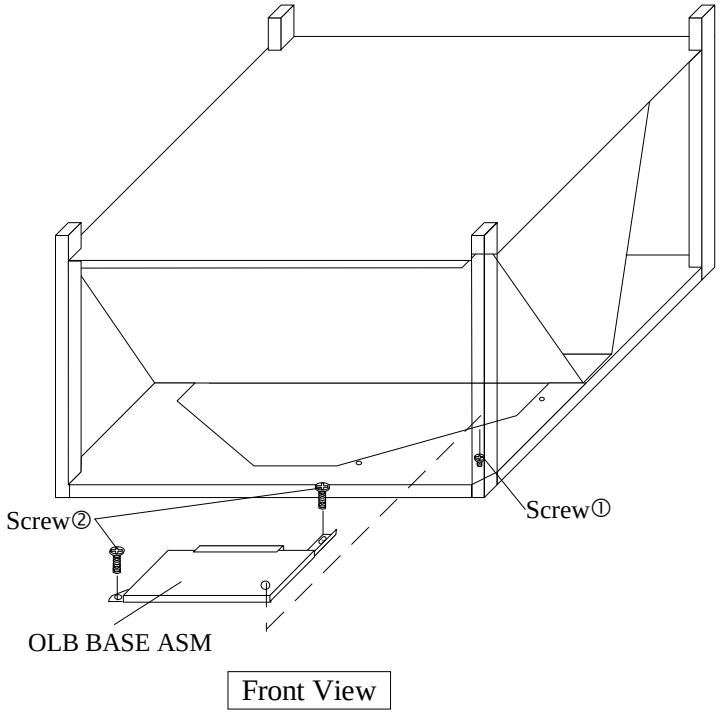

Fig. 3.14.1.3-2 Attachment of OLB BASE ASM

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b. Insert the Outlet Box to the stopper position located at the bottom of the Disk Controller.

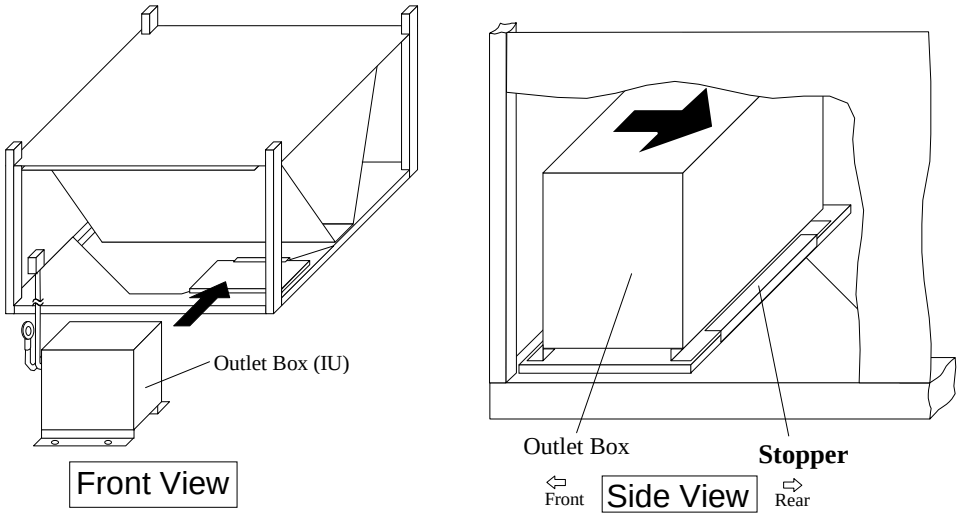

Fig. 3.14.1.3-2A Attachment of Outlet Box

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c. Attach the Outlet Box with two screws.
Attach the frame ground cable to the Disk Controller frame using the screw and lock washer.

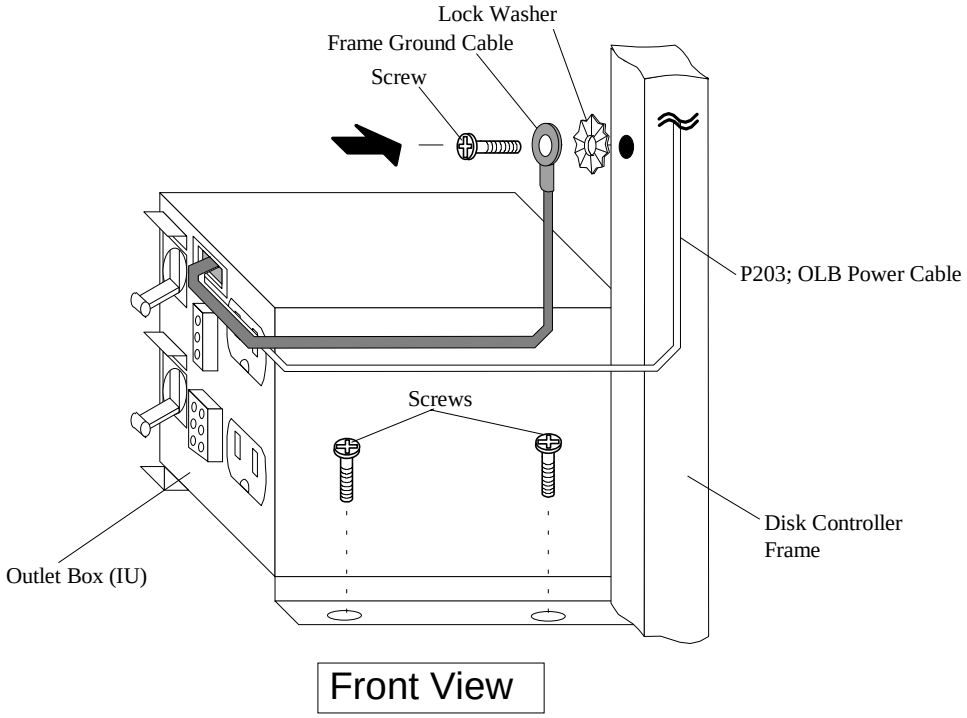

Fig. 3.14.1.3-3 Attachment of Outlet Box

d. Remove the cover and pass the OLB power cable (P203) through the gap in the plate. Attach the cover.

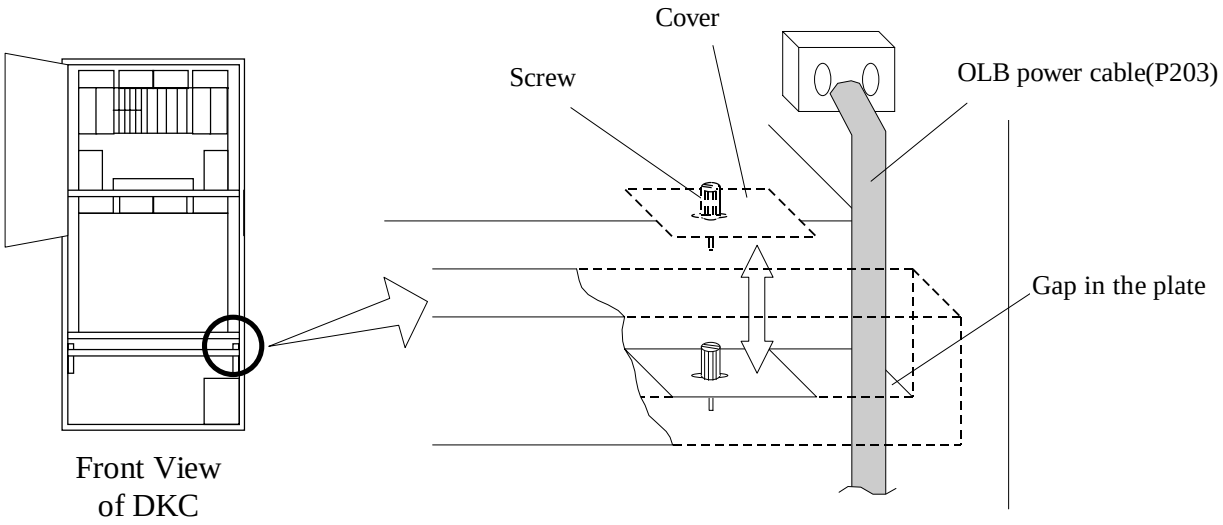

Fig. 3.14.1.3-4 Attachment of Outlet Box Power Cable

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e. Insert the Outlet Box connector as it was.
Attach the OLB power cable (P203).

Table 3.14.1.3-1 Outlet Box Connectors

Part Name	Connector No.			Remarks
	P203	J313		
Outlet Box(IU)	○	◆	◆	
	OLB power cable (Breaker Box-1)			

Symbols) ○: Insert the connector. ×: Do not insert the connector.
◆: Insert the connector as needed

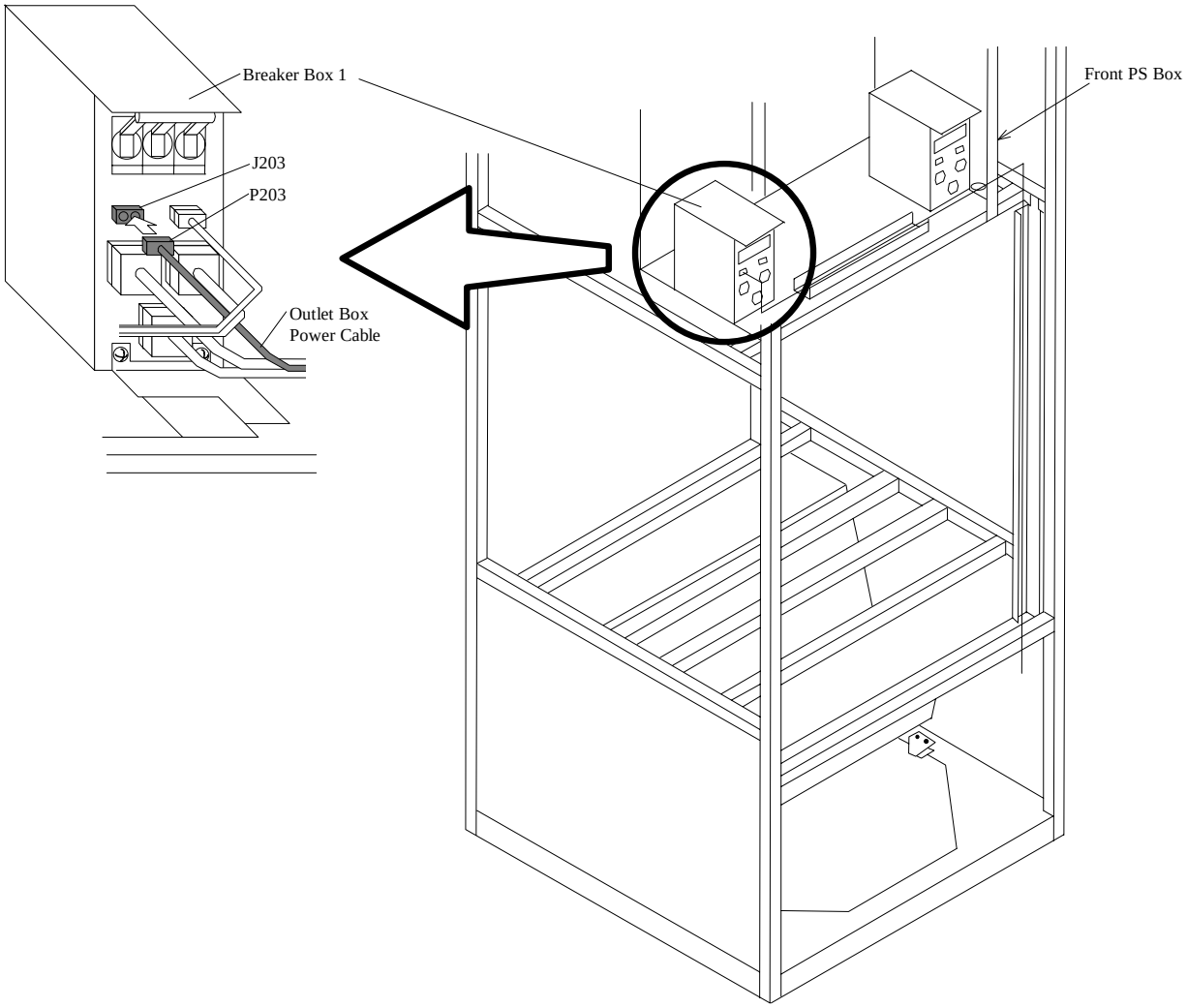

Fig. 3.14.1.3-5 Connection of Outlet Box Power Cable

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3. Cover Attachment
   a. Attach the Front PS Box Cover 2. Refer to INST03-10.
   b. Attach the cable duct cover and fasten the two screws. Refer to Fig. 3.14.1.3-1.
4. Checking the Voltage Select Jumper Connector at the Outlet Box.
   a. Check the P311 and P312 jumper connectors at the Outlet Box.

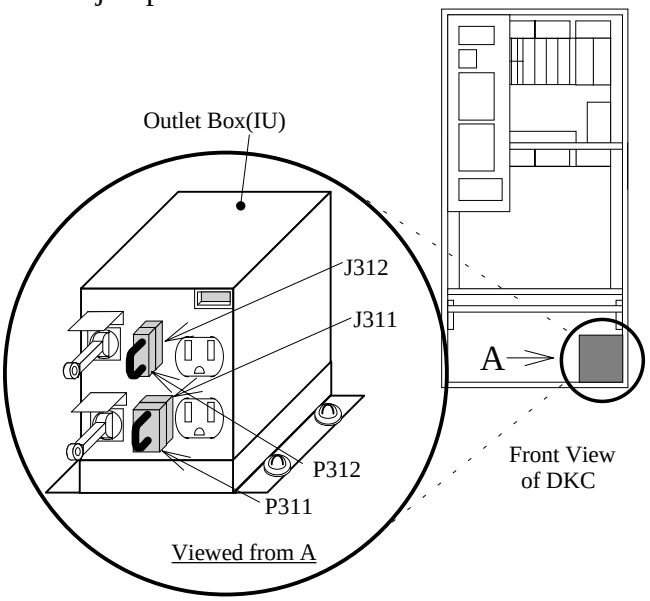

Fig. 3.14.1.3-6 Voltage Select Jumper Connectors

Table 3.14.1.3-2 Voltage Select Jumper Connector Setting

Input		Jumper Connectors		Output Voltage
Input Voltage	Frequency	J311	J312	
208 Vac	60 Hz	P311 208V	P312 115V	115 Vac
230 Vac		P311 230/400V	P312 115V	

5. Return to General Flow.
   New Installation: Go to INST02-10 step (2)-3.
   Non-Disruptive Installation : Go to INST02-24 step (12)-2.
   Disruptive Installation : Go to INST02-41 step (7)-2.

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3.14.2 Installation of Outlet Box(IE)

⚠ CAUTION

Perform The Outlet Box with care.
This Outlet Box is concerned with Primary Circuit.
Perform this procedure before connecting the Disk Unit to the frame and the Power Cable Assy.
Be sure to mind your head during operation, or you might hit your head against the movable rack, which causes injury.

3.14.2.1 Flowchart

Cover Removal
↓
Outlet Box Attachment
↓
Cover Attachment

3.14.2.2 Parts List

Table 3.14.2.2-1 Parts List

No.	Name of Part	Part Number	Quantity/Unit	Remarks
1	Outlet Box (IE type)	5497351-B	1	
2	OLB BASE ASM	3252602-A	1	

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3.14.2.3 Procedure of Outlet Box(IE) Installation

1. Cover removal
   a. Remove the Front PS Box Cover 2. Refer to INST03-10.
   b. Loosen the two screws and remove the cable duct cover.

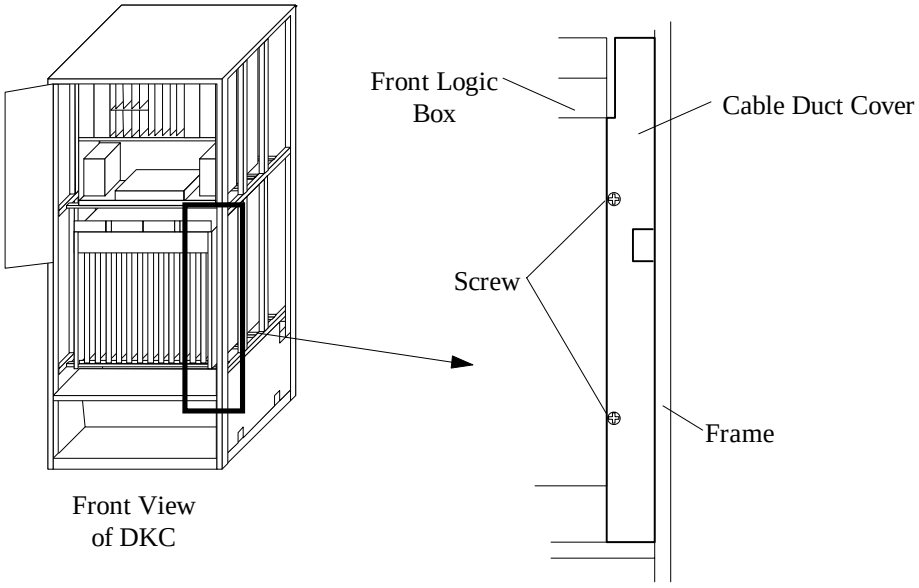

Fig. 3.14.2.3-1 Removal of Cable Duct Cover

2. Outlet Box attachment
   a. Loosen the screw① and attach the OLB BASE ASM with three screws.

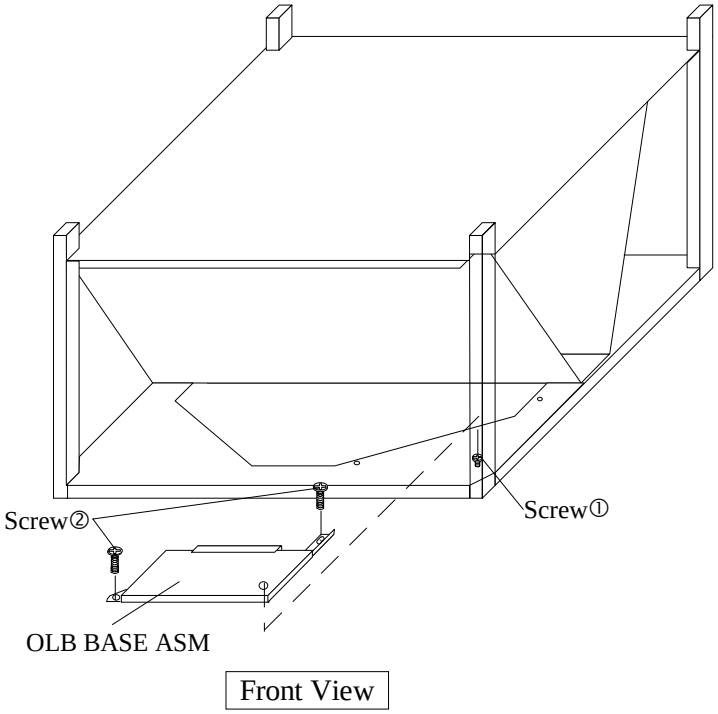

Fig. 3.14.2.3-2 Attachment of OLB BASE ASM

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b. Insert the Outlet Box to the stopper position located at the bottom of the Disk Controller.

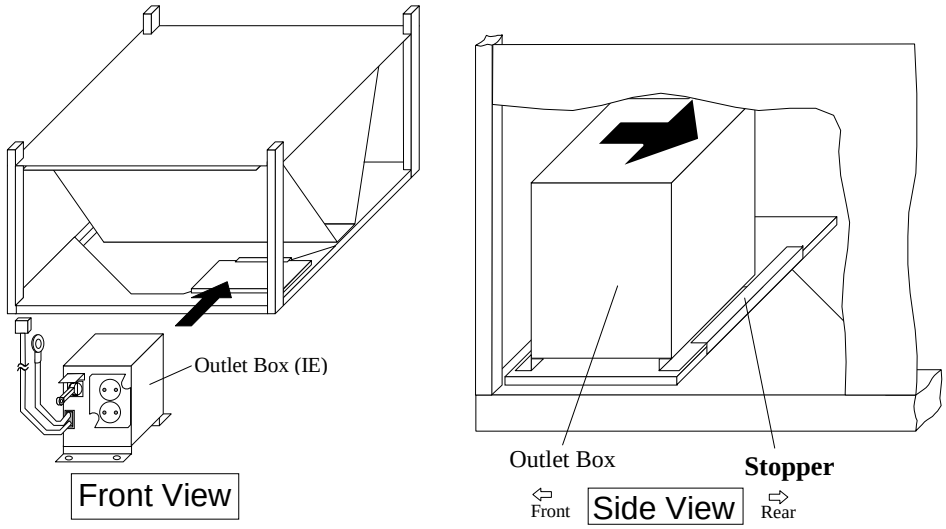

Fig. 3.14.2.3-2A Attachment of Outlet Box

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c. Attach the Outlet Box with two screws
Attach the frame ground cable to the Disk Controller frame using the screw and lock washer.

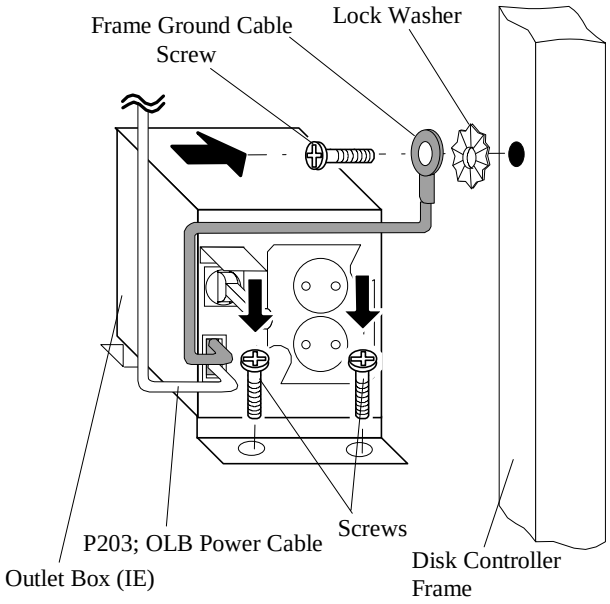

Fig 3.14.2.3-3 Attachment of Outlet Box

d. Remove the cover and pass the OLB power cable (P203) through the gap in the plate. Attach the cover.

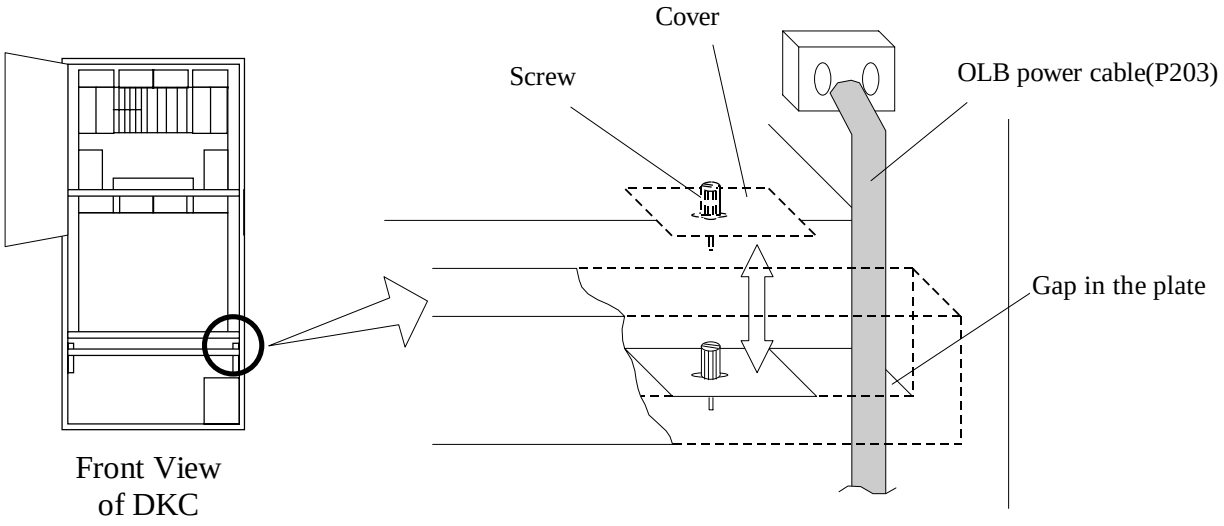

Fig. 3.14.2.3-4 Attachment of Outlet Box Power Cable

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e. Insert the Outlet Box connector as it was.
Attach the OLB power cable (P203) with three repeat binders.

Table 3.14.2.3-1 Outlet Box Connectors

Part Name	Connector No.					Remarks
	P203	P311	P312	J313		
Outlet Box(IE)	○	—	—	◆	◆	
	OLB power cable (Breaker Box-1)	For setting the input voltage	For setting the output voltage			

Symbols) ○: Insert the connector. ×: Do not insert the connector.
◆: Insert the connector as needed

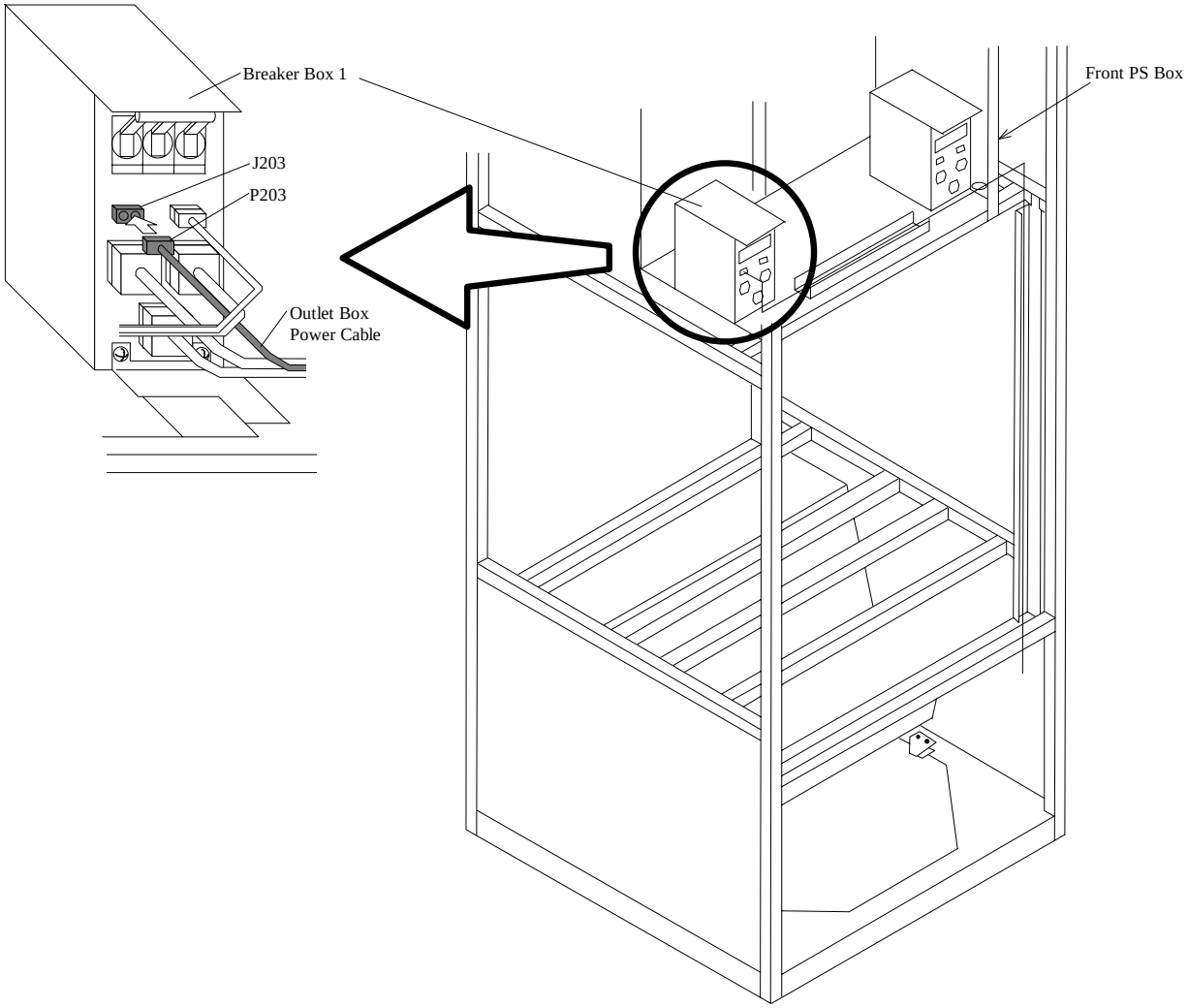

Fig. 3.14.2.3-5 Connection of Outlet Box Power Cable

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3. Cover Attachment
   a. Attach the Front PS Box Cover 2. Refer to INST03-10.
   b. Attach the cable duct cover and fasten the two screws. Refer to Fig. 3.14.2.3-1.

4. Return to General Flow.
   New Installation: Go to INST02-10 step (2)-3.
   Non-Disruptive Installation : Go to INST02-24 step (12)-3.
   Disruptive Installation : Go to INST02-41 step (8).

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3.15 Installation of Dump/Restore Function for Multi-Platform (DKC-F310I-M80)

3.15.1 Installation Procedure of Dump/Restore Function for Multi-Platform

1. Change the Nameplate.
   a. Wipe off the number ① of the nameplate.

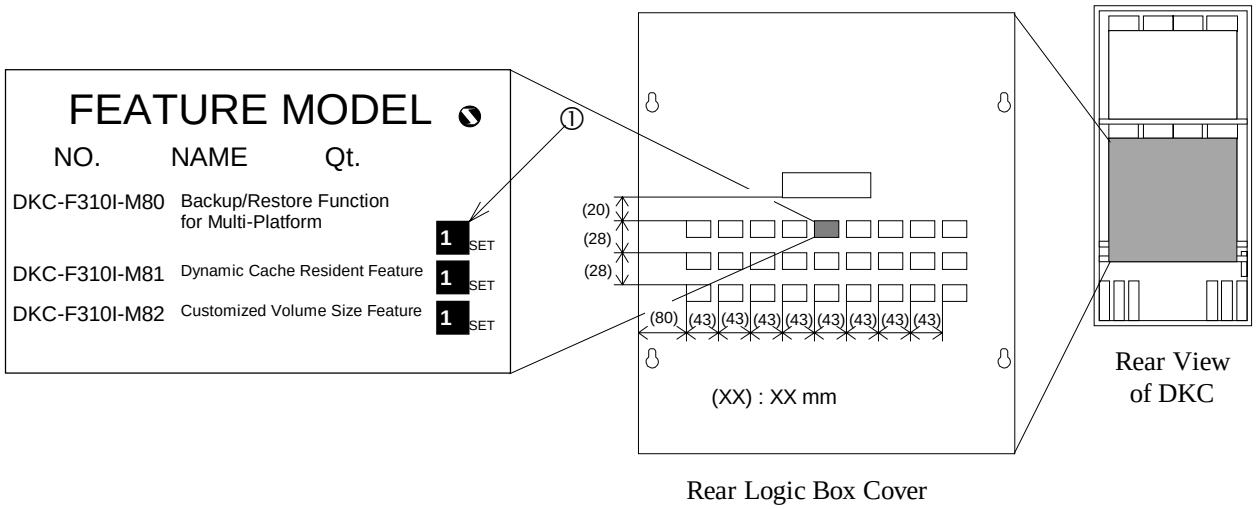

Fig. 3.15.1-1 Location of the Nameplate

2. Return to General Flow.
   New Installation : Go to INST02-11 step (11).
   Non-Disruptive Installation : Go to INST02-24 step (14).
   Disruptive Installation : Go to INST02-41 step (9).

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3.16 Installation of Dynamic Cache Resident Feature (DKC-F310I-M81)

3.16.1 Installation Procedure of Dynamic Cache Resident Feature

1. Change the Nameplate.
   a. Wipe off the number ① of the nameplate.

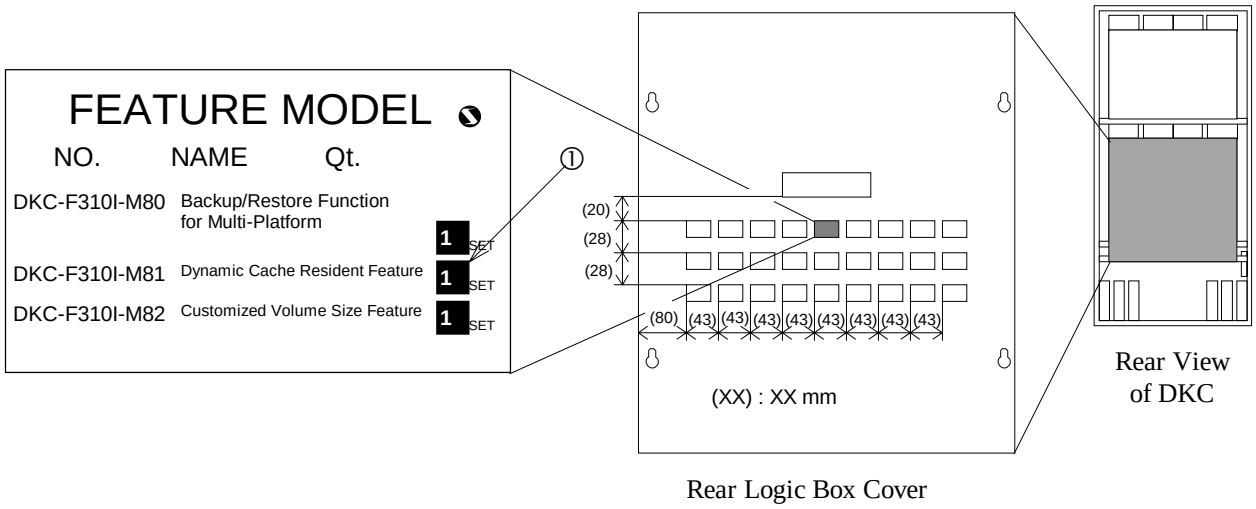

Fig. 3.16.1-1 Location of the Nameplate

2. Return to General Flow.
   New Installation : Go to INST02-11 step (12).
   Non-Disruptive Installation : Go to INST02-24 step (15).
   Disruptive Installation : Go to INST02-41 step (10).

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3.17 Installation of Customized Volume Size Feature (DKC-F310I-M82)

3.17.1 Installation Procedure of Customized Volume Size Feature

1. Change the Nameplate.
   a. Wipe off the number ① of the nameplate.

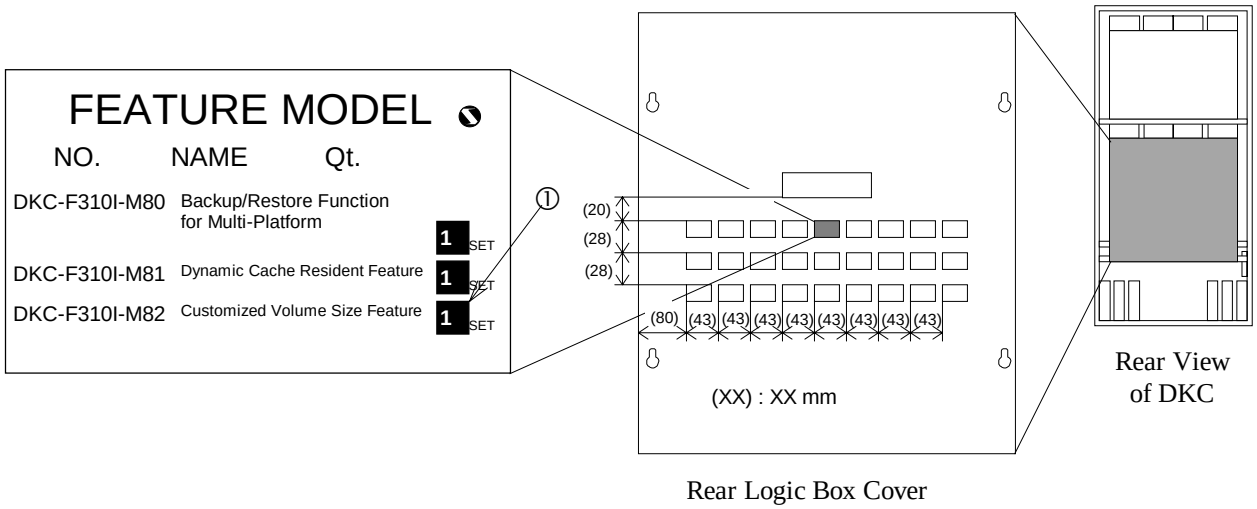

Fig. 3.17.1-1 Location of the Nameplate

2. Return to General Flow.
   New Installation : Go to INST02-12 step (12a).
   Non-Disruptive Installation : Go to INST02-24 step (16).
   Disruptive Installation : Go to INST02-41 step (10a).

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3.18 Check and Testing

NOTICE:
Install all of the remaining optional parts.

3.18.1 Checking Input Voltage

⚠WARNING

Do not touch the internal parts of the AC power cable the AC Box or the Breaker Box. Line voltage is present even if the circuit breaker is off.

1. Check the AC input voltage using a voltmeter at the customer's AC power source (at the distribution board or receptacle for R & S connectors).

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3.18.2 Checking Input Power Cable and Voltage Select Jumper Cable

Check the input power cable and jumper cable (P104) at the AC BOX-R10 and AC BOX-R11 in the Basic Disk Unit. See Table 3.18.2-1 and figures 3.18.2-1 and 3.18.2-2 for check items.

Table 3.18.2-1 AC Input Cable Conductors and Jumper Cable (P104) Positions

Input Voltage	AC Input Cable Conductors	Jumper Cable (P104) Position	Remarks
200-240Vac	4 conductors (R,S,T,FG)	J104-1	J104-2 dummy connector
380-415Vac	5 conductors (R,S,T,N,FG)	J104-2	J104-1 dummy connector

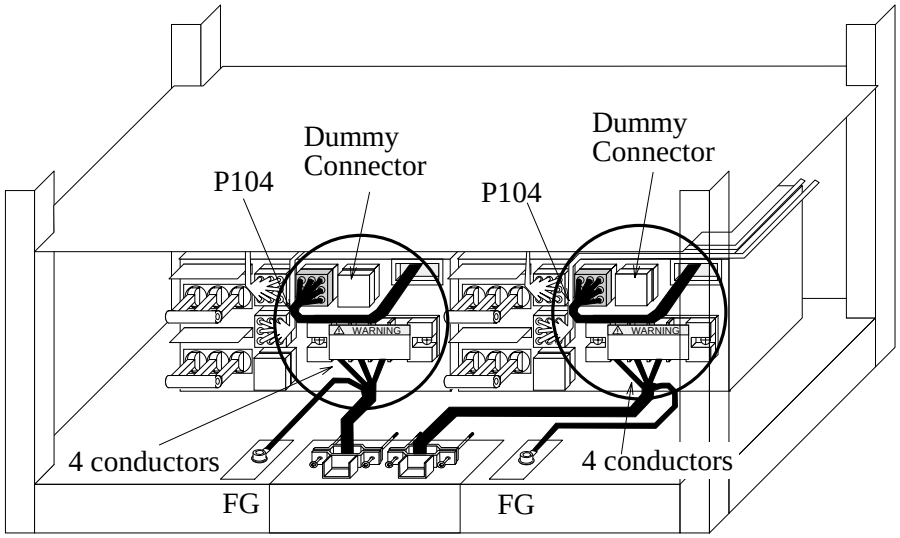

Fig. 3.18.2-1 AC Input Cable Conductors and Jumper Cable (P104) Positions 200-240Vac

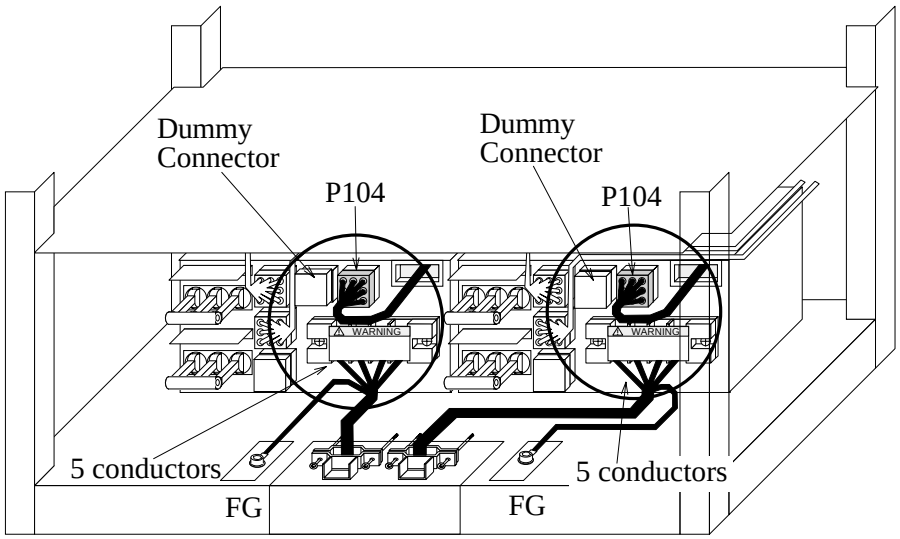

Fig. 3.18.2-2 AC Input Cable Conductors and Jumper Cable (P104) Positions 380-415Vac

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3.18.3 Checking the Voltage Select Jumper Connector at the OUTLET BOX

Input voltage 200-240 Vac ONLY

Check the P311 and P312 jumper connectors at the Outlet Box

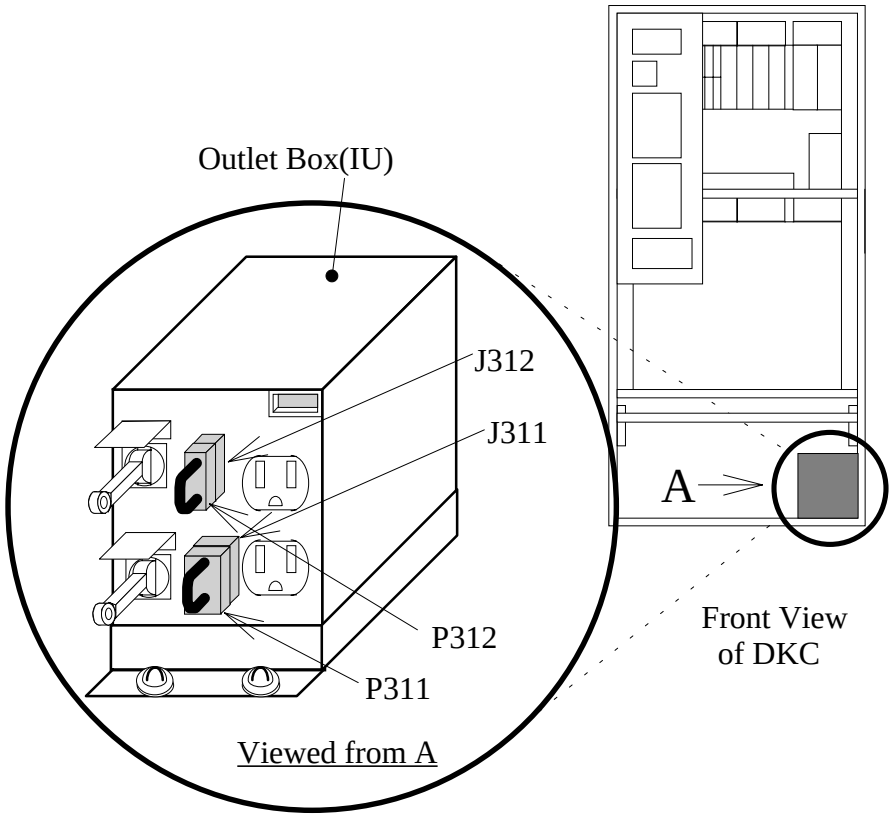

Fig. 3.18.3-1 Voltage Select Jumper Connectors

Table 3.18.3-1 Voltage Select Jumper Connector Setting

Input		Jumper Connectors		Output Voltage
Input Voltage	Frequency	J311	J312	
208 Vac	60 Hz	P311 208 V	P312 115 V	115 Vac
230 Vac		P311 230/400 V	P312 115 V	

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3.18.4 Power On/Off Check

1. Install all the remaining optional parts.

2. Turn on the disk controller according to the procedure shown in SECTION 3.19 POWER ON/OFF PROCEDURE. Refer to INST03-3040 through 3090.

3. Check the power supply output voltage to verify that it indicates the required level. Refer to PERIOD.

4. Turn off the Disk Subsystem according to the procedure shown in SECTION 3.19 POWER ON/OFF PROCEDURE. Refer to INST03-3100 through 3120.

5. New Installation: Go to INST02-12 step (14).

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3.19 Power ON/OFF Procedure

3.19.1 Power ON Procedure

3.19.1.1 Power ON Procedure of Disk Subsystem

Power on procedures are shown below. Refer to the details and start the operation.

1. Turn on the main circuit breaker at the AC Box on the Disk Unit.

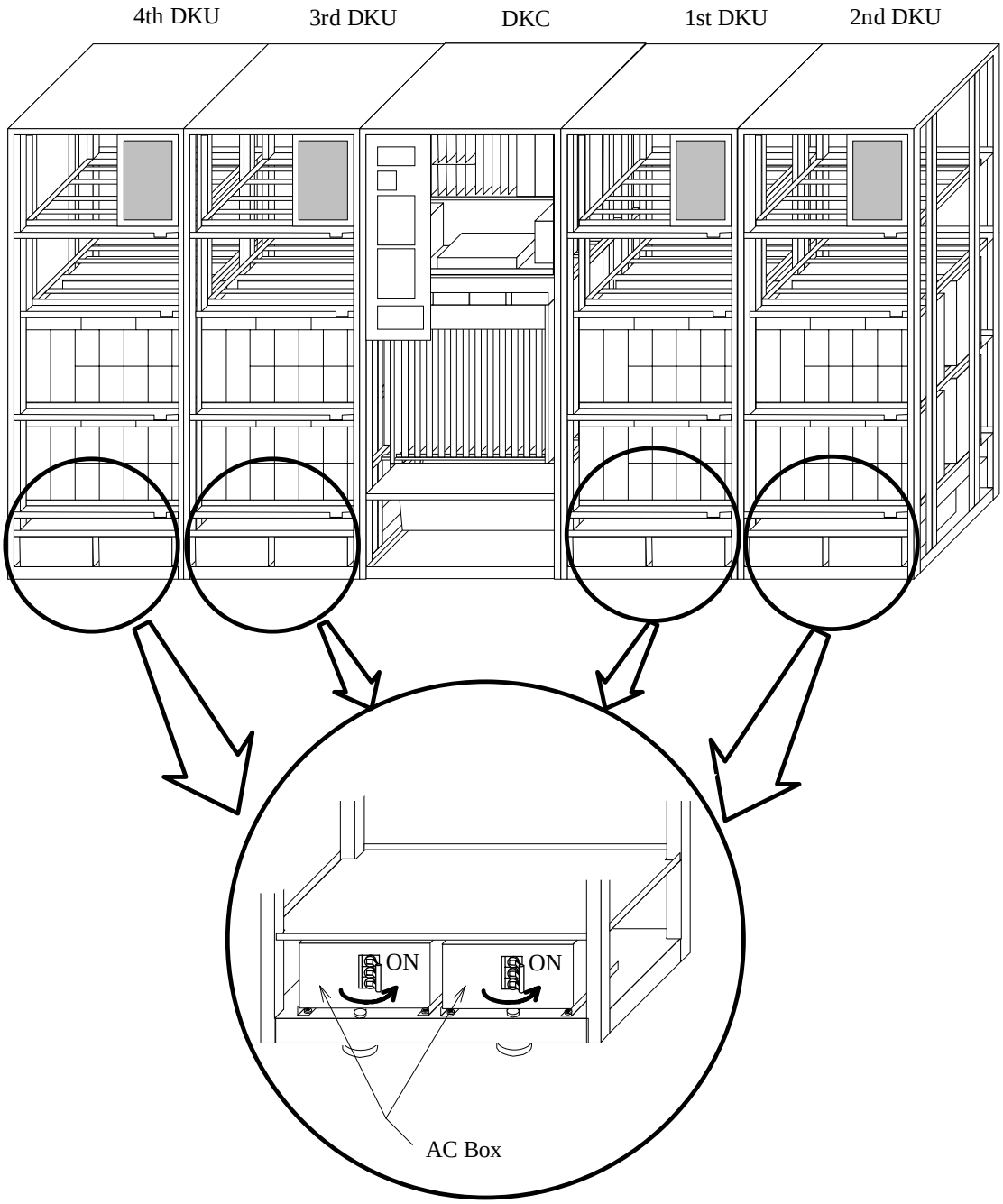

Fig. 3.19.1.1-1 Main Circuit Breaker on AC Box

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2. Turn on the circuit breaker at the Breaker Box-1 and 2 in the Disk Controller.

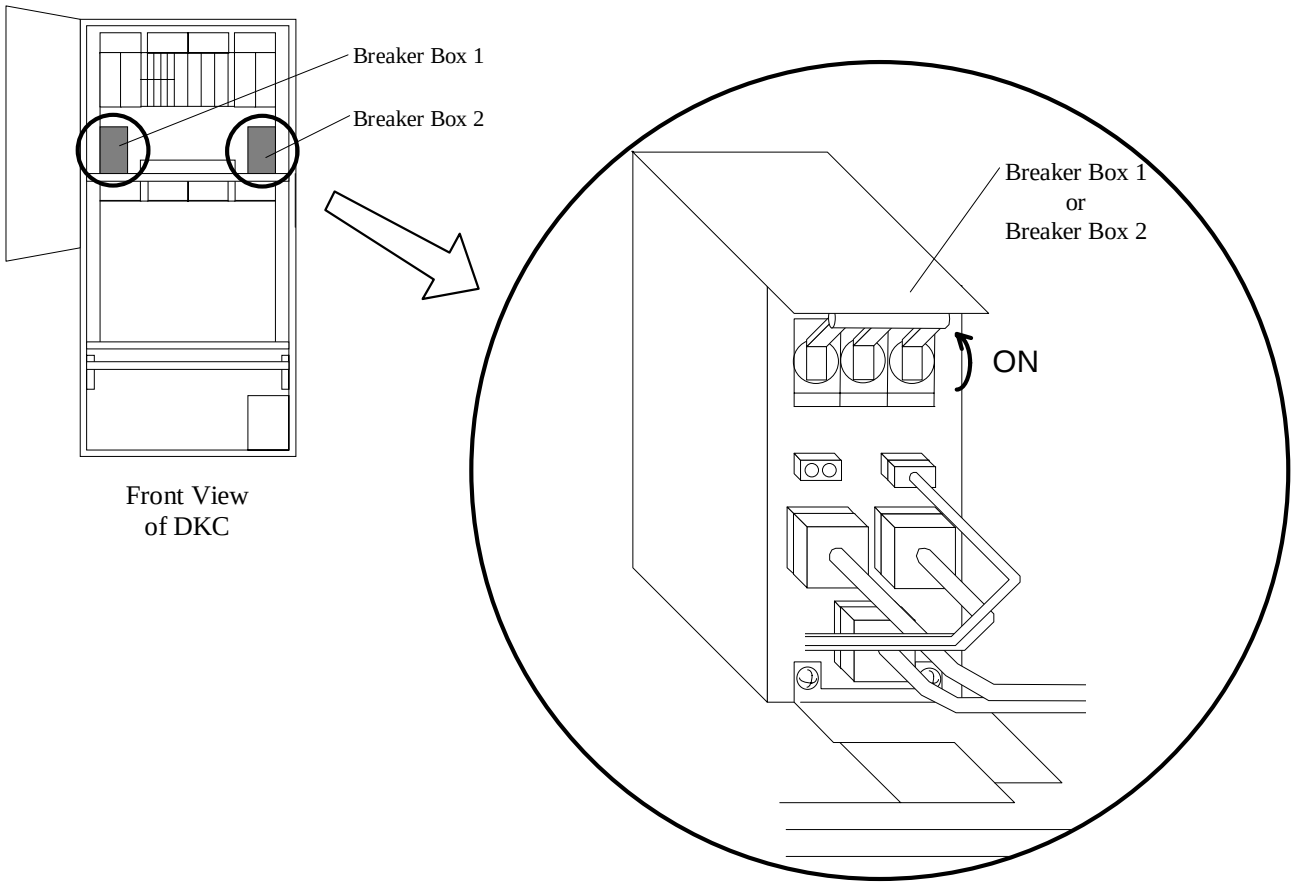

Fig. 3.19.1.1-2 Circuit Breaker in Breaker Box-1 and 2 and Outlet Box

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3. Check battery charge voltage and fuse blow up on Battery Controller PCBs.
   Check charge voltage on BATTERY 10 through 12 and BATTERY 20 through 22.
   a. Disconnect the two cables ①.
   b. Insert the pins of the digital voltmeter into the cable ① removed from battery to make sure that battery charge voltage is within the allowable charge voltage.
      If the battery charge voltage is not within the allowable charge voltage, replace the BAT-CTR PCB.
   c. Connect the two cables ①.

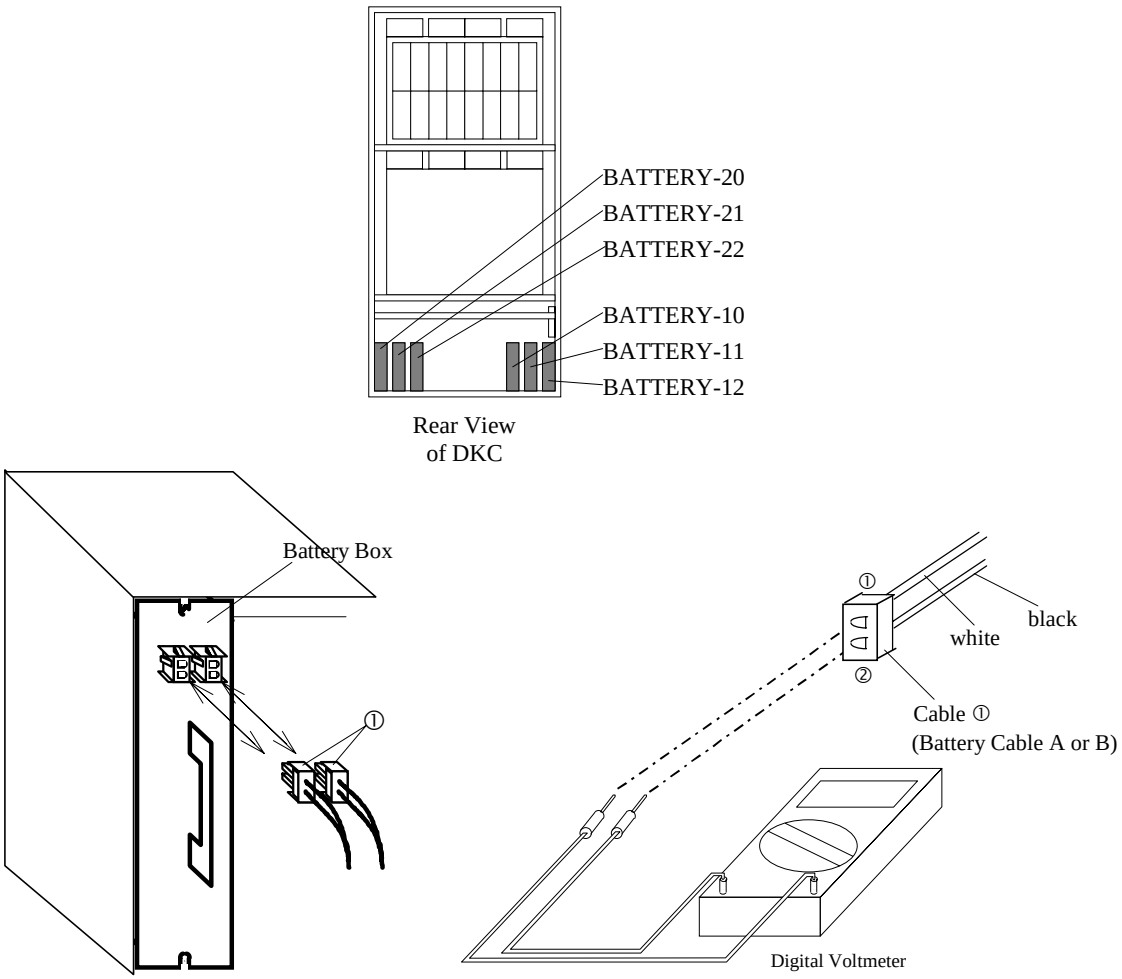

Fig. 3.19.1.1-3 Voltage Checkpoint

Table 3.19.1.1-1 Voltage Checkpoint and Allowable Voltage

No.	Pin No.		Allowable charge voltage
	+	-	
1	①	②	DC4.3V through DC4.95V

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4. Check battery voltage.
   Check battery voltage of the BATTERY 10 through 12 and BATTERY 20 through 22.
   a. Disconnect the two cables ①.
   b. Insert the pins of the digital voltmeter into the connector A on battery box to make sure that battery voltage is within the allowable battery voltage.
   c. Insert the pins of the digital voltmeter into the connector B on battery box to make sure that battery voltage is within the allowable battery voltage.
      If the battery voltage is not within the allowable battery voltage, replace the battery assembly.
   d. Connect the two cables ①.

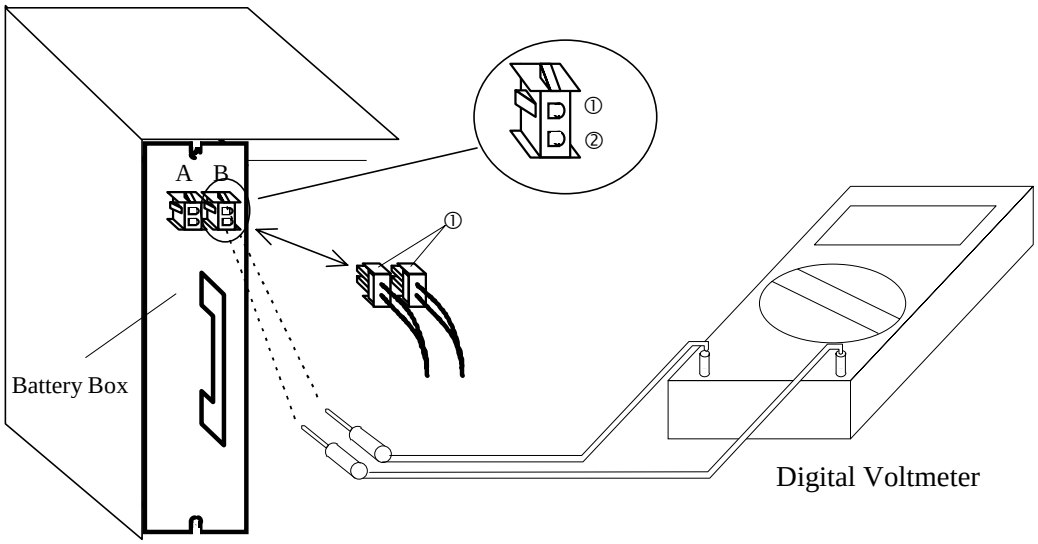

Fig. 3.19.1.1-4 Voltage Checkpoint

Table 3.19.1.1-2 Voltage Checkpoint and Allowable battery Voltage

Connector	Pin No.		Allowable battery voltage
	+	-	
A	①	②	DC4.0V through DC4.75V
B	①	②	DC4.0V through DC4.75V

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5. Turn the “ENABLE/DISABLE” switch on the DKUMN PCB’s to “ENABLE”.

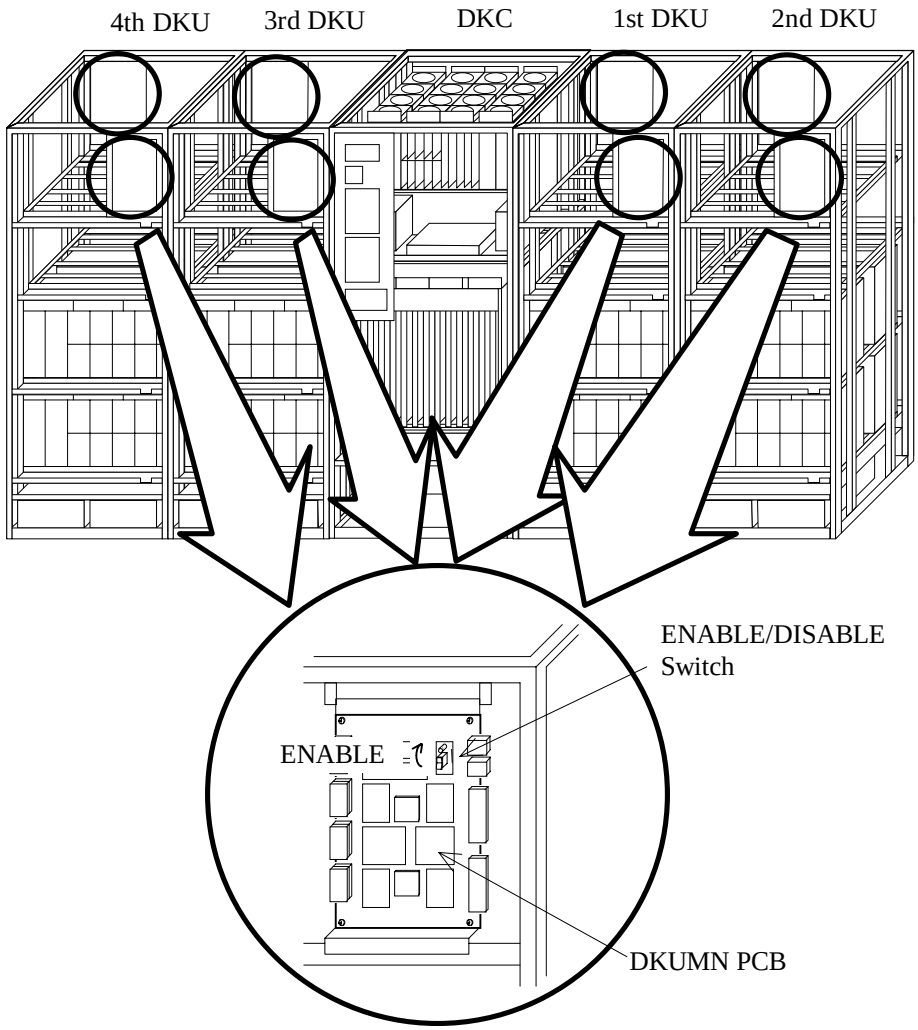

Fig. 3.19.1.1-5 ENABLE/DISABLE Switch on DKUMN PCBs

6. Return to General Flow.
   New Installation: Go to INST02-12 step (16).
   Disruptive Installation: Go to INST03-3070 step “7”.
   Disruptive De-installation: Go to INST03-3070 step “7”

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7. Turn “ENABLE/DISABLE” switch on the CE panel PCB to “ENABLE”.
8. [Case as custom engineer operates]
   Turn the “REMOTE/LOCAL” switch on the CE panel PCB to “LOCAL”.
   Turn the “POWER ON/OFF” switch on the CE panel PCB to “ON”.
   [Case as that operate from CPU]
   Turn the “REMOTE/LOCAL” switch on the CE panel PCB to “REMOTE”.
   Turn on the power supply from CPU.

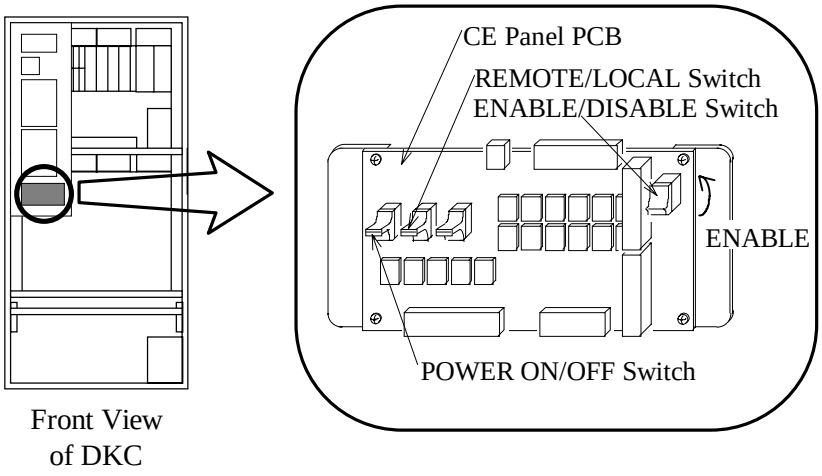

Fig. 3.19.1.1-6 CE Panel PCB

9. Return to General Flow.
   New Installation : Go to INST02-12 step (18).
   Disruptive Installation : Go to INST02-43 step (15).
   Disruptive De-installation : Go to INST02-54 step (21).

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3.19.1.2 Power ON Procedure of Additional Disk Unit

Before turning the power of AC BOX on, make sure that the Enable/Disable switch on the DKU Monitor is in “Disable” position. If the switch is in “Enable” position, turn the switch to “Disable” position.

1. Power on procedures are shown below. Refer to the details and start the operation.
   a. Turn on the main circuit breaker at the AC Box on the Disk Unit.

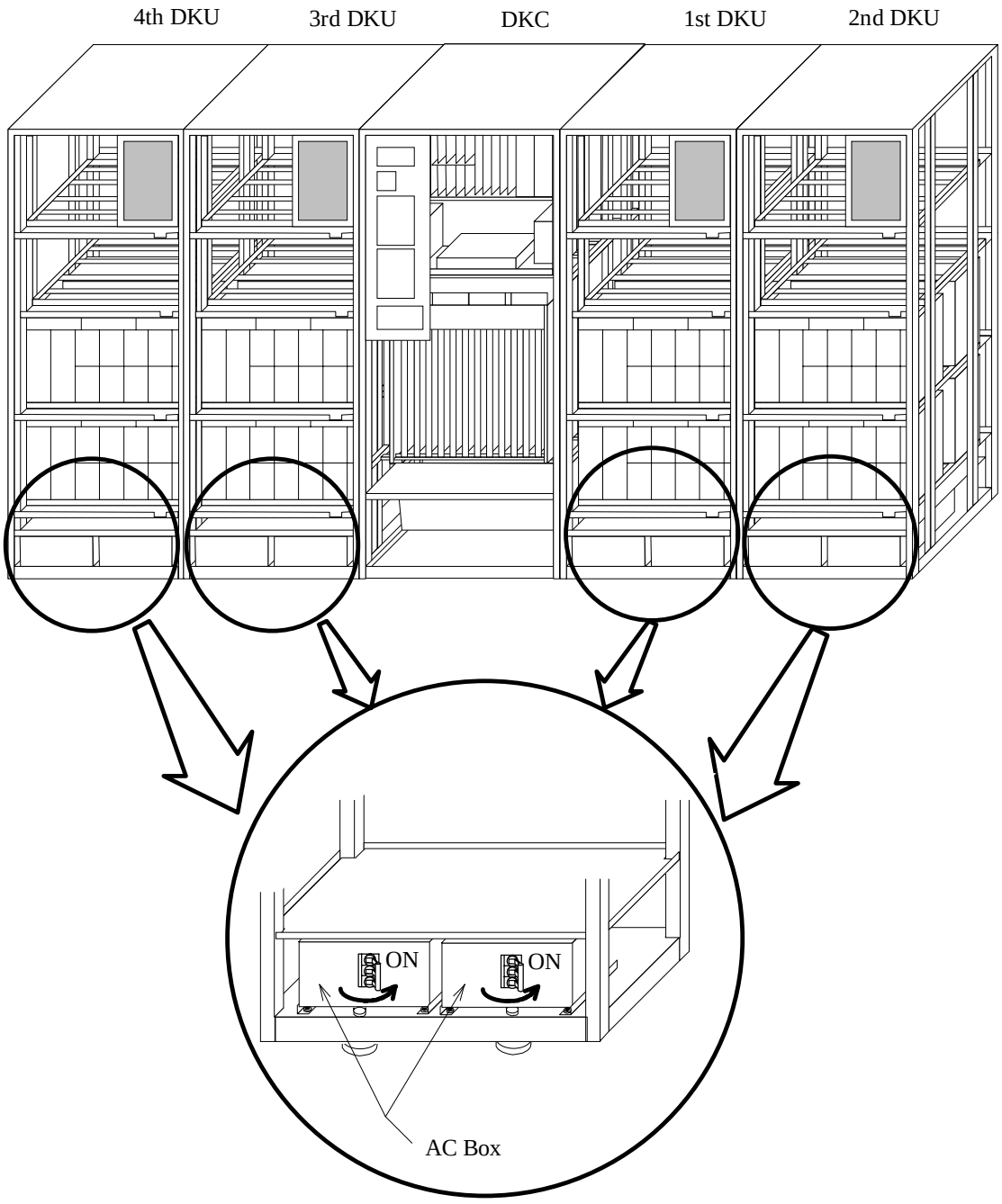

Fig. 3.19.1.2-1 Main Circuit Breaker on AC Box

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b. Turn the “ENABLE/DISABLE” switch on the DKUMN PCB’s to “ENABLE”.

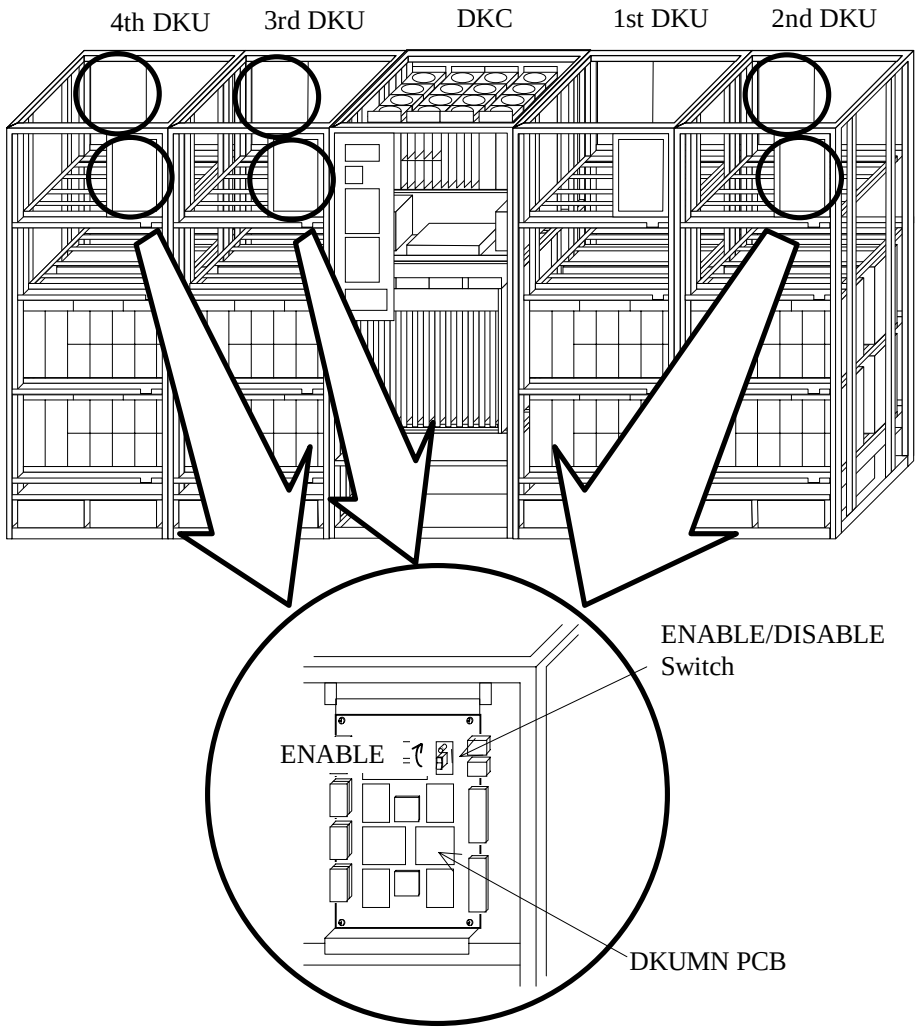

Fig. 3.19.1.2-2 ENABLE/DISABLE Switch on DKUMN PCBs

c. Return to General Flow.
Non-Disruptive Installation : Go to INST02-21 step (7)-4.

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3.19.2 Power OFF Procedure

3.19.2.1 Power OFF Procedure of Disk Subsystem

⚠ NOTICE

In this case power off Disk subsystem, after turn off power of DKC, be sure to off READY LED on the operate panel and PS-ON LED on the CE panel, and then turn off the main circuit breaker at the AC Box on the Disk Unit.

1. Power off procedures are shown below. Refer to the details and start the operation.
   a. Stop the SVP.
   b. [Case as custom engineer operates]
      Turn the “REMOTE/LOCAL” switch on the CE panel PCB to “LOCAL”.
      Turn the “POWER ON/OFF” switch on the CE panel PCB to “OFF”.
      [Case as that operate from CPU]
      Turn the “REMOTE/LOCAL” switch on the CE panel PCB to “REMOTE”.
      Turn off the power supply from CPU.

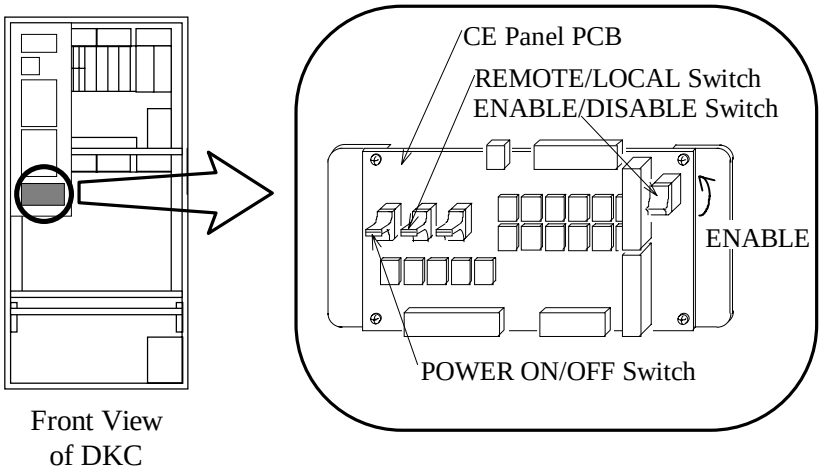

Fig. 3.19.2.1-1 CE Panel PCB

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c. Turn off the main circuit breaker at the AC Box on the Disk Unit.

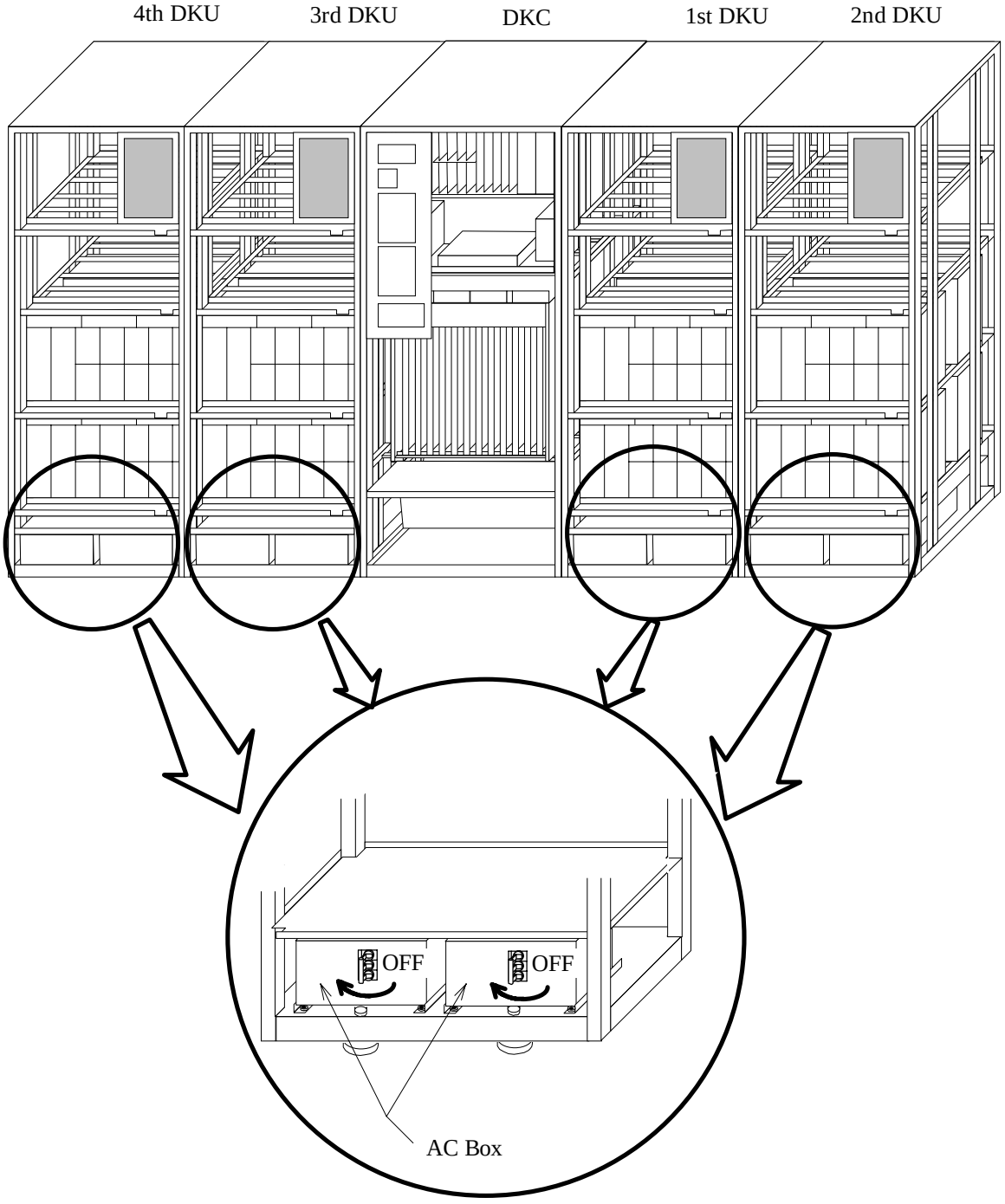

Fig. 3.19.1.2-2 Main Circuit Breaker on AC Box

d. Return to General Flow.
Disruptive Installation : Go to INST02-40 step (3).
Disruptive De-installation : Go to INST02-52 step (10).

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3.19.2.2 Power OFF Procedure of Additional Disk Unit

1. Power off procedures are shown below. Refer to the details and start the operation.
   a. Turn off the main circuit breaker at the AC Box on the Disk Unit.

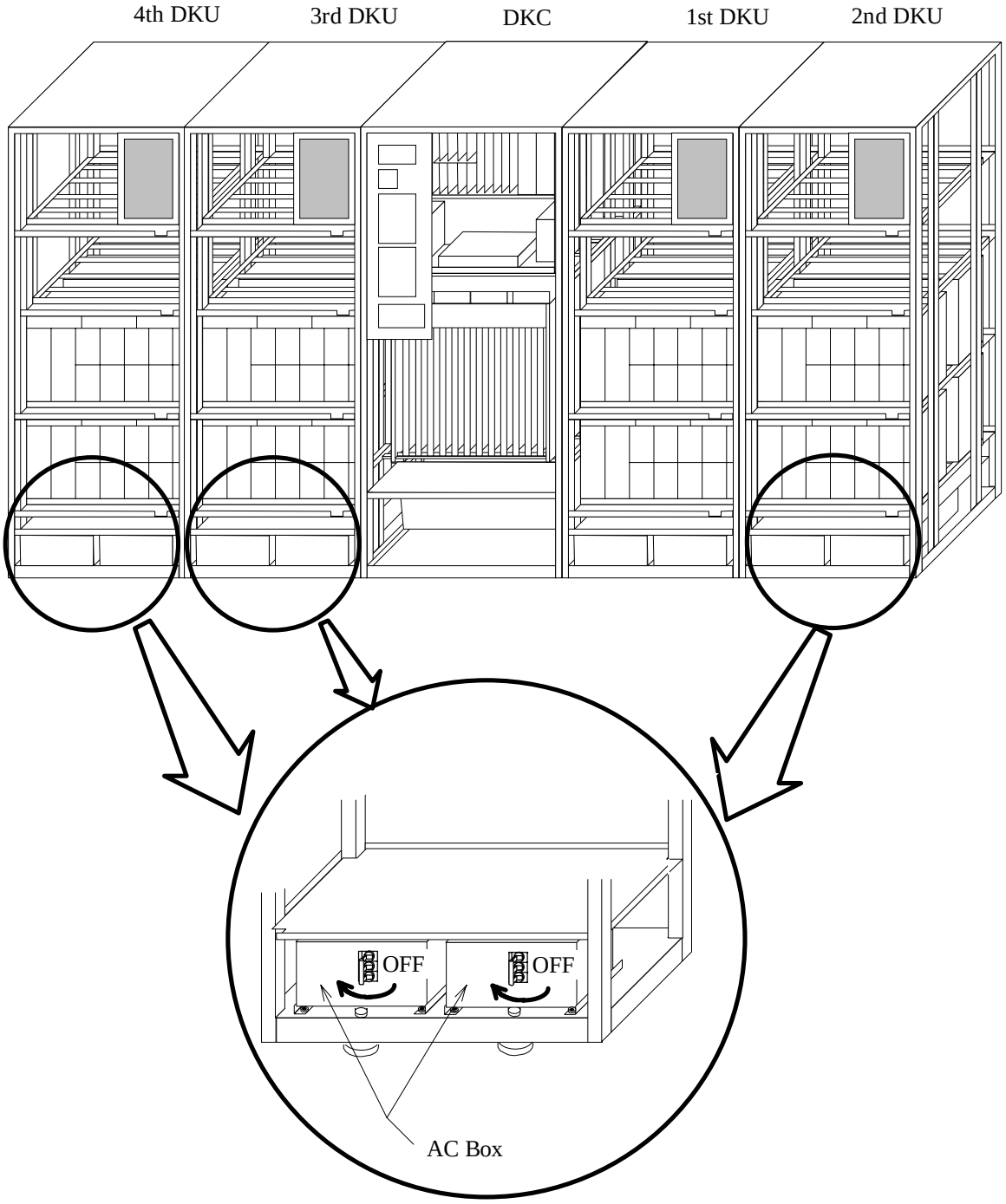

Fig. 3.19.2.2-1 Main Circuit Breaker on AC Box

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3.20 Installation of Hitachi Multiple RAID Coupling Facility Feature (DKC-F310I-M83)

3.20.1 Installation Procedure of Hitachi Multiple RAID Coupling Facility Feature

1. Change the Nameplate.
   a. Wipe off the number ① of the nameplate.

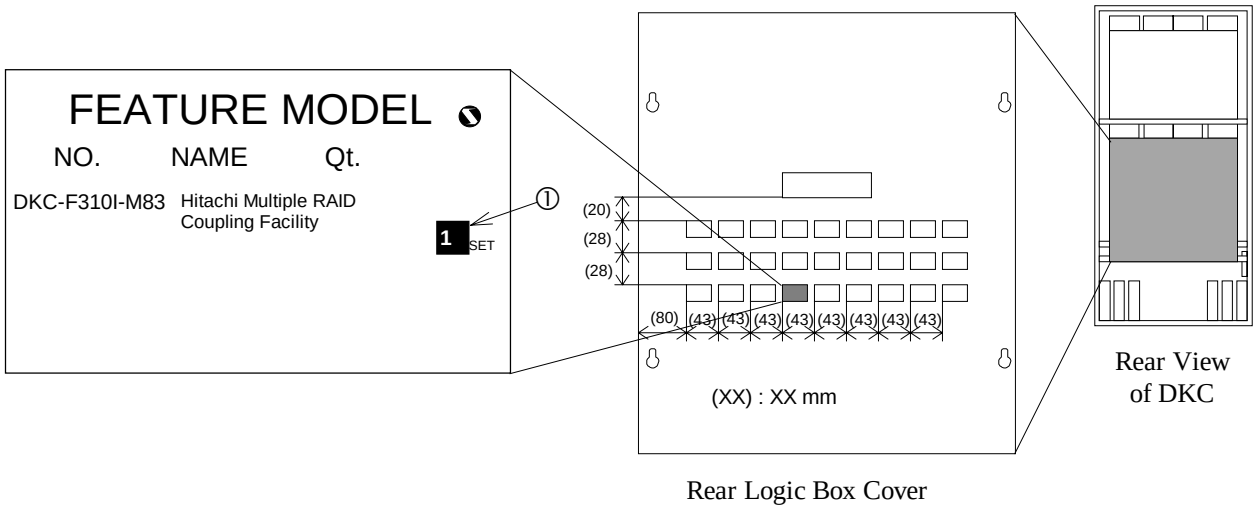

Fig. 3.17.1-1 Location of the Nameplate

2. Return to General Flow.
   New Installation : Go to INST02-12 step (13).
   Non-Disruptive Installation : Go to INST02-24 step END.
   Disruptive Installation : Go to INST02-41 step (11).

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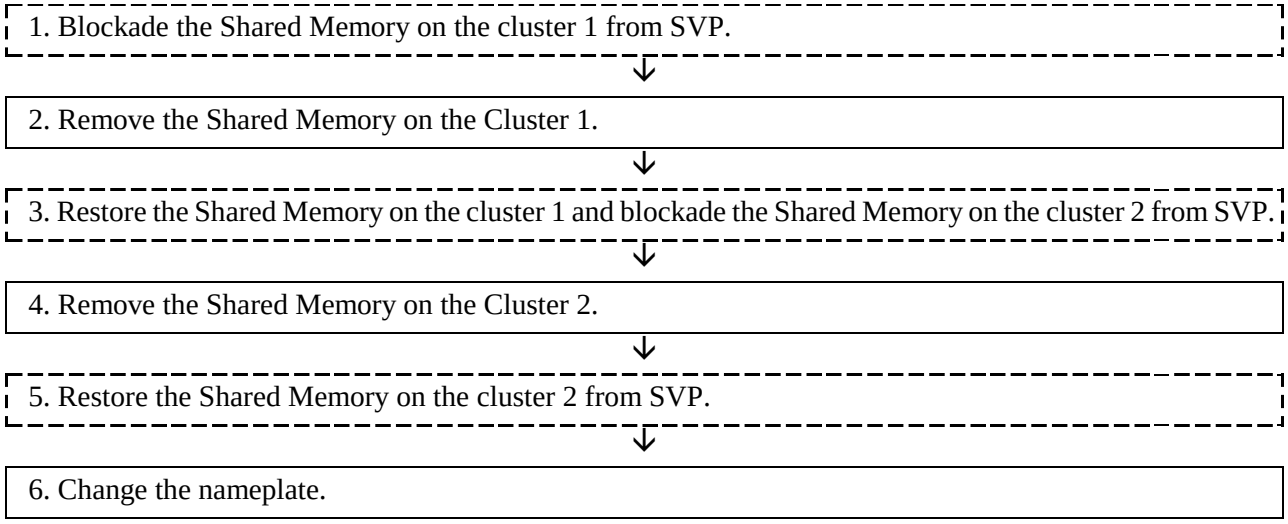
4. Hardware De-Installation

4.1 De-Installation of Shared Memory and Cache Memory

a. When only Shared Memory is to be de-installed,
go to “4.1.1 De-Installation of Additional Shared Memory (DKC-F310I-32/128)”.
b. When only Cache Memory is to be de-installed or when Shared Memory and Cache Memory are to be de-installed at the same time,
go to “4.1.2 De-Installation of Additional Cache Memory (DKC-F310I-20/256/1024)”.
(INST04-110)

4.1.1 De-Installation of Additional Shared Memory (DKC-F310I-32/128)

4.1.1.1 Flowchart



4.1.1.2 Parts List

Table 4.1.1.2-1 Parts List

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
1	DKC-F310I-32	SH024-B	1505404-B	2	Shared Memory Module(16MB)
		Nameplate	3252736-1	1	Not used
2	DKC-F310I-128	SH100-B	1501164-B	2	Shared Memory Module(64MB)

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4.1.1.3 De-Installation Procedure of Additional Shared Memory

1. Blockade the Shared Memory on the cluster 1 from SVP.
   a. Go to INST02-59D step ⑨.

2. Remove the Shared Memory on the Cluster 1.

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

2-1. Remove the PCB.

a. While referring to Fig. 4.1.1.3-1 and Table 4.1.1.3-1, check the Shut Down LED on the Cache Memory PCB in the Rear Logic Box. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

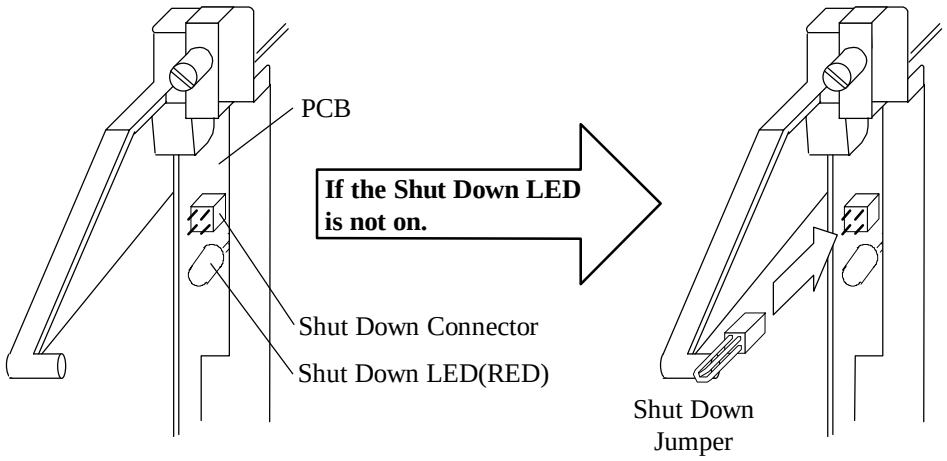

Fig. 4.1.1.3-1 Location of the Shut Down LED

Table 4.1.1.3-1 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB

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b. Remove the two screws and remove the Cache Memory PCB. Refer to Fig. 4.1.1.3-2 and Table 4.1.1.3-1.

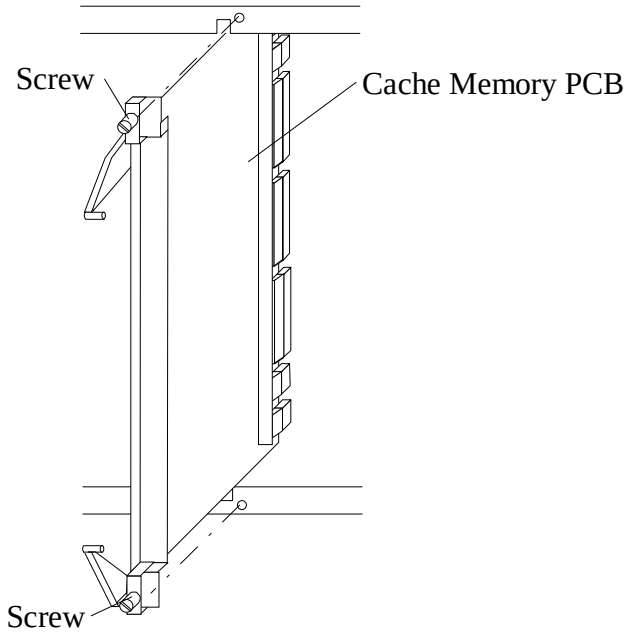

Fig. 4.1.1.3-2 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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2-2. Remove the Shared Memory Modules.

a. Remove the extra Shared Memory Modules according to the required Shared Memory capacity referring to Fig. 4.1.1.3-3 and Table 4.1.1.3-2 or 3.

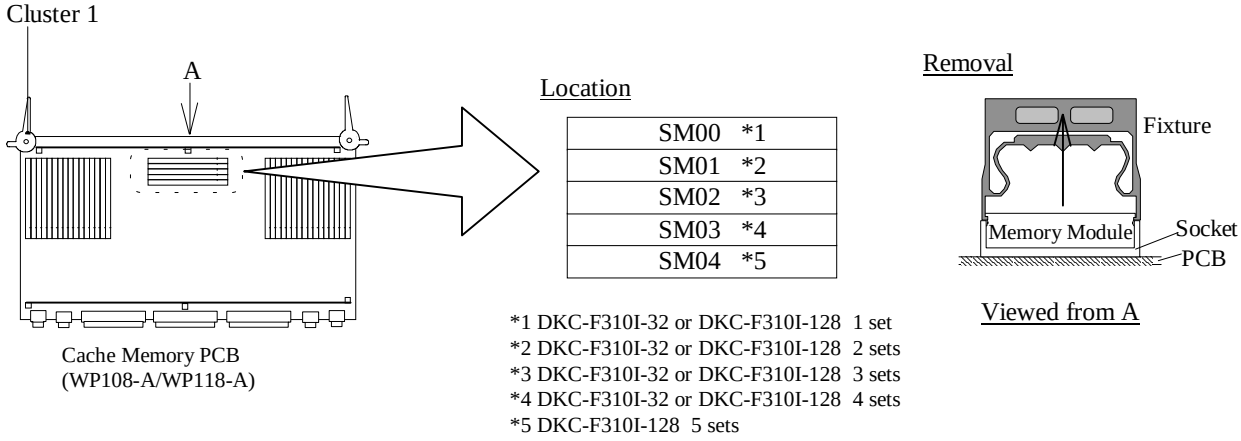

Fig. 4.1.1.3-3 Inserting Location of the Shared Memory Module

Table 4.1.1.3-2 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed of DKC-F310I-32 and DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	16 MB	DKC-F310I-32 1 set	SH024-B	1
2	16 MB	32 MB	DKC-F310I-32 2 sets	SH024-B	1
3	32 MB	48 MB	DKC-F310I-32 3 sets	SH024-B	1
4	48 MB	64 MB	DKC-F310I-32 4 sets	SH024-B	1
5	64 MB	128 MB	DKC-F310I-128 1 set	SH100-B	1

Note : This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

Table 4.1.1.3-3 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed only of DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	64 MB	DKC-F310I-128 1 set	SH100-B	1
2	64 MB	128 MB	DKC-F310I-128 2 sets	SH100-B	1
3	128 MB	192 MB	DKC-F310I-128 3 sets	SH100-B	1
4	192 MB	256 MB	DKC-F310I-128 4 sets	SH100-B	1

Note : This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

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2-3. Insert the PCB.

a. Insert the Cache Memory PCB into the Rear Logic Box referring to Table 4.1.1.3-4.

b. Fasten the two screws.

Table 4.1.1.3-4 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB

c. Go to INST02-59D step ⑪.

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3. Restore the Shared Memory on the cluster 1 and blockade the Shared Memory on the cluster 2 from SVP.
   a. Go to INST02-59D step ⑪.

4. Remove the Shared Memory on the Cluster 2.

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

4-1. Remove the PCB.

a. While referring to Fig. 4.1.1.3-4 and Table 4.1.1.3-5, check the Shut Down LED on the Cache Memory PCB in the Rear Logic Box. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

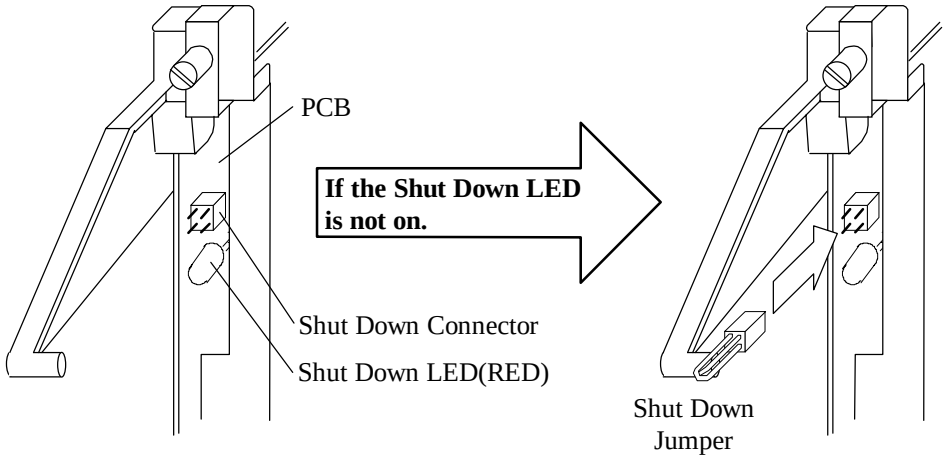

Fig. 4.1.1.3-4 Location of the Shut Down LED

Table 4.1.1.3-5 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB

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b. Remove the two screws and remove the Cache Memory PCB. Refer to Fig. 4.1.1.3-5 and Table 4.1.1.3-6.

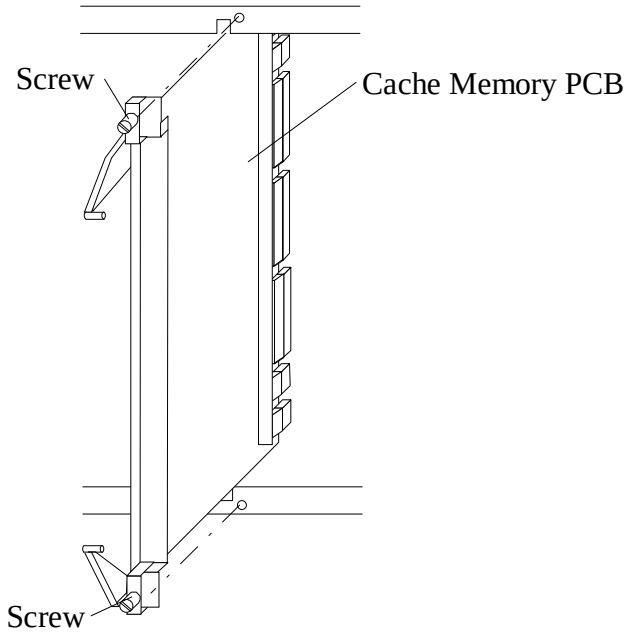

Fig. 4.1.1.3-5 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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4-2. Remove the Shared Memory Modules.

a. Remove the extra Shared Memory Modules according to the required Shared Memory capacity referring to Fig. 4.1.1.3-6 and Table 4.1.1.3-6 or 7.

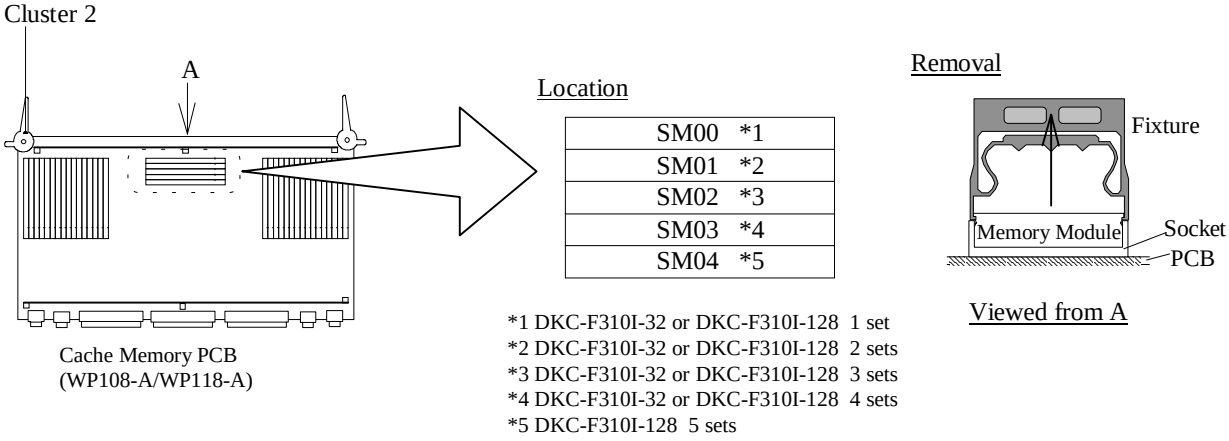

Fig. 4.1.1.3-6 Inserting Location of the Shared Memory Module

Table 4.1.1.3-6 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed of DKC-F310I-32 and DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	16 MB	DKC-F310I-32 1 set	SH024-B	1
2	16 MB	32 MB	DKC-F310I-32 2 sets	SH024-B	1
3	32 MB	48 MB	DKC-F310I-32 3 sets	SH024-B	1
4	48 MB	64 MB	DKC-F310I-32 4 sets	SH024-B	1
5	64 MB	128 MB	DKC-F310I-128 1 set	SH100-B	1

Note : This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

Table 4.1.1.3-7 Number of SMs and Corresponding Shared Memory Capacity
(When the Shared Memory was composed only of DKC-F310I-128)

No.	Shared Memory capacity (×2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	64 MB	DKC-F310I-128 1 set	SH100-B	1
2	64 MB	128 MB	DKC-F310I-128 2 sets	SH100-B	1
3	128 MB	192 MB	DKC-F310I-128 3 sets	SH100-B	1
4	192 MB	256 MB	DKC-F310I-128 4 sets	SH100-B	1

Note : This value is a half value of whole capacity of shared memories. (the capacity of shared memories on the one side)

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4-3. Insert the PCB.

a. Insert the Cache Memory PCB into the Rear Logic Box referring to Table 4.1.1.3-8.

b. Fasten the two screws.

Table 4.1.1.3-8 Location of the Cache PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB

c. Go to INST02-59D step ⑬.

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5. Restore the Shared Memory on the cluster 2 from SVP.
   a. Go to INST02-59D step ⑬.

6. Change the nameplate.
   a. Refer to Fig. 4.1.1.3-7 and Table 4.1.1.3-9 to paint out unnecessary numbers and wipe off a necessary number painted previously so that the "Qt." marking for the corresponding nameplate can be seen.

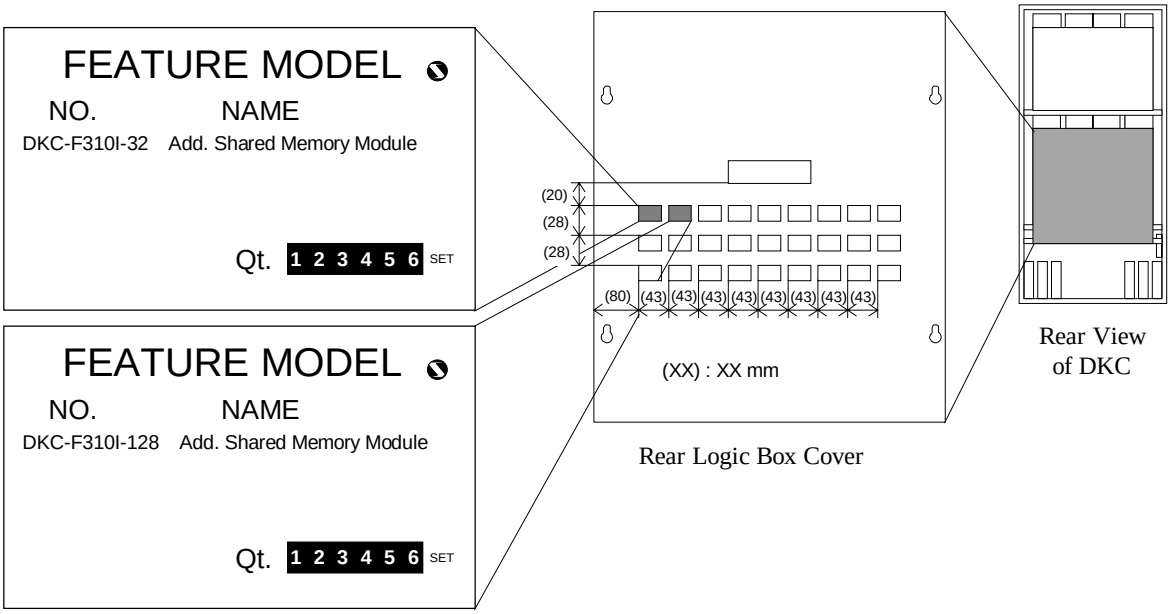

Fig. 4.1.1.3-7 Location of the Nameplate

Table 4.1.1.3-9 Quantity Marking

No.	Quantity Marking	
	Number of DKC-F310I-32/128 sets	Qt.
1	1 set	1
2	2 sets	2
3	3 sets	3
4	4 sets	4
5	5 sets	5
6	6 sets	6

7. Return to General Flow.
   Go to INST02-59D step ⑮.

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4.1.2 De-Installation of Additional Cache Memory (DKC-F310I-20/256/1024)

4.1.2.1 Flowchart

1. Blockade the Cache Memory on the cluster 1 from SVP.

↓

2. Remove the Cache Memory and Shared Memory on the cluster 1.

↓

3. Restore the Cache Memory on the cluster 1 and blockade the Cache Memory on the cluster 2 from SVP.

↓

4. Remove the Cache Memory and Shared Memory on the cluster 2.

↓

5. Restore the Cache Memory on the cluster 2 from SVP.

↓

6. When the Additional Cache Board (DKC-F310I-20) is removed, remove the Battery Boxes and BATT CTR PCBs
   When the Additional Cache Board (DKC-F310I-20) is not removed, go to step 7.

↓

7. Change the nameplate.

4.1.2.2 Parts List

Table 4.1.2.2-1 Parts List

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
1	DKC-F310I-20	WP108-B	1505482-B	2	Cache Memory PCB
		WP118-B	1505847-B		
		Battery Box	3236759-A	2	
		BATT CTR PCB	1514192-A	2	
		Jumper (Battery)	3250530-A	2	Jumper Connector (BTJP)
		Nameplate	3252542-1	1	
2	DKC-F310I-256	SH024-A	1505404-A	8	Cache Memory Module (32MB)
		Nameplate	3252543-1	1	Not used
3	DKC-F310I-1024	SH100-A	1501164-A	8	Cache Memory Module (128MB)

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4.1.2.3 De-Installation Procedure of Additional Cache Memory

Notice : Confirm the quantity of the options to be removed prior to de-installing the Cache Memory. Refer to Table 1.1.2-1 and Table 1.1.2-2 (INST01-40 through 50) for the required quantity of options.

1. Blockade the Cache Memory on the cluster 1 from SVP.
   a. Go to INST02-59C step ①.

2. Remove the Cache Memory and Shared Memory on the cluster 1.

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

2-1 Remove the PCBs.

a. While referring to Fig. 4.1.2.3-1 and Table 4.1.2.3-1, check the Shut Down LED on the Cache Memory PCB. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

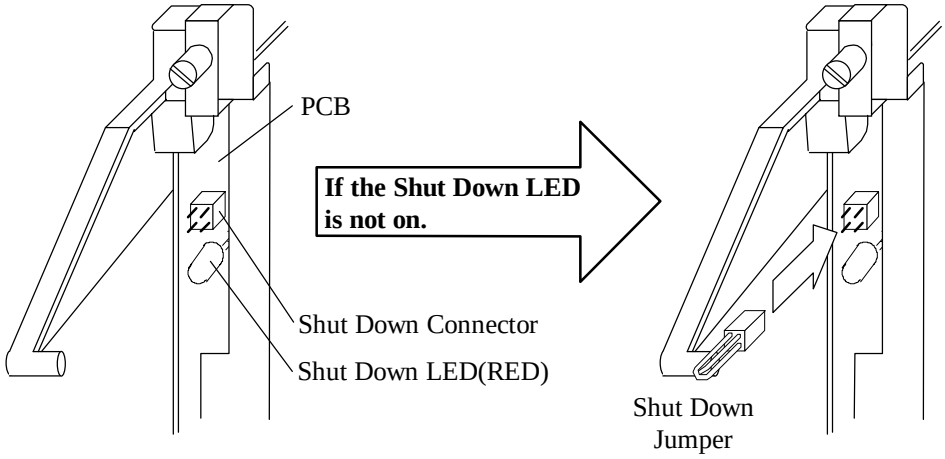

Fig. 4.1.2.3-1 Location of the Shut Down LED

Table 4.1.2.3-1 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB (Note 1)
	WP108-B/WP118-B	Front Logic Box	T	CACHE-1T	Cache Memory PCB (Note 2)

Note 1: No PCB needs to be removed if 8 or more DKC-F310I-256 or DKC-F310I-1024 sets are left after de-installation, except when installing DKC-F310I-32 or DKC-F310I-128 sets.

Note 2: Remove the PCB only when it is installed.

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b. Remove the two screws and remove the Cache Memory PCB. Refer to Fig. 4.1.2.3-2 and Table 4.1.2.3-1

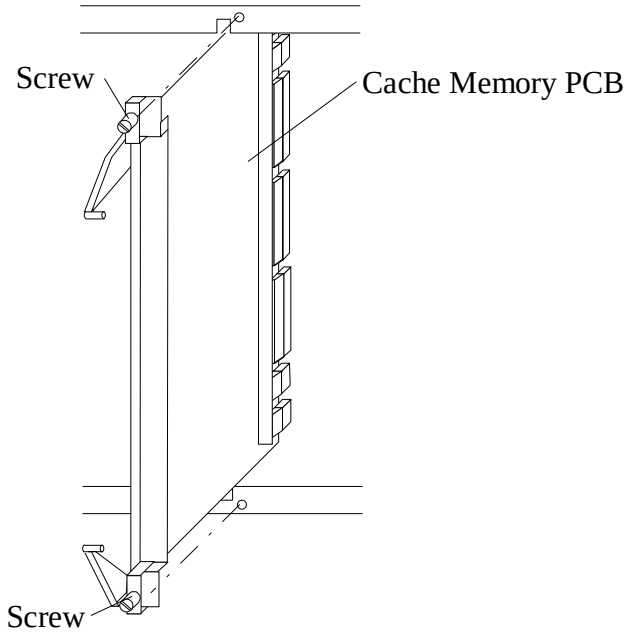

Fig. 4.1.2.3-2 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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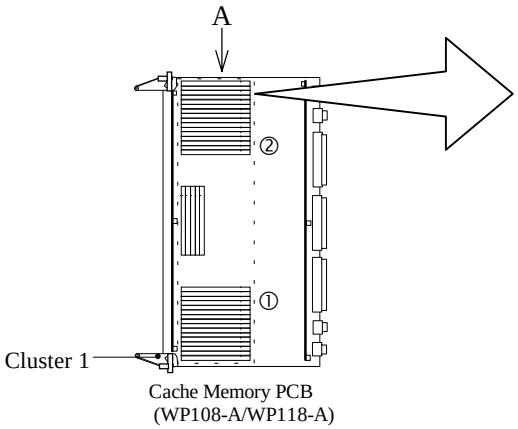
2-2 Remove the Cache Memory Modules.

a. Remove the extra Cache Memory Modules according to the required Cache Memory capacity referring to Fig. 4.1.2.3-3 and Table 4.1.2.3-2 or 3.



*1 DKC-F310I-256 or DKC-F310I-1024 · 1 set
*2 DKC-F310I-256 or DKC-F310I-1024 · 2 sets
*3 DKC-F310I-256 or DKC-F310I-1024 · 3 sets
*4 DKC-F310I-256 or DKC-F310I-1024 · 4 sets
*5 DKC-F310I-256 or DKC-F310I-1024 · 5 sets
*6 DKC-F310I-256 or DKC-F310I-1024 · 6 sets
*7 DKC-F310I-256 or DKC-F310I-1024 · 7 sets
*8 DKC-F310I-256 or DKC-F310I-1024 · 8 sets

Cache Memory Module Location

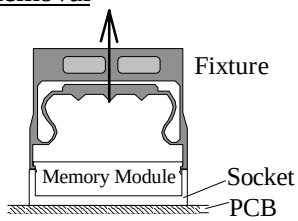
②

CM03	*1
CM13	*2
CM23	*3
CM33	*4
CM43	*5
CM53	*6
CM63	*7
CM73	*8
CM01	*1
CM11	*2
CM21	*3
CM31	*4
CM41	*5
CM51	*6
CM61	*7
CM71	*8

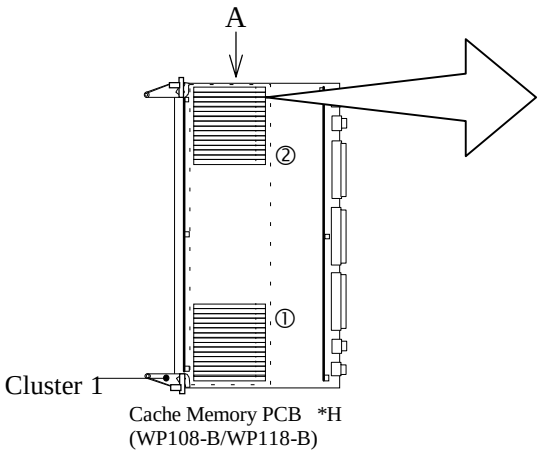
①

CM70	*8
CM60	*7
CM50	*6
CM40	*5
CM30	*4
CM20	*3
CM10	*2
CM00	*1
CM72	*8
CM62	*7
CM52	*6
CM42	*5
CM32	*4
CM22	*3
CM12	*2
CM02	*1

Removal



Viewed from A



*9 DKC-F310I-256 or DKC-F310I-1024 × 9 sets
*A DKC-F310I-256 or DKC-F310I-1024 × 10 sets
*B DKC-F310I-256 or DKC-F310I-1024 × 11 sets
*C DKC-F310I-256 or DKC-F310I-1024 × 12 sets
*D DKC-F310I-256 or DKC-F310I-1024 × 13 sets
*E DKC-F310I-256 or DKC-F310I-1024 × 14 sets
*F DKC-F310I-256 or DKC-F310I-1024 × 15 sets
*G DKC-F310I-256 or DKC-F310I-1024 × 16 sets
*H DKC-F310I-20

Cache Memory Module Location

②

CM03	*9
CM13	*A
CM23	*B
CM33	*C
CM43	*D
CM53	*E
CM63	*F
CM73	*G
CM01	*9
CM11	*A
CM21	*B
CM31	*C
CM41	*D
CM51	*E
CM61	*F
CM71	*G

①

CM70	*G
CM60	*F
CM50	*E
CM40	*D
CM30	*C
CM20	*B
CM10	*A
CM00	*9
CM72	*G
CM62	*F
CM52	*E
CM42	*D
CM32	*C
CM22	*B
CM12	*A
CM02	*9

Fig. 4.1.2.3-3 Inserting Location of the Cache Memory Module

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Table 4.1.2.3-2 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-256)

No.	Cache Memory capacity (× 2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	128 MB	DKC-F310I-256 1 set	SH024-A	4
2	128 MB	256 MB	DKC-F310I-256 2 sets	SH024-A	4
3	256 MB	384 MB	DKC-F310I-256 3 sets	SH024-A	4
4	384 MB	512 MB	DKC-F310I-256 4 sets	SH024-A	4
5	512 MB	640 MB	DKC-F310I-256 5 sets	SH024-A	4
6	640 MB	768 MB	DKC-F310I-256 6 sets	SH024-A	4
7	768 MB	896 MB	DKC-F310I-256 7 sets	SH024-A	4
8	896 MB	1024 MB	DKC-F310I-256 8 sets	SH024-A	4
9	1024 MB	1152 MB	DKC-F310I-256 9 sets	SH024-A	4
10	1152 MB	1280 MB	DKC-F310I-256 10 sets	SH024-A	4
11	1280 MB	1408 MB	DKC-F310I-256 11 sets	SH024-A	4
12	1408 MB	1536 MB	DKC-F310I-256 12 sets	SH024-A	4
13	1536 MB	1664 MB	DKC-F310I-256 13 sets	SH024-A	4
14	1664 MB	1792 MB	DKC-F310I-256 14 sets	SH024-A	4
15	1792 MB	1920 MB	DKC-F310I-256 15 sets	SH024-A	4
16	1920 MB	2048 MB	DKC-F310I-256 16 sets	SH024-A	4

Note : The value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

Table 4.1.2.3-3 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-1024)

No.	Cache Memory capacity (× 2)		Model No.	Cluster 1	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	512 MB	DKC-F310I-1024 1 set	SH100-A	4
2	512 MB	1024 MB	DKC-F310I-1024 2 sets	SH100-A	4
3	1024 MB	1536 MB	DKC-F310I-1024 3 sets	SH100-A	4
4	1536 MB	2048 MB	DKC-F310I-1024 4 sets	SH100-A	4
5	2048 MB	2560 MB	DKC-F310I-1024 5 sets	SH100-A	4
6	2560 MB	3072 MB	DKC-F310I-1024 6 sets	SH100-A	4
7	3072 MB	3584 MB	DKC-F310I-1024 7 sets	SH100-A	4
8	3584 MB	4096 MB	DKC-F310I-1024 8 sets	SH100-A	4
9	4096 MB	4608 MB	DKC-F310I-1024 9 sets	SH100-A	4
10	4608 MB	5120 MB	DKC-F310I-1024 10 sets	SH100-A	4
11	5120 MB	5632 MB	DKC-F310I-1024 11 sets	SH100-A	4
12	5632 MB	6144 MB	DKC-F310I-1024 12 sets	SH100-A	4
13	6144 MB	6656 MB	DKC-F310I-1024 13 sets	SH100-A	4
14	6656 MB	7168 MB	DKC-F310I-1024 14 sets	SH100-A	4
15	7168 MB	7680 MB	DKC-F310I-1024 15 sets	SH100-A	4
16	7680 MB	8192 MB	DKC-F310I-1024 16 sets	SH100-A	4

Note : The value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

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b. When the Additional Shared Memory Module (DKC-F310I-32) is removed, remove the Shared Memory Modules. Refer to Section 4.1.1.3 De-Installation Procedure of Additional Shared Memory Step 2-2 Remove the Shared Memory Modules (INST04-40).
When the Additional Shared Memory Module (DKC-F310I-32) is not removed, go to step 2-3.

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2-3 Insert the PCBs.

a. When the Additional Cache Board (DKC-F310I-20) is removed, attach the dummy plate and fasten the two screws. Refer to Fig. 4.1.2.3-4.
When the Additional Cache Board (DKC-F310I-20) is not removed, go to step b.

b. Install the Cache Memory PCB referring to Table 4.1.2.3-5.

c. Fasten the two screws.

Table 4.1.2.3-5 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
1	WP108-A/WP118-A	Rear Logic Box	F	CACHE-1F	Cache Memory PCB (Note 1)
	WP108-B/WP118-B	Front Logic Box	T	CACHE-1T	Cache Memory PCB (Note 2)

Note 1 : Insert the PCB when it is removed in step 2-1.

Note 2 : Insert the PCB when DKC-F310I-20 is installed.

Front Logic Box

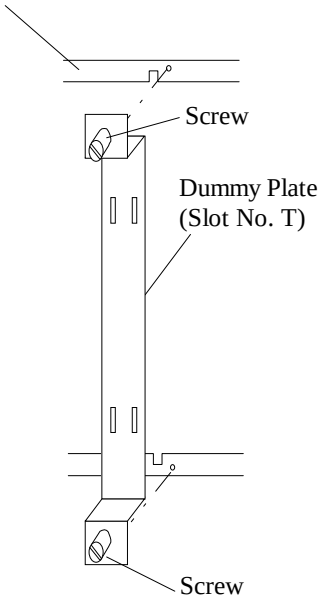

Fig. 4.1.2.3-4 Removal of the Dummy Plate

d. Go to INST02-59C step ③.

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3. Restore the Cache Memory on the cluster 1 and blockade the Cache Memory on the cluster 2 from SVP.

a. Go to INST02-59C step ③.

4. Remove the Cache Memory and Shared Memory on the cluster 2.

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

4-1 Remove the PCBs.

a. While referring to Fig. 4.1.2.3-5 and Table 4.1.2.3-6, check the Shut Down LED on the Cache Memory PCB. Connect the Shut Down Jumper to the Shut Down Connector if the Shut Down LED is not on.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

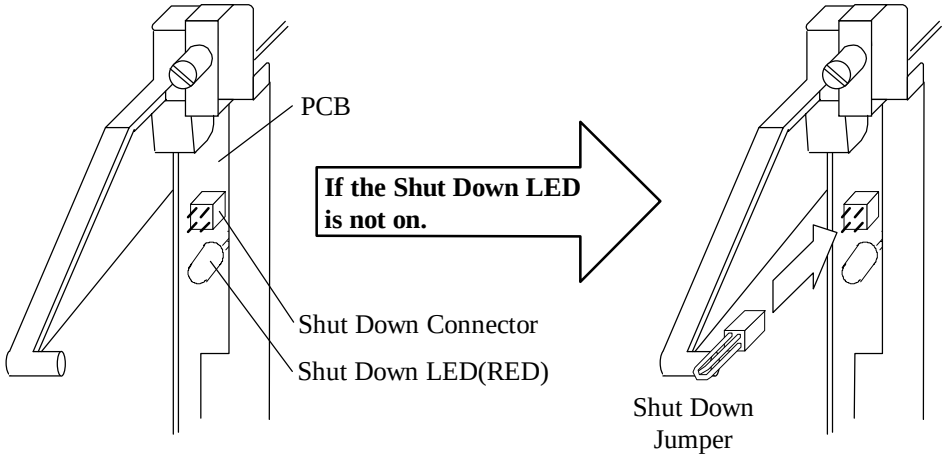

Fig. 4.1.2.3-5 Location of the Shut Down LED

Table 4.1.2.3-6 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB (Note 1)
	WP108-B/WP118-B	Front Logic Box	U	CACHE-2U	Cache Memory PCB (Note 2)

Note 1: No PCB needs to be removed if 8 or more DKC-F310I-256 or DKC-F310I-1024 sets are left after de-installation, except when installing DKC-F310I-32 or DKC-F310I-128 sets.

Note 2: Remove the PCB only when it is installed.

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b. Remove the two screws and remove the Cache Memory PCB. Refer to Fig.4.1.2.3-6 and Table 4.1.2.3-6.

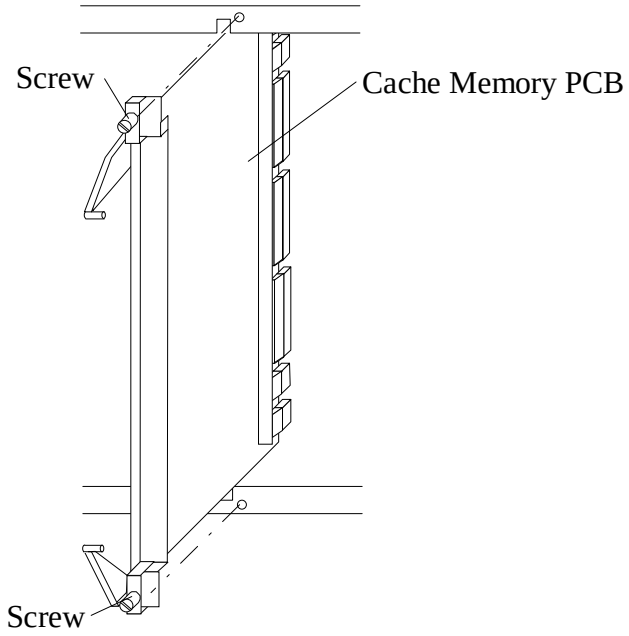

Fig. 4.1.2.3-6 Removal of the Cache Memory PCB

c. Remove the Shut Down Jumper if it is mounted.

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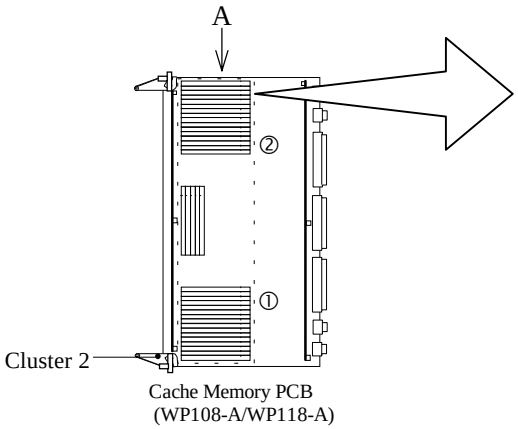
4-2 Remove the Cache Memory Modules.

a. Remove the Cache Memory Modules according to the required Cache Memory capacity referring to Fig. 4.1.2.3-7 and Table 4.1.2.3-7 or 8.



*1 DKC-F310I-256 or DKC-F310I-1024 · 1 set
*2 DKC-F310I-256 or DKC-F310I-1024 · 2 sets
*3 DKC-F310I-256 or DKC-F310I-1024 · 3 sets
*4 DKC-F310I-256 or DKC-F310I-1024 · 4 sets
*5 DKC-F310I-256 or DKC-F310I-1024 · 5 sets
*6 DKC-F310I-256 or DKC-F310I-1024 · 6 sets
*7 DKC-F310I-256 or DKC-F310I-1024 · 7 sets
*8 DKC-F310I-256 or DKC-F310I-1024 · 8 sets

Cache Memory Module Location

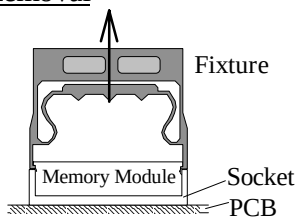
②

CM03	*1
CM13	*2
CM23	*3
CM33	*4
CM43	*5
CM53	*6
CM63	*7
CM73	*8
CM01	*1
CM11	*2
CM21	*3
CM31	*4
CM41	*5
CM51	*6
CM61	*7
CM71	*8

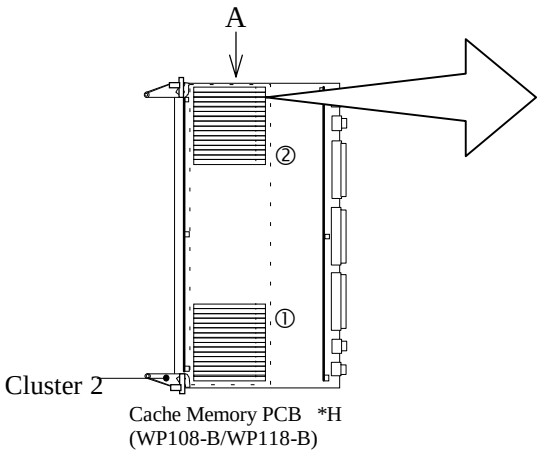
①

CM70	*8
CM60	*7
CM50	*6
CM40	*5
CM30	*4
CM20	*3
CM10	*2
CM00	*1
CM72	*8
CM62	*7
CM52	*6
CM42	*5
CM32	*4
CM22	*3
CM12	*2
CM02	*1

Removal



Viewed from A



*9 DKC-F310I-256 or DKC-F310I-1024 × 9 sets
*A DKC-F310I-256 or DKC-F310I-1024 × 10 sets
*B DKC-F310I-256 or DKC-F310I-1024 × 11 sets
*C DKC-F310I-256 or DKC-F310I-1024 × 12 sets
*D DKC-F310I-256 or DKC-F310I-1024 × 13 sets
*E DKC-F310I-256 or DKC-F310I-1024 × 14 sets
*F DKC-F310I-256 or DKC-F310I-1024 × 15 sets
*G DKC-F310I-256 or DKC-F310I-1024 × 16 sets
*H DKC-F310I-20

Cache Memory Module Location

②

CM03	*9
CM13	*A
CM23	*B
CM33	*C
CM43	*D
CM53	*E
CM63	*F
CM73	*G
CM01	*9
CM11	*A
CM21	*B
CM31	*C
CM41	*D
CM51	*E
CM61	*F
CM71	*G

①

CM70	*G
CM60	*F
CM50	*E
CM40	*D
CM30	*C
CM20	*B
CM10	*A
CM00	*9
CM72	*G
CM62	*F
CM52	*E
CM42	*D
CM32	*C
CM22	*B
CM12	*A
CM02	*9

Fig. 4.1.2.3-7 Inserting Location of the Cache Memory Module

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Table 4.1.2.3-7 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-256)

No.	Cache Memory capacity (× 2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	128 MB	DKC-F310I-256 1 set	SH024-A	4
2	128 MB	256 MB	DKC-F310I-256 2 sets	SH024-A	4
3	256 MB	384 MB	DKC-F310I-256 3 sets	SH024-A	4
4	384 MB	512 MB	DKC-F310I-256 4 sets	SH024-A	4
5	512 MB	640 MB	DKC-F310I-256 5 sets	SH024-A	4
6	640 MB	768 MB	DKC-F310I-256 6 sets	SH024-A	4
7	768 MB	896 MB	DKC-F310I-256 7 sets	SH024-A	4
8	896 MB	1024 MB	DKC-F310I-256 8 sets	SH024-A	4
9	1024 MB	1152 MB	DKC-F310I-256 9 sets	SH024-A	4
10	1152 MB	1280 MB	DKC-F310I-256 10 sets	SH024-A	4
11	1280 MB	1408 MB	DKC-F310I-256 11 sets	SH024-A	4
12	1408 MB	1536 MB	DKC-F310I-256 12 sets	SH024-A	4
13	1536 MB	1664 MB	DKC-F310I-256 13 sets	SH024-A	4
14	1664 MB	1792 MB	DKC-F310I-256 14 sets	SH024-A	4
15	1792 MB	1920 MB	DKC-F310I-256 15 sets	SH024-A	4
16	1920 MB	2048 MB	DKC-F310I-256 16 sets	SH024-A	4

Note : The value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

Table 4.1.2.3-8 Number of CMs and Corresponding Cache Memory Capacity
(When the Cache Memory was composed only of DKC-F310I-1024)

No.	Cache Memory capacity (× 2)		Model No.	Cluster 2	
	From (Note)	To (Note)		Part name	Quantity
1	0 MB	512 MB	DKC-F310I-1024 1 set	SH100-A	4
2	512 MB	1024 MB	DKC-F310I-1024 2 sets	SH100-A	4
3	1024 MB	1536 MB	DKC-F310I-1024 3 sets	SH100-A	4
4	1536 MB	2048 MB	DKC-F310I-1024 4 sets	SH100-A	4
5	2048 MB	2560 MB	DKC-F310I-1024 5 sets	SH100-A	4
6	2560 MB	3072 MB	DKC-F310I-1024 6 sets	SH100-A	4
7	3072 MB	3584 MB	DKC-F310I-1024 7 sets	SH100-A	4
8	3584 MB	4096 MB	DKC-F310I-1024 8 sets	SH100-A	4
9	4096 MB	4608 MB	DKC-F310I-1024 9 sets	SH100-A	4
10	4608 MB	5120 MB	DKC-F310I-1024 10 sets	SH100-A	4
11	5120 MB	5632 MB	DKC-F310I-1024 11 sets	SH100-A	4
12	5632 MB	6144 MB	DKC-F310I-1024 12 sets	SH100-A	4
13	6144 MB	6656 MB	DKC-F310I-1024 13 sets	SH100-A	4
14	6656 MB	7168 MB	DKC-F310I-1024 14 sets	SH100-A	4
15	7168 MB	7680 MB	DKC-F310I-1024 15 sets	SH100-A	4
16	7680 MB	8192 MB	DKC-F310I-1024 16 sets	SH100-A	4

Note : The value is a half value of whole capacity of cache memories. (the capacity of cache memories on the one side)

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b. When the Additional Shared Memory Module (DKC-F310I-32) is removed, remove the Shared Memory Modules. Refer to Section 4.1.1.3 De-Installation Procedure of Additional Shared Memory Step 4-2 Remove the Shared Memory Modules (INST04-80).
When the Additional Shared Memory Module (DKC-F310I-32) is not removed, go to step 4-3.

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4-3 Insert the PCBs.

a. When the Additional Cache Board (DKC-F310I-20) is removed, attach the dummy plate and fasten the two screws. Refer to Fig. 4.1.2.3-8.
When the Additional Cache Board (DKC-F310I-20) is not removed, go to step b.

b. Install the Cache Memory PCB referring to Table 4.1.2.3-10.

c. Fasten the two screws.

Table 4.1.2.3-10 Location of the Cache Memory PCB

Cluster	PCB Name	Box	Slot No.	Location No.	Remarks
2	WP108-A/WP118-A	Rear Logic Box	G	CACHE-2G	Cache Memory PCB (Note 1)
	WP108-B/WP118-B	Front Logic Box	U	CACHE-2U	Cache Memory PCB (Note 2)

Note 1 : Insert the PCB when it is removed in step 4-1.

Note 2 : Insert the PCB when DKC-F310I-20 is installed.

Front Logic Box

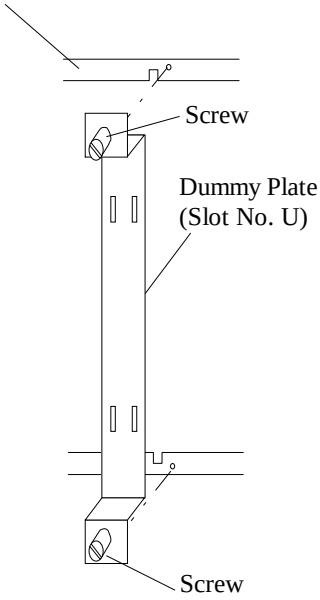

Fig. 4.1.2.3-8 Removal of the Dummy Plate

d. Go to INST02-59C step ⑤.

5. Restore the Cache Memory on the cluster 2 from SVP.

a. Go to INST02-59C step ⑤.

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6. When the Additional Cache Board (DKC-F310I-20) is removed, remove the Battery Boxes and BATT CTR PCBs

When the Additional Cache Board (DKC-F310I-20) is not removed, go to step 7.

a. Remove the two screws and open the covers.

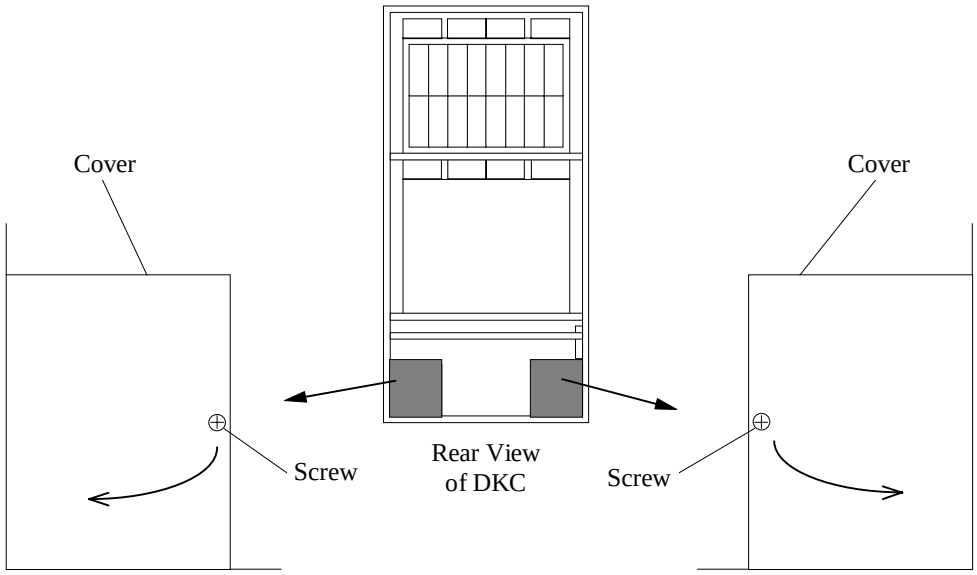

Fig.4.1.2.3-9 Opening of the Cover

b. Disconnect the Jumper Connectors from BATT CTR PCBs. Loosen the screws and rotate the stoppers. Remove the BATT CTR PCBs (BATT CTR-12 and BATT CTR-22).

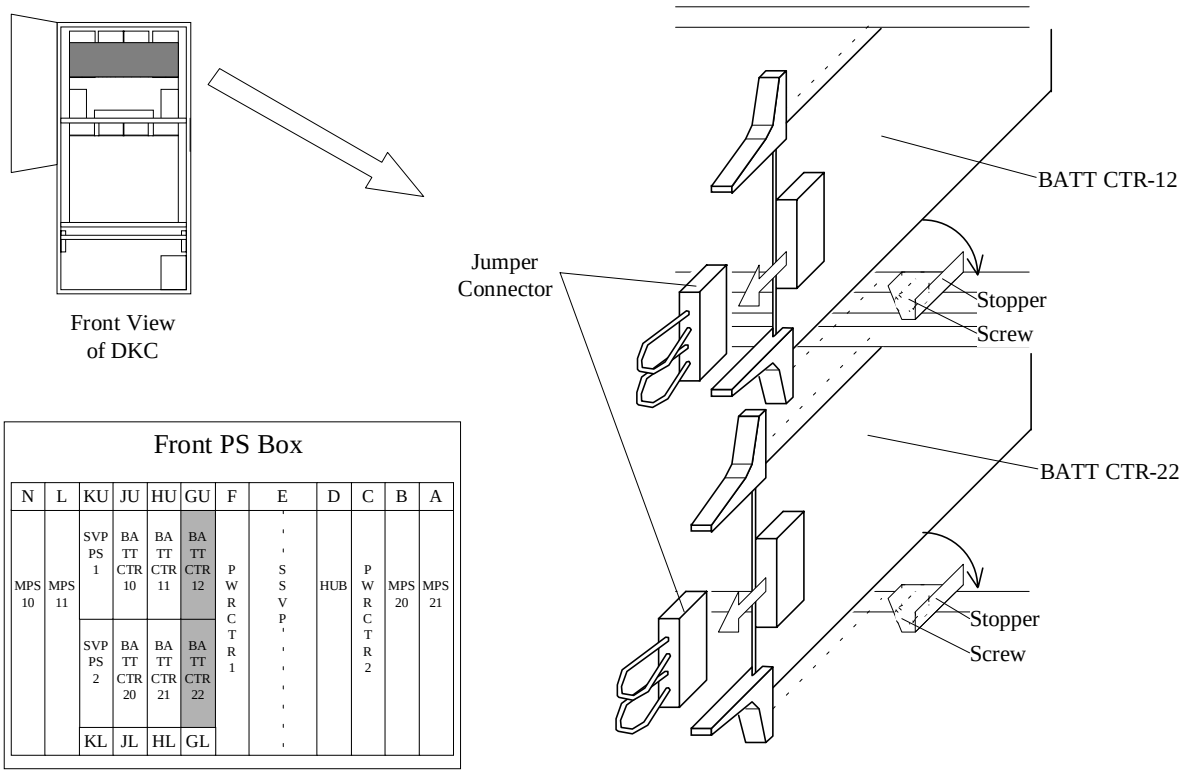

Fig.4.1.2.3-10 Insertion of the BAT CTR

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c. Disconnect the cables from the Battery Boxes. Loosen the screws and remove the Battery Boxes (BATTERY-12 and BATTERY-22).

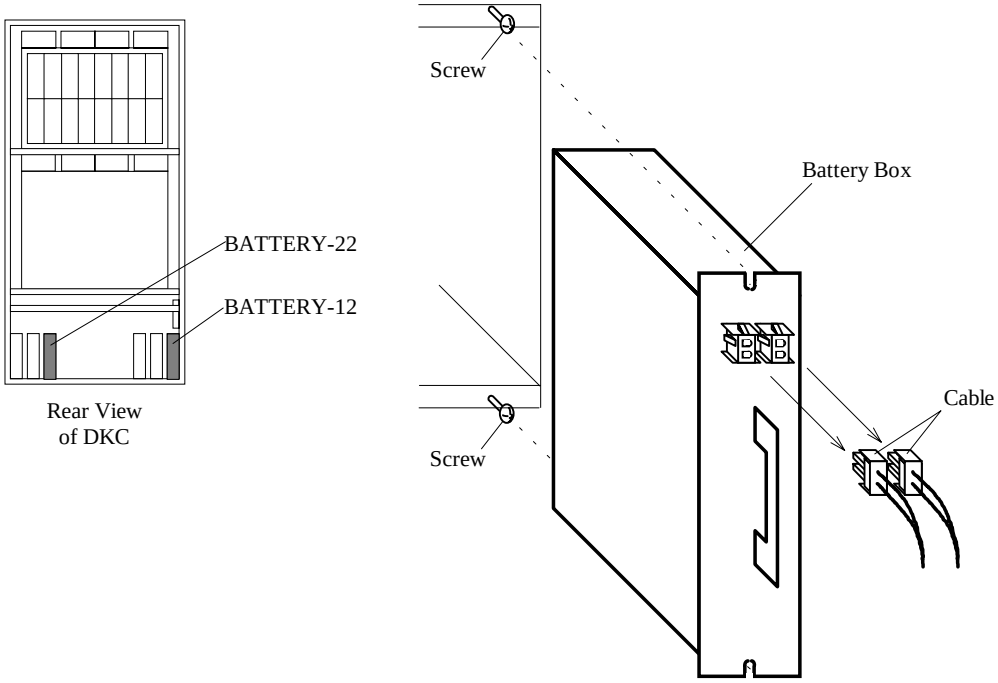

Fig.4.1.2.3-11 Insertion of the Battery Box

d. Close the covers and fasten the screws.

e. Go to INST02-59C step ⑦.

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7. Change the nameplate.

a. Refer to Fig. 4.1.2.3-12 and Table 4.1.2.3-11 to paint out unnecessary numbers and wipe off a necessary number painted previously so that the "Qt." marking for the corresponding nameplate can be seen.

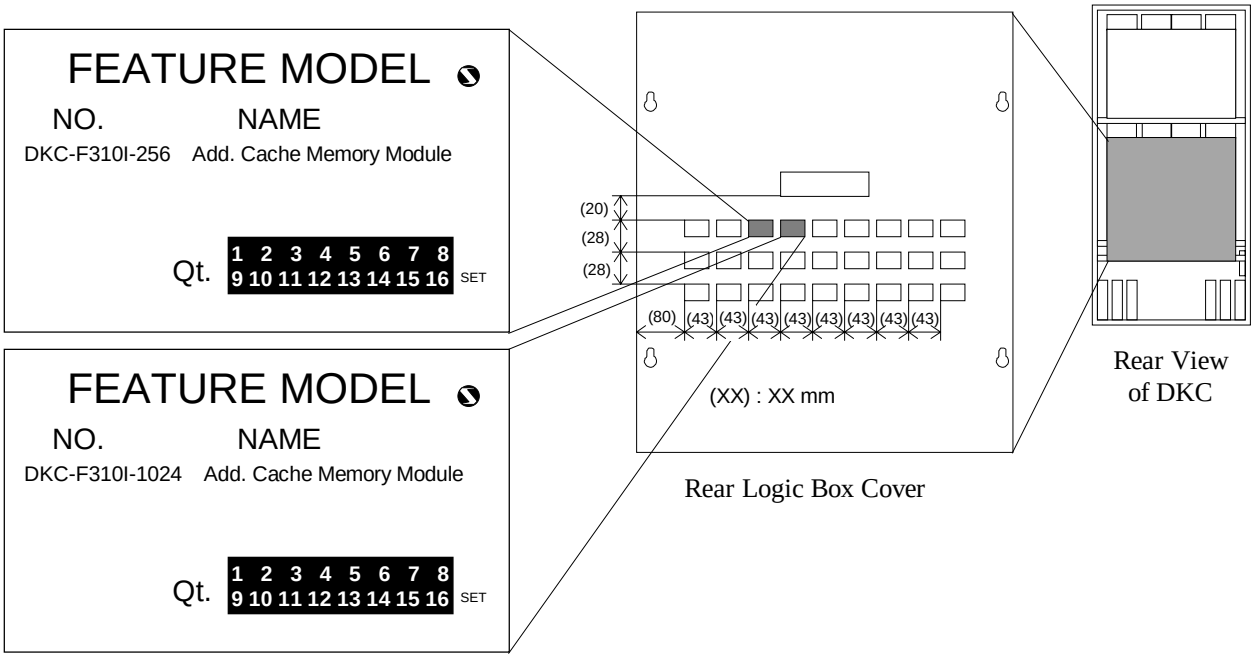

Fig. 4.1.2.3-12 Location of the Nameplate

Table 4.1.2.3-11 Quantity Marking

No.	Quantity Marking	
	Number of DKC-F310I-256/1024 sets	Qt.
1	1 set	1
2	2 sets	2
3	3 sets	3
4	4 sets	4
5	5 sets	5
6	6 sets	6
7	7 sets	7
8	8 sets	8

(To be continued)

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(Continued from the preceding page)

No.	Quantity Marking	
	Number of DKC-F310I-256/1024 sets	Qt.
9	9 sets	[redacted] 9
10	10 sets	[redacted] 10
11	11 sets	[redacted] 11
12	12 sets	[redacted] 12
13	13 sets	[redacted] 13
14	14 sets	[redacted] 14
15	15 sets	[redacted] 15
16	16 sets	[redacted] 16

b. When the Additional Shared Memory Module (DKC-F310I-32) is removed, change the nameplate of DKC-F310I-32. Refer to Section 4.1.1.3 De-Installation Procedure of Additional Shared Memory Step 6 Change the nameplate (INST04-100).
When the Additional Shared Memory Module (DKC-F310I-32) is not removed, go to step c.

c. When the Additional Cache Board (DKC-F310I-20) is removed, detach the nameplate of DKC-F310I-20. Refer to Fig. 4.1.2.3-13.
When the Additional Cache Board (DKC-F310I-20) is not removed, go to step 8.

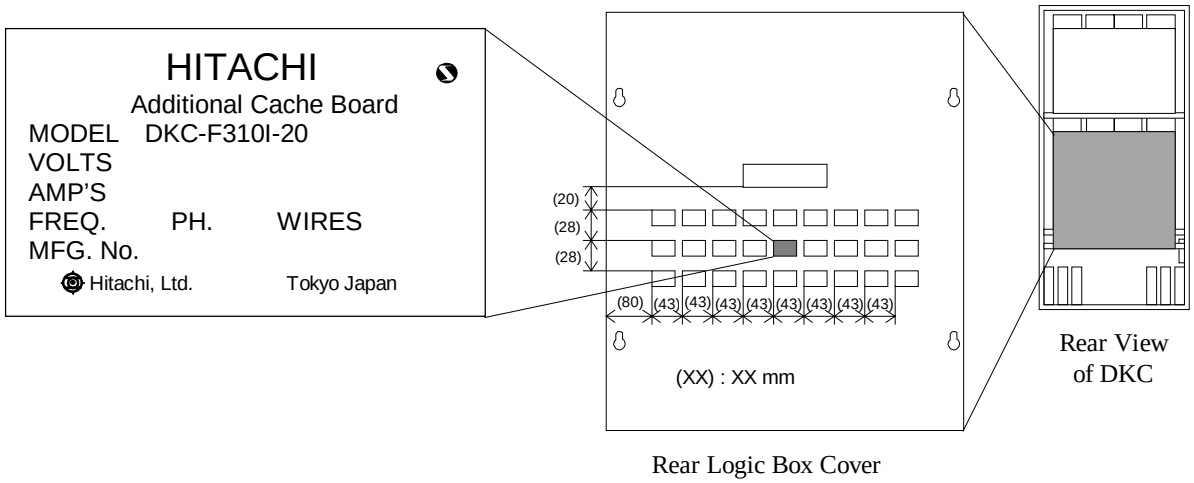

Fig. 4.1.2.3-13 Location of the Nameplate

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8. Return to General Flow.
   Go to INST02-59C step ⑧.

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4.2 De-installation of Disk Adapter (DKC-F310I-50/50E)

4.2.1 Parts list

Table 4.2-1 Parts List for Disk Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-50	Disk Adapter PCB	1505479-A	2	
		Nameplate	3252542-2	1	For DKC-F310I-50
2	DKC-F310I-50E	Disk Adapter PCB	1505479-B/ 1505871-B	2	Support of HMRCF
		Nameplate	3253835-1	1	For DKC-F310I-50E

4.2.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).

↓

(2) Disconnect the SCSI cables.

↓

(3) Remove the PCBs.

↓

(4) Remove the nameplate.

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4.2.3 De-Installation Procedure of Disk Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on. (Fig. 4.2-1) If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

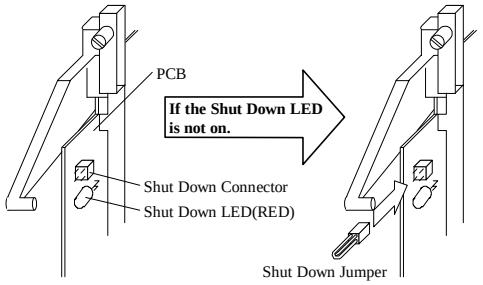

Fig. 4.2-1 Shut Down LED

2. Disconnection of the SCSI cables

Table 4.2-2 Removal Location (Rear of the unit)

Cluster	CL2						CL1					CL2
Slot No.	M	L	K	J	H	G	F	E	D	C	B	A
Function	TM	DKA	DKA	DKA	DKA	CACHE	CACHE	DKA	DKA	DKA	DKA	TM
Location No.	TM -2M	DKA -2L	DKA -2K	DKA -2J	DKA -2H	CACHE -2G	CACHE -1F	DKA -1E	DKA -1D	DKA -1C	DKA -1B	TM -2A
Order of addition		Add.3	Add.2	Add.1	Basic			Add.3	Add.2	Add.1	Basic	

In case of Add.1

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.2-2 and Fig. 4.2-2.

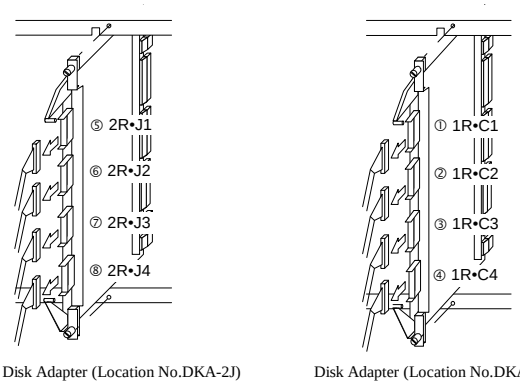

Fig. 4.2-2 Disconnection of SCSI Cables (Add.1)

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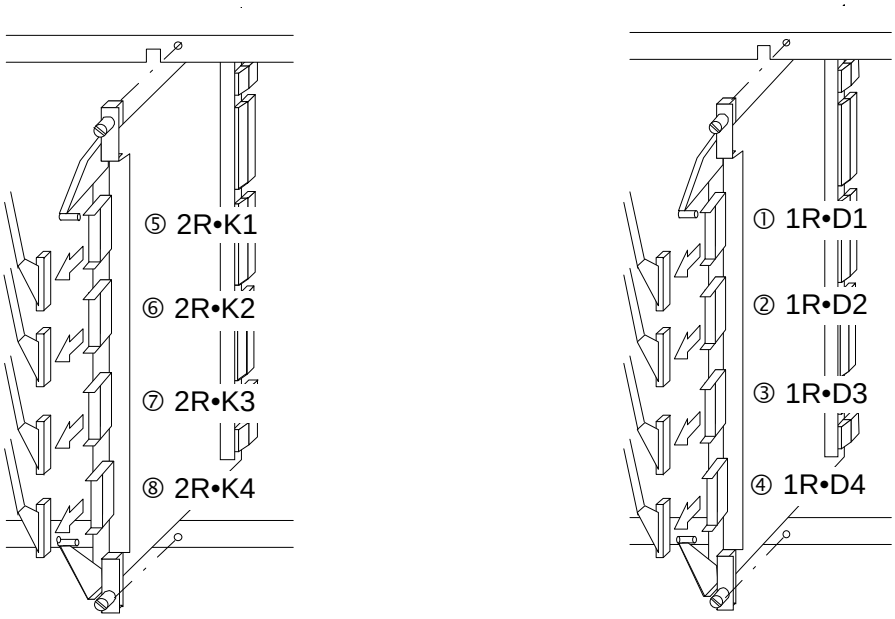
In case of Add.2

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.2-2 and Fig. 4.2-3.

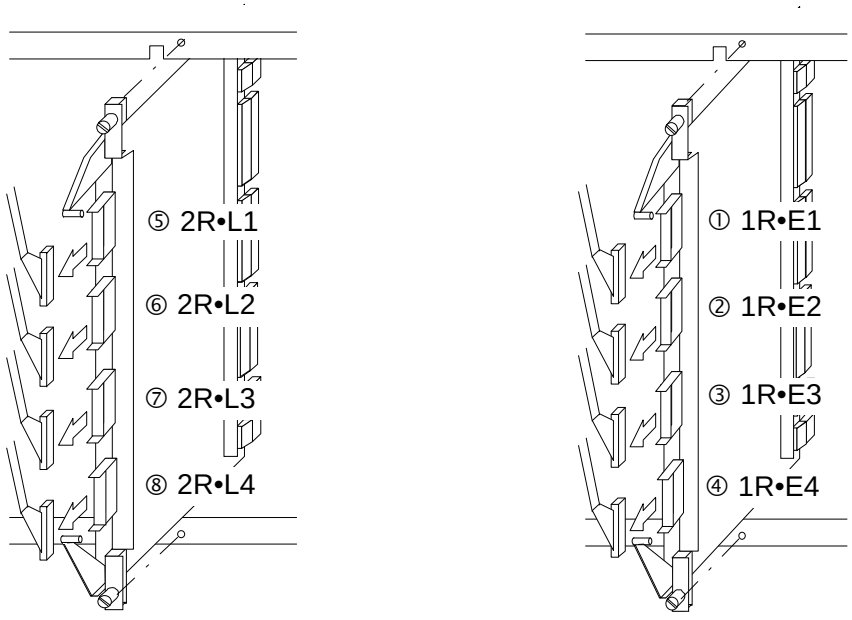


Disk Adapter (Location No.DKA-2K) Disk Adapter (Location No.DKA-1D)

Fig. 4.2-3 Disconnection of SCSI Cables (Add.2)

In case of Add.3

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.2-2 and Fig. 4.2-4.



Disk Adapter (Location No.DKA-2L) Disk Adapter (Location No.DKA-1E)

Fig. 4.2-4 Disconnection of SCSI Cables (Add.3)

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.2-5.
   b. Attach the dummy plates referring to Fig. 4.2-6.

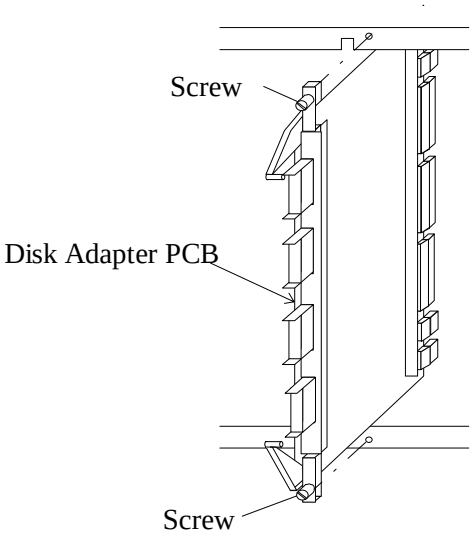

Fig. 4.2-5 Removal of PCB

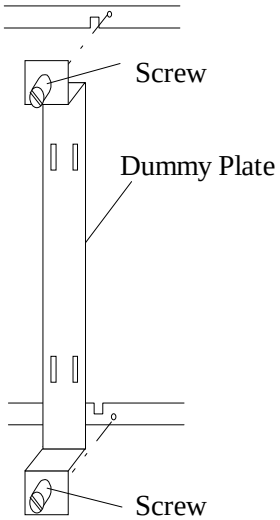

Fig. 4.2-6 Attachment of Dummy Plate

4. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.2-7.

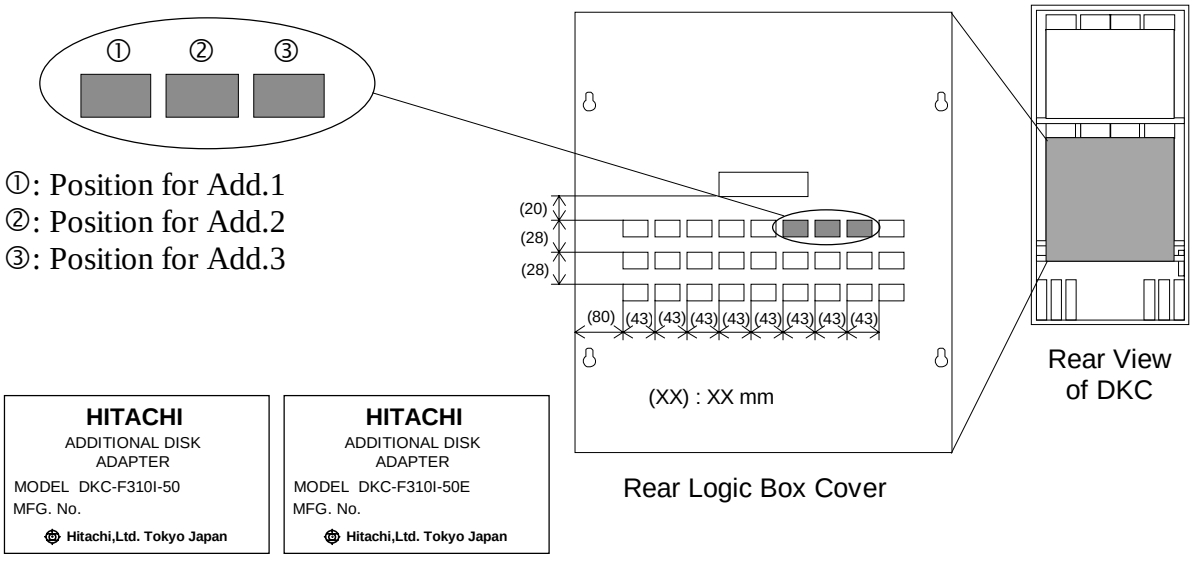

Fig. 4.2-7 Removal of Nameplate

5. Return to General Flow.
   Non-disruptive De-Installation : Go to INST02-31 Step (3)-5.
   Disruptive De-Installation: Go to INST02-53 Step (14).

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4.3 Disconnection of SCSI Interface Cables

4.3.1 Disconnection of Additional SCSI Interface Cables (DKU-F305I-3C)

4.3.1.1 Flowchart

1. Disconnection Procedure of SCSI Interface Cables between DKC and Third DKU (HDU-L10-L13) Chassises

1 Disconnection of the SCSI Interface Cables (Before removal of Third DKU(DKU305-14)) [INST04-340]

(1) Disconnect the SCSI interface cables. [INST04-340]

↓

(2) Remove the cable fixing wire and repeat binder. [INST04-350]

↓

(3) Remove the nameplate. [INST04-360]

2 Removal of SCSI Interface Cables (After removal of Third DKU(DKU305I-14)) [INST04-360]

(1) Remove the cable duct cover. [INST04-360]

↓

(2) Remove the four SCSI interface cables from the DKC. [INST04-370]

↓

(3) Attach the cable duct cover. [INST04-370]

2. Disconnection Procedure of SCSI Interface Cables between DKC and Third DKU (HDU-L14-L17) Chassises

1 Disconnection of the SCSI Interface Cables (Before removal of HDU Boxes(DKU-F305I-B4)) [INST04-380]

(1) Disconnect the SCSI interface cables. [INST04-380]

↓

(2) Remove the cable fixing wire and repeat binder. [INST04-390]

2 Removal of SCSI Interface Cables (After removal of HDU Boxes(DKU-F305I-B4)) [INST04-400]

(1) Remove the cable duct cover. [INST04-400]

↓

(2) Remove the four SCSI interface cables from the DKC. [INST04-400]

↓

(3) Attach the cable duct cover. [INST04-410]

↓

(4) Secure the 8 SCSI interface cables. [INST04-410]

4.3.1.2 Parts List

Table 4.3.1.2-1 Parts List for Additional SCSI Interface Cable

No.	Model Number	Parts Name	Parts No. (Spare Parts No.)	Quantity	Remarks
1	DKU-F305I-3C	SCSI Interface Cable	2101654-A through R (5500004-A through R)	16	HDU-L10-L17
		Nameplate	2099650-75	1	

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4.3.1.3 Disconnection Procedure of Additional SCSI Interface Cables (In case of HDU-L13 from L10)

1. Disconnection of the SCSI Interface Cables (Before removal of Third DKU(DKU305-14))
   a. Open the front and rear doors from the DKC and Third DKU.
   b. Remove the Rear Logic Box cover.
   c. Refer to Fig. 4.3.1.3-1. Disconnect the SCSI interface cables from the sub-edges on the disk adapter PCBs that are installed in locations Nos. D and K in the Rear Logic Box.

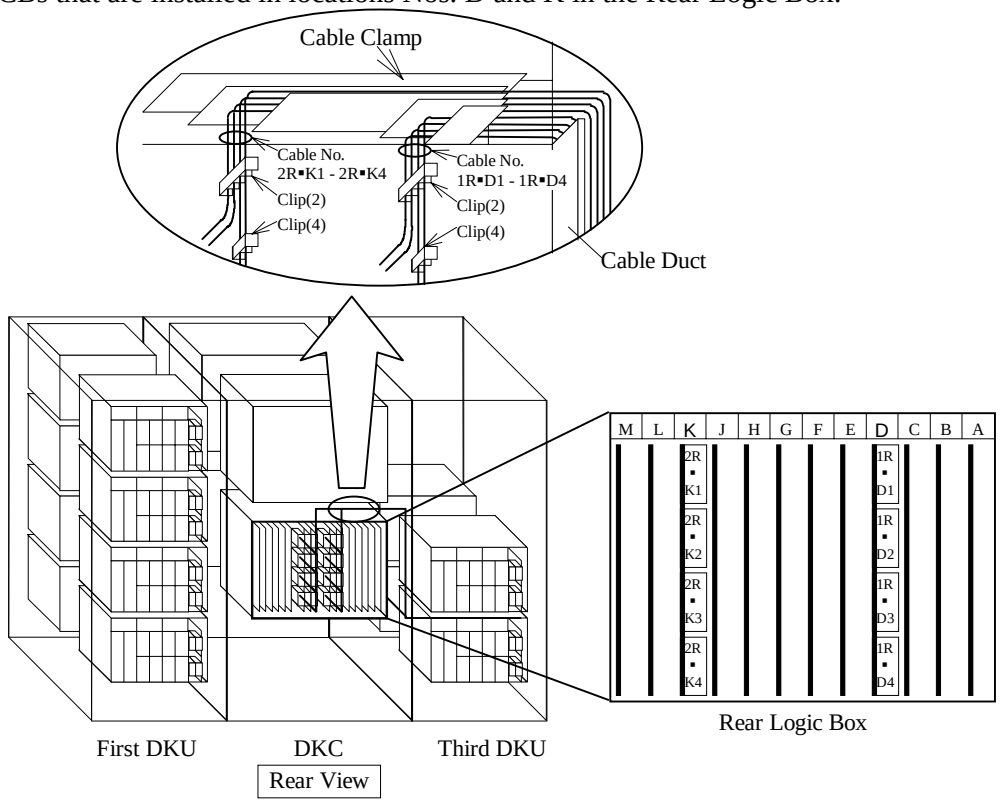

Fig. 4.3.1.3-1 SCSI Interface Cable Disconnecting Diagram (Disk Adapter PCB Side)

   d. Refer to Fig. 4.3.1.3-2. Disconnect the SCSI interface cables from the sub-edges on the SCSI BFR PCBs located in the HDU box.

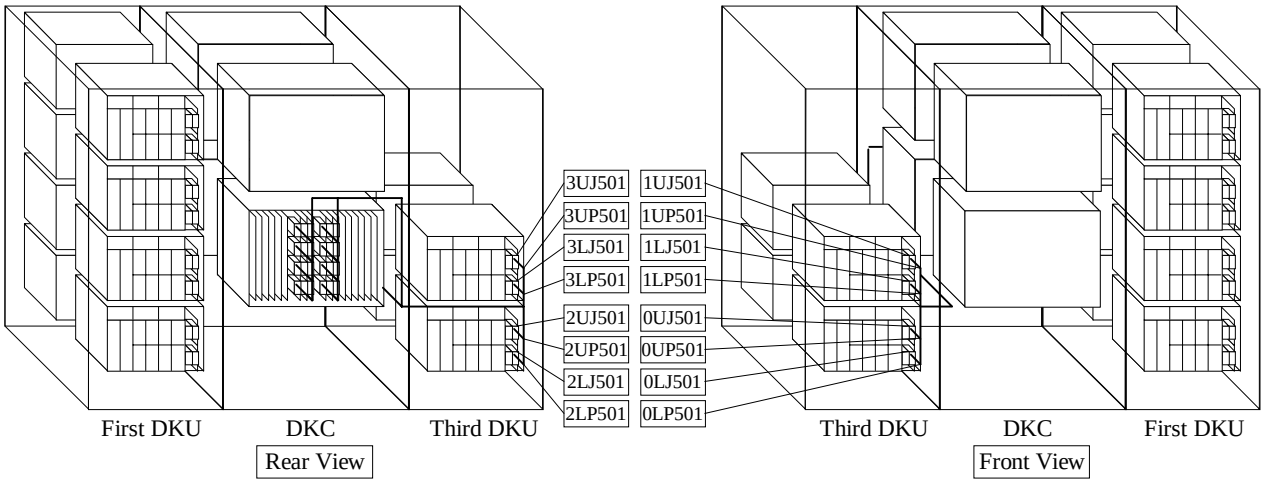

Fig. 4.3.1.3-2 SCSI Interface Cable Disconnecting Diagram (SCSI BFR PCB Side)

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e. Refer to Fig. 4.3.1.3-3. Remove the cable fixing wire and repeat binder that are securing the SCSI interface cables from cable duct.

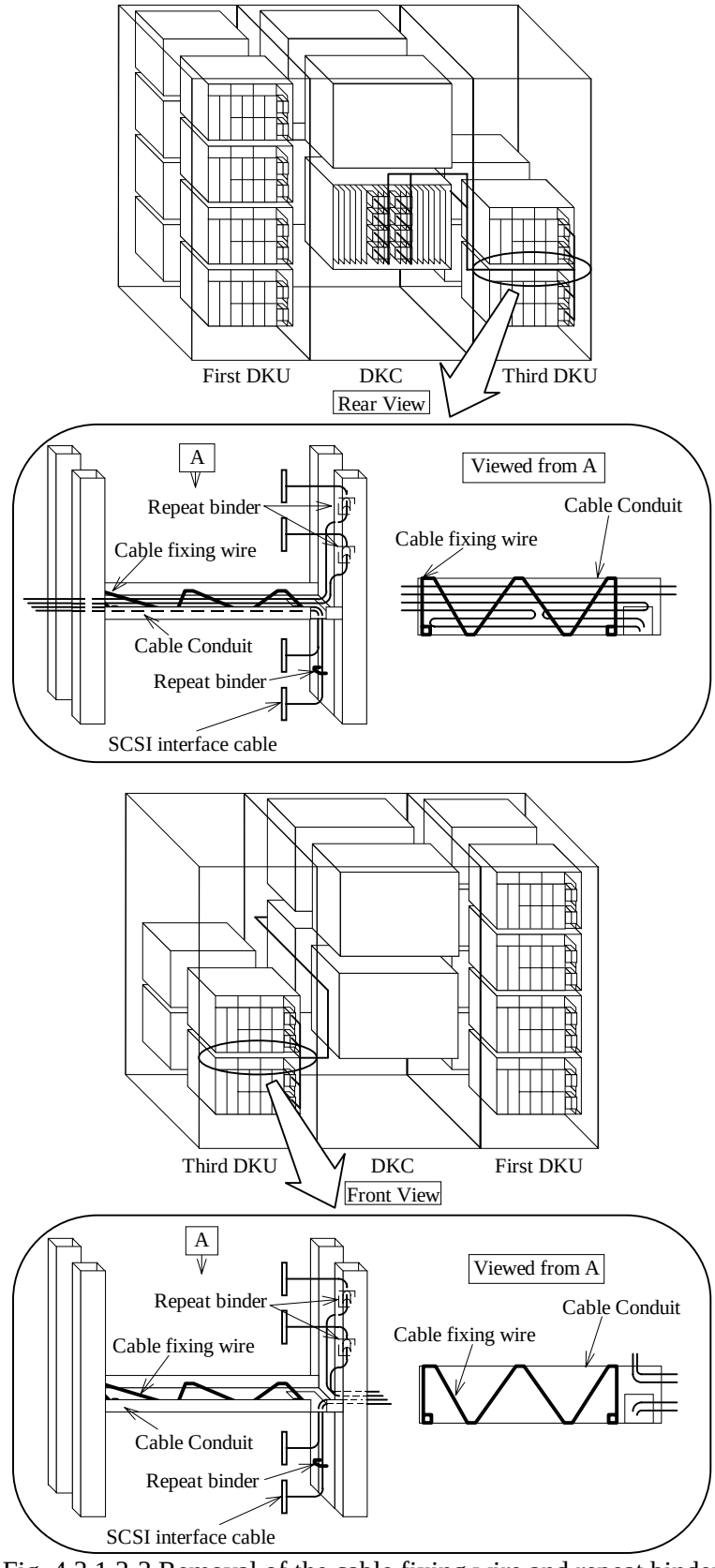

Fig. 4.3.1.3-3 Removal of the cable fixing wire and repeat binder

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f. Refer to Fig. 4.3.1.3-4. De-install the name plate.

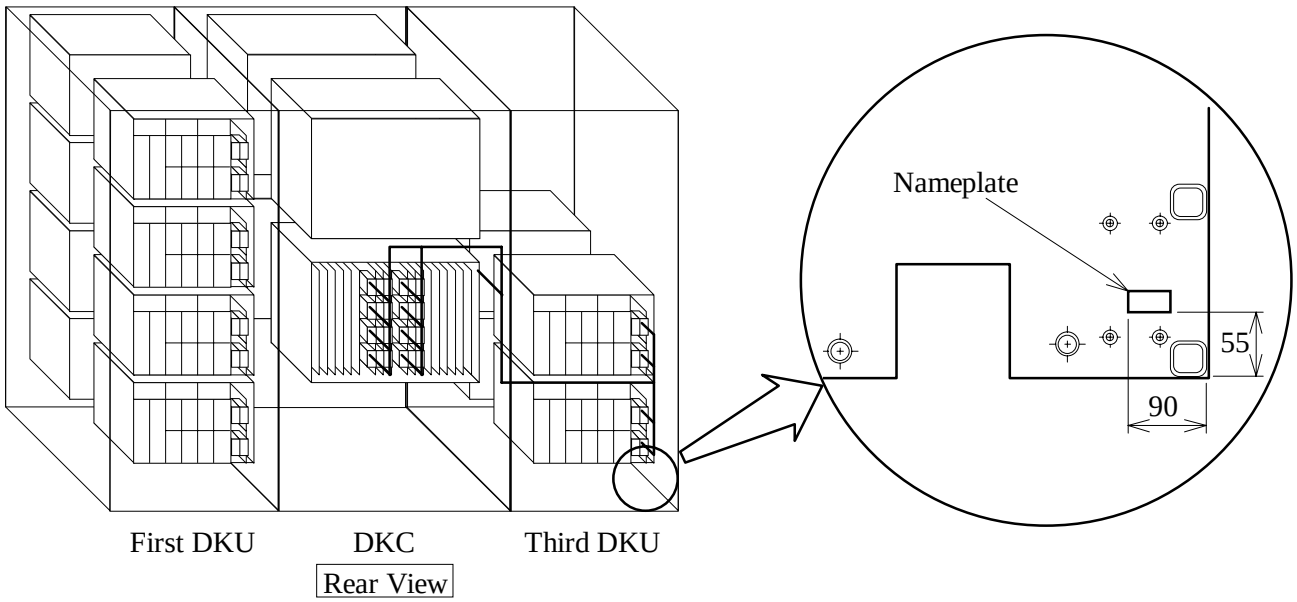

Fig. 4.3.1.3-4 De-installation of nameplate

g. Return to General Flow
Non-Disruptive De-Installation : Go to INST02-32 step (5)-7.
Disruptive De-Installation : Go to INST02-53 step (12)-5.

2. Removal of the SCSI Interface Cables (After removal of Third DKU(DKU305-14))
a. Loosen the two screws and remove the cable duct cover.

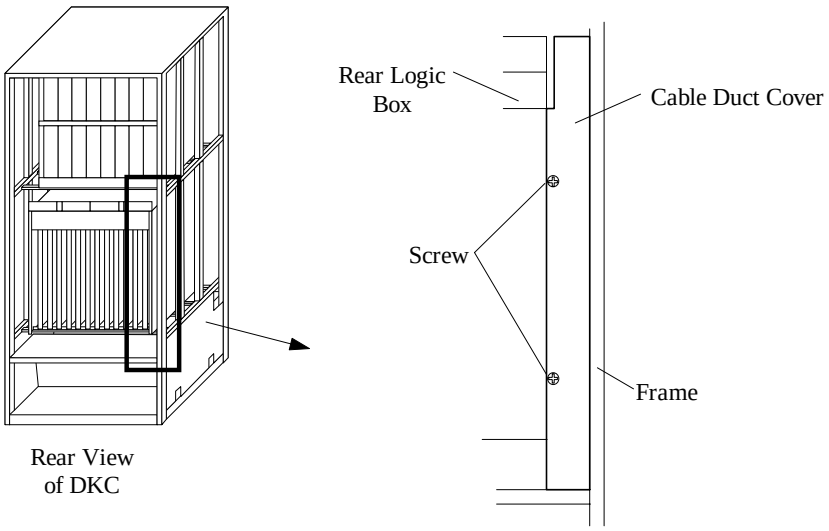

Fig. 4.3.1.3-5 Removal of Cable Duct Cover

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b. Refer to Fig. 4.3.1.3-6. Remove the four SCSI interface cables listed in Table 4.3.1.3-1 from the DKC.

Table 4.3.1.3-1 Parts List for Additional SCSI Interface Cable

No.	Connector No.		Parts No. (Spare Parts No.)
	Source	Destination	
1	1R▪D1	0U▪P501	2101654-A (5500004-A)
2	1R▪D2	1U▪P501	2101654-C (5500004-C)
3	2R▪K1	0L▪P501	2101654-B (5500004-B)
4	2R▪K2	1L▪P501	2101654-D (5500004-D)

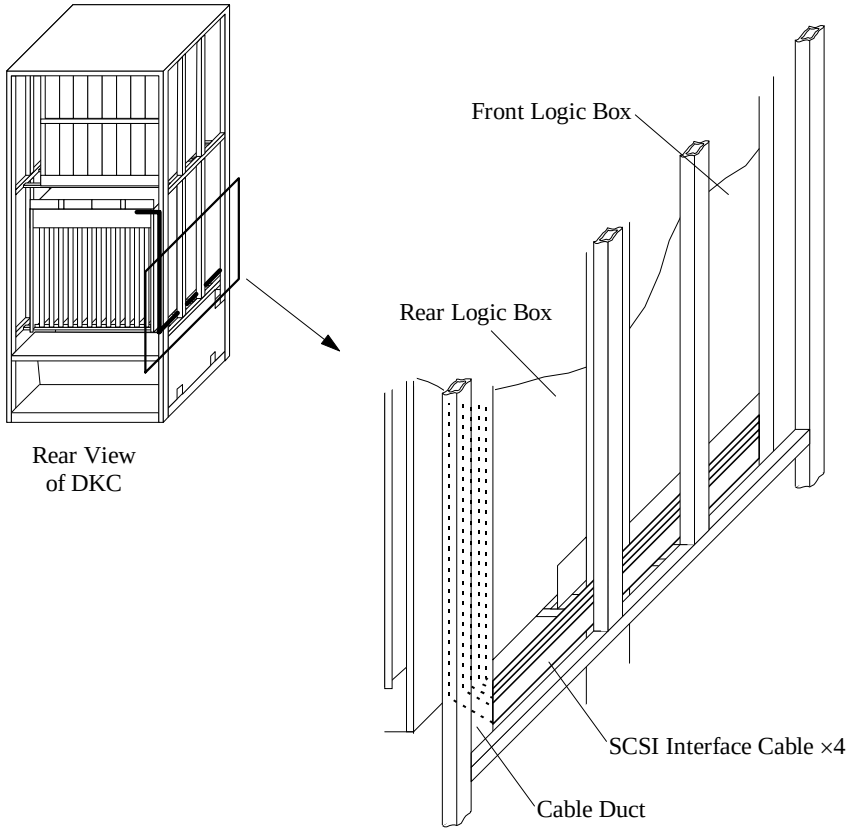

Fig. 4.3.1.3-6 Attachment of SCSI Interface Cable

c. Attach the cable duct cover and fasten the two screws.
d. Replace the Rear Logic Box cover.
e. Close the front and rear doors on the DKC and Third DKU.

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4.3.1.4 Disconnection Procedure of Additional SCSI Interface Cables (In case of HDU-L17 from L14)

1. Disconnection of the SCSI Interface Cables (Before removal of HDU Boxes(DKU-F305I-B4))
   a. Open the front and rear doors from the disk controller and Third Disk Unit.
   b. Remove the Rear Logic Box cover.
   c. Refer to Fig. 4.3.1.4-1. Disconnect the SCSI interface cables from the sub-edges on the disk adapter PCBs that are installed in locations Nos. E and L in the Rear Logic Box.

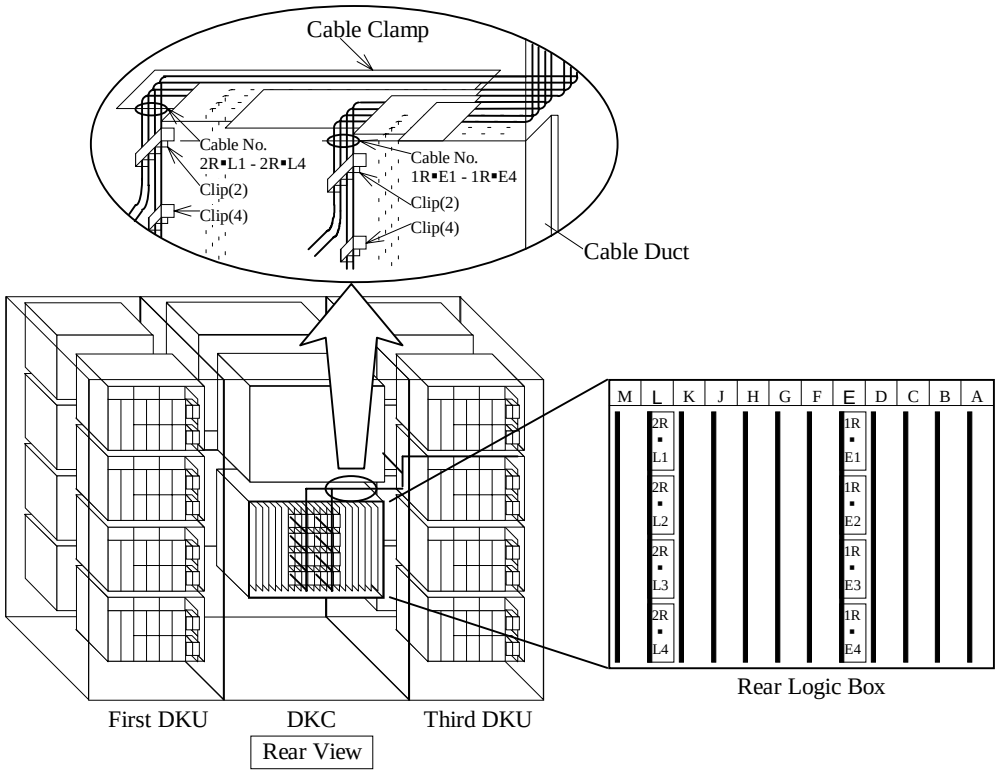

Fig. 4.3.1.4-1 SCSI Interface Cable Disconnecting Diagram (Disk Adapter PCB Side)

   d. Refer to Fig. 4.3.1.4-2 Disconnect the SCSI interface cables from the sub-edges on the SCSI BFR PCBs located in the HDU box.

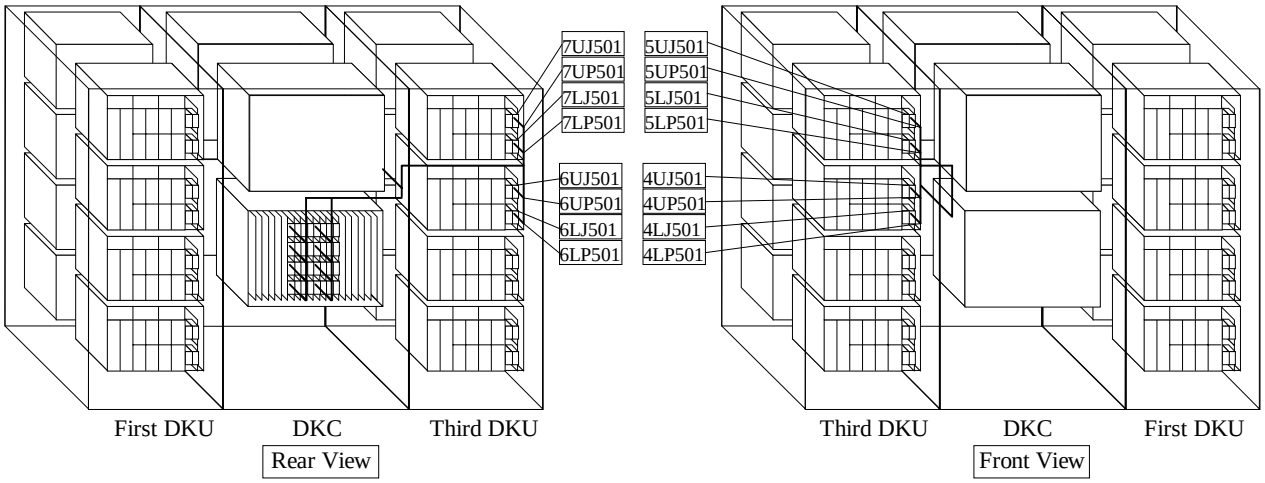

Fig. 4.3.1.4-2 SCSI Interface Cable Disconnecting Diagram (SCSI BFR PCB Side)

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e. Refer to Fig. 4.3.1.4-3. Remove the cable fixing wire and repeat binder that are securing the SCSI interface cables from the cable duct.

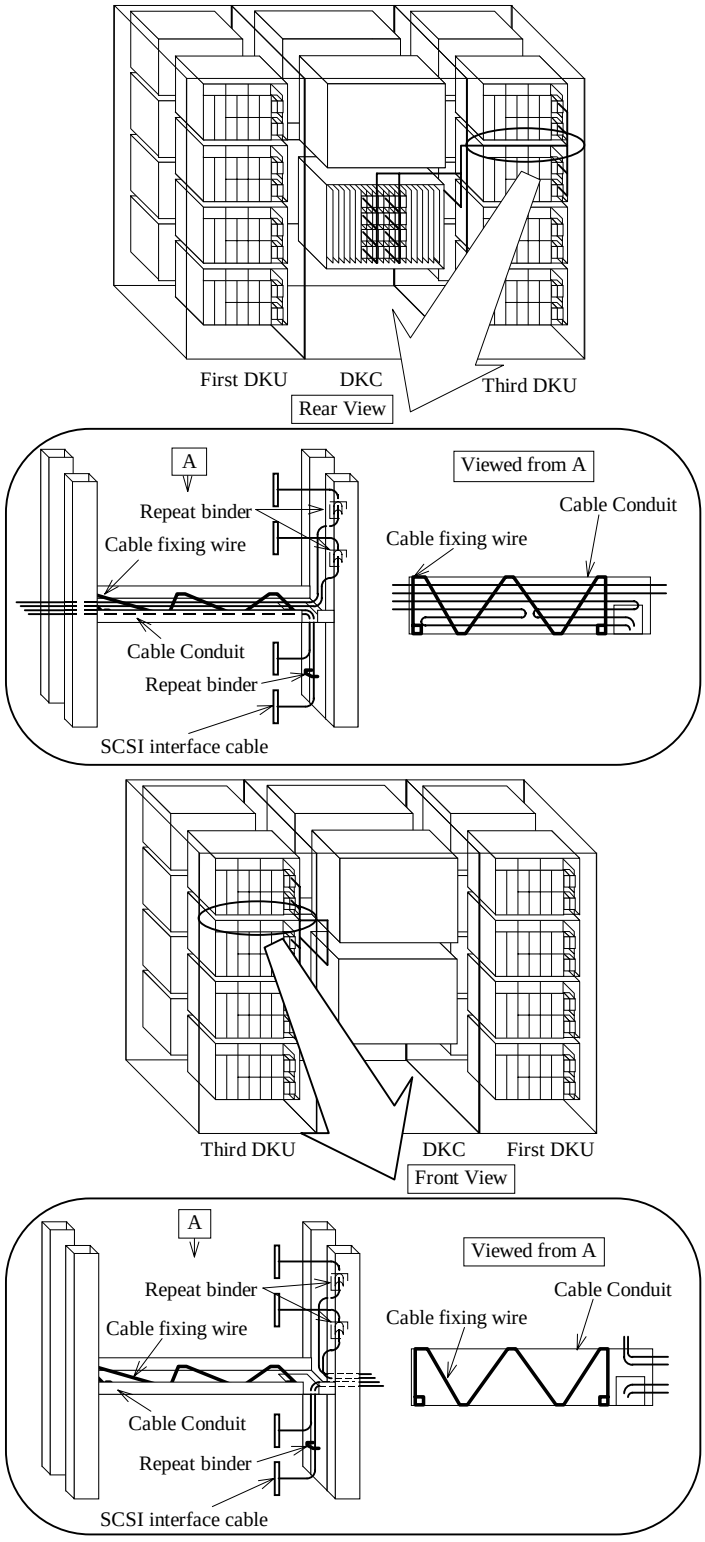

Fig. 4.3.1.4-3 Removal of Cable Clamp

f. Return to General Flow

Non-Disruptive De-Installation : Go to INST02-31 step (4)-6.
Disruptive De-Installation : Go to INST02-52 step (11)-5.

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2. Removal of the SCSI Interface Cables (After removal of HDU Boxes(DKU-F305I-B4))
a. Refer to Fig. 4.3.1.4-4 Loosen the two screws and remove the cable duct cover.

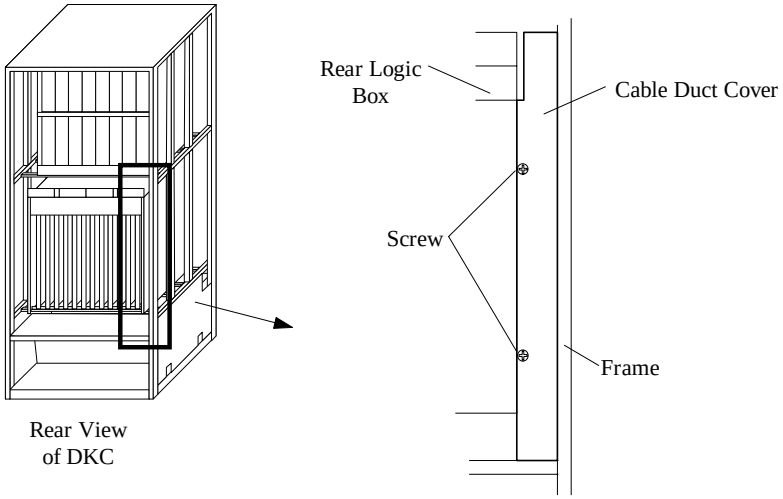

Fig. 4.3.1.4-4 Removal of Cable Duct Cover

b. Refer to Fig. 4.3.1.4-5. Remove the four SCSI interface cables listed in Table 4.3.1.4-1 from the DKC.

Table 4.3.1.4-1 Parts List for Additional SCSI Interface Cable

No.	Connector No.		Parts No. (Spare Parts No.)
	Source	Destination	
1	1R▪E1	4U▪P501	2101654-J (5500004-J)
2	1R▪E2	5U▪P501	2101654-L (5500004-L)
3	2R▪L1	4L▪P501	2101654-K (5500004-K)
4	2R▪L2	5L▪P501	2101654-M (5500004-M)

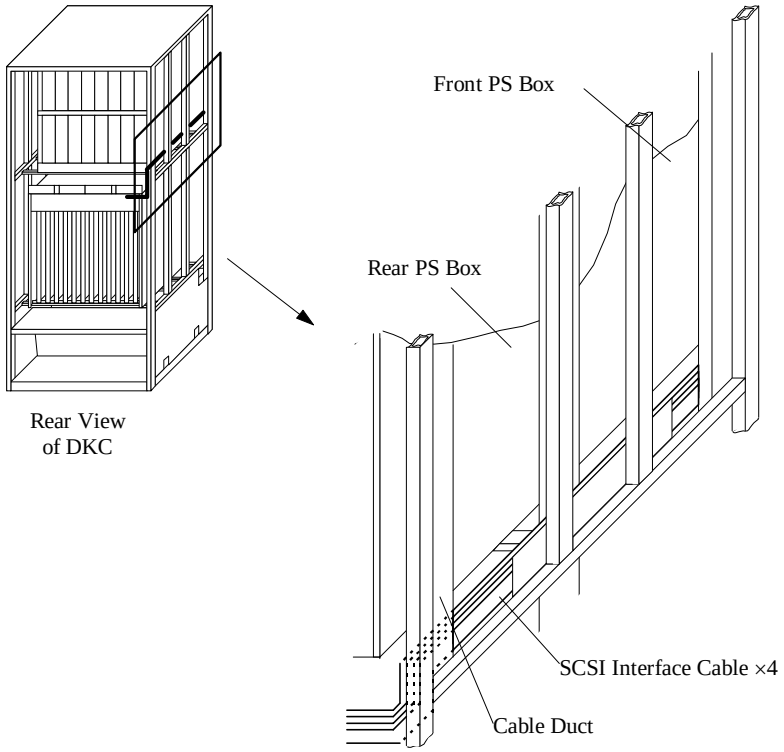

Fig. 4.3.1.4-5 Attachment of SCSI Interface Cables

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c. Attach the cable duct cover and fasten the two screws.
d. Refer to Fig. 4.3.1.4-6. Secure the 8 SCSI interface cables that removed inside the First Disk Unit with the tie wraps.

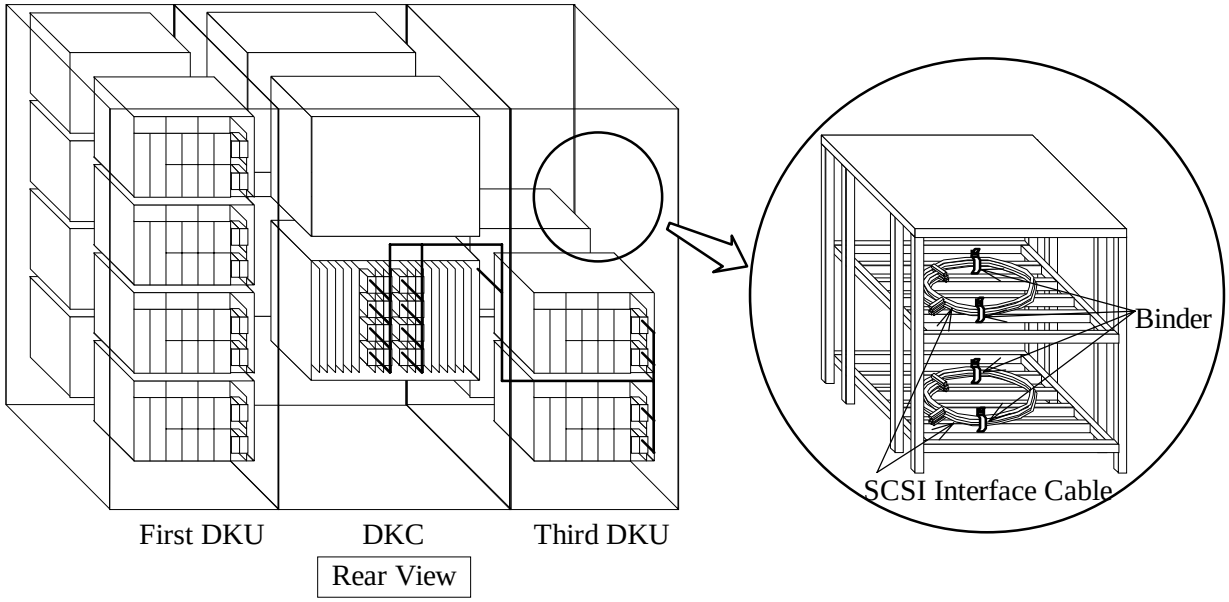

Fig. 4.3.1.4-6 Fixing of SCSI Interface Cables

d. Replace the Rear Logic Box cover.
e. Close the front and rear doors on the DKC and Third DKU.

f. Return to General Flow.
Non-Disruptive De-installation : Go to INST02-32 Step (5).
Disruptive De-installation : Go to INST02-53 Step (12).

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4.3.2 Disconnection of Additional SCSI Interface Cables (DKU-F305I-24C)

4.3.2.1 Flowchart

The disconnection procedure of the extension SCSI interface cables (DKU-F305I-24C) is shown below. You must perform the operations actually after referring to the details of the procedure. When connecting the SCSI interface cable with disk subsystem inactive, you don't have to check Shut Down LED on the SCSI BFR PCB and blocking/restoring both DKA PCB and SCSI BFR PCB through SVP.

1. Disconnection Procedure of SCSI Interface Cables between First (HDU-R10-R13) and Second DKU (HDU-R20-R23) ..... Chassises [INST04-420]
2. Disconnection Procedure of SCSI Interface Cables between First (HDU-R14-R17) and Second DKU (HDU-R24-R27) ..... Chassises [INST04-430]
3. Disconnection Procedure of SCSI Interface Cables between Third (HDU-L10-L13) and Fourth DKU (HDU-L20-L23) ..... Chassises [INST04-440]
4. Disconnection Procedure of SCSI Interface Cables between Third (HDU-L14-L17) and Fourth DKU (HDU-L24-L27) ..... Chassises [INST04-450]

1. Disconnection Procedure of SCSI Interface Cables between First (HDU-R10-R13) and Second DKU (HDU-R20-R23) Chassises

(1) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis. [INST04-470]

↓

(2) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST04-480]

↓

(3) In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected. [INST04-490]

↓

(4) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis. [INST04-500]

↓

(5) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. [INST04-510]

↓

(6) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the second DKU chassis. [INST04-520]

↓

(7) Remove the SCSI interface cables from inside the DKU chassises. [INST04-540]

↓

(8) Remove the nameplate from the second DKU chassis. [INST04-550]

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2. Disconnection Procedure of SCSI Interface Cables between First (HDU-R14-R17) and Second DKU (HDU-R24-R27) Chassises

(1) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis. [INST04-570]

↓

(2) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST04-580]

↓

(3) In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected. [INST04-590]

↓

(4) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis. [INST04-600]

↓

(5) In the first DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. [INST04-610]

↓

(6) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the second DKU chassis. [INST04-620]

↓

(7) Remove the SCSI interface cables from inside the DKU chassises. [INST04-640]

↓

(8) When the third DKU chassis consists of 4 HDU boxes, fix the disconnected SCSI interface cables in the second DKU chassis. [INST04-650]

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3. Disconnection Procedure of SCSI Interface Cables between Third (HDU-L10-L13) and Fourth DKU (HDU-L20-L23) Chassises

(1) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis. [INST04-670]

↓

(2) In the third DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST04-680]

↓

(3) In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected. [INST04-690]

↓

(4) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis. [INST04-700]

↓

(5) In the third DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. [INST04-710]

↓

(6) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the fourth DKU chassis. [INST04-720]

↓

(7) Remove the SCSI interface cables from inside the DKU chassises. [INST04-740]

↓

(8) Remove the nameplate from the fourth DKU chassis. [INST04-750]

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4. Disconnection Procedure of SCSI Interface Cables between Third (HDU-L14-L17) and Fourth DKU (HDU-L24-L27) Chassises

(1) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis. [INST04-770]

↓

(2) In the third DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. After the restoration is completed, block the SCSI BFR PCBs on the other side using the SVP. [INST04-780]

↓

(3) In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected. [INST04-790]

↓

(4) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis. [INST04-800]

↓

(5) In the third DKU chassis, use the SVP to restore the SCSI BFR PCBs from which the SCSI interface cables are disconnected. [INST04-810]

↓

(6) Disconnect the SCSI interface cables from the SCSI BFR PCBs in the fourth DKU chassis. [INST04-820]

↓

(7) Remove the SCSI interface cables from inside the DKU chassises. [INST04-840]

↓

(8) When the fourth chassis consists of 4 HDU boxes, fix the disconnected SCSI interface cables in the fourth DKU chassis. [INST04-850]

4.3.2.2 Parts List

Table 4.3.2.2-1 Parts List of the SCSI Interface Cable

No.	Model Number	Parts Name	Parts No. (Spare Parts No.)	Quantity	Remarks
1	DKU-F305I-24C	SCSI Interface Cable	2098192-A-R (5487067-A-R)	16	HDU-R20-R27/L20-L27
		DKUMN Cable	3239256-A,B	2	Dynamic 6
		DKUMN Cable	2098190-A,B	2	MRP 100
		Nameplate	2099650-78	1	

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4.3.2.3 Disconnection Procedure of Additional SCSI Interface Cables(In case of HDU-R23 from R20)

1. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs from which the SCSI interface cables are to be disconnected.

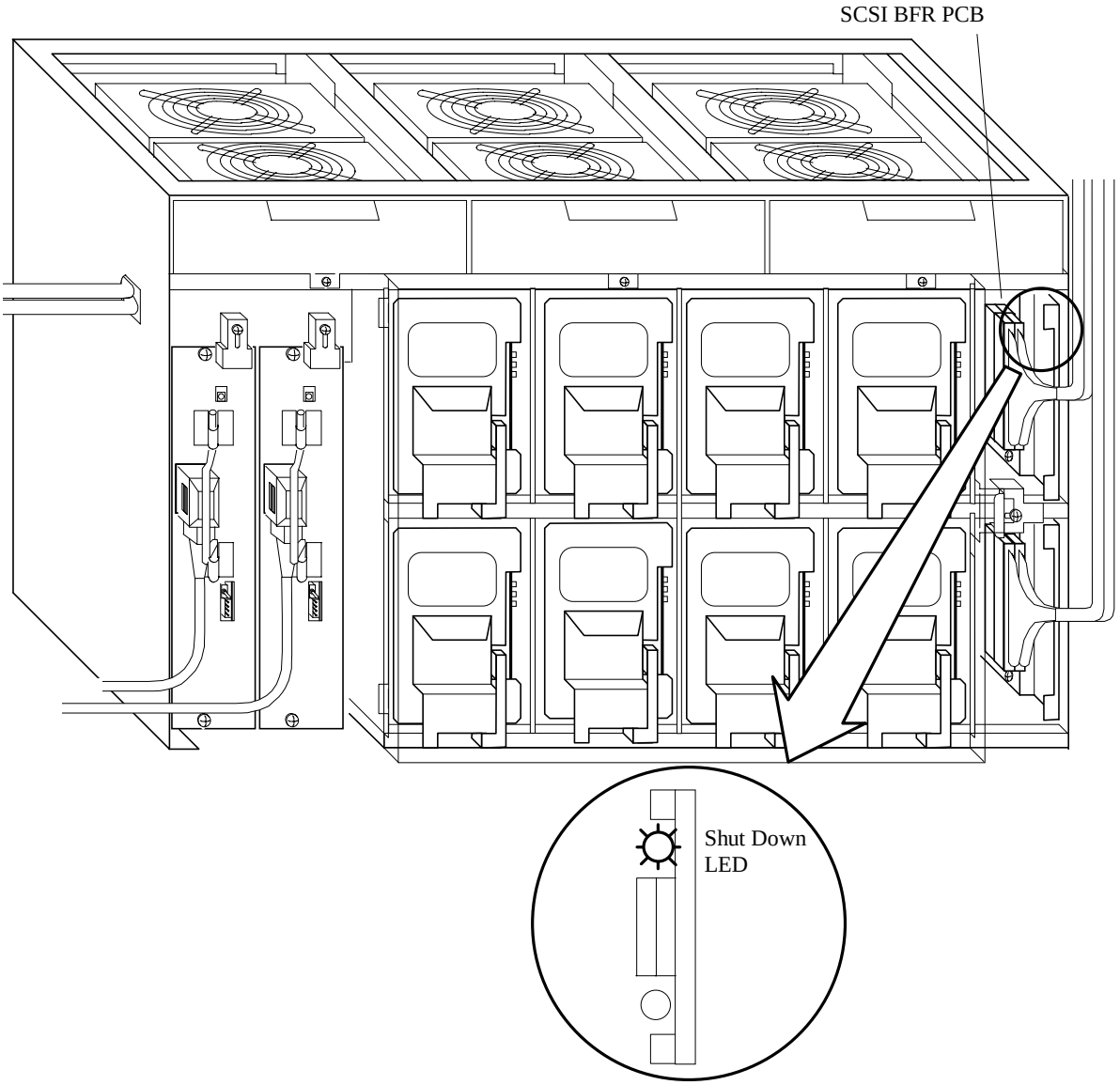

Fig. 4.3.2.3-1 Confirmation of the Shut Down LED Light

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2. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis referring to figures 4.3.2.3-2 and 4.3.2.3-3.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

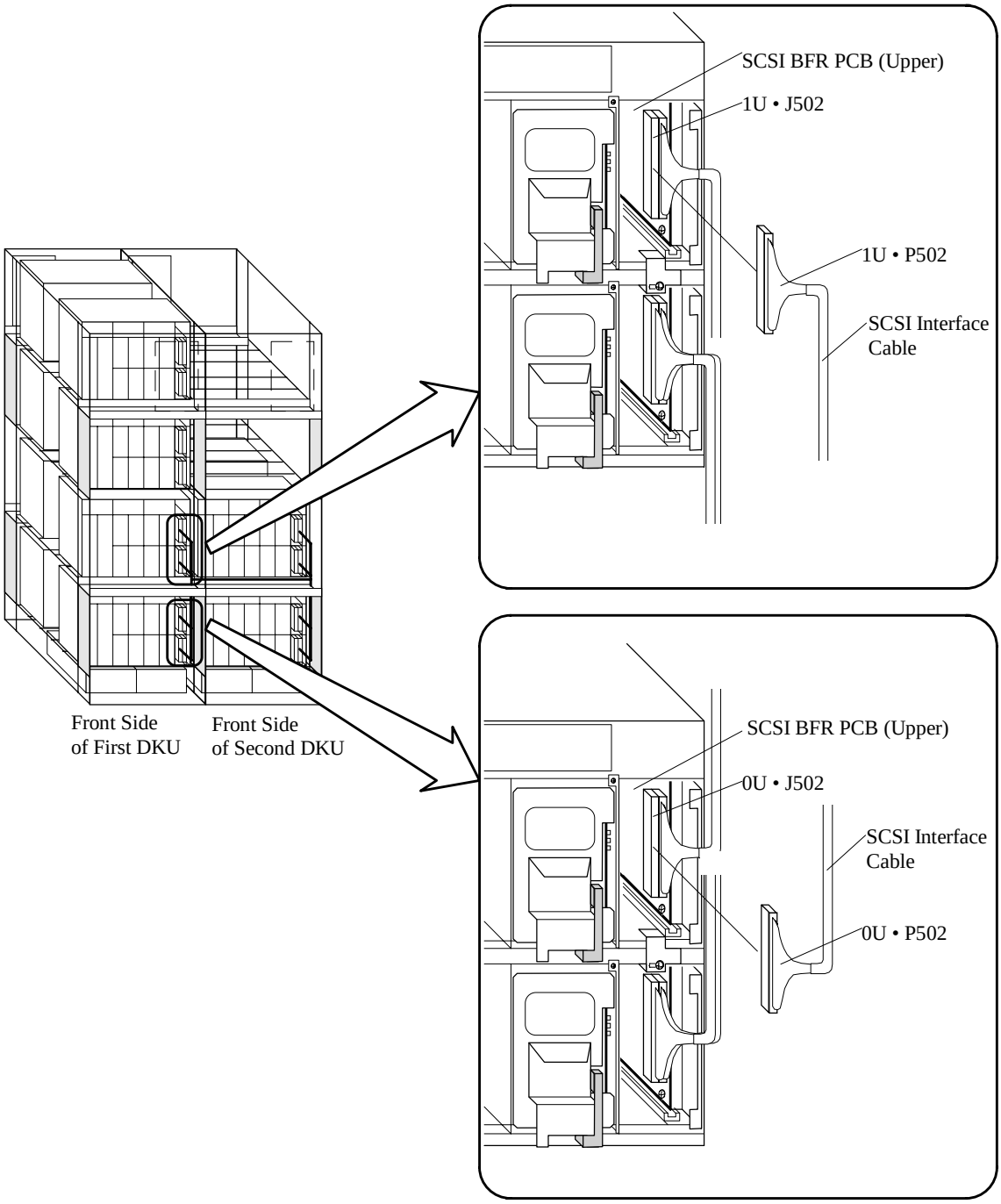

Fig. 4.3.2.3-2 Disconnection of the SCSI Interface Cables

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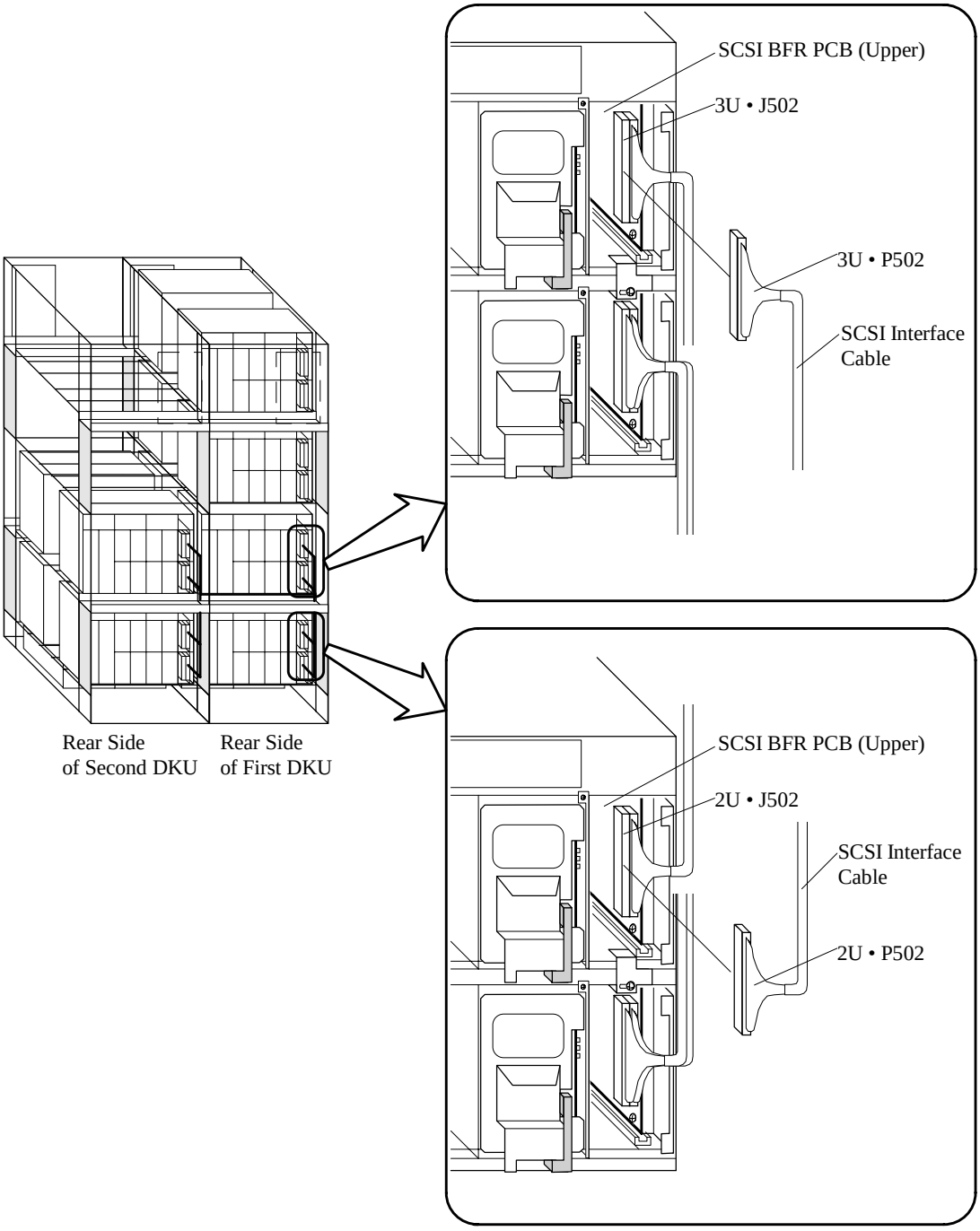

Fig. 4.3.2.3-3 Disconnection of the SCSI Interface Cables

3. Refer to INST02-58③ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-500 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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4. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected.

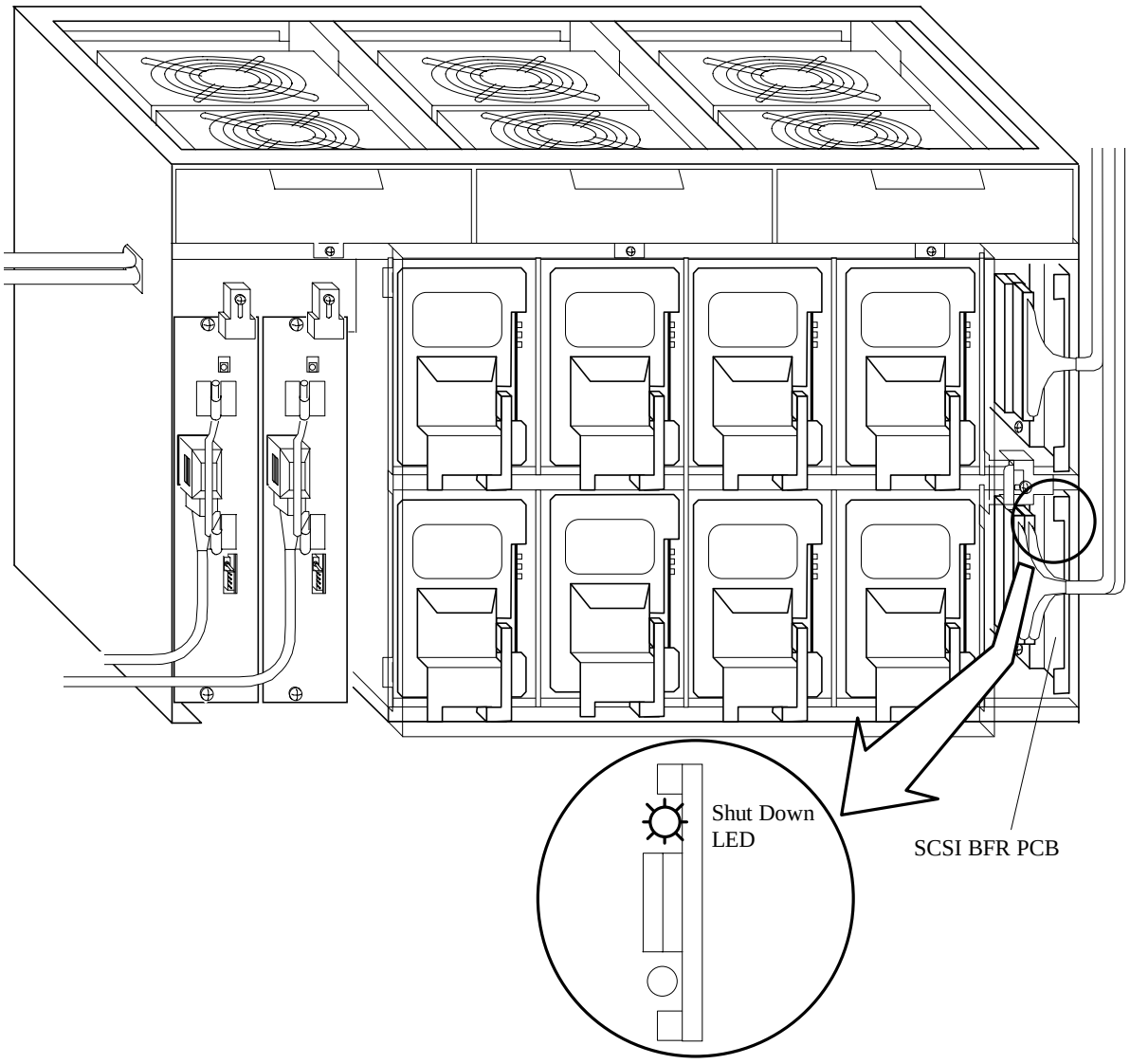

Fig. 4.3.2.3-4 Confirmation of the Shut Down LED Light

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5. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis referring to figures 4.3.2.3-5 and 4.3.2.3-6.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

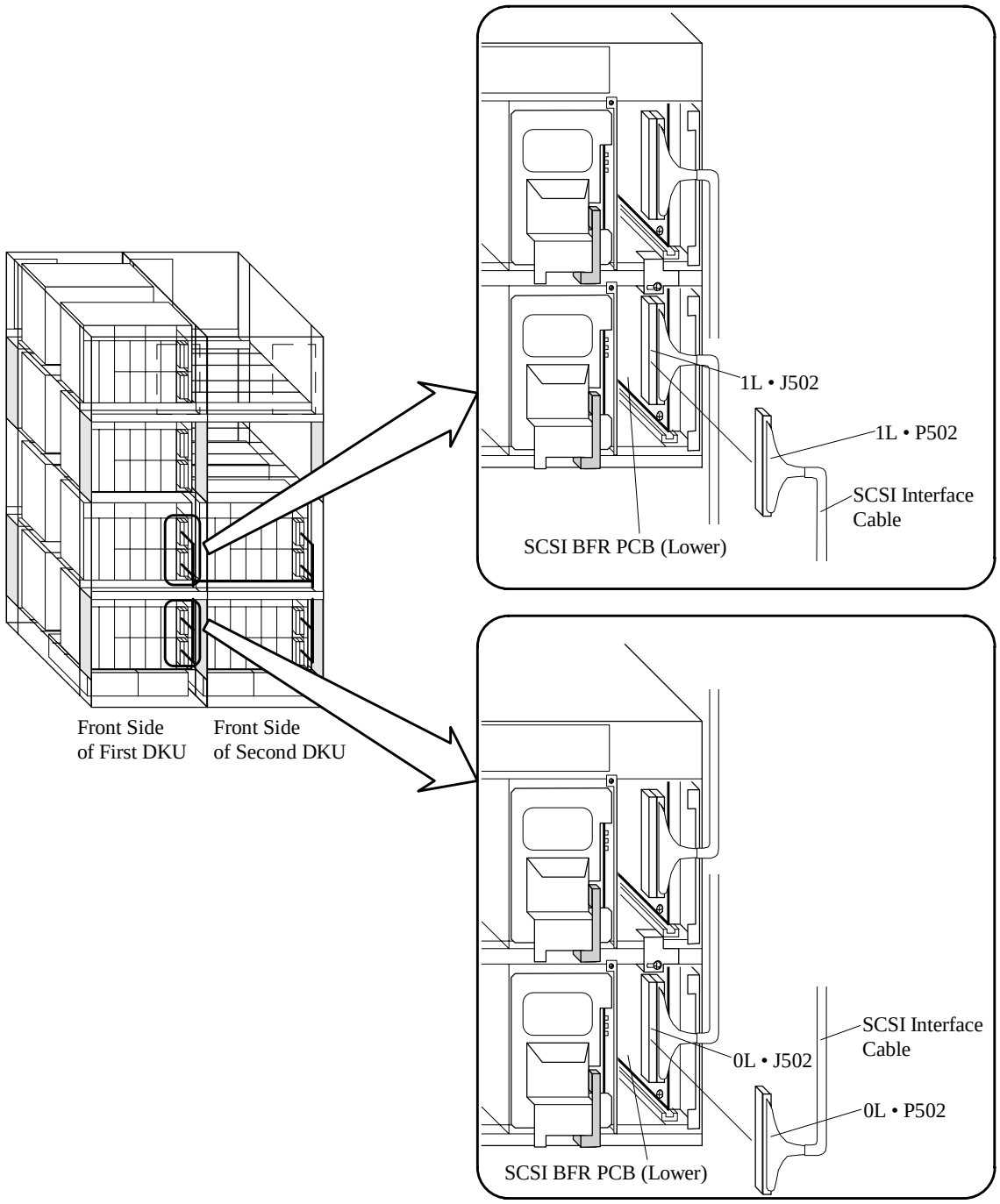

Fig. 4.3.2.3-5 Disconnection of the SCSI Interface Cables

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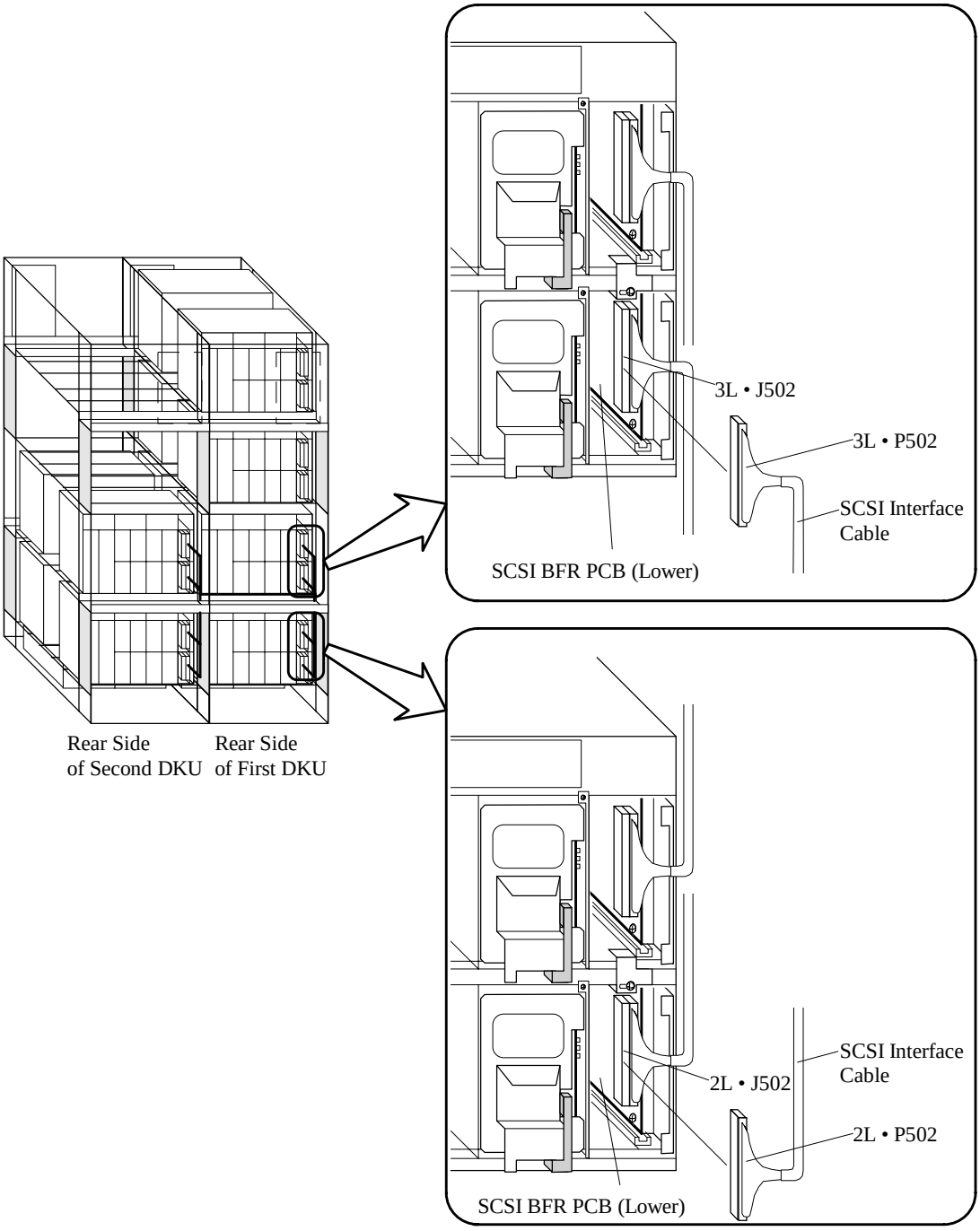

Fig. 4.3.2.3-6 Disconnection of the SCSI Interface Cables

6. Refer to INST02-59⑤ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-520 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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7. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the second DKU chassis referring to figures 4.3.2.3-7 and 4.3.2.3-8.

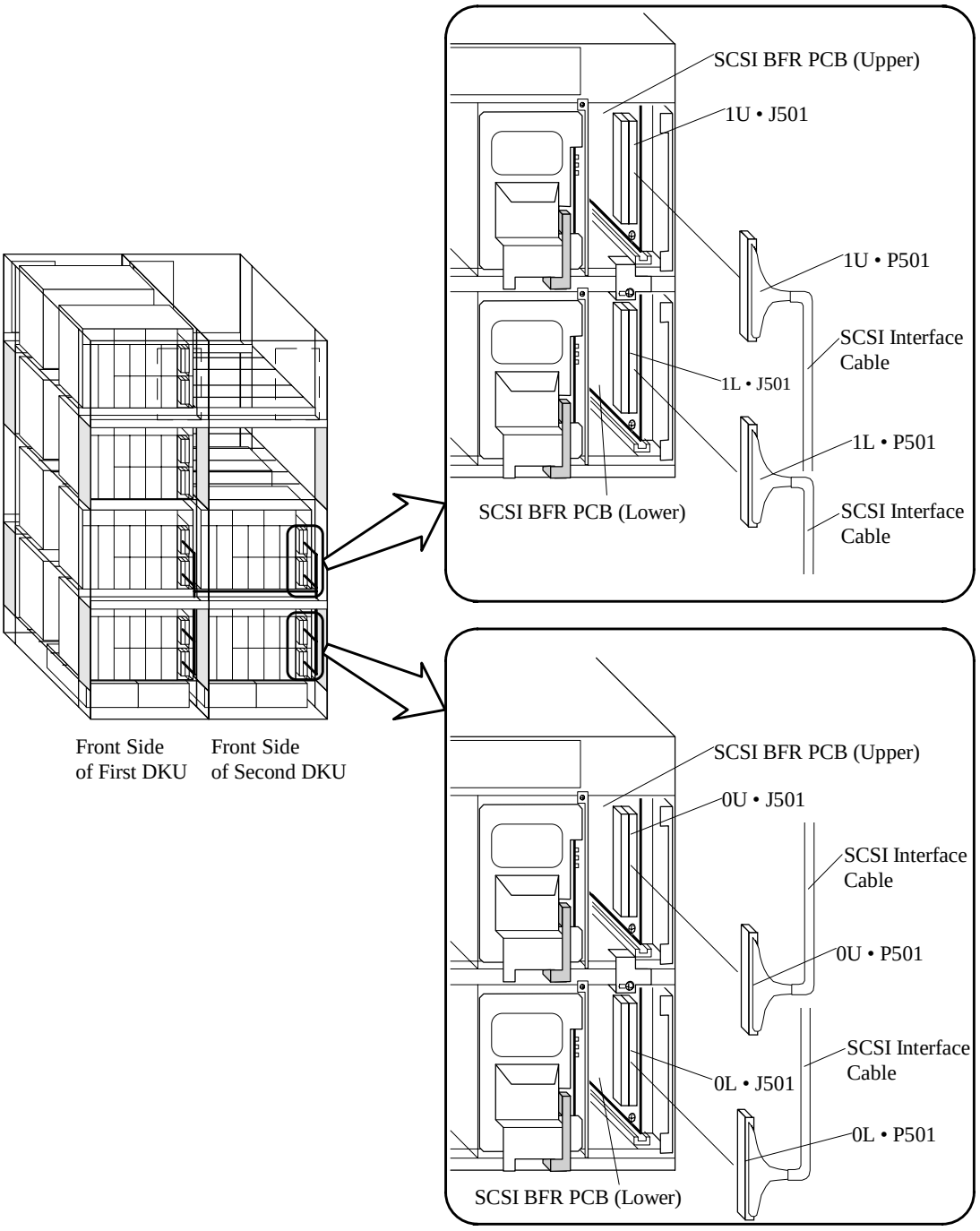

Fig. 4.3.2.3-7 Disconnection of the SCSI Interface Cables

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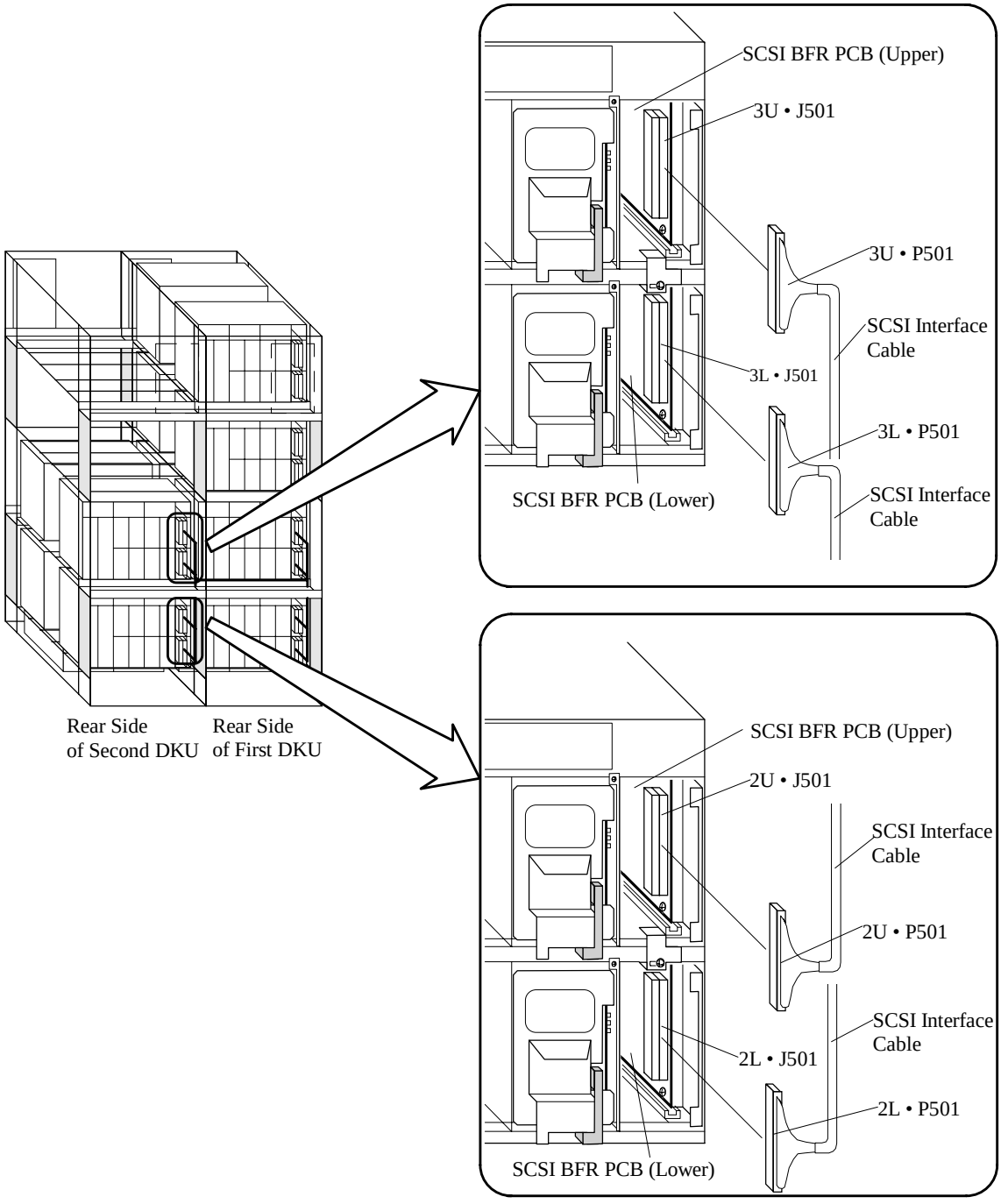

Fig. 4.3.2.3-8 Disconnection of the SCSI Interface Cables

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8. Remove the cable fixing wires and repeat binders and remove the SCSI interface cables from inside the DKU chassises.

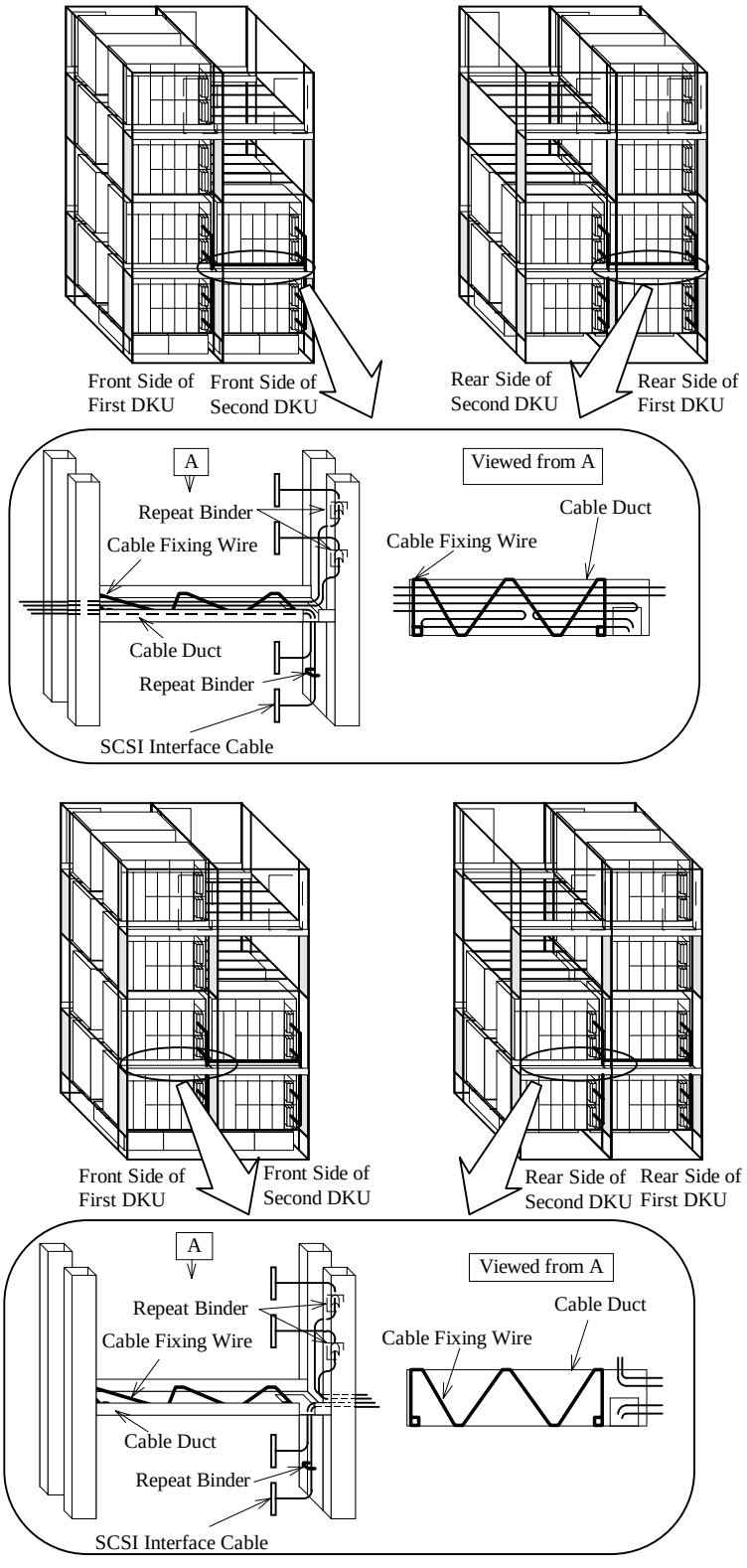

Fig. 4.3.2.3-9 Removal of the SCSI Interface Cables

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9. Remove the nameplate from the second DKU chassis.

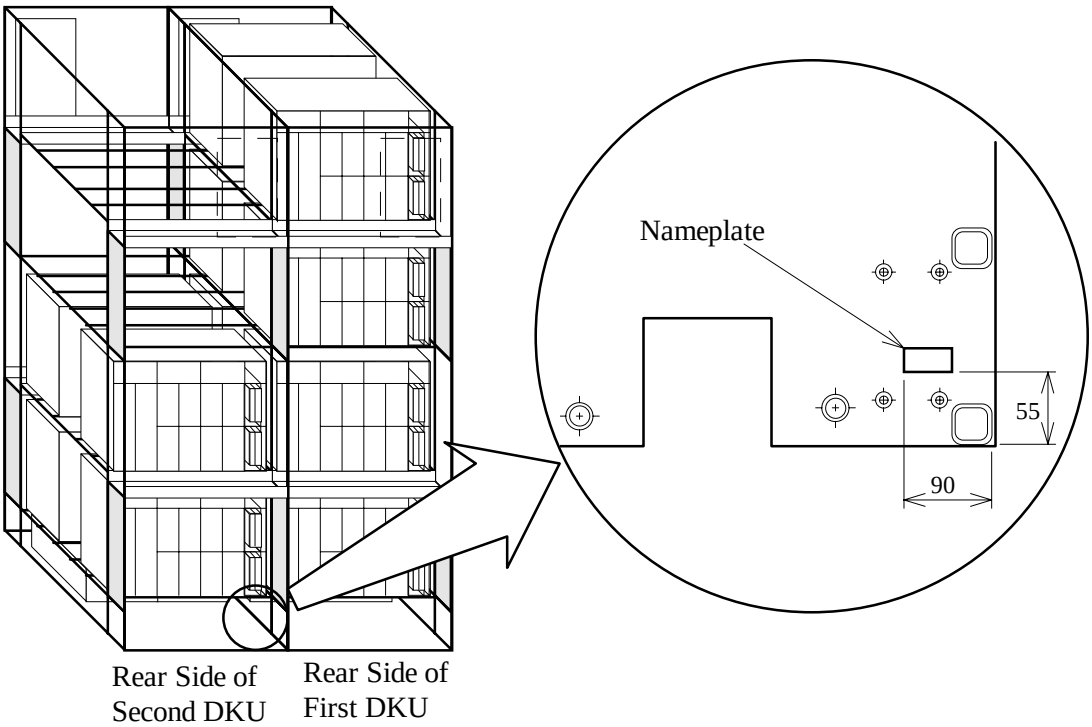

Fig. 4.3.2.3-10 Removal of the Nameplate

10. Go to INST02-59 Step ⑦.

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4.3.2.4 Disconnection Procedure of Additional SCSI Interface Cables(In case of HDU-R27 from R24)

1. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs from which the SCSI interface cables are to be disconnected.

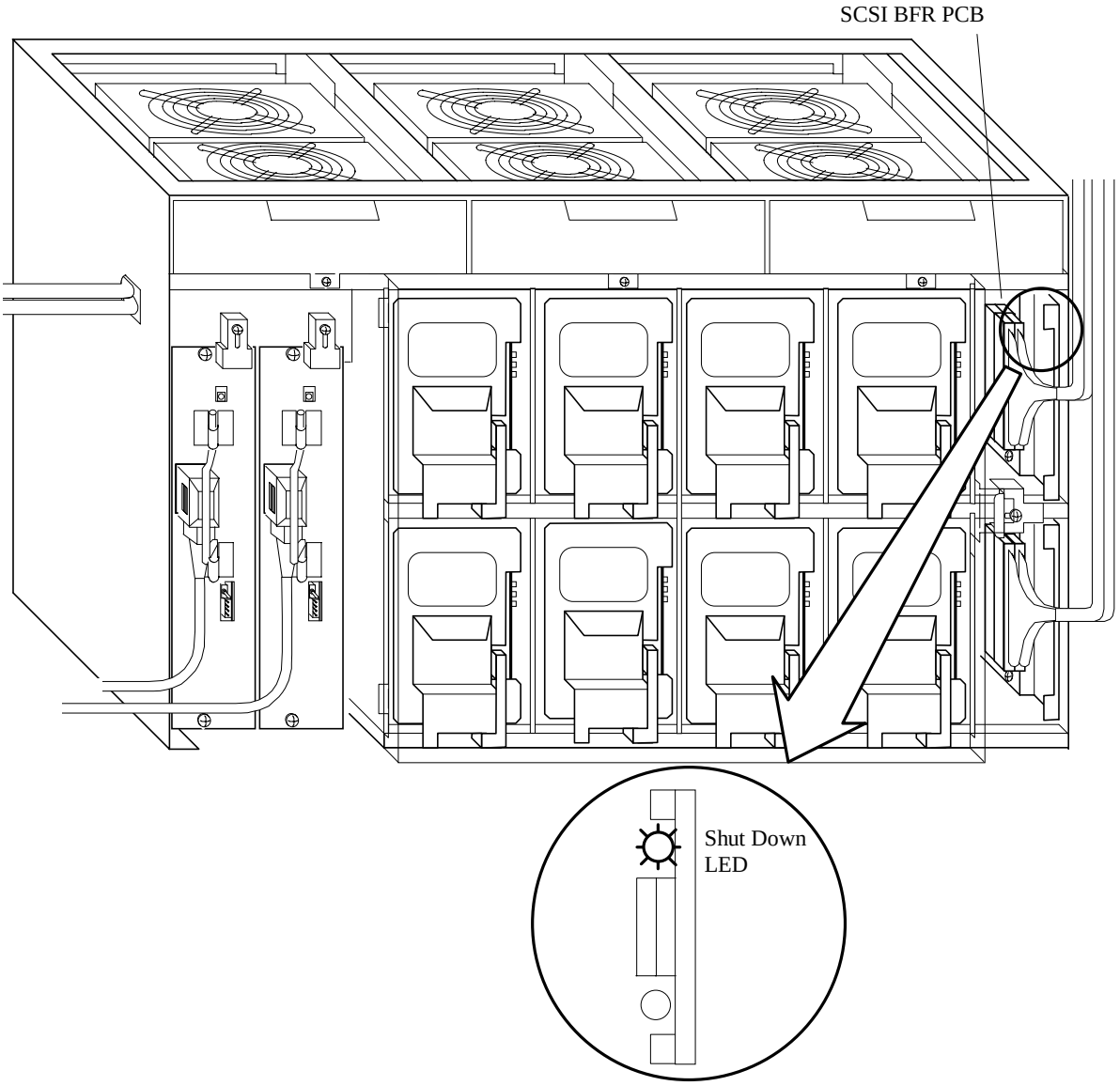

Fig. 4.3.2.4-1 Confirmation of the Shut Down LED Light

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2. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis referring to figures 4.3.2.4-2 and 4.3.2.4-3.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

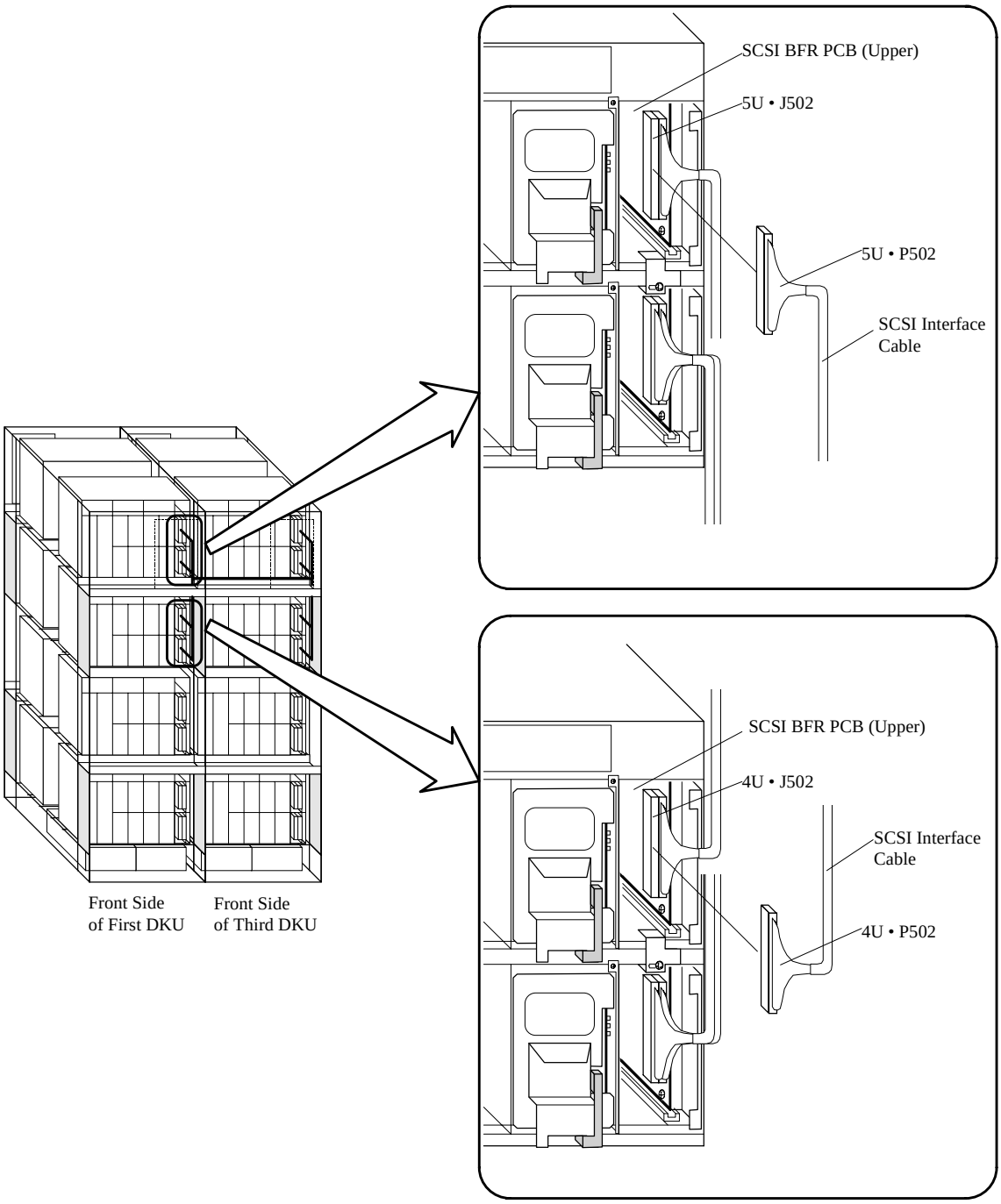

Fig. 4.3.2.4-2 Disconnection of the SCSI Interface Cables

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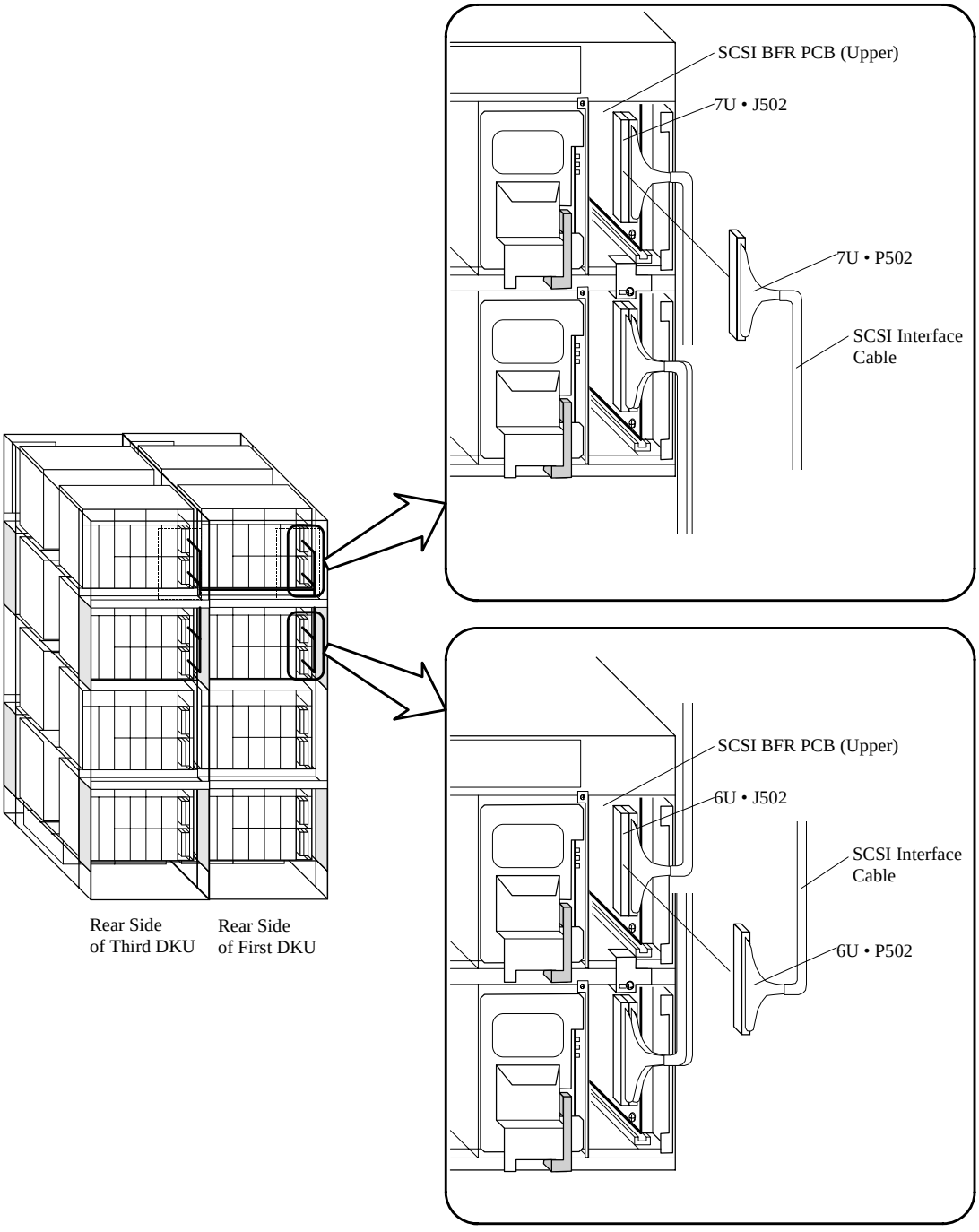

Fig. 4.3.2.4-3 Disconnection of the SCSI Interface Cables

3. Refer to INST02-58③ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-600 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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4. In the first DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected.

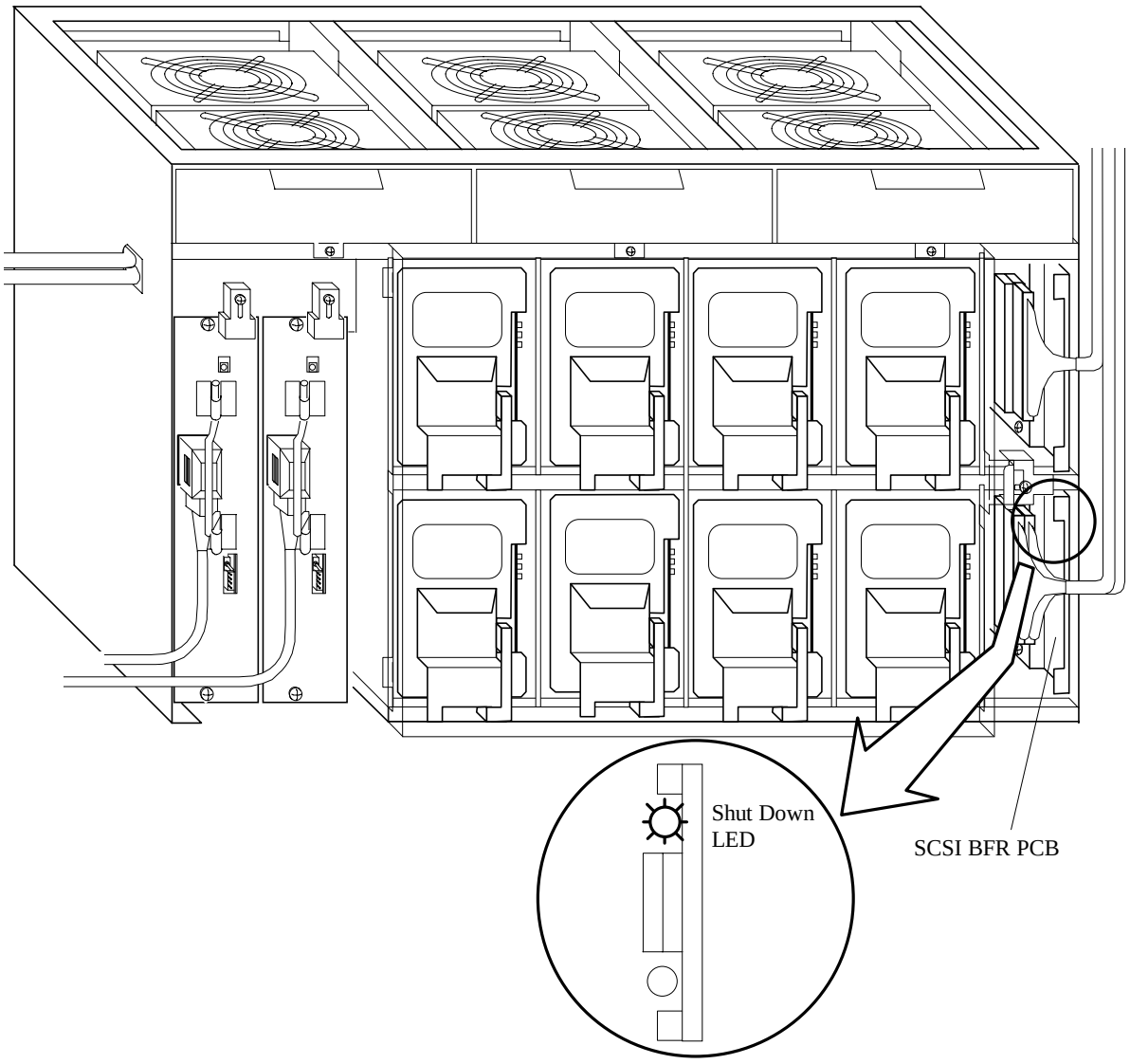

Fig. 4.3.2.4-4 Confirmation of the Shut Down LED Light

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5. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the first DKU chassis referring to figures 4.3.2.4-5 and 4.3.2.4-6.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

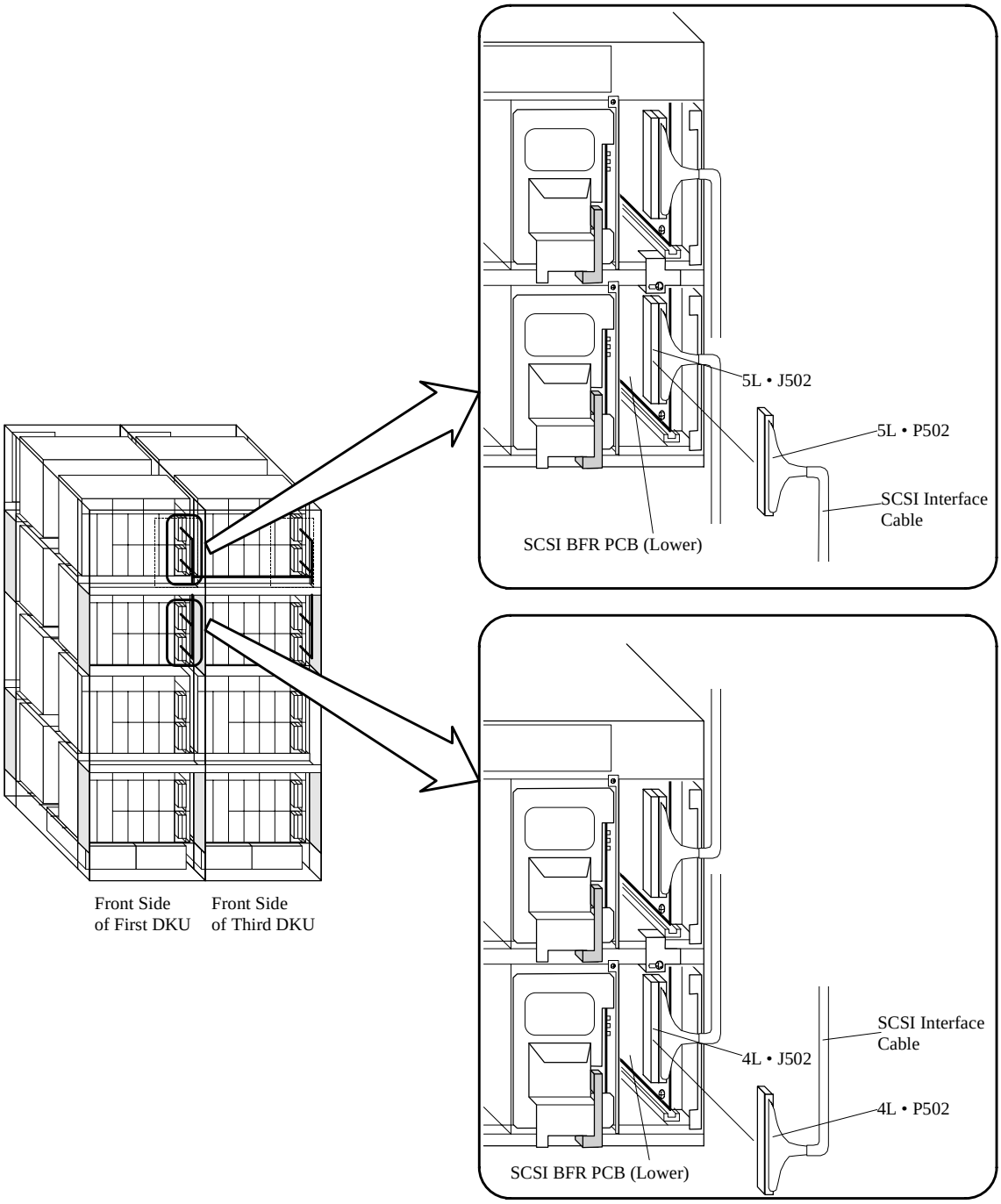

Fig. 4.3.2.4-5 Disconnection of the SCSI Interface Cables

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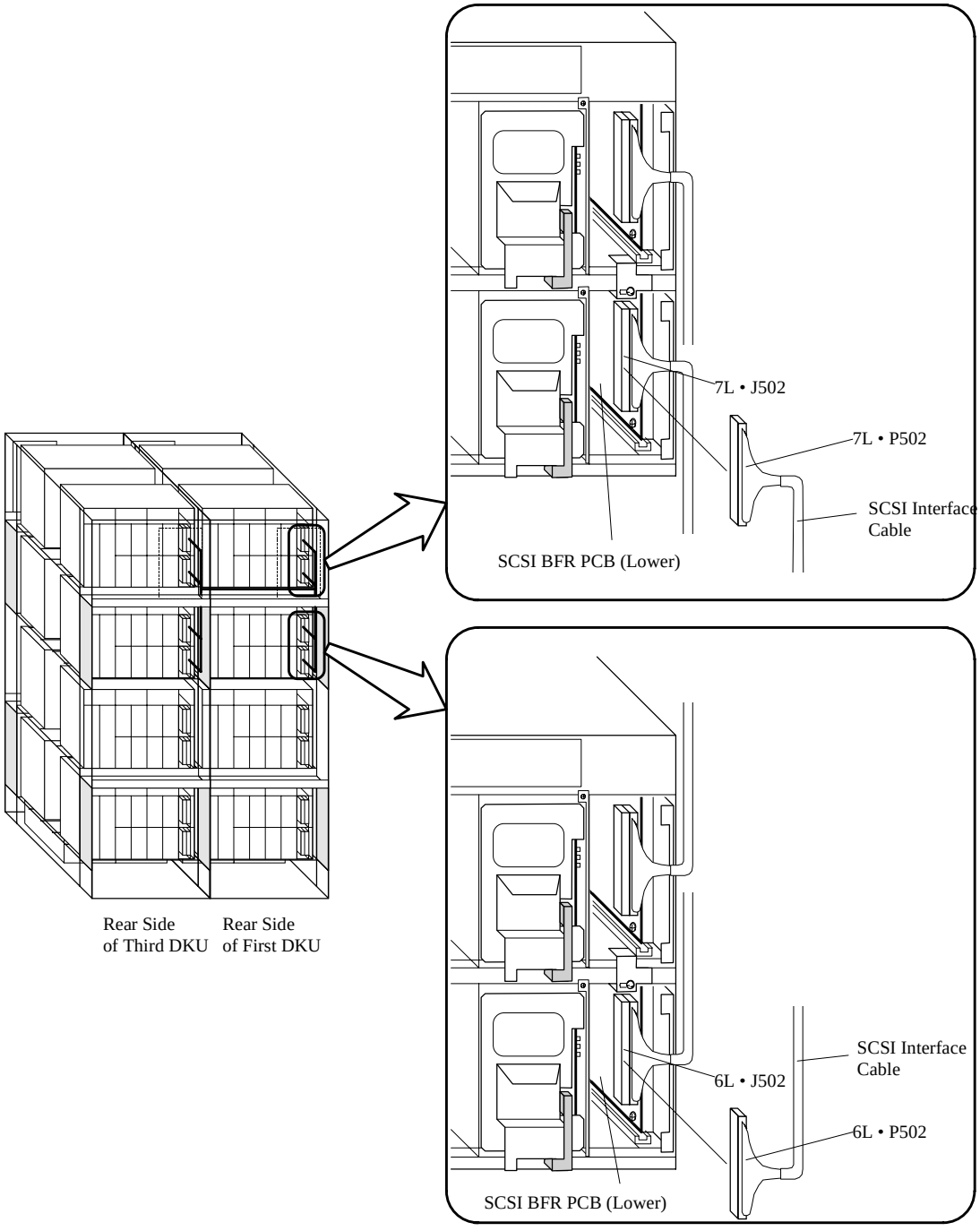

Fig. 4.3.2.4-6 Disconnection of the SCSI Interface Cables

6. Refer to INST02-59⑤ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-620 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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7. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis referring to figures 4.3.2.4-7 and 4.3.2.4-8.

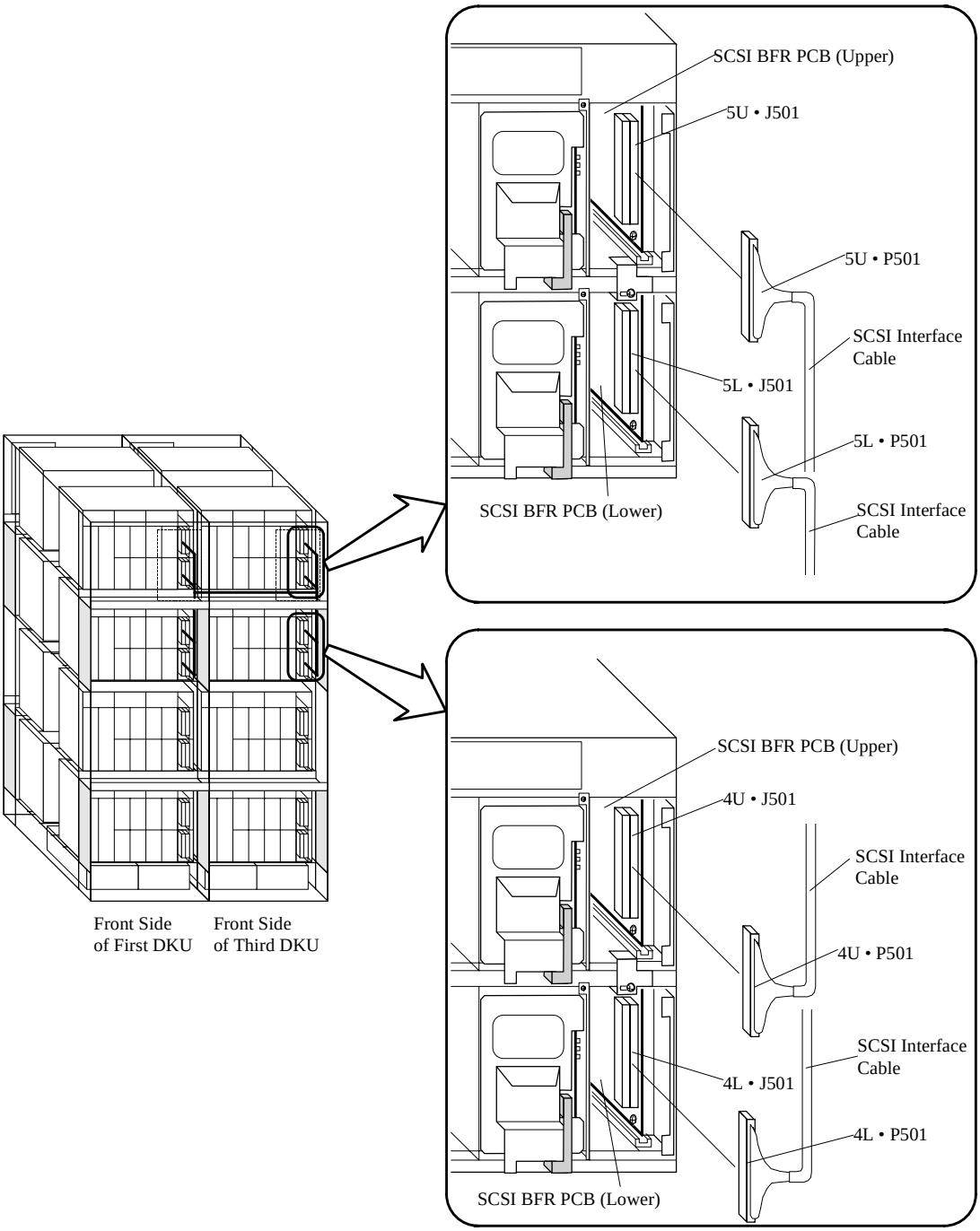

Fig. 4.3.2.4-7 Disconnection of the SCSI Interface Cables

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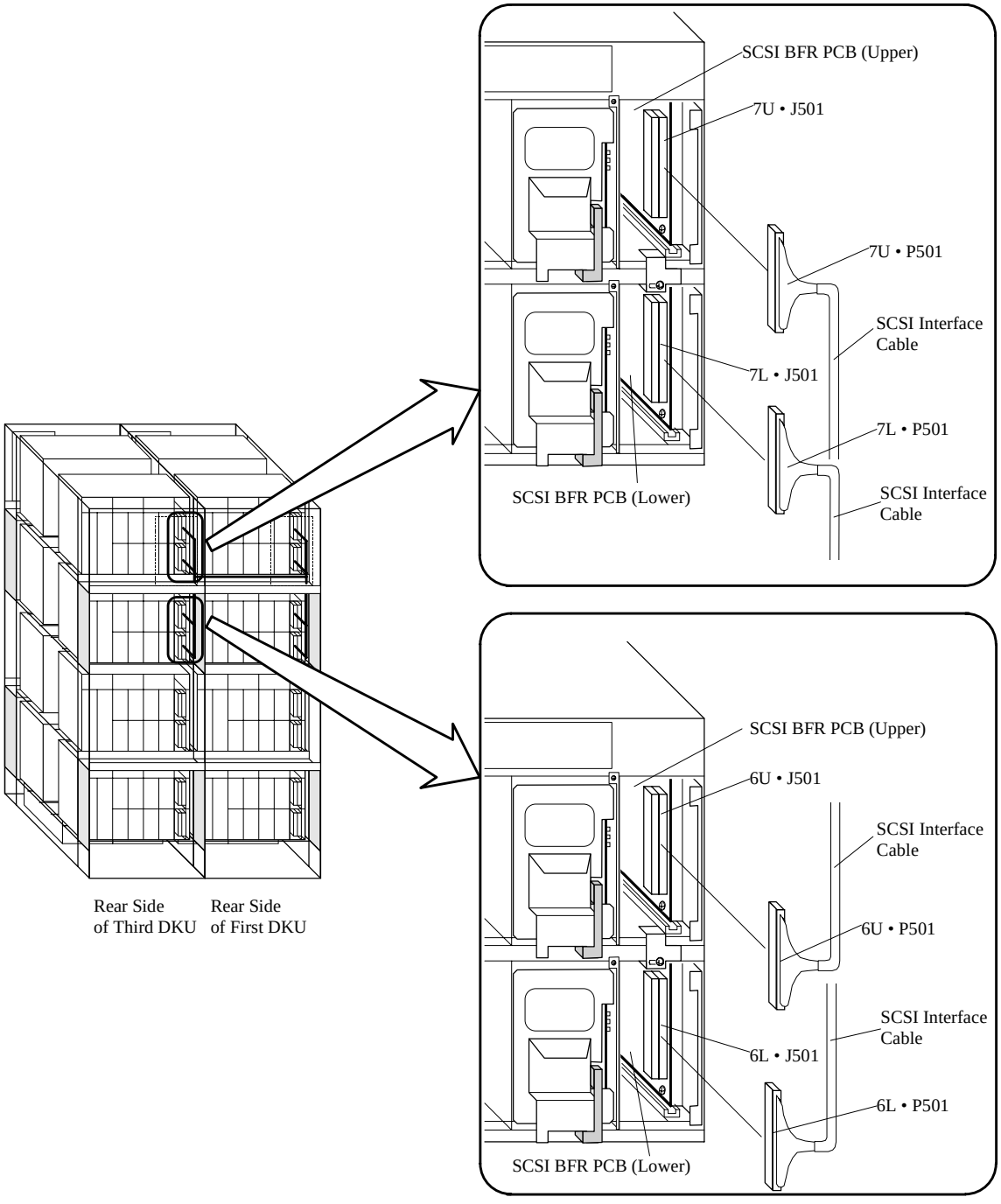

Fig. 4.3.2.4-8 Disconnection of the SCSI Interface Cables

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8. Remove the cable fixing wires and repeat binders and remove the SCSI interface cables from inside the DKU chassises.

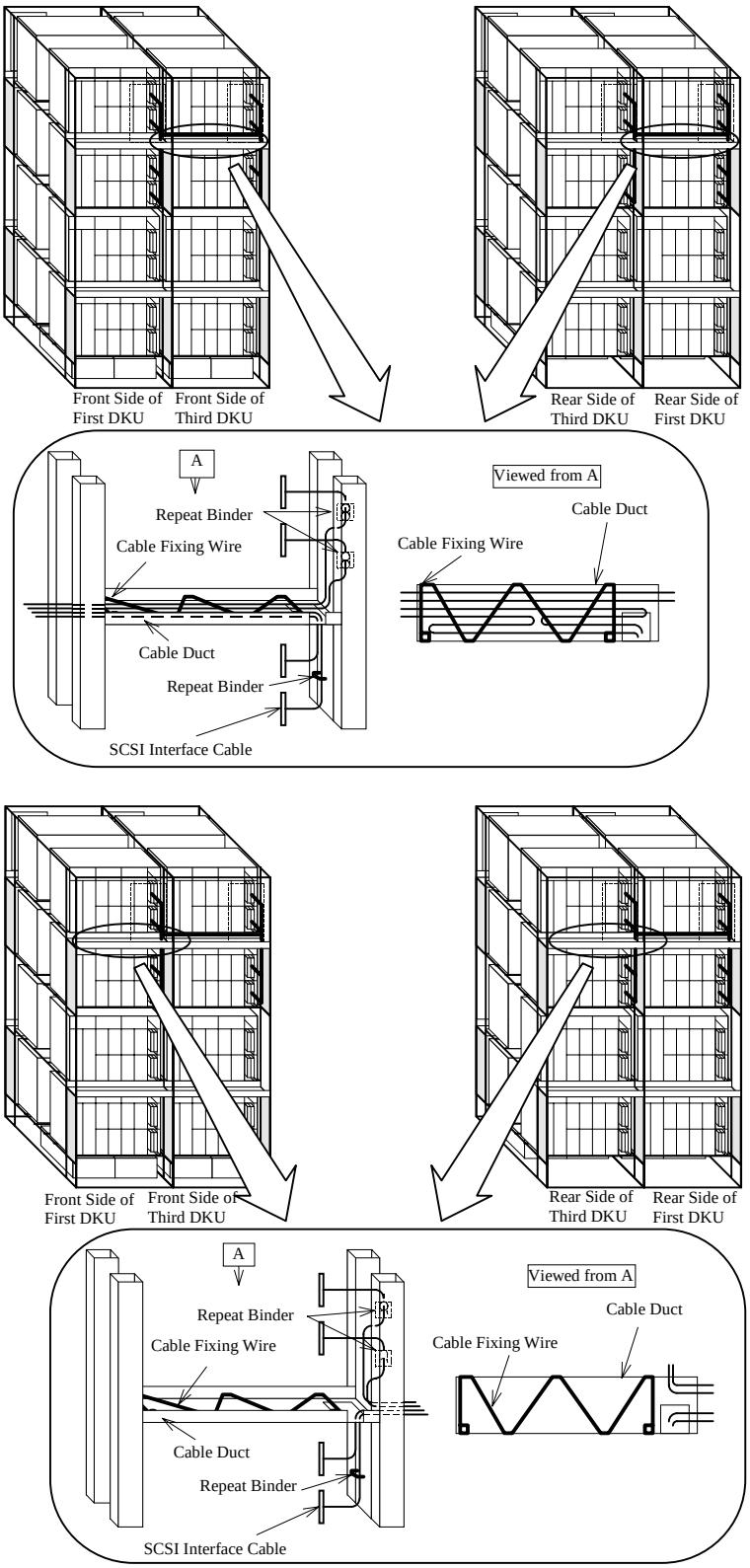

Fig. 4.3.2.4-9 Removal of the SCSI Interface Cables

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9. When the third DKU chassis consists of 4 HDU boxes, fix the disconnected SCSI interface cables in the third DKU chassis with the binders.

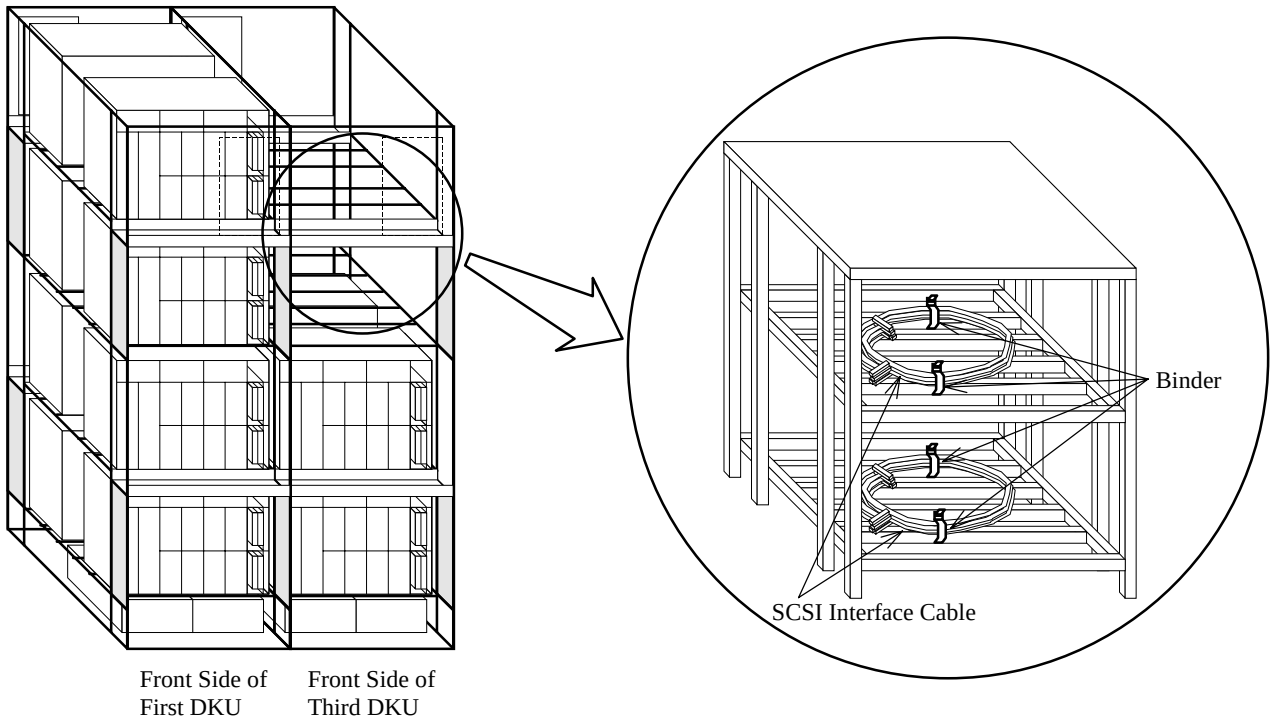

Fig. 4.3.2.4-10 Fixation of the SCSI Interface Cables

10. Go to INST02-59 Step ⑦.

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4.3.2.5 Disconnection Procedure of Additional SCSI Interface Cables(In case of HDU-L23 from L20)

1. In the second DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs from which the SCSI interface cables are to be disconnected.

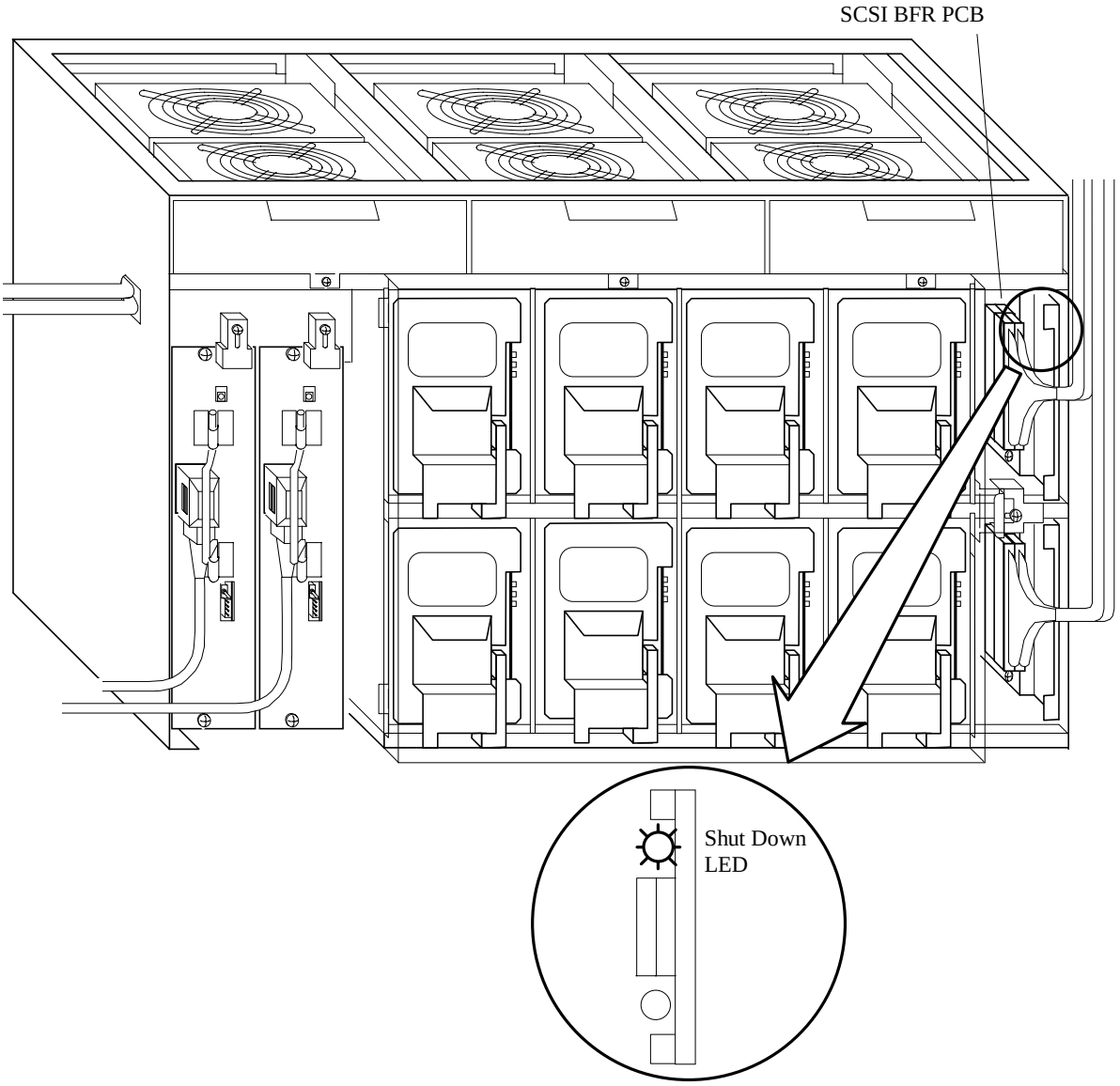

Fig. 4.3.2.5-1 Confirmation of the Shut Down LED Light

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2. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis referring to figures 4.3.2.5-2 and 4.3.2.5-3.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

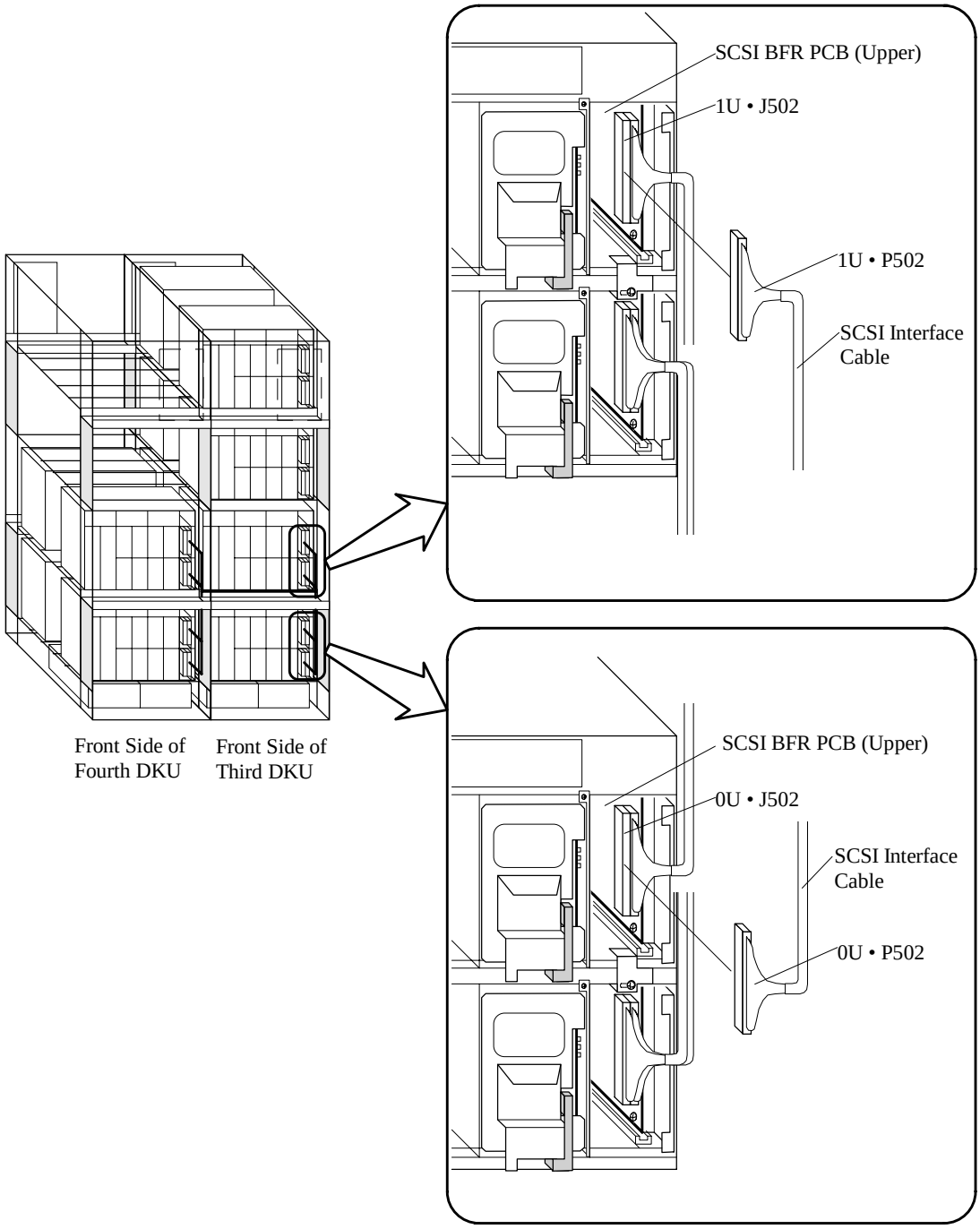

Fig. 4.3.2.5-2 Disconnection of the SCSI Interface Cables

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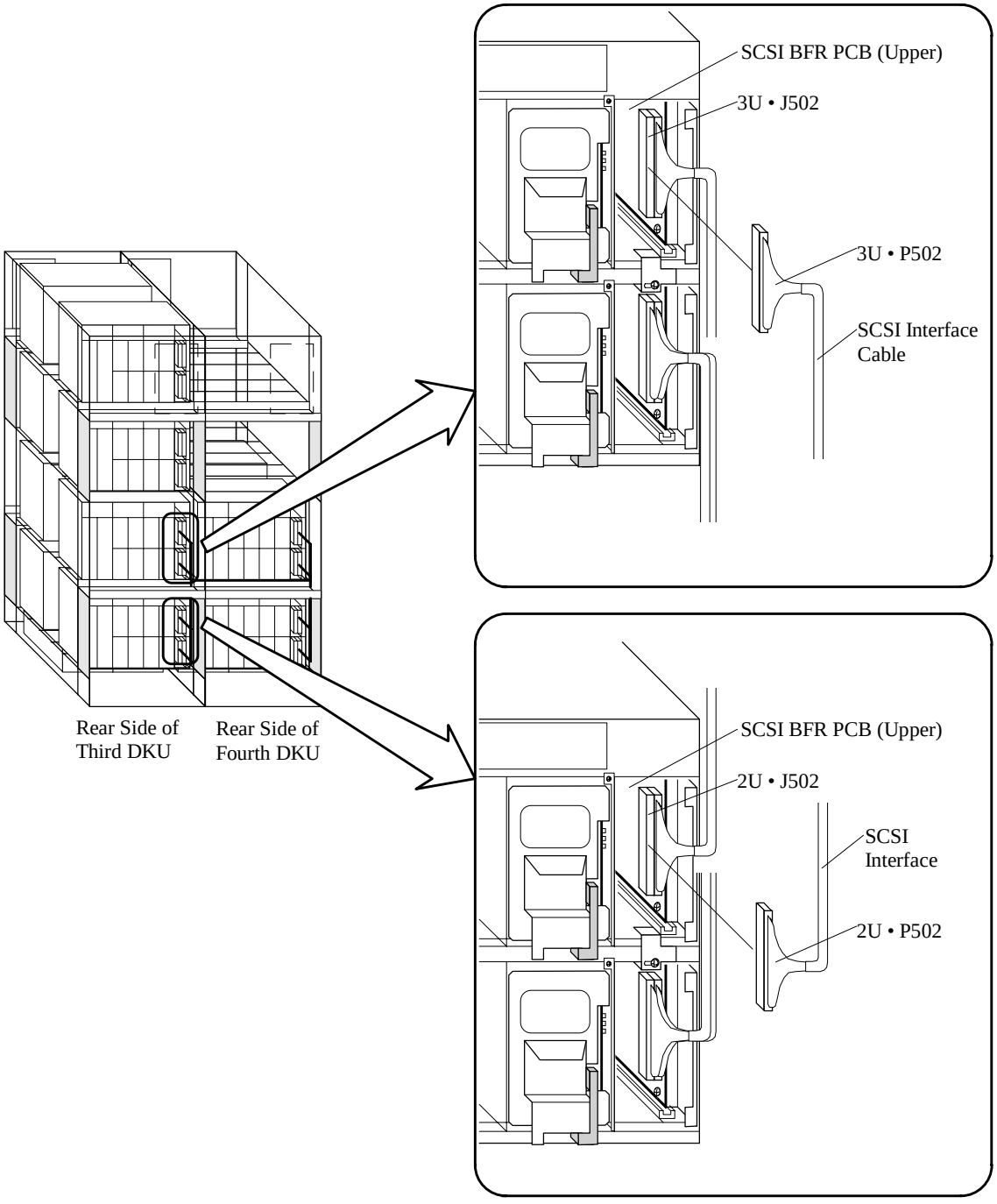

Fig. 4.3.2.5-3 Disconnection of the SCSI Interface Cables

3. Refer to INST02-58③ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-700 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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4. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected.

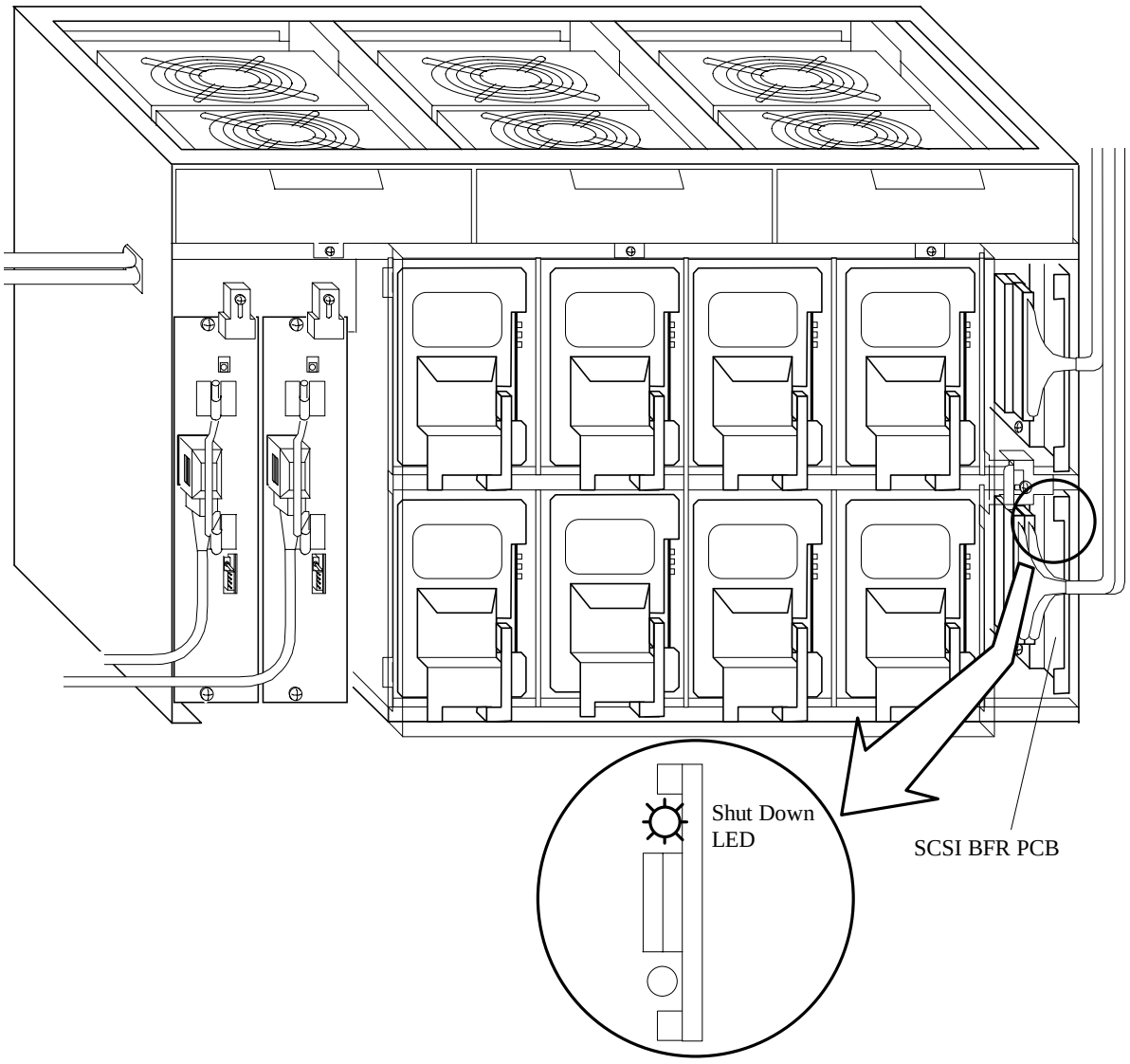

Fig. 4.3.2.5-4 Confirmation of the Shut Down LED Light

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5. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis referring to figures 4.3.2.5-5 and 4.3.2.5-6.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

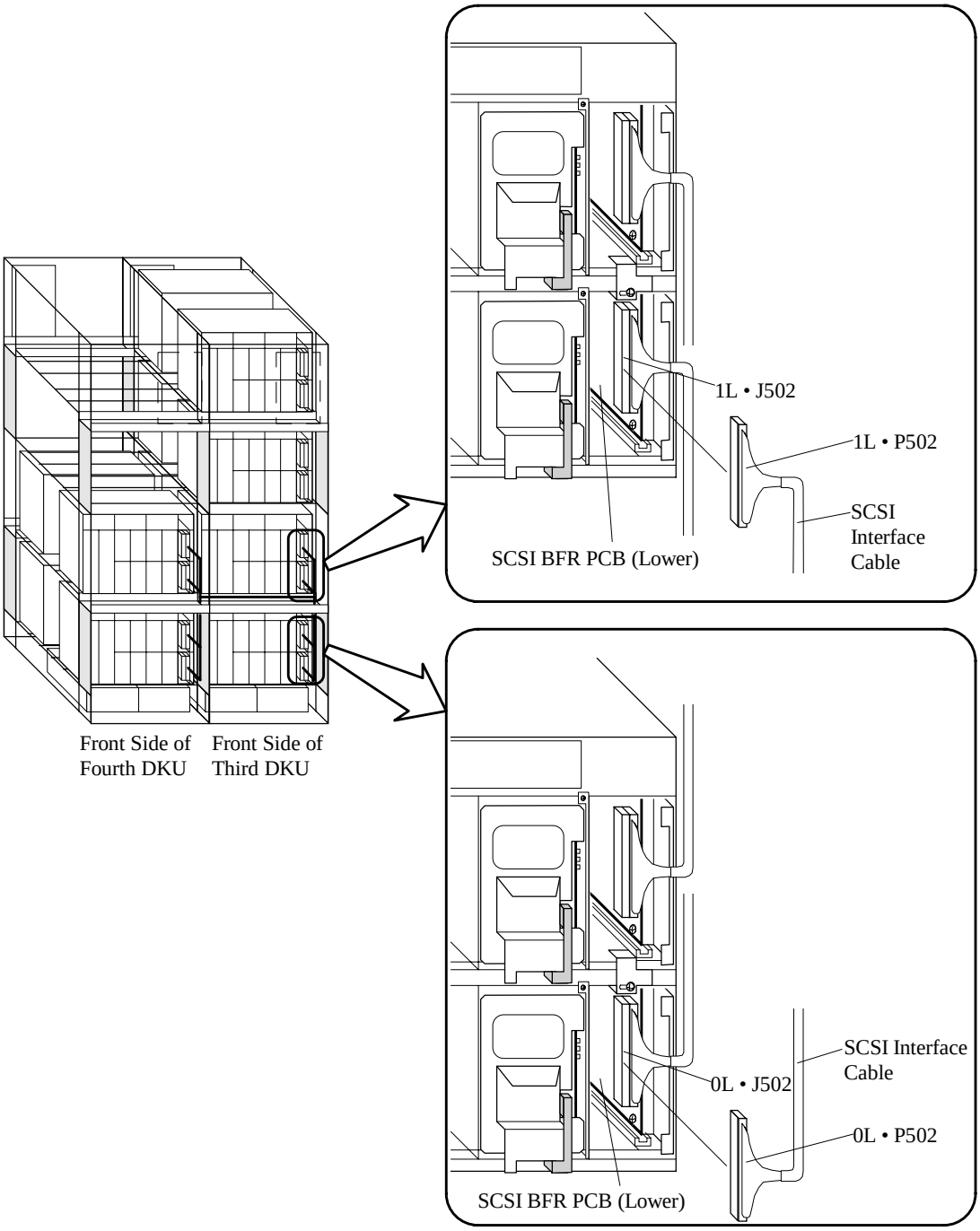

Fig. 4.3.2.5-5 Disconnection of the SCSI Interface Cables

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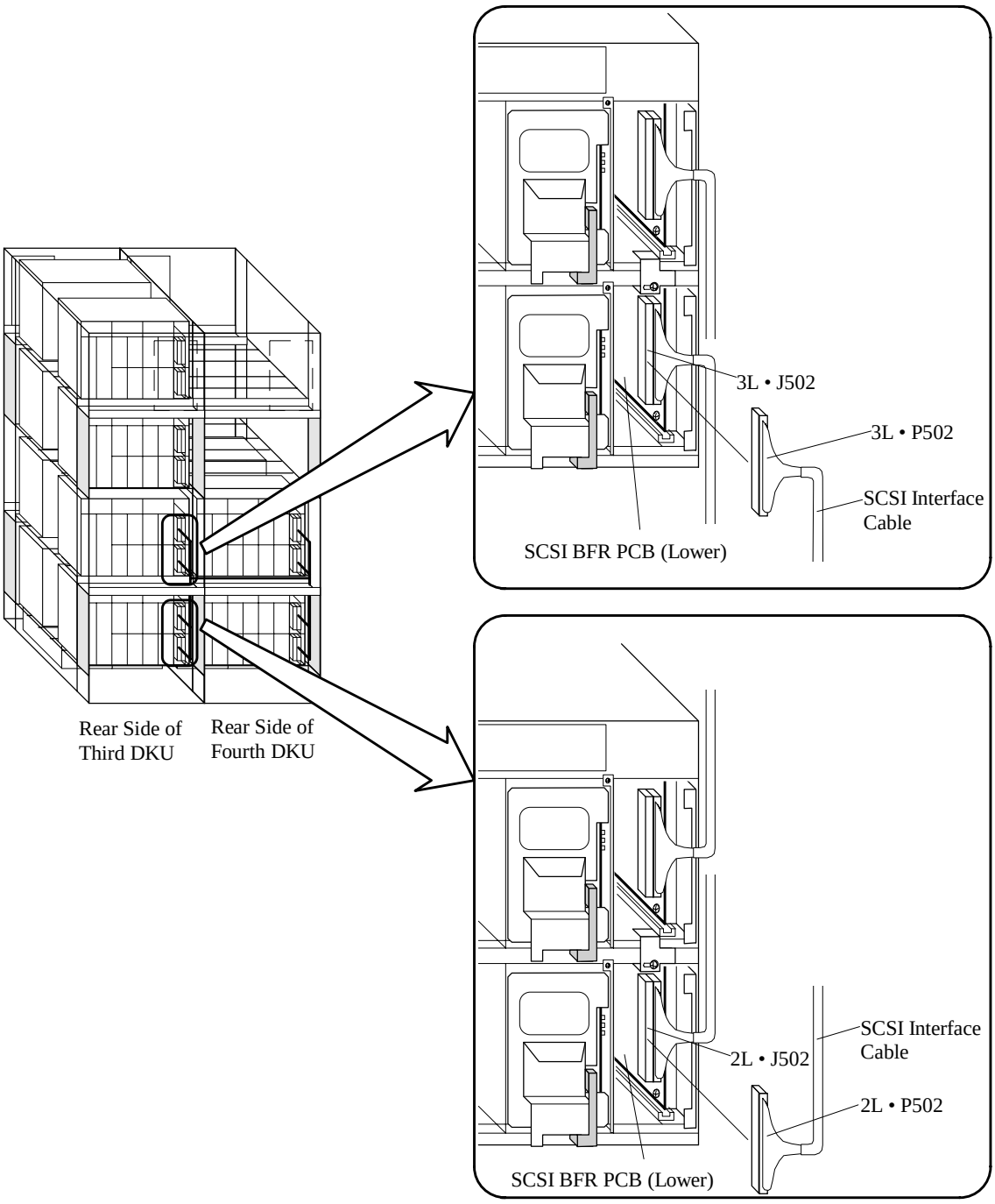

Fig. 4.3.2.5-6 Disconnection of the SCSI Interface Cables

6. Refer to INST02-59⑤ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-720 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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7. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the fourth DKU chassis referring to figures 4.3.2.5-7 and 4.3.2.5-8.

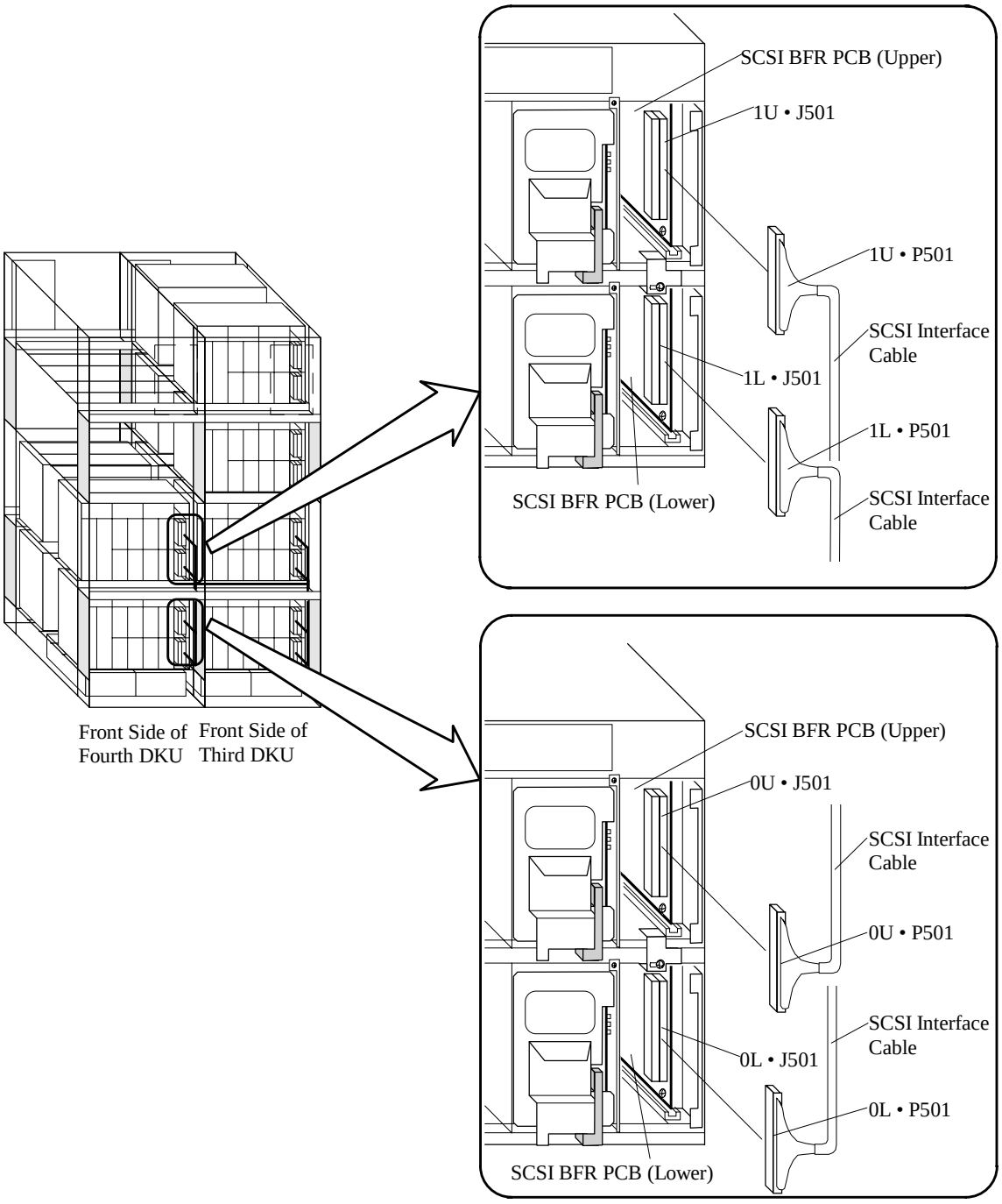

Fig. 4.3.2.5-7 Disconnection of the SCSI Interface Cables

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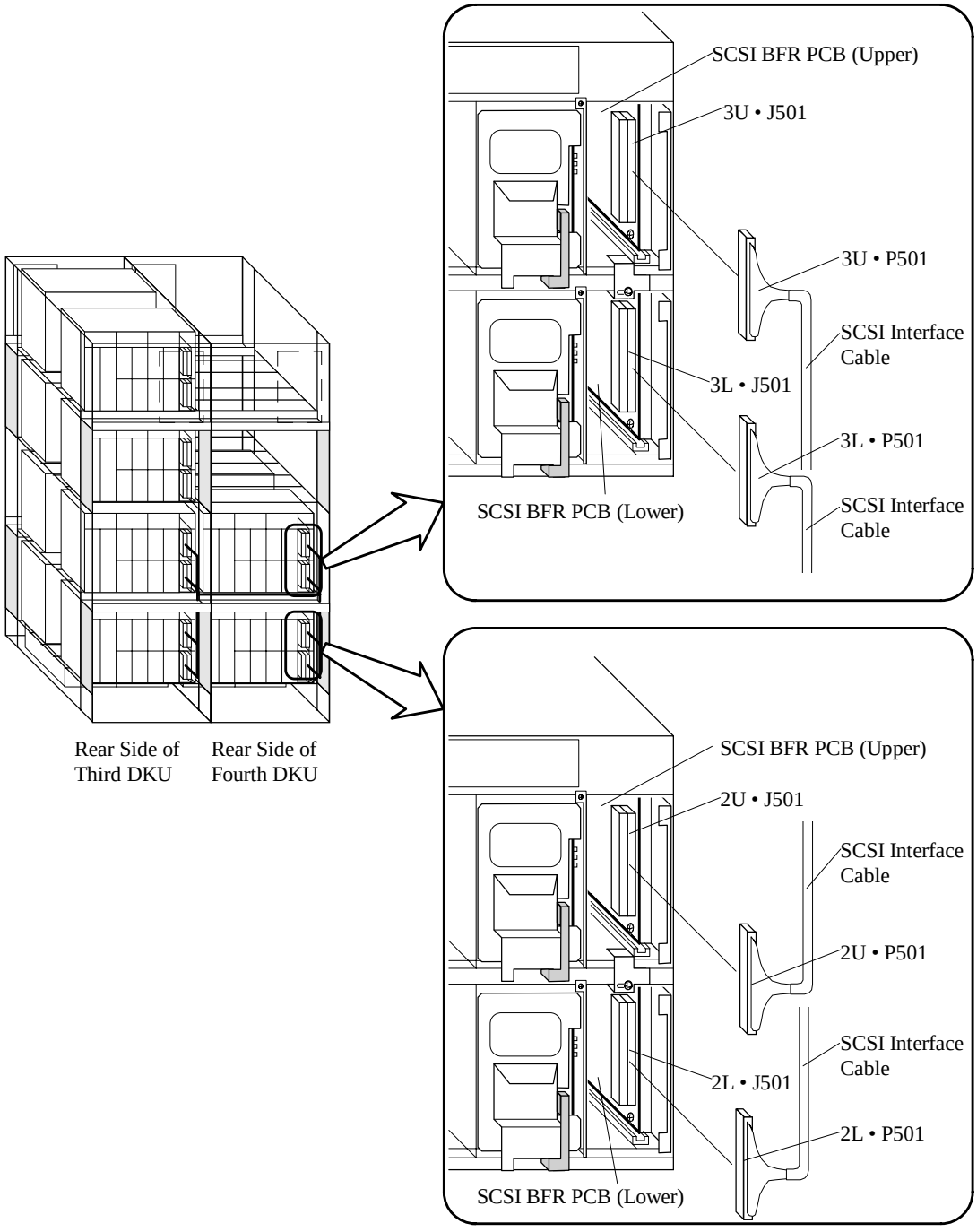

Fig. 4.3.2.5-8 Disconnection of the SCSI Interface Cables

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8. Remove the cable fixing wires and repeat binders and remove the SCSI interface cables from inside the DKU chassises.

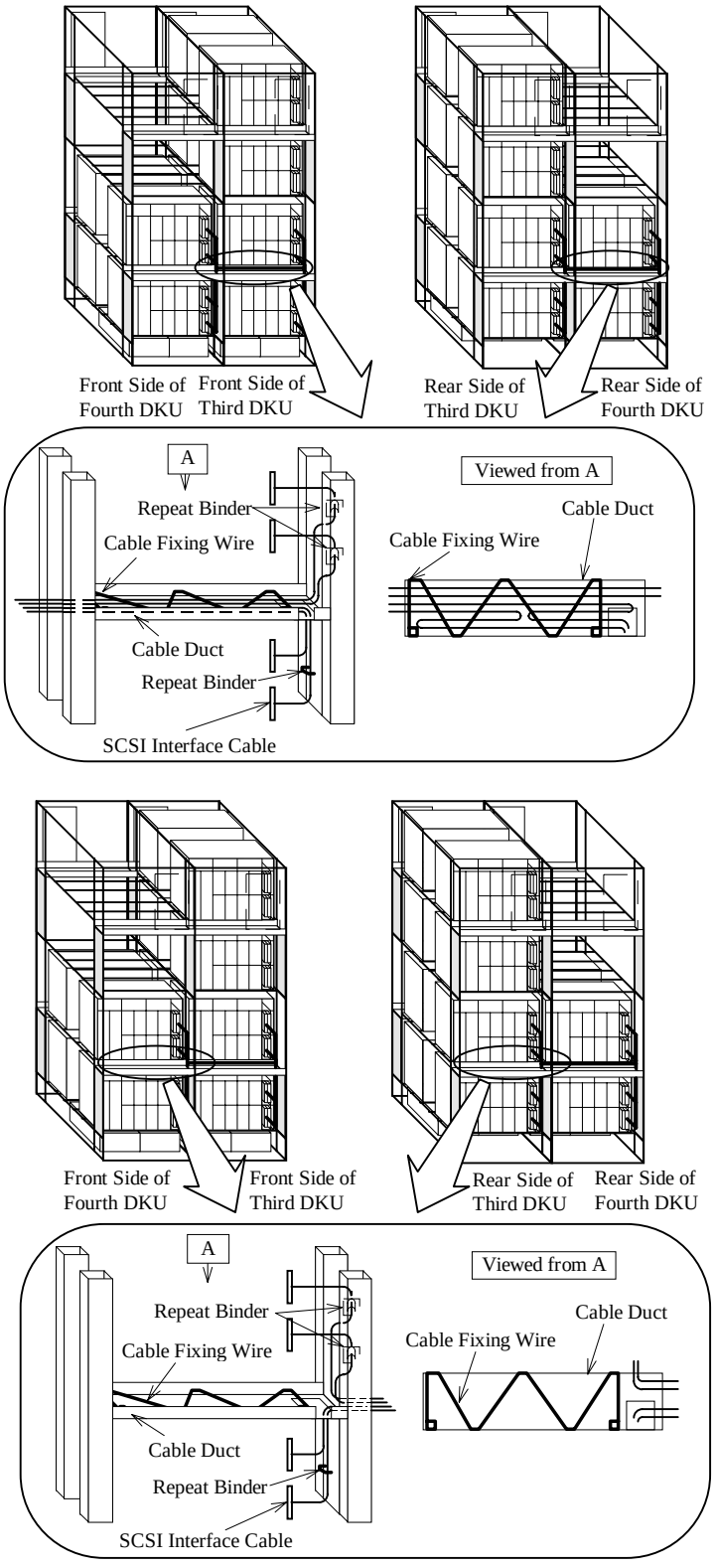

Fig. 4.3.2.5-9 Removal of the SCSI Interface Cables

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9. Remove the nameplate from the fourth DKU chassis.

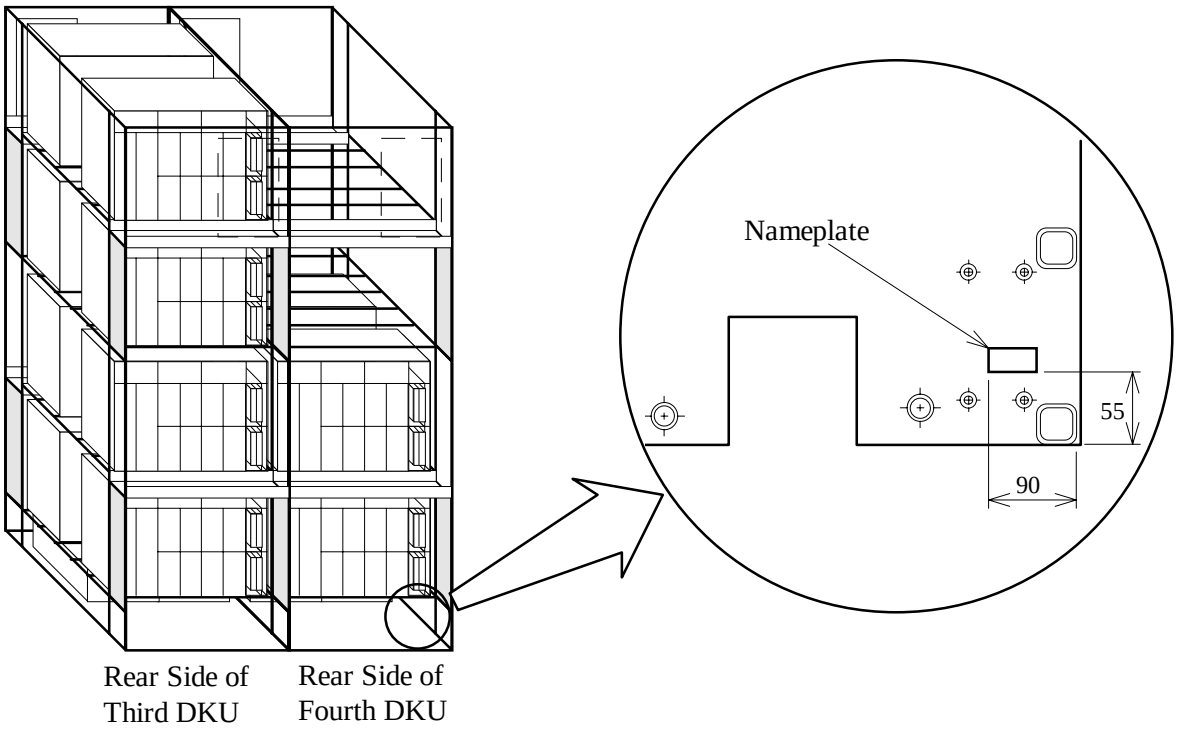

Fig. 4.3.2.5-10 Removal of the Nameplate

10. Go to INST02-59 Step ⑦.

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4.3.2.6 Disconnection Procedure of Additional SCSI Interface Cables(In case of HDU-L27 from L24)

1. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs from which the SCSI interface cables are to be disconnected.

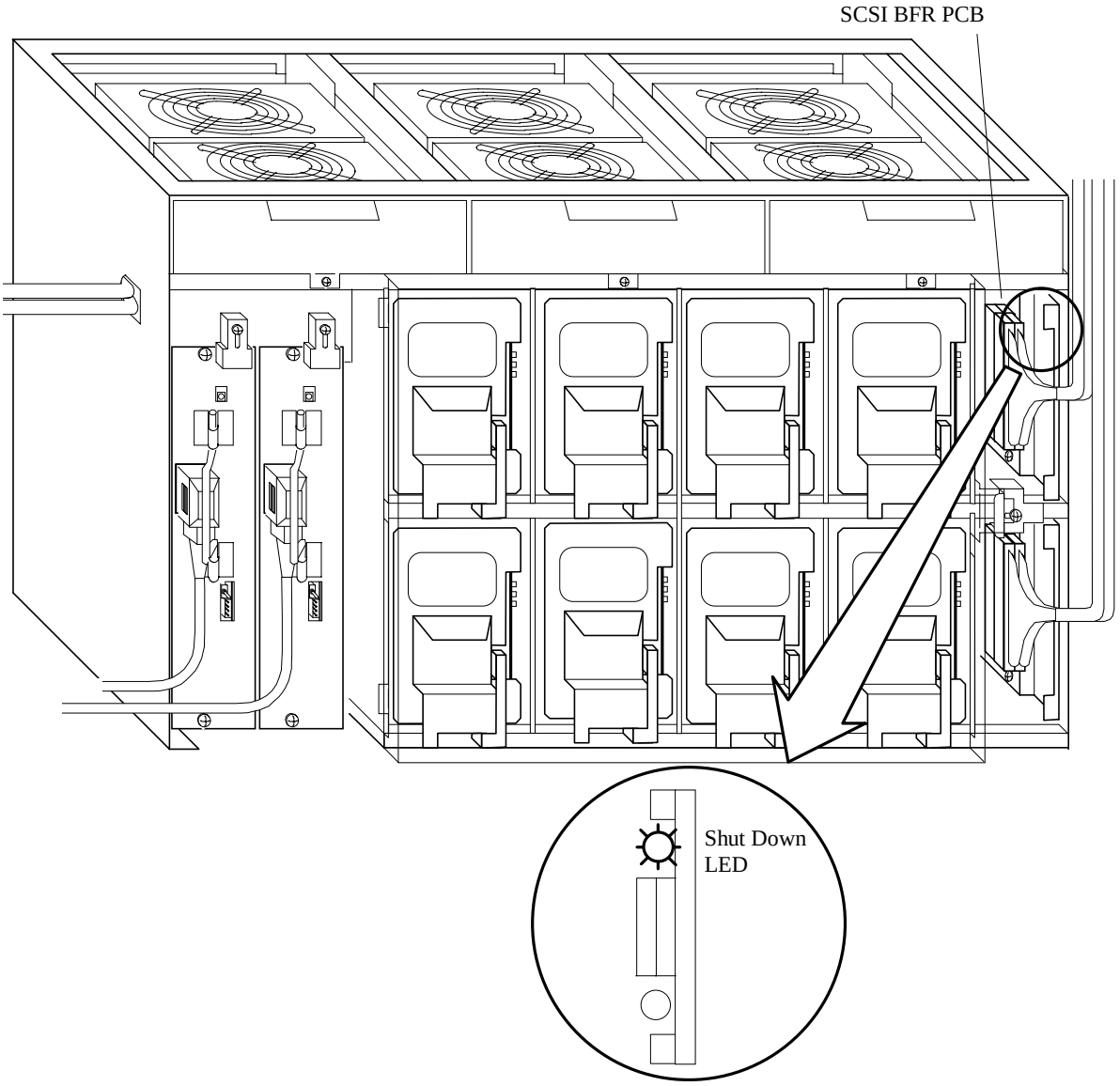

Fig. 4.3.2.6-1 Confirmation of the Shut Down LED Light

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2. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis referring to figures 4.3.2.6-2 and 4.3.2.6-3.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

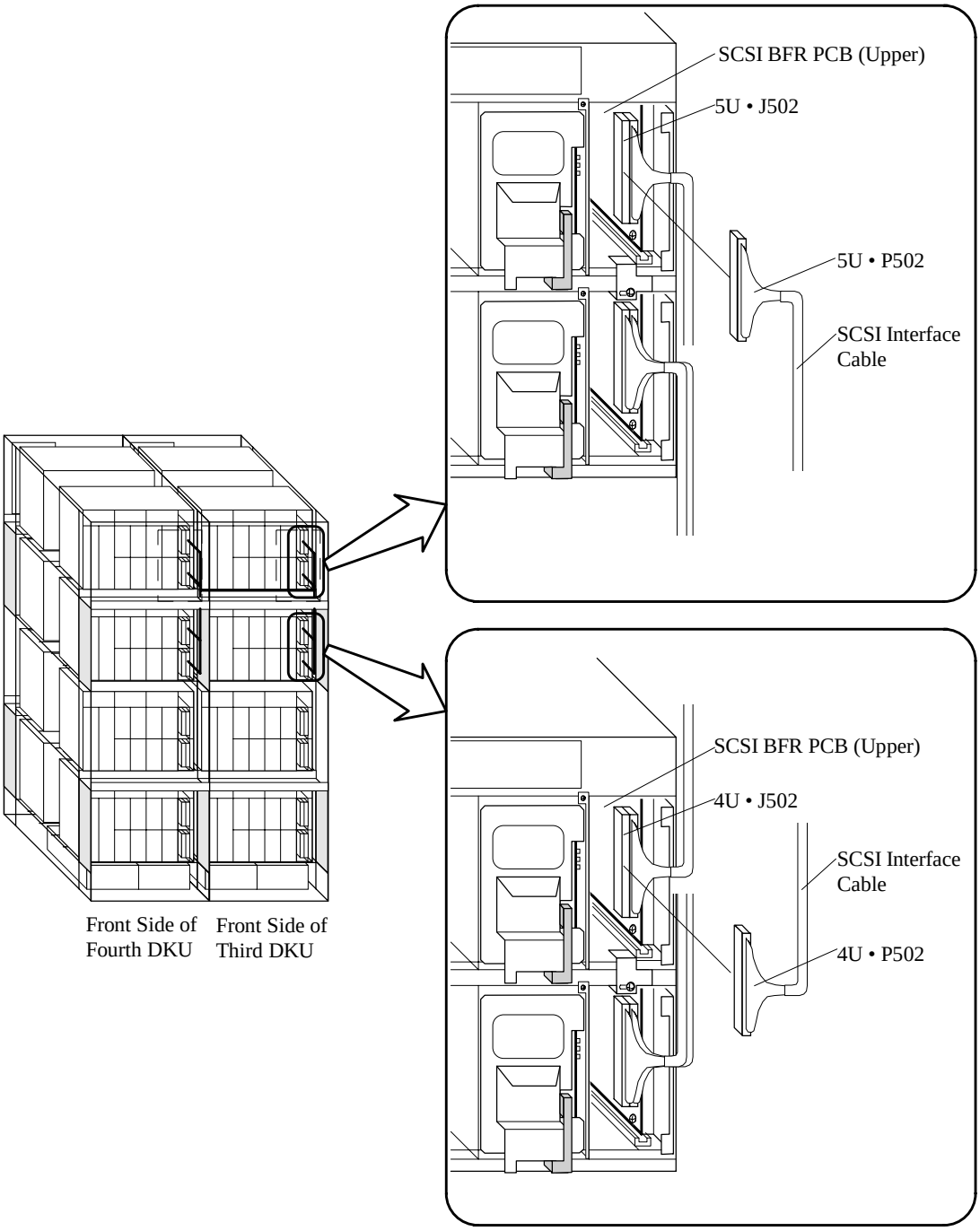

Fig. 4.3.2.6-2 Disconnection of the SCSI Interface Cables

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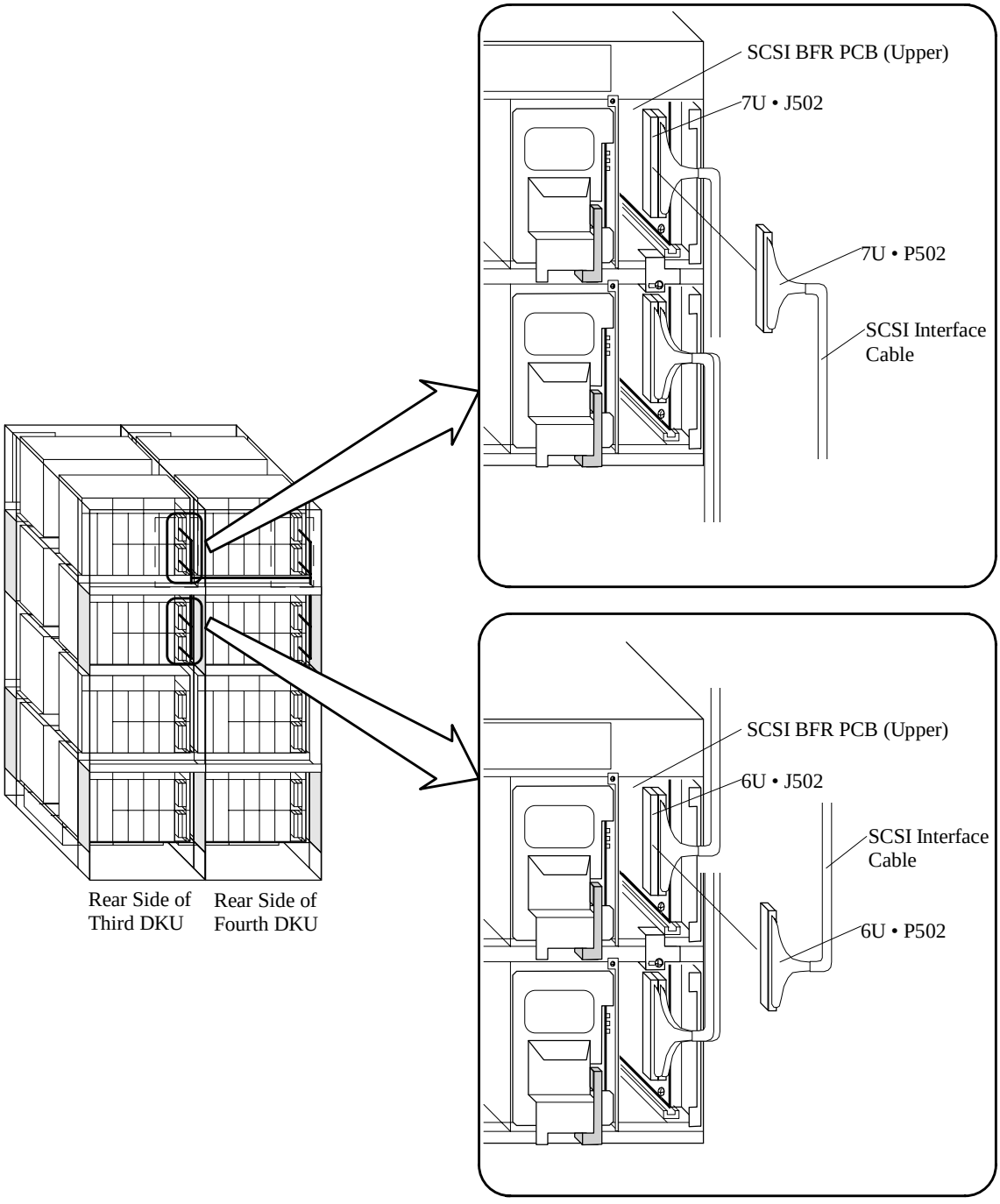

Fig. 4.3.2.6-3 Disconnection of the SCSI Interface Cables

3. Refer to INST02-58③ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-800 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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4. In the third DKU chassis, check that the Shut Down LEDs are lit on the SCSI BFR PCBs on the other side from which the SCSI interface cables are to be disconnected.

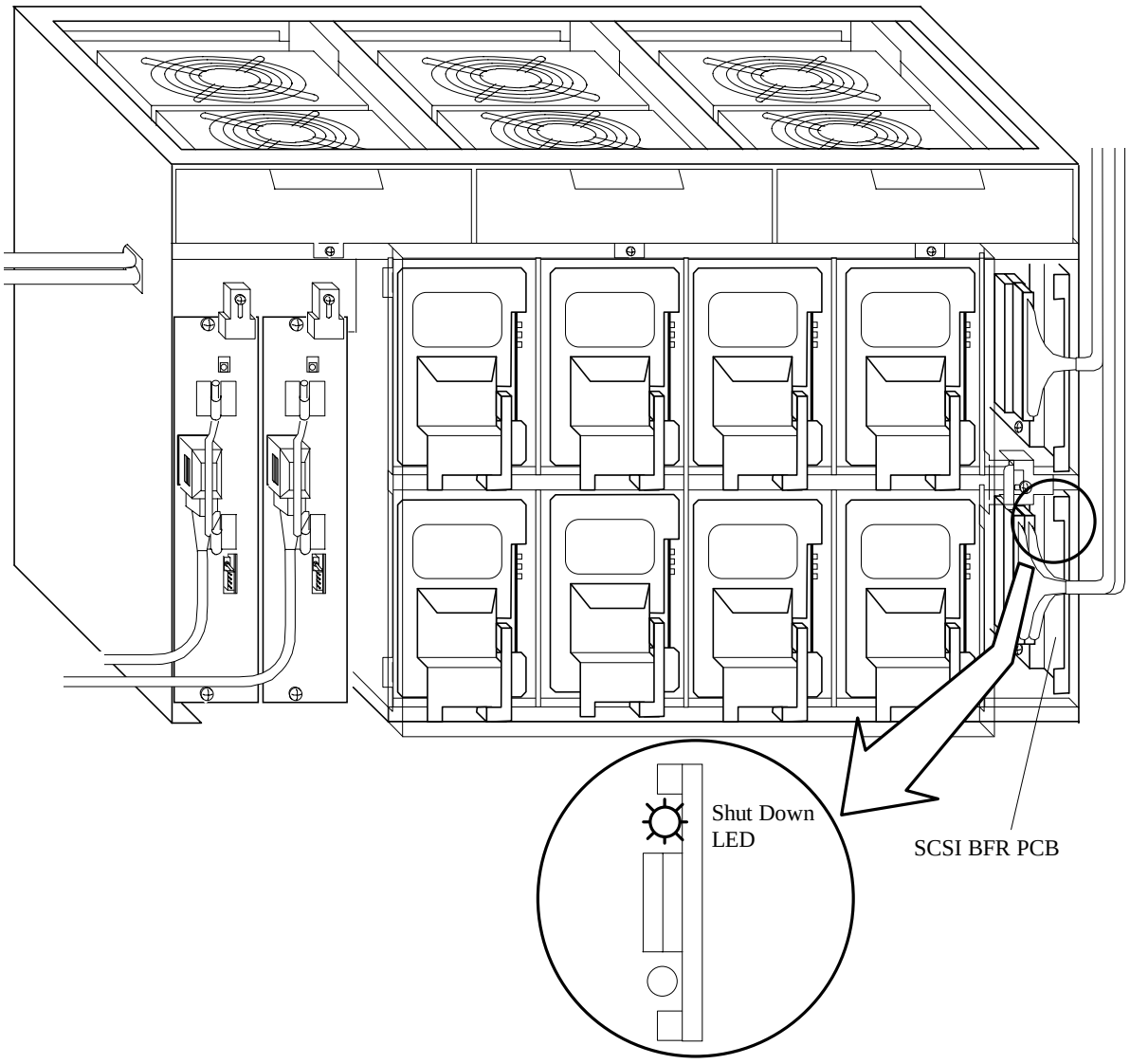

Fig. 4.3.2.6-4 Confirmation of the Shut Down LED Light

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5. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the third DKU chassis referring to figures 4.3.2.6-5 and 4.3.2.6-6.

Notice

When disconnecting the SCSI interface extension cable (DKU-F305I-24C) during the operation of subsystem, take the following actions from SVP to allow disconnection of only the SCSI interface cable whose Shut Down LED goes on.

1. Block the SCSI bus disconnecting the SCSI interface cable.
2. Light the Shut Down LED on the SCSI BFR PCB on the SCSI bus.

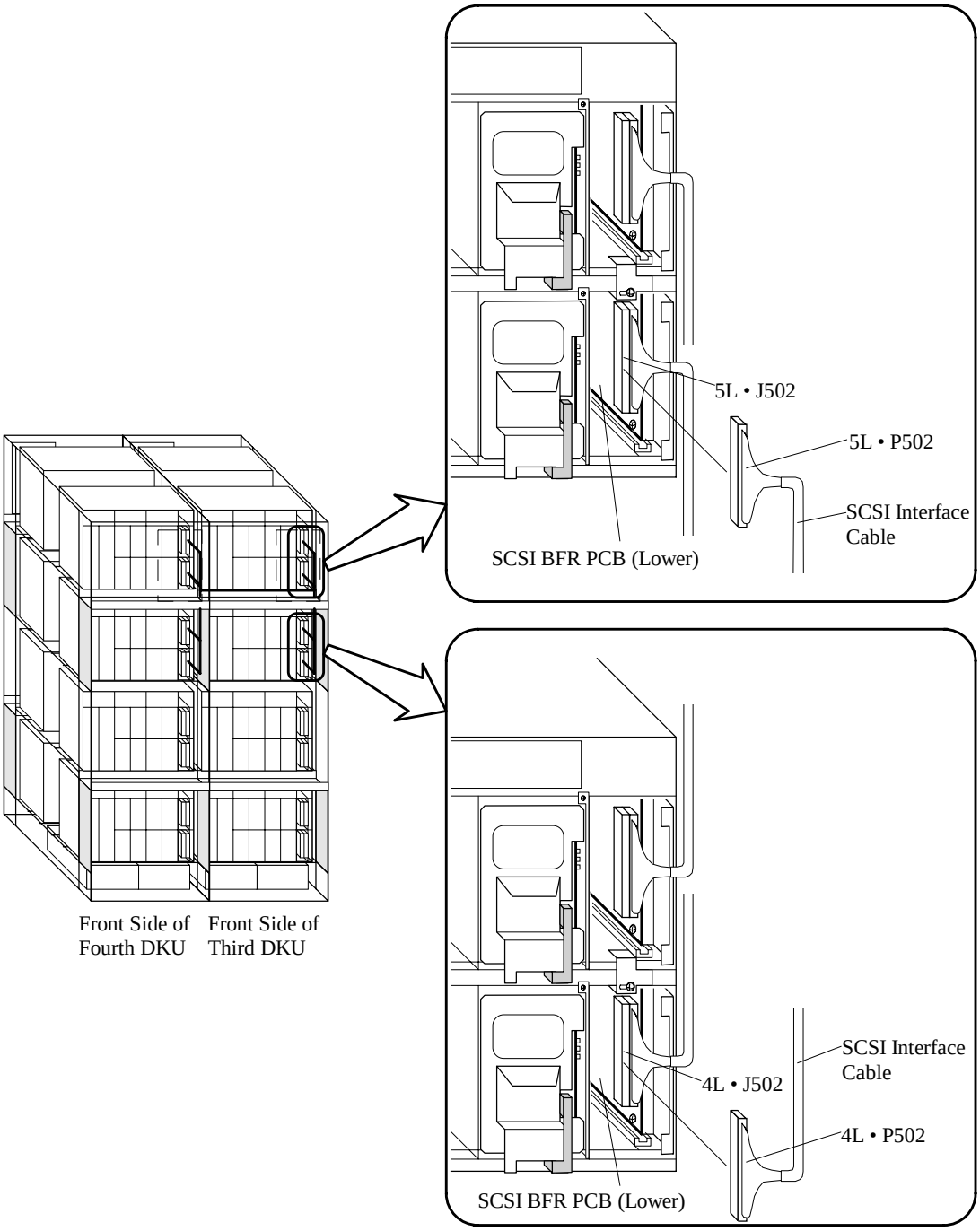

Fig. 4.3.2.6-5 Disconnection of the SCSI Interface Cables

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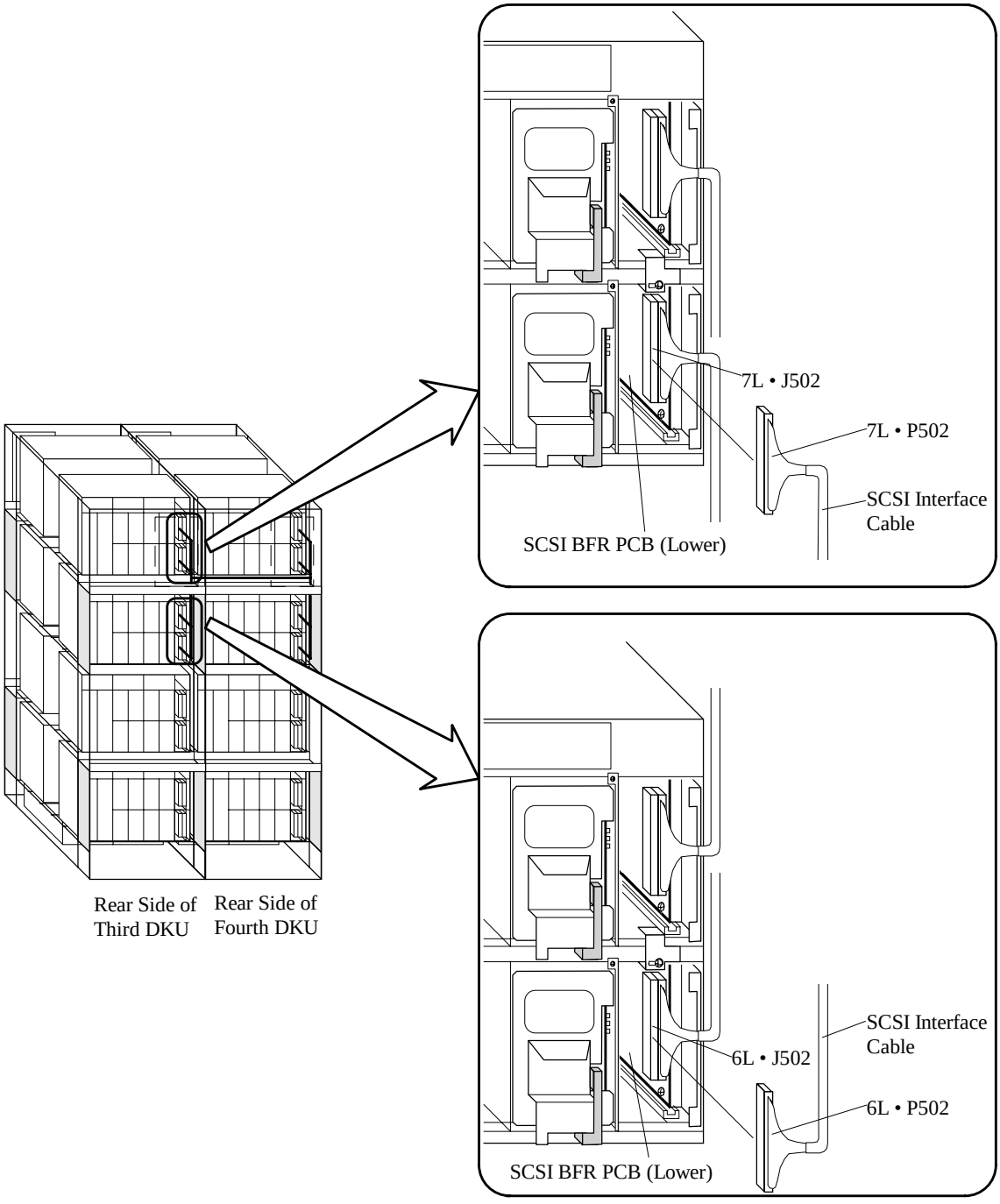

Fig. 4.3.2.6-6 Disconnection of the SCSI Interface Cables

6. Refer to INST02-59⑤ when disconnecting the additional SCSI interface cable while the sub-system is in operation. Refer to INST04-820 when disconnecting the additional SCSI interface cable with the sub-system switched off.

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7. Disconnect the SCSI interface cables from the SCSI BFR PCBs in the fourth DKU chassis referring to figures 4.3.2.6-7 and 4.3.2.6-8.

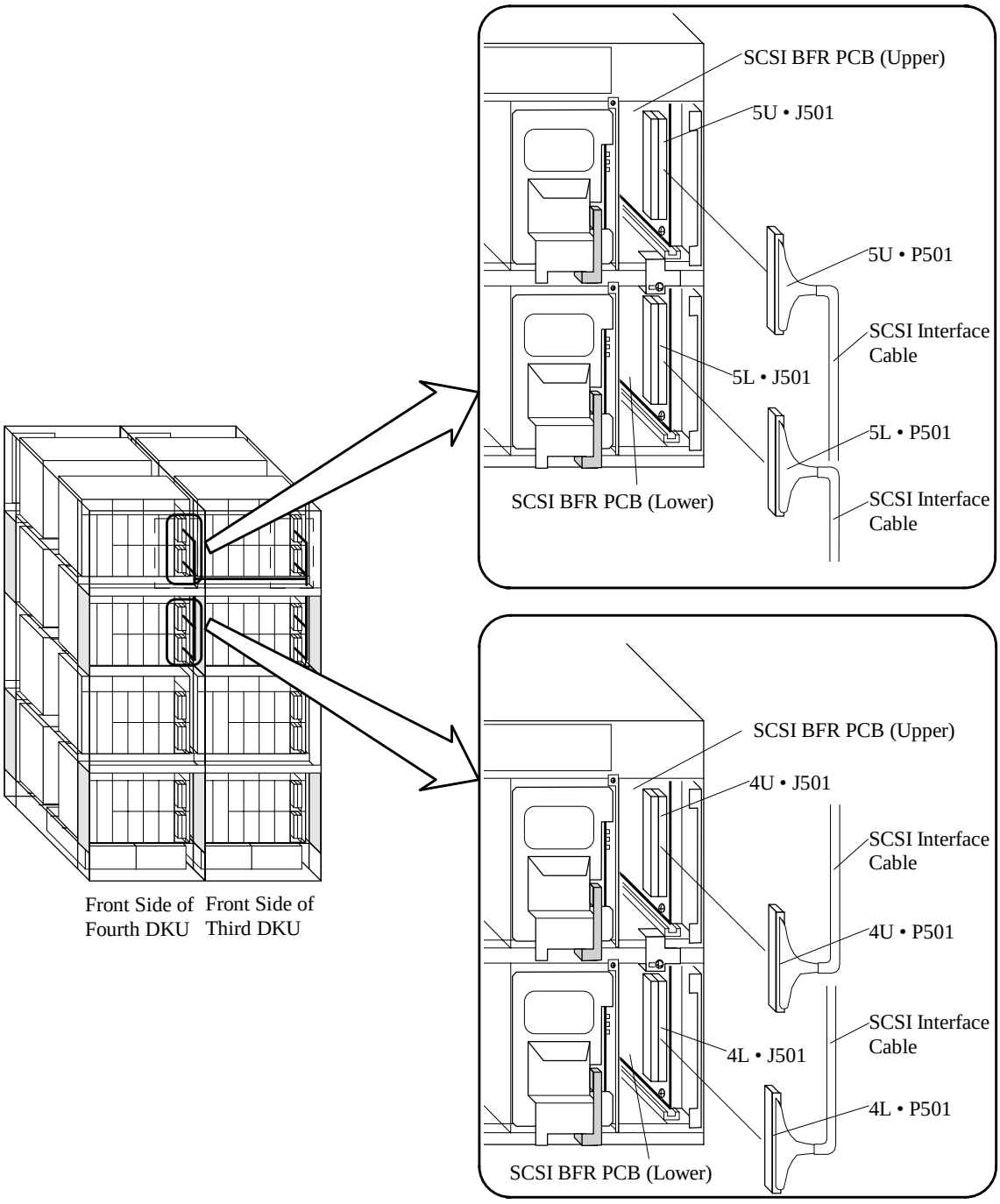

Fig. 4.3.2.6-7 Disconnection of the SCSI Interface Cables

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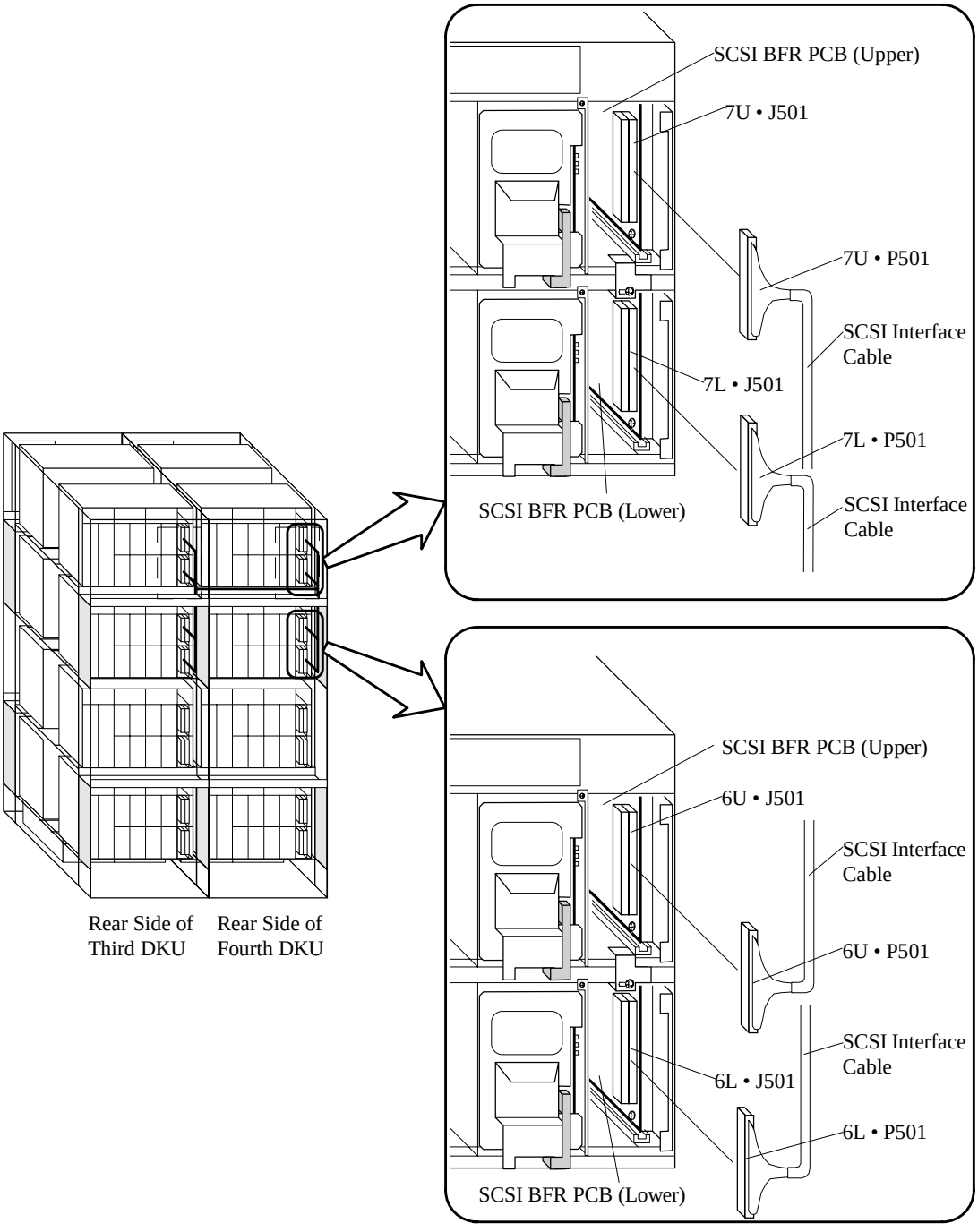

Fig. 4.3.2.6-8 Disconnection of the SCSI Interface Cables

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8. Remove the cable fixing wires and repeat binders and remove the SCSI interface cables from inside the DKU chassises.

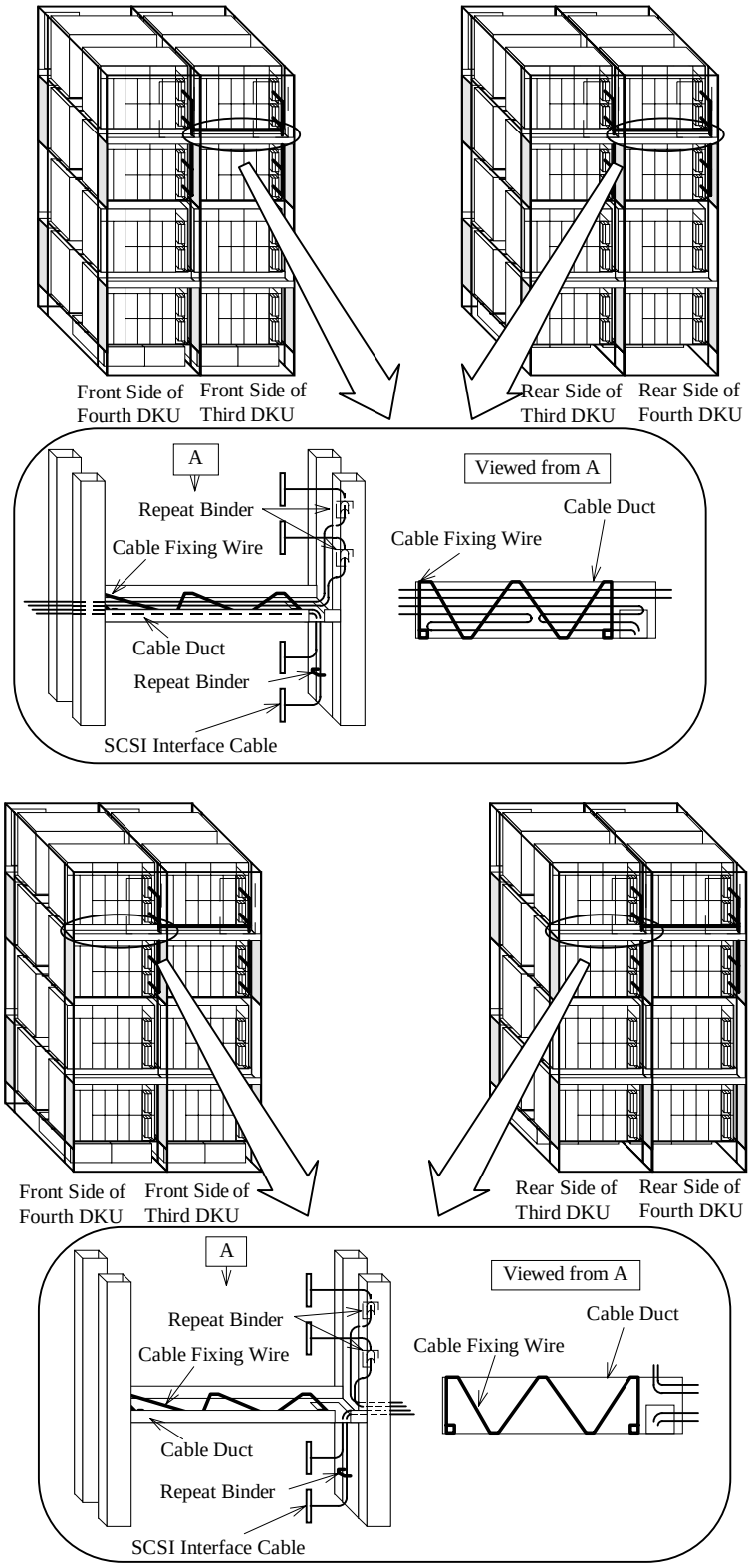

Fig. 4.3.2.6-9 Removal of the SCSI Interface Cables

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9. When the fourth DKU chassis consists of 4 HDU boxes, fix the disconnected SCSI interface cables in the fourth DKU chassis with the binders.

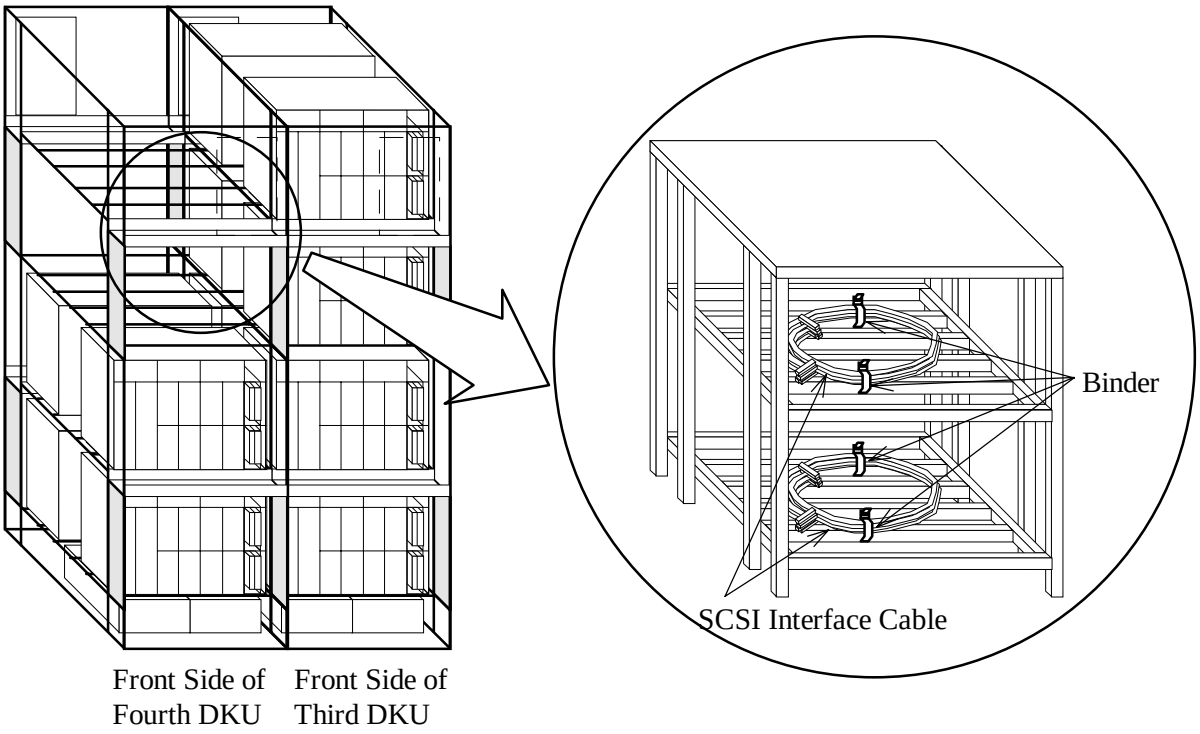

Fig. 4.3.2.6-10 Fixation of the SCSI Interface Cables

10. Go to INST02-59 Step ⑦.

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4.4 De-Installation of Disk Unit (DKU305I-14)

4.4.1 Flowchart

1. Power OFF of Disk Unit being De-Installed	[INST04-870]
↓	
2. DKUMN Cable Removal	[INST04-880]
↓	
3. Kick Plate Removal	[INST04-910]
↓	
4. Side Cover and Frame Ground Cable Removal	[INST04-910]
↓	
5. Frame Disconnection	[INST04-940]
↓	
6. Removal of SCSI Interface Cables (Only Third Disk Unit)	[INST04-950]
↓	
7. Side Cover Re-Installation	[INST04-950]
↓	
8. Power Cable Assy Fixing	[INST04-960]
↓	
9. Fall Proof Adapter Attachment	[INST04-970]

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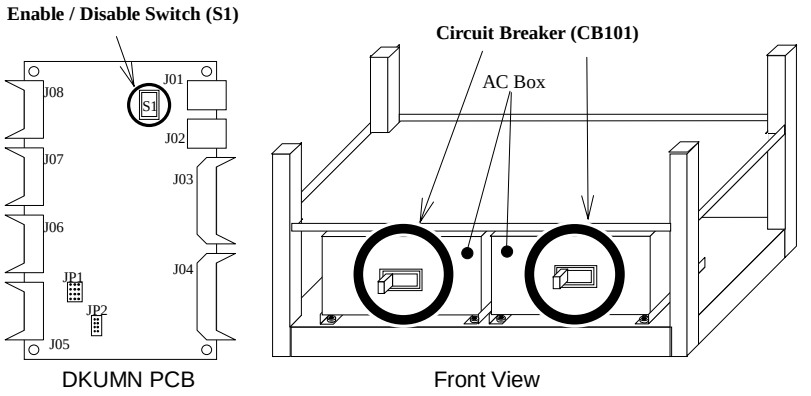
4.4.2 De-Installation Procedure of Disk Unit

1. Power OFF of Disk Unit being De-Installed
   a. Turn Enable / Disable switches (S1) to "DISABLE" position on the DKUMN PCBs of the Disk Unit.
   b. Turn off the circuit breaker (CB101) on the AC Boxes of the Disk Unit.

Table 4.4.2-1 De-Installed Disk Unit

No.	De-Installed Disk Unit	DKUMN PCB	AC Box	Remarks
1	Fourth Disk Unit	DKUMN-L2F DKUMN-L2R	AC BOX-R20 AC BOX-R21	
2	Third Disk Unit	DKUMN-L1F DKUMN-L1R	AC BOX-R10 AC BOX-R11	
3	Second Disk Unit	DKUMN-R2F DKUMN-R2R	AC BOX-L20 AC BOX-L21	



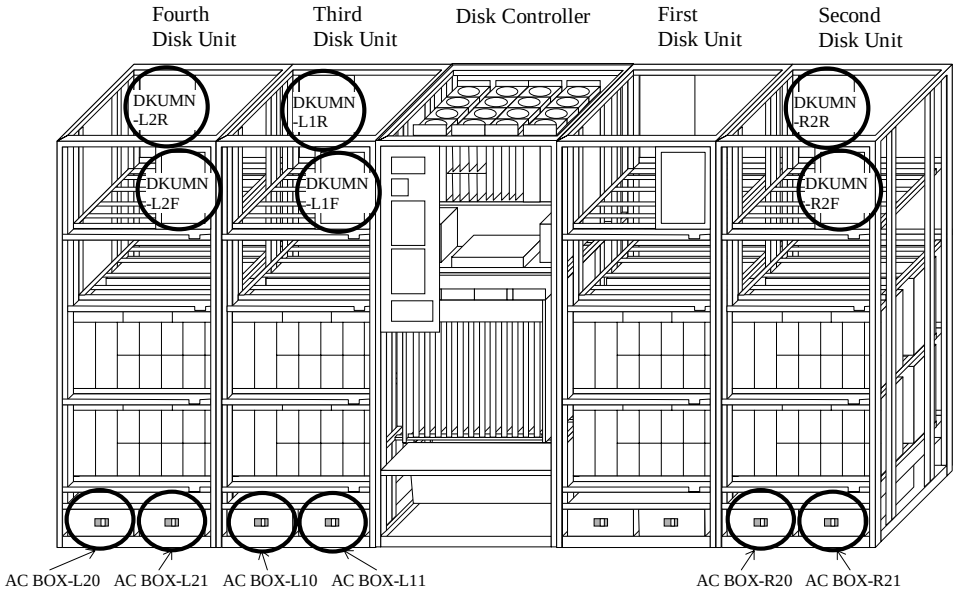


Fig. 4.4.2-1 AC Boxes and DKUMN PCBs

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2. DKUMN Cable Removal
   Remove the DKUMN cables in the reverse order of installation.

   Fourth Disk Unit

   Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.
   Disconnect the DKUMN cables between the Third Disk Unit and the Fourth Disk Unit as indicated in the table below.

Table 4.4.2-2 Connection of DKUMN Cables

No.	Third Disk Unit			Fourth Disk Unit			Remarks
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	DKUMN-L1F	J03	P3-1	DKUMN-L2F	J04	P4-1	
2	DKUMN-L1F	J01	P1-1	DKUMN-L2F	J01	P1-1	
3	DKUMN-L1R	J03	P3-2	DKUMN-L2R	J04	P4-2	
4	DKUMN-L1R	J01	P1-2	DKUMN-L2R	J01	P1-2	

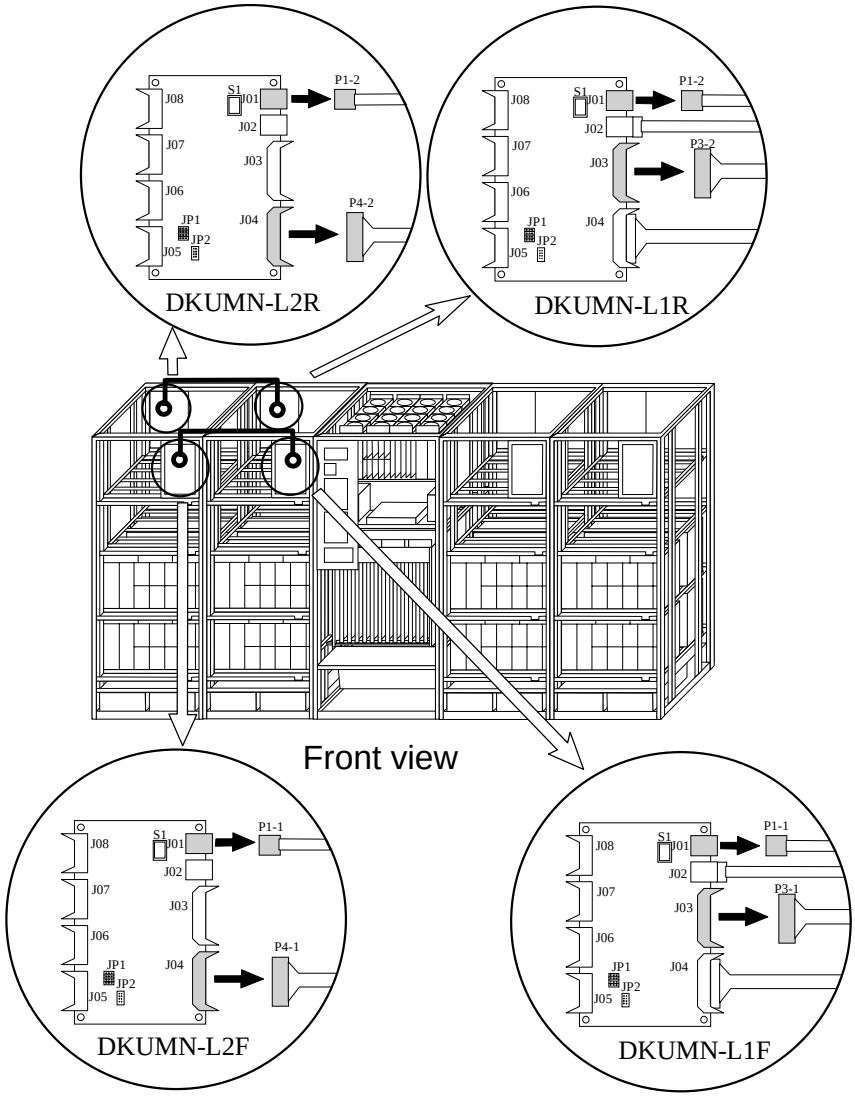

Fig. 4.4.2-2 Connection of DKUMN Cables

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Third Disk Unit

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

Disconnect between the PWRCTL PCBs or MPS Back Board(PL) and the DKUMN PCBs as summarized in the table below.

Table 4.4.2-3 Connection of DKUMN cable

No.	Disk Controller			Third Disk Unit			Remarks
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No	
1	PWRCTL-1	J11	SH-F22	DKUMN-L1F	J04	P4-1L	
2	MPS BB(PL)	N10	SH-N10	DKUMN-L1F	J02	P2-1L	
3	PWRCTL-2	J11	SH-F22	DKUMN-L1R	J04	P4-2L	
4	MPS BB(PL)	A10	SH-A10	DKUMN-L1R	J02	P2-2L	

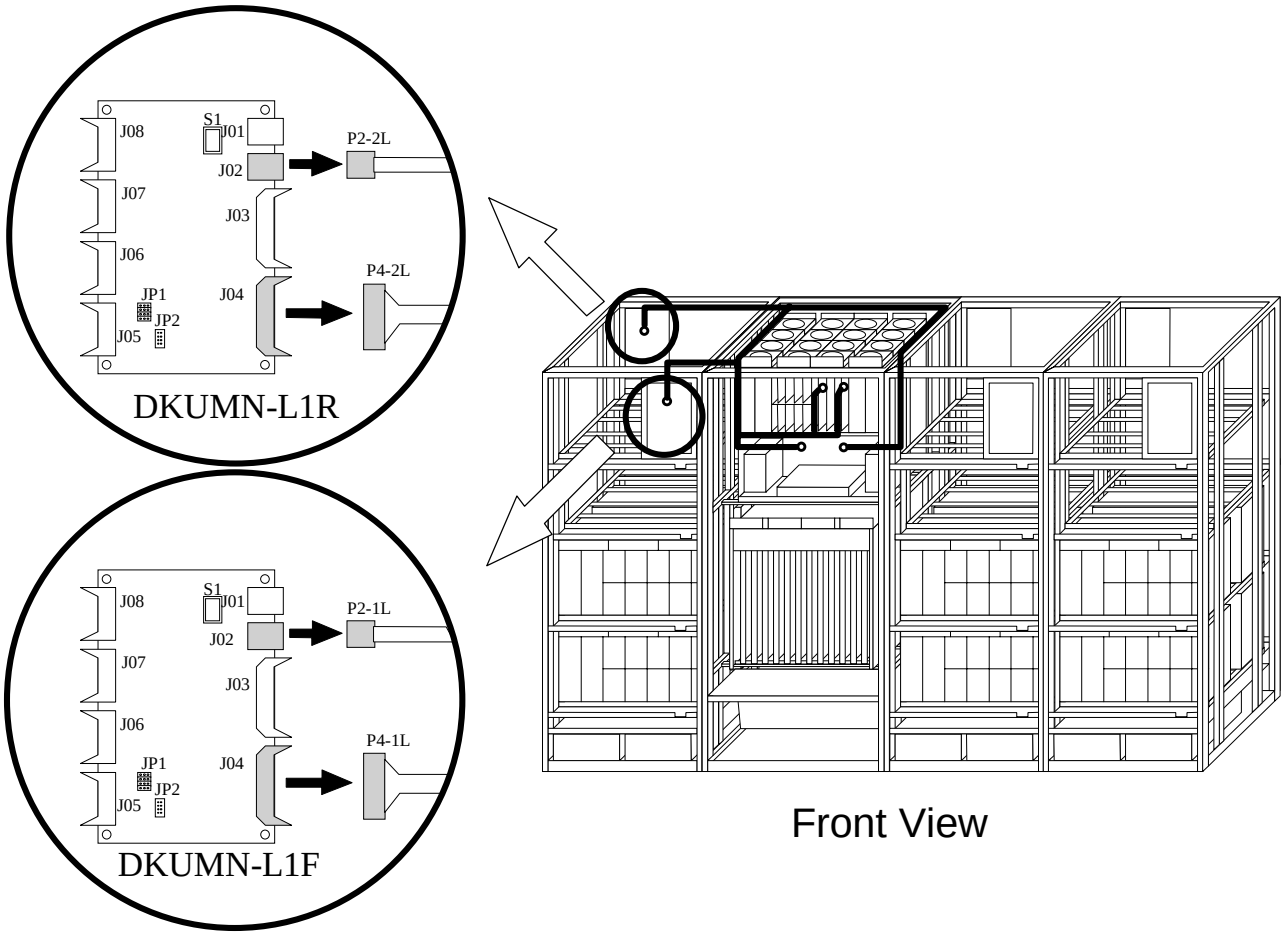

Fig. 4.4.2-3 Connection of DKUMN Cables

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Second Disk Unit

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

Disconnect the DKUMN cables between the First Disk Unit and the Second Disk Unit as indicated in the table below.

Table 4.4.2-4 Connection of DKUMN Cables

No.	First Disk Unit			Second Disk Unit			REMARKS
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	DKUMN-R1F	J03	P3-1	DKUMN-R2F	J04	P4-1	
2	DKUMN-R1F	J01	P1-1	DKUMN-R2F	J01	P1-1	
3	DKUMN-R1R	J03	P3-2	DKUMN-R2R	J04	P4-2	
4	DKUMN-R1R	J01	P1-2	DKUMN-R2R	J01	P1-2	

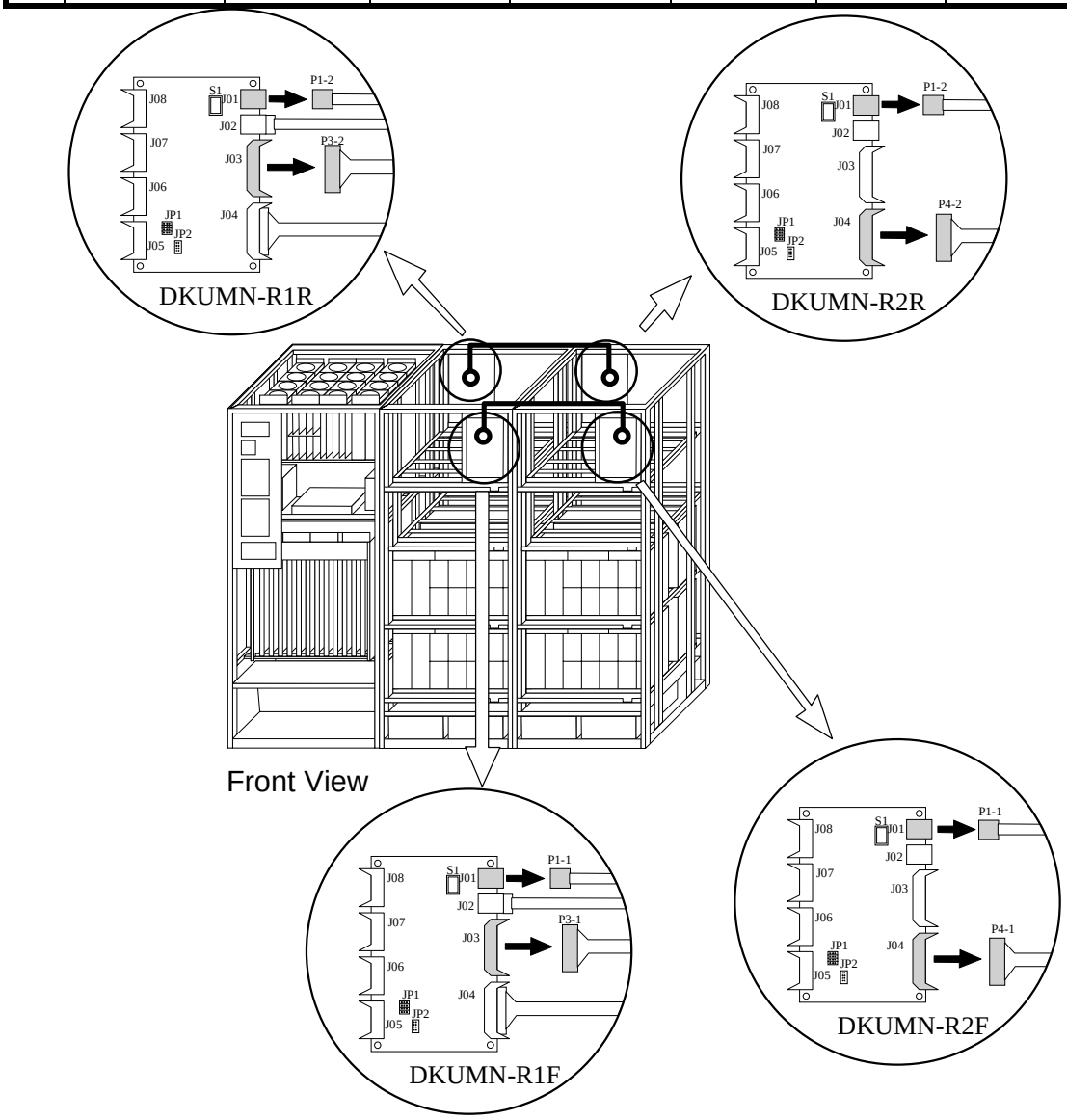

Fig. 4.4.2-4 Connection of DKUMN Cables

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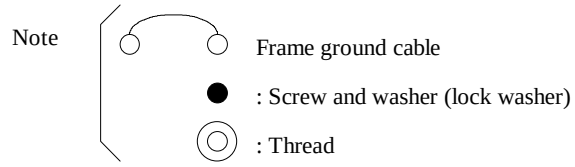
3 . Kick Plate De-Installation
Remove kick plate in the reverse order of installation.

SECTION 3.3.3.4 Installation of Kick Plate [INST03-240]
SECTION 3.4.3.5 Installation of Kick Plate [INST03-480]

4 . Side Cover and Frame Ground Cable Removal
Remove the side cover(s) and frame ground cable in the reverse order of installation.

Fourth Disk Unit

a. Remove the frame ground cable.
b. Remove the side cover from the Fourth Disk Unit.
c. Disconnect the frames.
d. Attach the left side cover to the Disk Controller or Third Disk Unit together with the frame ground cable.



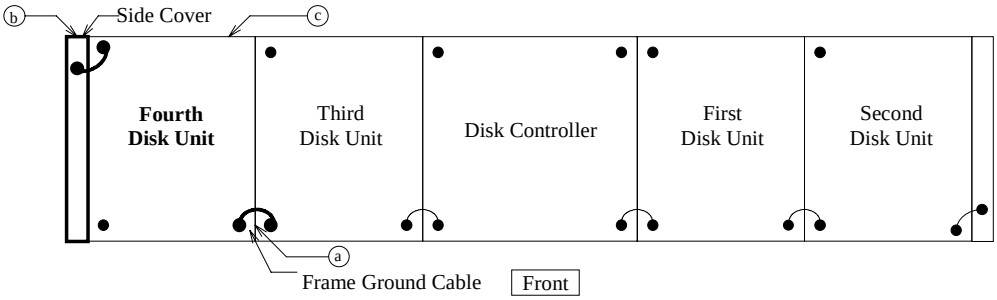


Fig. 4.4.2-5 Removal of Frame Ground Cable

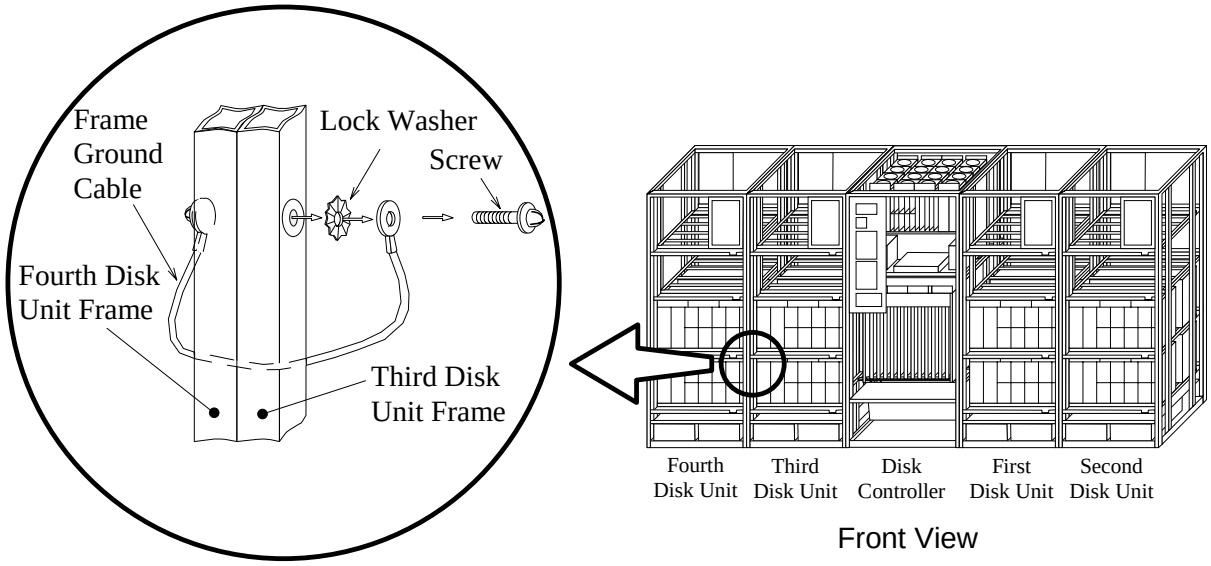


Fig. 4.4.2-6 Removal of Frame Ground Cable

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Third Disk Unit

a. Remove the frame ground cable.
b. Remove the side cover from the Third Disk Unit.
c. Disconnect the frames.
d. Remove the four SCSI Interface Cables from the Disk Controller [INST04-360 through 370 step 2].
e. Attach the left side cover of the Disk Controller with the frame ground cable.

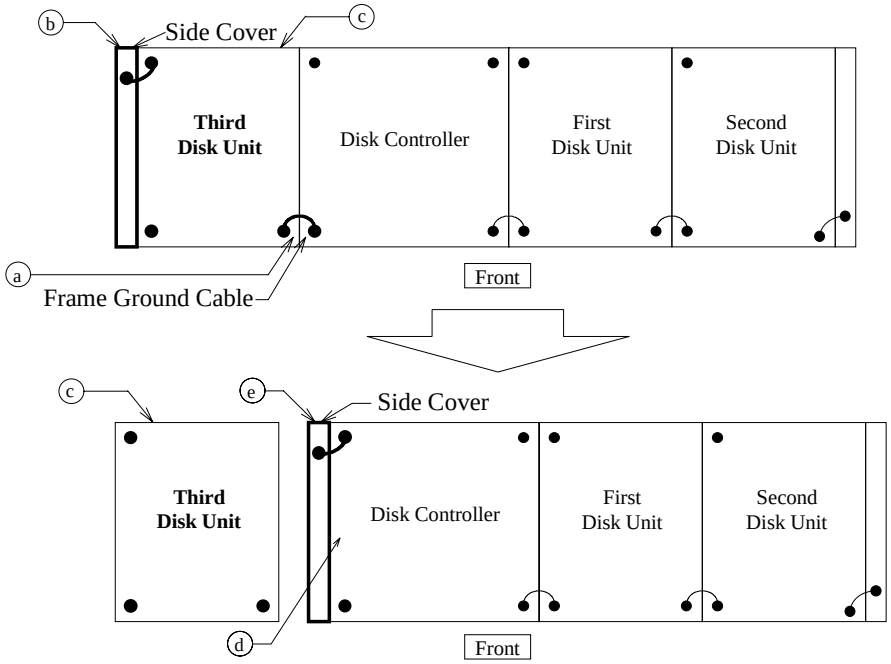

Fig. 4.4.2-7 Removal of Frame Ground Cable

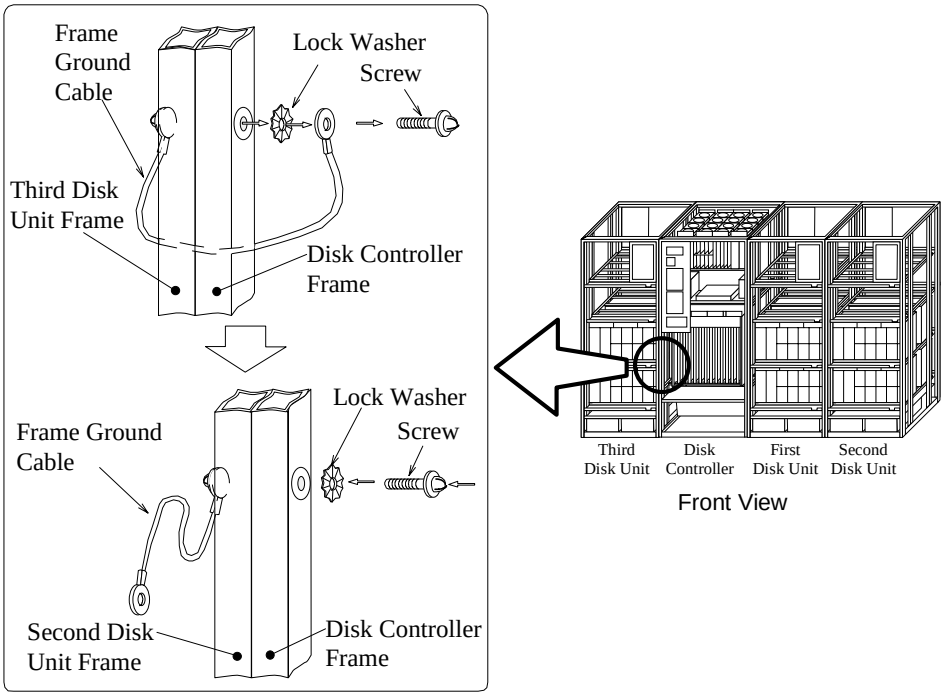

Fig. 4.4.2-8 Removal of Frame Ground Cable

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Second Disk Unit

a. Remove the frame ground cable.
b. Remove the side cover from the Second Disk Unit.
c. Disconnect the frames.
d. Attach the right side cover to the Disk Controller or First Disk Unit together with the frame ground cable.

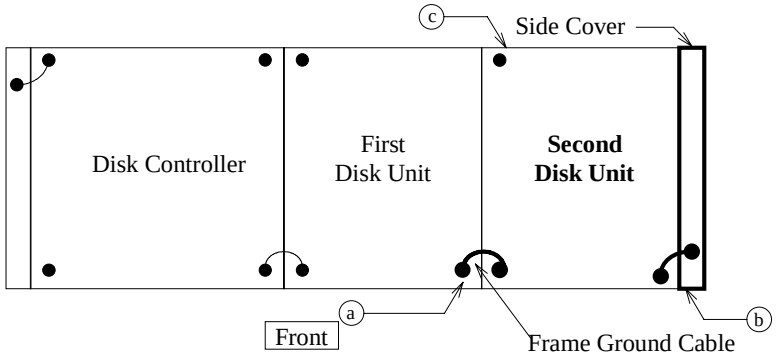

Fig. 4.4.2-9 Removal of Frame Ground Cable

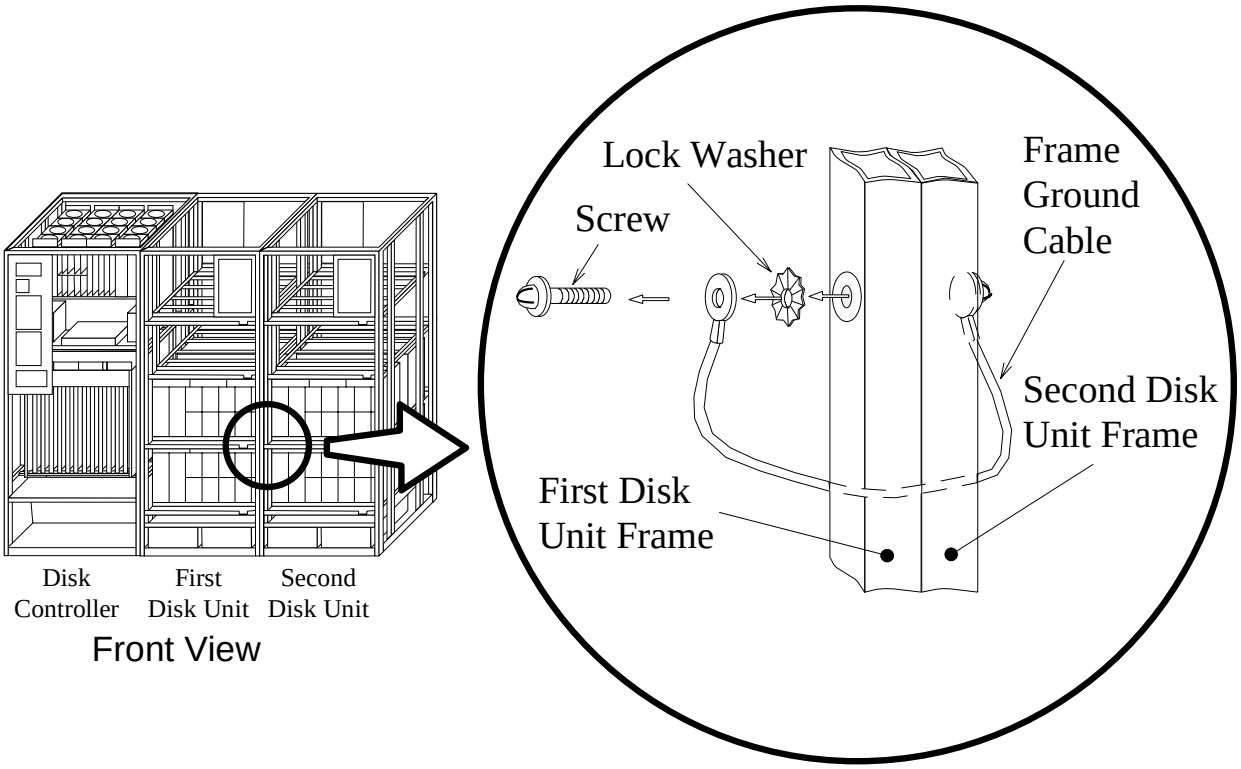

Fig. 4.4.2-10 Removal of Frame Ground Cable

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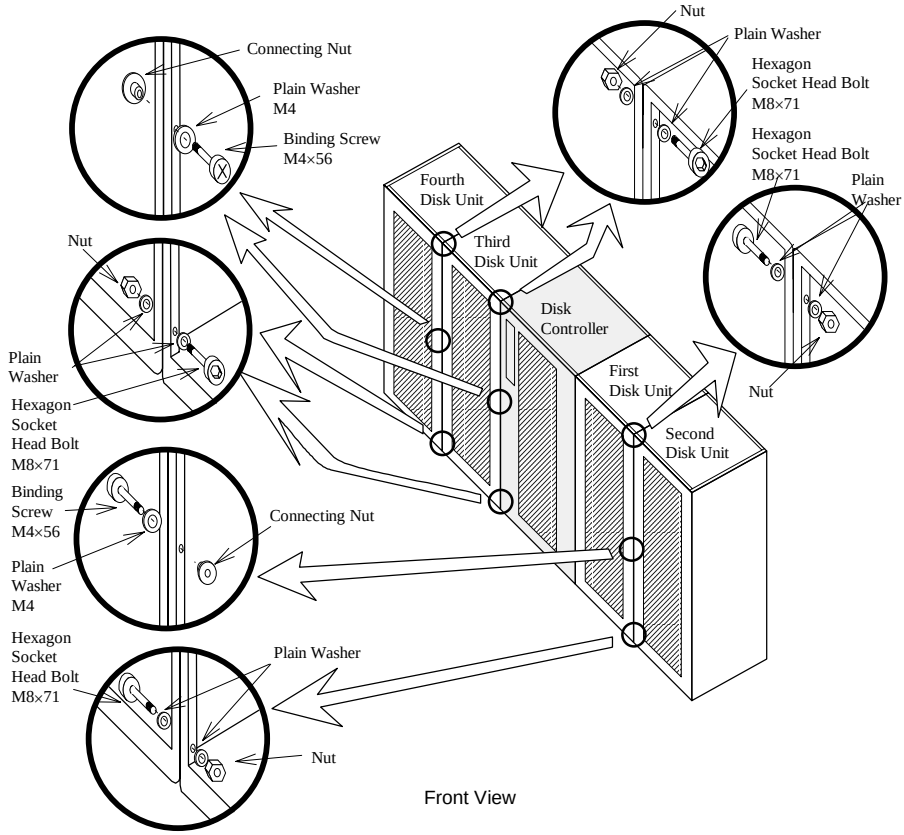
5. Frame Disconnection
   Disconnect the frames in the reverse order of frame connection.



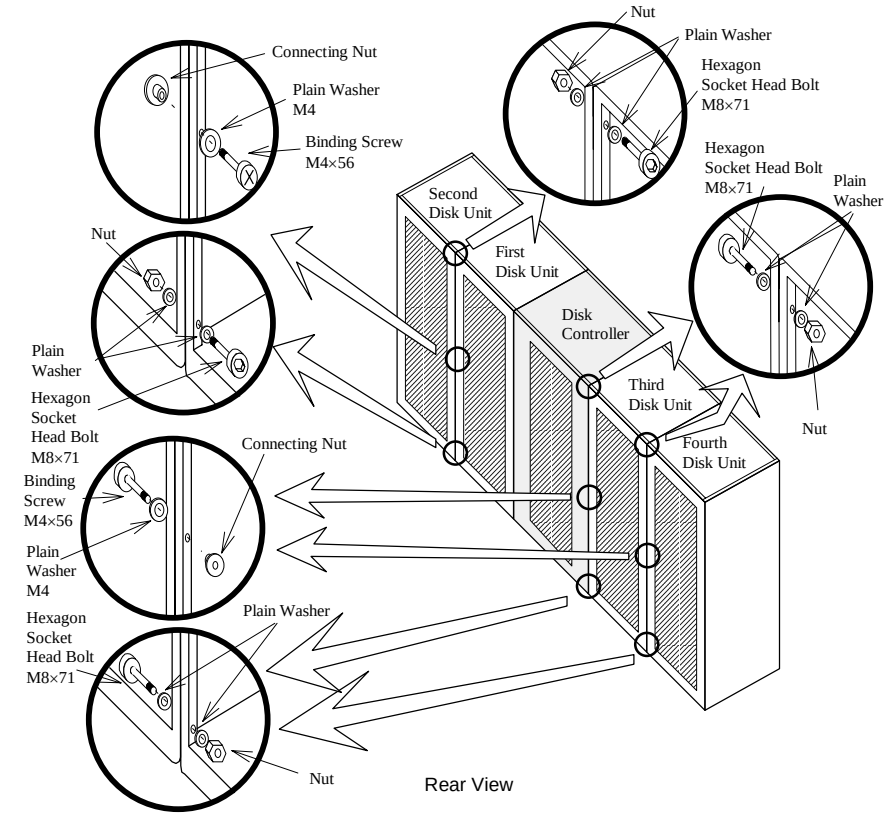


Fig. 4.4.2-11 Disconnection of Frame

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6. Removal of SCSI Interface Cables
   a. When the Third Disk Unit is removed, remove the four SCSI Interface Cables from the DKC. See INST04-360 through 370 (step a through e).
      When the Third Disk Unit is not removed, go to step 7.

7. Side Cover Re-Installation
   a. Attach the side cover to the end of the frame. See Table 4.4.2-5.

Table 4.4.2-5 Removal and Re-installation of Side Cover

Configuration	Fourth Disk Unit	Third Disk Unit	Disk Controller	First Disk Unit	Second Disk Unit
De-Installation of Second Disk Unit	——	——	Side Cover, Disk Controller	First Disk Unit	Second Disk Unit
De-Installation of Third Disk Unit	——	Third Disk Unit	Side Cover, Disk Controller	First Disk Unit	Second Disk Unit
De-Installation of Fourth Disk Unit	Fourth Disk Unit	Third Disk Unit	Side Cover, Disk Controller	First Disk Unit	Second Disk Unit

   b. Attach the side cover to the end of the string with the four binding screws and washers.

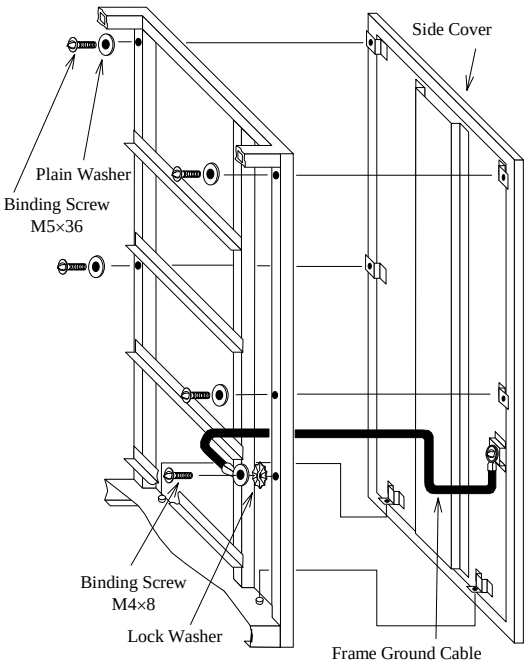

Fig. 4.4.2-12 Re-Installation of Side Cover

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8. Power Cable Assy Fixing
   a. Loosen the four screws.

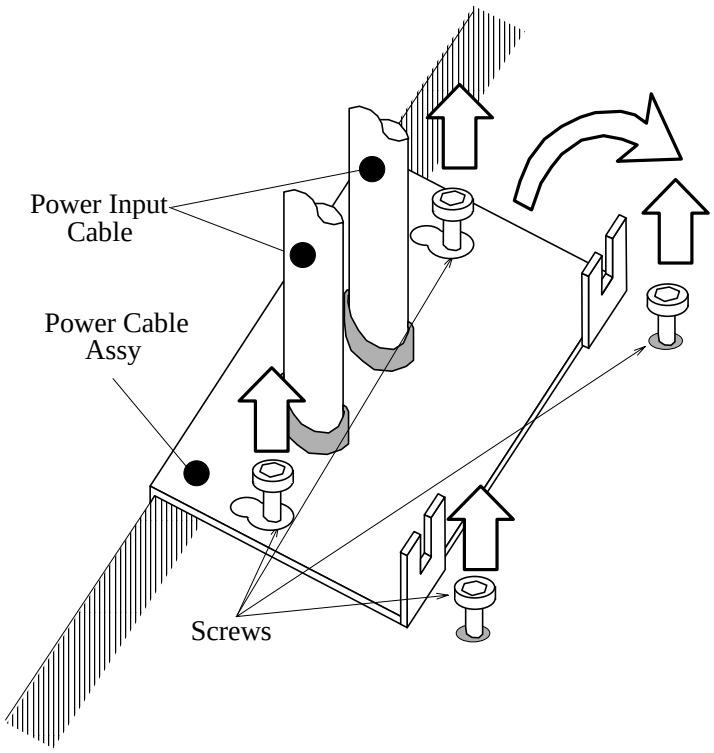

Fig. 4.4.2-13 Fixing of Power Cable Assy

   b. Secure the power cable Assy with the screws.

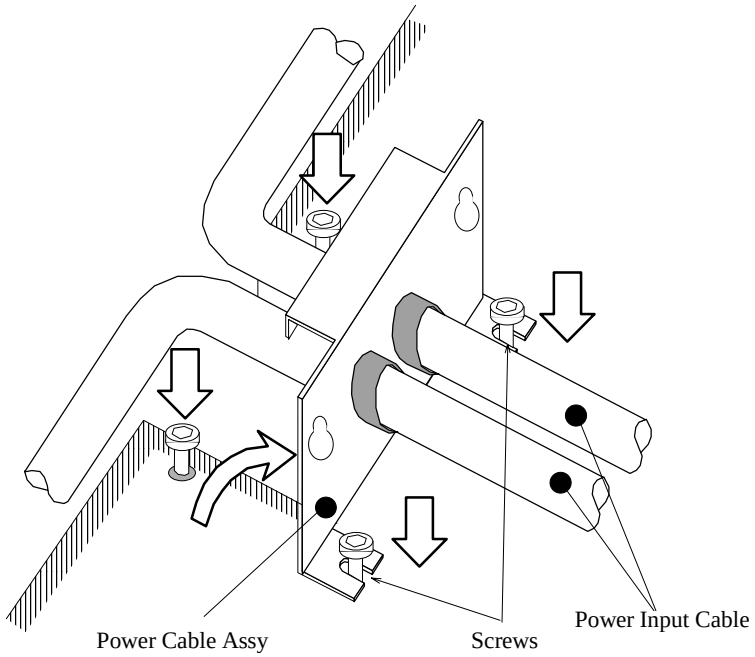

Fig. 4.4.2-14 Fixing of Power Cable Assy

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9. Fall Proof Adapter Attachment

   Attach the fall proof adapters to the Disk Unit(s).

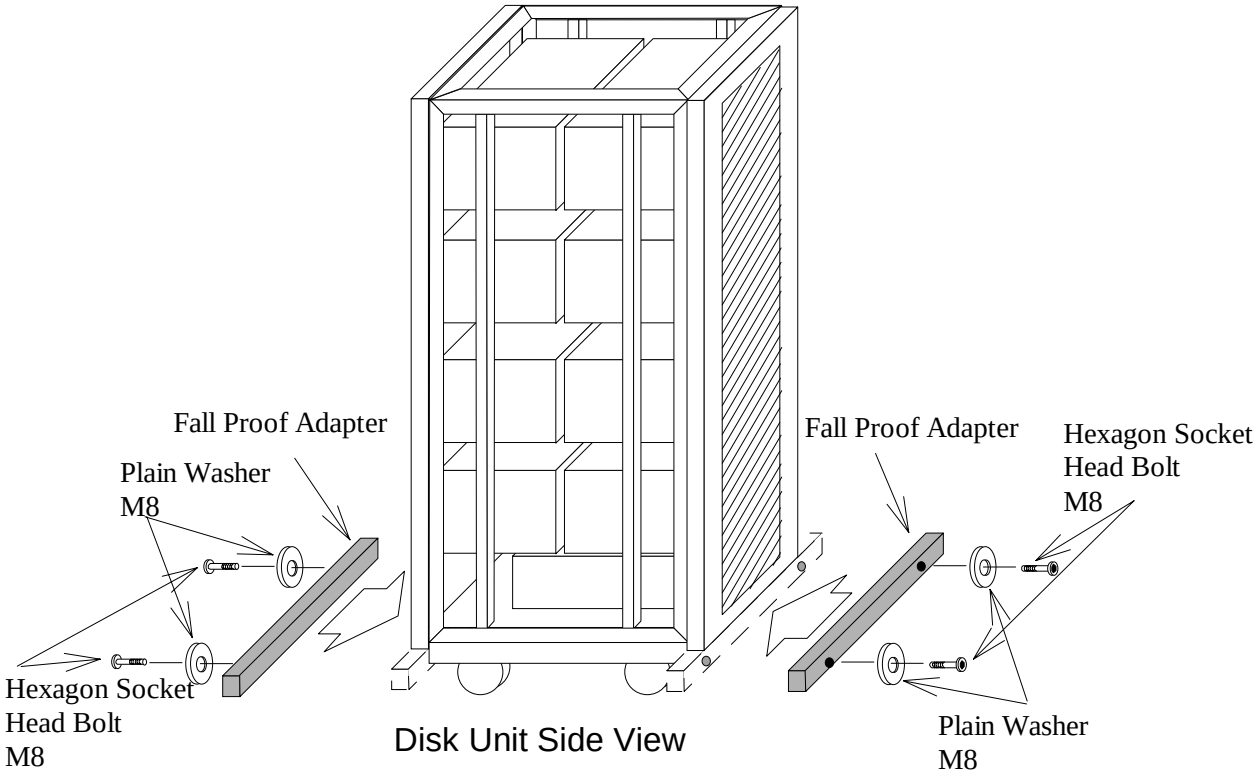

Fig. 4.4.2-15 Attachment of Fall Proof Adapter

10. Return to General Flow.
    Non-Disruptive De-installation : Go to INST02-32 Step (5)-9.
    Disruptive De-installation: Go to INST02-53 Step (13).

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4.5 De-Installation of HDD Canister (DKU-F305I-6F4/6F1/907/904/901/1804/1801/ 9F4/9F1/15F4/15F1/3604/3601/18J4/18J1/47J4/47J1)

4.5.1 Flowchart

(1) Checking the blocked state of the component to be de-installed. [INST04-990]
↓
(2) Removal of the acrylic cover. [INST04-990]
↓
(3) De-installation of the HDD canister. [INST04-990]
↓
(4) Attachment of the acrylic cover. [INST04-990]
↓
(5) Removal of the nameplate. [INST04-1000]

4.5.2 Parts List

Table 4.5.2-1 Parts List for HDD Canister

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
1	DKU-F305I-6F4	HDU-6F1(60)	5497472-A	4	DK3F1-60×4
		Nameplate	2102118-7	1	
2	DKU-F305I-6F1	HDU-6F1(60)	5497472-A	1	DK3F1-60×1
		Nameplate	2102118-10	1	
3	DKU-F305I-907	HDU-901(90)	5491618-A	7	DK308/309-90×7
		Nameplate	2102118-13	1	
4	DKU-F305I-904	HDU-901(90)	5491618-A	4	DK308/309-90×4
		Nameplate	2102118-16	1	
5	DKU-F305I-901	HDU-901(90)	5491618-A	1	DK308/309-90×1
		Nameplate	2102118-19	1	
6	DKU-F305I-1804	HDU-1801(180)	5497473-A	4	DK309/30A-180×4
		Nameplate	2102118-4	1	
7	DKU-F305I-1801	HDU-1801(180)	5497473-A	1	DK309/30A-180×1
		Nameplate	2102118-1	1	
8	DKU-F305I-9F4	HDU-9F1(90)	5502138-A	4	DK3F2-90×4
		Nameplate	2102118-34	1	
9	DKU-F305I-9F1	HDU-9F1(90)	5502138-A	1	DK3F2-90×1
		Nameplate	2102118-37	1	
10	DKU-F305I-15F4	HDU-15F1(150)	5502085-A	4	DK3F2-150×4
		Nameplate	2102118-22	1	
11	DKU-F305I-15F1	HDU-15F1(150)	5502085-A	1	DK3F2-150×1
		Nameplate	2102118-25	1	

(To be continued.)

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(Continued from preceding sheet.)

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
12	DKU-F305I-3604	HDU-3601(360)	5502084-A	4	DK30A-360×4
		Nameplate	2102118-28	1	
13	DKU-F305I-3601	HDU-3601(360)	5502084-A	1	DK30A-360×1
		Nameplate	2102118-31	1	
14	DKU-F305I-18J4	HDU-18J1SC(180)	5502372-A	4	DKR2B-J18SC×4
		Nameplate	2102118-53	1	
15	DKU-F305I-18J1	HDU-18J1SC(180)	5502372-A	1	DKR2B-J18SC×1
		Nameplate	2102118-54	1	
16	DKU-F305I-47J4	HDU-47J1SC(470)	5502373-A	4	DKR1B-J47SC×4
		Nameplate	2102118-55	1	
17	DKU-F305I-47J1	HDU-47J1SC(470)	5502373-A	1	DKR1B-J47SC×1
		Nameplate	2102118-56	1	

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4.5.3 De-Installation Procedure of HDD Canister

1. De-installation of the HDD canister.

   a. Check the Shut Down LED ① on the HDD canister ②. (It should be RED.)

> **⚠ CAUTION**
> A system down may be caused by a removal of an HDD canister other than that to be removed. Make sure that it is the HDD canister to be removed.

   b. Remove the acrylic cover ③.
   c. Remove connector ④ from HDD canister ②.
   d. Loosen screw ⑤ and remove HDD canister ② from the HDU Box ⑥.
   e. Insert connector ④ into Jxxx ⑦.
   f. Attach the acrylic cover ③ to the HDU Box ⑥.

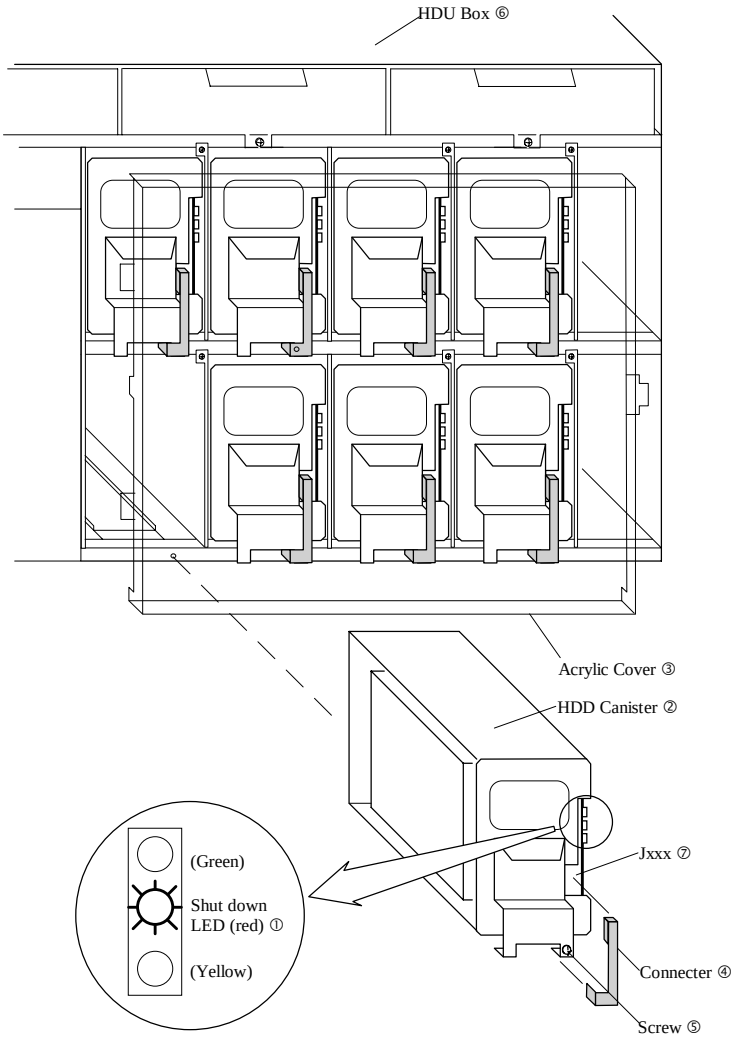

Fig. 4.5.3-1 De-Installation of HDD Canister

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2. Removal of the nameplate.

   a. Remove the nameplate corresponding to model number and serial number of the removed HDD canister(s).

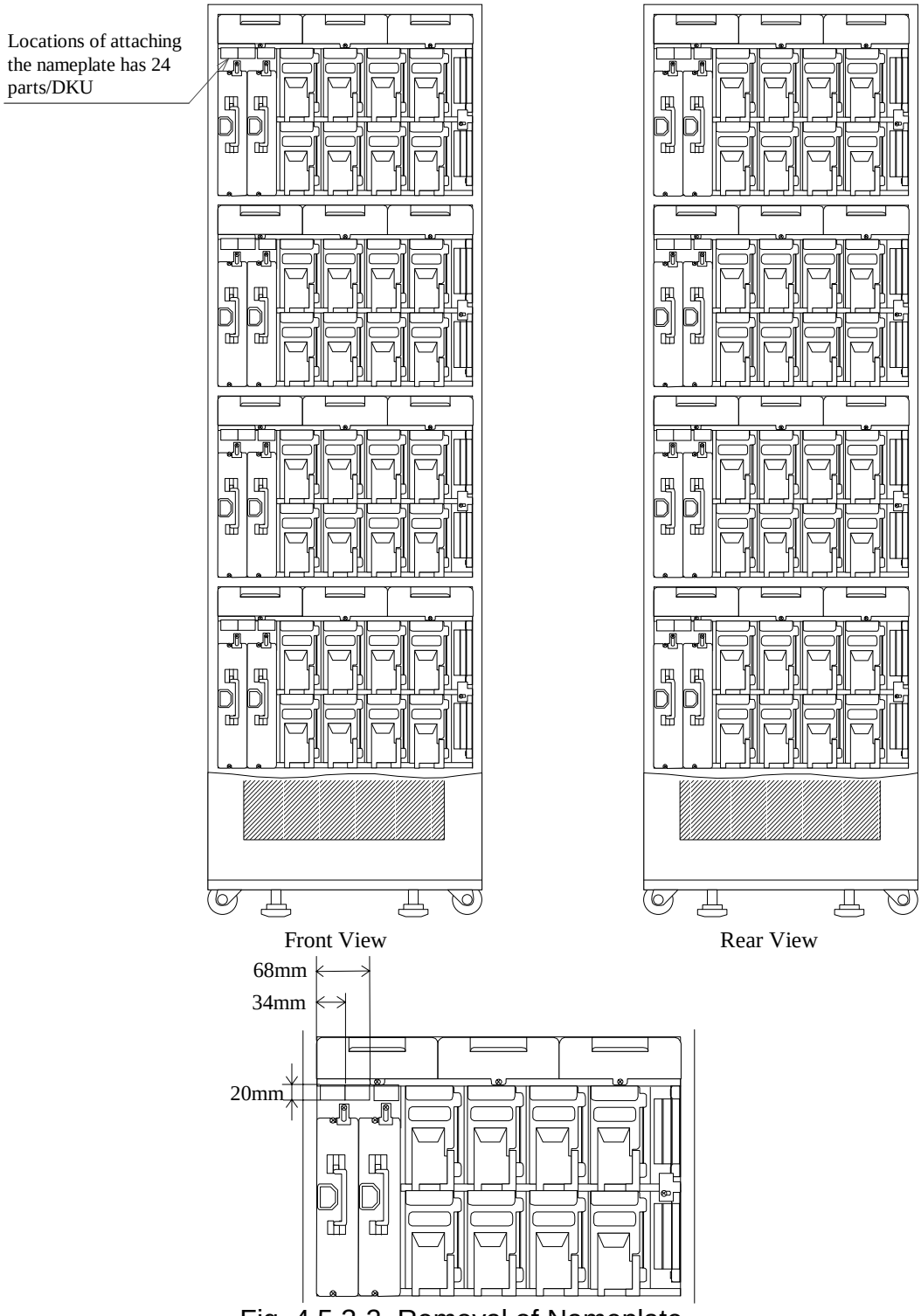

Fig. 4.5.3-2 Removal of Nameplate

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3. Return to General Flow.
   Non-Disruptive De-installation: Go to INST02-30 Step (2)-5.
   Disruptive De-installation: Go to INST02-52 Step (11).

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4.6 De-Installation of Platform for the Canister Mount (DKU-F305I-B4)

4.6.1 Flowchart

The procedure for de-installing the platform for the canister mount is shown below.

(1) Confirmation of de-installation position of platform for the canister mount. [INST04-1120]
↓
(2) Installation of the jumper plug in the DKUMN PCB. [INST04-1130]
↓
(3) Setting of the PS enable switch on the multi power supply. [INST04-1140]
↓
(4) Disconnection of the INLET cable. [INST04-1150]
↓
(5) Removal of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate. [INST04-1160]
↓
(6) Removal of the side plate. [INST04-1180]
↓
(7) Disconnection of the DKUMN cable. [INST04-1190]
↓
(8) De-Installation of the HDU Box. [INST04-1200]
↓
(9) Attachment of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate. [INST04-1200]
↓
(10) Attachment of the side plate. [INST04-1200]
↓
(11) Removal of the nameplate and label (REV). [INST04-1210]

4.6.2 Parts List

Table 4.6.2-1 Parts List for Platform for Canister Mount

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKU-F305I-B4	HDU Box	1505534-A	4	
		Multi Power Supply	5497470-A/B/C	8	
		SCSI BFR PCB	5497468-A	8	
		HDD FAN Assembly	5497471-A	12	
		Nameplate E (DKU-F305I)	2099650-57	1	
		Label (REV)	5497283-1	1	

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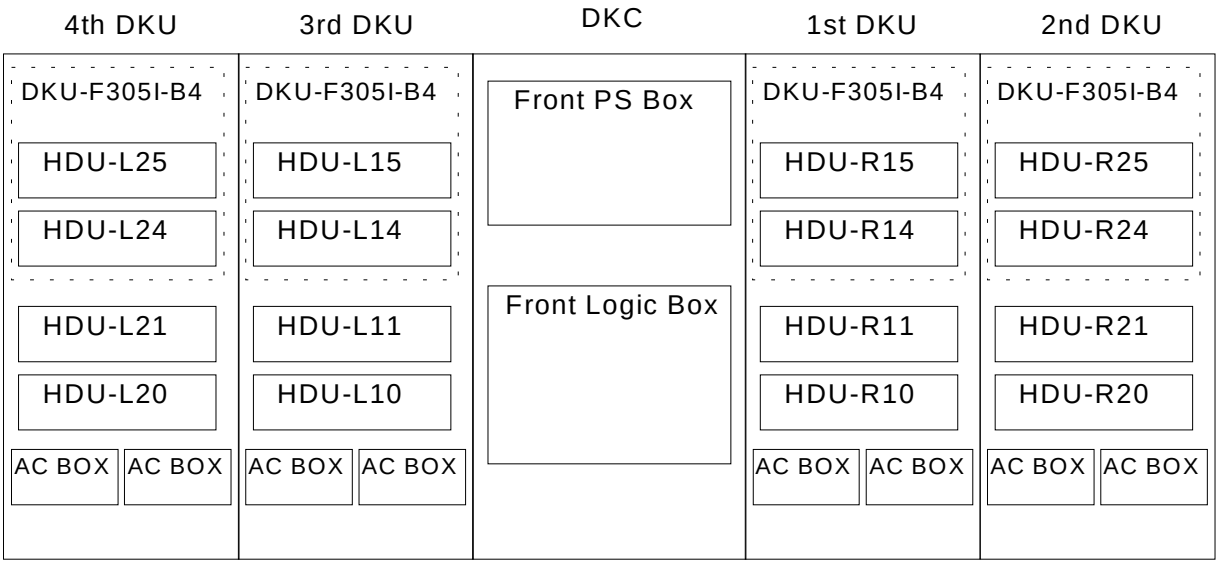
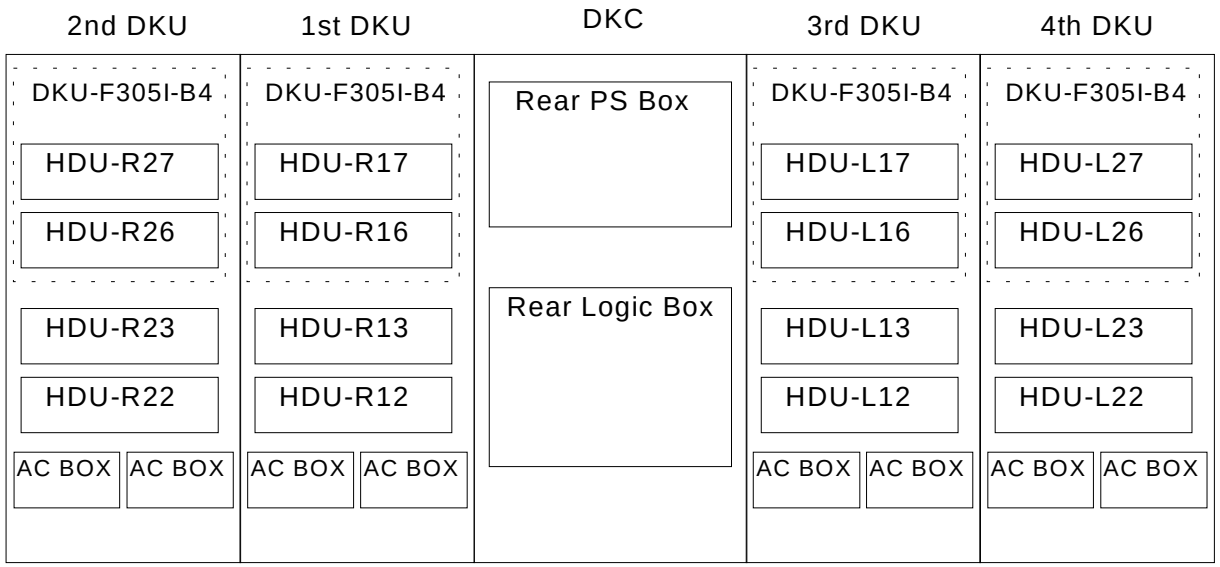
4.6.3 De-Installation Procedure of Platform for the Canister Mount

1. Confirmation of de-installation position of platform for the canister mount.

   a. Confirm a position to remove platform for the canister mount.



Front View



Rear View

Fig 4.6.3-1 Check of the Blocked State of Component to be De-Installed

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2. Installation of the jumper plug in the DKUMN PCB.

   a. Install the jumper plugs for JP3 ① on the DKUMN PCBs ②, referring to Fig. 4.6.3-2.

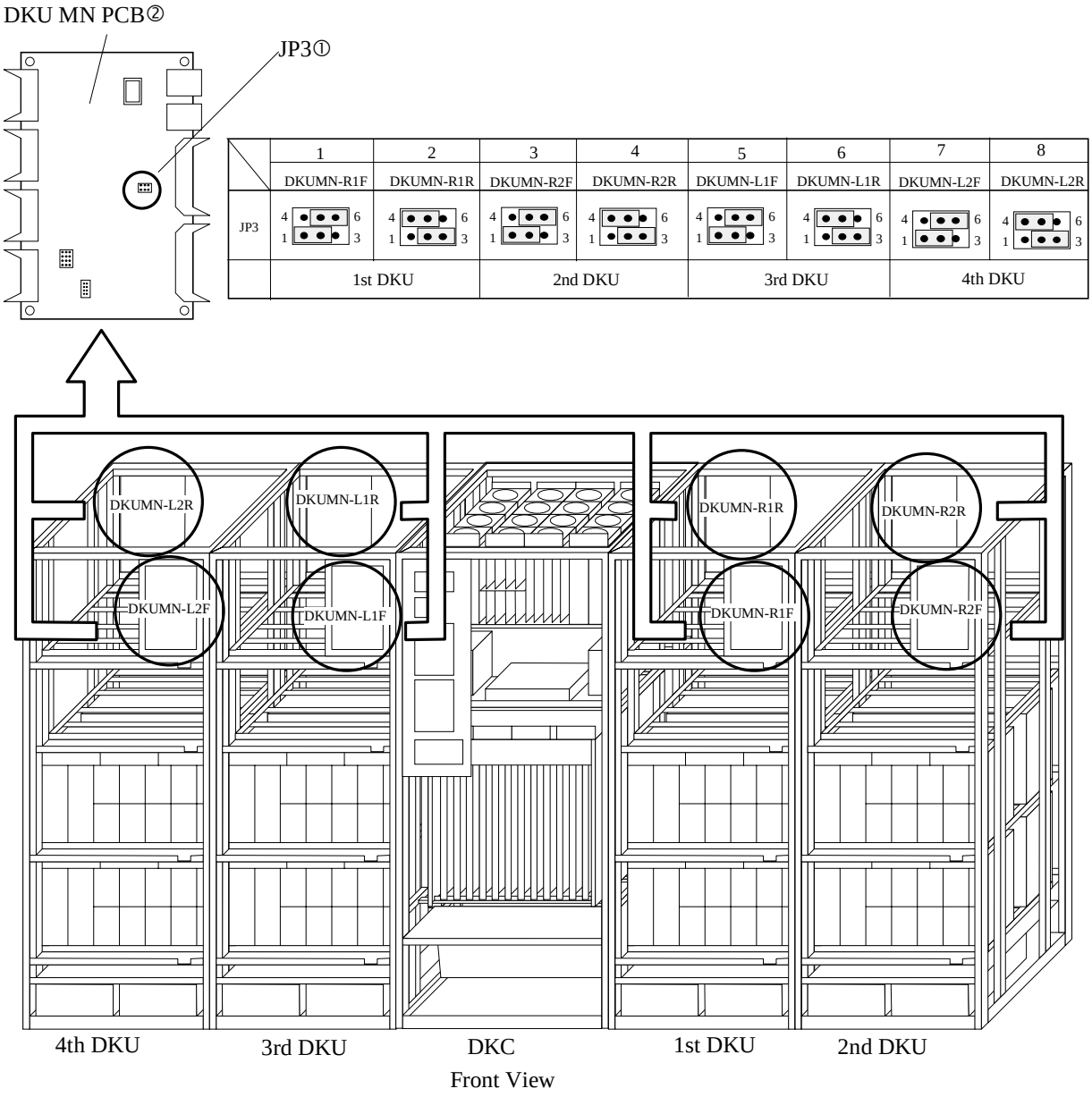

Fig. 4.6.3-2 DKUMN PCB jumper plug Positions

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3. Setting of the PS enable switch on the multi power supply.

   a. Set the PS enable switch ① on the multi power supply ② to Disable and make sure that the PS enable LED ③ goes off.

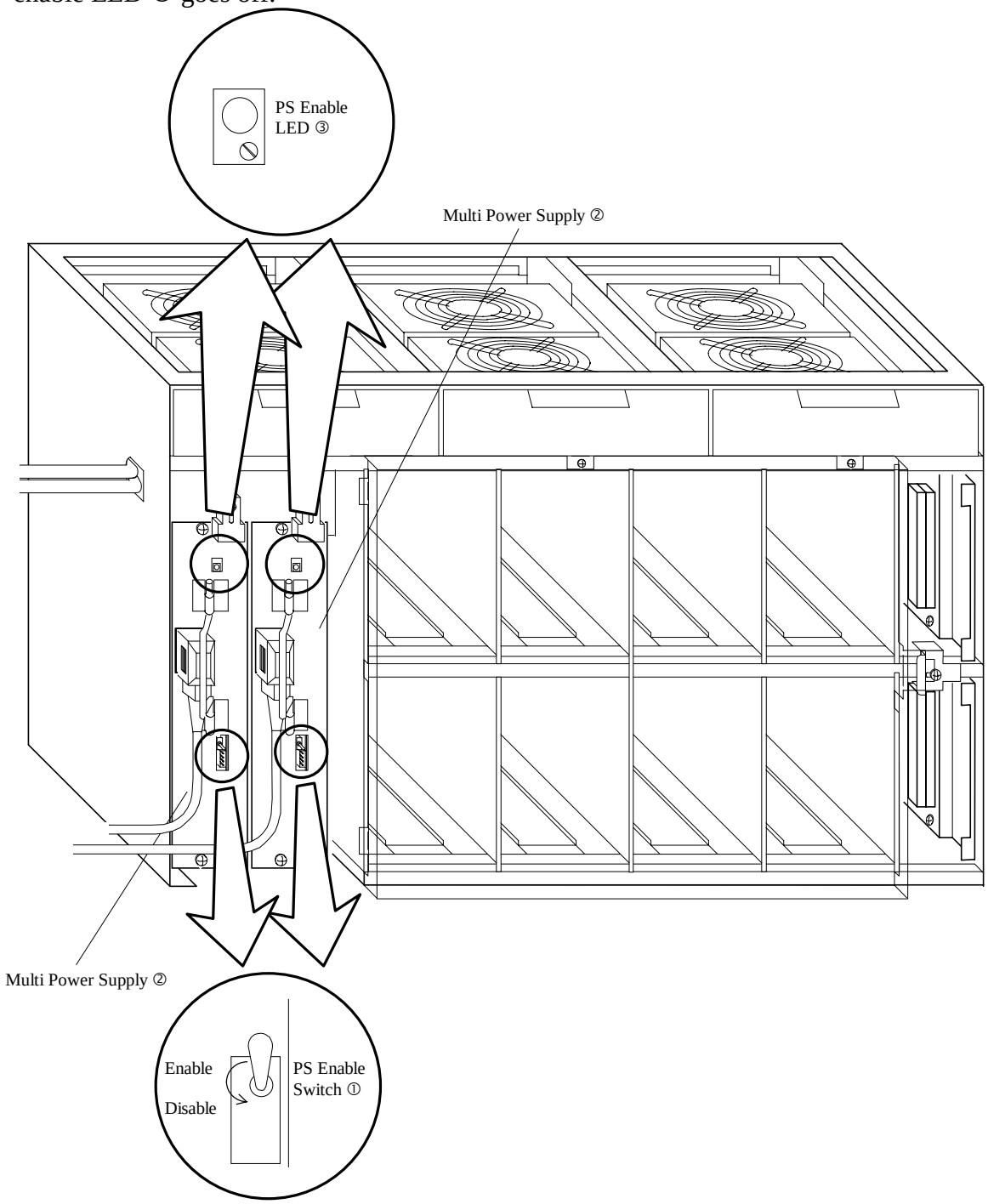

Fig. 4.6.3-3 Set the PS Enable Switch on the Multi Power Supply

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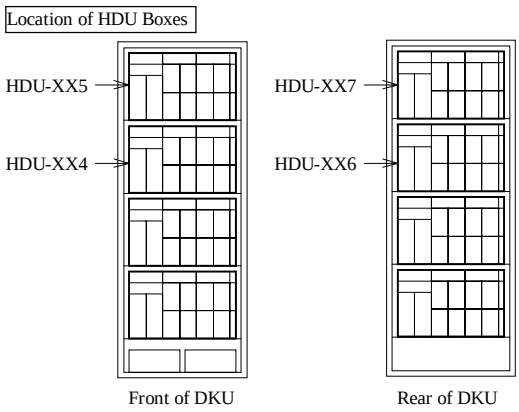
4. Disconnection of the INLET cable.

   a. Disconnect the INLET cables referring to Table 4.6.3-1 and Fig. 4.6.3-4.

Table 4.6.3-1 INLET Cables and Matching Connectors

Location of HDU Box	No.	INLET Cable ①	Connector
XX4	1	4-P601-1	4-J601-1
	2	4-P601-2	4-J601-2
XX5	1	5-P601-1	5-J601-1
	2	5-P601-2	5-J601-2
XX6	1	6-P601-1	6-J601-1
	2	6-P601-2	6-J601-2
XX7	1	7-P601-1	7-J601-1
	2	7-P601-2	7-J601-2



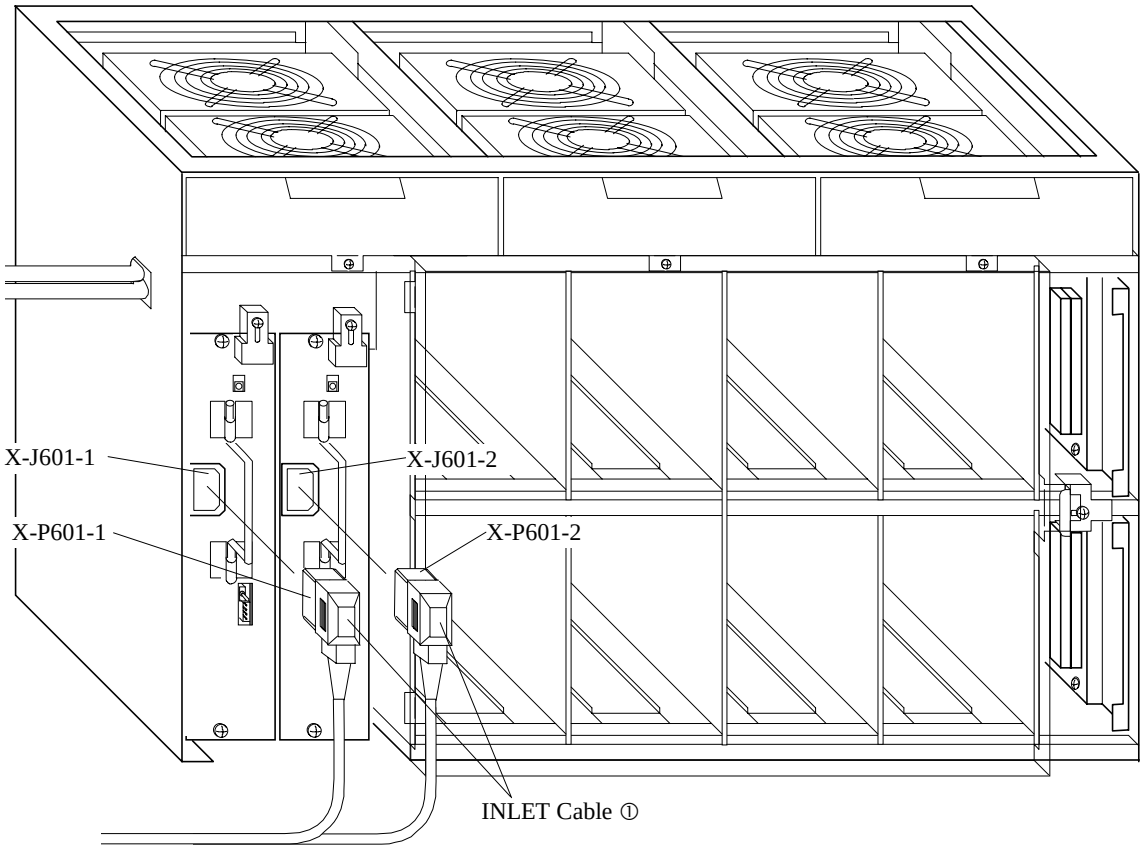


Fig. 4.6.3-4 Disconnection of the INLET Cable

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5. Removal of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate.

   a. Remove the acrylic cover①.

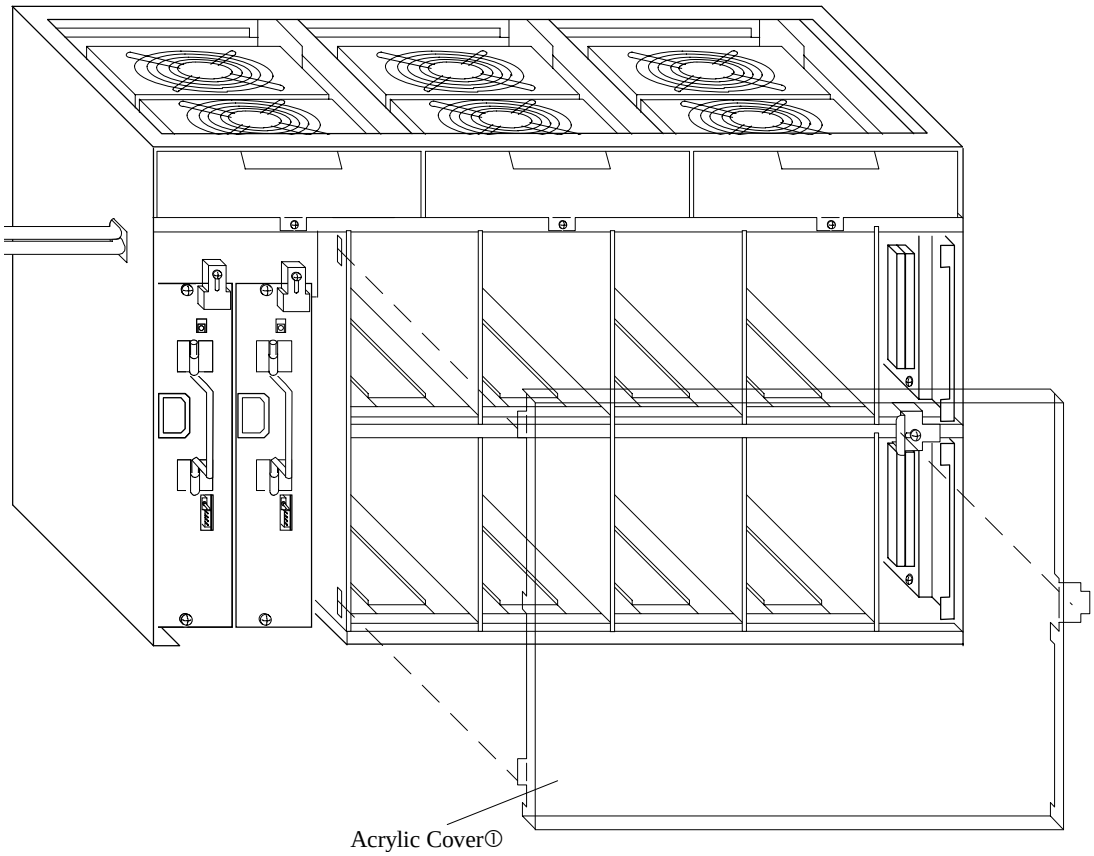

Fig. 4.6.3-5 Removal of the Acrylic Cover

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b. Loosen screw ① on stopper ② securing the SCSI BFR PCB ③ in the HDU box to be installed, slide stopper ② to the left, and pull out the SCSI BFR PCB ③.

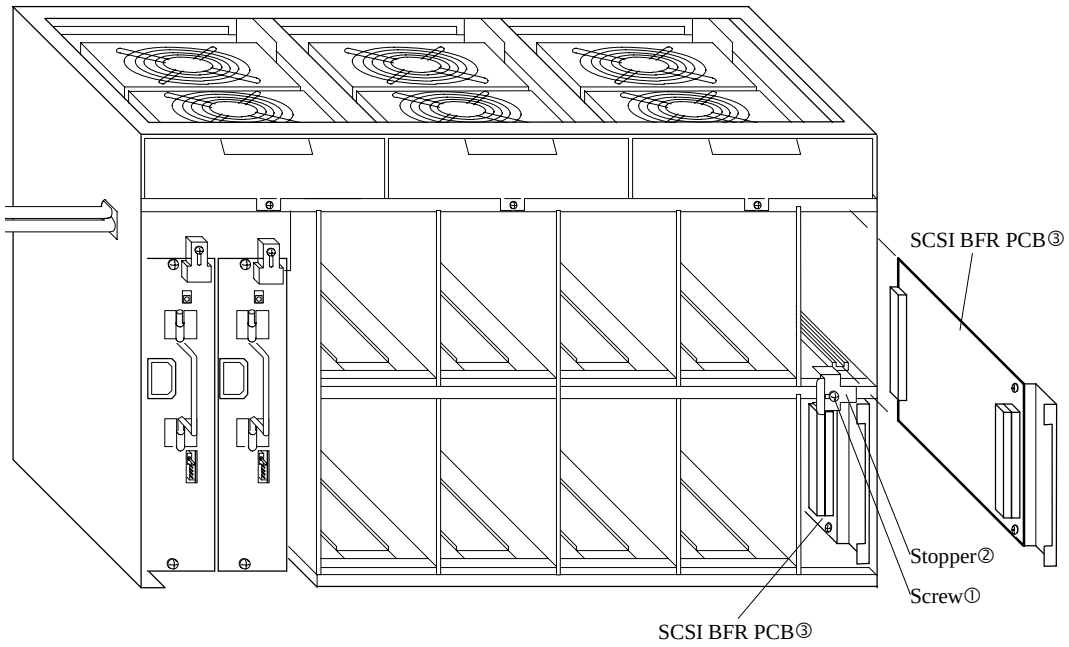

Fig. 4.6.3-6 Removal of the SCSI BFR PCB

c. Remove screws ① securing the multi power supply ② in the HDU box to be installed, flip up the buffering rubbers ③, and pull out the multi power supply ②.

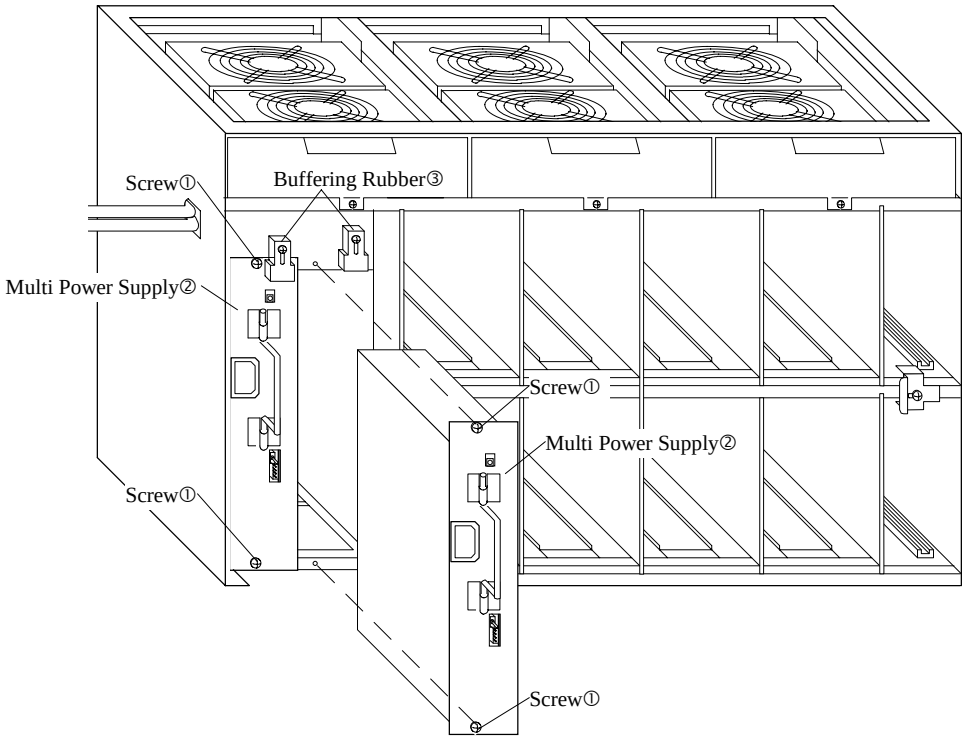

Fig. 4.6.3-7 Removal of the Multi Power Supply

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d. Pull out the partition plates ①.

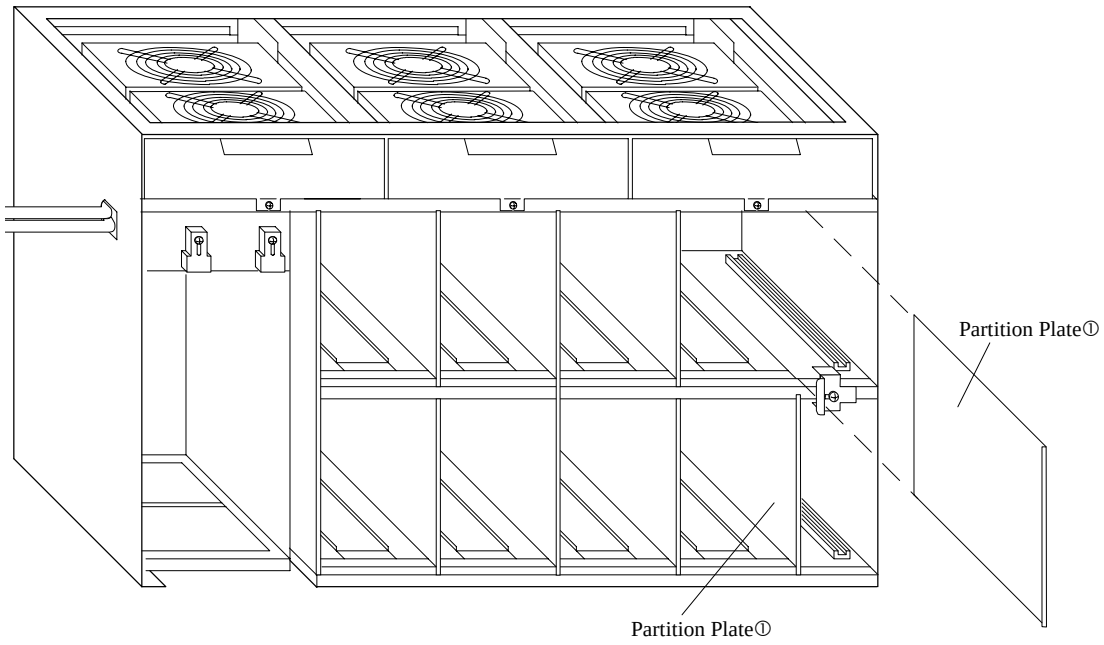

Fig. 4.6.3-8 Removal of the Partition Plate

6. Removal of the side plate.

a. Loosen screws ① and raise DKUMN PCBs ② and secure DKUMN PCBs ② with screws ③.
b. Remove screws ④ and side plates ⑤.
c. Loosen screws ⑥ and raise cable ducts ⑦ when de-installing the HDU box.

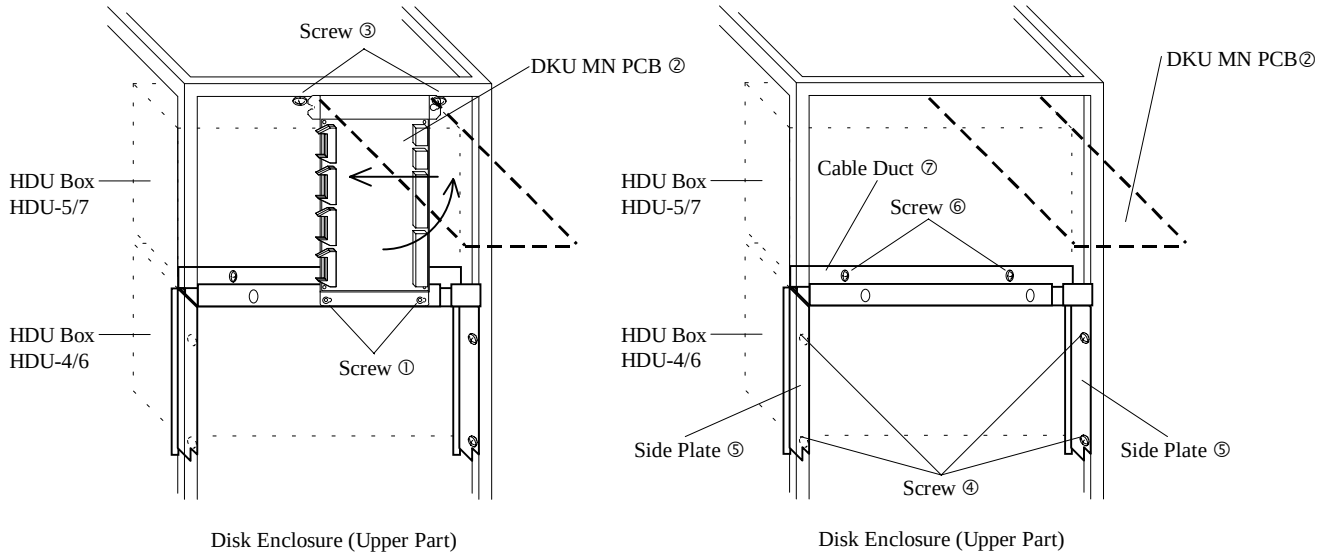

Fig. 4.6.3-9 Removal of the Side Plate

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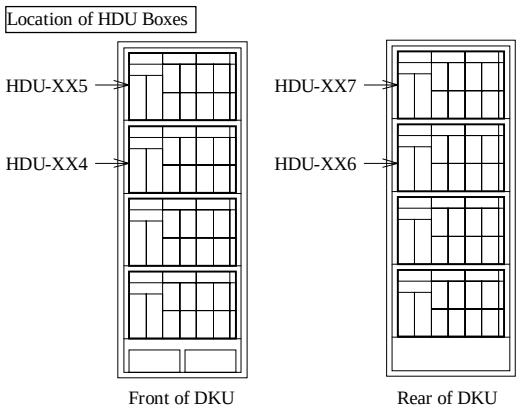
7. Disconnection of the DKUMN cable.

   a. Disconnection of the DKUMN cables ① referring to Table 4.6.3-2 and Fig. 4.6.3-10.

Table 4.6.3-2 DKUMN Cables and Matching Connectors

Location of HDU Box	No.	DKU MN Cable ①	Connector
XX4	1	4-P301	4-J301
	2	4-P302	4-J302
XX5	1	5-P301	5-J301
	2	5-P302	5-J302
XX6	1	6-P301	6-J301
	2	6-P302	6-J302
XX7	1	7-P301	7-J301
	2	7-P302	7-J302



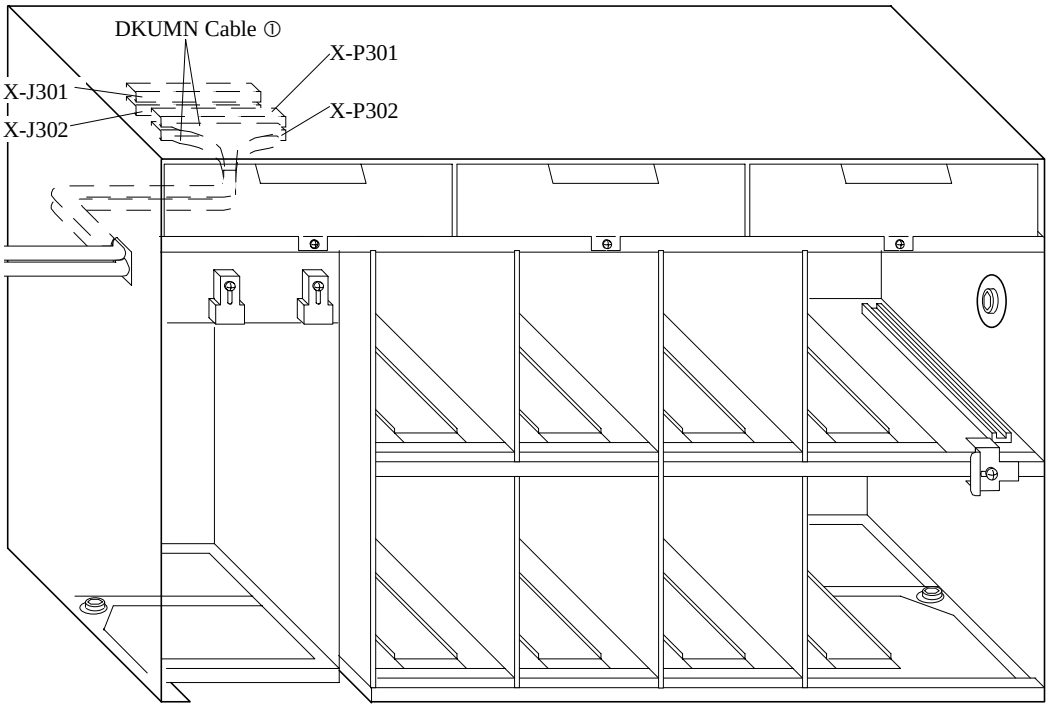


Fig. 4.6.3-10 Disconnection of the DKUMN Cable

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8. De-Installation of the HDU Box.
   a. Remove screws ① and plastic washers ②, and remove the HDU Box from the Disk Unit.

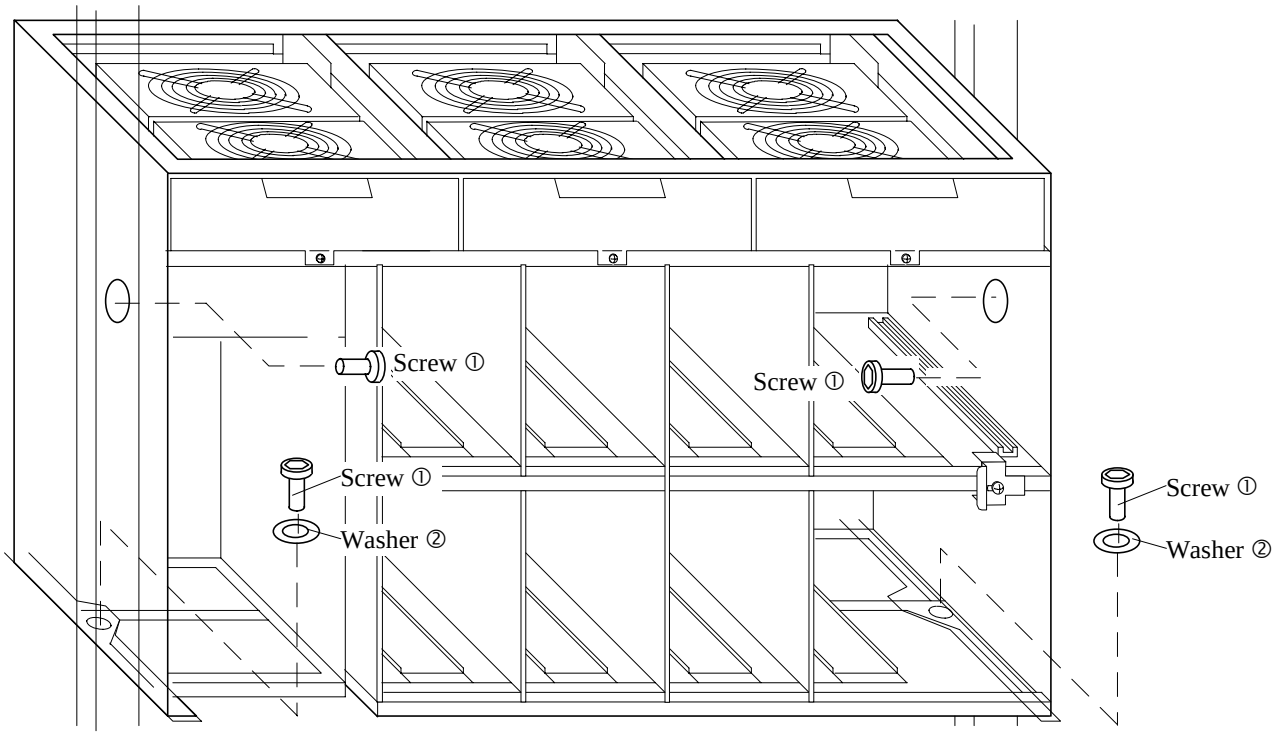

Fig. 4.6.3-11 De-Installation of the HDU Box

9. Attachment of the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate.

   a. Attach the acrylic cover, SCSI BFR PCB, multi power supply, and partition plate in the HDU Box in the reverse order of Step 5.

10. Attachment of the side plate.

   a. Attach the side plates in the reverse order of Step 6.

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11. Removal of the nameplate and label (REV).
    a. Remove the nameplate ① and label (REV) ② of additional HUD box, referring to a Fig. 4.6.3-12.

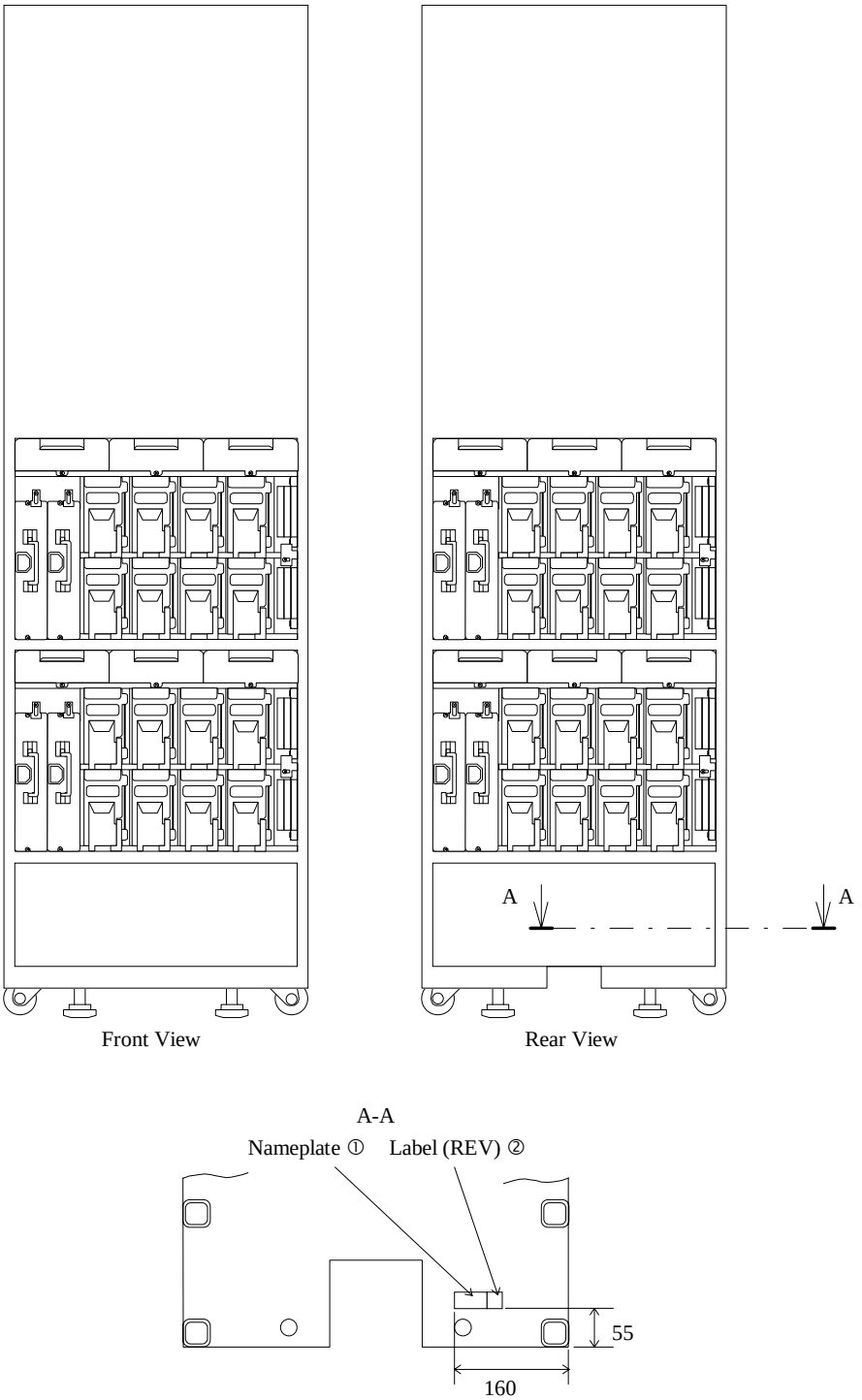

Fig. 4.6.3-12 Removal of the Nameplate and Label (REV)

12. Return to General Flow.
    Non-Disruptive De-installation: Go to INST02-31 Step (4)-8.
    Disruptive De-installation: Go to INST02-52 Step (11)-6.

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4.7 De-installation of Channel Adapter

4.7.1 De-installation of Parallel 8-channel Switch (DKC-F310I-8P)

4.7.1.1 Parts list

Table 4.7.1-1 Parts List for Parallel 8-channel Switch

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8P	Parallel 4-channel Switch PCB	3252510-A	2	
		I/F Connector Panel (CH A)	2102090-A	2	For Channel A
		I/F Connector Panel (CH B)	2102090-B	2	For Channel B
		I/F Connector Panel (CH C)	2102090-C	2	For Channel C
		I/F Connector Panel (CH D)	2102090-D	2	For Channel D
		Screw	SB408	32	
		Label	5500246-1	4	Parallel
		Nameplate	3252542-5	1	For DKC-F310I-8P
		Bypass Connector	5430027-8	8	For Removal of CHA

4.7.1.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).

↓

(2) Disconnect the CH cables.

↓

(3) Remove the PCBs.

↓

(4) Remove the I/F connector panels.

↓

(5) Remove the labels.

↓

(6) Remove the nameplate.

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4.7.1.3 De-Installation Procedure of Parallel 8-channel Switch

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.1-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

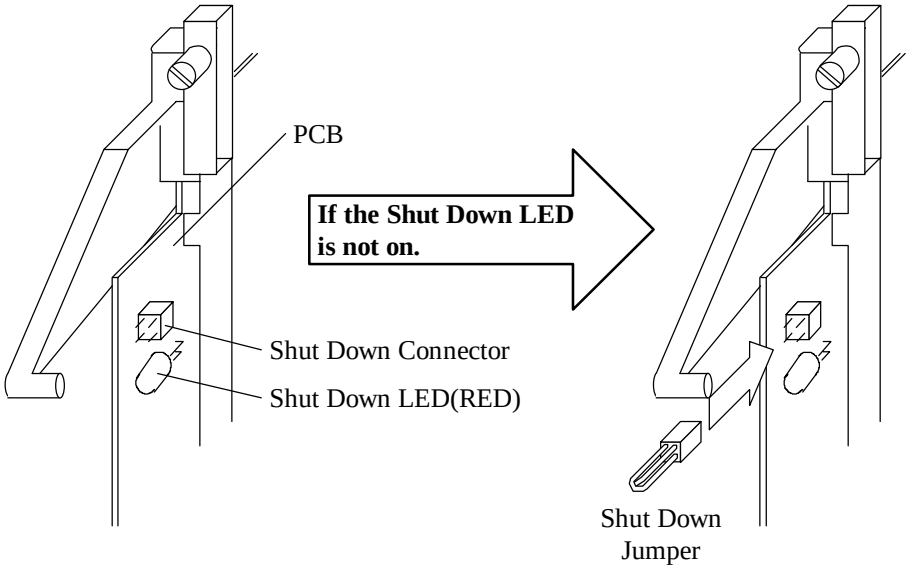

Fig. 4.7.1-1 Shut Down LED

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2. Disconnection of the CH cables
   a. Disconnect the CH cables from the Sub-edge connectors on the PCB referring to Table 4.7.1-2, Table 4.7.1-3, and Fig. 4.7.1-2.

Table 4.7.1-2 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

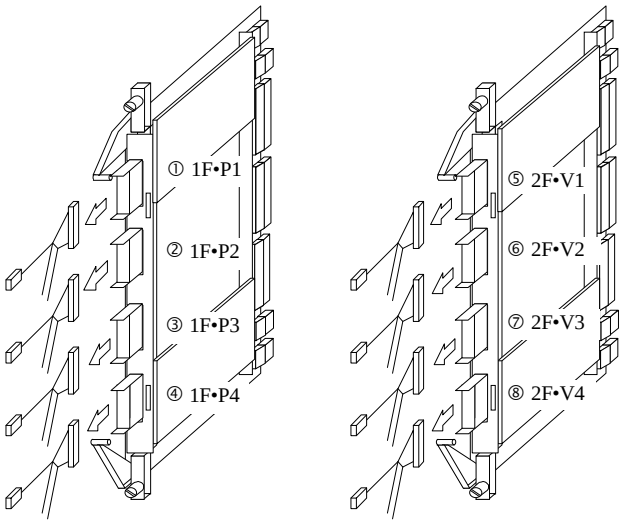

Fig. 4.7.1-2 Disconnection of CH Cables

Table 4.7.1-3 CH Cable Connection

No.	CH Cable	Sub-edge connector on PCB
1	1F•P1/2F•V1	1F•P1
2	1F•P2/2F•V2	1F•P2
3	1F•P3/2F•V3	1F•P3
4	1F•P4/2F•V4	1F•P4
5	1F•P1/2F•V1	2F•V1
6	1F•P2/2F•V2	2F•V2
7	1F•P3/2F•V3	2F•V3
8	1F•P4/2F•V4	2F•V4

3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.1-3.
   b. Attach the dummy plates referring to Fig. 4.7.1-4.

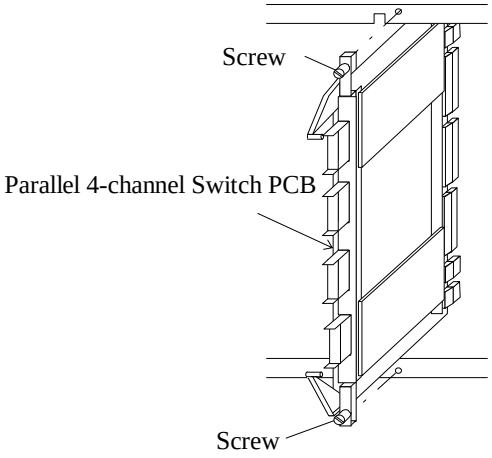

Fig. 4.7.1-3 Removal of PCB

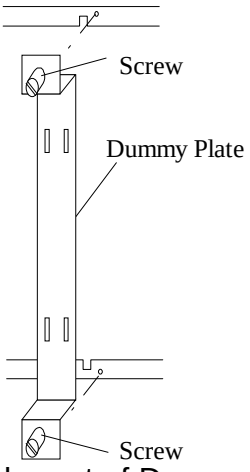

Fig. 4.7.1-4 Attachment of Dummy Plate

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4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.1-5.
   b. Attach the dummy plates referring to Fig. 4.7.1-6.

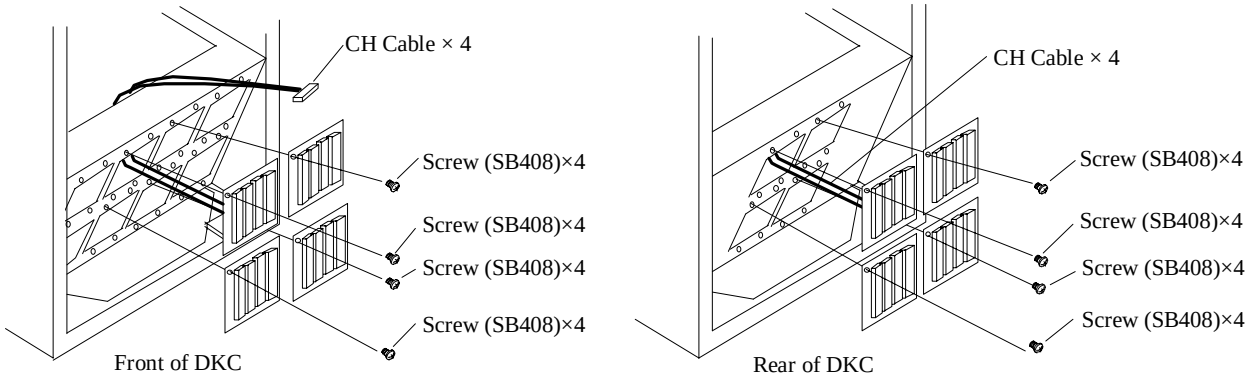

Fig. 4.7.1-5 Removal of I/F Connector Panel

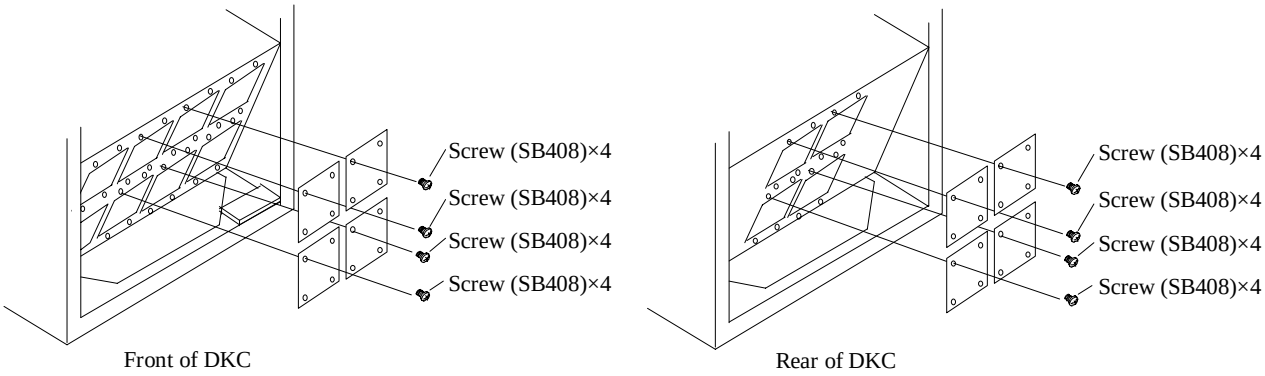

Fig. 4.7.1-6 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " PARALLEL PORT " from ① and ② referring to Fig. 4.7.1-7.

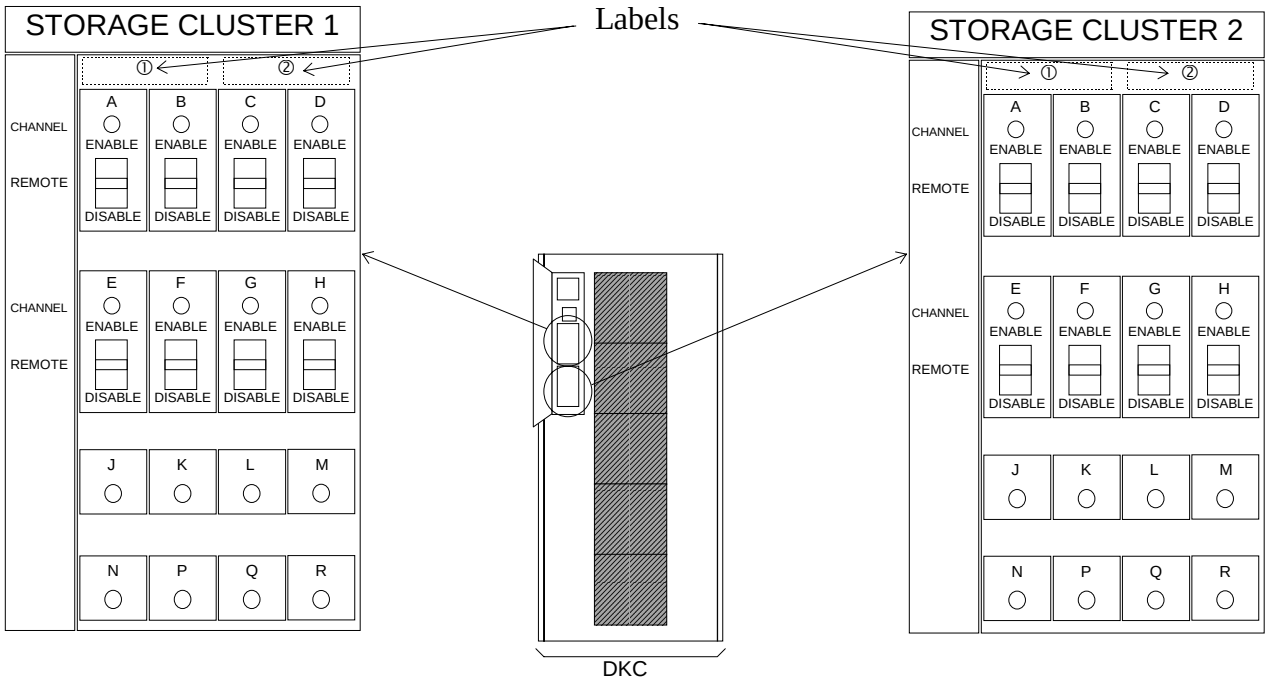

Fig. 4.7.1-7 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.1-8.

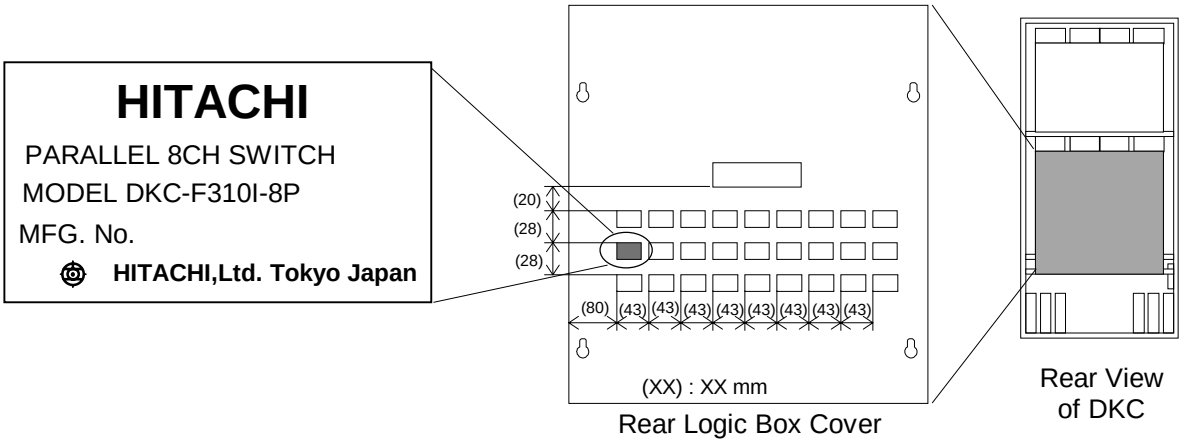

Fig. 4.7.1-8 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.7.2 De-installation of Parallel 8-channel Switch (DKC-F310I-8PS)

4.7.2.1 Parts list

Table 4.7.2-1 Parts List for Parallel 8-channel Switch

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8PS	Parallel 4-channel Switch PCB	3252510-A	2	
		I/F Connector Panel (CL1-CH A,B/E,F)	2102073-A	2	For CL1-CH A,B/E,F
		I/F Connector Panel (CL1-CH C,D/G,H)	2102073-B	2	For CL1-CH C,D/G,H
		I/F Connector Panel (CL2-CH A,B/E,F)	2102073-C	2	For CL2-CH A,B/E,F
		I/F Connector Panel (CL2-CH C,D/G,H)	2102073-D	2	For CL2-CH C,D/G,H
		Screw	SB408	16	
		Label	5500246-1	4	Parallel
		Nameplate	3252542-16	1	For DKC-F310I-8PS
		Bypass Connector	5430027-8	8	For Removal of CHA

4.7.2.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).

↓

(2) Disconnect the CH cables.

↓

(3) Remove the PCBs.

↓

(4) Remove the I/F connector panels.

↓

(5) Remove the labels.

↓

(6) Remove the nameplate.

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4.7.2.3 De-Installation Procedure of Parallel 8-channel Switch

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.2-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

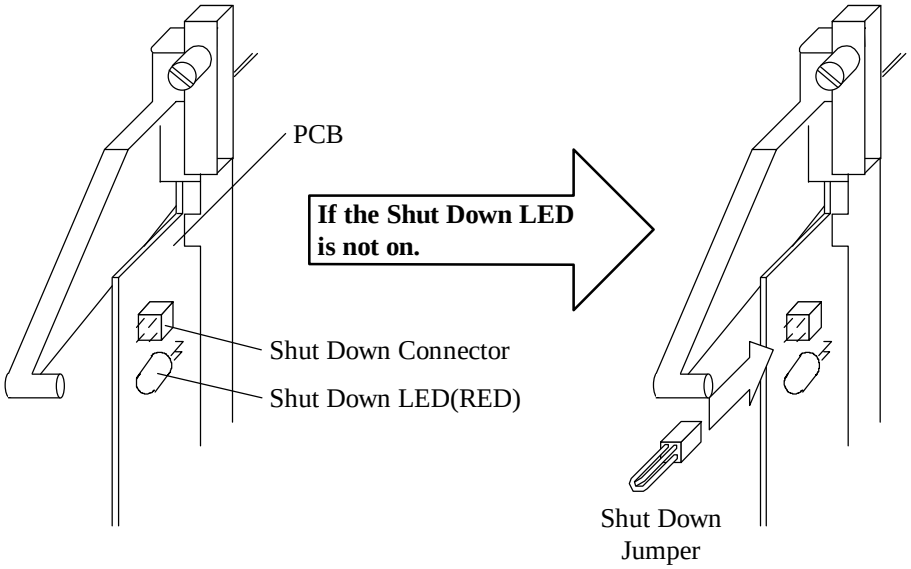

Fig. 4.7.2-1 Shut Down LED

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2. Disconnection of the CH cables

Table 4.7.2-2 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

In case of Basic

a. Disconnect the CH cables from the Sub-edge connectors on the PCB referring to Table 4.7.2-2, Table 4.7.2-3, and Fig. 4.7.2-2.

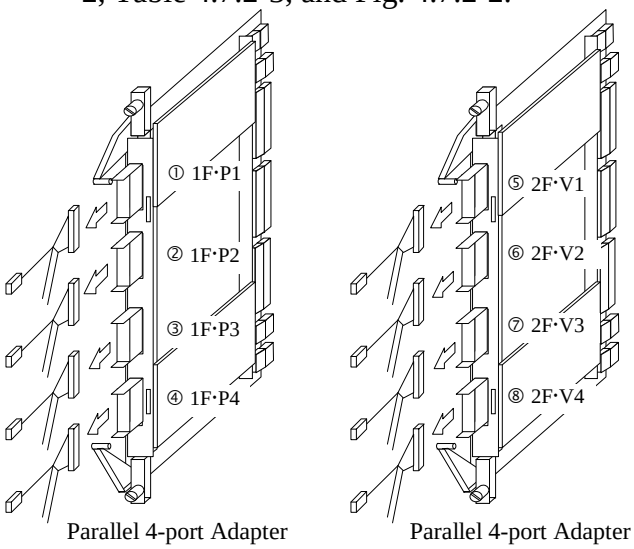

Fig. 4.7.2-2 Disconnection of CH Cables (Basic)

Table 4.7.2-3 CH Cable Connection

No.	CH Cable	Sub-edge connector on PCB
1	1F･P1/1F･Q1	1F･P1
2	1F･P2/1F･Q2	1F･P2
3	1F･P3/1F･Q3	1F･P3
4	1F･P4/1F･Q4	1F･P4
5	2F･V1/2F･W1	2F･V1
6	2F･V2/2F･W2	2F･V2
7	2F･V3/2F･W3	2F･V3
8	2F･V4/2F･W4	2F･V4

In case of Add.1

a. Disconnect the CH cables from the Sub-edge connectors on the PCB referring to Table 4.7.2-2, Table 4.7.2-4, and Fig. 4.7.2-3.

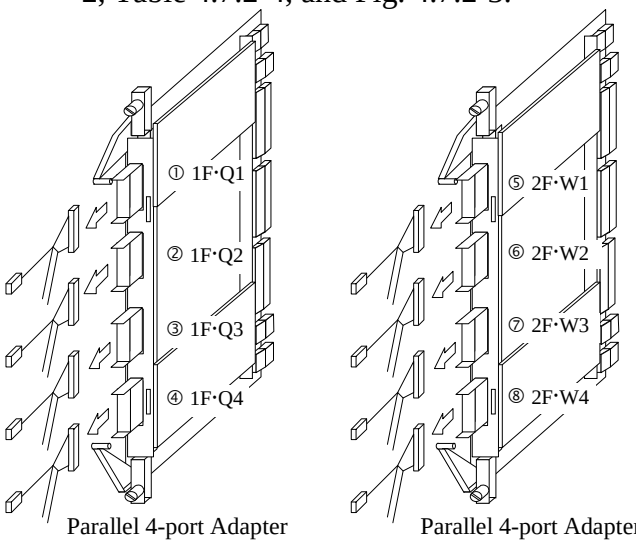

Fig. 4.7.2-3 Disconnection of CH Cables (Add.1)

Table 4.7.2-4 CH Cable Connection

No.	CH Cable	Sub-edge connector on PCB
1	1F･P1/1F･Q1	1F･Q1
2	1F･P2/1F･Q2	1F･Q2
3	1F･P3/1F･Q3	1F･Q3
4	1F･P4/1F･Q4	1F･Q4
5	2F･V1/2F･W1	2F･W1
6	2F･V2/2F･W2	2F･W2
7	2F･V3/2F･W3	2F･W3
8	2F･V4/2F･W4	2F･W4

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.2-4.
   b. Attach the dummy plates referring to Fig. 4.7.2-5.

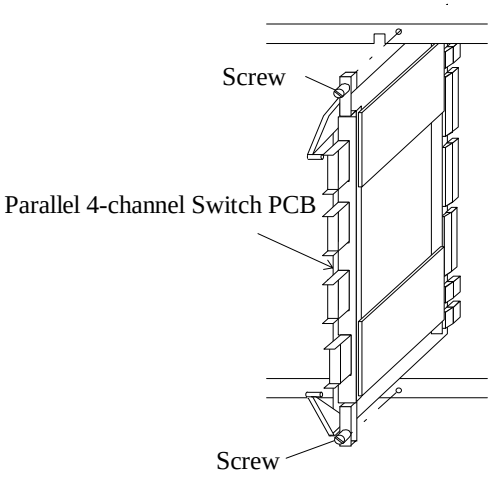

Fig. 4.7.2-4 Removal of PCB

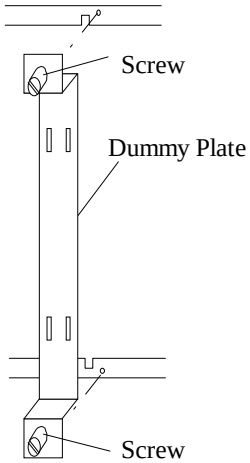

Fig. 4.7.2-5 Attachment of Dummy Plate

4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.2-6.
   b. Attach the dummy plates referring to Fig. 4.7.2-7.

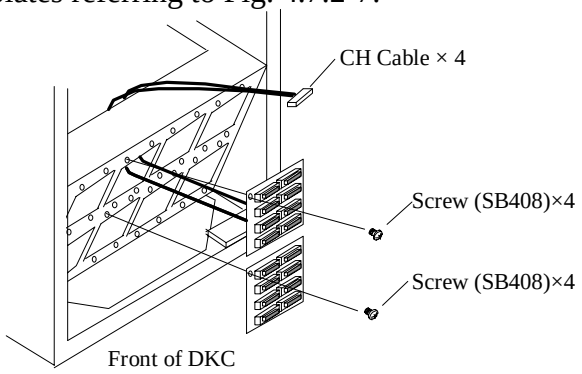

Fig. 4.7.2-6 Removal of I/F Connector Panel

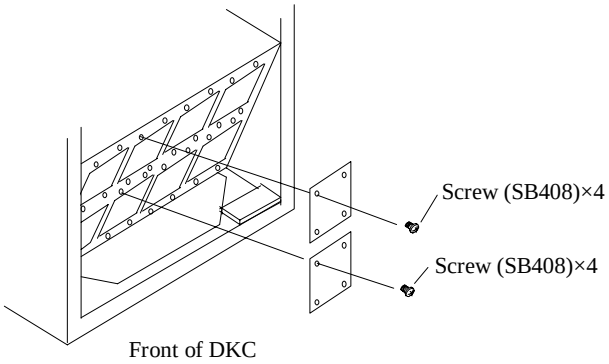

Fig. 4.7.2-7 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " PARALLEL PORT " from ① through ④ referring to Fig. 4.7.2-8.

Table 4.7.2-5 Removal of Labels

Order of addition	Basic	Add.1
Labeling position	① and ②	③and ④
Channel No.	A,B,C,D	E,F,G,H

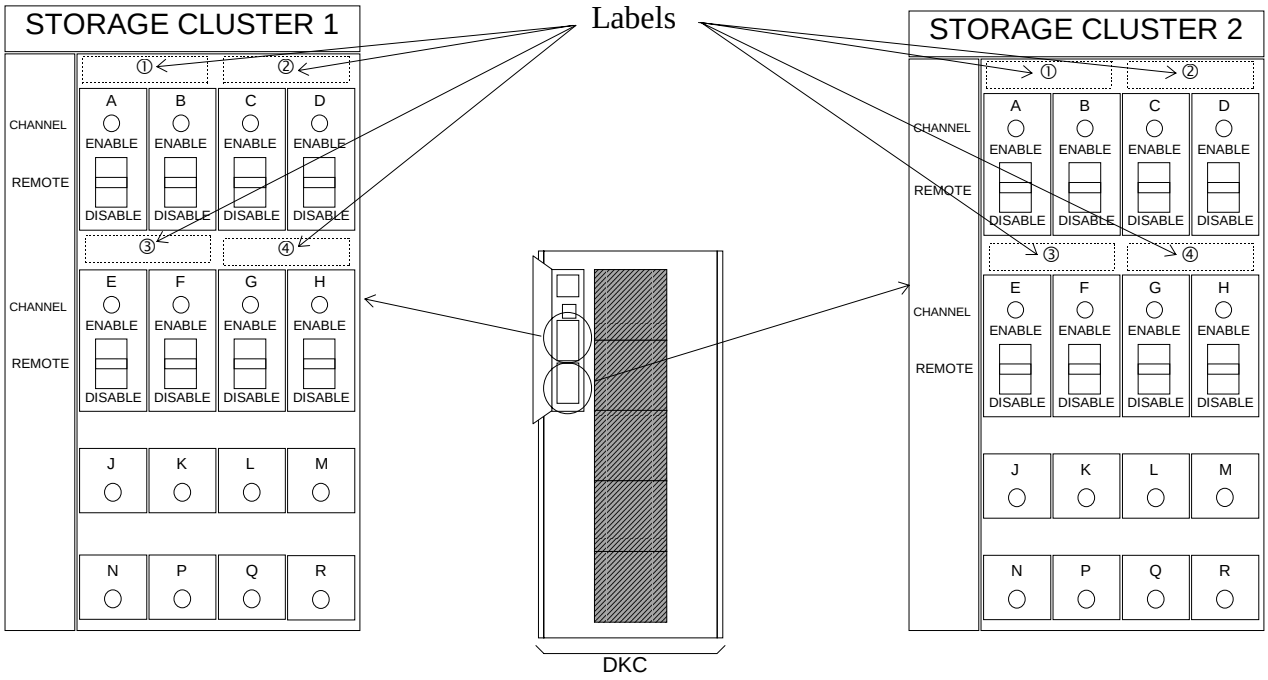

Fig. 4.7.2-8 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.2-9.

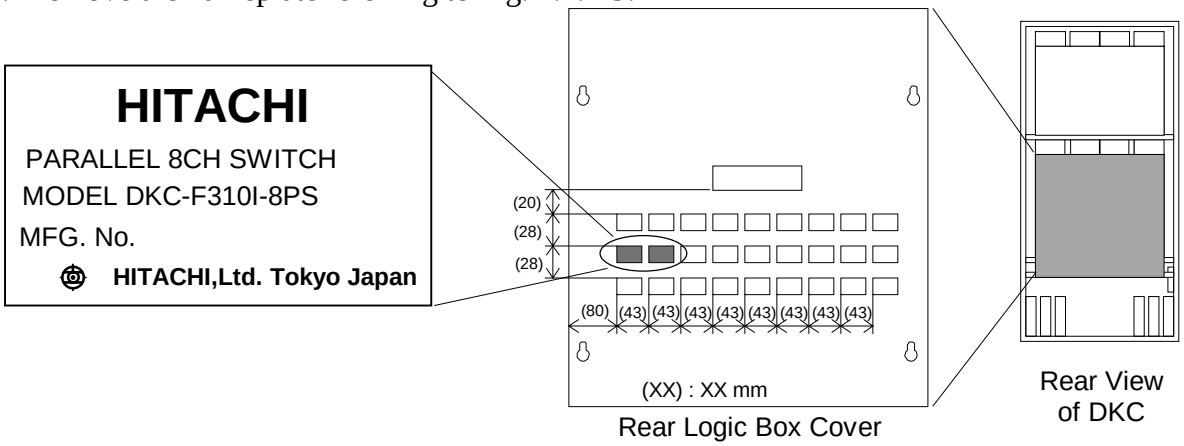

Fig. 4.7.2-9 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.7.3 De-installation of Serial 4-port Adapter (DKC-F310I-4S)

4.7.3.1 Parts list

Table 4.7.3-1 Parts List for Serial 4-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-4S	Serial 2-port Adapter PCB	3252509-B	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500245-1	2	For Serial
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Holder	2084816-1	4	
		Nameplate	3252542-3	1	For DKC-F310I-4S

4.7.3.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).
↓
(2) Disconnect the optical fiber cables.
↓
(3) Remove the PCBs.
↓
(4) Remove the I/F connector panels.
↓
(5) Remove the labels.
↓
(6) Remove the nameplate.

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4.7.3.3 De-Installation Procedure of Serial 4-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.3-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

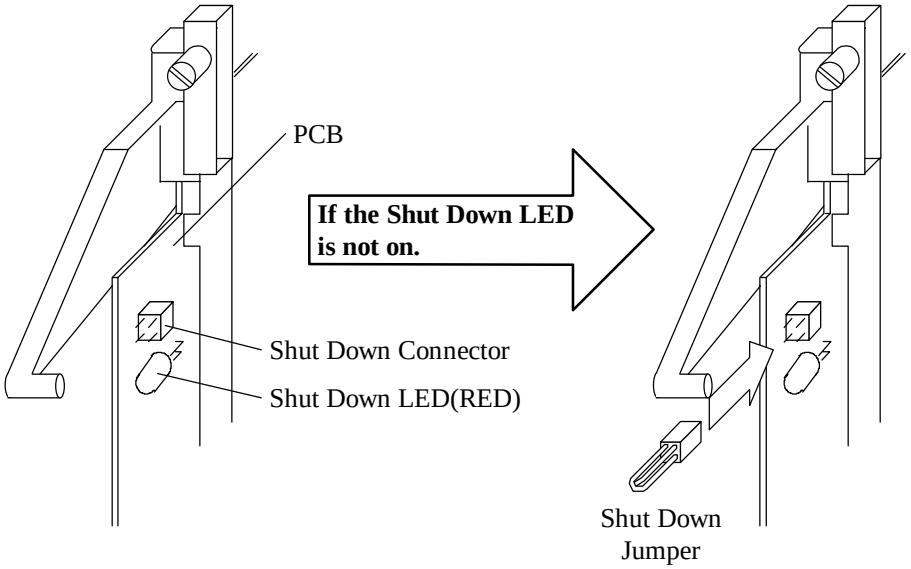

Fig. 4.7.3-1 Shut Down LED

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2. Disconnection of the optical fibre cables
   a. Remove the Bracket③ and Strain Relief② referring to Fig. 4.7.3-2.
   b. Disconnect the optical fibre cables and remove the Holder④ referring to Fig. 4.7.3-3.

Table 4.7.3-2 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

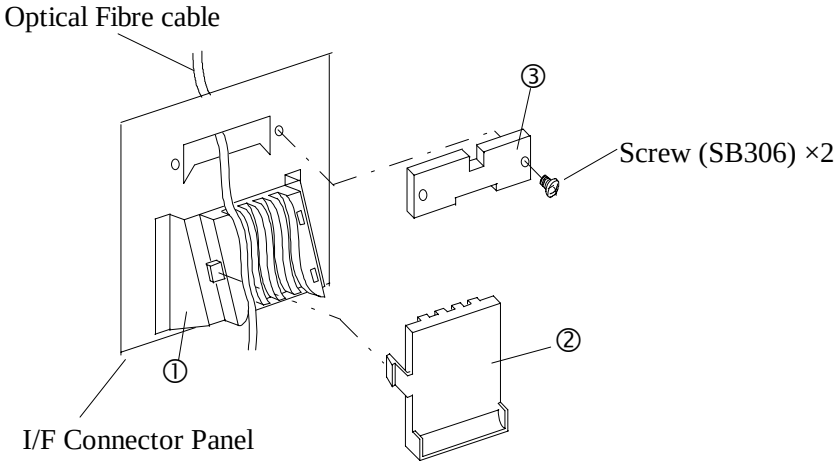

Fig 4.7.3-2 Removal of Strain Relief

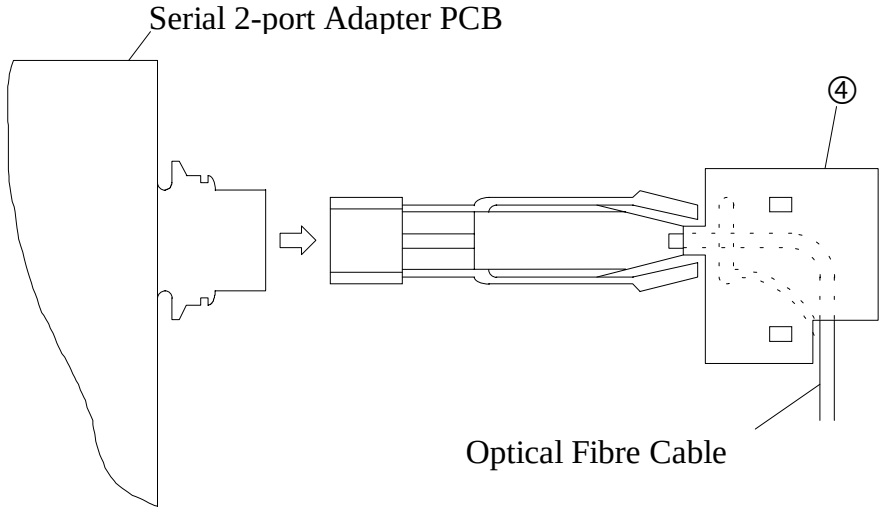

Fig. 4.7.3-3 Disconnect of Optical Fibre Cable

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.3-4.
   b. Attach the dummy plates referring to Fig. 4.7.3-5

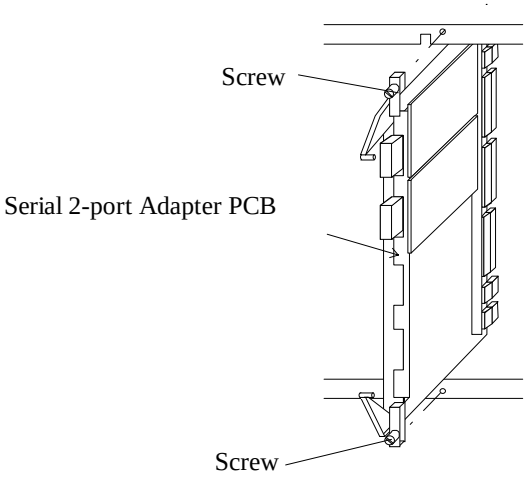

Fig. 4.7.3-4 Removal of PCB

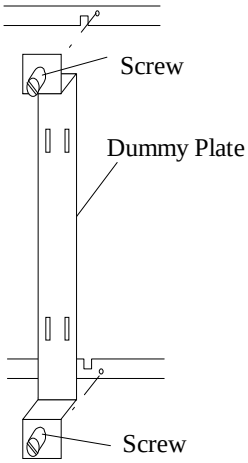

Fig. 4.7.3-5 Attachment of Dummy Plate

4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.3-6.
   b. Attach the dummy plates referring to Fig. 4.7.3-7

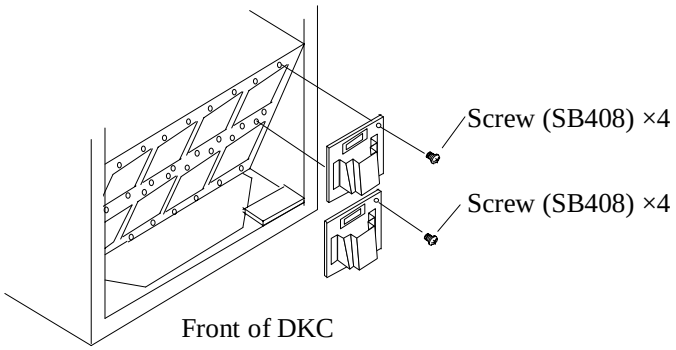

Fig. 4.7.3-6 Removal of I/F Connector Panel

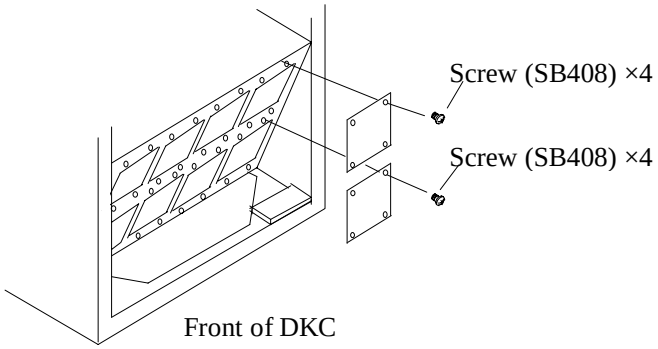

Fig. 4.7.3-7 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " SERIAL PORT " from ①, ③, ⑤, or ⑦ referring to Fig. 4.7.3-8.

Table 4.7.3-3 Removal of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	①	③	⑤	⑦
Channel No.	A,B	E,F	J,K	N,P

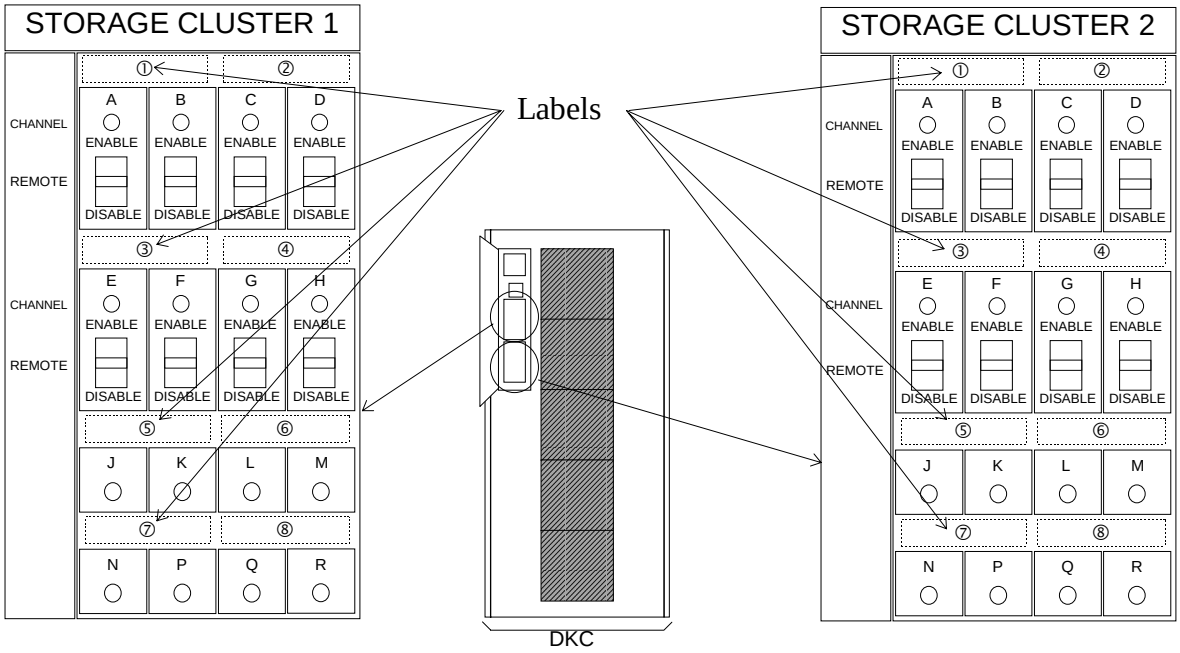

Fig. 4.7.3-8 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.3-9.

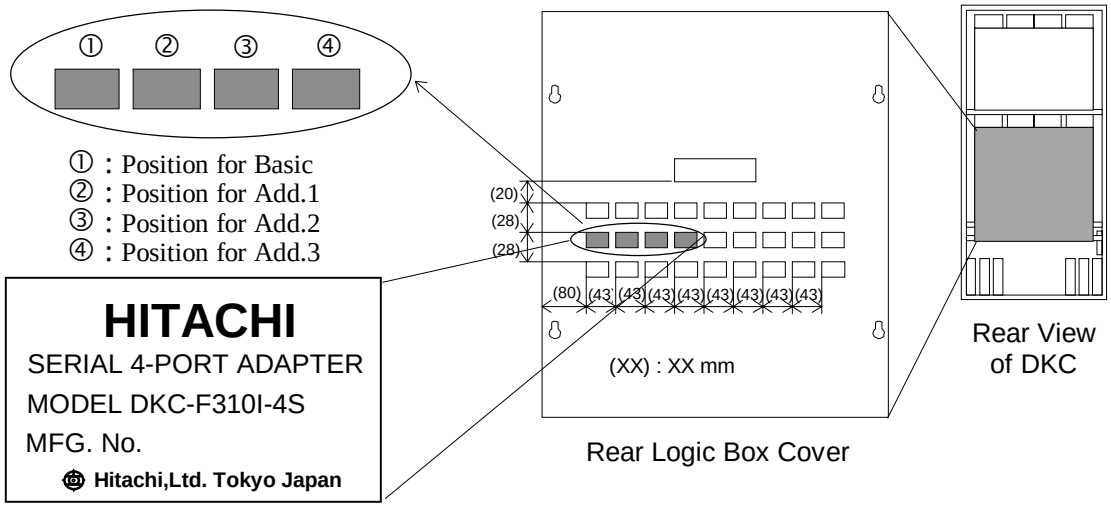

Fig. 4.7.3-9 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.7.4 De-installation of Serial 8-port Adapter (DKC-F310I-8S)

4.7.4.1 Parts list

Table 4.7.4-1 Parts List for Serial 8-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8S	Serial 4-port Adapter PCB	3252509-A	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500245-1	4	For Serial
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Holder	2084816-1	8	
		Nameplate	3252542-4	1	For DKC-F310I-8S

4.7.4.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).
↓
(2) Disconnect the optical fiber cables.
↓
(3) Remove the PCBs.
↓
(4) Remove the I/F connector panels.
↓
(5) Remove the labels.
↓
(6) Remove the nameplate.

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4.7.4.3 De-Installation Procedure of Serial 8-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.4-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

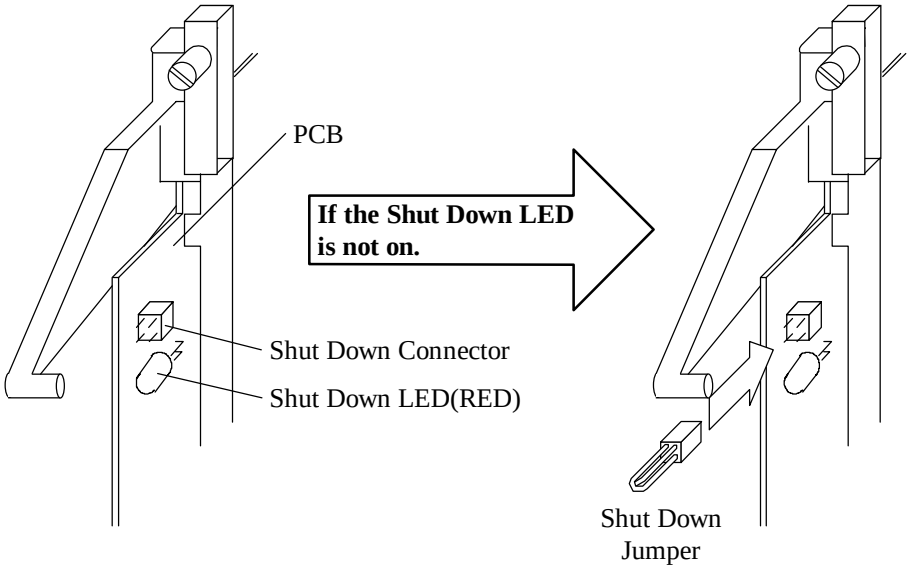

Fig. 4.7.4-1 Shut Down LED

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2. Disconnection of the optical fibre cables
   a. Remove the Bracket③ and Strain Relief ② referring to Fig 4.7.4-2.
   b. Disconnect the optical fibre cables and remove the Holder④ referring to Fig 4.7.4-3.

Table 4.7.4-2 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

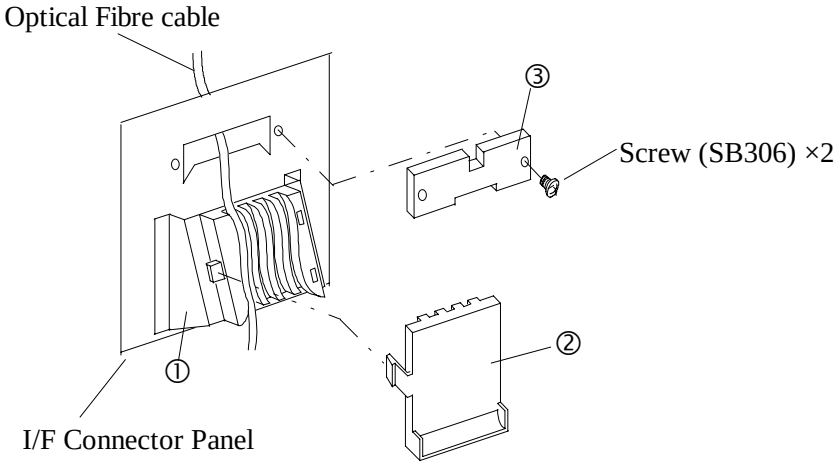

Fig 4.7.4-2 Removal of Strain Relief

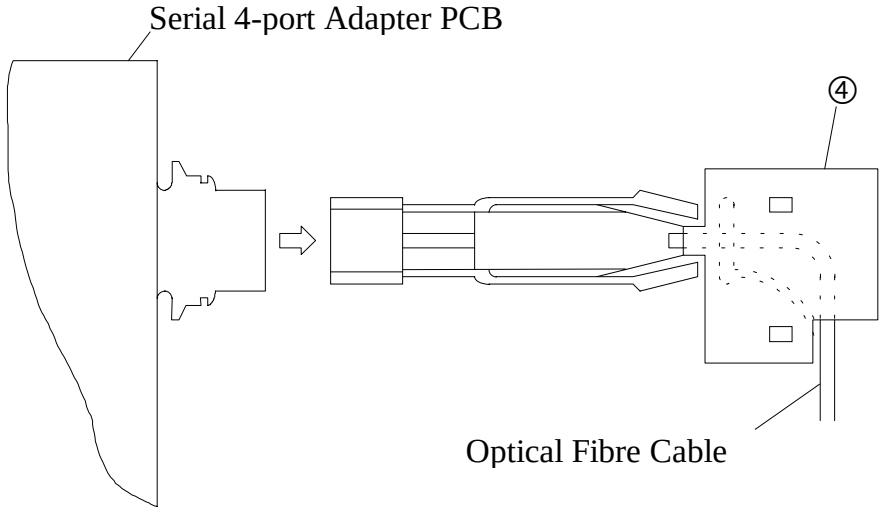

Fig. 4.7.4-3 Disconnect of Optical Fibre Cable

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.4-4.
   b. Attach the dummy plates referring to Fig. 4.7.4-5.

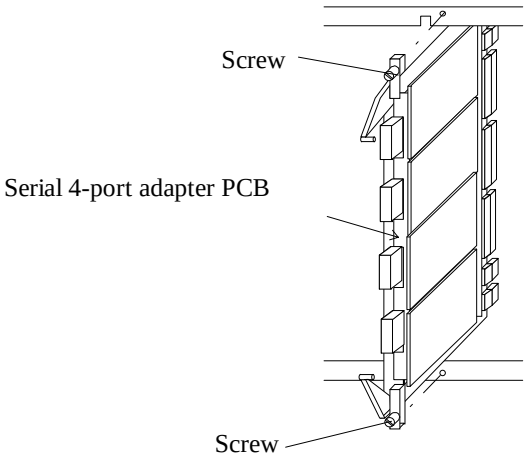

Fig. 4.7.4-4 Removal of PCB

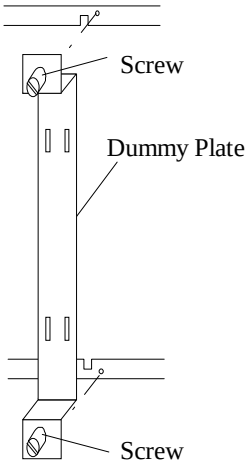

Fig. 4.7.4-5 Attachment of Dummy Plate

4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.4-6.
   b. Attach the dummy plates referring to Fig. 4.7.4-7.

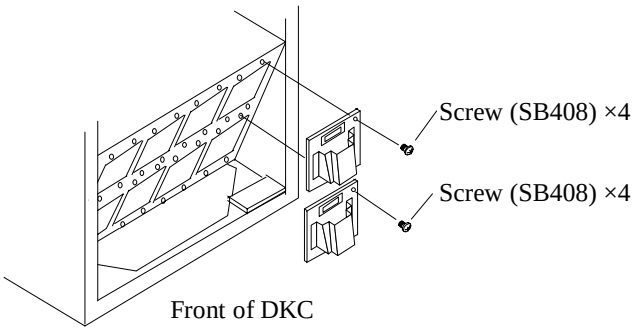

Fig. 4.7.4-6 Removal of I/F Connector Panel

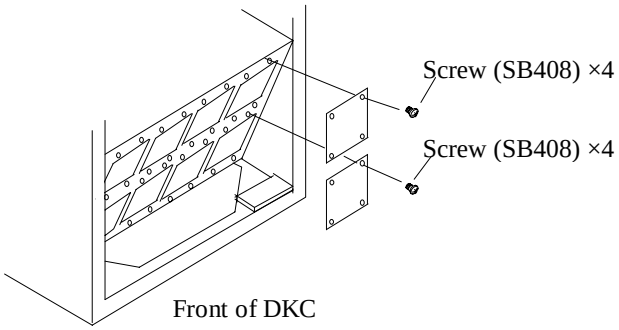

Fig. 4.7.4-7 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " SERIAL PORT " from ① through ⑧ referring to Fig. 4.7.4-8.

Table 4.7.4-3 Removal of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	① and ②	③ and ④	⑤ and ⑥	⑦ and ⑧
Channel No.	A,B,C,D	E,F,G,H	J,K,L,M	N,P,Q,R

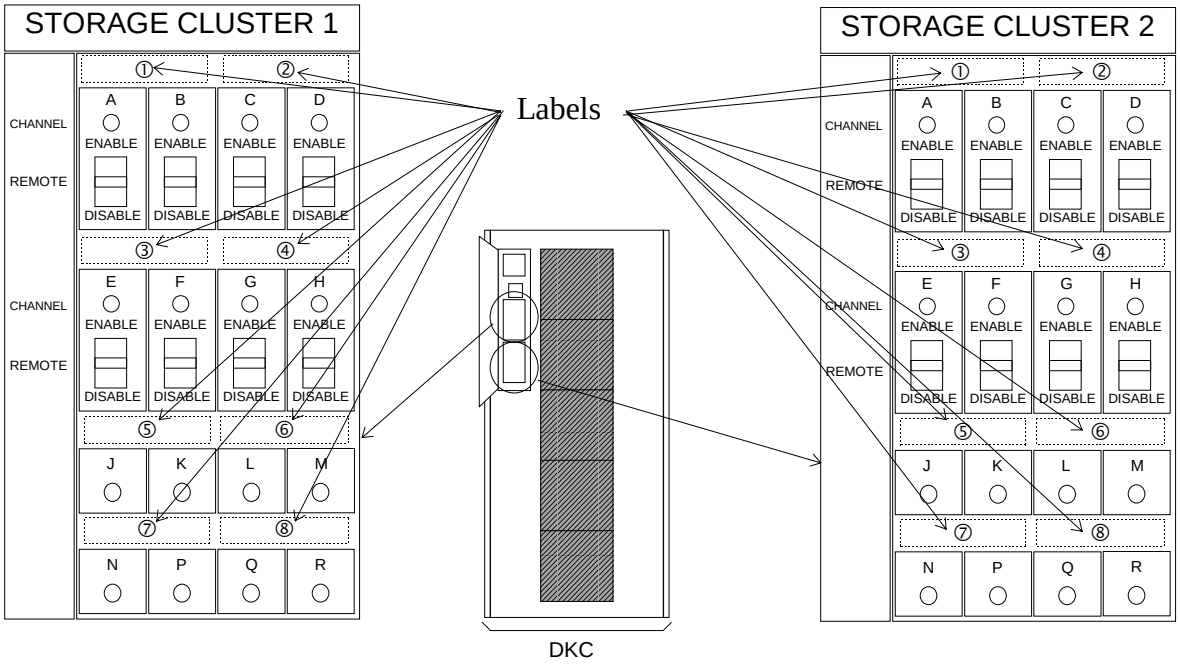

Fig. 4.7.4-8 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.4-9.

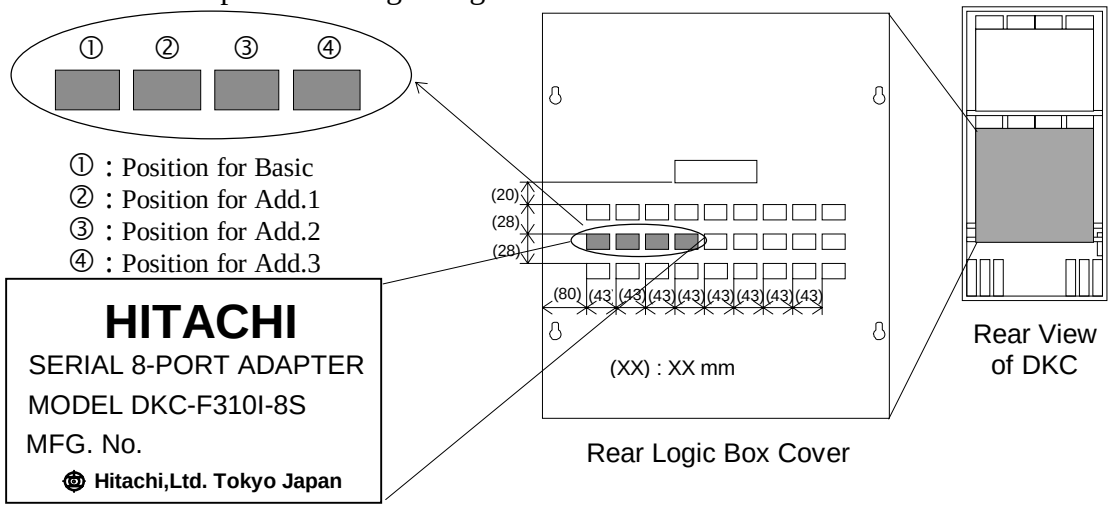

Fig. 4.7.4-9 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.7.5 De-installation of SCSI 8-port Adapter (DKC-F310I-8C)

4.7.5.1 Parts list

Table 4.7.5-1 Parts List for SCSI 8-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-8C	SCSI 4-port Adapter PCB	3252505-A	2	
		I/F Connector Panel (CL1)	2102035-A	1	Cluster 1 side
		I/F Connector Panel (CL2)	2102035-B	1	Cluster 2 side
		Screw	SB408	8	
		Label	5500247-1	4	SCSI
		Nameplate	3252542-6	1	For DKC-F310I-8C
		Connector (Terminator)	5486080-868	8	

4.7.5.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).

↓

(2) Disconnect the SCSI cables.

↓

(3) Remove the PCBs.

↓

(4) Remove the I/F connector panels.

↓

(5) Remove the labels.

↓

(6) Remove the nameplate.

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4.7.5.3 De-Installation Procedure of SCSI 8-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.5-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

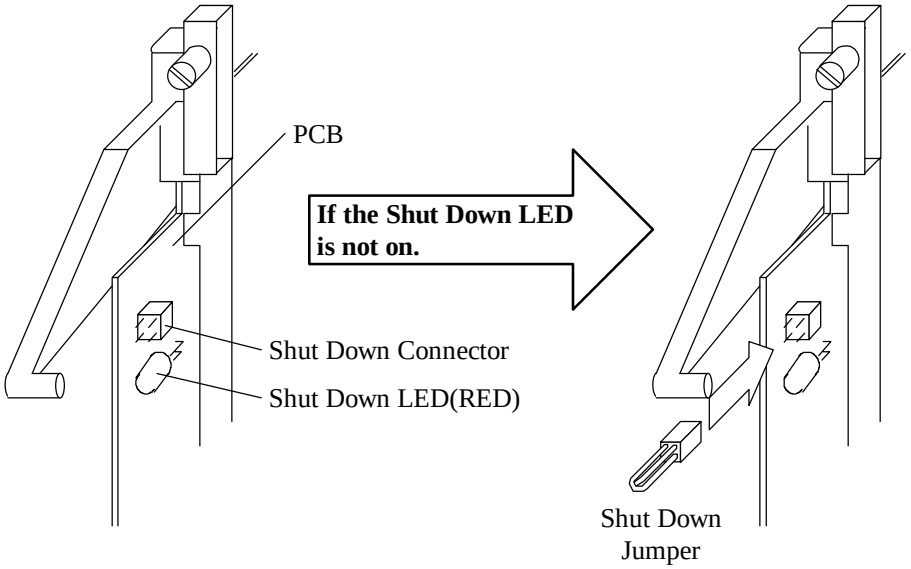

Fig. 4.7.5-1 Shut Down LED

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2. Disconnection of the SCSI cables

Table 4.7.5-2 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

In case of Basic

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.7.5-2, Table 4.7.5-3, and Fig. 4.7.5-2.

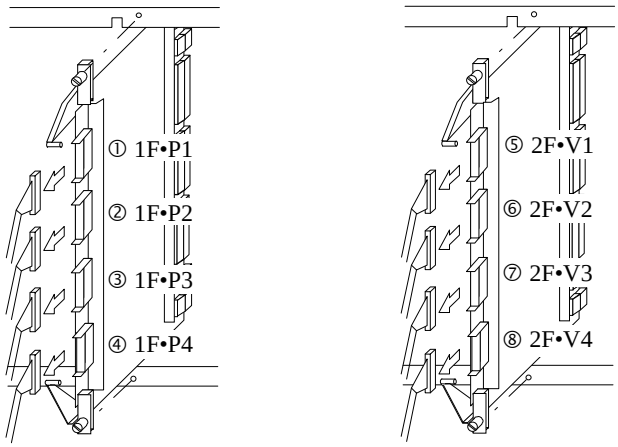

Table 4.7.5-3 SCSI Cable Disconnection

No.	SCSI cable	Sub-edge connector on PCB
1	1F•SC1	1F•P1
2	1F•SC2	1F•P2
3	1F•SC3	1F•P3
4	1F•SC4	1F•P4
5	2F•SC1	2F•V1
6	2F•SC2	2F•V2
7	2F•SC3	2F•V3
8	2F•SC4	2F•V4

Fig. 4.7.5-2 Disconnection of SCSI Cables (Basic)

In case of Add.1

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.7.5-2, Table 4.7.5-4, and Fig. 4.7.5-3.

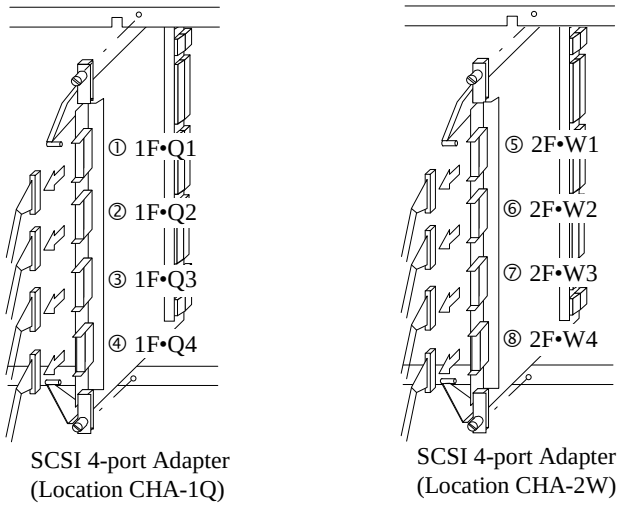

Table 4.7.5-4 SCSI Cable Disconnection

No.	SCSI cable	Sub-edge connector on PCB
1	1F•SC1	1F•Q1
2	1F•SC2	1F•Q2
3	1F•SC3	1F•Q3
4	1F•SC4	1F•Q4
5	2F•SC1	2F•W1
6	2F•SC2	2F•W2
7	2F•SC3	2F•W3
8	2F•SC4	2F•W4

Fig. 4.7.5-3 Disconnection of SCSI Cables (Add.1)

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In case of Add.2

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.7.5-2, Table 4.7.5-5, and Fig. 4.7.5-4.

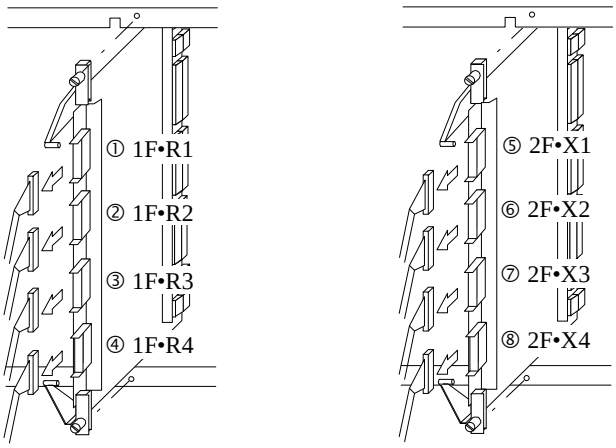

Fig. 4.7.5-4 Disconnection of SCSI Cables (Add.2)

Table 4.7.5-5 SCSI Cable Disconnection

No.	SCSI cable	Sub-edge connector on PCB
1	1F•SC1	1F•R1
2	1F•SC2	1F•R2
3	1F•SC3	1F•R3
4	1F•SC4	1F•R4
5	2F•SC1	2F•X1
6	2F•SC2	2F•X2
7	2F•SC3	2F•X3
8	2F•SC4	2F•X4

In case of Add.3

a. Disconnect the SCSI cables from the Sub-edge connectors on the PCB referring to Table 4.7.5-2, Table 4.7.5-6, and Fig. 4.7.5-5.

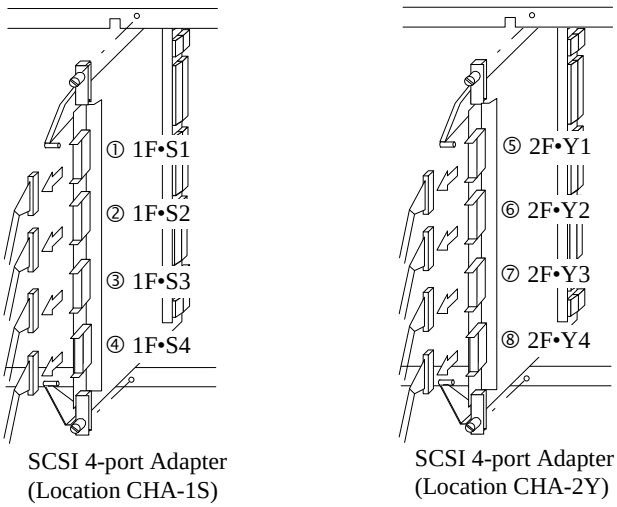

Fig. 4.7.5-5 Disconnection of SCSI Cables (Add.3)

Table 4.7.5-6 SCSI Cable Disconnection

No.	SCSI cable	Sub-edge connector on PCB
1	1F•SC1	1F•S1
2	1F•SC2	1F•S2
3	1F•SC3	1F•S3
4	1F•SC4	1F•S4
5	2F•SC1	2F•Y1
6	2F•SC2	2F•Y2
7	2F•SC3	2F•Y3
8	2F•SC4	2F•Y4

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.5-6.
   b. Attach the dummy plates referring to Fig. 4.7.5-7.

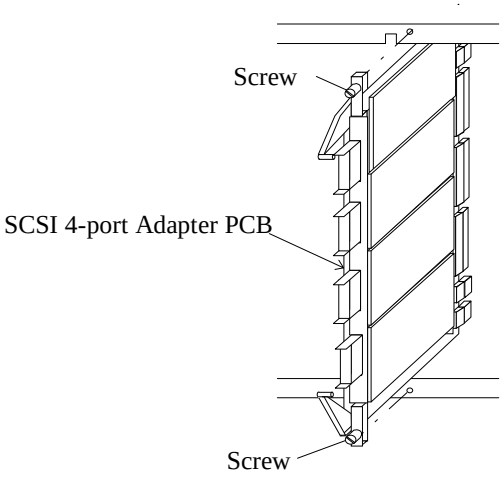

Fig. 4.7.5-6 Removal of PCB

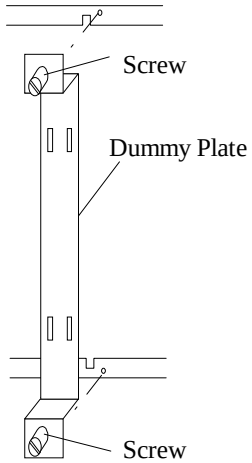

Fig. 4.7.5-7 Attachment of Dummy Plate

4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.5-8.
   b. Attach the dummy plates referring to Fig. 4.7.5-9.

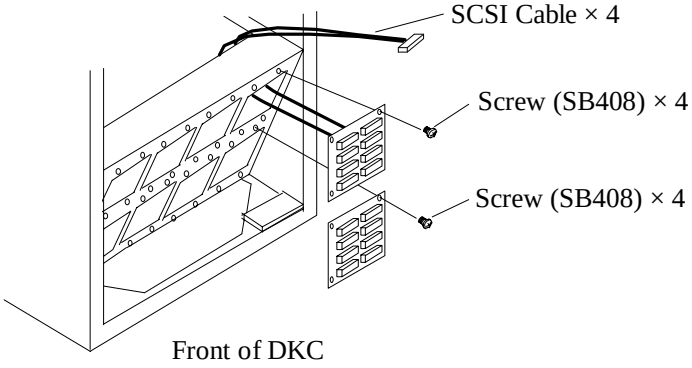

Fig. 4.7.5-8 Removal of I/F Connector Panel

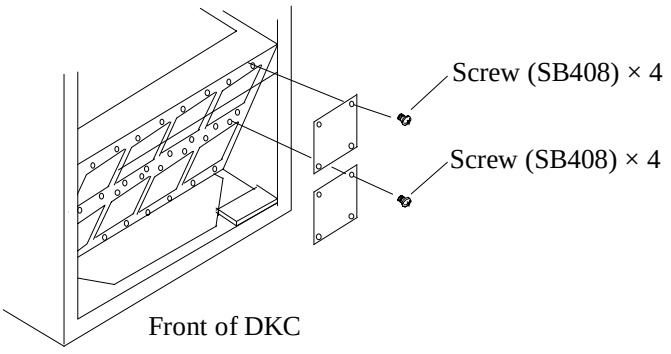

Fig. 4.7.5-9 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " SCSI PORT " from ① through ⑧ referring to Fig. 4.7.5-10.

Table 4.7.5-7 Removal of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	① and ②	③ and ④	⑤ and ⑥	⑦ and ⑧
Channel No.	A,B,C,D	E,F,G,H	J,K,L,M	N,P,Q,R

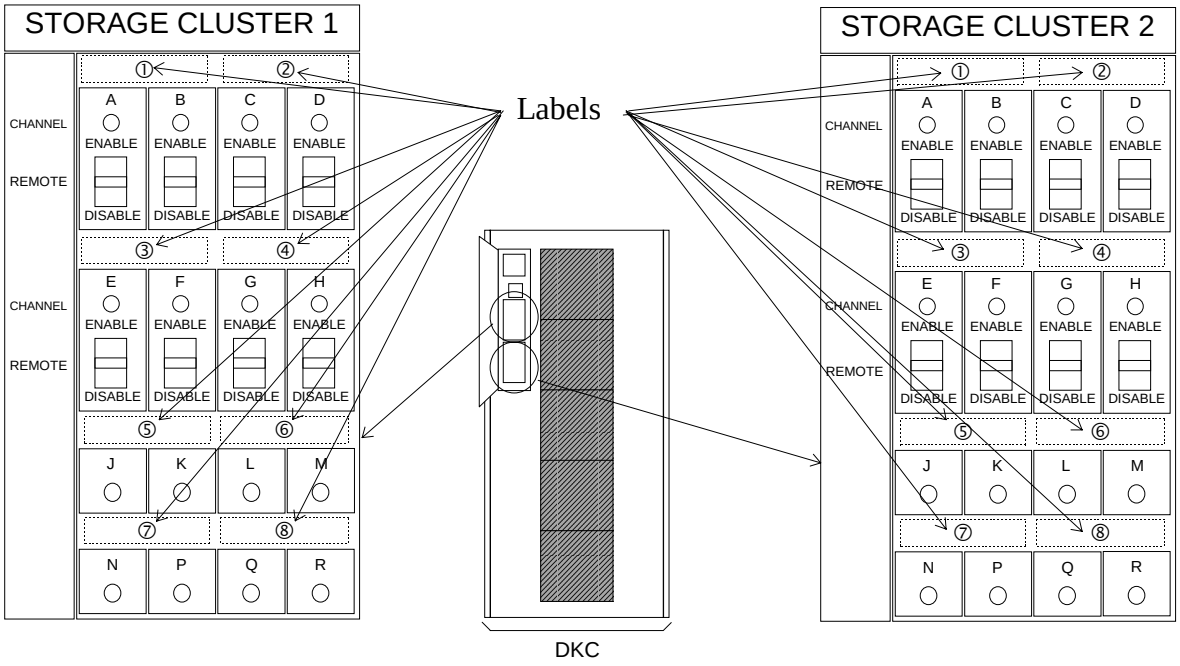

Fig. 4.7.5-10 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.5-11.

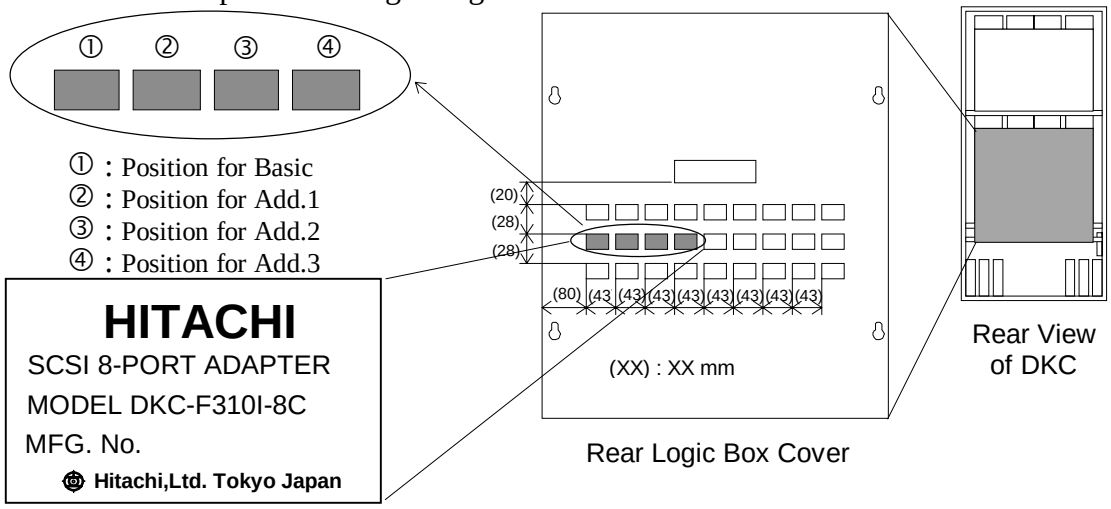

Fig. 4.7.5-11 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.7.6 De-installation of Fibre 4-port Adapter for Optical Cable (DKC-F310I-4F/4FE)

4.7.6.1 Parts list

Table 4.7.6-1 Parts List for Fibre 4-port Adapter

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-4F	Fibre 2-port Adapter PCB	3252506-A	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	2	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-7	1	For DKC-F310I-4F
2	DKC-F310I-4FE	Fibre 2-port Adapter PCB	3252506-C	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	2	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-75	1	For DKC-F310I-4FE

4.7.6.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).

↓

(2) Disconnect the optical fiber cables.

↓

(3) Remove the PCBs.

↓

(4) Remove the I/F connector panels.

↓

(5) Remove the labels.

↓

(6) Remove the nameplate.

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4.7.6.3 De-Installation Procedure of Fibre 4-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.6-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

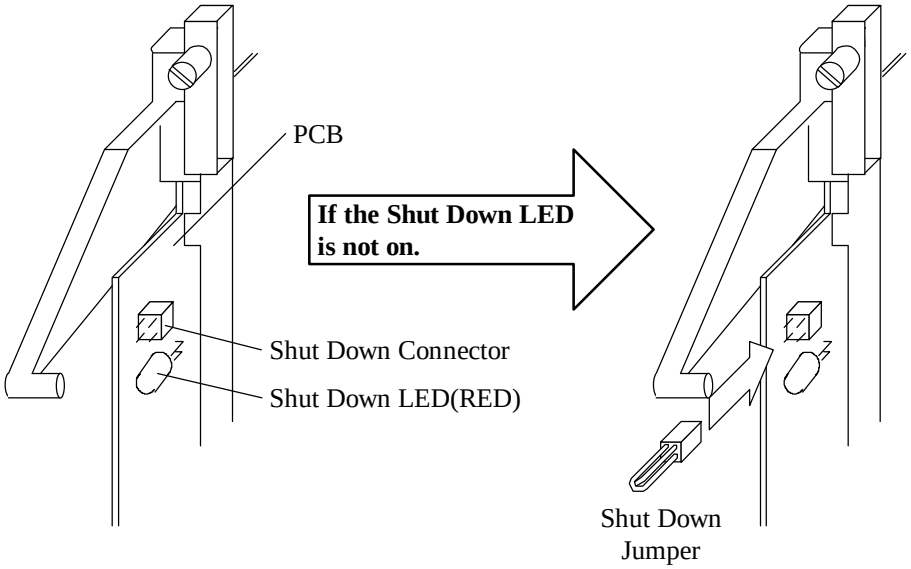

Fig. 4.7.6-1 Shut Down LED

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2. Disconnection of the optical fibre cables
   a. Remove the Bracket③ and the Strain Relief② referring to Fig. 4.7.6-2.
   b. Disconnect the optical fibre cables referring to Fig. 4.7.6-3.

Table 4.7.3-2 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

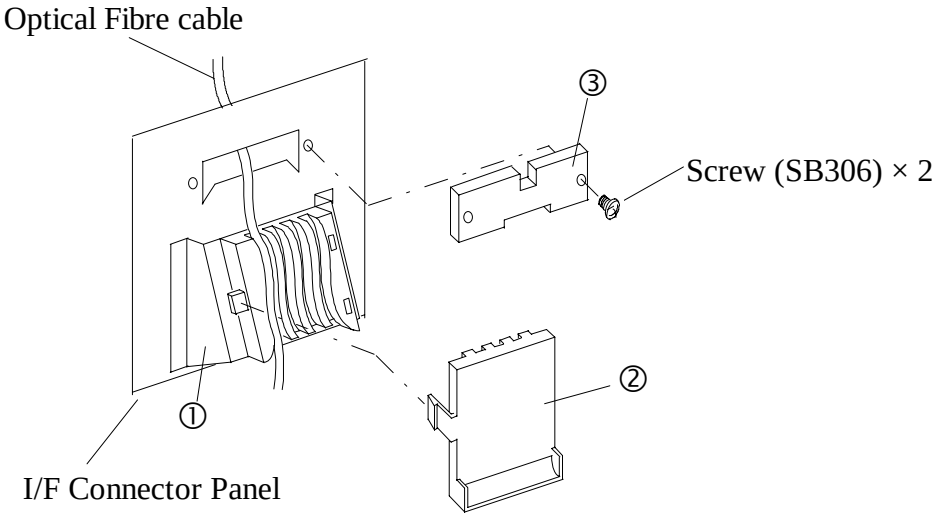

Fig 4.7.6-2 Removal of Strain Relief

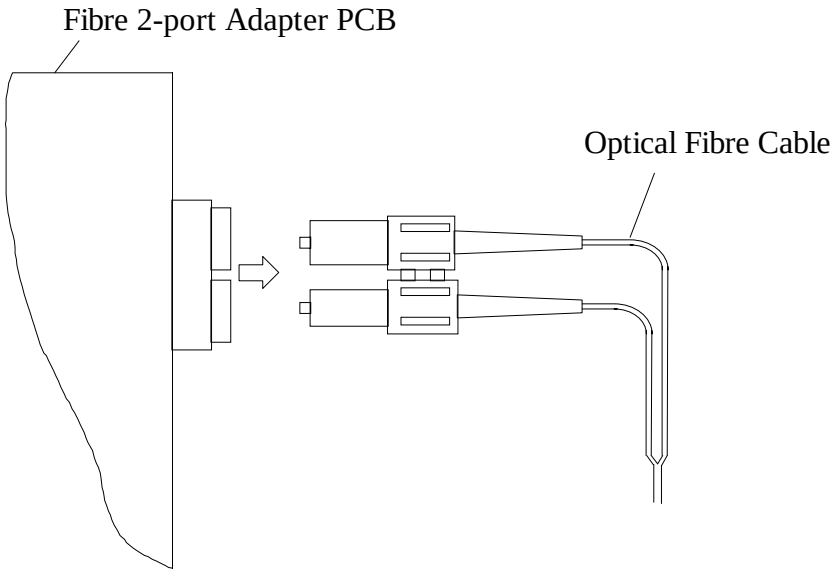

Fig. 4.7.6-3 Disconnect of Optical Fibre Cable

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.6-4.
   b. Attach the dummy plates referring to Fig. 4.7.6-5.

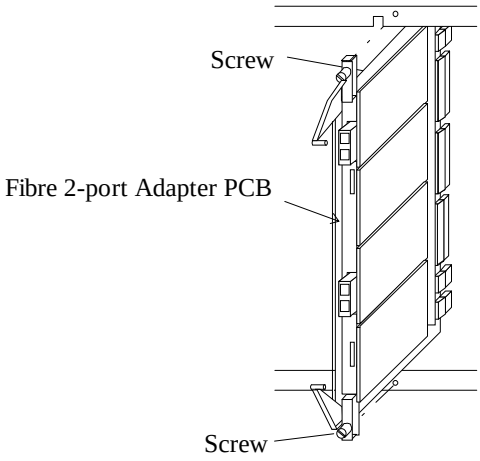

Fig. 4.7.6-4 Removal of PCB

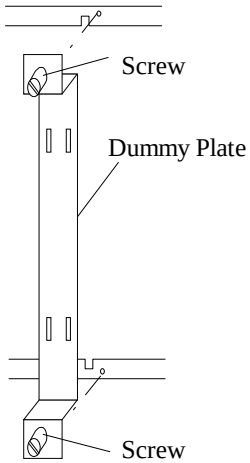

Fig. 4.7.6-5 Attachment of Dummy Plate

4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.6-6.
   b. Attach the dummy plates referring to Fig. 4.7.6-7.

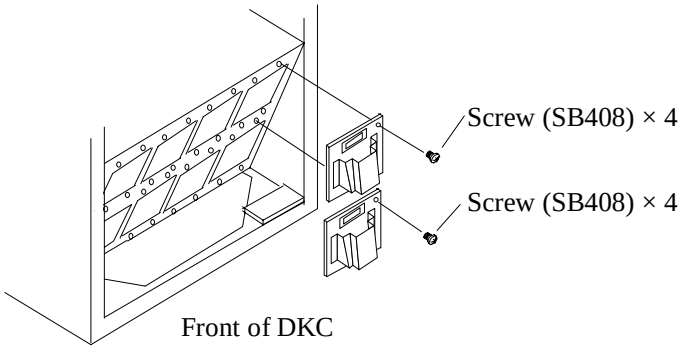

Fig. 4.7.6-6 Removal of I/F Connector Panel

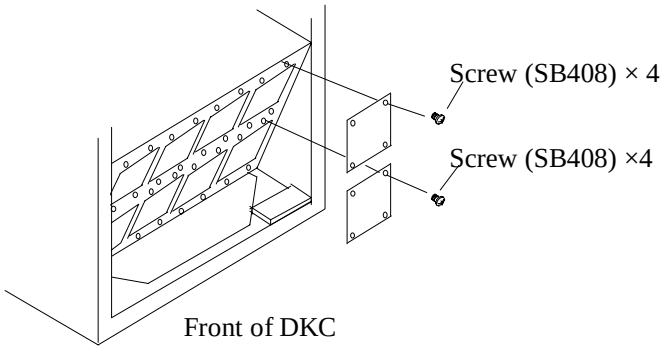

Fig. 4.7.6-7 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " FIBRE PORT " from ①, ③, ⑤, or ⑦ referring to Fig. 4.7.6-8.

Table 4.7.6-3 Removal of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	①	③	⑤	⑦
Channel No.	A,B	E,F	J,K	N,P

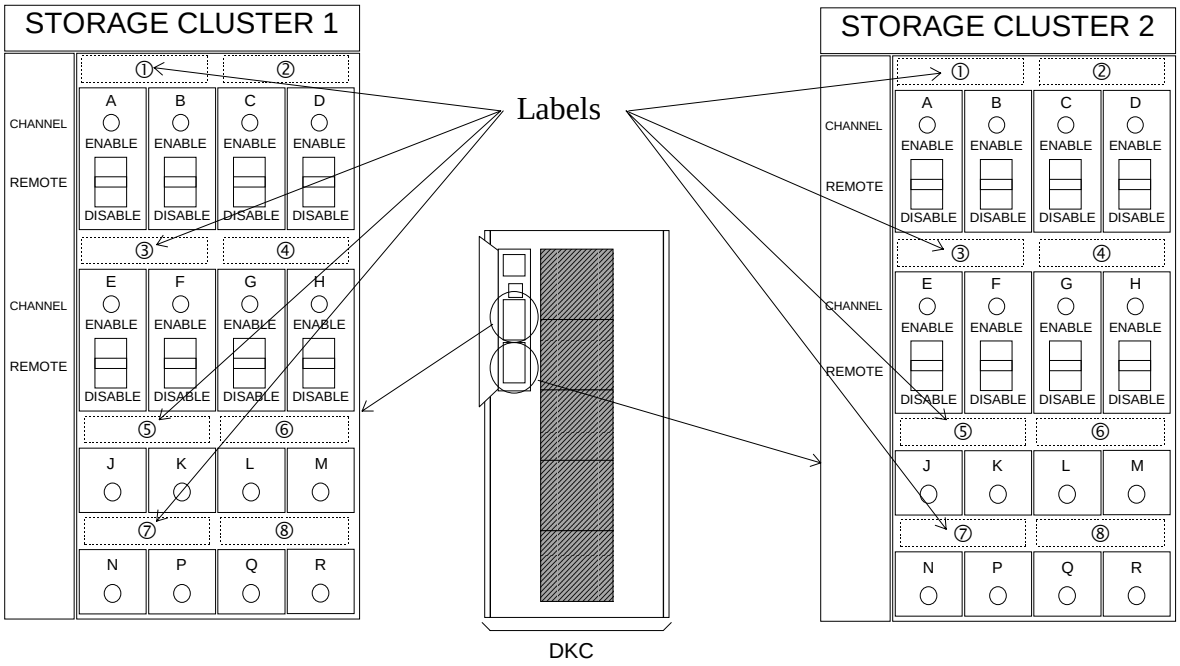

Fig. 4.7.6-8 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.6-9.

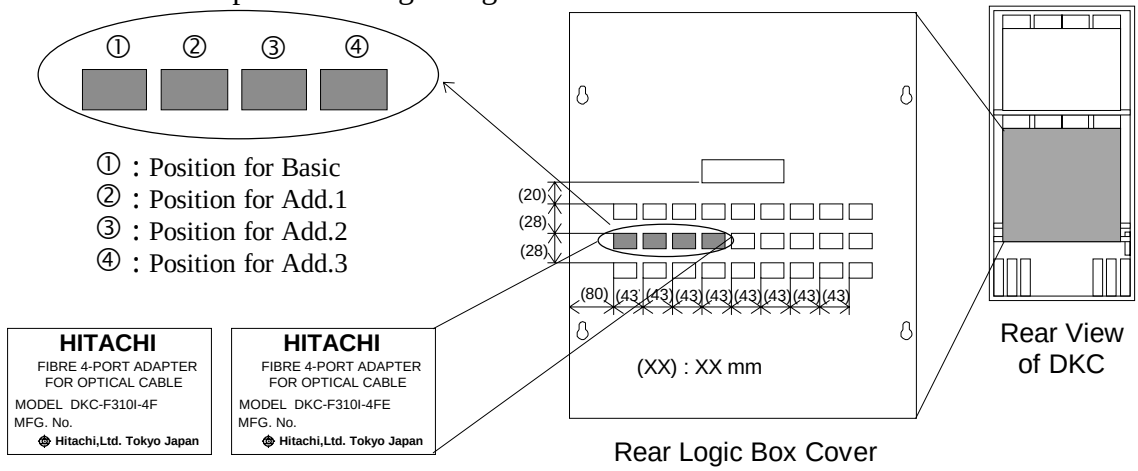

Fig. 4.7.6-9 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.7.7 De-installation of Fibre 4-port Adapter for Optical Cable (DKC-F310I-4GS/4GL)

4.7.7.1 Parts list

Table 4.7.7-1 Parts List for Fibre 4-port Adapter (Short Wavelength)

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-4GS (Short Wavelength)	Fibre 2-port Adapter PCB	3254519-A	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	2	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-63	1	

Table 4.7.7-2 Parts List for Fibre 4-port Adapter (Long Wavelength)

No.	Model Number	Part Name	Part No.	Quantity	Remarks
2	DKC-F310I-4GL (Long Wavelength)	Fibre 2-port Adapter PCB	3254519-B	2	
		I/F Connector Panel	3250912-A	2	
		Screw	SB408	8	
		Label	5500248-1	2	For Fibre
		Screw	SB306	4	
		Bracket	5471998-1	2	
		Nameplate	3252542-64	1	

4.7.7.2 Flowchart

(1) Confirm the Shut Down LED (only non-disruptive procedure).
↓
(2) Disconnect the optical fiber cables.
↓
(3) Remove the PCBs.
↓
(4) Remove the I/F connector panels.
↓
(5) Remove the labels.
↓
(6) Remove the nameplate.

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4.7.7.3 De-Installation Procedure of Fibre 4-port Adapter

Note: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirmation of the Shut Down LED (Only Non-Disruptive Procedure)
   a. Confirm that Shut Down LED is on.(Fig. 4.7.7-1). If the LED is not on, connect the Shut Down Jumper to the Shut Down Connector.

⚠ CAUTION

A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be removed. Make sure that it is the PCB to be removed.

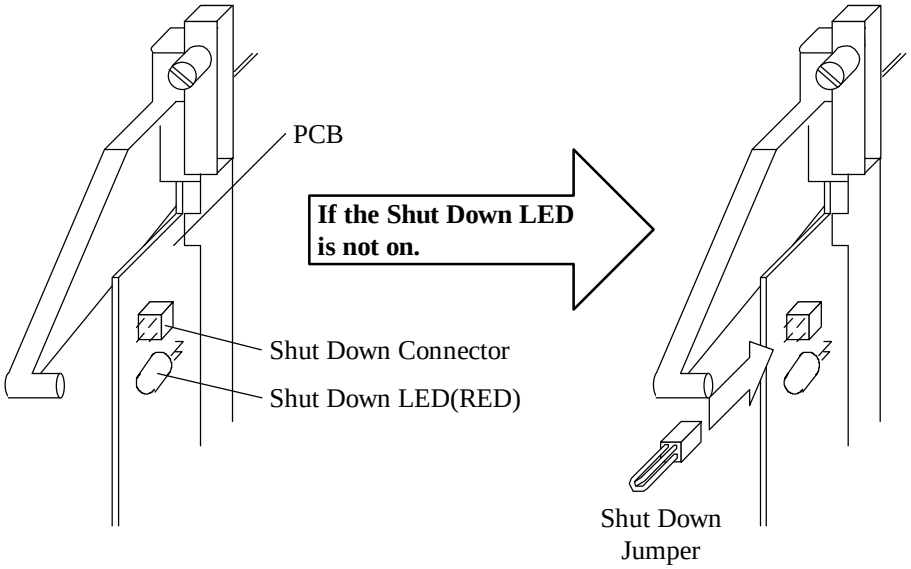

Fig. 4.7.7-1 Shut Down LED

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2. Disconnection of the optical fibre cables
   a. Remove the Bracket③ and the Strain Relief② referring to Fig. 4.7.7-2.
   b. Disconnect the optical fibre cables referring to Fig. 4.7.7-3.

Table 4.7.7-3 Removal Location (Front of the unit)

Cluster	CL1						CL2					CL1
Slot No.	N	P	Q	R	S	T	U	V	W	X	Y	Z
Function	TM	CHA	CHA	CHA	CHA	CACHE	CACHE	CHA	CHA	CHA	CHA	TM
Location No.	TM -1N	CHA -1P	CHA -1Q	CHA R	CHA -1S	CACHE -1T	CACHE -2U	CHA -2V	CHA -2W	CHA -2X	CHA -2Y	TM -1Z
Order of addition		Basic	Add.1	Add.2	Add.3			Basic	Add.1	Add.2	Add.3	

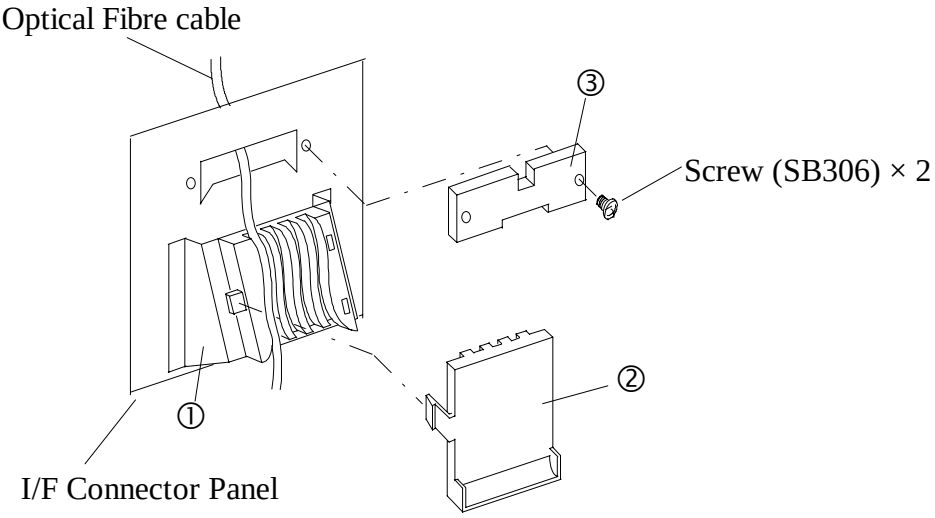

Fig 4.7.7-2 Removal of Strain Relief

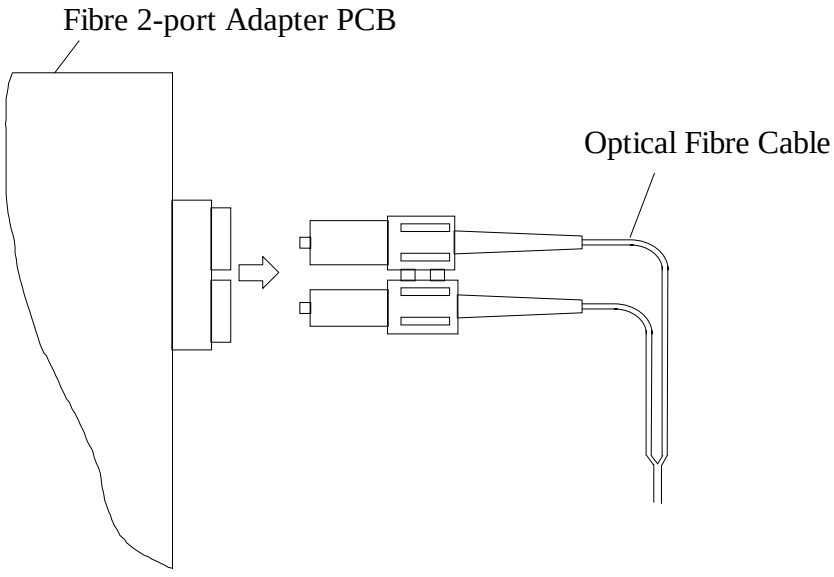

Fig. 4.7.7-3 Disconnect of Optical Fibre Cable

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3. Removal of the PCBs
   a. Remove the two screws and remove the PCBs from the correct locations in the Logic Box referring to Fig. 4.7.7-4.
   b. Attach the dummy plates referring to Fig. 4.7.7-5.

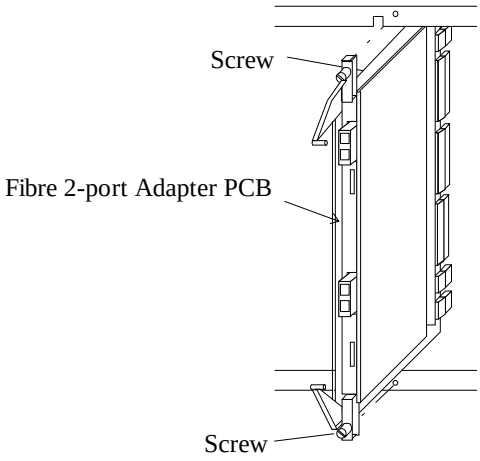

Fig. 4.7.7-4 Removal of PCB

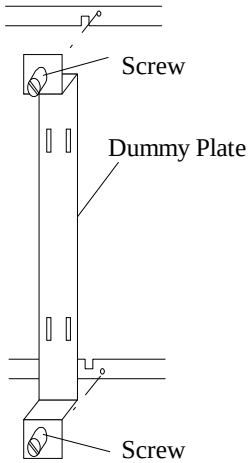

Fig. 4.7.7-5 Attachment of Dummy Plate

4. Removal of the I/F Connector Panel
   a. Remove the I/F connector panels referring to Fig. 4.7.7-6.
   b. Attach the dummy plates referring to Fig. 4.7.7-7.

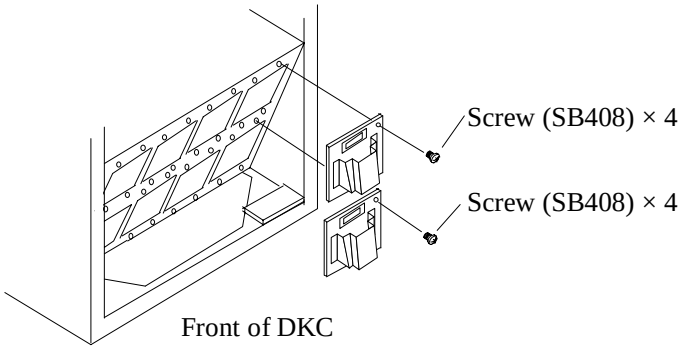

Fig. 4.7.7-6 Removal of I/F Connector Panel

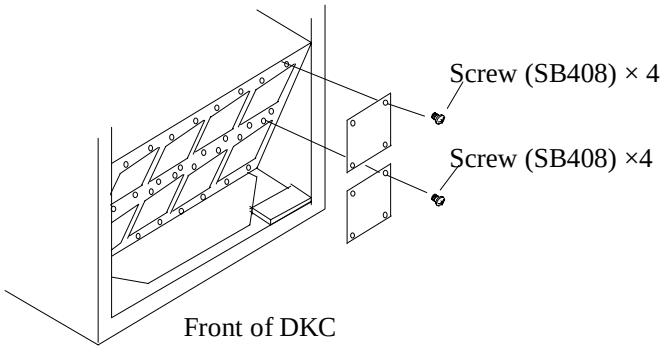

Fig. 4.7.7-7 Attachment of Dummy Plate

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5. Removal of the labels.
   a. Remove the labels " FIBRE PORT " from ①, ③, ⑤, or ⑦ referring to Fig. 4.7.7-8.

Table 4.7.7-4 Removal of Labels

Order of addition	Basic	Add.1	Add.2	Add.3
Labeling position	①	③	⑤	⑦
Channel No.	A,B	E,F	J,K	N,P

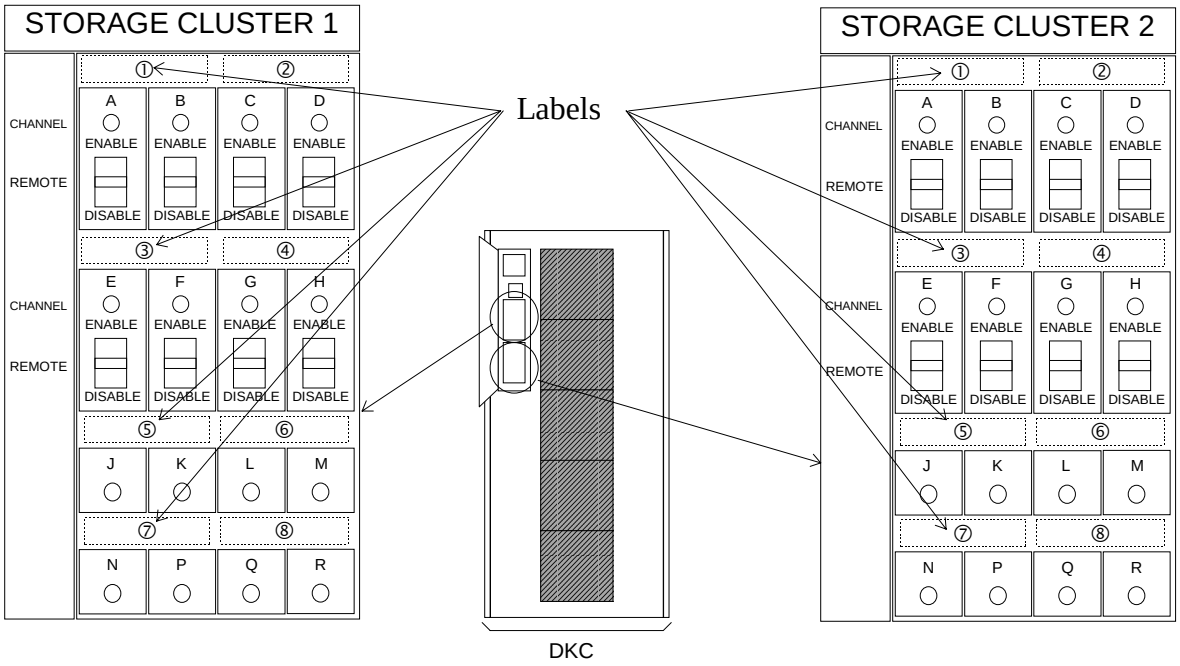

Fig. 4.7.7-8 Removal of Labels

6. Removal of the Nameplate
   a. Remove the nameplate referring to Fig. 4.7.7-9.

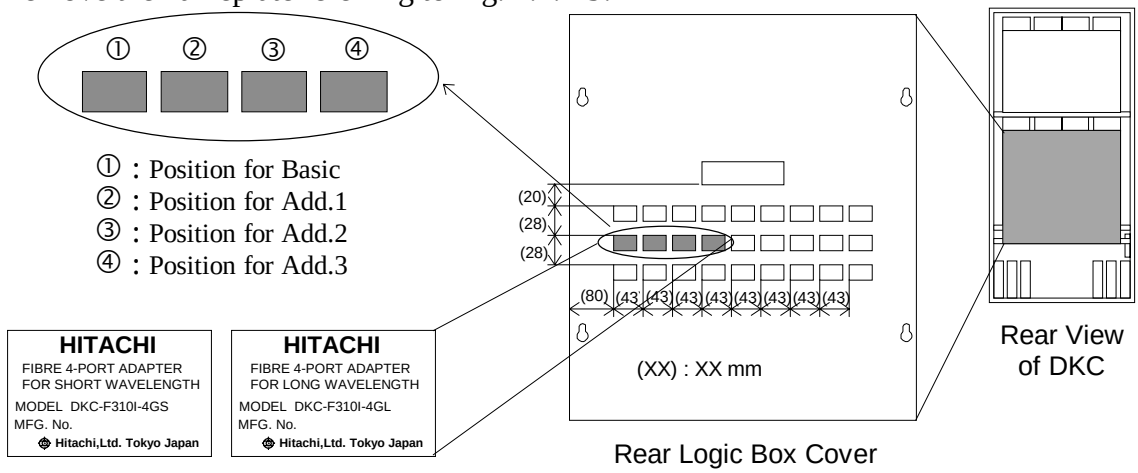

Fig. 4.7.7-9 Removal of Nameplate

7. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (8)-5.
   Disruptive De-Installation: Go to INST02-53 Step (15).

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4.8 De-Installation of Redundant Power Supply

4.8.1 De-Installation of CL Additional Power Supply(DKC-F310I-80)

4.8.1.1 Flowchart

(1) Turn off the Additional Power Supply.
↓
(2) Disconnect the inlet cable.
↓
(3) Remove the Additional Power Supply(5V and 3V PS).
↓
(4) Remove the nameplate.

4.8.1.2 Parts List

Table 4.8.1.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-80	5V power supply	5500003-A	2	HS05065C-S
					TAH-325HSA
					HS05065C-W
		3V power supply	5500003-B	2	HS03075C-S
					TAH-264HSA
					HS03075C-W
		Nameplate	3252542-9	1	

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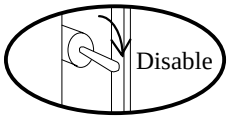
4.8.1.3 De-Installation Procedure of CL Additional Power Supply

1. Turn off the Additional Power Supply
   a. Turn the PS Enable/Disable Switch to (DOWN) **Disable**. Refer to Table 4.8.1.3-1, Fig. 4.8.1.3-1, and Fig. 4.8.1.3-2.

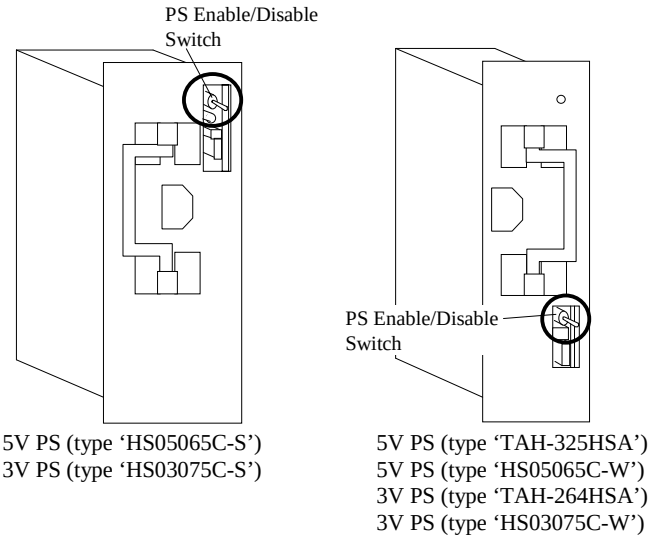
> **⚠ CAUTION**
> A system down may be caused by setting the PS Enable/Disable switch of the switching power supply other than that to be removed to "Disable". Make sure that it is a switching power supply to be removed.

Table 4.8.1.3-1 Removal Location

No.	Part Name	PS Location		Remarks
		Cluster 1	Cluster 2	
1	5V Power Supply	5VPS12	5VPS22	
2	3V Power Supply	3VPS12	3VPS22	



PS Enable/Disable Switch



5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')

5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

Fig. 4.8.1.3-1 Switch

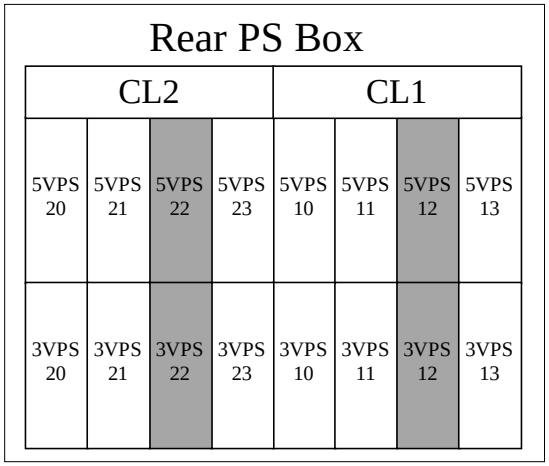


Fig. 4.8.1.3-2 Removal Location

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2. Disconnection of the inlet cable
   a. Disconnect the inlet cables. Refer to Fig. 4.8.1.3-3.

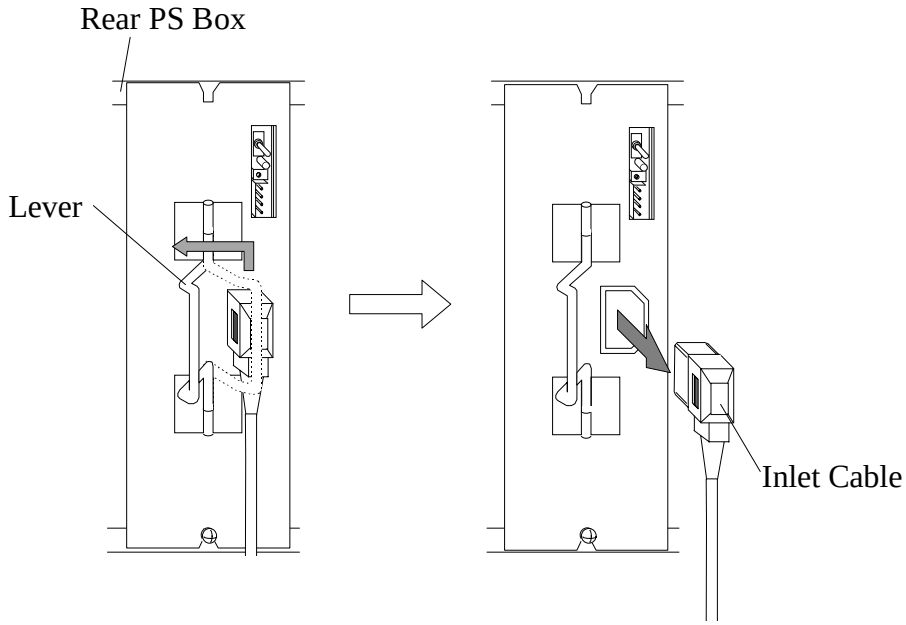

Fig. 4.8.1.3-3 Disconnection of Inlet Cable

3. Removal of the Additional Power Supply
   a. Loosen the screws and remove the Additional Power Supplies. Refer to Fig. 4.8.1.3-4.
   b. Attach the dummy plates to the removal locations and fasten the screws. Refer to Fig. 4.8.1.3-5.
   c. Insert the removed inlet cables into respective dummy plates and secure them using cable clamps.

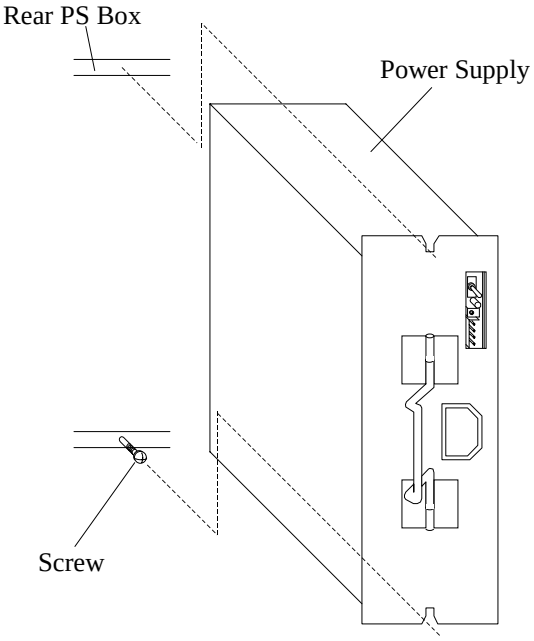

Fig. 4.8.1.3-4 Removal of Power Supply

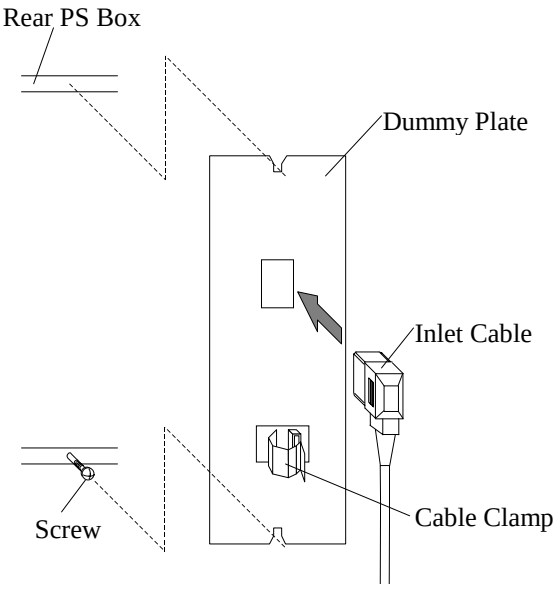

Fig. 4.8.1.3-5 Attachment of Dummy Plate.

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4. Removal of the nameplate
   a. Remove the nameplate of DKC-F310I-80 referring to Fig. 4.8.1.3-6.

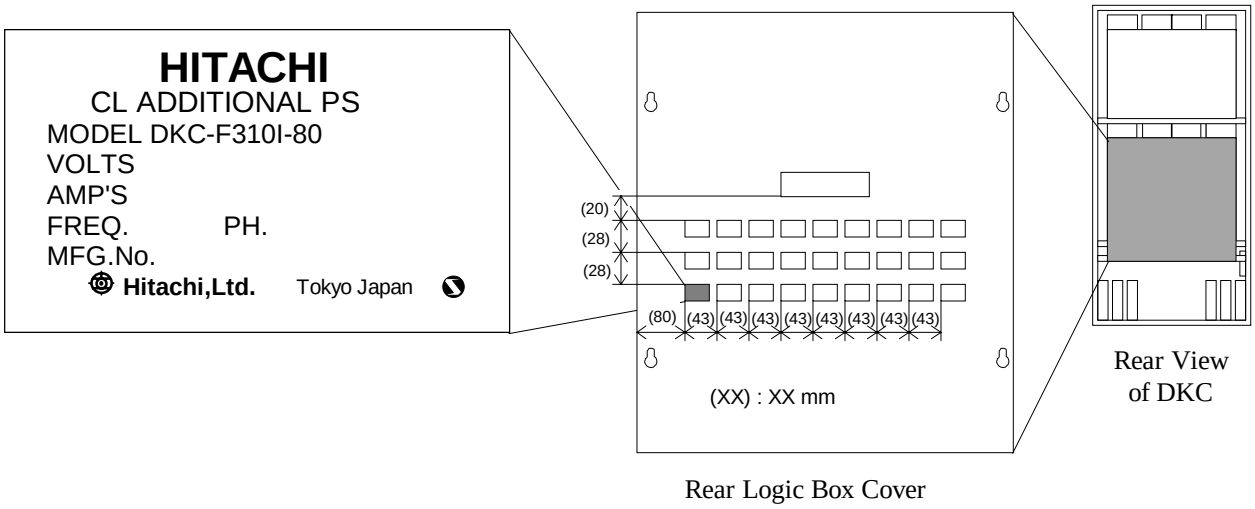

Fig. 4.8.1.3-6 Removal of Nameplate

5. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (9)-5. But if any other optional power supply must be removed, perform the proper hardware procedure.
   DKC-F310I-81 .....INST04-1620 through 1650
   DKC-F310I-82 .....INST04-1660 through 1690
   Disruptive De-Installation: Go to INST02-53 Step (15)-2. But if any other optional power supply must be removed, perform the proper hardware procedure.
   DKC-F310I-81 .....INST04-1620 through 1650
   DKC-F310I-82 .....INST04-1660 through 1690

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4.8.2 De-Installation of CL Redundant Power Supply(DKC-F310I-81)

4.8.2.1 Flowchart

(1) Turn off the Redundant Power Supply.
↓
(2) Disconnect the inlet cable.
↓
(3) Remove the Redundant Power Supply(5V, 3V, and Multi PS).
↓
(4) Attach the dummy plate.
↓
(5) Remove the nameplate.

4.8.2.2 Parts List

Table 4.8.2.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-81	5V power supply	5500003-A	2	HS05065C-S
					TAH-325HSA
					HS05065C-W
		3V power supply	5500003-B	2	HS03075C-S
					TAH-264HSA
					HS03075C-W
		Multi power supply	5500003-C	2	HS300-04C-R, V
			5491916-2		TSG-370HS-C
			EC5000367-A		HS400-08GR
		Nameplate	3252542-10	1	

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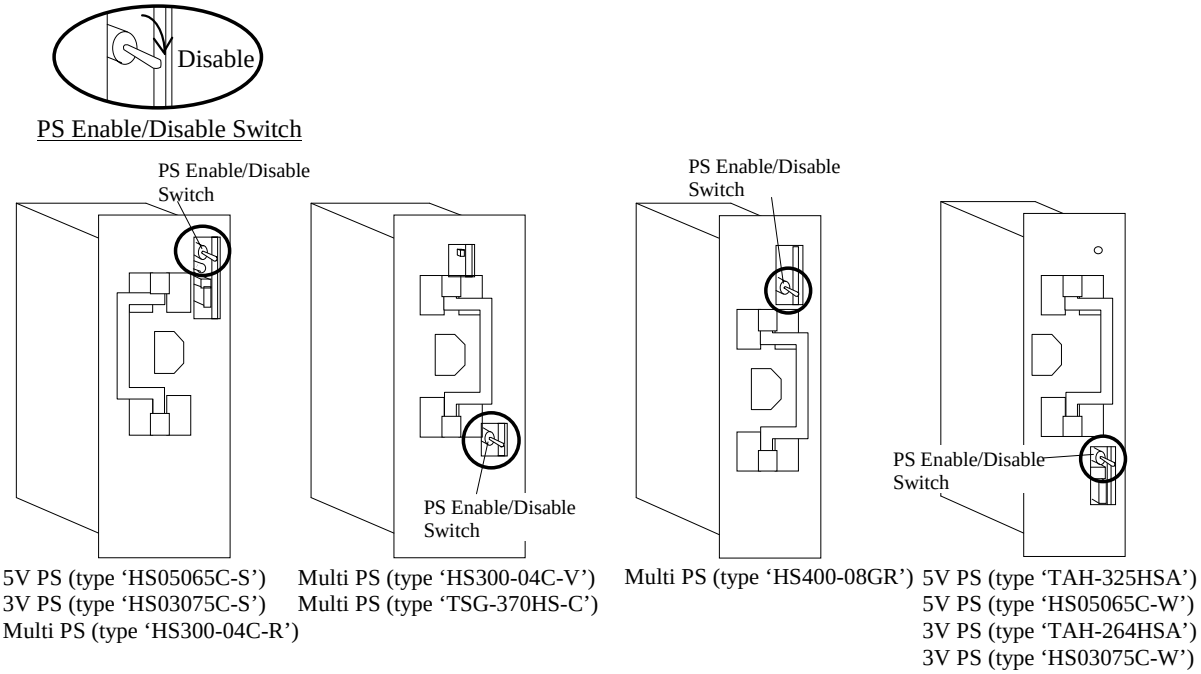
4.8.2.3 De-Installation Procedure of CL Redundant Power Supply

1. Turn off the Redundant Power Supply
   a. Turn the PS Enable/Disable Switch to (DOWN) **Disable**. Refer to Table 4.8.2.3-1, Fig. 4.8.2.3-1, and Fig. 4.8.2.3-2.

> **⚠ CAUTION**
>
> A system down may be caused by setting the PS Enable/Disable switch of the switching power supply other than that to be removed to "Disable". Make sure that it is a switching power supply to be removed.

Table 4.8.2.3-1 Removal Location

No.	Part Name	PS Location		Remarks
		Cluster 1	Cluster 2	
1	5V power supply	5VPS11	5VPS21	
2	3V power supply	3VPS11	3VPS21	
3	Multi power supply	MPS11	MPS21	



5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')
Multi PS (type 'HS300-04C-R')

Multi PS (type 'HS300-04C-V')
Multi PS (type 'TSG-370HS-C')

Multi PS (type 'HS400-08GR')

5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

Fig. 4.8.2.3-1 Switch

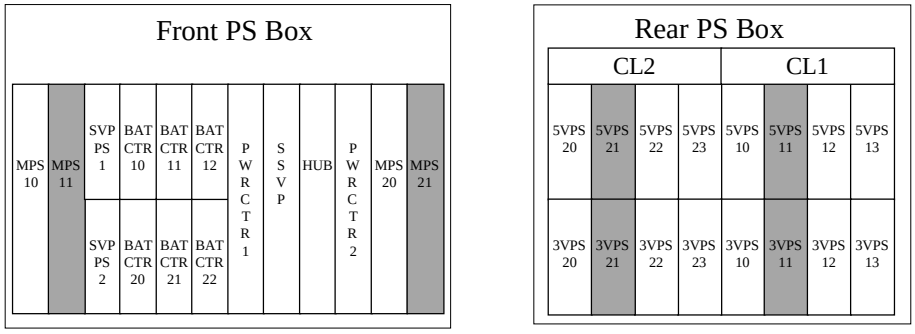


Fig. 4.8.2.3-2 Removal Location

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2. Disconnection of the inlet cable
   a. Disconnect the inlet cables. Refer to Fig. 4.8.2.3-3.

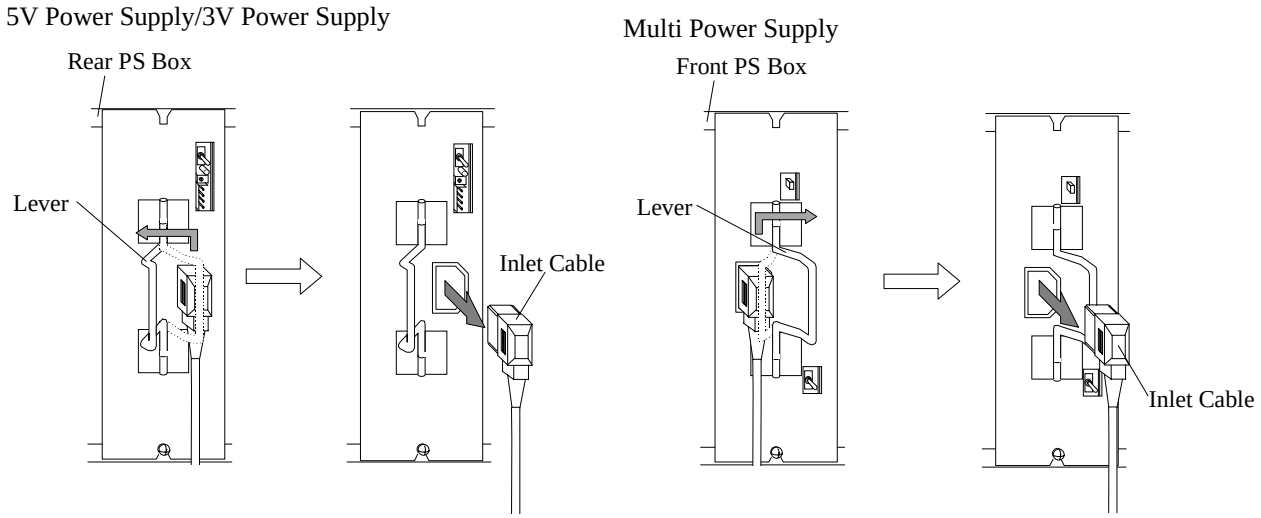

Fig. 4.8.2.3-3 Disconnection of Inlet Cable

3. Removal of the Redundant Power Supply
   a. Loosen the screws and remove the Redundant Power Supplies. Refer to Fig. 4.8.2.3-4.
   b. Attach the dummy plates to the removal locations and fasten the screws. Refer to Fig. 4.8.2.3-5.
   c. Insert the removed inlet cables into respective dummy plates and secure them using cable clamps.

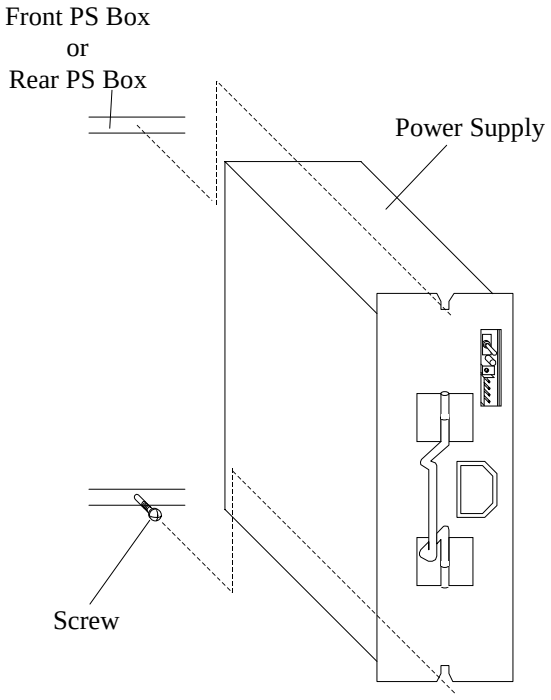

Fig. 4.8.2.3-4 Removal of Power Supply

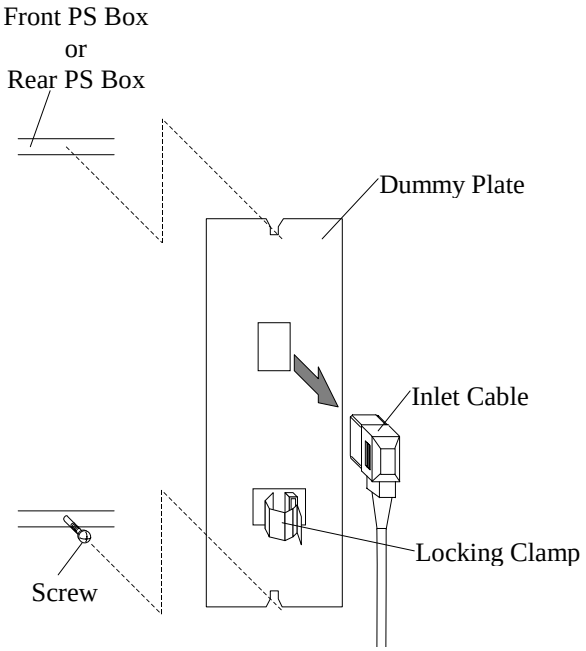

Fig. 4.8.2.3-5 Attachment of Dummy Plate

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5. Removal of the nameplate
   a. Remove the nameplate of DKC-F310I-81 referring to Fig. 4.8.2.3-8.

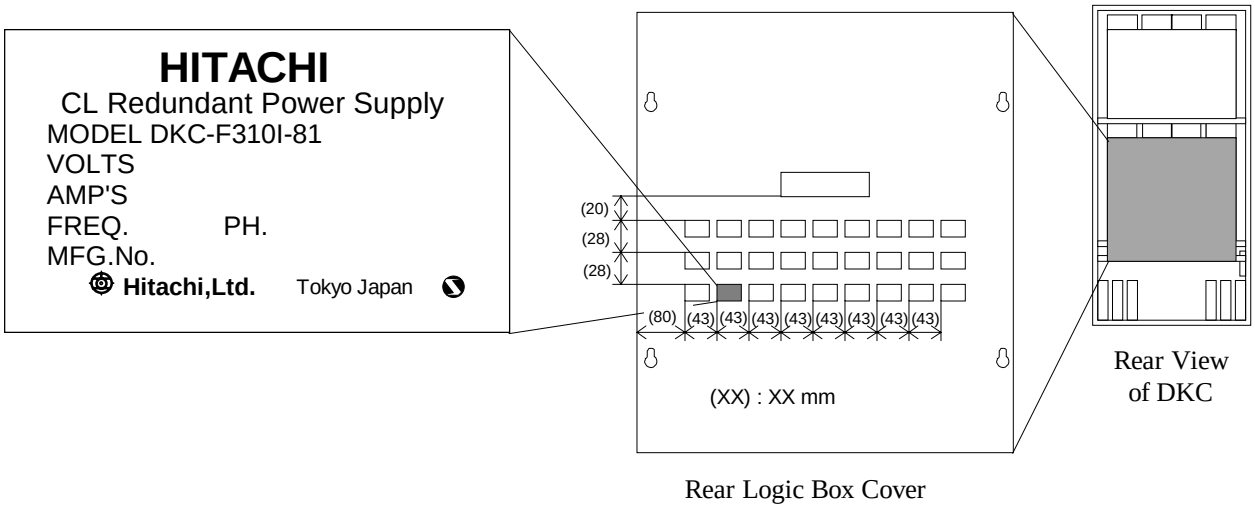

Fig. 4.8.2.3-8 Removal of Nameplate

6. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (9)-6. But if any other optional power supply must be removed, perform the proper hardware procedure.
   DKC-F310I-80 .....INST04-1580 through 1610
   DKC-F310I-82 .....INST04-1660 through 1690
   Disruptive De-Installation: Go to INST02-53 Step (15)-3. But if any other optional power supply must be removed, perform the proper hardware procedure.
   DKC-F310I-80 .....INST04-1580 through 1610
   DKC-F310I-82 .....INST04-1660 through 1690

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4.8.3 De-Installation of CL Additional Redundant Power Supply(DKC-F310I-82)

4.8.3.1 Flowchart

(1) Turn off the Additional Redundant Power Supply.
↓
(2) Disconnect the inlet cable.
↓
(3) Remove the Additional Redundant Power Supply(5V and 3V PS).
↓
(4) Remove the nameplate.

4.8.3.2 Parts List

Table 4.8.3.2-1 Parts List

No.	Model Number	Part Name	Part No.	Quantity	Remarks
1	DKC-F310I-82	5V power supply	5500003-A	2	HS05065C-S
					TAH-325HSA
					HS05065C-W
		3V power supply	5500003-B	2	HS03075C-S
					TAH-264HSA
					HS03075C-W
		Nameplate	3252542-11	1	

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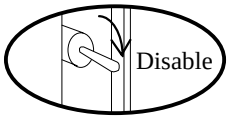
4.8.3.3 De-Installation Procedure of CL Additional Redundant Power Supply

1. Turn off the Redundant Power Supply
   a. Turn the PS Enable/Disable Switch to (DOWN) **Disable**. Refer to Table 4.8.3.3-1, Fig. 4.8.3.3-1, and Fig. 4.8.3.3-2.

> **⚠ CAUTION**
> A system down may be caused by setting the PS Enable/Disable switch of the switching power supply other than that to be removed to "Disable". Make sure that it is a switching power supply to be removed.

Table 4.8.3.3-1 Removal Location

No.	Part Name	PS Location		Remarks
		Cluster 1	Cluster 2	
1	5V power supply	5VPSC13	5VPSC23	
2	3V power supply	3VPSC13	3VPSC23	



PS Enable/Disable Switch

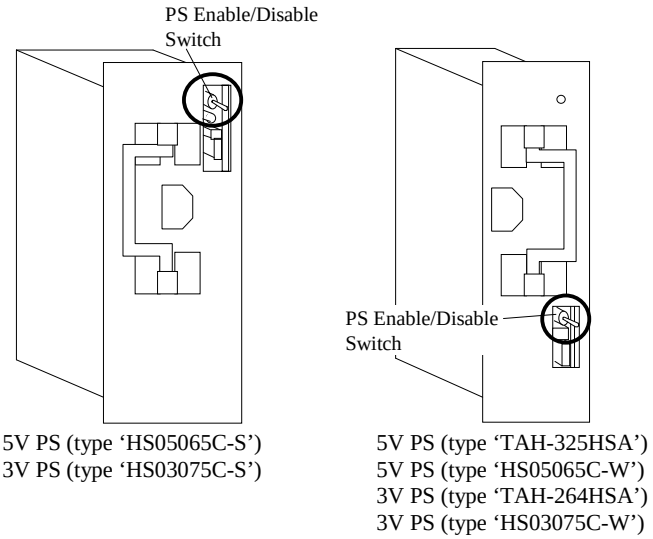


Fig. 4.8.3.3-1 Switch

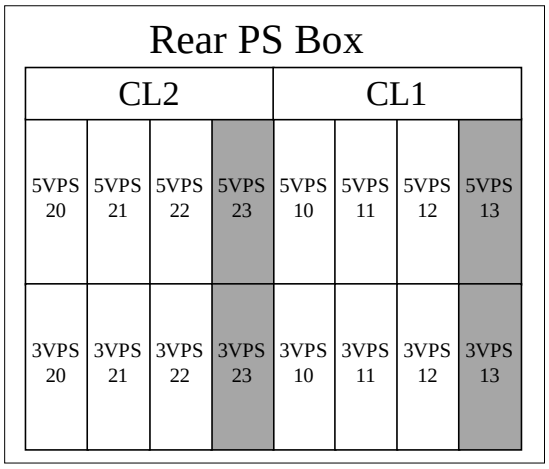


Fig. 4.8.3.3-2 Removal Location

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2. Disconnection of the inlet cable
   a. Disconnect the inlet cables. Refer to Fig. 4.8.3.3-3.

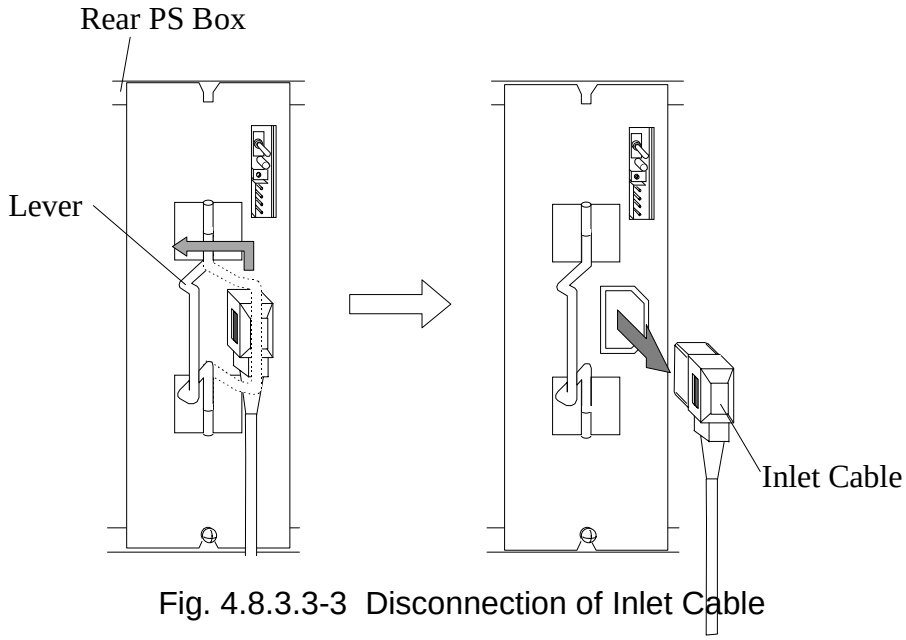
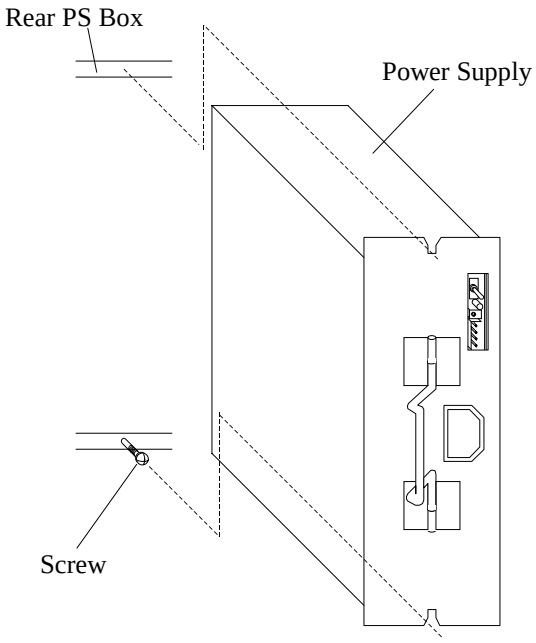


Fig. 4.8.3.3-3 Disconnection of Inlet Cable

3. Removal of the Additional Redundant Power Supply
   a. Loosen the screws and remove the Additional Redundant Power Supplies. Refer to Fig. 4.8.3.3-4.
   b. Attach the dummy plates to the removal locations and fasten the screws. Refer to Fig. 4.8.3.3-5.
   c. Insert the removed inlet cables into respective dummy plates and secure them using cable clamps.



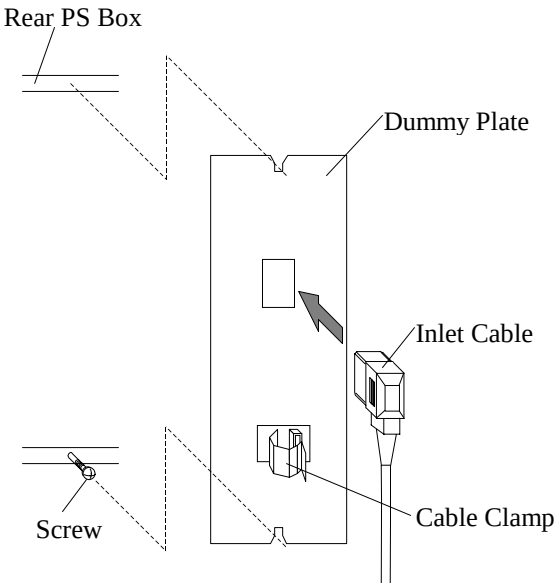


Fig. 4.8.3.3-4 Removal of Power Supply Fig. 4.8.3.3-5 Attachment of Dummy Plate

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4. Removal of the nameplate
   a. Remove the nameplate of DKC-F310I-72 referring to Fig. 4.8.3.3-6.

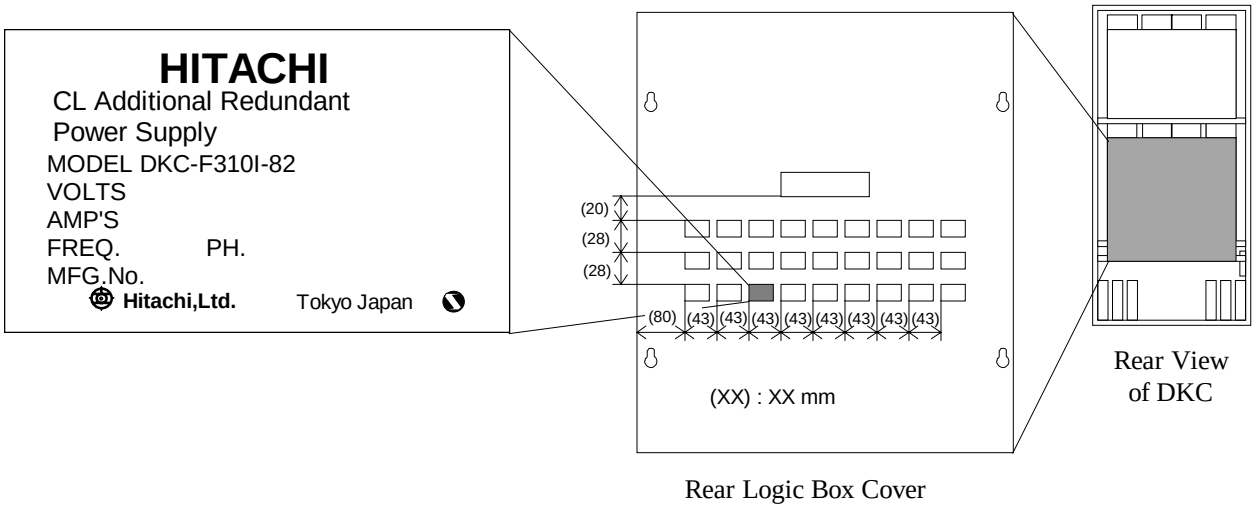

Fig. 4.8.3.3-6 Removal of Nameplate

5. Return to General Flow.
   Non-disruptive De-Installation: Go to INST02-33 Step (9)-7. But if any other optional power supply must be removed, perform the proper hardware procedure.
   DKC-F310I-80 .....INST04-1580 through 1610
   DKC-F310I-81 .....INST04-1620 through 1650
   Disruptive De-Installation: Go to INST02-54 Step (16). But if any other optional power supply must be removed, perform the proper hardware procedure.
   DKC-F310I-80 .....INST04-1580 through 1610
   DKC-F310I-81 .....INST04-1620 through 1650

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4.9 De-Installation of Interface Connector

4.9.1 De-Installation of PCI I/F Connector (DKC-F310I-18)

4.9.1.1 Flowchart

1. Confirm that the REMOTE/LOCAL Switch of CE Panel is set to LOCAL. If not, set the REMOTE/LOCAL Switch to LOCAL.

↓

2. Connect the "CE Panel INH" jumper plug to the sockets on the HUB.

↓

3. Set the jumper connectors(JP1 and JP2) of the CE Panel.

↓

4. Remove the PCI CONN PCB.

↓

5. Disconnect the "CE Panel INH" jumper plug from the socket on the HUB.

↓

6. Detach the nameplate.

4.9.1.2 Parts List

Table 4.9.1.2-1 Parts List

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
1	DKC-F310I-18	PCI CONN	3236713-A	1	
		Nameplate	3252542-14	1	

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4.9.1.3 De-Installation Procedure of PCI I/F Connector

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Confirm that the REMOTE/LOCAL Switch of CE Panel is set to LOCAL. If not, set the REMOTE/LOCAL Switch to LOCAL.

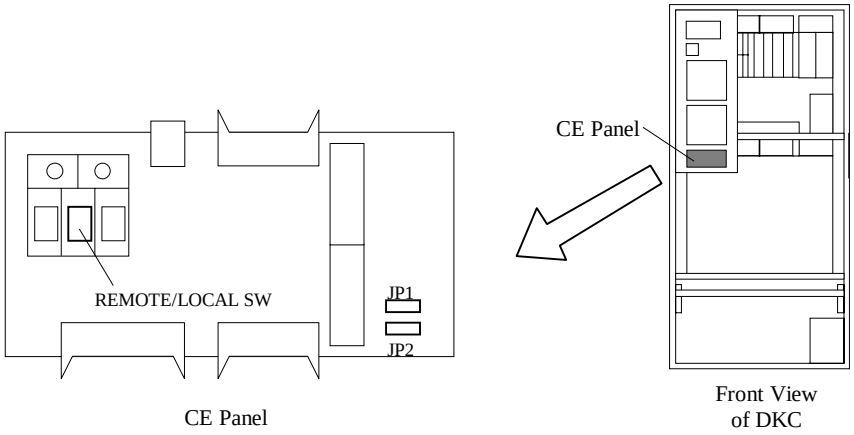

Fig. 4.9.1.3-1 Setting of REMOTE/LOCAL Switch

2. Connect the "CE Panel INH" jumper plug to the socket on the HUB.

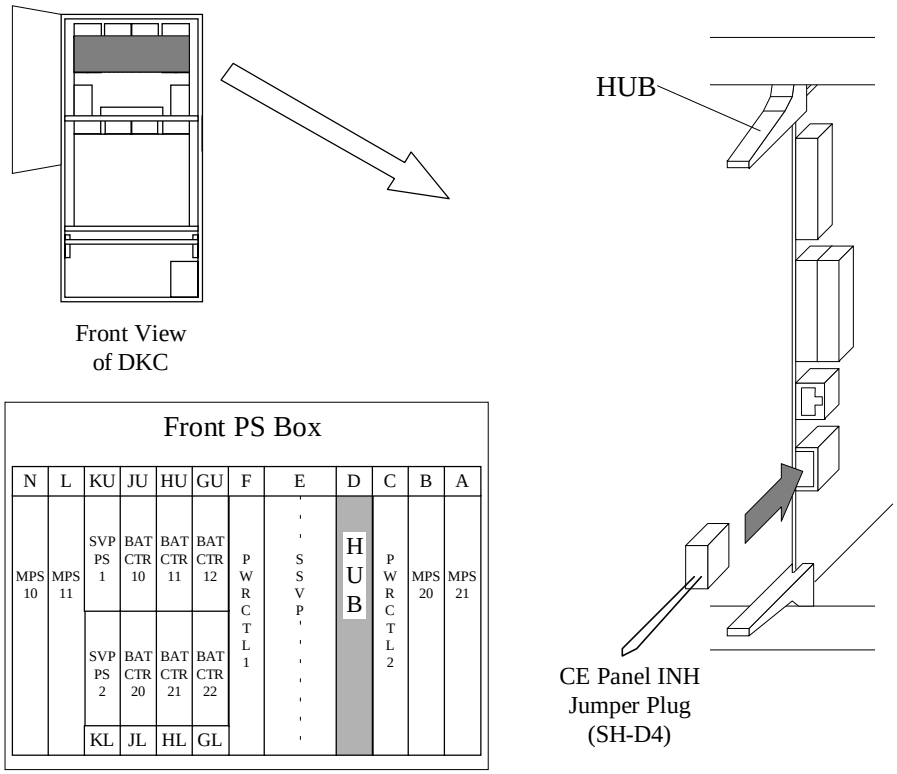

Fig. 4.9.1.3-2 Insertion of Jumper Plug

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3. Set the jumper connectors(JP1 and JP2) of the CE Panel.

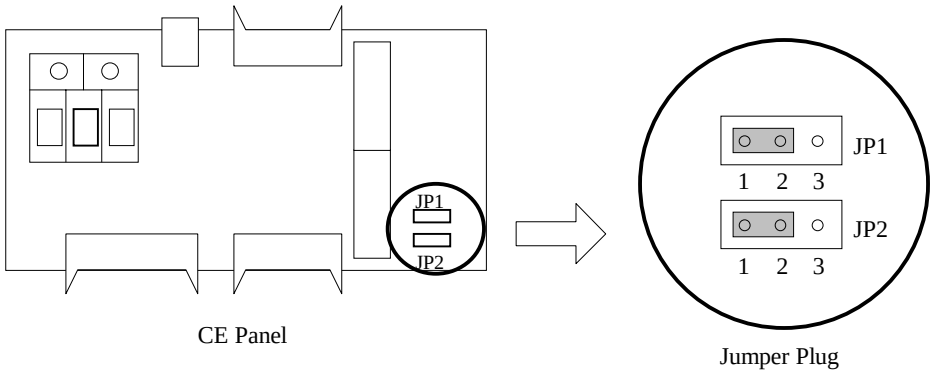

Fig. 4.9.1.3-3 Insertion of Jumper Plug

4. Remove the PCI CONN PCB.
   a. Disconnect the cable.
   b. Remove the screw① and remove the plate.
   c. Loosen the screw② and remove the PCI CONN PCB.
   d. Attach the plate and fasten the screw①.

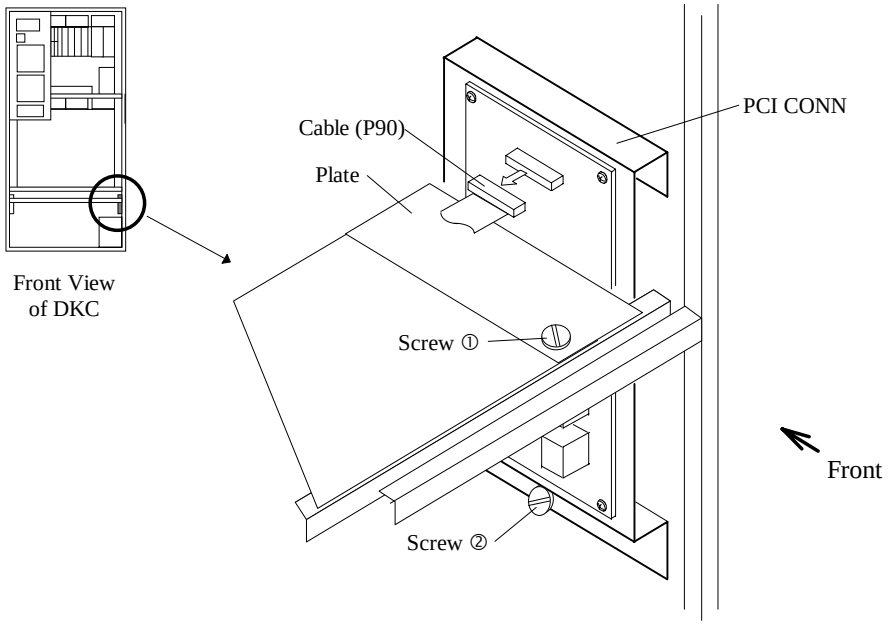

Fig. 4.9.1.3-4 Attachment of PCI CONN PCB

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5. Disconnect the "CE Panel INH" jumper plug from the socket on the HUB.

6. Detach the nameplate.
   a. Detach the nameplate of DKC-F310I-18.

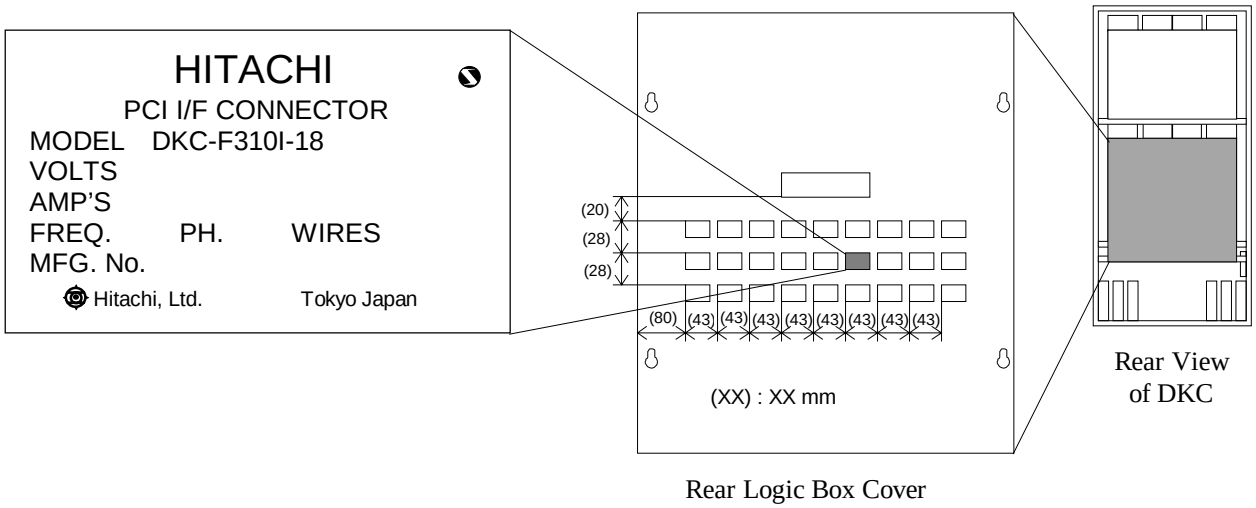

Fig. 4.9.1.3-5 Location of the Nameplate

7. Return to General Flow.
   Non-Disruptive De-Installation : Go to INST02-33 step (10)-2.
   Disruptive De-Installation : Go to INST02-54 step (16)-2.

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4.9.2 De-Installation of RCU I/F Connector (DKC-F310I-19)

4.9.2.1 Flowchart

1. Remove the RCU CONN PCB.

↓

2. Detach the nameplate.

4.9.2.2 Parts List

Table 4.9.2.2-1 Parts List

No.	Model Number	Parts Name	Parts No.	Quantity	Remarks
1	DKC-F310I-19	RCU CONN	3236713-B	1	
		Nameplate	3252542-15	1	

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4.9.2.3 De-Installation Procedure of RCU I/F Connector

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

1. Remove the RCU CONN PCB.
   a. Disconnect the cables(P70, 71).
   b. Remove the screw① and remove the plate.
   c. Remove the screw②and remove the RCU CONN.
   d. Attach the plate and fasten the screw①.

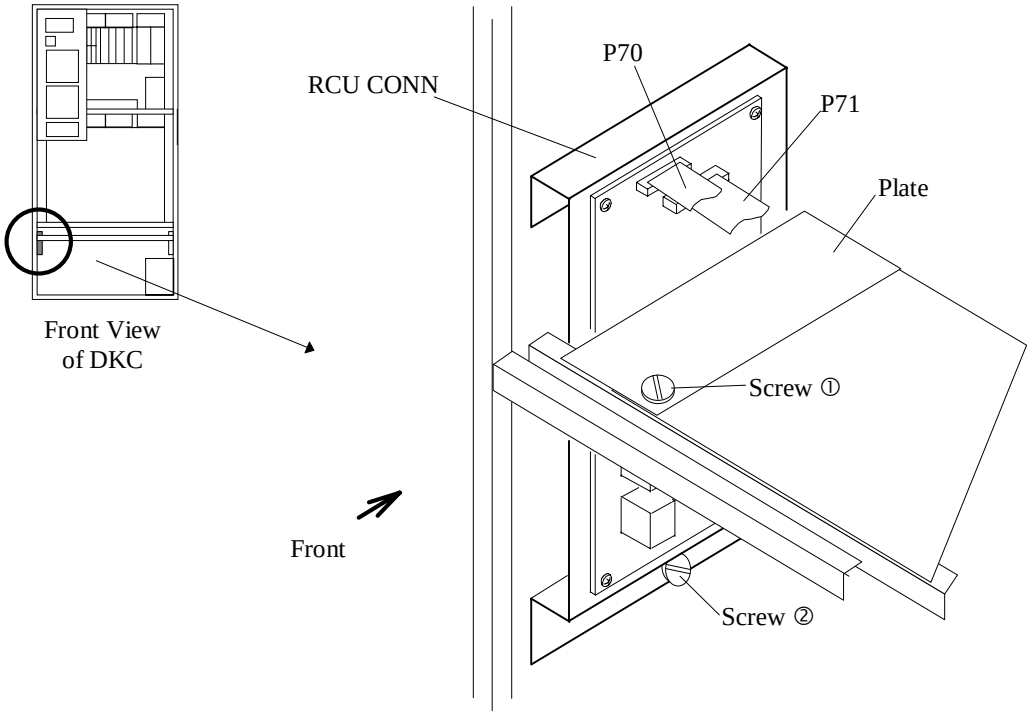

Fig. 4.9.2.3-1 Attachment of RCU CONN PCB

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2. Detach the nameplate.

a. Detach the nameplate of DKC-F310I-19.

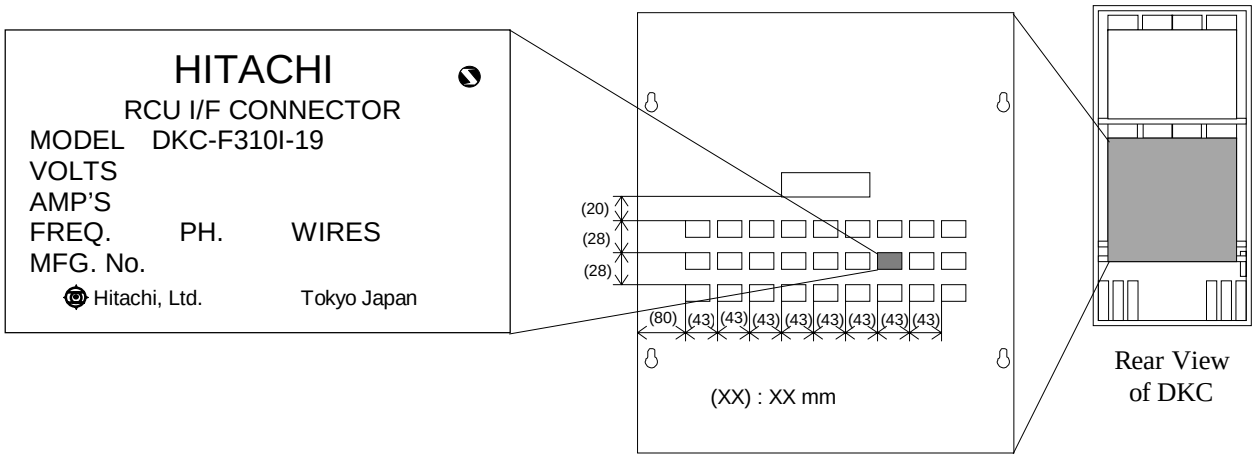

Fig. 4.9.2.3-2 Location of the Nameplate

3. Return to General Flow.

Non-Disruptive De-Installation : Go to INST02-33 step (10)-3.

Disruptive De-Installation : Go to INST02-54 step (17).

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4.10 De-Installation of Dump/Restore Function for Multi-Platform (DKC-F310I-M80)

4.10.1 De-Installation Procedure of Dump/Restore Function for Multi-Platform

1. Change the Nameplate.

a. Paint out the number ① of the nameplate.

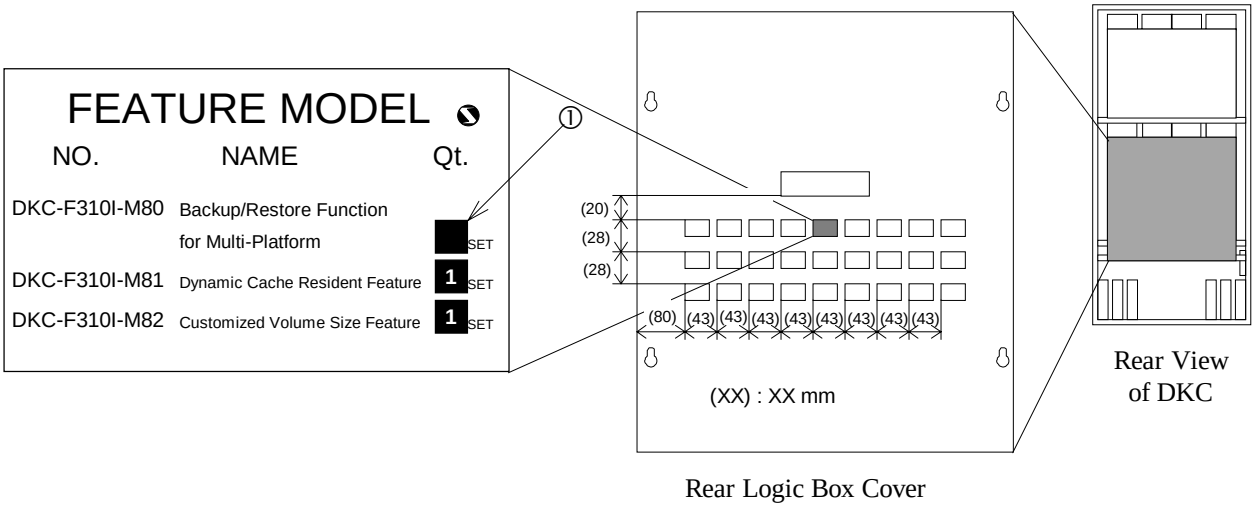

Fig. 4.10.1-1 Location of the Nameplate

2. Return to General Flow.

Non-Disruptive De-Installation : Go to INST02-34 step (12).

Disruptive De-Installation : Go to INST02-54 step (18).

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4.11 De-Installation of Dynamic Cache Resident Feature (DKC-F310I-M81)

4.11.1 De-Installation Procedure of Dynamic Cache Resident Feature

1. Change the Nameplate.

a. Paint out the number ① of the nameplate.

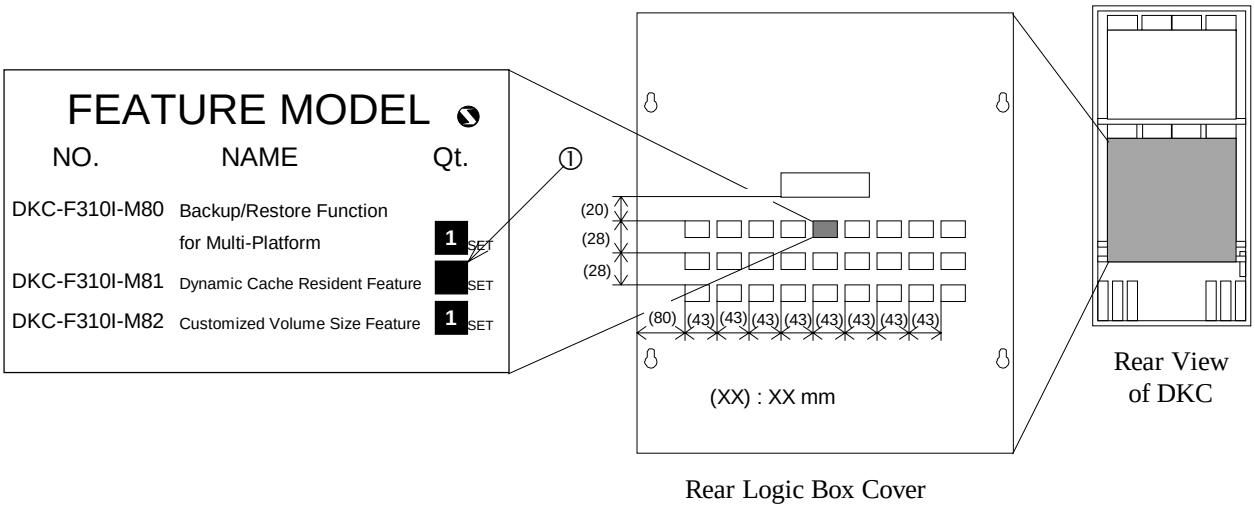

Fig. 4.11.1-1 Location of the Nameplate

2. Return to General Flow.

Non-Disruptive De-Installation : Go to INST02-34 step (13).

Disruptive De-Installation : Go to INST02-54 step (19).

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4.12 De-Installation of Customized Volume Size Feature (DKC-F310I-M82)

4.12.1 De-Installation Procedure of Customized Volume Size Feature

1. Change the Nameplate.

a. Paint out the number ① of the nameplate.

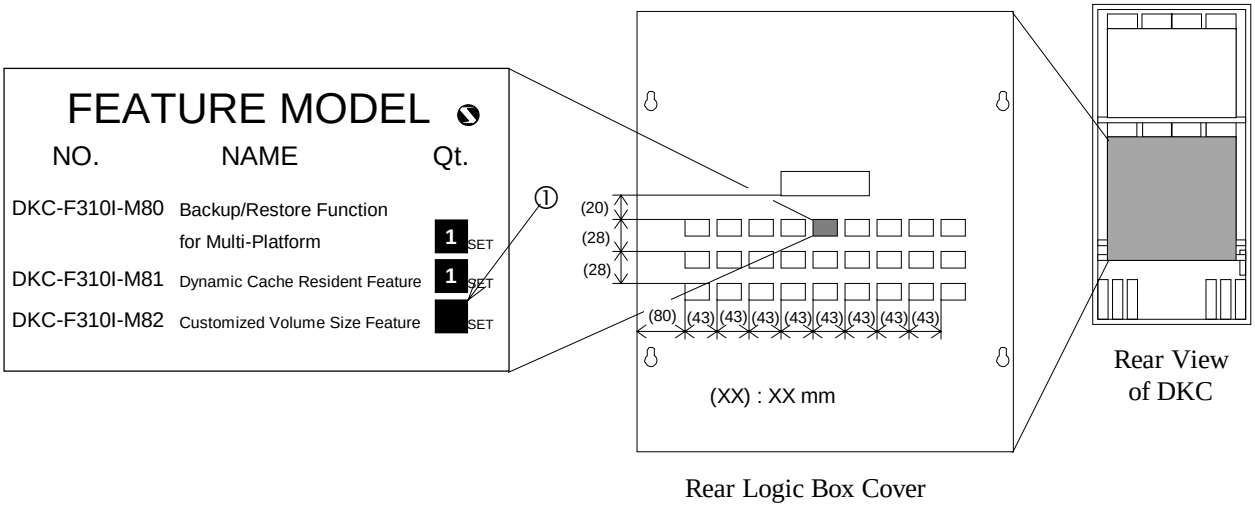

Fig. 4.12.1-1 Location of the Nameplate

2. Return to General Flow.

Non-Disruptive De-Installation : Go to INST02-34 step (13a).

Disruptive De-Installation : Go to INST02-54 step (19a).

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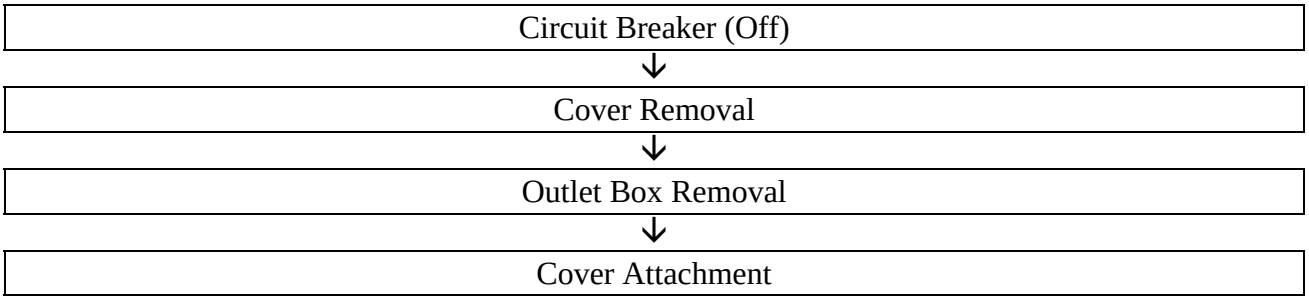
4.13 De-Installation of Outlet Box

4.13.1 De-Installation of Outlet Box(IU)

4.13.1.1 Flowchart



4.13.1.2 Parts List

Table 4.13.1.2-1 Parts List

No.	Name of Part	Part Number	Quantity/Unit	Remarks
1	Outlet Box (IU type)	5497351-A	1	
2	Jumper Plug (P311:208V)	3250946-B	1	
3	Jumper Plug (P311:230/400V)	3250946-D	1	
4	Jumper Plug (P312:115V)	3250946-G	1	
5	OLB BASE ASM	3252602-A	1	

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4.13.1.3 De-Installation Procedure of Outlet Box(IU)

1. Circuit Breaker (Off)

⚠ WARNING

Be Careful with Electric Shock

- The power of the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.

⚠ CAUTION

Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which causes injury.

a. Turn off the circuit breakers in the DKC.

Table 4.13.1.3-1 Circuit Breakers to be Turned Off

No.	Unit	Location No.	Breaker No.	Remarks
1	DKC	Outlet Box	CB301	Failure to turn off may result in an electric shock.
2	DKC	Outlet Box	CB302	Failure to turn off may result in an electric shock.

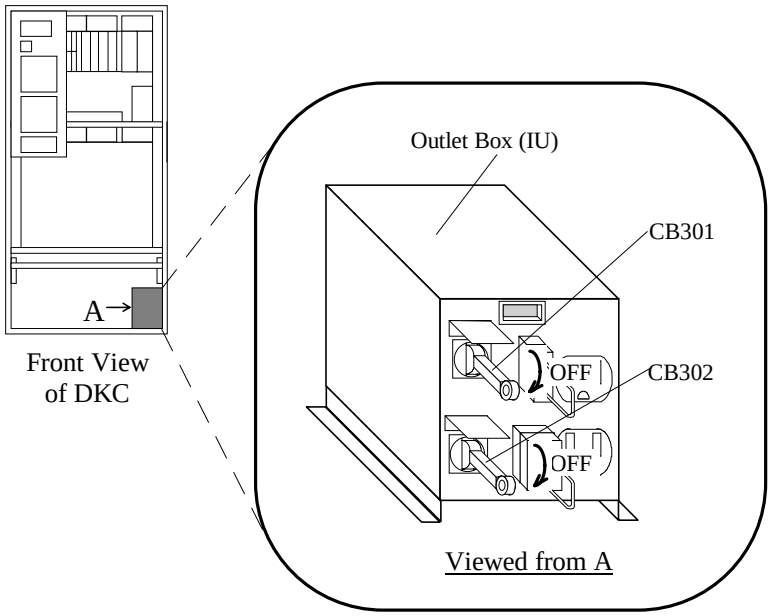

Fig. 4.13.1.3-1 Circuit Breakers to be Turned Off

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2. Cover Removal
   a. Remove the Front PS Box Cover 2. Refer to INST03-10.
   b. Loosen the two screws and remove the cable duct cover.

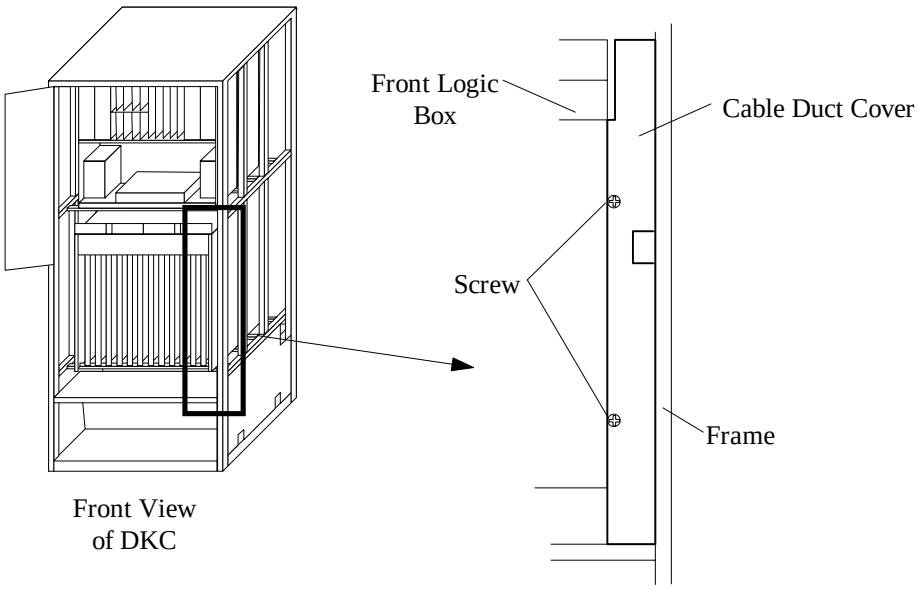

Fig. 4.13.1.3-2 Removal of Cable Duct Cover

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3. Outlet Box Removal
   a. Detach the OLB power cable (P203) from Breaker Box-1.

⚠ WARNING

Be Careful with Electric Shock

- Be sure to turn off the circuit breakers (CB301 and CB302) on Outlet Box before operation.
- The connector J203 on Breaker Box-1 is a live part. So be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.
- The connector J203 on Breaker Box-1 is a live part. So be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.

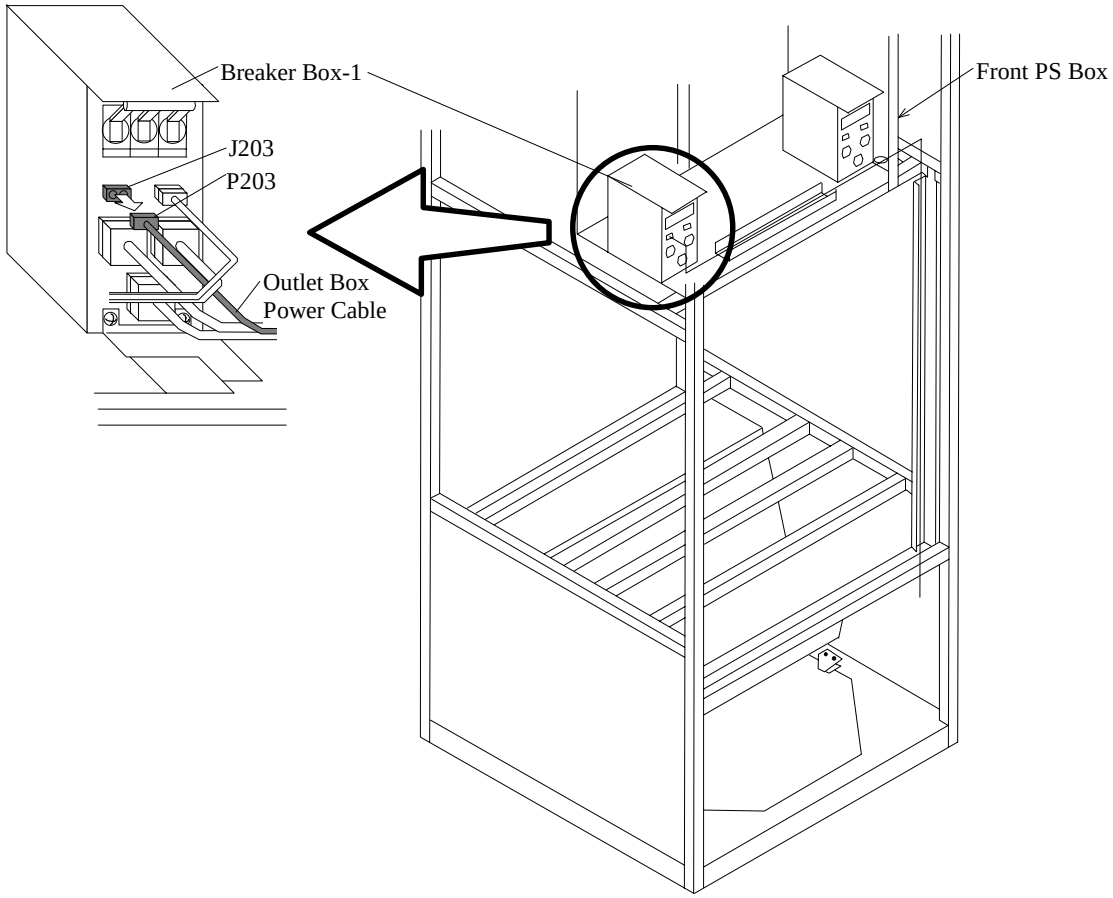

Fig. 4.13.1.3-3 Removal of OLB Power Cable

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b. Remove the cover and draw the OLB power cable(P203). Attach the cover with the screw.

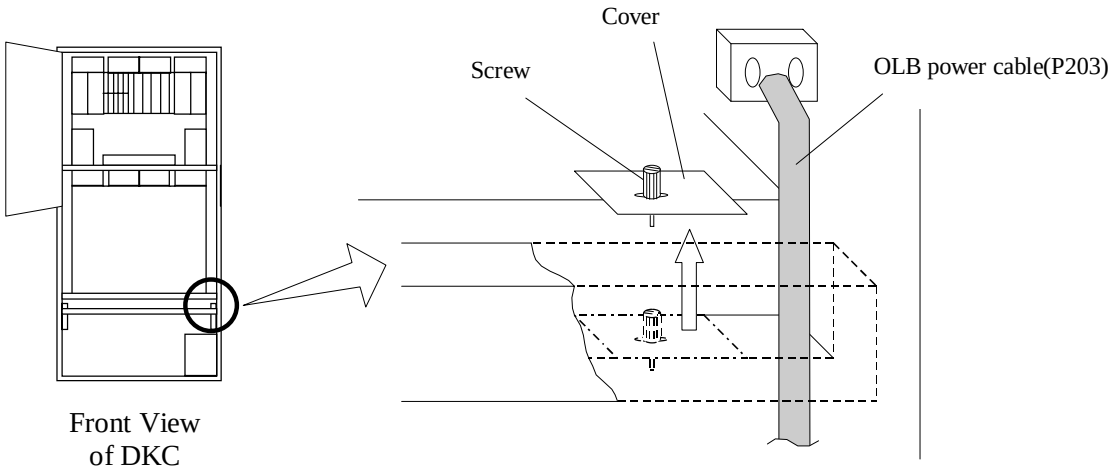

Fig. 4.13.1.3-4 Removal of OLB Power Cable

c. Detach the Outlet Box frame ground wire from the DKC frame. Remove the two screws that fasten the Outlet Box.

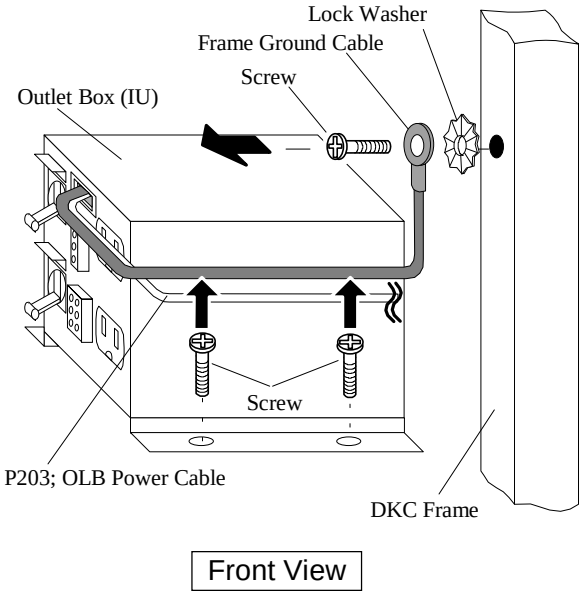

Fig. 4.13.1.3-5 Removal of Outlet Box

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d. Remove the Outlet Box.

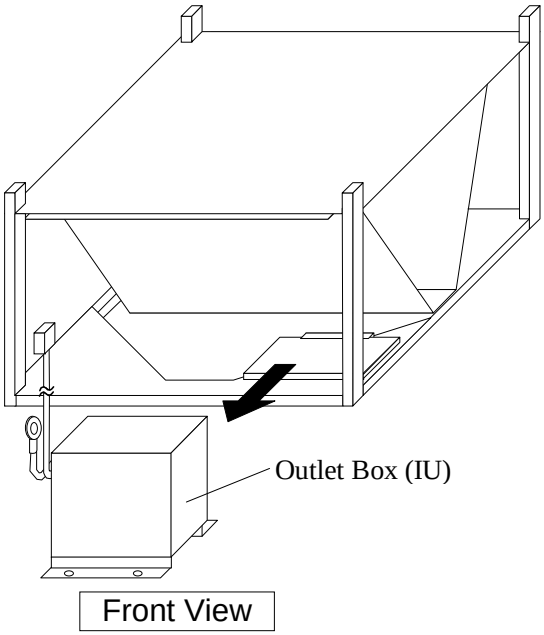

Fig. 4.13.1.3-6 Removal of Outlet Box

e. Loosen the screw① and remove the two screws②. Remove the OLB BASE ASM.

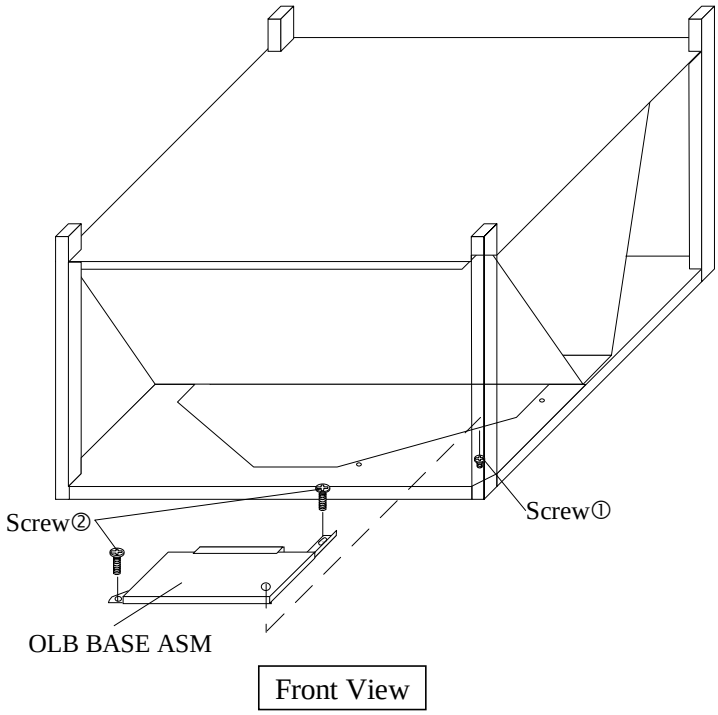

Fig. 4.13.1.3-7 Removal of OLB BASE ASM

4. Cover Attachment
   a. Attach the Front PS Box Cover 2. Refer to INST03-10.
   b. Attach the cable duct cover and fasten the two screws. Refer to Fig. 4.13.1.3-2.

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5. Return to General Flow.
   Non-Disruptive De-Installation : Go to INST02-34 step (15).
   Disruptive De-Installation : Go to INST02-54 step (21).

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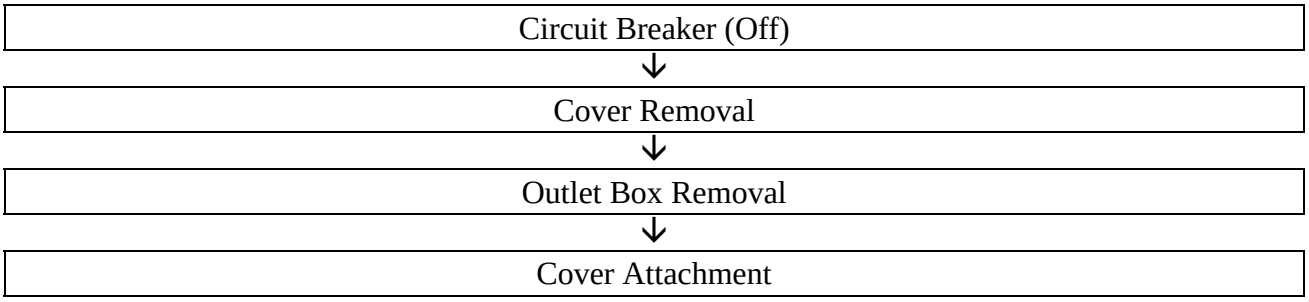
4.13.2 De-Installation of Outlet Box(IE)

4.13.2.1 Flowchart



4.13.2.2 Parts List

Table 4.13.2.2-1 Parts List

No.	Name of Part	Part Number	Quantity/Unit	Remarks
1	Outlet Box (IE type)	5497351-B	1	
2	OLB BASE ASM	3252602-A	1	

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4.13.2.3 De-Installation Procedure of Outlet Box(IE)

1. Circuit Breaker (Off)

⚠ WARNING

Be Careful with Electric Shock

- The power of the device is still on after turning off the breaker shown below.
- The device may be powered off when turning off the breakers not shown below.

⚠ CAUTION

Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which causes injury.

a. Turn off the circuit breaker in the DKC.

Table 4.13.2.3-1 Circuit Breaker to be Turned Off

No.	Unit	Location No.	Breaker No.	Remarks
1	DKC	Outlet Box	CB301	Failure to turn off may result in an electric shock.

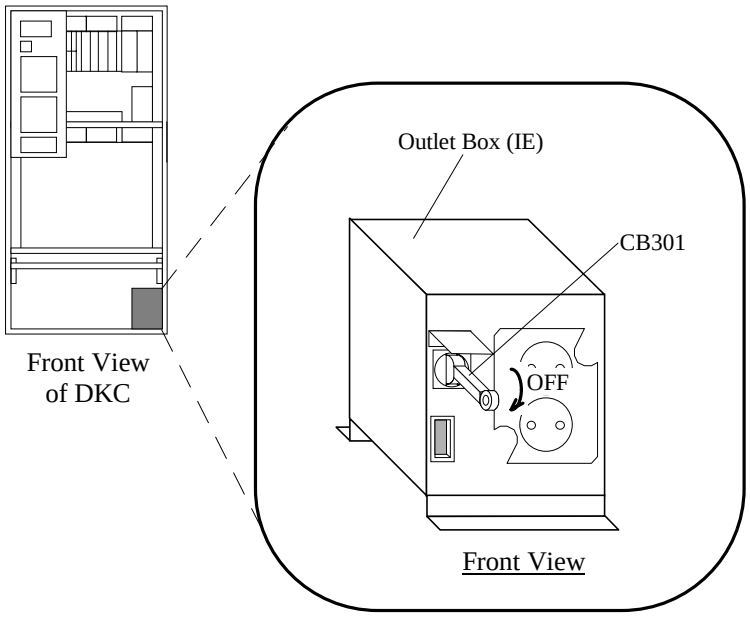

Fig. 4.13.2.3-1 Circuit Breaker to be Turned Off

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2. Cover Removal
   a. Remove the Front PS Box Cover 2. Refer to INST03-10.
   b. Loosen the two screws and remove the cable duct cover.

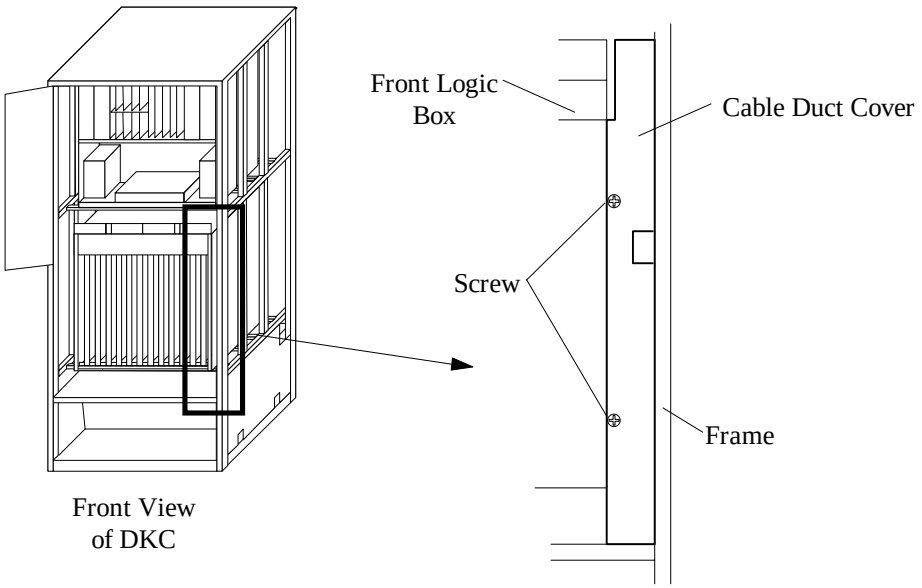

Fig. 4.13.2.3-2 Removal of Cable Duct Cover

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3. Outlet Box attachment
   a. Detach the OLB power cable (P203) from Breaker Box-1.

⚠ WARNING

Be Careful with Electric Shock

- Be sure to turn off the circuit breaker (CB301) on Outlet Box before operation.
- The connector J203 on Breaker Box-1 is a live part. So be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.
- The connector J203 on Breaker Box-1 is a live part. So be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.

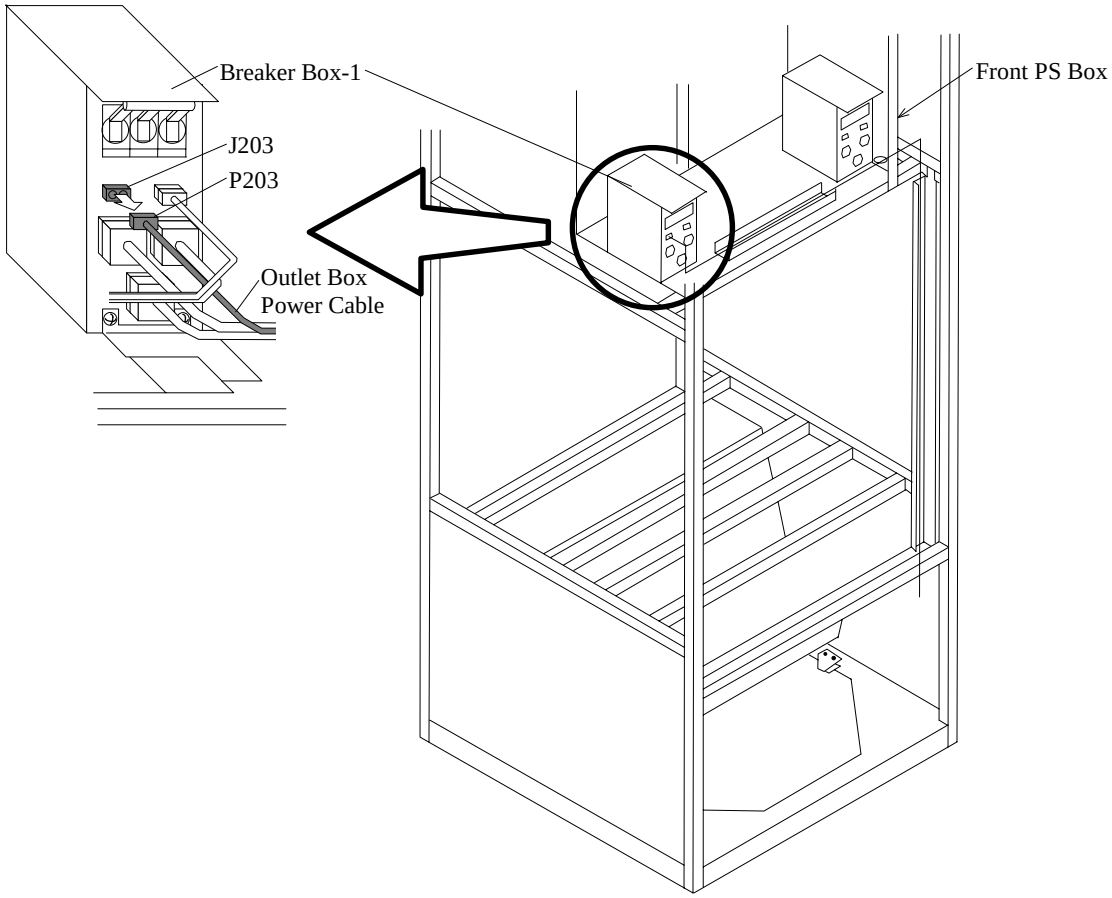

Fig. 4.13.2.3-3 Removal of OLB Power Cable

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b. Remove the cover and draw the OLB power cable(P203). Attach the cover with the screw.

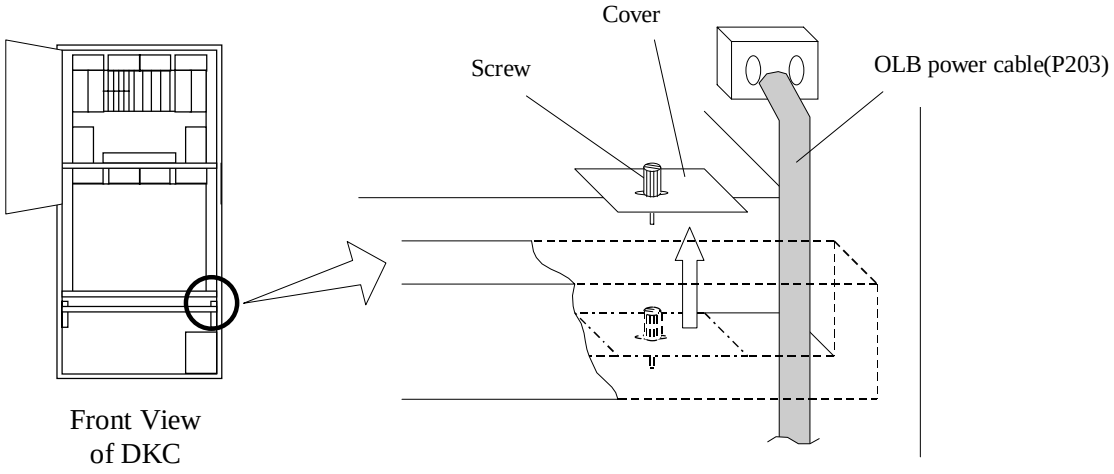

Fig. 4.13.2.3-4 Removal of OLB Power Cable

c. Detach the Outlet Box frame ground wire from the DKC frame. Remove the two screws that fasten the Outlet Box.

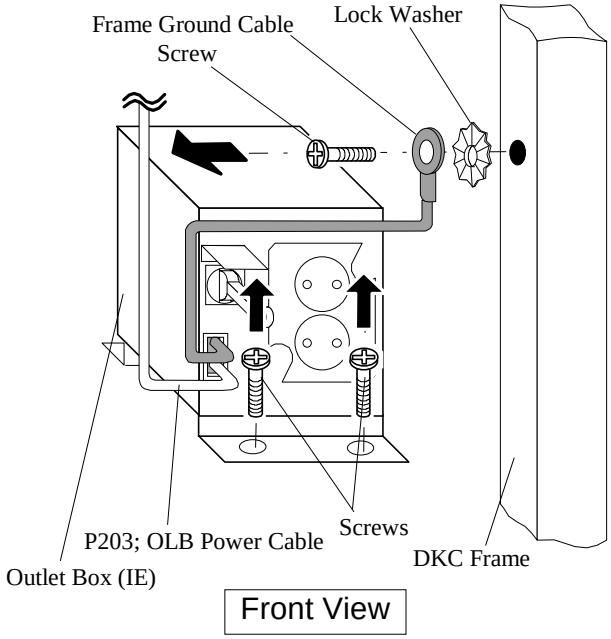

Fig. 4.13.2.3-5 Removal of Outlet Box

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d. Remove the Outlet Box.

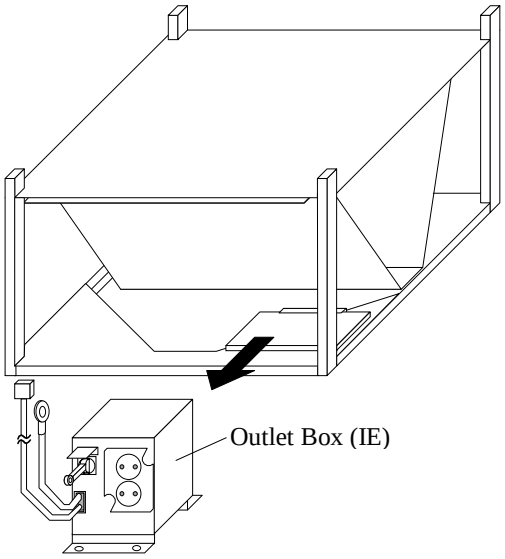

Fig. 4.13.2.3-6 Removal of Outlet Box

e. Loosen the screw① and remove the two screws②. Remove the OLB BASE ASM.

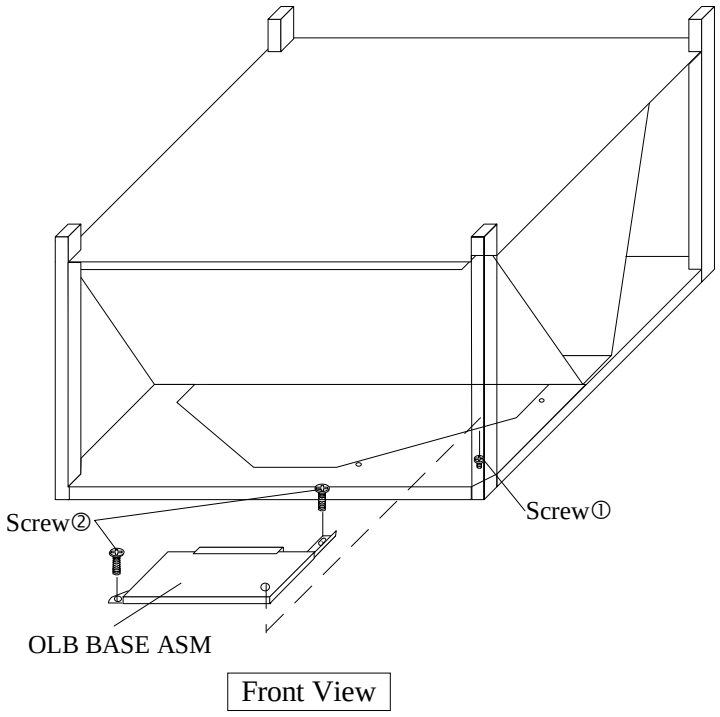

Fig. 4.13.2.3-7 Removal of OLB BASE ASM

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4. Cover Attachment
   a. Attach the Front PS Box Cover 2. Refer to INST03-10.
   b. Attach the cable duct cover and fasten the two screws. Refer to Fig. 4.13.2.3-2.

5. Return to General Flow.
   Non-Disruptive De-Installation : Go to INST02-34 step (15).
   Disruptive De-Installation : Go to INST02-54 step (21).

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4.14 De-Installation of Hitachi Multiple RAID Coupling Facility Feature (DKC-F310I-M83)

4.14.1 De-Installation Procedure of Hitachi Multiple RAID Coupling Facility Feature

1. Change the Nameplate.
   a. Wipe off the number ① of the nameplate.

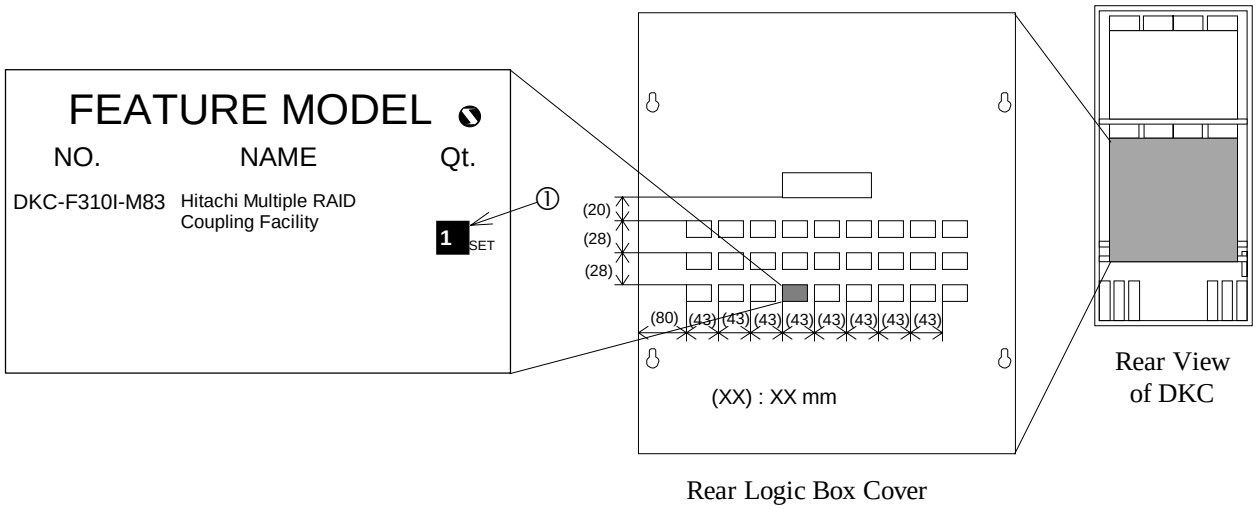

Fig. 3.17.1-1 Location of the Nameplate

2. Return to General Flow.
   Non-Disruptive De-Installation : Go to INST02-34 step (14).
   Disruptive De-Installation : Go to INST02-54 step (20).

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5 SVP procedure

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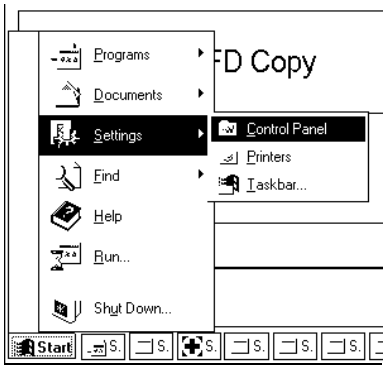
5.2 New Installation SVP Procedure

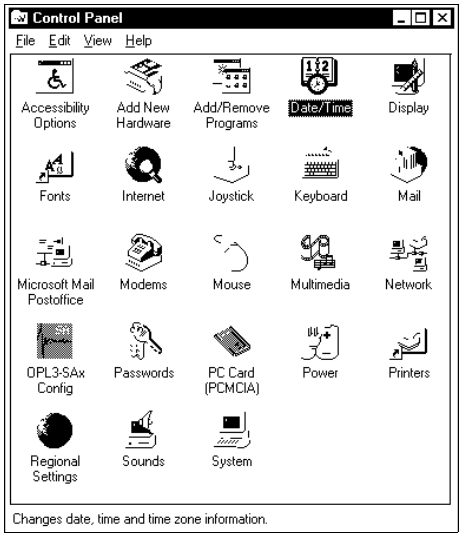
5.2.1 TOD Setting and Set IP Address

[1] TOD Setting (Turn on subsystem power before TOD Setting)

1. <Open [Control Panel]>
   Select (DR) [Settings] and then [Control Panel] from [Start].



2. <Open [Date/Time]>
   Select (DC) [Date/Time] from [Control Panel].



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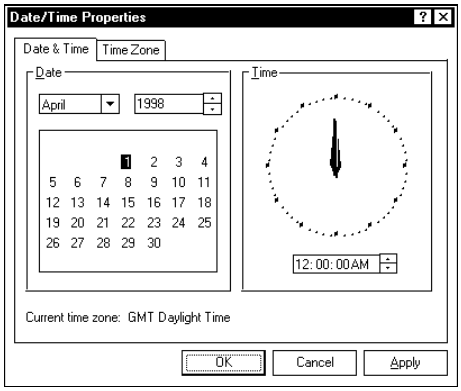
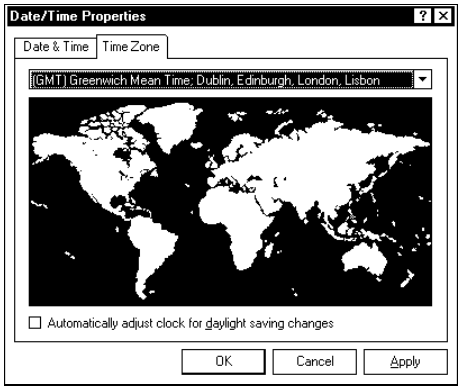
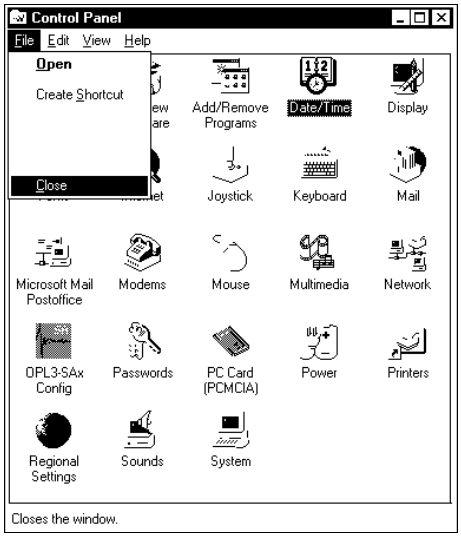
3. <Select [Time Zone]>
Select (CL) [Time Zone].



4. <Check the setting of [Time Zone]>
Make sure that the setting of [Time Zone] is "[GMT] Greenwich Mean Time; Dublin, Edinburgh, London, Lisbon". Also, make sure that a check box on the left of "Automatically adjust clock for daylight saving changes" is ☐ (without a check mark). Then, press [OK] (CL).



5. <Close [Control Panel]>
Select (DR) [File] and then [Close] from [Control Panel].



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6.

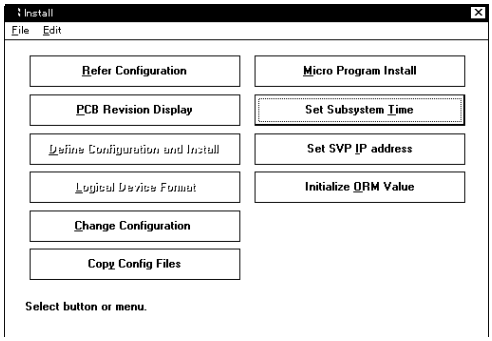
Change the mode to [Modify Mode] from [View Mode] (CL).

7.

Select (CL) [Install].

8.

Select (CL) [Set Subsystem Time] in the ‘Install’ window.



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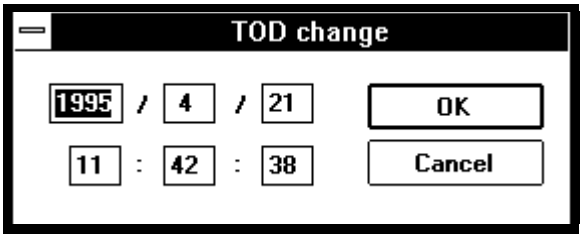
9.

Specify the date (year, month and day) and time (hour, minute and second) and select (CL) [OK].



10.

Close the ‘Install’ window.

In case of New Installation, go to INST02-12 step (16)-2.

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[2] Set IP Address

1.

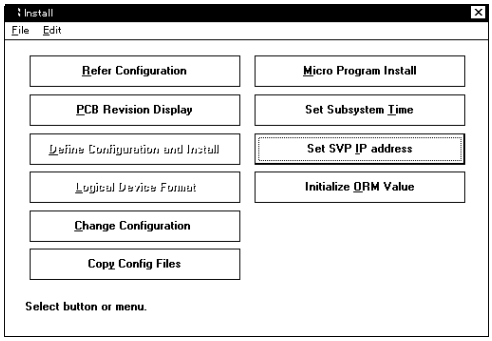
Change the mode to [Modify Mode] from [View Mode] (CL).

2.

Select (CL) [Install].

3.

Select (CL) [Set SVP IP address] in the 'Install' window.



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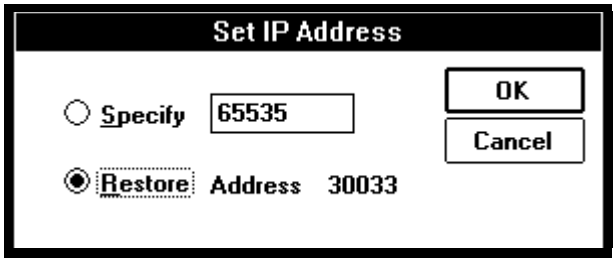
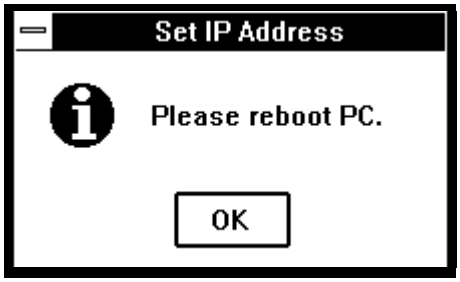
4. <Change the IP Address>

(i) In the case of setting “65535” as the IP Address of LAN of SVP.
   ① Select (CL) [Specify] and then select (CL) [OK] after you recognized that the value is 65535. If the value is not 65535, select (CL) [OK] after entering 65535.
   ② In response to the message “Please reboot PC”, select (CL) [OK].

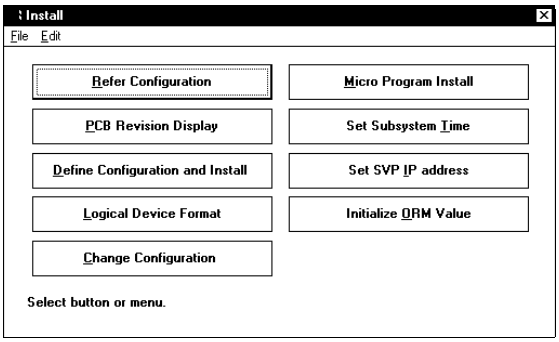
(ii) In the case of setting the DKC serial number that was specified in “Define Configuration and Install”.
   ① Select (CL) [Restore] and then select (CL) [OK].
   ② In response to the message “Please reboot PC”, select (CL) [OK].





5. <Termination of Install>

Select (CL) the [File] menu in the ‘Install’ window and select (DR) [Exit].



6. <Restart the PC>

Select (CL) “Start”.
Select (DR) “Shut down”.
Select (CL) “Restart the computer?”, and
Select (CL) [Yes].

Go to INST02-12 step (17).

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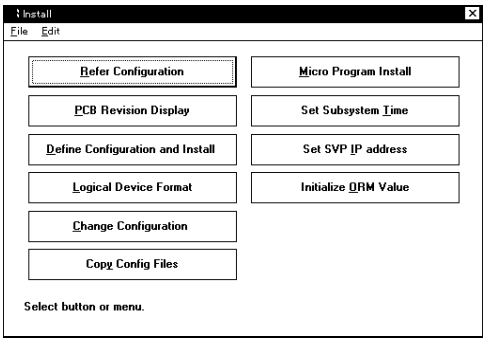
5.2.2 Configuration Information Definition

NOTICE
This operation is necessary only when a subsystem is newly installed. It is not performed afterward. If it is performed by mistake, a system down or a data loss may be caused.

1. <Mode Change>
   Change the mode to INITIAL SETUP Mode.
   Select “Shift” + “Ctrl” + “I”.

   Enter the password and select (CL) [OK].
   Please call Technical Support Center for asking it.
   Select (CL) [Install].

2.
   Select (CL) [Define Configuration and Install...].



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if executed in an occasion other the new subsystem installation, and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

3.

(1) Select (CL) [OK] in response to the confirmation message “<Important CAUTION>
This Operation is new installation. If you want to Non-disruptive Install or Non-disruptive de-install, terminate this procedure by [CANCEL] button and select INSTALL-CHANGE CONFIGURATION menu.”.

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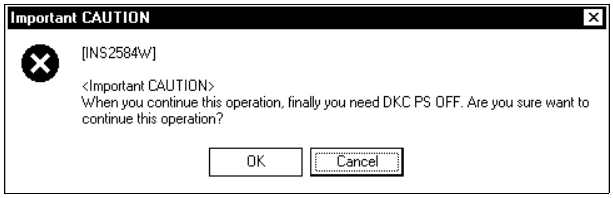
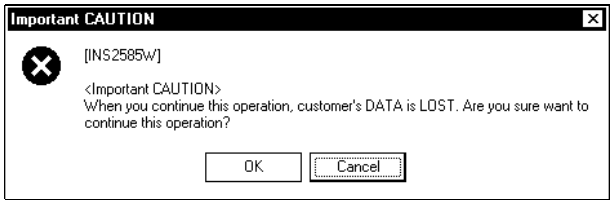
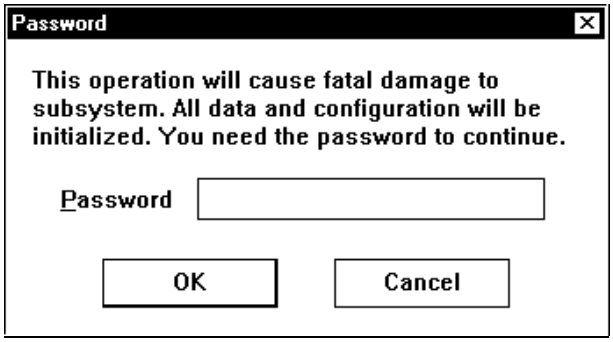
(2) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you continue this operation, finally you need DKC PS OFF. Are you sure want to continue this operation?".



(3) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you continue this operation, customer's DATA is LOST. Are you sure want to continue this operation?".



(4) Enter the password and select (CL) [OK].
Entering the password is required in this operation.
Please call Technical Support Center for asking it.



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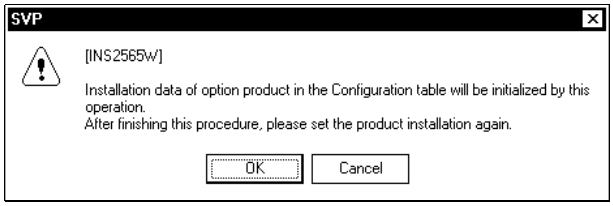
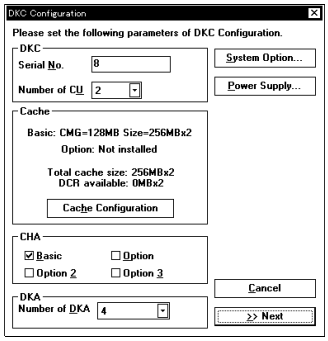
(5) Select (CL) [OK] in response to the confirmation message “Installation data of option product in the Configuration table will be initialized by this operation. After finishing this procedure, please set the product installation again.”.



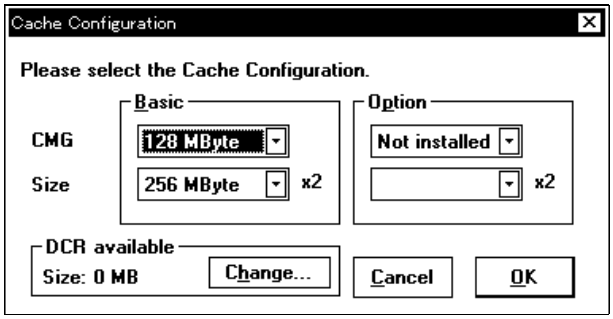
4. <Define configuration information>

Define the device configuration information from ‘DKC Configuration’ according to the device configuration worksheet.
After defining all input items is completed, select (CL) [>>Next].
If [Cache Configuration] is selected, ‘Cache Configuration’ dialog box is displayed. (See step 4-1.)
If [System Option] is selected, ‘System Option’ dialog box is displayed. (See step 4-2.)
If [Power Supply] is selected, ‘Redundant Power Supply’ dialog box is displayed. (See step 4-3.)
If [Cancel] is selected, this procedure is terminated.



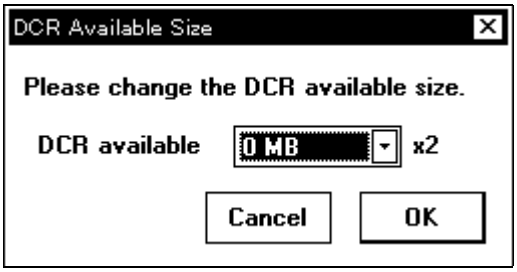
4-1. <Define Cache Capacity>

Define the cache capacity in the ‘Cache Configuration’ dialog box.
If you want to use DCR, select (CL) [Change...] to set DCR available size. (See SSD Optional Function Section)



4-1-1. <Define DCR Available Size>

Define the DCR available size in the ‘DCR Available Size’ dialog box.
And select (CL) [OK].
Go to step 4-1.
Selecting (CL) [Cancel] returns you to step 4-1.



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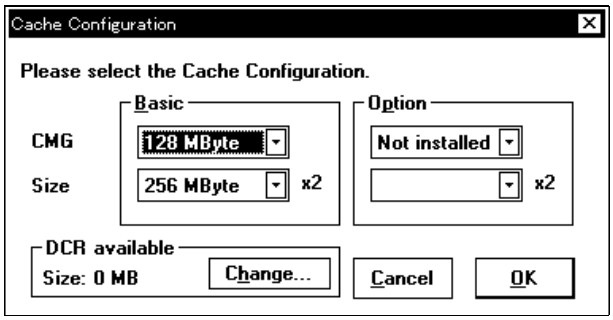
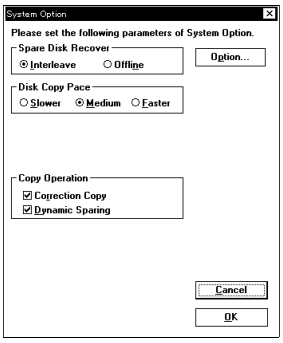
4-1-2.

Select (CL) [OK].
Go to step 4.
Selecting (CL) [Cancel] returns you to step 4.



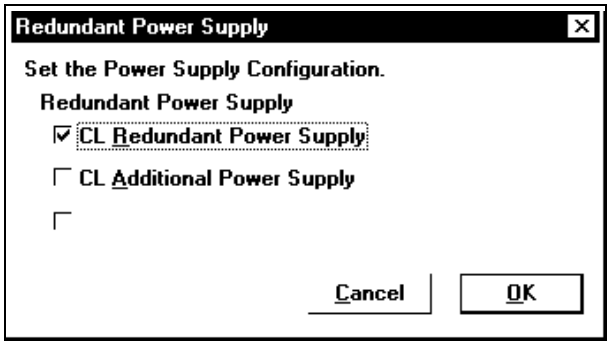
4-2. <Define System Options>

Define the device configuration information from 'System Option Setup' according to the device configuration worksheet.
After setting up all items, select (CL) [OK].
Go to step 4.
Selecting (CL) [Cancel] returns you to step 4.



4-3. <Set Power Supply>

Set the power supply information in the 'Redundant Power Supply' dialog box.
After setting up all items, select (CL) [OK].
Go to step 4.
Selecting (CL) [Cancel] returns you to step 4.



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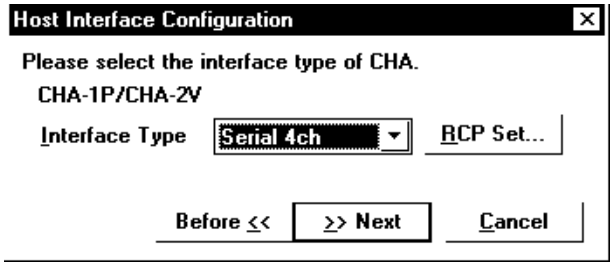
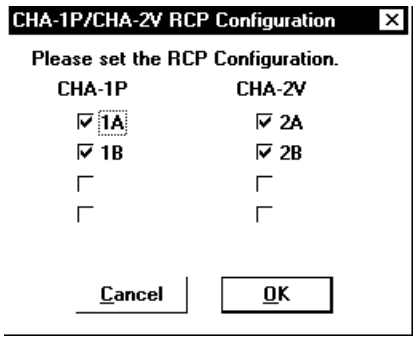
5. <Setting channel type>

Set the subsystem configuration information in the 'Host Interface Configuration' window according to the subsystem configuration information work sheet.
When [Serial 2 ch] or [Serial 4 ch] is selected, select (CL) [RCP Set...] and go to step 5-1.
When [Parallel 4 ch] is selected, select (CL) [>>Next] and go to step 5-2.
(Execute the operation above for all the channels installed.)
After all the items are set, select (CL) [>>Next]. Go to step 7.
When [Before<<] is selected (CL), the screen is returned to the previous one.



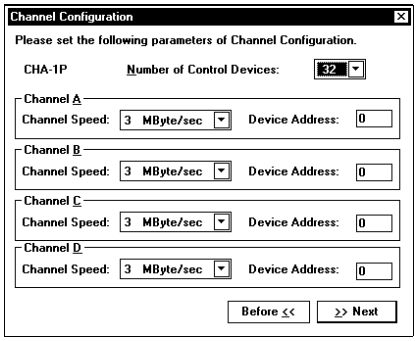
5-1. <Setting RCP port>

Select (CL) the port defined as the RCP port and select (CL) [OK].
Go to step 5-3.
When [Cancel] is selected (CL), the routine returns to step 5.



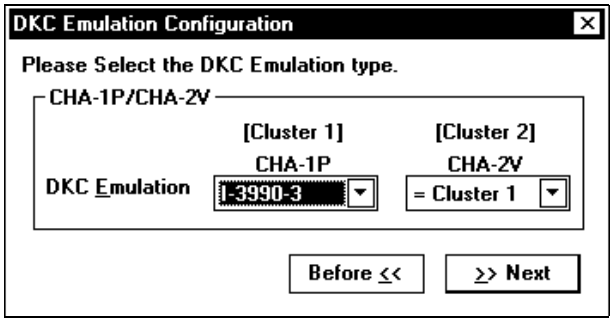
5-2. <Setting parallel CH>

Set the subsystem configuration information in the 'Cancel Configuration' window.
When all the items are set, select (CL) [>>Next]. Go to step 5-3.
When [Before<<] is selected (CL), the routine returns to step 5.



5-3. <Setting DKC emulation type>

Set the subsystem configuration information in the 'DKC Emulation Configuration' window according to the subsystem configuration information work sheet.
After the setting is completed, select (CL) [>>Next]. The routine returns to step 5.
When [Before<<] is selected (CL), the routine returns to step 5.



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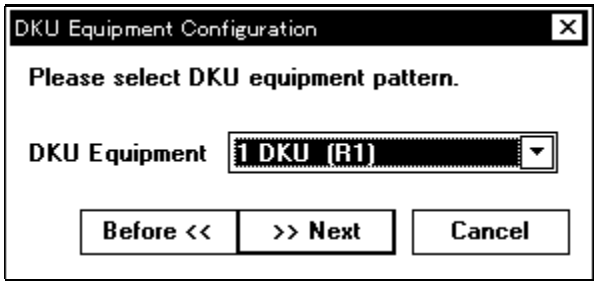
6.

BLANK

7. <Set DKU Equipment>

Define the DKU equipment pattern in the 'DKU Equipment'.
After setting up, select (CL) [>>Next].
Selecting (CL) [Before<<] returns you to the previous screen.
This procedure is terminated by selecting (CL) [Cancel].

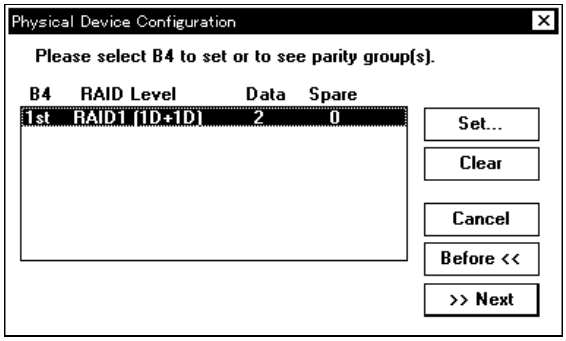


8. <Install Drive Configuration Information>

Define drive configuration according to the 'Physical Device Configuration' screen displaying the mounted B4 based on the result of setting of DKU mount pattern.
Detailed procedure is shown below.

- Select (CL) the item and select (CL) [Set...]. Go to step 8-1 through 8-3.
- Selecting (CL) [Clear...] after selecting (CL) the item clears the B4 setting.

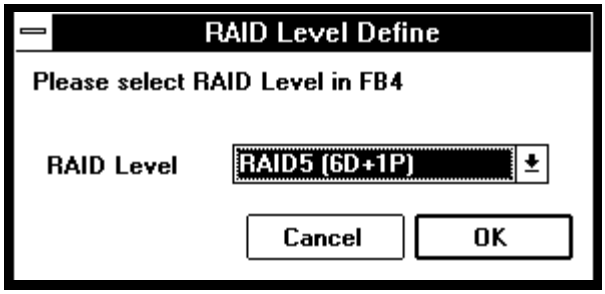
After setting up all items, select (CL) [>>Next].
Selecting (CL) [Before<<] returns you to the previous screen.
This procedure is terminated by selecting (CL) [Cancel].



FB4	Location
1st	HDU-R10, 11, 12, 13
2nd	HDU-R14, 15, 16, 17
3rd	HDU-L10, 11, 12, 13
4th	HDU-L14, 15, 16, 17
5th	HDU-R20, 21, 22, 23
6th	HDU-R24, 25, 26, 27
7th	HDU-L20, 21, 22, 23
8th	HDU-L24, 25, 26, 27

8-1.

Define RAID level of the B4 in the 'RAID Level Define'.



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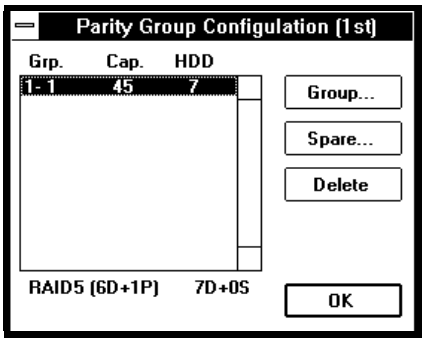
8-2.

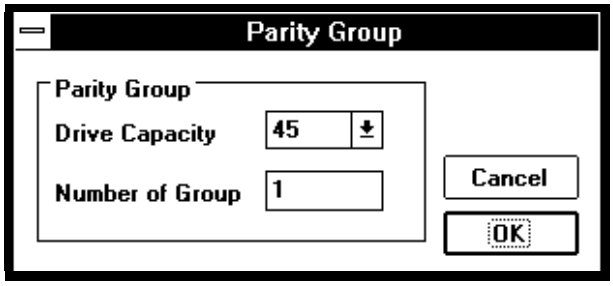


- To define Parity Group, select the drive to be defined and select (CL) [Group...] in the 'Parity Group Configuration' dialog box. See step 8-2-1.
- To define Spare, select the drive to be defined and select (CL) [Spare...] in the 'Parity Group Configuration' dialog box. See step 8-2-2.
- To delete an item, select an item to be deleted and select (CL) [Delete] in the 'Parity Group Configuration' dialog box.

After setting up all items, select (CL) [OK]. Return to step 8.

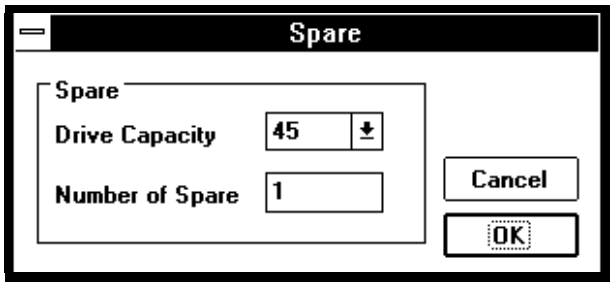
8-2-1.

Define the drive capacity and the number of parity groups in the 'Parity Group' dialog box. Then select (CL) [OK]. Return to step 8-2.



8-2-2.

Define the drive capacity and the number of spare drives in the 'Spare' dialog box. Then select (CL) [OK]. Return to step 8-2.



9. <Define Device Emulation>

After setting up all items for definition of Device Emulation, select (CL) [>>Next]. Selecting (CL) [Before<<] returns you to the previous screen.

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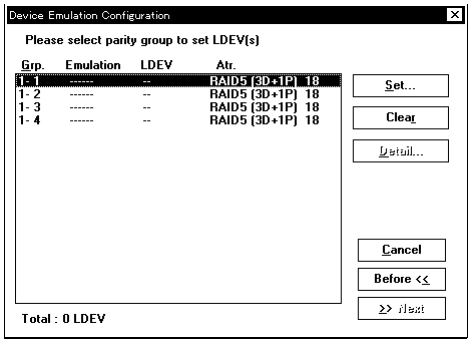
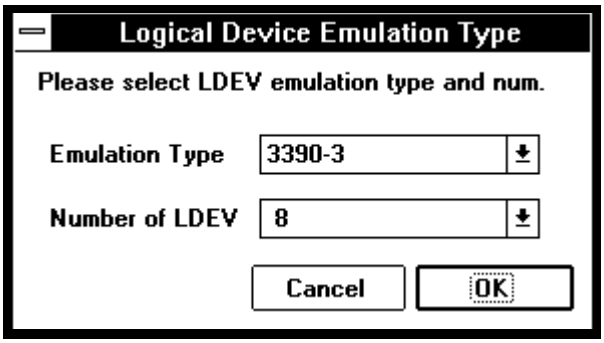
9-1.

In case of defining Device Emulation:
Select (CL) device and select (CL) [Set...].
This procedure is terminated by selecting (CL) [Cancel].



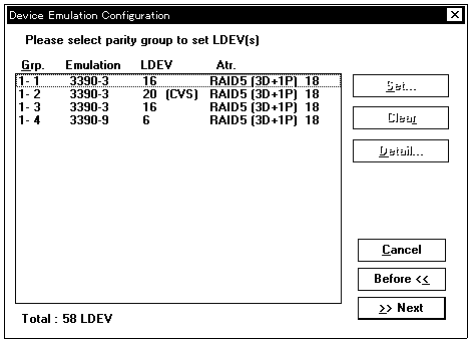
9-1-1.

After setting up all items in the 'Logical Device Emulation Type' dialog box, select (CL) [OK]. Selecting (CL) [Cancel] returns you to step 9-1.



9-2. <Defining of Customized Volume Size (CVS)>

(1) Select (CL) a parity group for which the LDEV emulation type and the number of LDEVs have been set on the "Device Emulation Configuration" screen and select (CL) [Detail...].
This procedure is terminated by selecting (CL) [Cancel].



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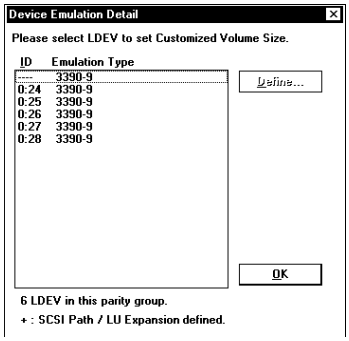
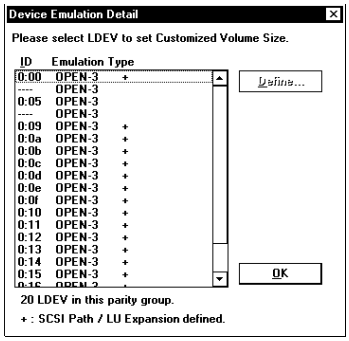
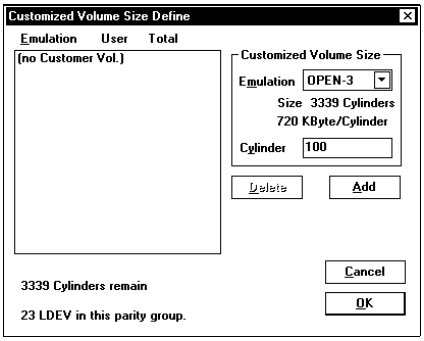
(2) Select (CL) an LDEV for which the CVS is to be set on the "Device Emulation Detail" screen and press (CL) the [Define...] button.
Selecting (CL) [Cancel] returns you to the previous screen.

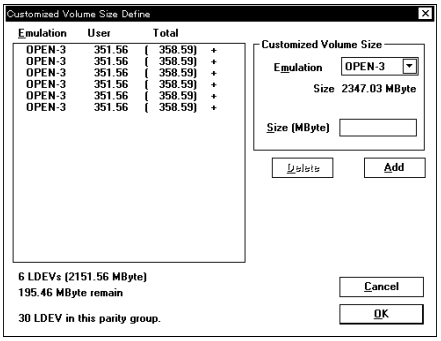


Note : Meaning of "+" character
1) Volume with SCSI path.
2) LU expanded volume.



(3) Enter the LDEV emulation type of a customized volume(CV) to be registered and the number of user cylinders (in the case of Mainframe system. Refer to the upper screen) or the size (Mbyte) (in the case of open system. Refer to the lower screen) on the "Customized Volume Size Define" screen, then press (CL) the [Add] button to add them.





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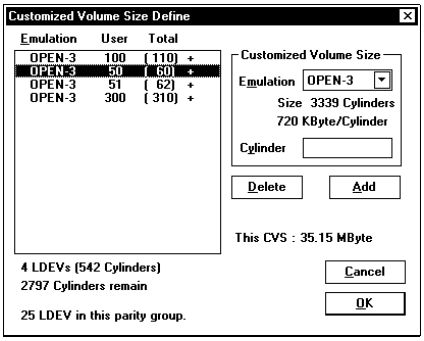
(4) The CV registered by mistake can be deleted by selecting it from the list box and pressing (CL) the [Delete] button.
Note: One or more CV can be selected.



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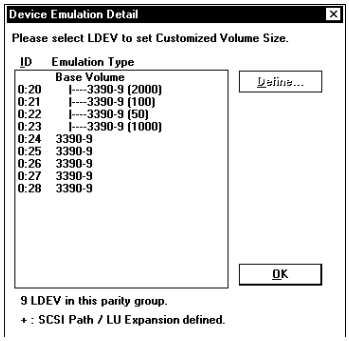
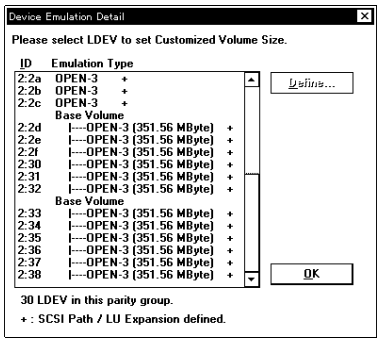
(5) When the setting is decided, press (CL) the [OK] button to return the screen to the “Device Emulation Detail” screen. The added CV is displayed.



(In the case of Mainframe system)

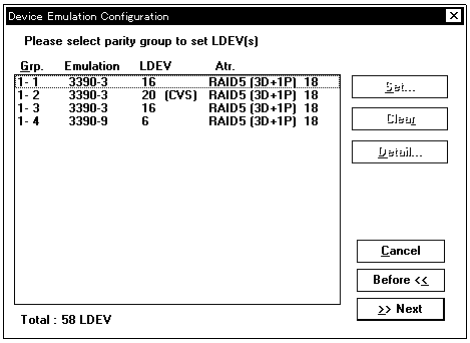


(In the case of open system)

(6) To add a CV to the base volume for which CV(s) has been defined, select (CL) Base Volume in the list box on the “Device Emulation Detail” screen and define the CV.

9-3.

In case of deletion:
Select (CL) device and select (CL) [Clear].
This procedure is terminated by selecting (CL) [Cancel].



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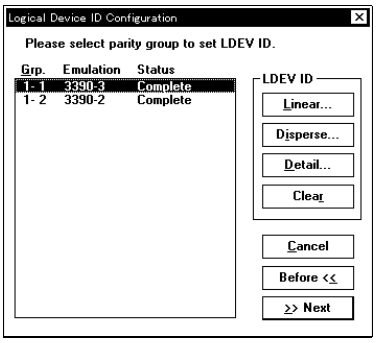
10. <Define LDEV ID>

After setting up all items, select (CL) [>>Next]. Selecting (CL) [Before<<] returns you to the previous screen. (Refer to INST05-181)

10-1. <Definition Screen for LDEV ID>

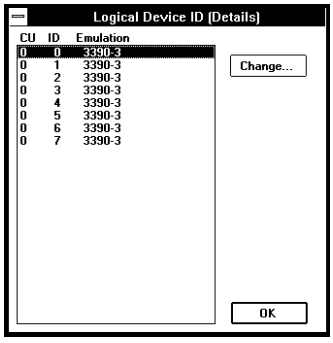


Select (CL) the parity group to be defined and select (CL) a function from [LDEV ID] list box.
[Linear...]: LDEV ID is assigned to LDEV in the order of parity group. See step 10-3.
[Disperse...]: LDEV is assigned discretely in the order of parity group. See step 10-3.
[Detail...]: A screen to define LDEV in detail is displayed. See step 10-2.

- '-----' is displayed in CU area and ID area for the parity group to which LDEV ID is not assigned.
- 'xxxxx' is displayed in ID area for the parity group to which any LDEV ID is not assigned.

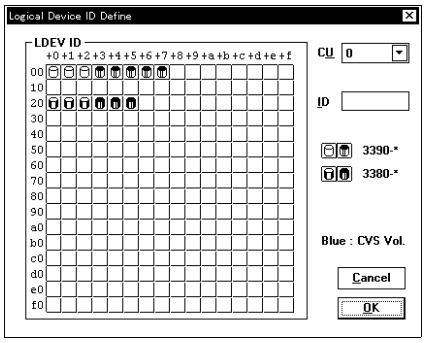
This procedure is terminated by selecting (CL) [Cancel].

10-2. <Detailed Definition Screen for LDEV ID>



LDEV ID is defined in detail for each LDEV in the parity group. Select (CL) [LEDV] from the list box and select (CL) [Change...]. The screen for LDEV ID input is displayed.

10-3. <Input LDEV ID>



Select CU ID in CU combo box.
The status of usage of ID in the CU is displayed in the LDEV ID panel.

White disk of panel: not used
Black disk of panel: using

Input LDEV ID you want to set or head LDEV ID in the ID Edit box.
After setting, select (CL) [OK]. Return to step 10.

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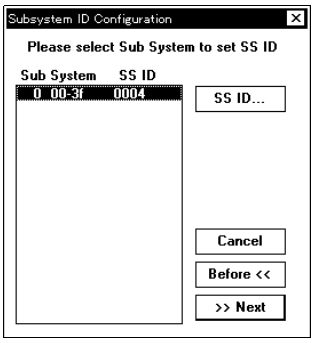
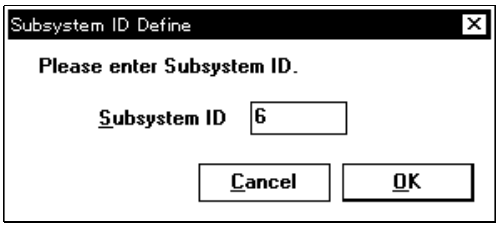
11. <Define Subsystem ID>

To define Subsystem ID, select (CL) [SSID].
After setting, select (CL) [>>Next].
This procedure is terminated by selecting (CL) [Cancel].



11-1.

Define Subsystem ID and select (CL) [OK].
Return to step 11.



12. <Defining DCR>

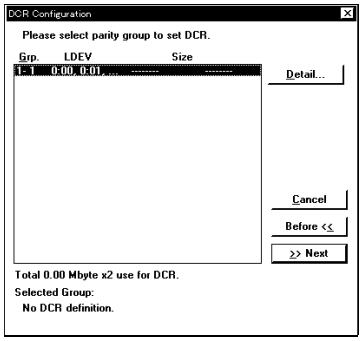
(1) Select (CL) a parity group having LDEV(s) for which the DCR is to be set on the "DCR Configuration" screen and press (CL) the [Detail...] button.

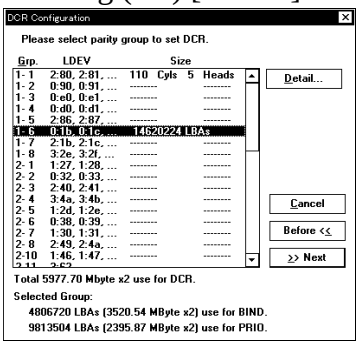
Total cache memory size which DCR area use is displayed.

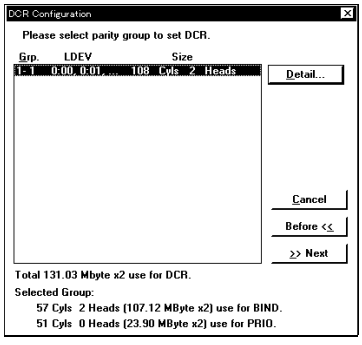
If parity group which selected have a DCR area, BIND size and PRIO size is displayed under "DCR Configuration" screen.

After setting, select (CL) [>>Next].

This procedure is terminated by selecting (CL) [Cancel].







(In the case of open system) (In the case of Mainframe system)

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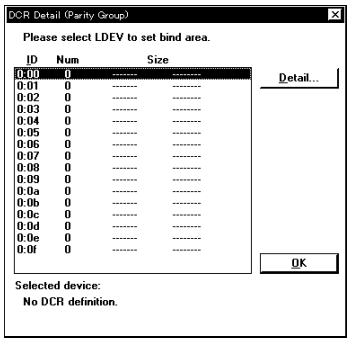
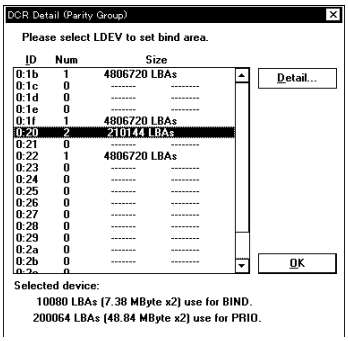
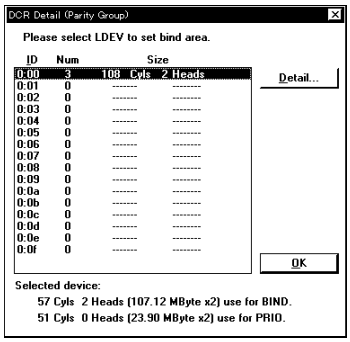
(2) Select (CL) an LDEV for which the DCR is to be set on the "DCR Detail (Parity Group)" screen and press (CL) the [Detail...] button.

If LDEV which selected have a DCR area, BIND size and PRIO size is displayed under "DCR Detail (Parity Group)" screen.

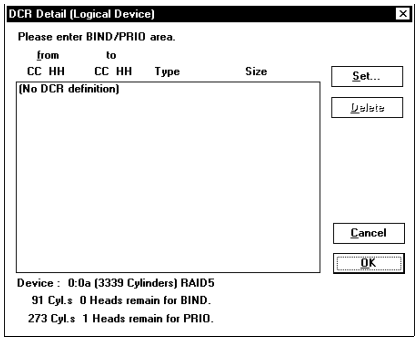




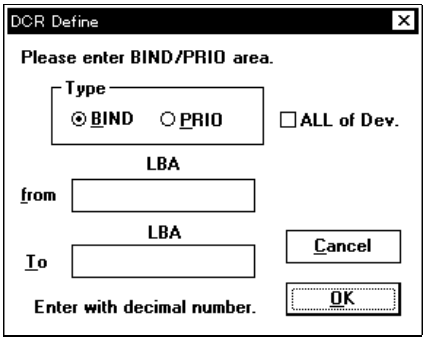


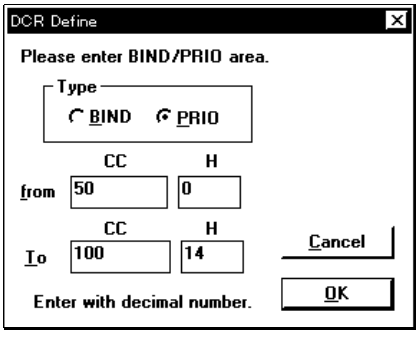
(In the case of open system) (In the case of Mainframe system)

(3) Confirm the LDEV size and the number of slots allowed to be set for each type on the "DCR Detail (Logical Device)" screen. Press (CL) the [Set...] button to set the DCR area.



(4) Enter the type, starting cylinder number, starting head number, ending cylinder number, and ending head number (in the case of Mainframe system. Refer to the screen on the right.) or the tyepe, starting LBA, and ending LBA (in the case of open system. Refer to the screen on the left.) on the "DCR Define" screen and select (CL) [OK].
In the case of open system, all items are allowed to be set.





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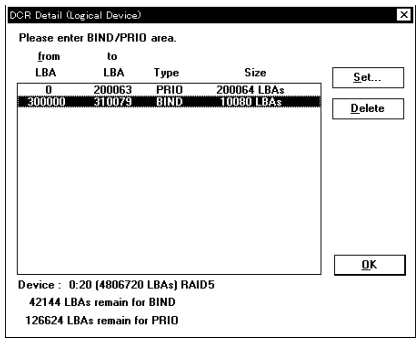
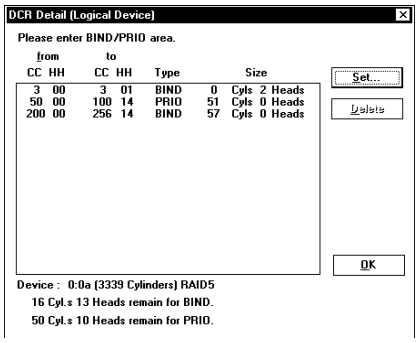
(5) When the screen is returned to the “DCR Detail (Logical Device)” screen, the entrance result is displayed.

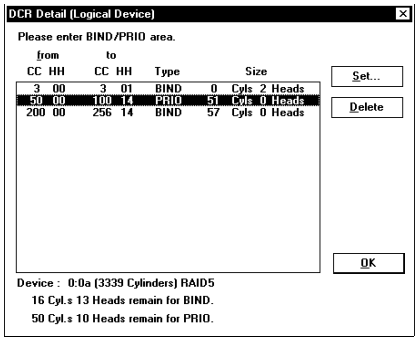


(In the case of open system)



(In the case of Mainframe system)

(6) When an item in the list box is selected (CL) and the [Delete] button is pressed (CL) on the “DCR Detail (Logical Device)” screen, the DCR setting is deleted. When the setting is completed, press (CL) the [OK] button.



(7) If you want to set other LDEV(s) in parity group which you selected, repeat steps (2) to (6) for the LDEV(s).

(8) If you want to set other LDEV(s) in other parity group, repeat steps (1) to (6) for the LDEV(s).

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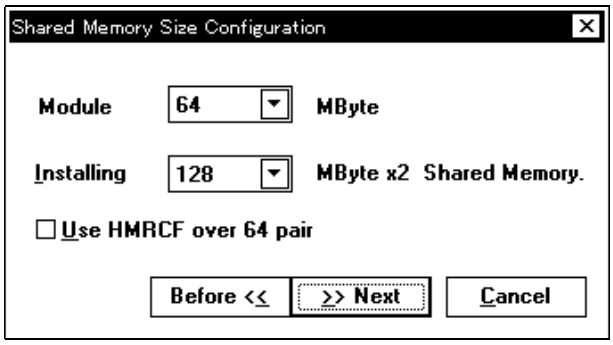
13. <Define Shared Memory Size>

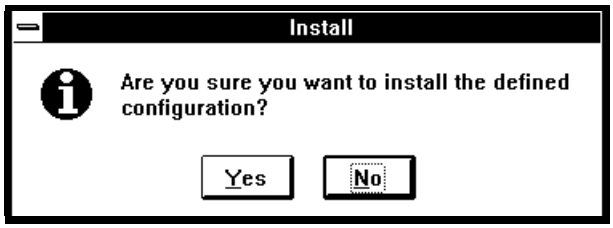
Define the shared memory size in the 'Shared Memory Size Configuration' dialog box.
Select (CL) [>>Next].
This procedure is terminated by selecting (CL) [Cancel].

When 64 or more pairs of HMRCF are used, please check the check box.
If SCSI path information is defined, go to INST05-591.

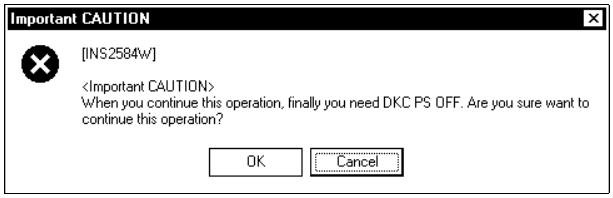


14. <Include configuration information>

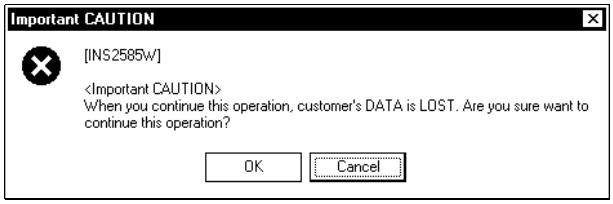
(1) Select (CL) [Yes] in response to the confirmation message "Are you sure you want to install the defined configuration?".
"Wait..." is displayed, then "Turn off DKC subsystem" is displayed.
Selecting (CL) [No] suppresses the configuration inclusion processing and terminates the installation procedure.



(2) Select (CL) [OK] in response to the confirmation message
"<Important CAUTION>
When you continue this operation, finally you need DKC PS OFF. Are you sure want to continue this operation?".



(3) Select (CL) [OK] in response to the confirmation message
"<Important CAUTION>
When you continue this operation, customer's DATA is LOST. Are you sure want to continue this operation?".



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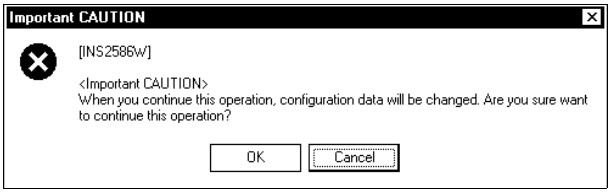
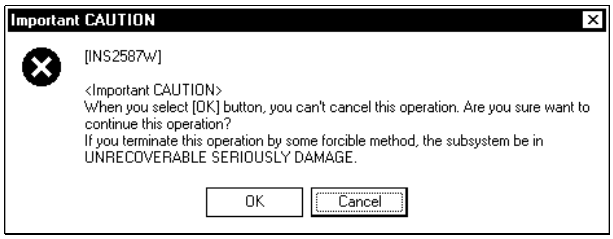
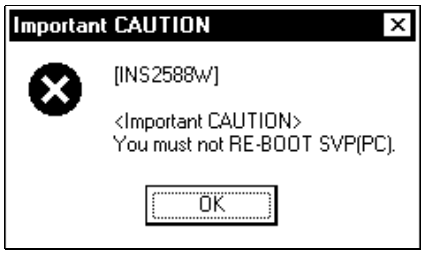
(4) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you continue this operation, configuration data will be changed. Are you sure want to continue this operation?".



(5) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you select [OK] button, you can't cancel this operation. Are you sure want to continue this operation?
If you terminate this operation by some forcible method, the subsystem be in UNRECOVERABLE SERIOUSLY DAMAGE.".

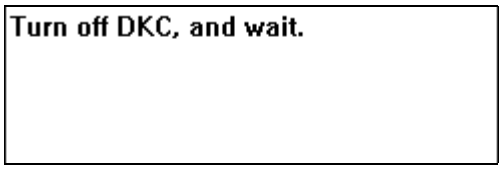


(6) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
You must not RE-BOOT SVP(PC).".



15. <Power off DKC P/S>
Make sure that "Turn off DKC, and wait." is displayed and perform the power-off procedure from the DKC maintenance panel.

After a while "Wait..." is displayed.



16.
This step causes the contents of the SVP HD to be loaded into SM and FM.
When this procedure is completed, message "Please insert config FD in FDD." is displayed.

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17.

Insert the configuration FD into FDD, select (CL) [OK].

18.

When this procedure is completed, message "Backup is done. Remove FD." is displayed. Remove the FD, select (CL) [OK].

19.

After making sure that DKC power is turned off, select (CL) [OK] in response to "Installation was finished.".
Select (CL) [OK] in response to "Please reboot PC.".
The initial Install screen is restored.

Note: SVP power will not turn off or reboot even when DKC is powered off.

20.

Close 'Install'.
Go to INST02-12 step (20)-2.

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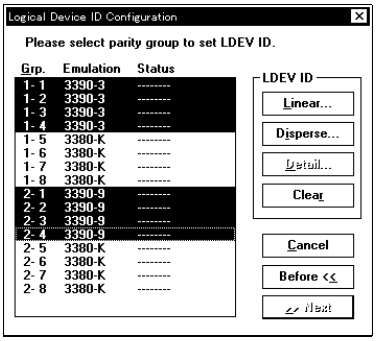
5.2.2.1 LDEV ID setting procedure when the emulation types of different systems coexist

5.2.2.1.1 Coexistence in units of parity group

The LDEV ID setting procedure is explained using an example of a case in which both the 3390 system LDEV and 3380 system LDEV are set in the same subsystem. This example shows the ID setting procedure when the B4-1/B4-2 is fully equipped with RAID5 (3D+1P), and the B4-1 and the B4-2 are defined as the 3390-3/3380-K and the 3390-9/3380-K respectively. Since systems other than the 3390 system and the 3390-3R cannot coexist in the parity group, the ID can be defined in this procedure.

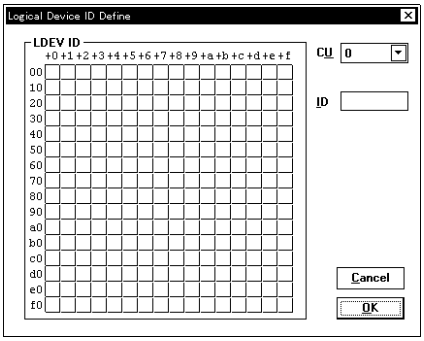
1.

Select only the parity group for which the 3390 system emulation type has been defined.



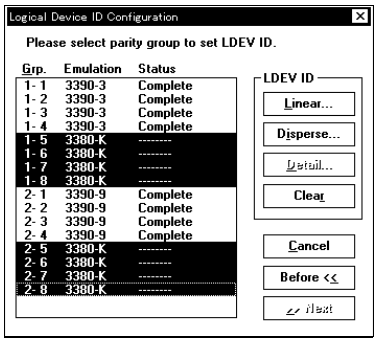
2.

Press the Linear or Disperse button to open the LDEV ID input screen and input the LDEV ID. (In the example, the Disperse button is pressed.)



3.

Next, select only the parity group for which the 3380 system emulation type has been set.



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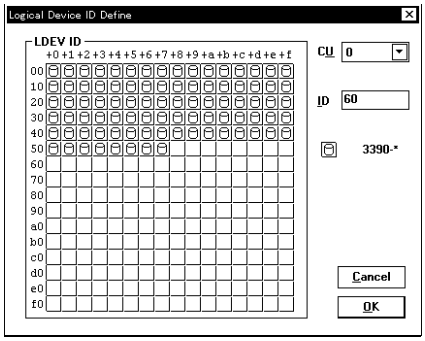
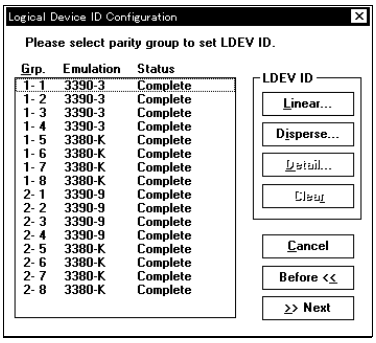
4.

Press the Linear or Disperse button to open the LDEV ID input screen and input the LDEV ID. In this case, take care not to make a coexistence occur in the block. In the example, 0:60 and the subsequent are unused blocks. Therefore, input 60.



5.

Setting is completed.



Needless to say, the setting sequence of steps (1) and (3) may reversed.
If emulation types of different systems are selected at the same time, the guarding function works to prevent the setting by making the Linear and Dispense buttons unselectable.

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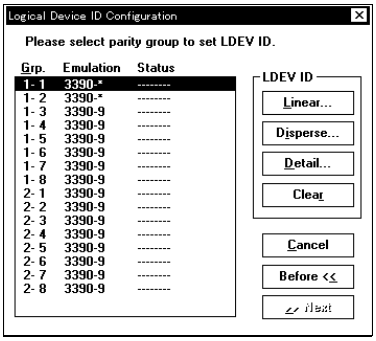
5.2.2.1.2 Coexistence in a parity group

The 3390-3R can be set as a CV in the 3390 system parity group. The 3390 system LDEV can also be set as a CV in the 3390-3R parity group. If the ID is set in the procedure explained in Section 3.1 when this emulation setting has been performed, an intra-block coexistence setting violation occurs. To prevent the coexistence violation, set the ID following the procedure below.

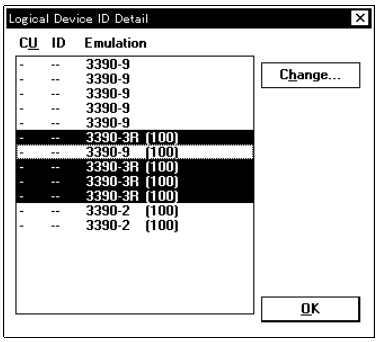
1.

For the parity group for which definitions of the 3390 system and 3390-3R coexist, the emulation type is displayed as "3390-*". Select one parity group defining the 3390-3R as the CV and press the Detail button to open the screen displaying the LDEV definition detail in the parity group.



2.

Select the 3390-3R on the detail screen and define the LDEV ID.

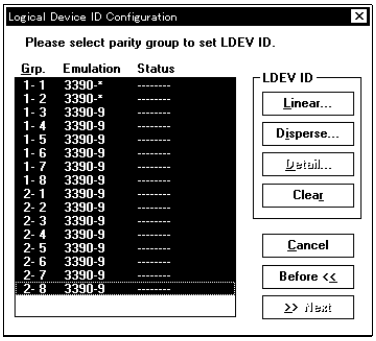


3.

Repeat (1) and (2) until the definition of the 3390-3R LDEV ID is finished. In the example, the 3390-3R is assigned to IDs starting from ID 0:80.

4.

When the definition of the 3390-3R is completed, select the parity group defining emulation type of the same system and define the LDEV ID in the same way as that Section 3.1.



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5.2.3 Check Procedure

NOTICE
This operation is necessary only when a subsystem is newly installed. It is not performed afterward. If it is performed by mistake, a system down or a data loss may be caused.

1. <Execute Power-on CUDG>
   Perform the power-on procedure from the DKC maintenance panel.
   (See INST03-2300)
   Power-on CUDG is automatically executed on the DKC logic circuitry.
   If an error occurs, SIM Log, SSB Log has logging.
   (See SVP02-30)

2. <Execute DKU Path inline test>
   Perform DKU Path inline tests on all DKAs installed during the new installation procedure to check the validity of the drives.
   See DIAGNOSIS SECTION for the test procedure. (DIAG04-180)

   Note: Before carrying out the DKU Path inline test, switch the current application to the program manager and have the SVP initial screen (which is shown in the right figure) displayed.

3. <Check subsystem status and all MPs micro-version>

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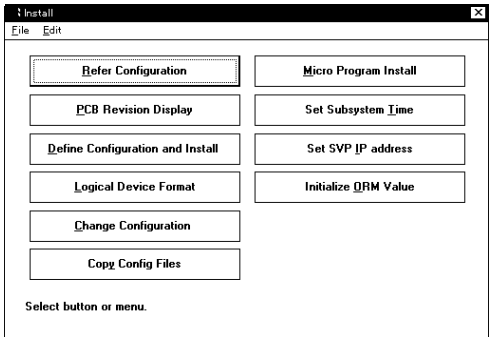
NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if executed in an occasion other the new subsystem installation, and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

4. <Format L-DEV>

(1) Change the mode to INITIAL SETUP Mode.
Select "Shift" + "Ctrl" + "I".
Enter the password and select (CL) [OK].
Please call Technical Support Center for asking it.
Select (CL) [Install].

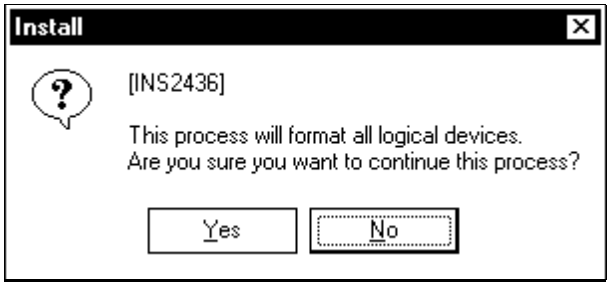
(2) Select (CL) [Logical Device Format].

Note: Execute Format Logical Device after confirming all Logical Device is blocked.



4.1.

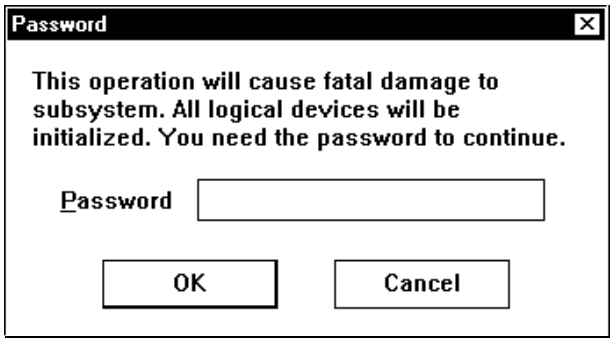
Select (CL) [Yes] in response to "This process will format all logical devices. Are you sure you want to continue this process?"



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if executed in an occasion other the new subsystem installation, and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

4.2.

Enter the password and select [OK] (CL).
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.



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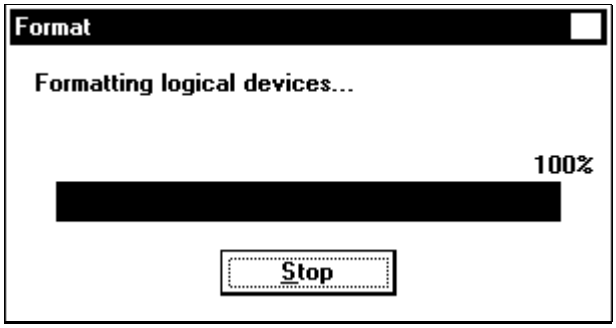
4.3.

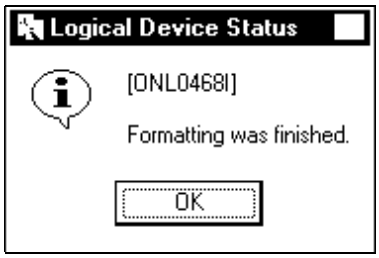
When L-DEV Formatting is complete, 'Formatting logical devices...' shown in the right figure disappears and "Formatting was finished." is displayed.



4.4.

Select (CL) [OK] in response to "Formatting was finished.".

L-DEV formatting is abnormally terminated if the message "Formatting logical devices rejected by DKC." or "Formatting the logical device is failed." is displayed.
Identify the error cause according to the procedure shown in "Section 6 TROUBLE SHOOTING" .



4.5. <Check logical device status>

Check normality of Logical Devices with referring 'Logical Device Status' display.

5. <Check subsystem status>

Check normality of all parts with referring 'Maintenance'.

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6. <Check system interlock operation>
   Start the test program from the host to check for normal subsystem's interlocked operation with the host.

7. <Delete error log>
   Power cycle the subsystem to make sure that the subsystem starts normally (neither ALARM nor MESSAGE indicators should light).

   Delete all error log information from the SVP and transfer the subsystem to the user. See page SVP02-150.

   Go to INST02-12 step (END).

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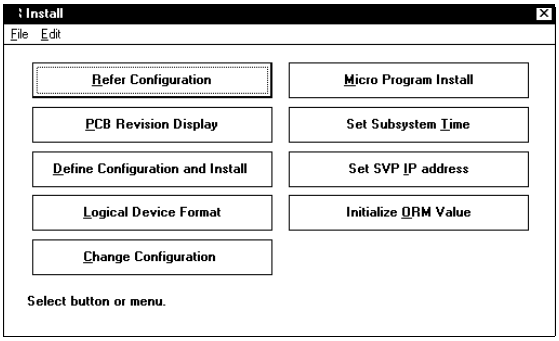
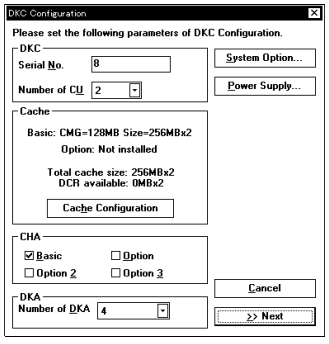
5.2.4 Refer Configuration

1. <Start [Install]>
   Select (CL) [Install] from ‘SVP’.

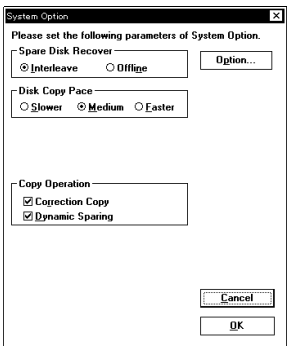
2.
   Select (CL) [Refer Configuration].



3. <DKC configuration information>
   When you select (CL) [>>Next], ‘Host Interface Configuration’ is automatically displayed.
   This procedure finishes when you select (CL) [Cancel].
   If [System Options...] is selected (CL), ‘System Option’ is automatically displayed.
   If [Power Supply...] is selected (CL), ‘Redundant Power Supply’ is automatically displayed.



4.
   Selecting (CL) [OK] returns the screen to step 3.



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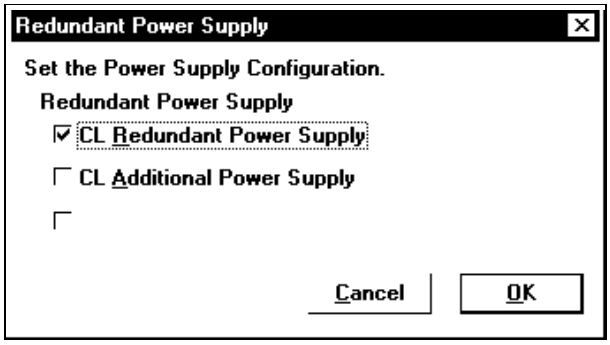
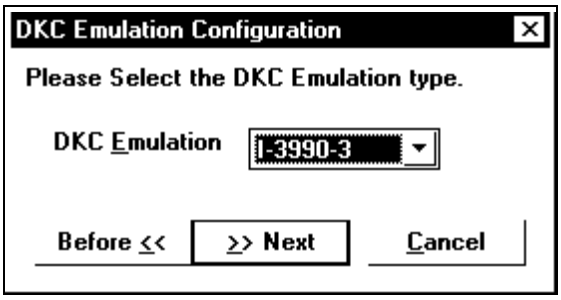
5.

Selecting (CL) [OK] returns the screen to step 3.

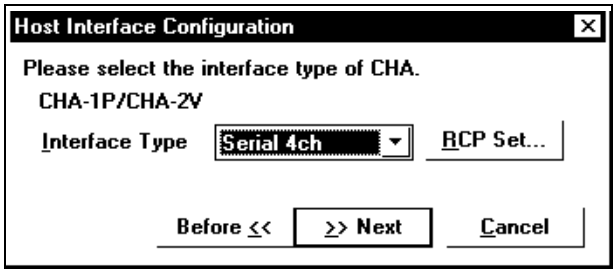


6. <Set DKC Emulation>
DKC Emulation type is displayed.
Select (CL) [>>Next].

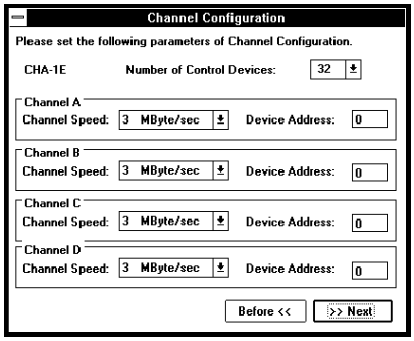


7.

When you select (CL) [Parallel 4ch] from this screen, the next 'Channel Configuration' is displayed. This procedure finishes when you select another item.
The [RCP Set...] button is enabled. Selecting (CL) [RCP Set...] skip the screen to step 9.
Processing skip to step 10 if you select another item.
Selecting (CL) [Before <<] returns the screen to step 3.



8. <Set Parallel CH>
This procedure finishes when you select (CL) [>> Next].
Go to step 10.
Selecting (CL) [Before <<] returns the screen to step 7.



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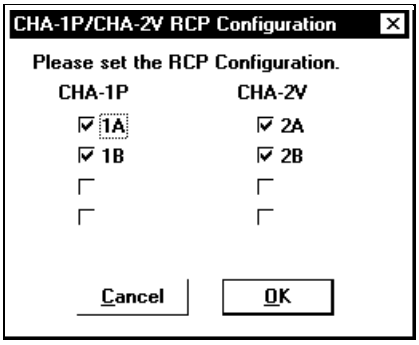
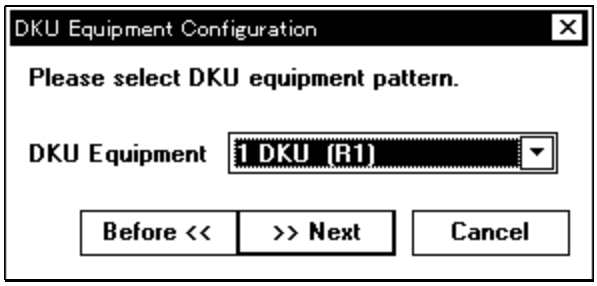
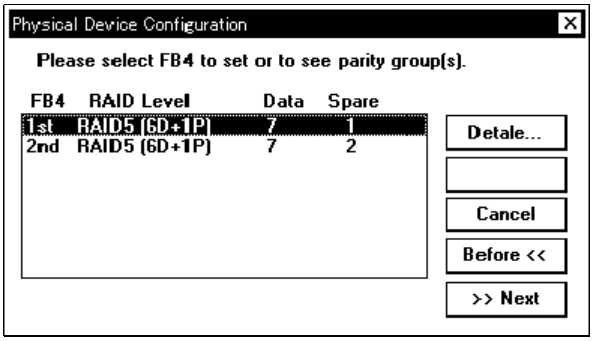
9. <Set RCP port>
RCP port setting is displayed.
Then by selecting (CL) [OK] returns the screen to step 7.



10. <Set DKU Equipment>
DKU Equipment pattern is displayed.
Select (CL) [>> Next].
This procedure is terminated by selecting (CL) [Cancel].



11. <Set Physical Device>
Physical device configuration is displayed.
Select (CL) the FB4 and select (CL) [Detail...].
Go to 11-1
Select (CL) [>> Next].
This procedure is terminated by selecting (CL) [Cancel].



FB4	Location
1st	HDU-R10, 11, 12, 13
2nd	HDU-R14, 15, 16, 17
3rd	HDU-L10, 11, 12, 13
4th	HDU-L14, 15, 16, 17
5th	HDU-R20, 21, 22, 23
6th	HDU-R24, 25, 26, 27
7th	HDU-L20, 21, 22, 23
8th	HDU-L24, 25, 26, 27

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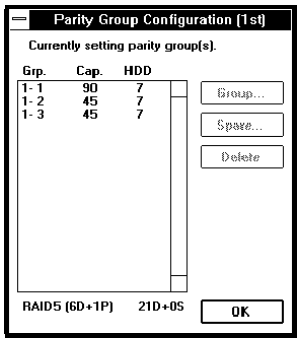
11-1.

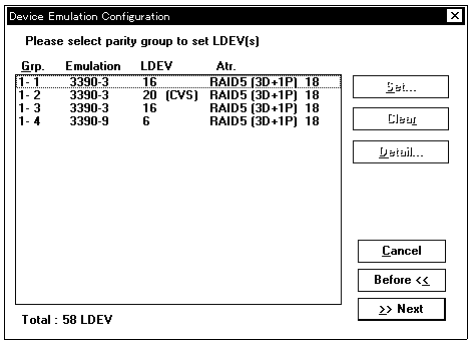
Parity Group Configuration is displayed.
Select (CL) [OK]. Return to step 11



12. <Set Device Emulation>

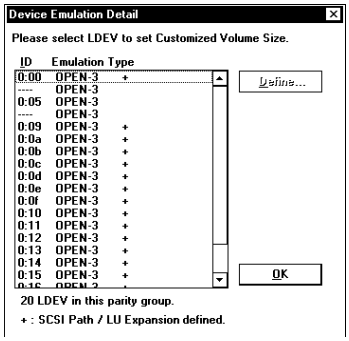
Device Emulation Configuration is displayed.
Select (CL) parity group and select (CL) [Detail...].
Select (CL) [>> Next] .
This procedure is terminated by selecting (CL) [Cancel].

(CVS): The parity group which CVS is installed.



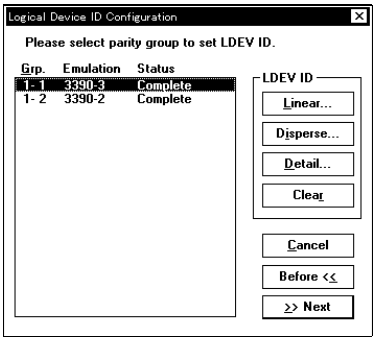
12-1.

Device Emulation Detail is displayed.
Select (CL) [OK]. Return to step 12.



13. <Set Logical Device ID>

Logical Device ID Configuration is displayed.
Select (CL) parity group and select (CL) [Detail...].
Select (CL) [>> Next].
This procedure is terminated by selecting (CL) [Cancel].



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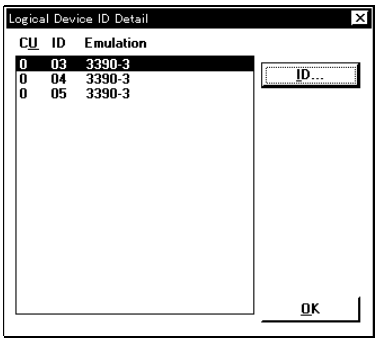
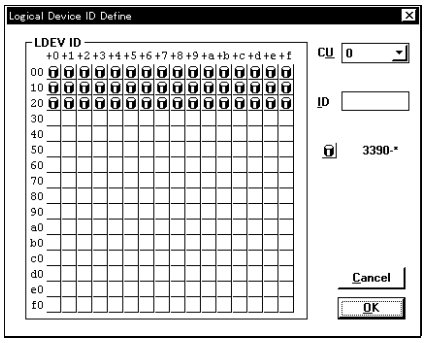
13-1.

Logical Device ID Detail is displayed.
Select (CL) [ID...].
Select (CL) [OK]. Return to step 13.



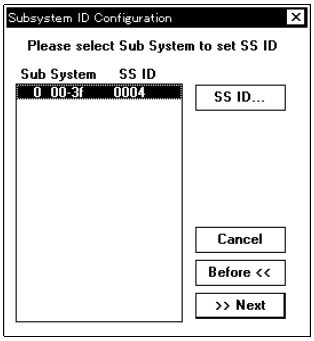
13-2.

Logical Device ID allocation is displayed.
Select (CL) [OK] or [Cancel]. Return to step 13-1.



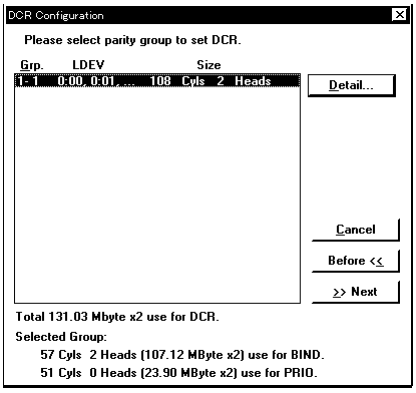
14. <Set Subsystem ID>

Subsystem ID Configuration is displayed.
Select (CL) [>> Next].
This procedure is terminated by selecting (CL) [Cancel].



15. <Set DCR>

DCR Configuration is displayed.
Select (CL) parity group and select (CL) [Detail...]. Go to step 15-1.
Select (CL) [>> Next].
This procedure is terminated by selecting (CL) [Cancel].



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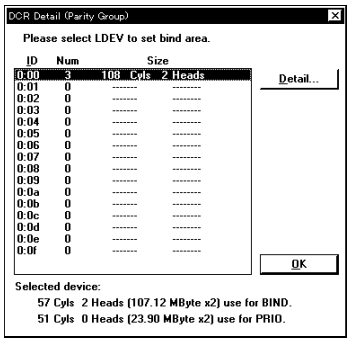
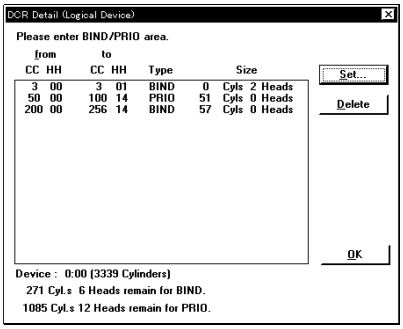
15-1.

DCR detail (Parity group) is displayed.
Select (CL) LDEV and select [Detail...]. Go to step 15-2
Select (CL) [OK] . Return to step 15.



15-2.

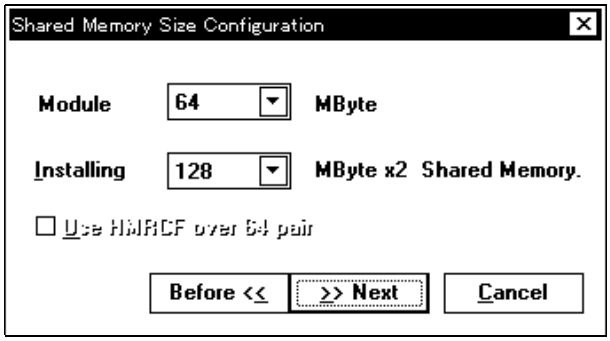
DCR detail (Logical device) is displayed.
Select (CL) [OK]. Return to step 15-1.



16. <Set Shared Memory Size >

Shared Memory Size Configuration is displayed.
Select (CL) [>> Next].
This procedure is terminated by selecting (CL) [Cancel].

If SCSI path information is defined, go to INST05-591.



17.

Select (CL) [OK].
Close the 'Install' window.

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5.3 Installation and De-installation SVP procedure

(Note) If you fail to install (or de-install), take back-up file of configuration by executing "Create Configuration Backup" (go to MICRO-FC08-10).

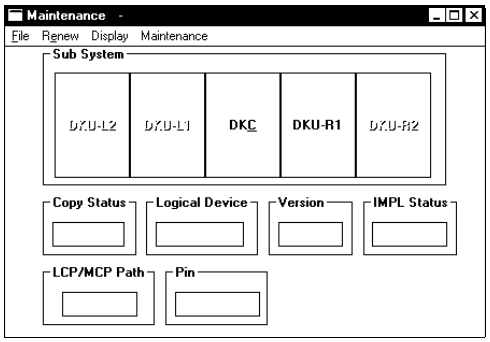
5.3.1 SCSI Cable Connection (Disconnection) Procedures

When installing or de-installing DKU-F305I-B4 options on or from the 2nd and 4th frames, it becomes necessary to connect (or disconnect) SCSI cables between the frames. In this case, it is necessary to temporarily maintenance-block the target DKA. The maintenance block procedure is shown below. If there is no need to install (or de-install) DKU-F305I-B4 options on or from the 2nd and 4th frames, skip to the following step 5.3.2 Setting up the New Device Structure Information on page INST05-320.

1. <Operation mode change]>
   Change the mode to [Modify Mode].

2.
   Select (CL) [Maintenance] from 'SVP'.

3. <'Maintenance' window >
   'Maintenance' window is displayed.



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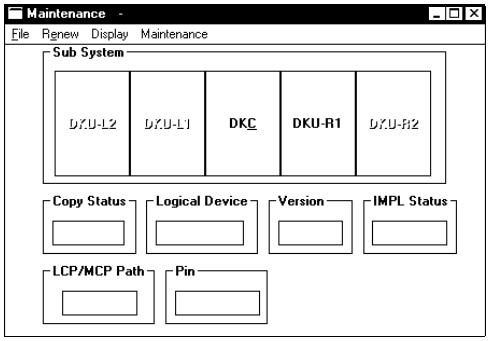
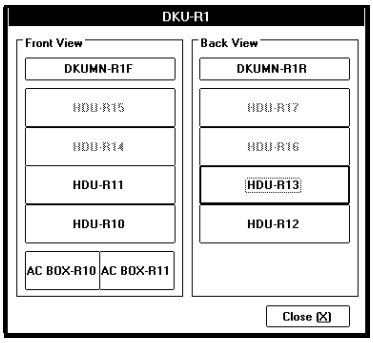
4. <Maintenance>
In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.

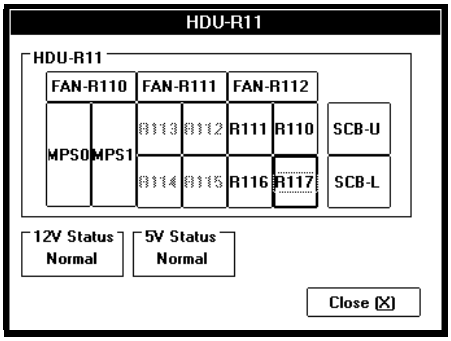


5. <Select HDU-BOX>
Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
Selecting (CL) [Close] returns you to step 5

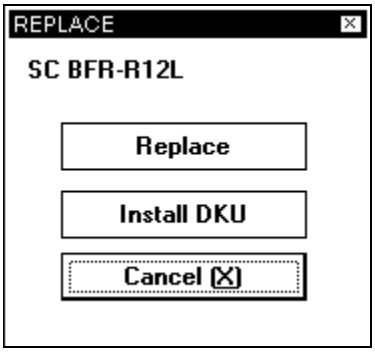
Make sure that all status values on the screen are not flashing. If there is any error, correction of that error must take precedence.
See page TRBL03-20.



6. <Select SCSI Buffer>
Select (CL) [SCB-U] or [SCB-L] to be replaced.
Selecting (CL) [Close] returns you to step 5.



7. <Specify Replacement>
(1) When DKU is installed, select (CL) [Install DKU].
Selecting (CL) [Cancel] returns you to step 6.



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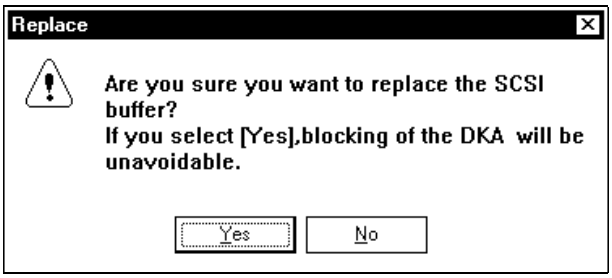
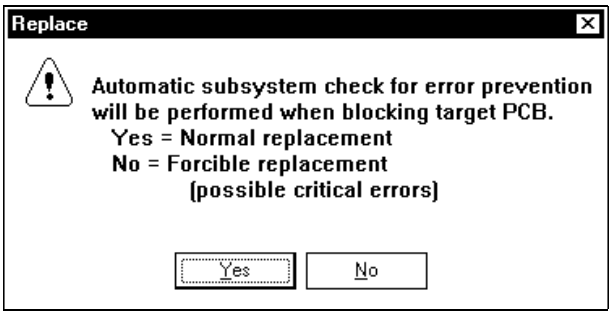
8.

In response to “Are you sure you want to replace the SCSI buffer? If you select [Yes], blocking of the DKA will be unavoidable.”, make sure that the selected DKA is correct and select (CL) [Yes]. If the DKA proves to be incorrect, select (CL) [No] and restart the procedure at step 6.



9.

Select (CL) [Yes] in response to “Automatic subsystem check for error prevention will be performed when blocking target PCB.
Yes = Normal replacement
No = Forcible replacement
(Possible critical errors)”



10.

“The DKA is being blocked...” is displayed.

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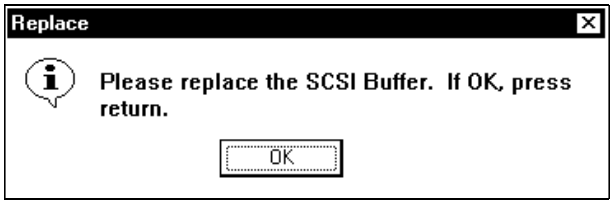
11.

The corresponding SCSI-BUFF shut down LEDs turn on. Perform the SCSI cable hardware procedure.

Hardware	Cluster No.	Flowchart Page
Connection	Cluster 1	INST02-56 step 3
	Cluster 2	INST02-57 step 5
Disconnection	Cluster 1	INST02-58 step 2
	Cluster 2	INST02-58 step 4

12. <Replace SCSI Buffer>

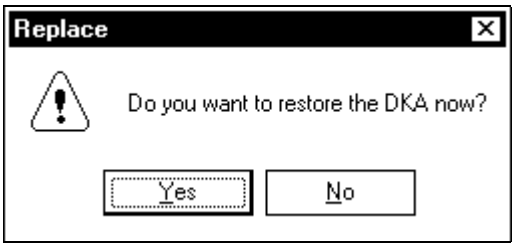
Remove SCSI BUF PCB, and insert it to turn off shut down LED (It is not necessary to replace SCSI BUF PCB.).
(see REP03-260)
Select (CL) [OK] in response to "Please replace the SCSI Buffer. If OK, press return.".



If the SCSI Buffer LED is not turn on, please remove SCSI BUF PCB, and insert it.

13.

"Do you want to restore the DKA now?" is displayed. Select (CL) [Yes].



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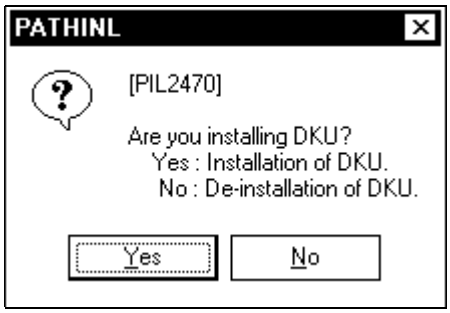
14.

"DKA PATH INLINE is now running..." is displayed.

15.

"Are you installing DKU?" is displayed.
In case of installation for the 2nd or 4th DKU, select (CL) [Yes].
In case of except installation for the 2nd or 4th DKU, select (CL) [No].



16.

"Restoring the DKA..." is displayed.

17.

Blank

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18.

"Replace finished." is displayed.
Select (CL) [OK].

19.

Blank

20. <Connect (disconnect) Corresponding SCSI cables on other cluster>
Perform steps 7 to 19 on the corresponding path. After completing all SCSI cable connection (disconnection) steps, close 'Maintenance'.

21. <Check that no other parts are affected by this procedure>
If there is any error, correct the error. Be sure and renew status first.
See page TRBL03-20.

If there is no influence imposed on the other parts, go to the pages listed in the table below.

Hardware	Flowchart Page
Installation	INST02-57 step 7
De-installation	INST02-59 step 6

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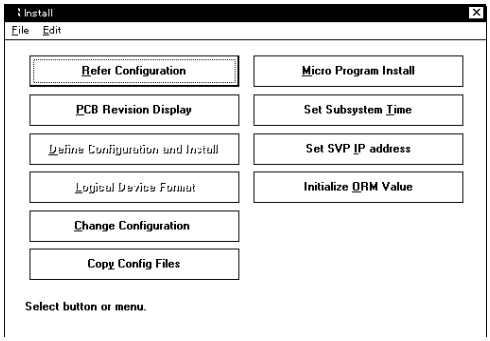
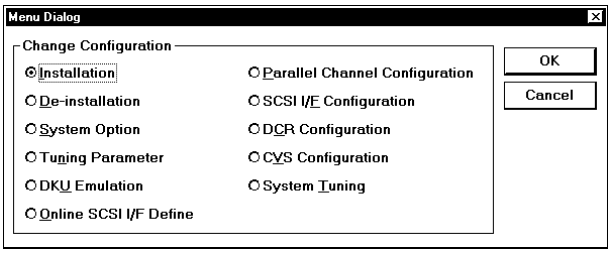
5.3.2 Setting up the New Device Structure Information

1. <Mode Change>
   Change the mode to Modify Mode.
   Select (CL) [Install].

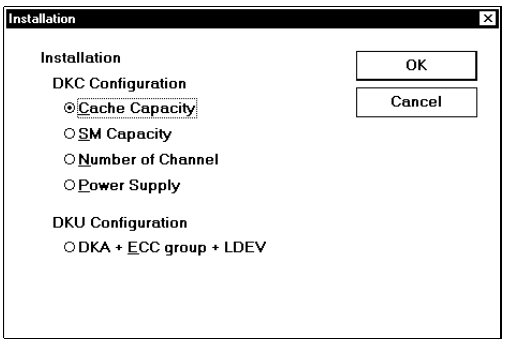
2. <Start 'Menu Dialog' screen>
   Select (CL) [Change Configuration].



3. <Start Device Structure Setup screen>
   Select (CL) the item in the 'Menu Dialog' dialog box and select (CL) [OK].
   Except for the case of installation and de-installation, go to INST05-340.



4. <Select a part to be changed>
   Select (CL) a part to be changed.
   When installation is selected on step 3, go to INST05-340.



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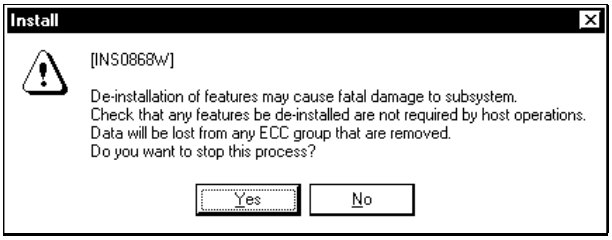
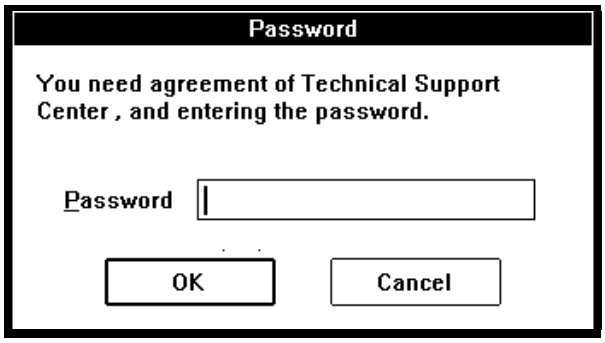
5.

Select (CL) [No] in response to “De-installation of features may cause fatal damage to subsystem. Check that any features be de-installed are not required by host operations. Data will be lost from any ECC group that are removed. Do you want to stop this process?”.



6. <Input password>
Enter the password and select (CL) [OK].



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

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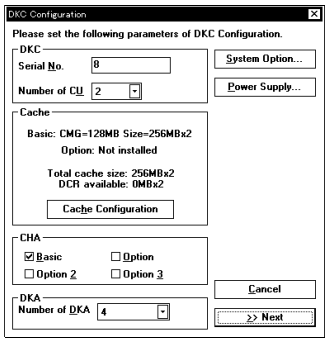
5.3.2.1 Install

1. Cache Capacity

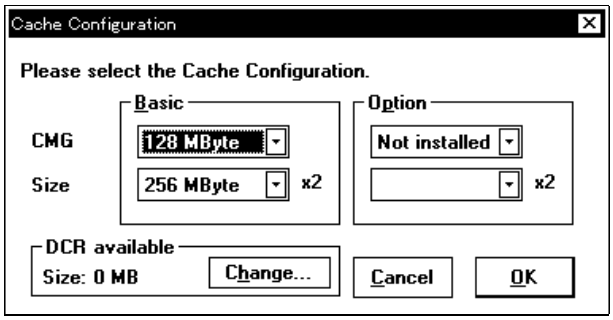
(1) <Update Configuration Information>
Select (CL) [Cache Configuration] in the 'DKC Configuration'.
(Go to step (2).)

Note: It is not possible to install or de-install plural parts at the same time.

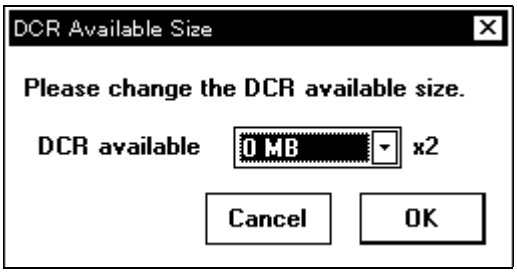
Make sure that all entered items are correct and select (CL) [>>Next].
Go to step (3).



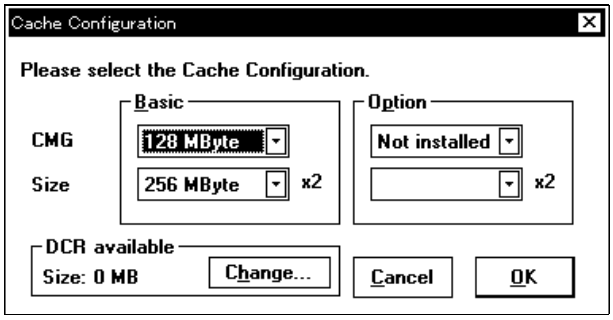
(2) <Define Cache>
Define each item in the 'Cache Configuration'.
If you want to change DCR available size, select (CL) [Change...] to change it.
(See SSD Optional Function Section)



(2-1) <Define DCR Available Size>
Define the DCR available size in the 'DCR Available Size' dialog box.
And select (CL) [OK].



(2-2)
After setting up all items, select (CL) [OK].
Return to step (1).



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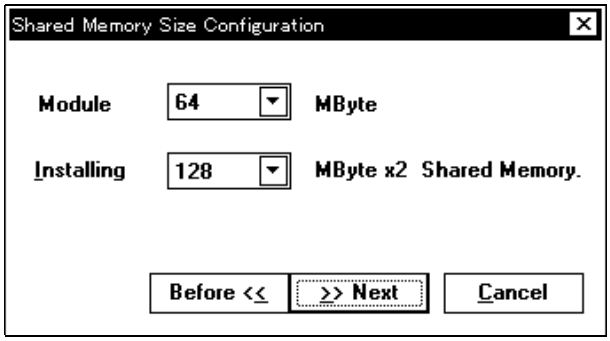
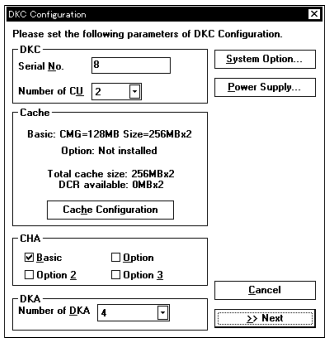
(3) <Display SM size>
'Shared Memory size Configuration' dialog box is displayed.
Select (CL) [>>Next].



2. Number of Channel

(1) <Update Configuration Information>
Enter the item to CHA in the 'DKC Configuration'.
Make sure that the entered item is correct and select (CL) [>>Next].



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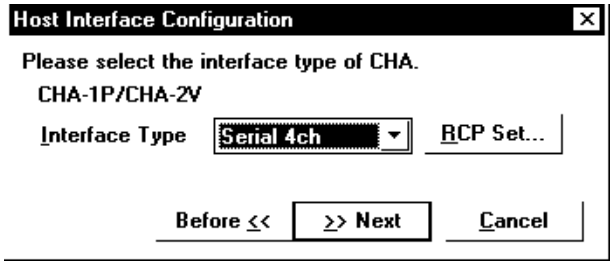
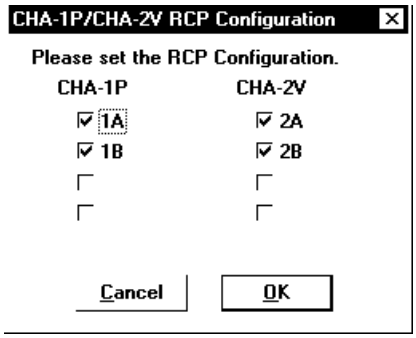
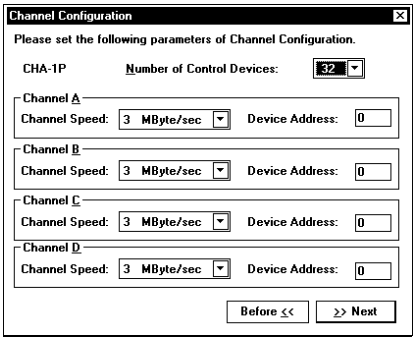
(2) <Defining channel type>
Input each item in the "Host Interface Configuration" window.
Repeat the operation above as many times as the number of channels installed.
When [Serial 2 ch] or [Serial 4 ch] is selected, select (CL) [RCP Set...] and go to step (3).
When [Parallel 4 ch] is selected, "Channel Configuration" is displayed. Go to step (4).
Verify that the inputted item is correct and select (CL) [>>Next].



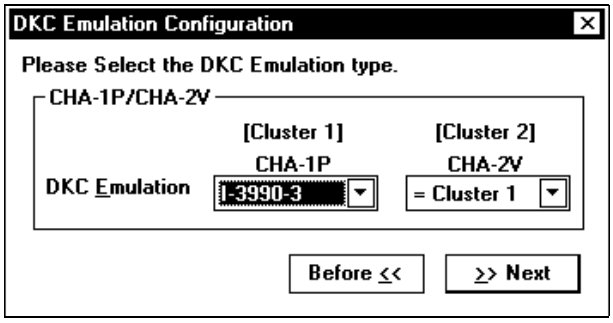
(3) <Defining RCP port>
Select (CL) the item defined as an RCP port and select (CL) [OK].
The routine returns to step (2).
When [Cancel] is selected (CL), the routine returns to step (2).



(4) <Defining parallel CH>
When all the items are set, select (CL) [>>Next].
(Repeat the operation above as many times as the number of channels installed.)



(5) <Defining DKC emulation type>
Define the DKC emulation type in the "DKC Emulation Configuration" window.
After the setting is completed, select (CL) [>>Next].



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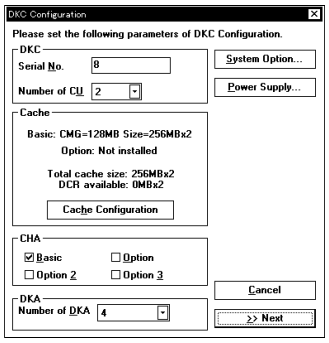
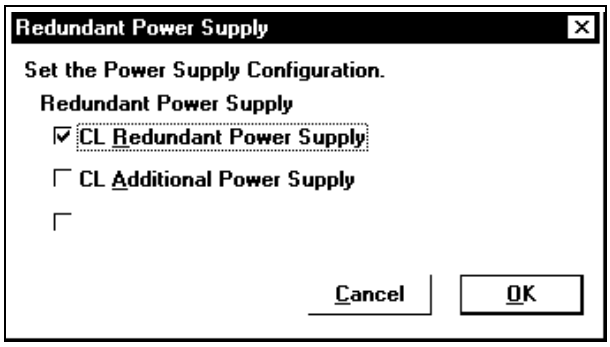
3. Redundant Power Supply

(1) <Update Configuration Information>
Select (CL) [Power Supply] in the 'DKC Configuration'.
Make sure that the entered item is correct and select (CL) [>>Next].



(2) <Define Redundant Power Supply>
Select (CL) redundant power supply to be added in the 'Redundant Power Supply'.
Select (CL) [OK]. Return to step (1).

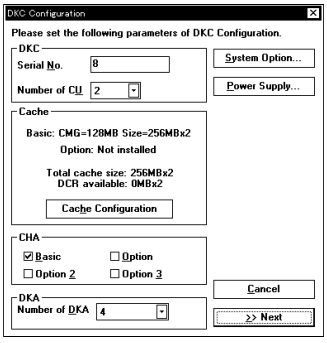
Note: If entered item is wrong, the part not to be installed or de-installed may be blocked.



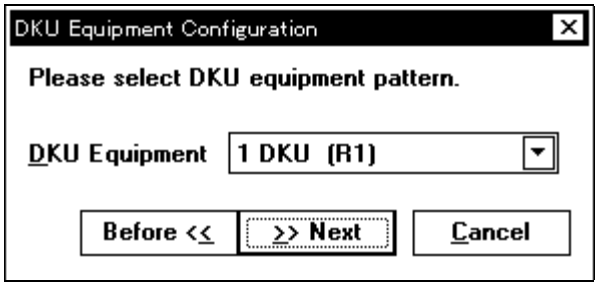
4. DKA + ECC group + LDEV

(1) <Update Configuration Information>
Define the number of CU in DKC and The number of DKA in the 'DKC Configuration'.

Make sure that the entered item is correct and select (CL) [>>Next].



(2) <Set DKU Equipment>
Define the DKU equipment pattern in the 'DKU Equipment'.
After setting up, select (CL) [>>Next].



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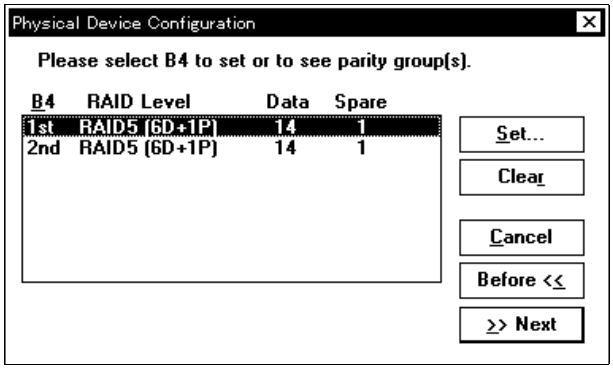
(3) <Change Drive Configuration Information>
Define drive configuration according to the 'Physical Device Configuration' screen displaying the mounted B4 based on the result of setting of DKU mount pattern.
Detailed procedure is shown below.

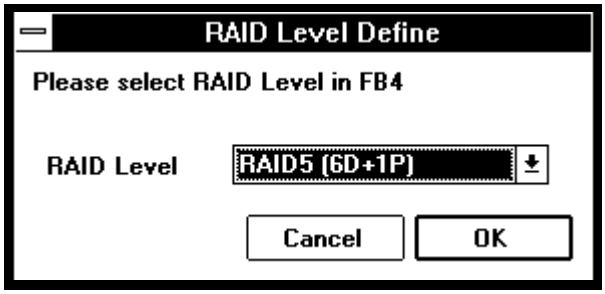
- Select (CL) the item and select (CL) [Set...]. Go to step (4) through (5).
- Selecting (CL) [Clear...] after selecting (CL) the item clears the B4 setting.

After setting up all items, select (CL) [>>Next].
Selecting (CL) [Before<<] returns you to the previous screen.



FB4	Location
1st	HDU-R10, 11, 12, 13
2nd	HDU-R14, 15, 16, 17
3rd	HDU-L10, 11, 12, 13
4th	HDU-L14, 15, 16, 17
5th	HDU-R20, 21, 22, 23
6th	HDU-R24, 25, 26, 27
7th	HDU-L20, 21, 22, 23
8th	HDU-L24, 25, 26, 27

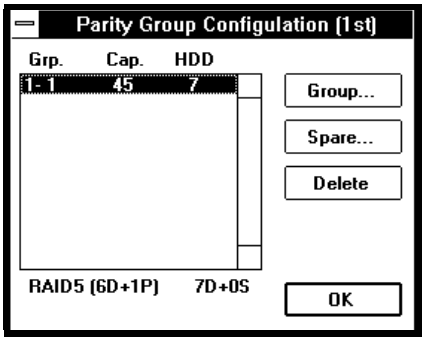
(4) <Define RAID level>
In case of this window is displayed, define RAID level of the B4 in the 'RAID Level Define'.
After setting up, select (CL) [OK].



(5) <Define Parity Group>

- To define Parity Group, select (CL) [Group...] in the 'Parity Group Configuration' dialog box. See step (6)-1.
- To define Spare, select (CL) [Spare...] in the 'Parity Group Configuration' dialog box. See step (6)-2.
- To delete an item, select an item to be deleted and select (CL) [Delete] in the 'Parity Group Configuration' dialog box.

After setting up all items, select (CL) [OK]. Return to step (3).



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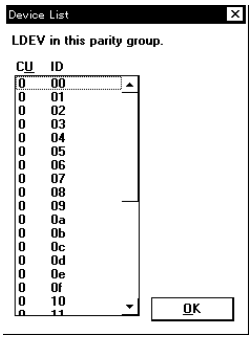
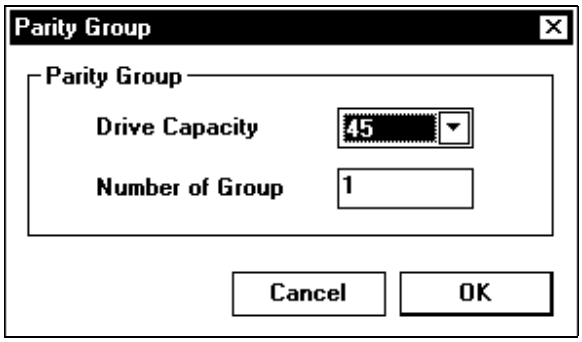
- To display LDEV ID in Parity group, select an item to be displayed and select (DC) this item on list box. 'Device List' dialog box will appear.



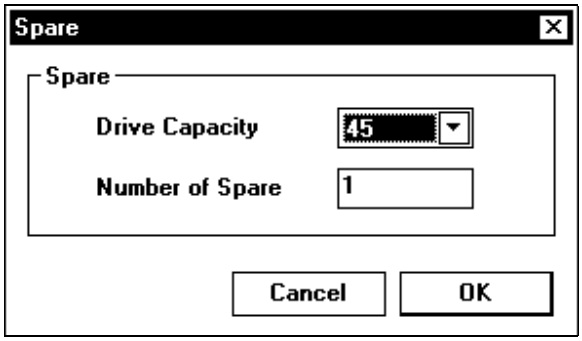
(6)-1

Define the drive capacity and the number of parity groups in the 'Parity Group' dialog box. Then select (CL) [OK]. Return to step (5).



(6)-2

Define the drive capacity and the number of spare drives in the 'Spare' dialog box. Then select (CL) [OK]. Return to step (5).

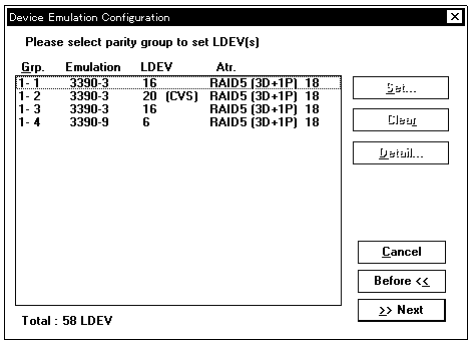


(7) <Define Device Emulation>

After setting up all items for definition of Device Emulation, select (CL) [>>Next]. Selecting (CL) [Before<<] returns you to the previous screen.

(7)-1

In case of defining Device Emulation:
Select (CL) device and select (CL) [Set...].



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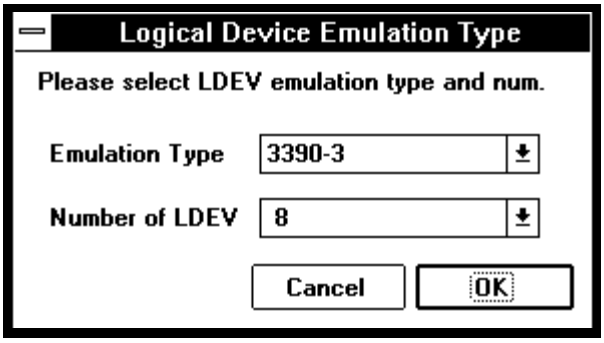
(7)-1-1

After setting up all items in the 'Logical Device Emulation Type' dialog box, select (CL) [OK]. Selecting (CL) [Cancel] returns you to step (7)-1.



(7)-2

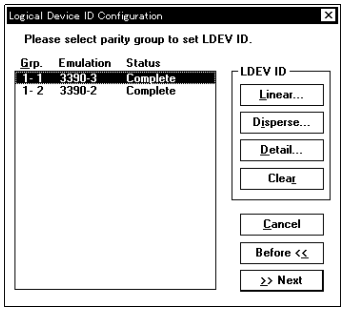
In case of detailed display:
Select (CL) device and select (CL) [Detail...].
The detailed information is displayed.

---

(8) <Define LDEV ID>

(8)-1 Definition Screen for LDEV ID

Select (CL) the parity group to be defined and select (CL) a function from [LDEV ID] list box.
[Linear...]: LDEV ID is assigned to LDEV in the order of parity group. See step (8)-3.
[Disperse...]: LDEV is assigned discretely in the order of parity group. See step (8)-3.
[Detail...]: A screen to define LDEV in detail is displayed.
See step (8)-2. (When plural groups are selected (CL), it is invalid.)
[Clear]: Select (CL) [Clear] to delete.

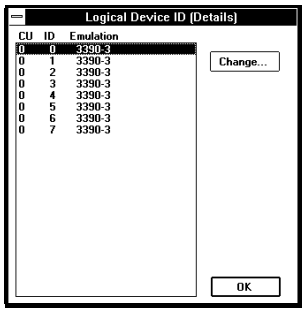


- '-----' is displayed in CU area and ID area for the parity group to which LDEV ID is not assigned.
- 'xxxxx' is displayed in ID area for the parity group to which any LDEV ID is not assigned.

After setting up all items, select (CL) [>>Next]. (Refer to INST05-181)

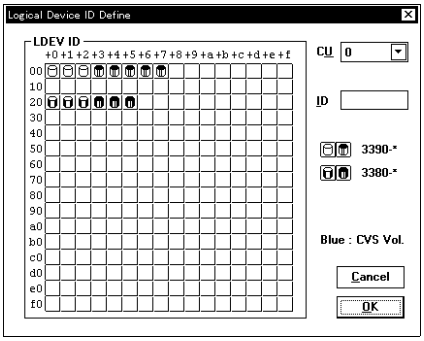
(8)-2 Detailed Definition Screen for LDEV ID

LDEV ID is defined in detail for each LDEV in the parity group.
Select (CL) [LDEV] from the list box and select (CL) [Change...].
The screen for LDEV ID input is displayed.



(8)-3 Input LDEV ID

Select CU ID in CU combo box.
The status of usage of ID in the CU is displayed in the LDEV ID panel.
White disk of panel: not used
Patterned disk of panel: using
Input LDEV ID you want to set or head LDEV ID in the ID Edit box.
After setting, select (CL) [OK]. Return to step (8).



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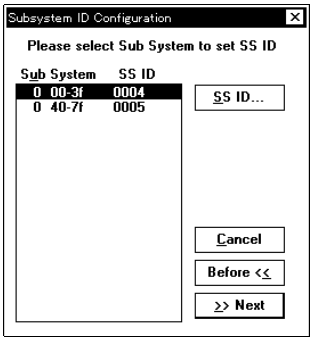
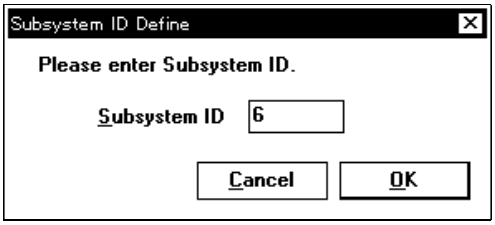
(9) <Define Subsystem ID>
To define Subsystem ID, select (CL) the item from the list box and select (CL) [SSID].
After setting, select (CL) [>>Next].



(9)-1 Define Subsystem ID and select (CL) [OK].
Return to step (9).



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Blank Sheet

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Blank Sheet

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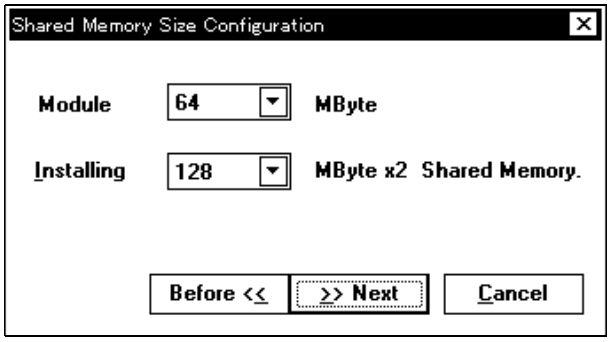
5. SM Capacity

(1) <Define Shared Memory Size>
Define the shared memory size in the 'Shared Memory Size Configuration' dialog box.
Select (CL) [>>Next].



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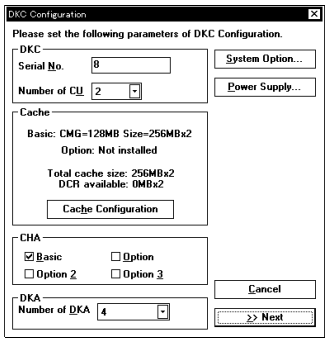
5.3.2.2 De-Install

1. Cache Capacity

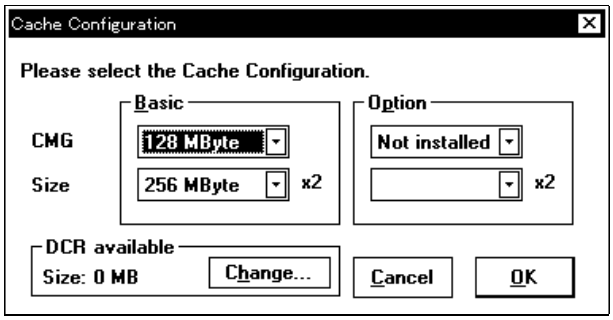
(1) <Update Configuration Information>
Select (CL) [Cache Configuration] in the 'DKC Configuration'.
(Go to step (2).)

Note: It is not possible to install or de-install plural parts at the same time.

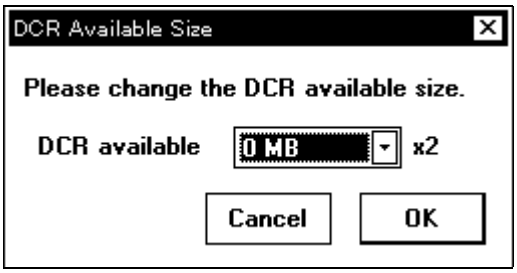
Make sure that all entered items are correct and select (CL) [>>Next].
Go to step (3).



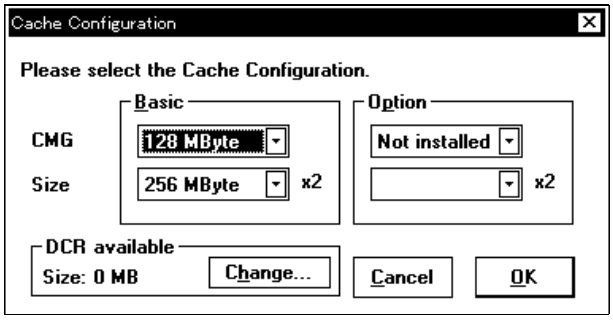
(2) <Define Cache>
Define each item in the 'Cache Configuration'.
If you want to change DCR available size, select (CL) [Change...] to change it.
(See SSD Optional Function Section)



(2-1) <Define DCR Available Size>
Define the DCR available size in the 'DCR Available Size' dialog box.
And select (CL) [OK].



(2-2)
After setting up all items, select (CL) [OK].
Return to step (1).



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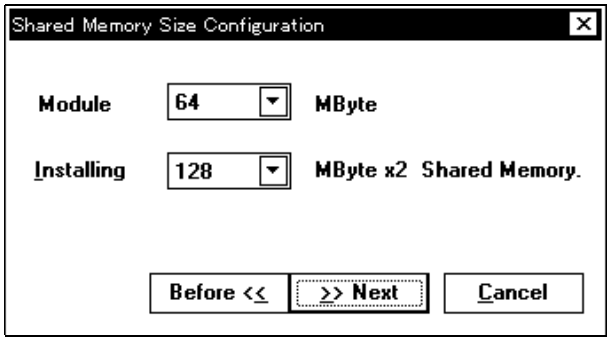
(3) <Display SM size>
'Shared Memory size Configuration' dialog box is displayed.
Select (CL) [>>Next].



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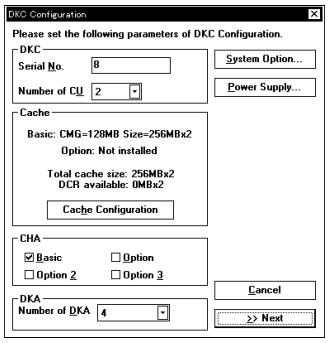
2. Number of Channel

(1) <Update Configuration Information>
Define the item to CHA in the 'DKC Configuration'.



Note 1: It is not possible to install or de-install plural parts at the same time.

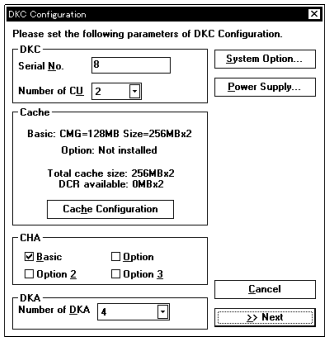
Note 2: In case of Multiplatform configuration,
1. If you want to change Multiplatform into ALL SCSI, after de-installing mainframe volumes, then CHA must be de-installed.
2. If you want to change ALL SCSI into Multiplatform, after de-installing open volumes, then CHS/CHF/CHT must be de-installed.

Make sure that the entered item is correct and select (CL) [>>Next].

---

3. Redundant Power Supply

(1) <Update Configuration Information>
Select (CL) [Power Supply] in the 'DKC Configuration'.

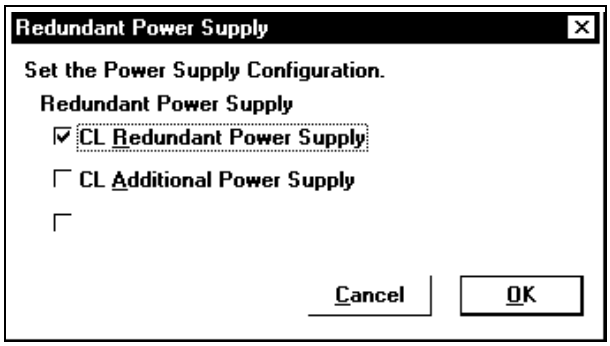


Note: It is not possible to install or de-install plural parts at the same time.

Make sure that the entered item is correct and select (CL) [>>Next].

---

(2) <Define Redundant Power Supply>
Select (CL) redundant power supply to be de-installed in the 'Redundant Power Supply'.
Select (CL) [OK]. Return to step (1).



Note: If entered item is wrong, the part not to be installed or de-installed may be blocked.

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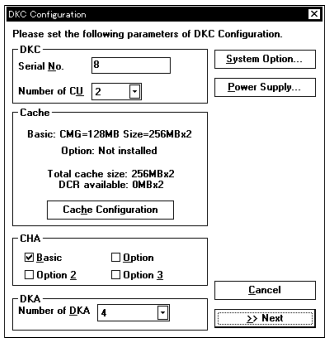
4. DKA + ECC group + LDEV

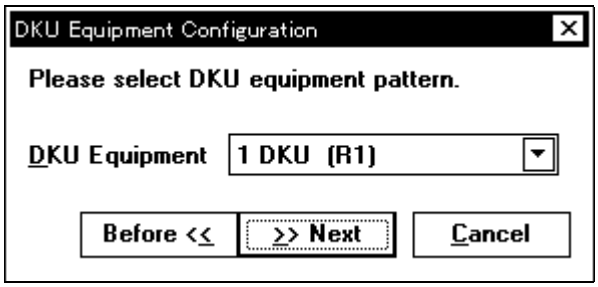
(1) <Update Configuration Information>
Set the item to be de-installed for DKC and DKA in the 'DKC Configuration'.

Note: It is not possible to install or de-install plural parts at the same time.

Make sure that the entered item is correct and select (CL) [>>Next].



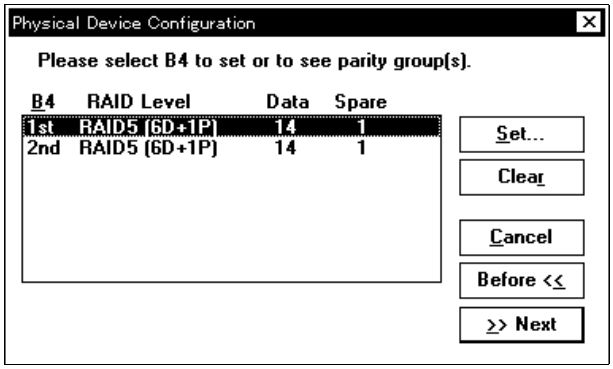
(2) <Set DKU Equipment>
Set the DKU equipment pattern in the 'DKU Equipment'.
After setting up, select (CL) [>>Next].



(3) Change Drive Configuration Information>
Set drive configuration according to the 'Physical Device Configuration' screen displaying the mounted B4 based on the result of setting of DKU mount pattern.
Detailed procedure is shown below.

- Select (CL) the item and select (CL) [Set...]. Go to step (4).
- Selecting (CL) [Clear...] after selecting (CL) the item clears the B4 setting.

After setting up all items, select (CL) [>>Next].
Selecting (CL) [Before<<] returns you to the previous screen.



FB4	Location
1st	HDU-R10, 11, 12, 13
2nd	HDU-R14, 15, 16, 17
3rd	HDU-L10, 11, 12, 13
4th	HDU-L14, 15, 16, 17
5th	HDU-R20, 21, 22, 23
6th	HDU-R24, 25, 26, 27
7th	HDU-L20, 21, 22, 23
8th	HDU-L24, 25, 26, 27

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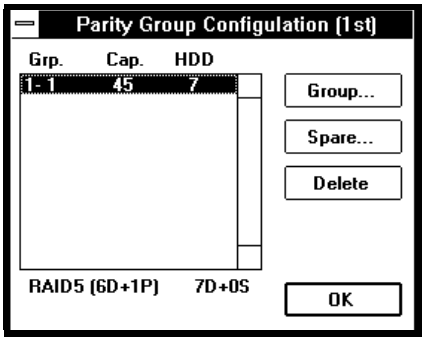
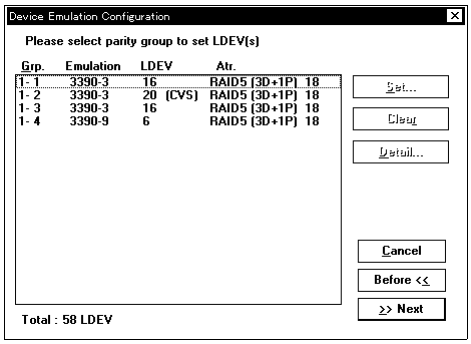
(4) <Define Parity Group>
Select (CL) the group to be de-installed and select (CL) [Delete] in the 'Parity Group Configuration' dialog box.
After setting, select (CL) [OK]. Return to step (3).



(5) <Define Device Emulation>
After setting up all items for definition of Device Emulation, select (CL) [>>Next].
Selecting (CL) [Before<<] returns you to the previous screen.



(5)-1 Detailed display:
Select (CL) device and select (CL) [Detail...].
The detailed information is displayed.
Select (CL) [OK] and return to step (5)

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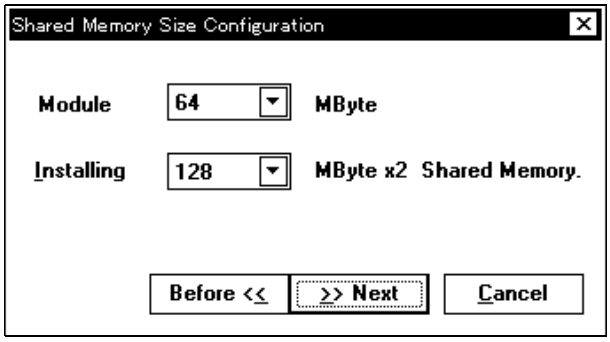
5. SM Capacity

(1) <Define Shared Memory Size>
Define the shared memory size in the 'Shared Memory Size Configuration' dialog box.
Select (CL) [>>Next].



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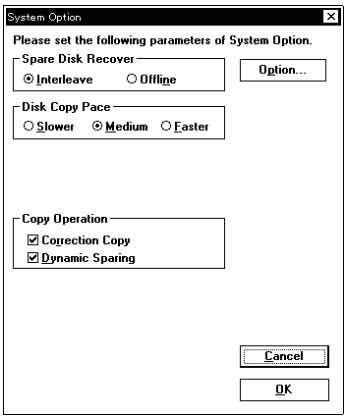
5.3.2.3 System Option

1. <System Option Definition>
   Define system option information in the ‘System Option’.
   After setting up all items, select (CL) [OK].



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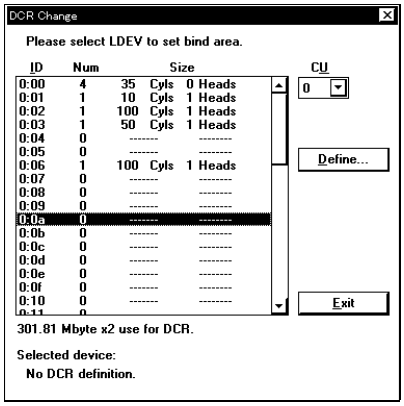
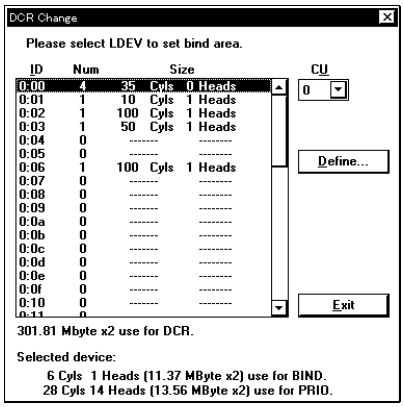
5.3.2.4 DCR Configuration

(1) The “DCR Change” screen opens and the contents of the setting which has been made are displayed. When the CU is selected (DR) is the combo box, installed LDEV(s) and contents of the DCR definition are updated. Select (CL) and LDEV the setting for which is to be changed, then press (CL) the [Define...] button.

Total cache memory size which DCR area use is displayed.

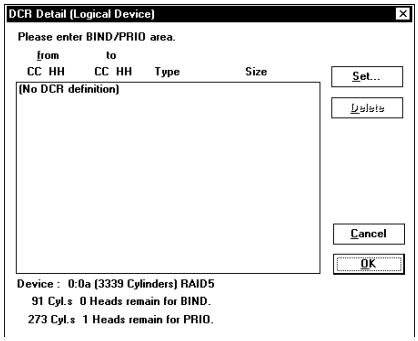
If LDEV which selected have a DCR area, BIND size and PRIO size is displayed under “DCR Change” screen.





NOTICE
To use DCR function, you should install DCR program product (P-242R-J1641-E) for mainframe volumes or Open DCR program product (P-242R-J1642-E) for open volumes into the DKC.

(2) The “DCR Detail (Logical Device)” screen opens and the setting of the DCR in the LDEV is displayed.
To add a new setting, press (CL) the [Set...] button.



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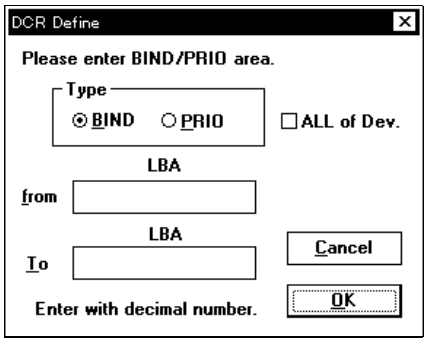
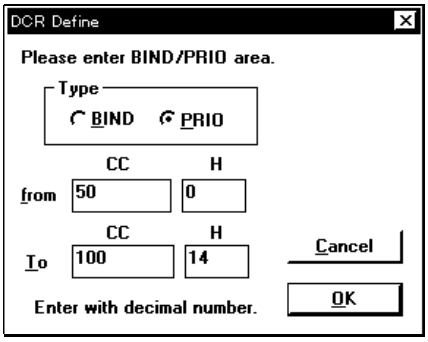
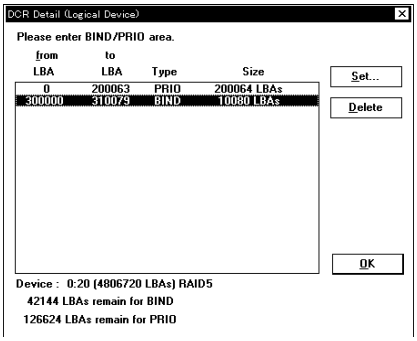
(3) When the [Set...] button is pressed (CL) on the "DCR Detail (Logical Device)" screen, the "DCR Define" screen appears. Enter the type, starting cylinder number, starting head number, ending cylinder number, and ending head number (in the case of Mainframe. Refer to the screen on the right.) or the type, starting LBA, and ending LBA (in the case of the open system. Refer to the screen on the left.) of the DCR area to be newly registered.
When the entry is completed, return the screen to the "DCR Detail (Logical Device)" screen by pressing (CL) the [OK] button.

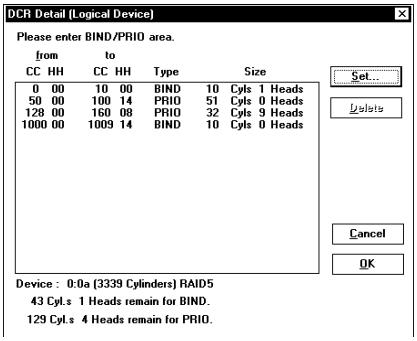




(4) Contents of the setting which has been made are displayed in the list box on the "DCR Detail (Logical Device)" screen.

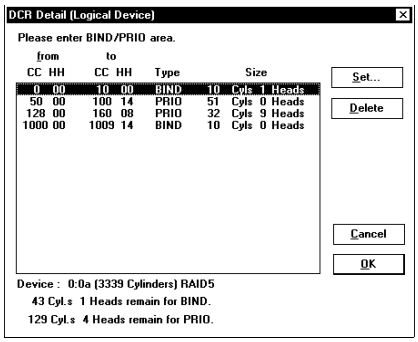


(In the case of open system)



(In the case of Mainframe system)

(5) To delete a set item, select (CL) the DCR setting to be deleted and press (CL) the [Delete] button on the "DCR Detail (Logical Device)" screen.



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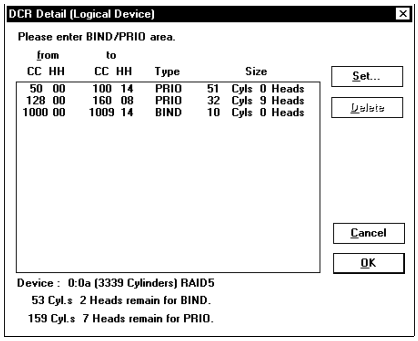
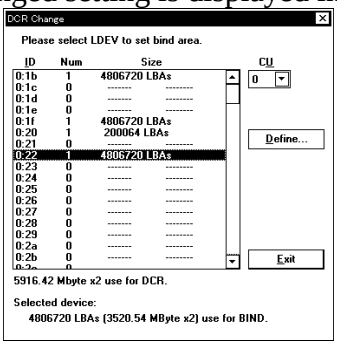
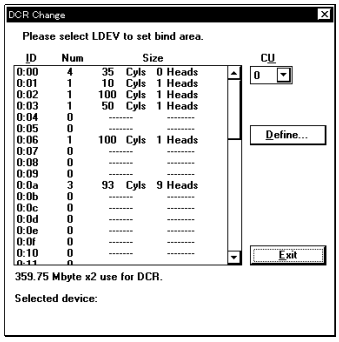
(6) By pressing (CL) the [OK] button on the "DCR Detail (Logical Device)" screen after the setting is decided, a process to change the setting for the LDEV is executed.
When no change is necessary, press (CL) the [Cancel] button.



(7) The screen returns to the "DCR Change" screen after the processing is completed. The changed setting is displayed in the list box.



(In the case of open system)



(In the case of Mainframe system)

(8) Repeat steps (1) to (7) for the LDEV(s) you want to change the setting of it.

(9) When the changing operation is completed, quit the "DCR Change" screen by pressing (CL) the [EXIT] button.

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5.3.2.5 CVS Configuration

Only screens for Mainframe system are described here. Refer to the page INST05-110 or later for screens or definition for open system.

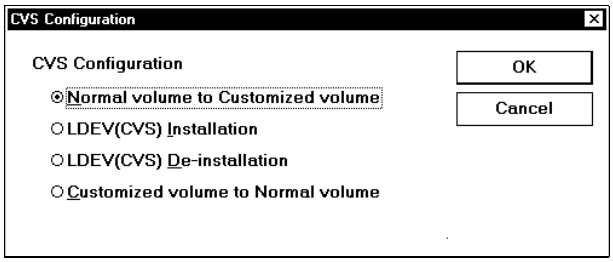
1. <Normal Volume to Customized Volume>

NOTICE
When you set HMDE volumes to customized volumes and reset them to the normal volume again, these volumes could not be set as HMDE volumes. Please refer to the following table.

Emulation Types for HMDE volumes	Emulation types after changing from Customized volume to normal volume
3390-3A	3390-3
3390-3B	
3380-KA	3380-K
3380-KB	

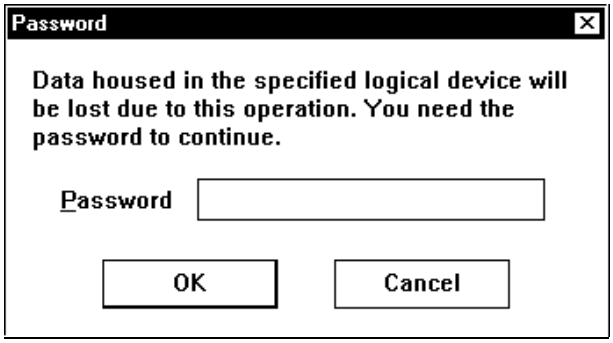
If you want to reset these volumes as HMDE, please call technical support center to set them to HMDE volumes by SVP.

(1) Select (CL) [Normal Volume to Customized Volume] and press (CL) the [OK] button.



NOTICE
To use CVS function, you should install CVS program product (P-242R-J1541-E) for mainframe volumes or Open CVS program product (P-242R-J1542-E) for open volumes into the DKC.

Enter the password and select (CL) [OK].



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

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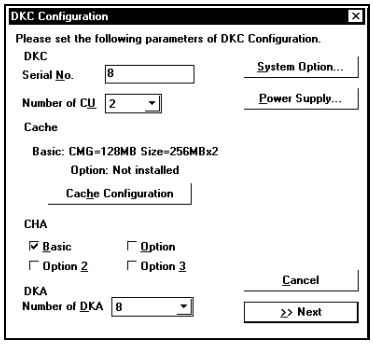
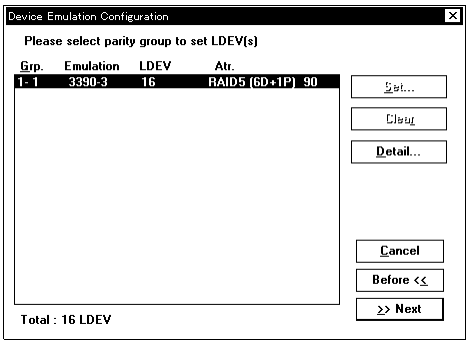
(1-1) Define the number of CU in DKC in the 'DKC Configuration'.

Make sure that the entered item is correct and select (CL) [>>Next].



(2) Select (CL) a parity group having Volume(s) to be changed on the "Device Emulation Configuration" screen and press (CL) the [Detail...] button.

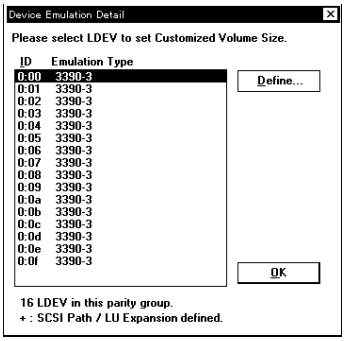
(CVS): The parity group which CVS is installed.



(3) Select (CL) a volume to be changed on the "Device Emulation Detail" screen and press (CL) the [Define...] button.

Note: In the following case, [Define...] button is not available.

1) Base volume is selected.
2) CV is selected.
3) Volume with SCSI path(s) ("+" indicated) is selected.
4) LU expanded volume ("+" indicated) is selected.



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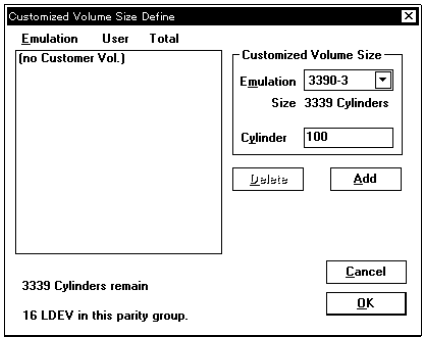
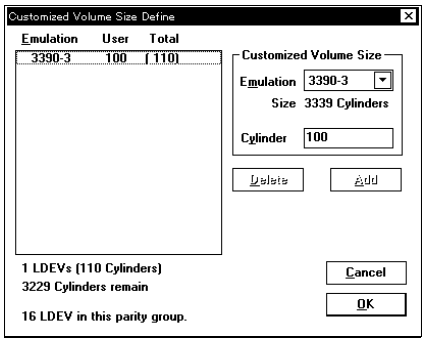
(4) Select (CL) the emulation type on the “Customized Volume Size Define” screen and register only one CV newly.
When an emulation type for open host is selected, the size per cylinder is displayed ([K byte]).



(5) The registration result is displayed in the list box on the left side of the screen. Press (CL) the [OK] button.
When CV for open host is selected, the size is displayed ([M byte]).



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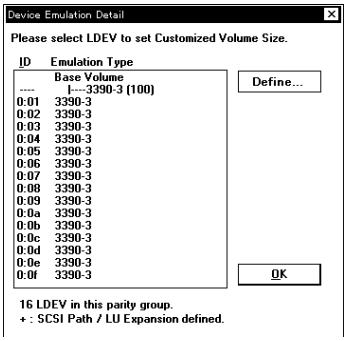
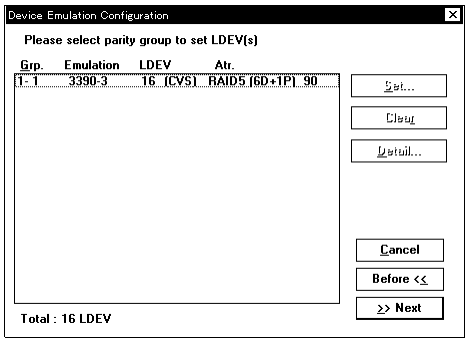
(6) When the screen is returned to the “Device Emulation Detail” screen, the setting result is displayed. Press (CL) the [OK] button.



(7) To change other LDEV(s) in the parity group to the CV(s), repeat steps (3) to (6) for the LDEV(s) concerned.

(8) The screen is returned to the “Device Emulation Configuration” screen.
Press (CL) the [>>Next] button.



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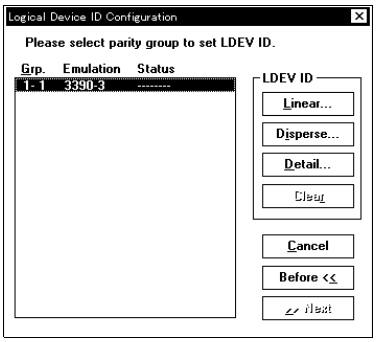
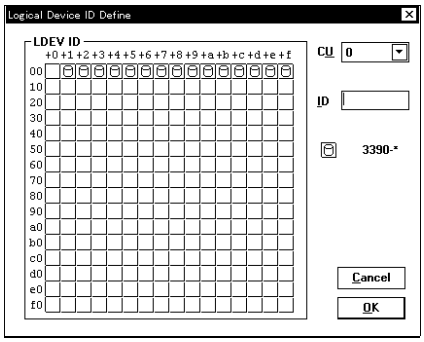
(9) To change the LDEV(s) in other parity group(s) to the CV(s), repeat steps (2) to (8).

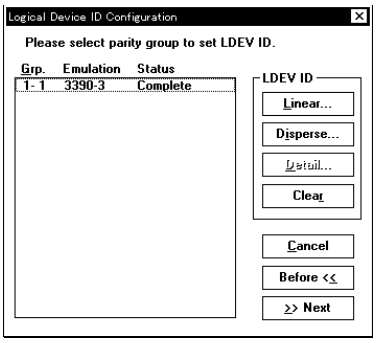
(10) Select (CL) the parity group having the LDEV(s) for which the ID(s) has not been set on the “Logical Device ID Configuration” screen, and press (CL) the [Linear...] button. Two or more parity groups can be selected.



(11) Select CU ID in CU combo box.
Input LDEV ID you want to set in the ID Edit box.
After setting, select (CL) [OK] button.
(Refer to INST05-181)



(12) Status of the parity group the setting for which is completed changes to “Complete”.
Press (CL) the [>>Next] button.



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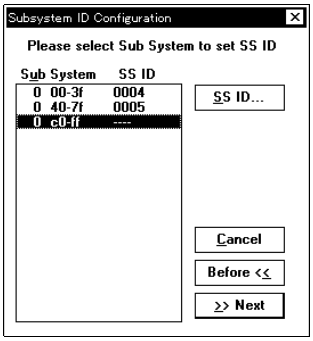
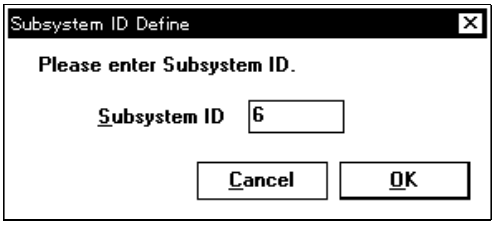
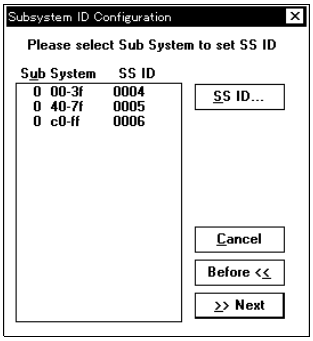
(13) When the screen is changed to the “Subsystem ID Configuration” screen and a new SS ID is required to be set, define the SS ID newly. Select (CL) a subsystem for which SS ID is not defined and press (CL) the [SS ID...] button.



(14) Enter an SS ID on the “Subsystem ID Define” screen. Press (CL) the [OK] button.

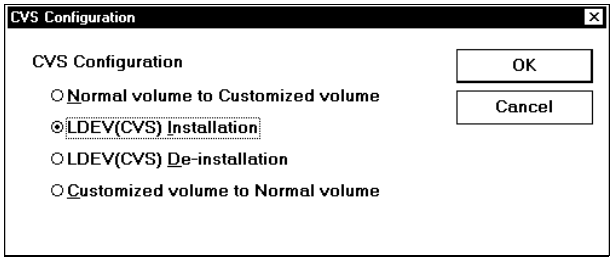


(15) When the screen is returned to the “Subsystem ID Configuration” screen, the registered SS ID is displayed. Press (CL) the [>>Next] button to quit the definition screen.



2. <LDEV(CVS) Installation>

(1) Select (CL) [LDEV(CVS) Installation] and press (CL) the [OK] button.



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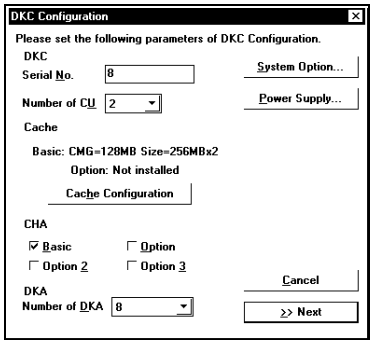
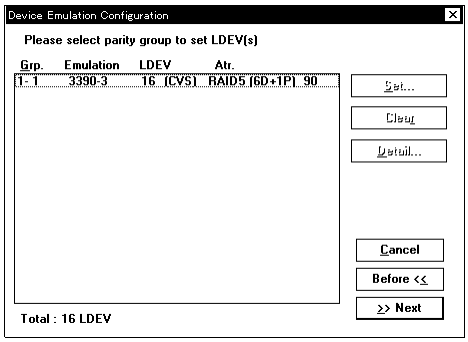
(1-1) Define the number of CU in DKC in the 'DKC Configuration'.

Make sure that the entered item is correct and select (CL) [>>Next].



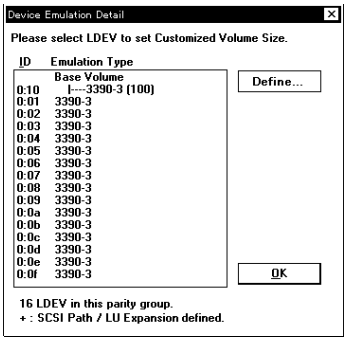
(2) Select (CL) a parity group to which the CV(s) is to be added on the "Device Emulation Configuration" screen and press (CL) the [Detail] button.

(CVS): The parity group which CVS is installed.

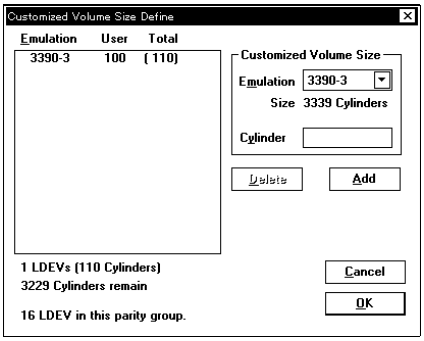


(3) Select (CL) a base volume to which the CV(s) is to be added on the "Device Emulation Detail" screen and press (CL) the [Define...] button.

Note: In the following cases, [Define...] becomes invalid.
1) When a CV is selected
2) When an LDEV which has not been changed to a CV is selected



(4) Register the CV to be added by selecting (CL) the emulation type of it, entering the number of cylinders, and selecting (CL) [Add] on the "Customized Volume Size Define" screen.
When an emulation type for open host is selected, the size per cylinder is displayed ([K byte]).



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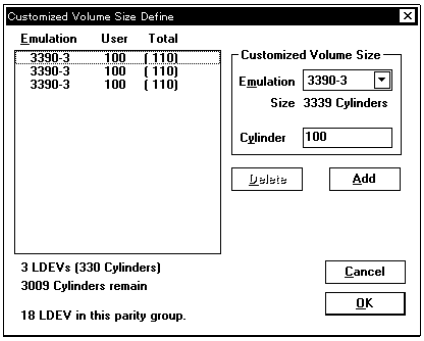
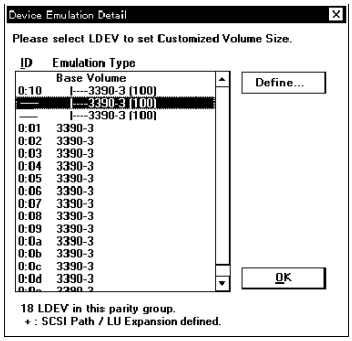
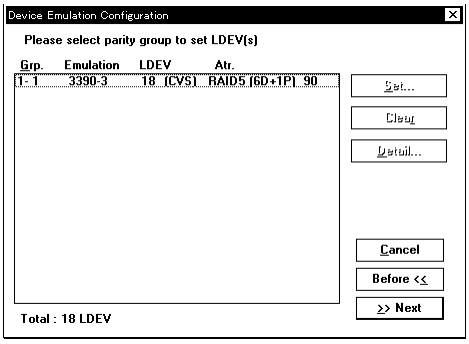
(5) The contents of the registration which has been made are displayed in the list box. The deletion can be made only for the added CV(s). When the addition is made incorrectly, select (CL) [Cancel] to make the setting invalid and perform the setting again.
When CV for open host is selected, the size is displayed ([M byte]).



(6) When the screen is returned to the “Device Emulation Detail” screen by pressing (CL) the [OK] button, the setting result is displayed.



(7) When the screen is returned to the “Device Emulation Configuration” screen by pressing (CL) the [OK] button, the setting result is displayed.



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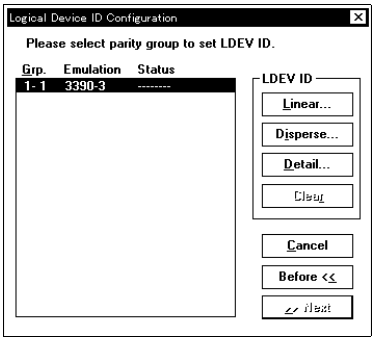
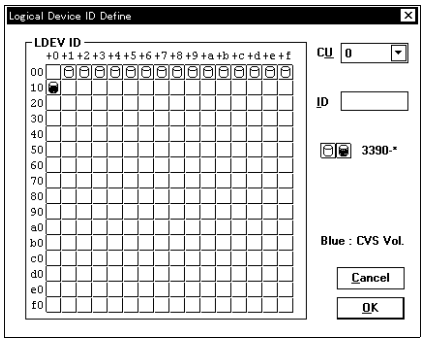
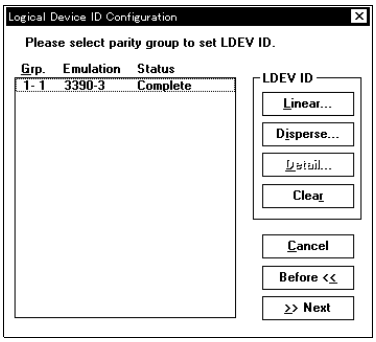
(8) When the [>>Next] button is pressed (CL), the LDEV ID setting screen appears.
Set LDEV ID(s) for the added CV(s). For the parity group having the added CV(s), status which shows the ID allocation is indicated as "---------". Therefore, select (CL) such parity group. (Refer to INST05-181)



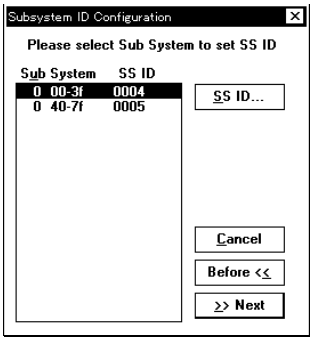
(9) Press (CL) the [Linear...] button and enter an LDEV ID you want to allocate on the "Logical Device ID Define" screen.



(10) When the screen is returned to the "Logical Device ID Configuration" screen by pressing (CL) the [OK] button, the setting result is displayed.



(11) When the [>>Next] button is pressed (CL), the "Subsystem ID Configuration" screen is opened. If a new SS ID is required as a result of defining an LDEV ID, define it. Select (CL) a subsystem for which the SS ID is to be newly defined and press (CL) the [SS ID...] button.



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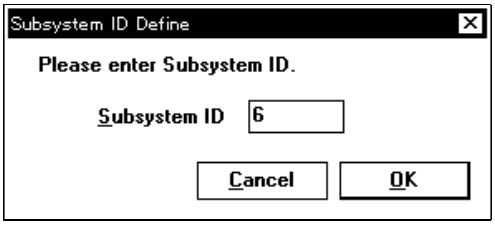
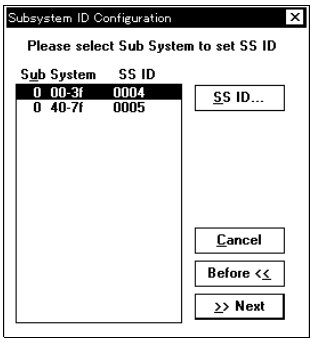
(12) Enter the SS ID on the “Subsystem ID Define” screen and select (CL) [OK].



(13) When the screen is returned to the “Subsystem ID Configuration” screen by pressing (CL) the [OK] button, the contents of the setting which has been made are displayed.



(14) When [>>Next] is selected (CL), the definition of the addition ends. (Adding process starts.)

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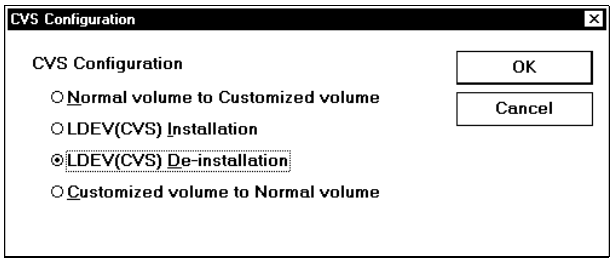
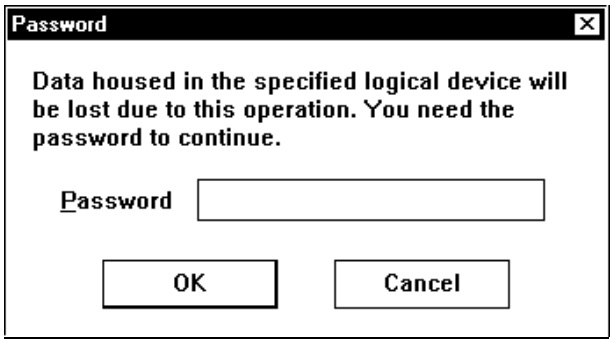
3. <LDEV(CVS) De-installation>

(1) Select (CL) [LDEV(CVS) De-installation] and press (CL) the [OK] button.



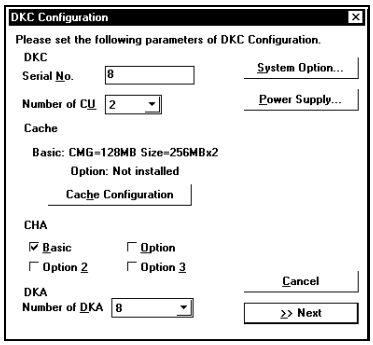
Enter the password and select (CL) [OK].

NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.



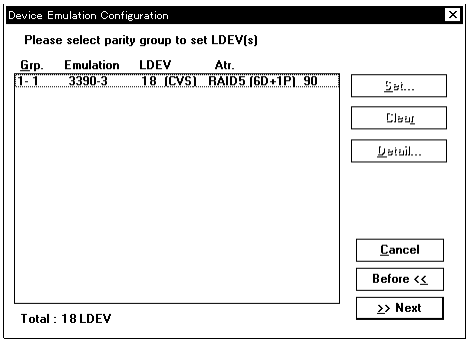
(1-1) Define the number of CU in DKC in the 'DKC Configuration'.

Make sure that the entered item is correct and select (CL) [>>Next].



(2) Select (CL) a parity group CVs in which are to be reduced on the "Device Emulation Configuration" screen, then select (CL) [Detail].

(CVS): The parity group which CVS is installed.



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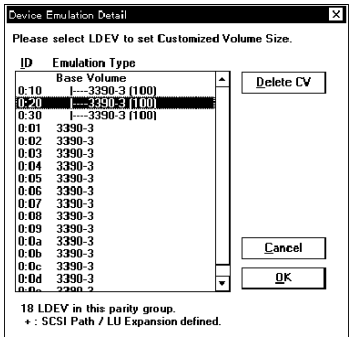
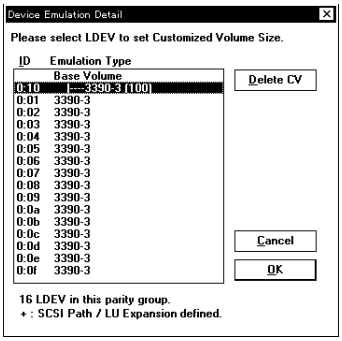
(3) When the CV(s) to be deleted is selected (CL) on the "Customized Volume Detail" screen and the [Delete CV] button is pressed (CL), the CV(s) is deleted. When the operation fails, the screen can be returned to the preceding one by pressing (CL) the [Cancel] button.



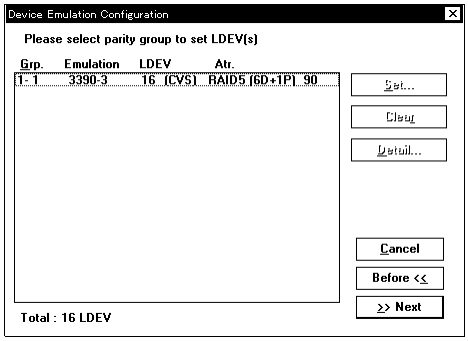
Note: In the following case, [Delete CV] button is not available.

1) The last CV is selected.
2) All CVs in base volume are selected.
3) Volume with SCSI path(s) ("+" indicated) is selected.

(4) Push (CL) [OK] button to get back to [Device Emulation Detail] Screen, you can see the set information in the screen.



(5) When the screen is returned to the "Device Emulation Configuration" screen by pressing (CL) the [OK] button and the[>>Next] button is pressed (CL), the definition of reduction is decided.



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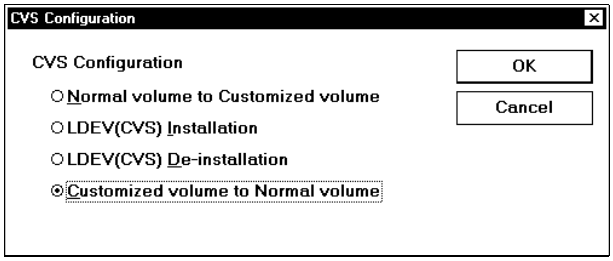
4. <Customized Volume to Normal Volume>

NOTICE
When you set HMDE volumes to customized volumes and reset them to the normal volume again, these volumes could not be set as HMDE volumes. Please refer to the following table.

Emulation Types for HMDE volumes	Emulation types after changing from Customized volume to normal volume
3390-3A	3390-3
3390-3B	
3380-KA	3380-K
3380-KB	

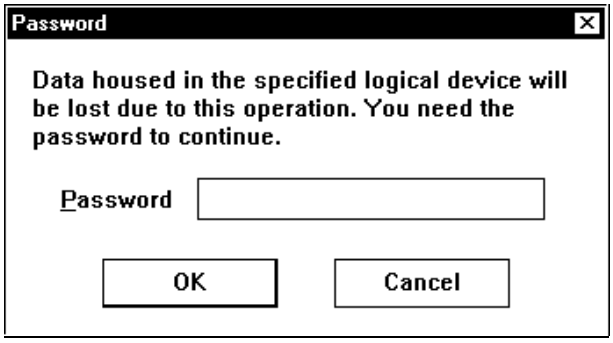
If you want to reset these volumes as HMDE, please call technical support center to set them to HMDE volumes by SVP.

(1) Select (CL) [Customized Volume to Normal Volume], then select (CL) [OK].



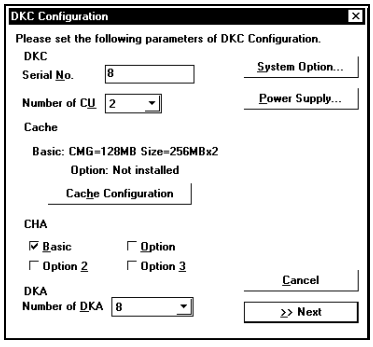
Enter the password and select (CL) [OK].

NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.



(1-1) Define the number of CU in DKC in the 'DKC Configuration'.

Make sure that the entered item is correct and select (CL) [>>Next].



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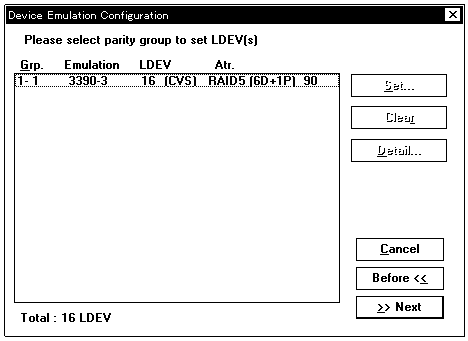
(2) Select (CL) a parity group having volume(s) to be changed on the "Device Emulation Configuration" screen and select (CL) [Detail...].

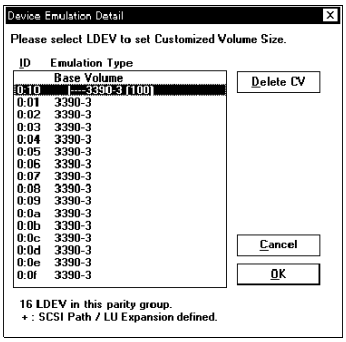
(CVS): The parity group which CVS is installed.



(3) Select (CL) a CV from the list box on the "Customized Volume Detail" screen, press (CL) the [Delete CV] button to delete the CV, and return it to a normal volume. When the operation fails, the screen can be returned to the preceding one by pressing (CL) the [Cancel] button.

Note: In the following case, [Delete CV] button is not available.

1) The last CV is selected.
2) All CVs in base volume are selected.
3) Volume with SCSI path(s) is selected.



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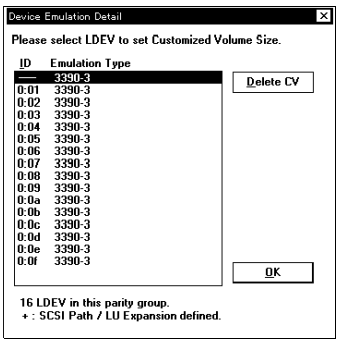
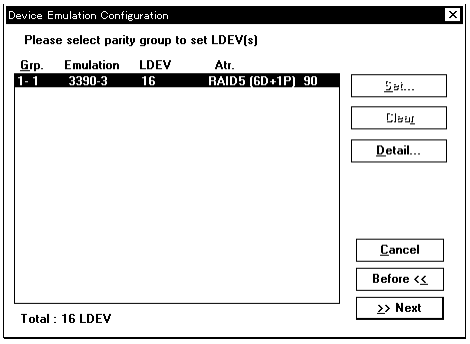
(4) The setting result is displayed. Press (CL) the [OK] button.



(5) To return other base volume(s) in the parity group to the normal LDEV(s), repeat steps (3) to (4) for the LDEV(s) concerned.

(6) Press (CL) the [OK] button to return to the “Device Emulation Configuration” screen.



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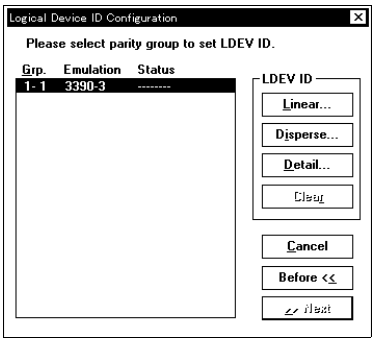
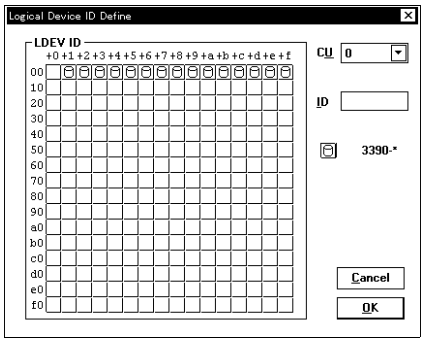
(7) To return the base volume(s) in other parity group(s) to the normal LDEV(s), repeat steps (2) to (6).

(8) Press (CL) the [>>Next] button to change the screen to the "Logical Device ID Configuration" screen. Since the normal LDEV returned from the base volume is an LDEV newly defined, define the ID for it. Select (CL) the parity group having the LDEV(s) for which the ID(s) has not been set, then select (CL) [Linear...]. Two or more parity groups can be selected. (Refer to INST05-181)



(9) Select CU ID in CU combo box.
Input LDEV ID you want to set in the ID edit box.
After setting, select (CL) [OK] button.



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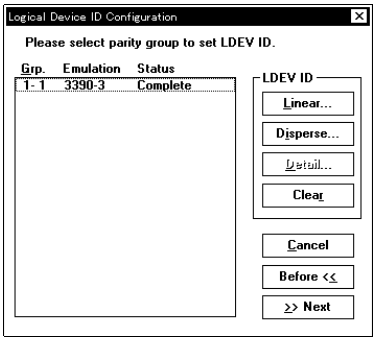
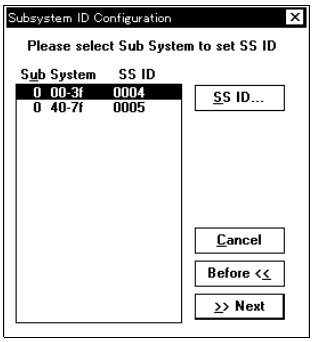
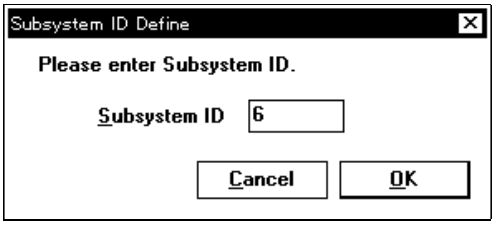
(12) Status of the parity group the setting for which is completed changes to “Complete”.
Press (CL) the [>>Next] button to change the screen to the “Subsystem ID Configuration” screen.



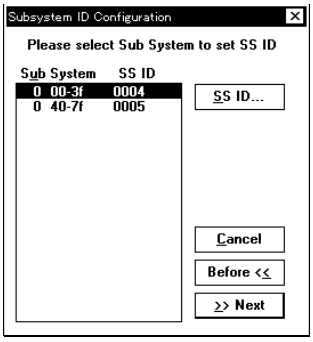
(13) When it is necessary to set a new SS ID, define the SS ID newly.
Select (CL) a subsystem for which SS ID is not defined, then select (CL) [SS ID...].



(14) Enter an SS ID on the “Subsystem ID Define” screen and select (CL) [OK].



(15) When the screen is returned to the “Subsystem ID Configuration” screen, the registered SS ID is displayed.
Press (CL) the [>>Next] button to quit the definition screen.



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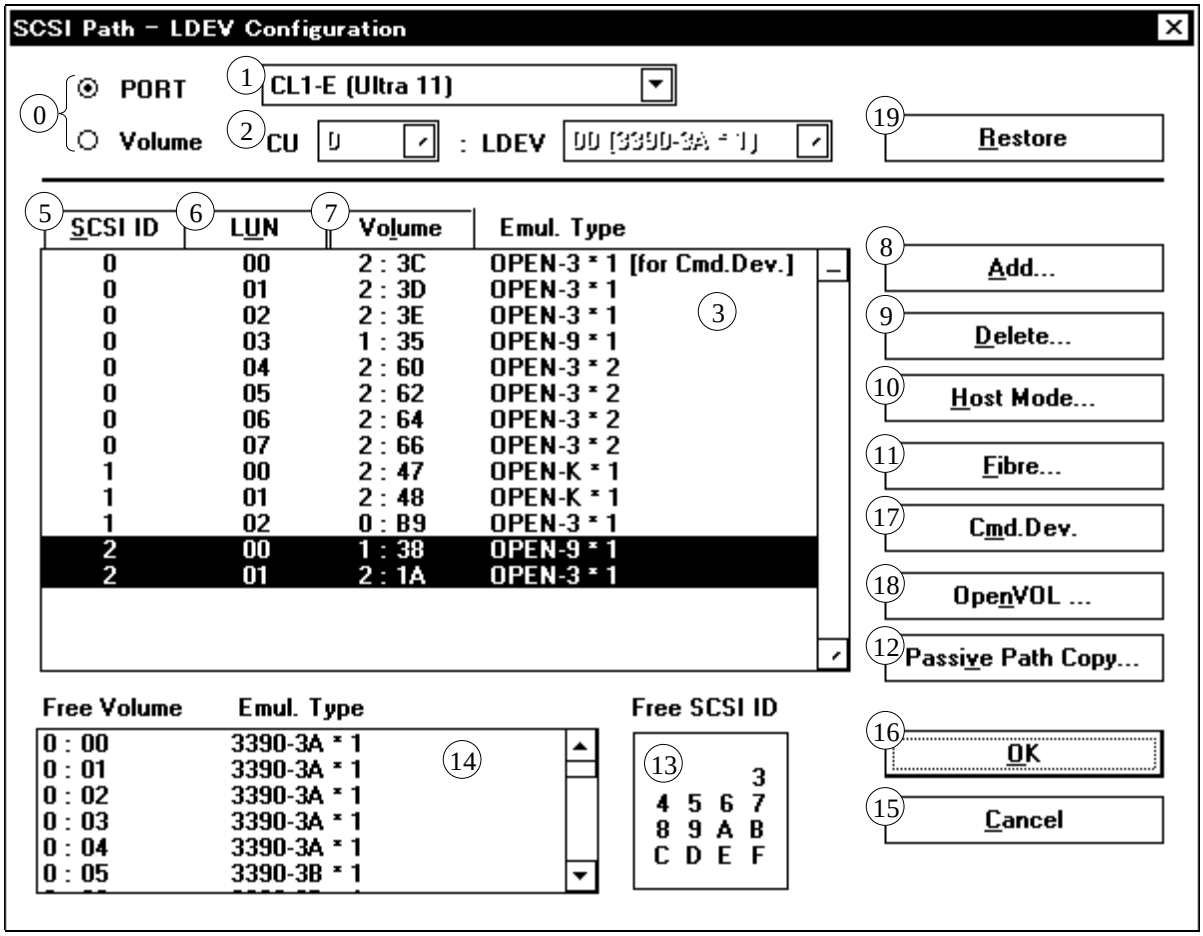
5.3.2.6 SCSI I/F Configuration ('SCSI Path-LDEV Configuration' window)

* In case of "Refer Configuration", there are some buttons which cannot be selected in this window.

1. Summary

1-1 The name of each part ('SCSI Path-LDEV Configuration' window)



1-2 Outline of each part

(0) Display pattern button
- PORT : SCSI paths defined on the selected port are displayed in SCSI path list
- Volume : SCSI paths defined in the selected CU:LDEV ID are displayed in SCSI path list.

(1) Installed port list
Ports of installed CHS/CHF/CHTs (CHS:4ports/CHF, CHT:2ports) are displayed.

(2) Installed Volume list
CU:LDEV IDs of installed OPEN-CU:LDEV are displayed.

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(3) SCSI path list
According to (0), displayed the defined SCSI paths.
* If PORT is selected in (0), '+' added to Volume denotes multiple path setting.

(4) PORT button (in the case of Volume in (0))
SCSI paths are sorted increasingly in port number. The precedence of sorting follows: PORT, SCSI ID and LUN.

(5) SCSI ID button
SCSI paths are sorted increasingly in SCSI ID. The precedence of sorting follows: SCSI ID, PORT and LUN (or SCSI ID, LUN and LDEV ID).

(6) LUN button
SCSI paths are sorted increasingly in LUN. The precedence of sorting follows: LUN, PORT and SCSI ID (or LUN, SCSI ID and LDEV ID).

(7) Volume button (in the case of PORT in (0))
SCSI paths are sorted increasingly in CU:LDEV ID. The precedence of sorting follows: CU:LDEV ID, SCSI ID and LUN.

(8) Add button
A new SCSI path definition is added (go to 2-1).

(9) Delete button
Defined SCSI paths are deleted (go to 2-2)

(10) Host Mode button
The window which shows the setting situation of host identification codes for each installed CHS/CHF port is displayed (go to 2-3).

CAUTION

On the CHF, Host Mode must be set to "Mode 00".

(11) Fibre button
The window which activates windows for setting the following information about Fibre channel ports is displayed (go to 2-4).
1. Address Information ("Fibre - Port Address Information" window)
2. Topology Information ("Fibre - Topology Information" window)
3. Security Information (Not supported)

(12) Passive Path Copy button
Alternate SCSI paths on Cluster-2 corresponding to the ones on Cluster-1 are automatically generated (go to 2-5).

(13) Free SCSI ID area
Unused SCSI IDs are displayed.

(14) Free Volume area
Unused CU:LDEV IDs are displayed.

(15) Cancel button
SCSI path definition is canceled (go to 2-7).

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(16) OK button
SCSI path definition is ended (go to 2-7).

(17) Command Device button
Command Device is set (go to 2-8).

(18) Open VOL button
Open VOLs can be set (go to 2-9).

(19) Restore button
Backup data for SCSI I/F Configuration is restored (go to 2-10).

---

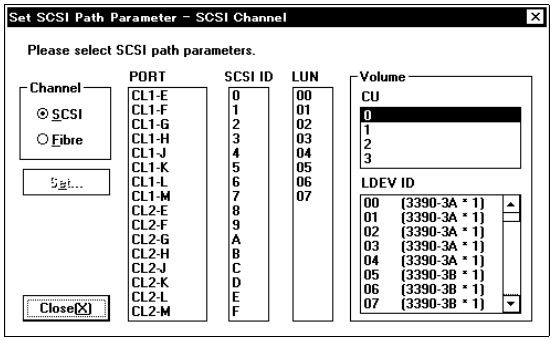
2. Detail

2-1 Add

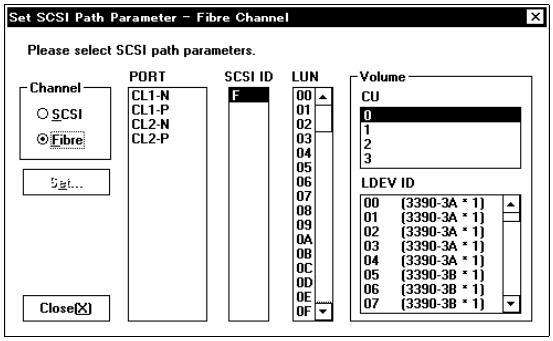
(1) Select (CL) [Add...] button in 'SCSI Path-LDEV Configuration' window.

'Set SCSI Path Parameter' window is displayed. Multiple PORT, SCSI ID, LUN and LDEV ID can be selected (Single CU can be selected).

*For SCSI channel



*For Fibre channel



- Channel area : Installed channel is able to be selected.
- PORT : According to the selection in Channel area, all installed CHS, CHF or CHT ports are displayed.
- SCSI ID : For SCSI channel, 16 SCSI IDs from 0 to F are displayed. For Fibre channel, only 1 SCSI ID F is displayed. *
- LUN : For SCSI channel, 8 LUNs from 00 to 07 are displayed. For Fibre channel, 120 LUNs from 00 to 77 are displayed (SVP Version 51-36-xx: 8LUNs from 0 to 7).
- Volume : CU/LDEV IDs in which the emulation type corresponding to OPEN-LDEV is set are displayed.
  The symbol '+' added to LDEV ID denotes the existence of path setting as follow:
  '+' a path is set
  '++' multiple paths are set
  none no path is set

* For Fibre channel, SCSI ID is meaningless. However, SCSI ID "F" is indicated all the times and "F" must be selected as a dummy.

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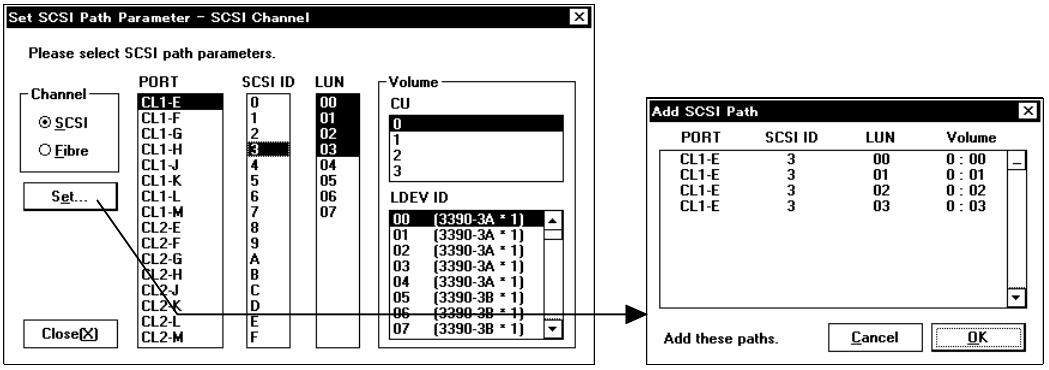
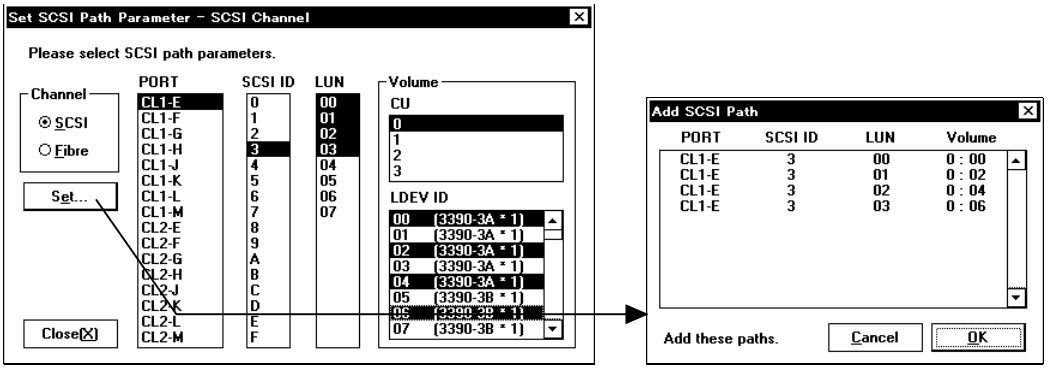
(2) Select (CL) [Set...] in ‘Set SCSI Path Parameter’ window.
SCSI paths are constructed based on the above selection, and the confirmation window is displayed.
* This button comes to be available just after selections from all lists are completed.

According to the number of the selected LDEV ID, “continuous LDEV ID allocation” and “arbitrary LDEV ID allocation” are possible.

Ex.1 Continuous LDEV ID allocation



Ex.2 Arbitrary LDEV ID allocation



(3) Confirm in ‘Add SCSI Path’ window.

- [OK] : Newly set paths are displayed in the ‘SCSI Path-LDEV Configuration’ window, and go back to ‘Set SCSI Path Parameter’ window.

- [Cancel] : Go back to ‘Set SCSI Path Parameter’ window.

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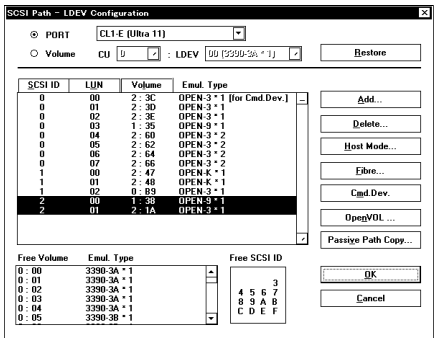
2-2 Delete

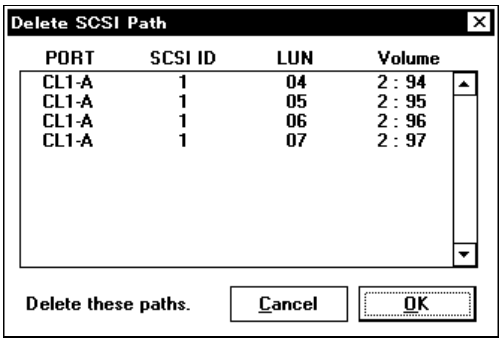
(1) SCSI paths are selected at the SCSI path list in 'SCSI Path-LDEV Configuration' window.



(2) Select (CL) [Delete...] in 'SCSI Path-LDEV Configuration' window.

The confirmation window for the deleted paths is displayed.

* This button comes to be available just after selections from SCSI path list.



(3) Confirm in 'Delete SCSI Path' window.

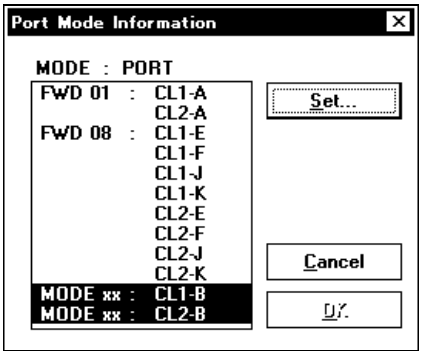
- [OK] : The situation in that selected paths are deleted is displayed in 'SCSI Path-LDEV Configuration' window.
- [Cancel] : Go back to 'SCSI Path-LDEV Configuration' window with nothing done.

2-3 Host Mode

(1) Select (CL) [Host Mode...] button in 'SCSI Path-LDEV Configuration' window.

'Port Mode Information' window is displayed.

* When invalid value for Host identification information is read, "MODE xx" is reversibly displayed. And [OK] button is not available.



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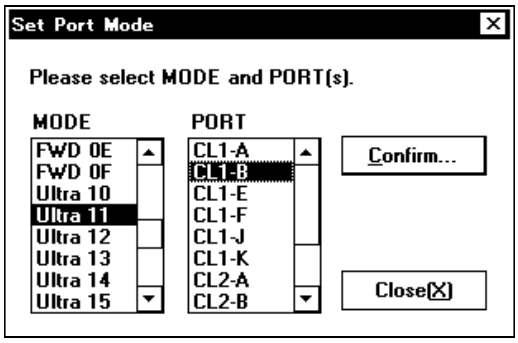
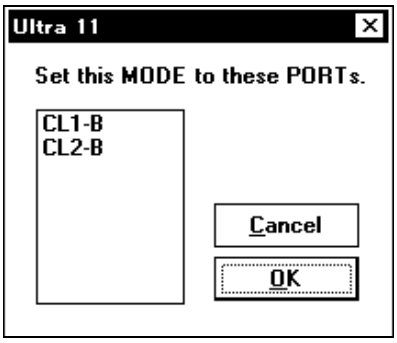
(2) Select (CL) [Set...] in 'Port Mode Information' window.

'Set Port Mode' window is displayed on which parameters needed for host identification codes setting are selected.



(3) Select (CL) [Confirm...] in 'Set Port Mode' window.

The confirmation window is displayed.
* Both Mode and Port are selected, the button can be available.



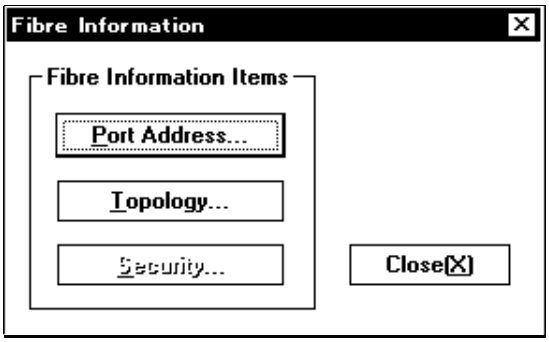
(4) Confirm in 'FWD(Ultra) xx' window.

- [OK] : Mode is updated, which is displayed on 'Port Mode Information' window.
- [Cancel] : Go back to 'Set Port Mode' window with nothing done.

2-4 Fibre

(0) Select (CL) [Fibre...] in 'SCSI Path-LDEV Configuration' window.

'Fibre Information' window is displayed.



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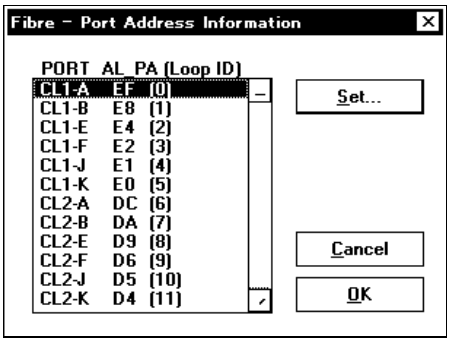
2-4-1 Port Address

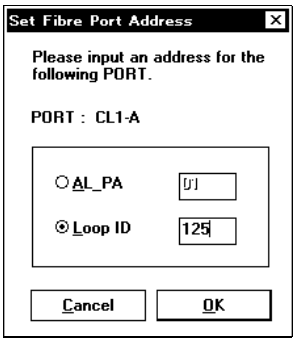
(1) Select (CL) [Port Address...] in 'Fibre Information' window.

'Fibre - Port Address Information' window is displayed.



(2) Select (CL) port of which Address information is changed, and select (CL) [Set...] in 'Fibre - Port Address Information' window.

'Set Fibre Port Address' window is displayed.
* [Set...] button comes to be available just after selections of port.



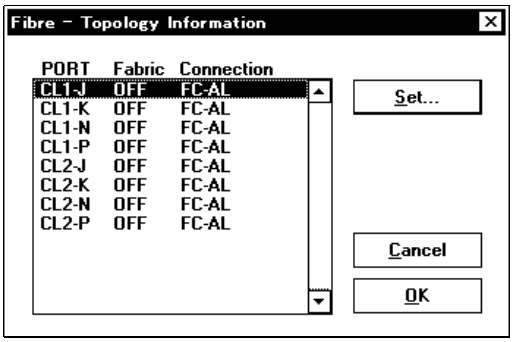
(3) Input address value in 'Set Fibre Port Address' window.
AL_PA : 01 ~ EF (HEXA DECIMAL number)
Loop ID : 0 ~ 125 (DECIMAL number)
AL_PA is an ID based on Fibre standard. It denotes an address of each port on Fibre loop.
Loop ID, whose initial value is 0, is an identifier continuously assigned to each AL_PA in descending order. (see page INST05-599J)

- [OK] : Address is updated, which is displayed on 'Fibre - Port Address Information' window.
  * This button comes to be available just after input of valid address value.
- [Cancel] : Go back to 'Fibre - Port Address Information' window with nothing done.

2-4-2 Topology

(1) Select (CL) [Topology...] in 'Fibre Information' window.

'Fibre - Topology Information' window is displayed.



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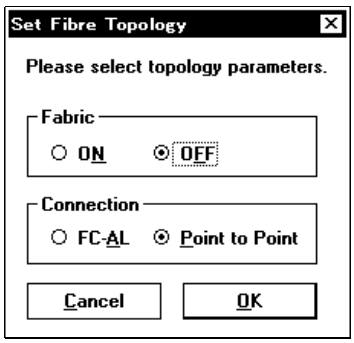
(2) Select (CL) port of which Topology information is changed, and select (CL) [Set...] in 'Fibre - Topology Information' window.

'Set Fibre Topology' window is displayed.
* [Set...] button comes to be available just after selections of port.



(3) Select (CL) Fabric (On/Off) and FC-AL/Point to Point in 'Set Fibre Topology' window.

- [OK] : Topology is updated, which is displayed on 'Fibre - Topology Information' window.
- [Cancel] : Go back to 'Fibre - Topology Information' window with nothing done.

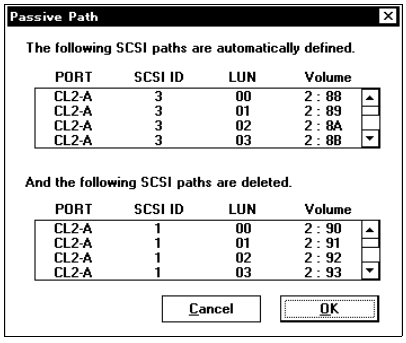
2-4-3 Security

Not supported.

2-5 Passive Path Copy

(1) Select (CL) [Passive Path Copy...] in 'SCSI Path-LDEV Configuration' window.

'Passive Path' window is displayed.
* This button comes to available under the following conditions.
  1. PORT is selected at Display pattern button.
  2. The selected port is in Cluster-1.
  3. The mode of the selected port is 01, 11, 02 or 12.
  4. SCSI path is defined which has even SCSI ID.



(2) Confirm in 'Passive Path' window.

- [OK] : SCSI paths in the upper list are defined, and SCSI paths in the lower list are deleted. And then go back to 'SCSI Path-LDEV Configuration' window.
- [Cancel] : Go back to 'SCSI Path-LDEV Configuration' window with nothing done.

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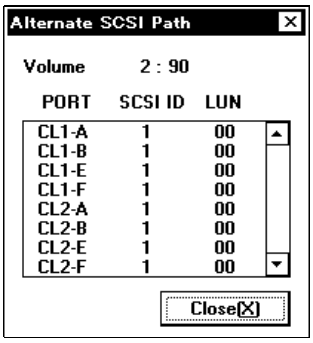
2-6 Alternate Path Display

(1) Select (DC) SCSI path at SCSI path list in 'SCSI Path-LDEV Configuration' window.

'Alternate SCSI Path' window is displayed.



(2) Select (CL) [Close(X)] in 'Alternate SCSI Path' window.

Go back to 'SCSI Path-LDEV Configuration' window.

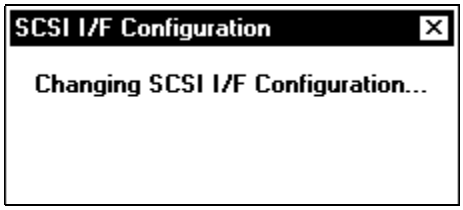
2-7 End of "SCSI Path-LDEV Configuration" window

(1) 'Define Configuration & Install'
(2) 'Refer Configuration'
(3) 'Change Configuration'

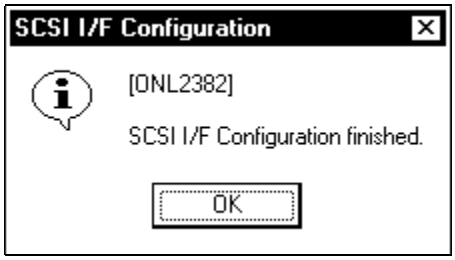
(1) In case of 'Define Configuration & Install'
[OK]: Go back to INST05-170 step 14. Or, go to INST05-599-50.
[Cancel]: Go back to INST05-70 step 4.

(2) In case of 'Refer Configuration'
[OK]: Go back to INST05-230 step 2. Or, go to INST05-599-50.
[Cancel]: Go back to INST05-230 step 2.

(3) In case of 'Change Configuration'
[OK]: 'SCSI I/F Configuration' windows is displayed. Or, go to INST05-599-50.



After "Wait..." message, select (CL) [OK] in response to "SCSI I/F Configuration finished". Go back to INST05-320 step 2.



[Cancel]: Go back to INST05-320 step 2.

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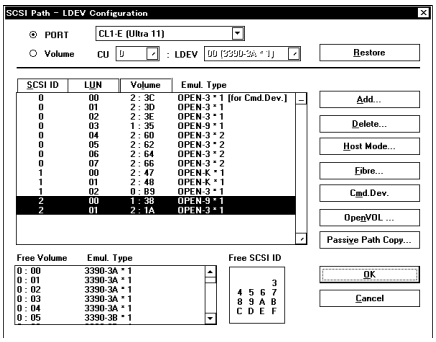
2-8 Command Device

(1) Set or Reset

(1-1) In case display pattern button is PORT
Select (CL) SCSI path(s) in SCSI path list and select (CL) [Cmd.Dev.] button in 'SCSI Path-LDEV Configuration' window.

(1-2) In case display pattern button is Volume
Select (CL) [Cmd.Dev.] button.



(2) Confirm
The string "[for Cmd.Dev.]" in SCSI path list denotes 'Command Device'.

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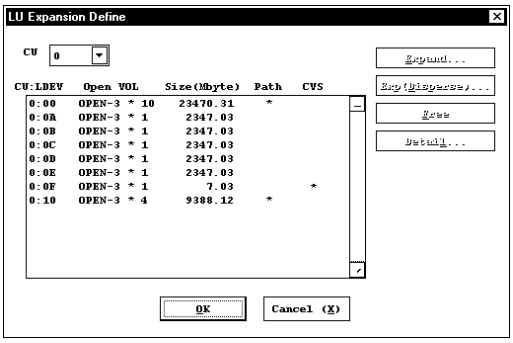
2-9 LU Expansion

Select (CL) [Open VOL...] button in 'SCSI path-LDEV' Configuration' window.

'LU Expansion Define' window is displayed.



Detail of the list

- The list is displayed line by line in CU (The selection can be done on CU list).
- The number of LDEVs connected sequentially together which formalize LU Expansion (Open VOL)
  ex.) The first line on the right figure indicates that 10 LDEVs whose emulation type is OPEN-3 are connected together sequentially.
- The existence of SCSI path definition to the Open VOL.
  ex.) In the first line, '*' shows that CU:LDEV=0:00 and 0:10 have a SCSI path definition.
- The existence of CVS definition to the Open VOL.
  ex.) In the seventh line '*' shows that CU:LDEV=0:0F has a CVS difinition.

Detail of the buttons

- [OK] button : To register the setting information
- [Cancel] button : Not to register the setting information
- [Expand...] button : To display 'LU Expansion' window (go to (1))
- [Exp(Disperse)...] button : To display 'LU Expansion (Disperse)' window (go to (2))
- [Free] button : To dissolve LU Expansion consisted of two or more LDEVs (go to (3))
- [Detail...] button : To display 'Open VOL Detail' window (go to (4))

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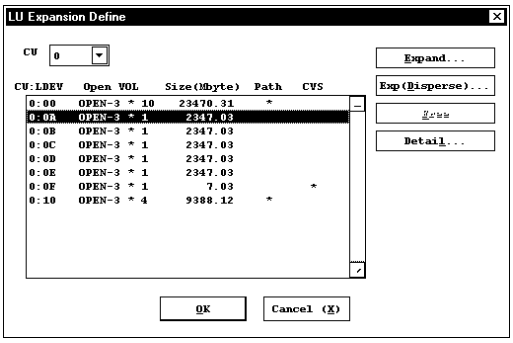
(1) The setting of LU Expansion (‘LU Expansion’ window)

Select (CL) [Expand...] button in ‘LU Expansion Define’ window. [Expand...] button comes to be available at the time of selecting connectable CU:LDEV from the list.

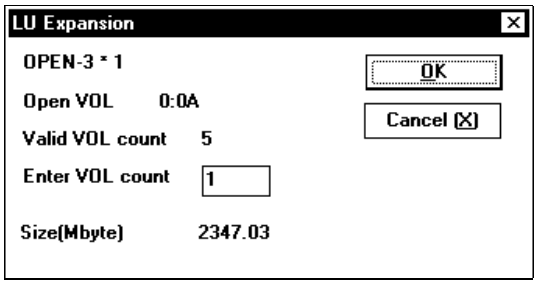


Connectable CU:LDEV denotes the following LDEVs.

- Unconnected CU:LDEVs
- CU:LDEV without SCSI path definition
- CU:LDEV with same emulation type
- CU:LDEV with same capacity
- CU:LDEV with has no CVS definition, if you select CU:LDEV which has no CVS definition.
- CU:LDEV with has CVS definition, if you select CU:LDEV which has CVS definition.

The selected CU:LDEV comes to be the head of Open VOL and also CU:LDEV# comes to be Open VOL#.

‘LU Expansion’ window is displayed.



Detail of displayed information

OPEN-XXX : Emulation type
OPEN VOL : Open VOL# (Selected CU:LDEV#)
Valid VOL count : Total number of LDEVs connectable together (maximum: 36)
Enter VOL count : The input field of connection number
Size [Mbyte] : The capacity of Open VOL

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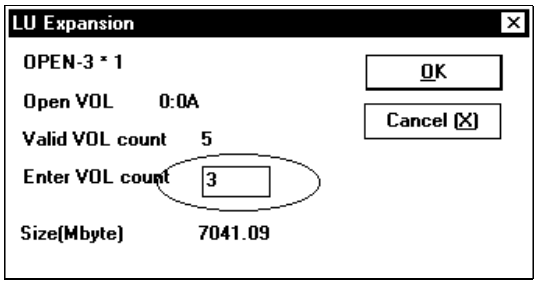
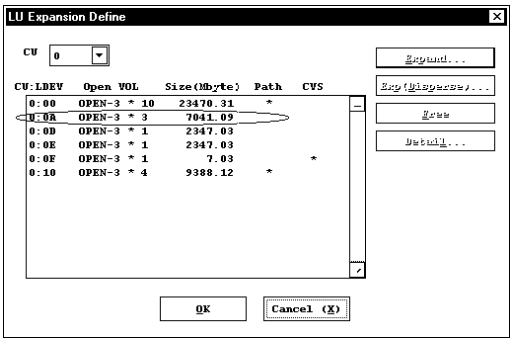
After the input of connection number, select (CL) [OK] button.

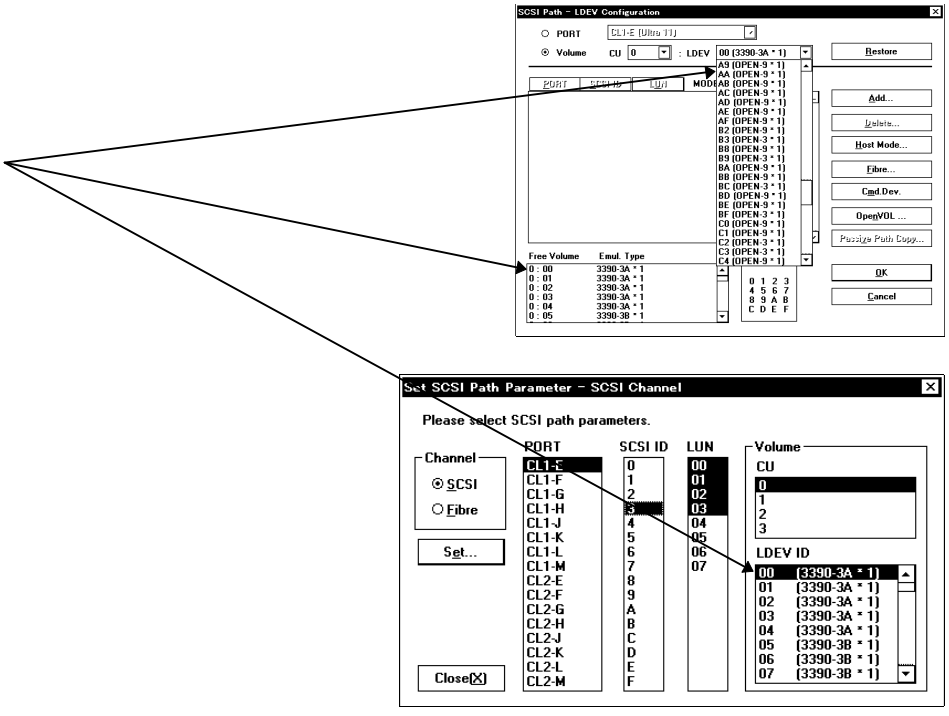


Update the list of 'LU Expansion Define' window.
(The right figure shows the case that 3 LDEVs starting at CU:LDEV=0:0A are connected together.)



Selecting (CL) [OK] button brings you back to 'SCSI Path-LDEV Configuration' window, and the contents of the window automatically updated. At the same time, the contents of 'Set SCSI Path Parameter' window is also updated (in the case that [Add...] button is selected (CL)).

Updated parts



The target of the SCSI path definition after Open VOL formalization is the CU:LDEV# of the head of Open VOL (Open VOL#).

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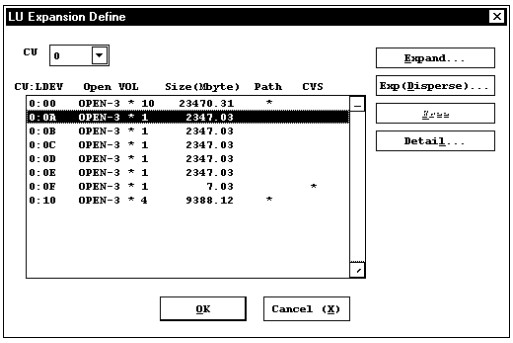
(2) The setting of LU Expansion by dispersive LDEV (‘LU Expansion (Disperse)’ window)

Select (CL) [Exp(Disperse)...] button in ‘LU Expansion Define’ window. [Exp(Disperse)...] button comes to be available at the time of selecting connectable CU:LDEV from the list.

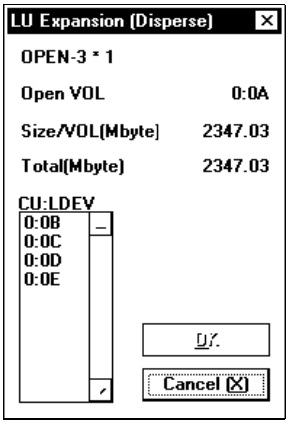


Connectable CU:LDEV denotes the following LDEVs.

- Unconnected CU:LDEVs
- CU:LDEV without SCSI path definition
- CU:LDEV with same emulation type
- CU:LDEV with same capacity
- CU:LDEV with has no CVS definition, if you select CU:LDEV which has no CVS definition.
- CU:LDEV with has CVS definition, if you select CU:LDEV which has CVS definition.

The selected CU:LDEV comes to be the head of Open VOL and also CU:LDEV# comes to be Open VOL#.

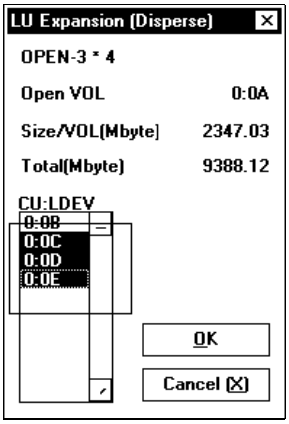
‘LU Expansion (Disperse)’ window is displayed.



Detail of displayed information

OPEN-XXX : Emulation type
Open VOL : Open VOL# (Selected CU:LDEV#)
Size/VOL(Mbyte) : The capacity per one CU:LDEV
Total(Mbyte) : The capacity of Open VOL
CU:LDEV list : Connectable CU:LDEV#

After the selection (CL) of connection CU:LDEV from the list, select (CL) [OK] button. (You can connect 36 CU:LDEVs include the head at a maximum.)



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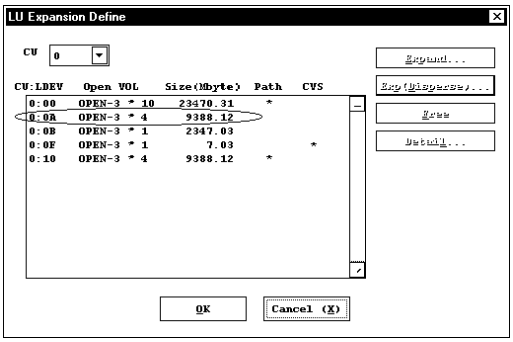
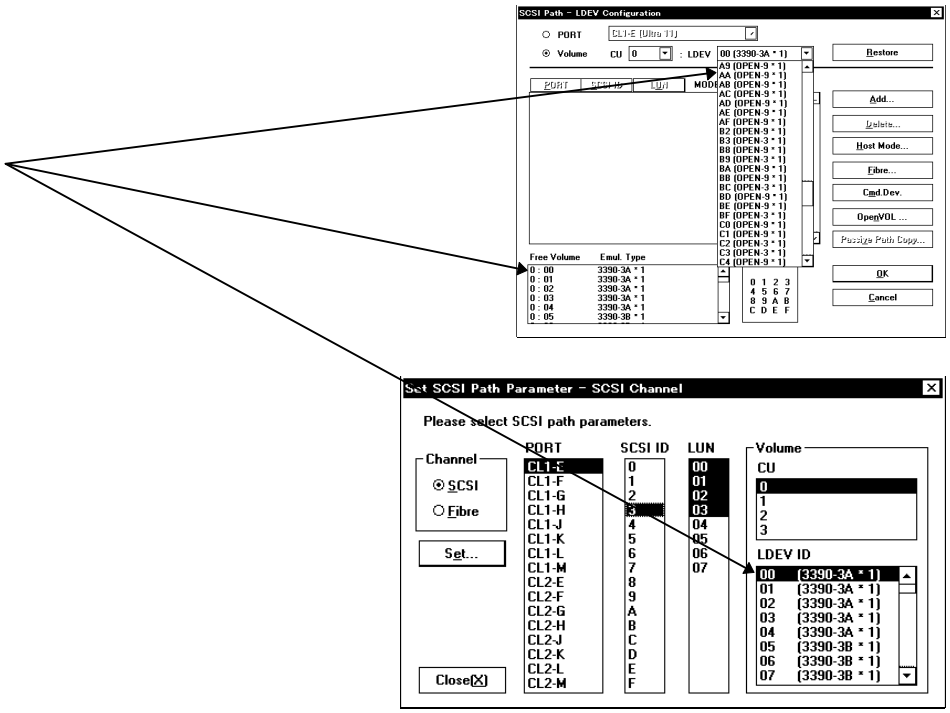
Update the list of ‘LU Expansion Define’ window.
(The right figure shows the case that CU:LDEV=0:0A, 0:0C, 0:0D, 0:0E are connected together.)



Selecting (CL) [OK] button brings you back to ‘SCSI Path-LDEV Configuration’ window, and the contents of the window automatically updated. At the same time, the contents of ‘Set SCSI Path Parameter’ window is also updated (in the case that [Add...] button is selected (CL)).

Updated parts



The target of the SCSI path definition after Open VOL formalization is the CU:LDEV# of the head of Open VOL (Open VOL#).

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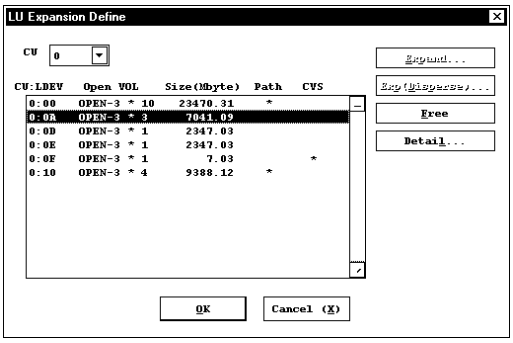
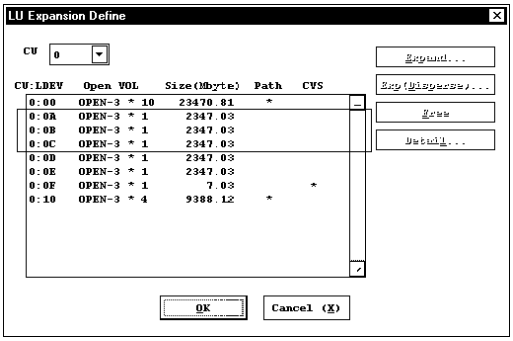
(3) Dissolution of Open VOL ('LU Expansion Define' window)

Select (CL) [Free] button on 'LU Expansion Define' window.
[Free] button comes to be available at the time that the "Dissolvable" Open VOL is selected in the list.



"Dissolvable" Open VOL denotes the Open VOL which satisfies the following conditions:
- Open VOL which has two or more LDEVs connected
- Open VOL which has no SCSI path definition

Update the list in 'LU Expansion Define' window. (The right figure shows the case that Open VOL#=0:0A which consisted of 3 LDEVs has been dissolved.)



Selecting (CL) [OK] button brings you back to 'SCSI Path-LDEV Configuration' window, and the contents of the window automatically updated. At the same time, the contents of 'Set SCSI Path Parameter' window is also updated (In the case that [Add...] button is selected).

After the Open VOL dissolution, the target of the SCSI path definition operation comes to the LDEV# after the dissolution.

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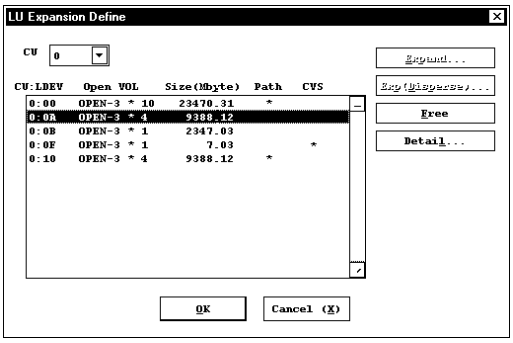
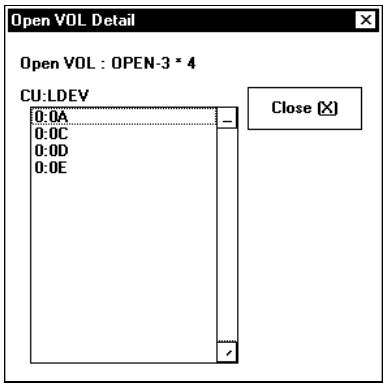
(4) Display detail information of Open VOL (‘Open VOL Detail’ window)

After the selection (CL) of LDEV at ‘LU Expansion Define’ window, select (CL) [Detail...] button.



‘Open VOL Detail’ window is displayed.

Detail of displayed information
CU:LDEV : CU:LDEV# of LDEV compose Open VOL



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Fibre port address (AL_PA and Loop ID)

AL PA	Loop ID	AL PA	Loop ID	AL PA	Loop ID	AL PA	Loop ID	AL PA	Loop ID	AL PA	Loop ID	AL PA	Loop ID	AL PA	Loop ID
EF	0	CD	16	B2	32	98	48	72	64	55	80	3A	96	25	112
E8	1	CC	17	B1	33	97	49	71	65	54	81	39	97	23	113
E4	2	CB	18	AE	34	90	50	6E	66	53	82	36	98	1F	114
E2	3	CA	19	AD	35	8F	51	6D	67	52	83	35	99	1E	115
E1	4	C9	20	AC	36	88	52	6C	68	51	84	34	100	1D	116
E0	5	C7	21	AB	37	84	53	6B	69	4E	85	33	101	1B	117
DC	6	C6	22	AA	38	82	54	6A	70	4D	86	32	102	18	118
DA	7	C5	23	A9	39	81	55	69	71	4C	87	31	103	17	119
D9	8	C3	24	A7	40	80	56	67	72	4B	88	2E	104	10	120
D6	9	BC	25	A6	41	7C	57	66	73	4A	89	2D	105	0F	121
D5	10	BA	26	A5	42	7A	58	65	74	49	90	2C	106	08	122
D4	11	B9	27	A3	43	79	59	63	75	47	91	2B	107	04	123
D3	12	B6	28	9F	44	76	60	5C	76	46	92	2A	108	02	124
D2	13	B5	29	9E	45	75	61	5A	77	45	93	29	109	01	125
D1	14	B4	30	9D	46	74	62	59	78	43	94	27	110		
CE	15	B3	31	9B	47	73	63	56	79	3C	95	26	111		

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2-10 Backup/Restore function

(1) Backup function
When finishing SCSI PATH-LDEV Configuration by selecting [OK], SVP will get the backup data of SCSI path definition information, Host mode information, Fibre information and LU size expansion information. You can choose if the data backup is need or not by displayed message.

(2) Restore function
SVP reads the backup data and displays it. The conditions that SVP execute the data restore function are following.

PCB installation/type
Current installed PCBs and their types are same as the backup data (Fibre 2ch and FibreT 2ch are treated as the same type)

Volume installation/type
Current installed volumes, their emulation types, command device setting are same as the backup data.

HORC
There is no HORC volume pair.

HOMRCF
There is no HOMRCF volume pair.

<Notice>
If you delete one of the SCSI path, the program will automatically delete the LUN security information corresponding to that deleted path. But, the Backup function could not get the LUN Security information. After using restore function, SVP will restore the deleted SCSI path information but SVP would not restore the LUN security information. (In this case, you should define the LUN security information again).

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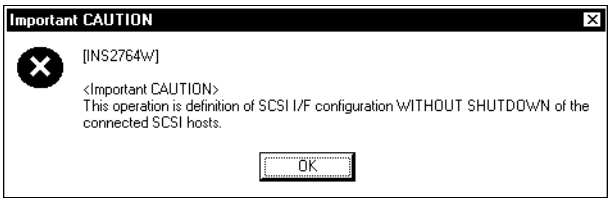
5.3.2.7 Online LUN Definition

NOTICE
Please confirm the OS of the connected SCSI hosts, before this operation.
If your connected OS is wrong, a system down or data lost (The operation may do unrecoverable serious damage to your file system.) may occur.

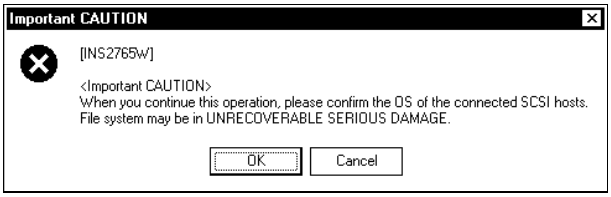
1.

Select (CL) [OK] in response to the confirmation message.
"<Important CAUTION>
This operation is definition of SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts."



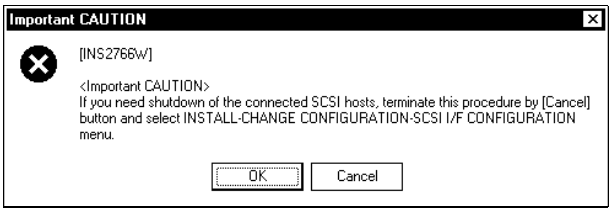
2.

Select (CL) [OK] in response to the confirmation message.
"<Important CAUTION>
When you continue this operation, please confirm the OS of the connected SCSI hosts.
File system may be in UNRECOVERABLE SERIOUS DAMAGE."



3.

Select (CL) [OK] in response to the confirmation message.
"<Important CAUTION>
If you need shutdown of the connected SCSI hosts, terminate this procedure by [Cancel] button and select INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION menu."



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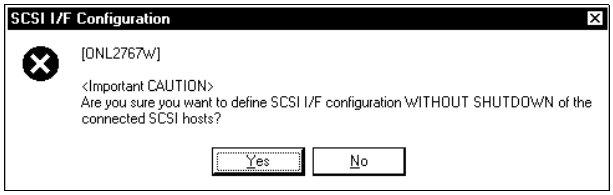
4.

Select (CL) [YES] in response to the confirmation message.
"<Important CAUTION>
Are you sure you want to define SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts?"



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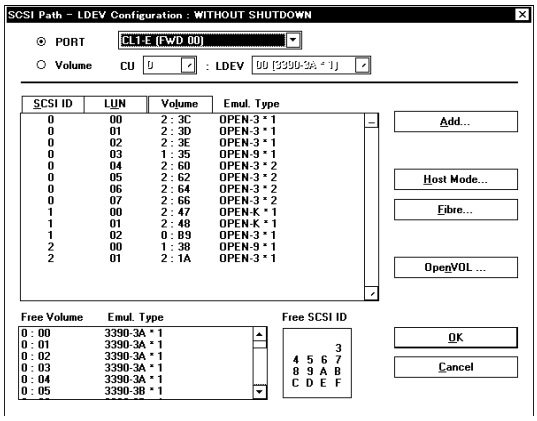
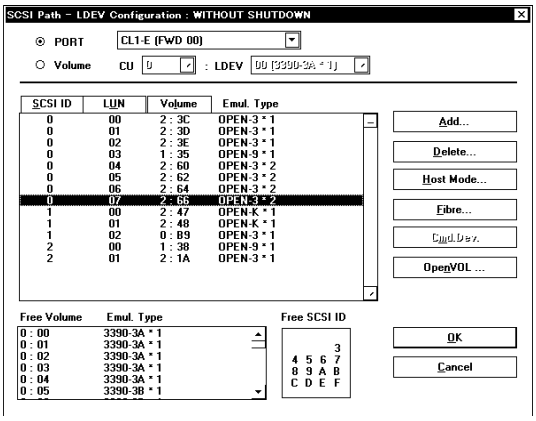
5.

"SCSI Path LDEV Configuration" window is displayed.





(1) Add

Refer to INST05-593.
After this operation, [Delete...] button can't be selected.

(2) Delete

Refer to INST05-595.
After this operation, [Add...] button can't be selected.

(3) Host Mode

Refer to INST05-595.
If you add path(s) to a port with no path, Host Mode of the port can be changed.

(4) Fibre

Refer to INST05-596.
If you add path(s) to a port with no path, Fibre information of the port can be changed.

(5) Open VOL

Refer to INST05-599B.

(6) Command Device

Refer to INST05-599A.
If you add path(s) to a volume with no path, Command Device can be set to the volume.
If you delete all path(s) to a Command Device volume, Command Device can be reset to the volume.

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6.

"LUN Security" screen is displayed.

NOTICE

Please confirm that there is no I/O to the LUN of which you will operate LUN Security configuration, before this operation.
If you do a wrong operation, a system down or data lost (The operation may do unrecoverable serious damage to your file system.) may occur.

Go to "LUN Security" (INST05-599-50).

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Blank Sheet

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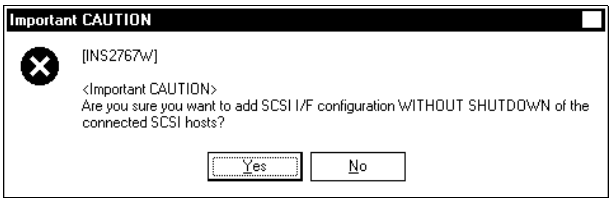
6.

"Checking Subsystem..." is displayed.

7.

Select (CL) [YES] in response to the confirmation message.
"<Important CAUTION>
Are you sure you want to add SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts?"

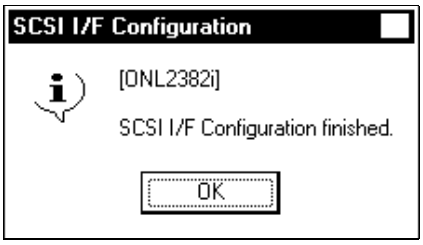


8.

"Changing SCSI I/F Configuration..." is displayed.
"Waiting for changing configuration data..." is displayed.

9.

Select (CL) [OK] in response to the confirmation message.
"SCSI I/F Configuration finished."



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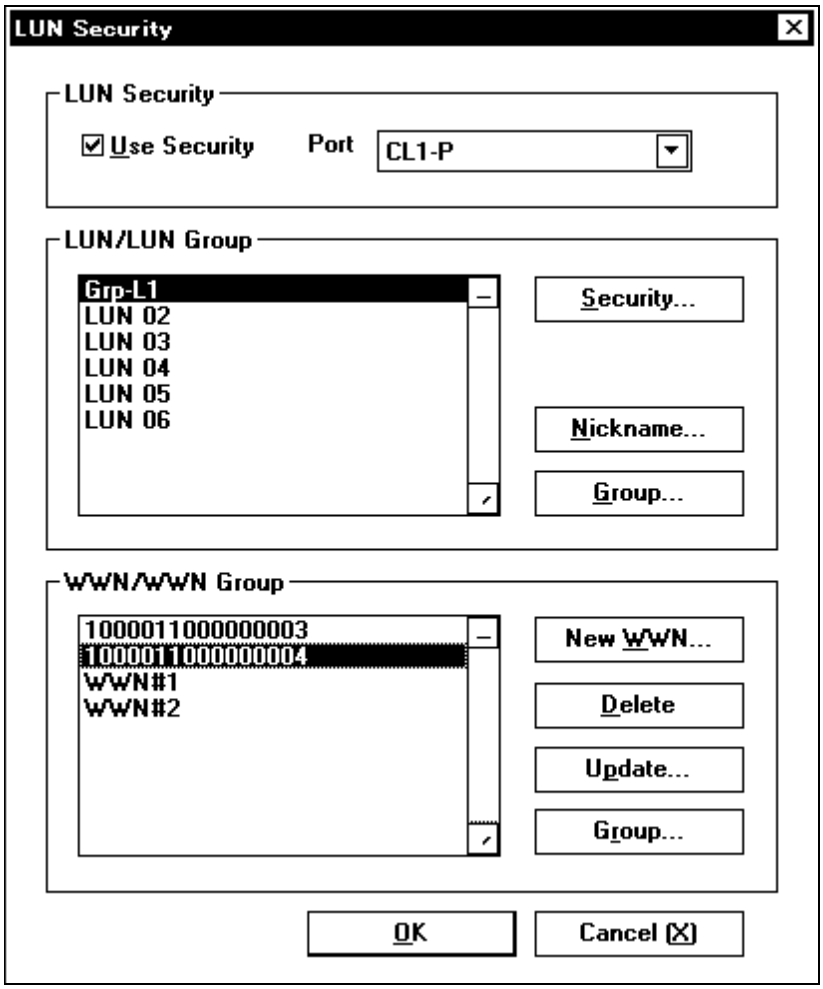
5.3.2.8 LUN Security

1. Name



(1) Use Security check box.
To determine the usage of LUN security function for each port.
(2) Port List
List of installed Fibre ports.
(3) LUN/LUN Group List
List of LUN groups which are set of the ports.
(4) Security button
To display Security Information Setting Screen.
(5) Nickname button
To display Name change Screen to set the LUN group name.
(6) Group button (LUN)
To display LUN group screen.
(7) WWN/WWN Group List
List of WWN/WWN groups which are set of the ports.

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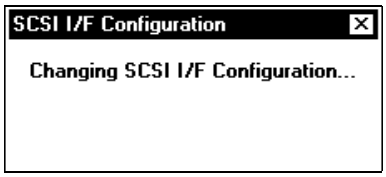
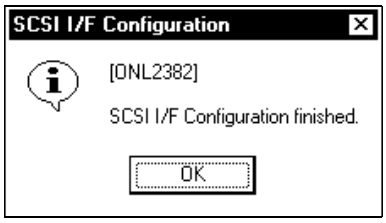
(8) New WWN button
To display WWN entry screen.
(9) Delete button
To delete WWN.
(10) Update button
To display a screen to change WWN/WWN groups.
(11) Group button (WWN)
To display WWN group screen.
(12) OK button
Define Configuration & Install : Go back to INST05-170 (14).
Refer Configuration : Go back to INST05-230 (2).
Change Configuration : To display 'SCSI I/F Configuration' screen.
After displaying "Wait..." message, please select [OK] in the 'SCSI I/F Configuration finished." and go back to INST05-320 (2).
(13) Cancel button
Define Configuration & Install : Go back to INST05-70 (4).
Refer Configuration : Go back to INST05-230 (2).
Change Configuration : Go back to INST05-320 (2).





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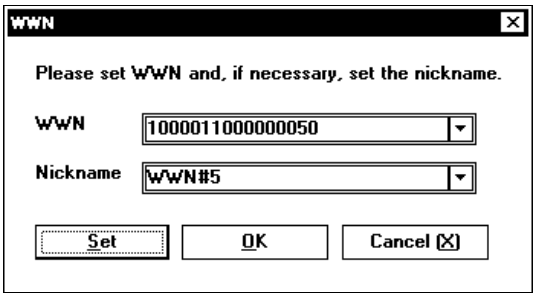
2. Detail

2.1 WWN Screen

This screen is to enter a new WWN (Max 31 WWNs).

(1) Input WWN in the 'WWN' as hexadecimal number (16 figures). If necessary, you can define a nickname to the WWN into 'Nickname'.



* You cannot use the following characters in the Nickname.
\ / : , ; * ? < > |

(2) Select [Set] button. SVP will display a confirmation message.

(3) Next, SVP will display blank in "WWN" and "Nickname" area. Therefore, you can continue entering a next new WWN by repeating the (1) - (2) steps

(4) If you select [OK] button, SVP will close this screen with entering the defined data in this screen. If you select [Cancel] button, SVP will close this screen with out entering the data.

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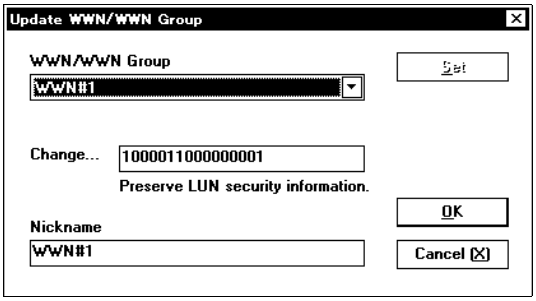
2.2 Update WWN/WWN Group Screen

This screen is to change WWN of WWN/WWN group and its group name.

(1) Select WWN or WWN group in WWN/WWN Group List which you want to change.



(2) In the case of changing WWN, input a new WWN in the 'Change...'. In the case of changing a WWN nickname or WWN group name, input a new nickname or group name in the 'Nickname'.

* You cannot use the following characters as a Nickname or a group name.
\ / : , ; * ? < > |

(3) Select [Set] button. SVP will display a confirmation message.

(4) If you select [OK] button, SVP will close this screen with entering the defined data in this screen. If you select [Cancel] button, SVP will close this screen with out entering the data.

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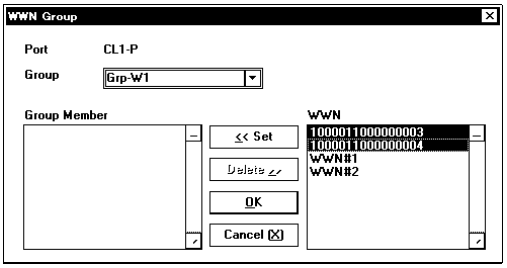
2.3 WWN Group Screen

This screen is to make WWN groups or change the member of the group. (Max:16 groups)
If a group has no or only 1 member, the group will be deleted automatically.

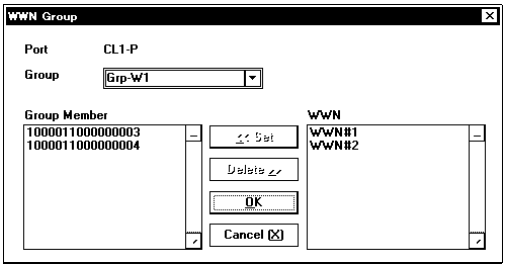
(1) Select a group from the Group List. If you enter a new group, input a new group name.



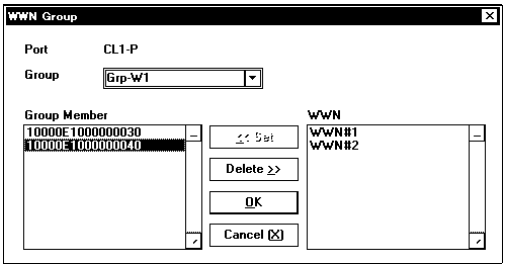
* You cannot use the following characters as a Nickname or a group name.
\ / : , ; * ? < > |

(2) Select several WWNs in the WWN list which you want to enter the member of the group.

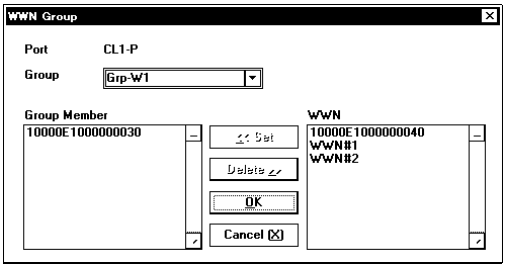
(3) Select [<<Set] button. SVP will move WWNs from the WWN List to Group Member List which you select.



(4) If you want to delete members from the group, select WWNs in the Group Member List.



(5) Select [Delete>>] button. SVP will move the selected WWNs from Group Member List to WWN list.



(6) If you select [OK] button, SVP will close this screen with entering the defined data in this screen.
If you select [Cancel] button, SVP will close this screen with out entering the data.

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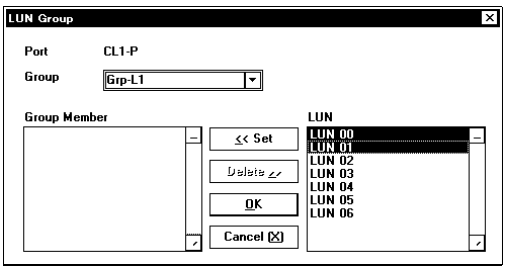
2.4 LUN Group Screen

This screen is to make LUN group or change the member of LUN group. (Max:16 groups)

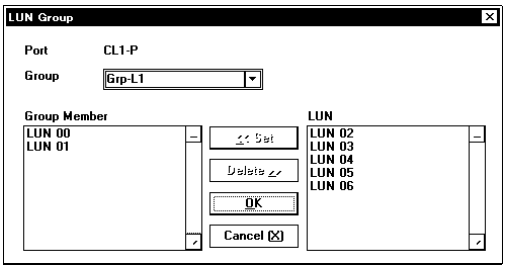
(1) Select a group form the Group List. If you make a new group, input a new group name.

* You cannot use the following characters as a Nickname or a group name.
\ / : , ; * ? < > |

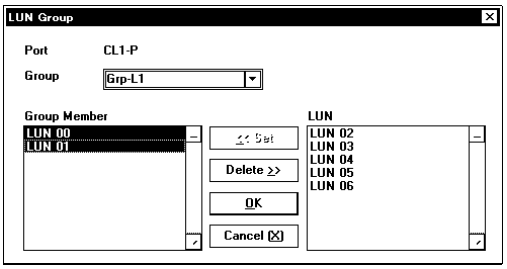


(2) Select several LUNs from the LUN list which you want to make group.

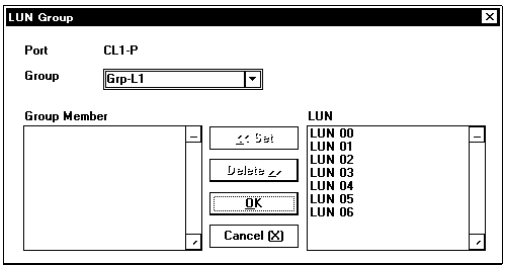
(3) Select [<<Set] button. SVP will move selected LUN from LUN List to Group Member List.



(4) If you want to delete member from the group, select the LUNs from the Group Member List.



(5) Select [Delete>>] button. SVP will move the selected LUNs from the Group Member List to LUN List.



(6) If you select [OK] button, SVP will close this screen with entering the defined data in this screen. If you select [Cancel] button, SVP will close this screen with out entering the data.

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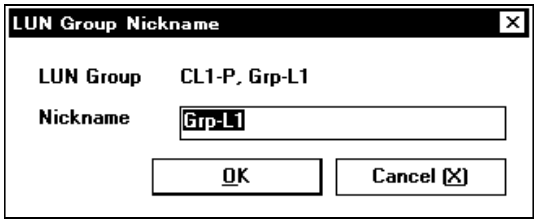
2.5 Nickname Screen

This screen is to change LUN group name.

(1) Input a nickname in the ‘Nickname’.

* You cannot use the following characters as a Nickname or a group name.
  \ / : , ; * ? < > |



(2) If you select [OK] button, SVP will close this screen with entering the defined data in this screen. If you select [Cancel] button, SVP will close this screen with out entering the data.

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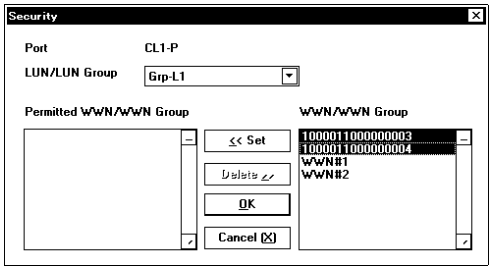
2.6 Security Screen

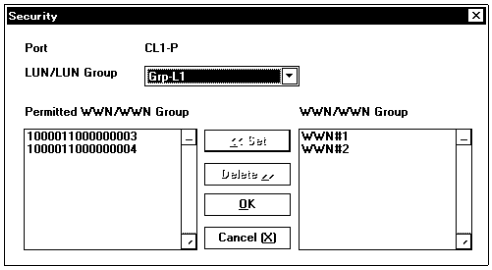
This screen is to set/reset the security information.

(1) Select LUN or LUN group in the LUN/LUN Group List which you want to set/reset.

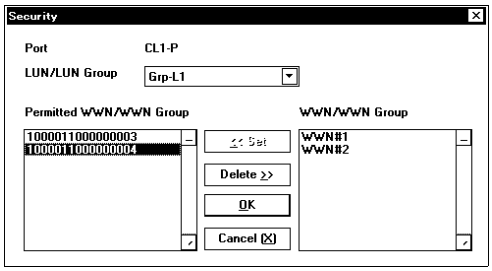


(2) Select WWN or WWN group from the WWN/WWN Group List which you want to permit the access to the selected LUN or LUN group.

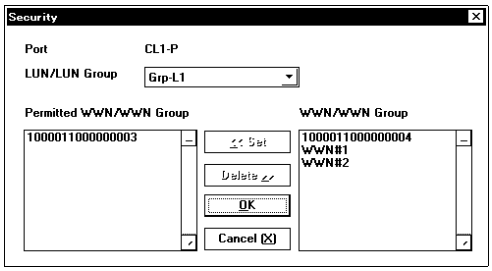
(3) Select [<<Set] button. SVP will move the selected WWN or WWN groups from WWN/WWN Group List to the permitted WWN/WWN Group List.



(4) If you want to delete the permitted list, select WWN or WWN groups from the WWN/WWN Group List.



(5) Select [Delete>>] button. SVP will move the selected WWN or WWN group from the permitted WWN/WWN Group List to WWN/WWN Group List



(6) If you select [OK] button, SVP will close this scrren with entering the defined data in this screen. If you select [Cancel] button, SVP will close this scrren with out entering the data.

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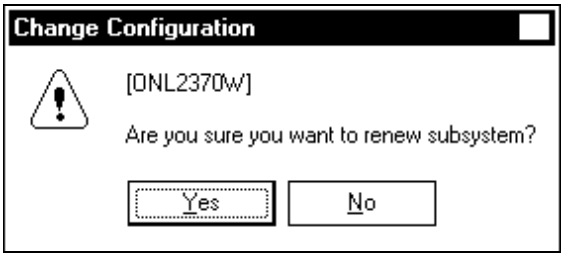
5.3.3 System Update Processing (SVP Procedure)

5.3.3.1 Installation system update processing

(a) Power supply installation

1. <Start installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2.
   “Reading the subsystem configuration data...”
   “Checking the physical device status...”
   “Reading the environment monitor...”
   are displayed.

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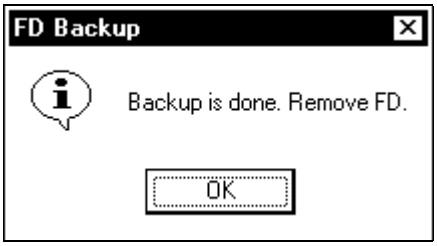
3. <End of system update processing>
"Renewal process has completed. Please check subsystem status." is displayed when recovery processing on all installed components is completed. Select (CL) [OK] in response to this message.

4.
"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

5.
When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



6. <Return to General flow page>
[In case of DKC additional power supplies and CL redundant power supplies (DKC-F310I-81/82) Installation]

Non-Disruptive Installation	: Go to INST02-20 step (3)-6.
Disruptive Installation	: Go to INST02-43 step (16)-3.

[In case of CL redundant power supplies (DKC-F310I-80) Installation]

Non-Disruptive Installation	: Go to INST02-20 step (2)-5.
Disruptive Installation	: Go to INST02-43 step (16)-3.

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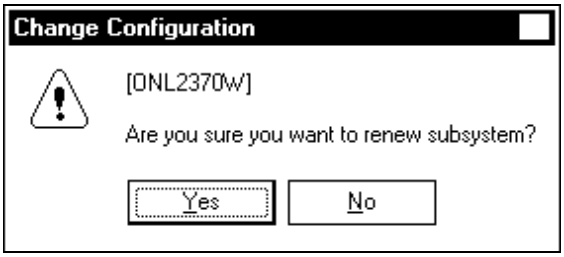
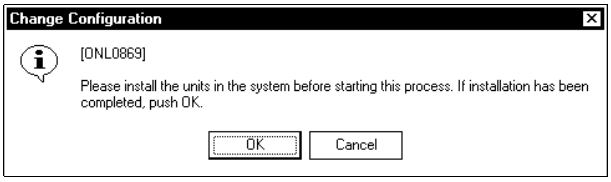
(b) CHA (DKA) installation

1. <Start installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2. <Check that hardware components are installed>
   Select (CL) [OK] after making sure that all hardware components are installed correctly in response to “Please install the units in the system before starting this process. If installation has been completed, push OK.”.



3.
   “Waiting for Power Event... Usually, several minutes (maximum 10 minutes)” is displayed.

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4. <Downloading microprogram>
Microprograms are automatically downloaded for each processor.

When CHA was installed, LCP (MCP), LCDG, MAIN, RAM BOOT Micro Programs are downloaded.

5. <CHA/DKA is restored>
CHA/DKA recovery processing is automatically executed.

6. <DKU PATH INLINE>
When DKA is installed, DKU PATH INLINE is run.

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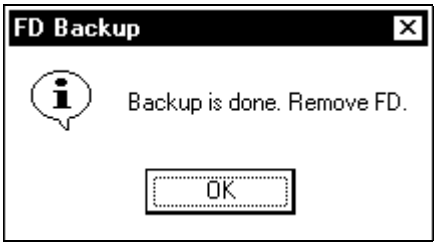
7. <End of system update processing>
"Renewal process has completed. Please check subsystem status." is displayed when recovery processing on all installed components is completed. Select (CL) [OK] in response to this message.

8.

"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

9.

When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



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8. <Return to General flow page>
   [In case of CHAs Installation]
   Non-Disruptive Installation : Go to INST02-20 step (4)-4.
   Disruptive Installation : Go to INST02-43 step (17)-3.
   [In case of DKAs Installation]
   Non-Disruptive Installation : Go to INST02-22 step (9)-5.
   Disruptive Installation : Go to INST02-43 step (20)-3.

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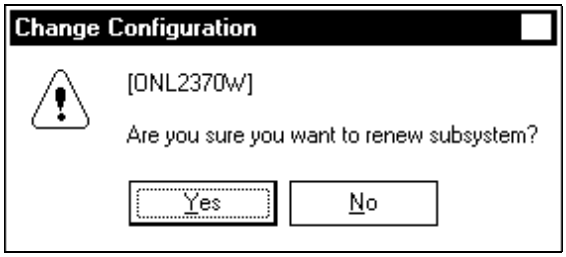
(c) Cache installation

1. <Start installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2.
   “The Shared Memory PCB is being blocked...” is displayed.

3. <Include Cache Memory>
   “The Cache Memory PCB is being blocked...” is displayed.

4.
   “Lighting LED of the PCB...” is displayed.

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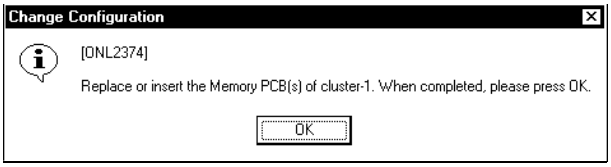
5. <Perform cache hardware installation>
When “Replace or insert the Memory PCBs of cluster-x. When completed, select [OK]” is displayed, install hardware components according to the cache hardware installation procedure.

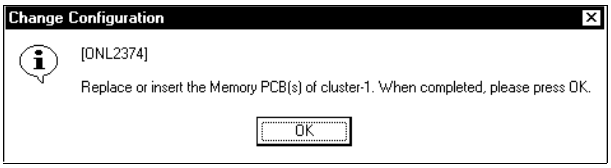


Go to the pages listed in the table below.

Cluster No.	Flowchart Page
Cluster 1	INST02-59A step ③
Cluster 2	INST02-59A step ⑤

6.

After installation of cache memory on one side is completed, select (CL) [OK] in response to “Replace or insert the Memory PCBs of cluster-x. When completed, select [OK].”.



7. <Cache CUDG executes>
“INLINE CUDG is now running...” is displayed.

8.

“Changing the configuration date, for equipment of shared/cache memory...” is displayed

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9.

"Restoring the Cache Memory PCB..." is displayed.

10.

"Restoring the Shared Memory PCB..." is displayed.

11. <Recover one side of cache>
When recovery processing is completed,
"The Cache Memory PCB is being blocked..." message appears.
Processing proceeds to blocking of the other side of CACHE Memory.

Subsequently, repeat steps 2 to 10 for the other side of cache.

12. <End of system update processing>
"Renewal process has completed. Please check subsystem status." is displayed when recovery processing on all installed components is completed. Select (CL) [OK] in response to this message.

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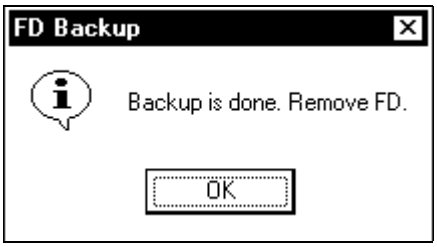
13.

"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

14.

When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



15. <Return to General flow page>
[In case of Cache Memory and Shared Memory Installation]
Go to INST02-59A step ⑦.

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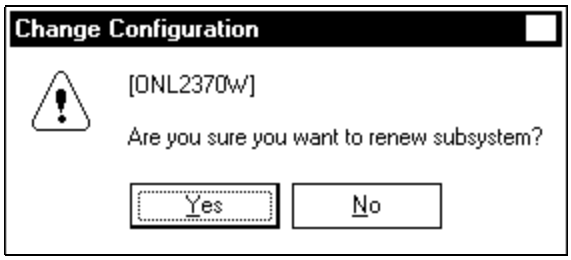
(c) SM installation

1. <Start installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2. “The Shared Memory PCB is being blocked...” is displayed.

3. “Lighting LED of the PCB...” is displayed.

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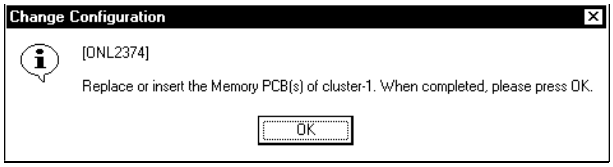
4. <Perform cache hardware installation>
When “Replace or insert the Memory PCBs of cluster-x. When completed, select [OK]” is displayed, install hardware components according to the cache hardware installation procedure.

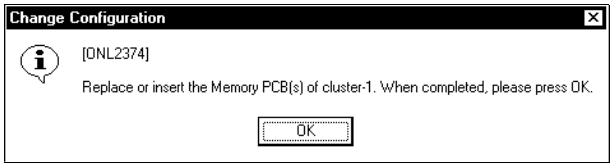


Go to the pages listed in the table below.

Cluster No.	Flowchart Page
Cluster 1	INST02-59B step ⑪
Cluster 2	INST02-59B step ⑫

5.

After installation of shared memory on one side is completed, select (CL) [OK] in response to “Replace or insert the Memory PCBs of cluster-x. When completed, select [OK].”.



6.

“Changing the configuration date, for equipment of shared/cache memory...” is displayed.

7.

“INLINE CUDG is now running...” is displayed.

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8.

"Restoring the Cache Memory PCB..." is displayed.

9.

"Restoring the Shared Memory PCB..." is displayed.

10. <Recover one side of cache>
When recovery processing is completed,
"The Shared Memory PCB is being blocked." message appears.
Processing proceeds to blocking of the other side of Shared Memory.

Subsequently, repeat steps 2 to 9 for the other side of cache.

11. <End of system update processing>
"Renewal process has completed. Please check subsystem status." is displayed when recovery processing on all installed components is completed. Select (CL) [OK] in response to this message.

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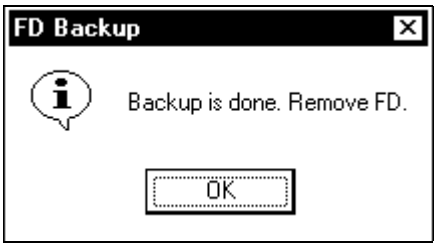
12.

"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

13.

When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



14. <Return to General flow page>
[In case of Cache Memory and Shared Memory Installation]
Go to INST02-59B step ⑭.

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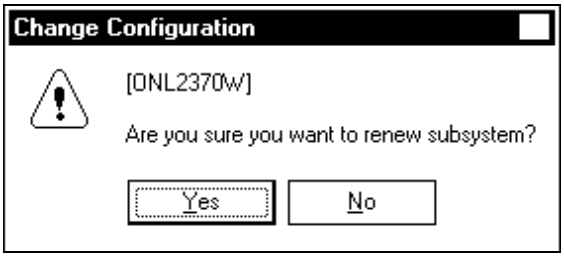
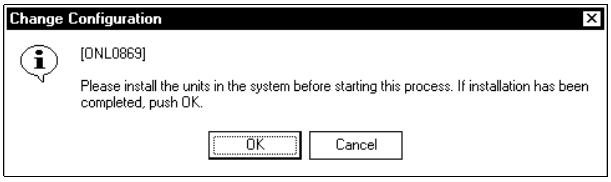
(d) HDD installation

1. <Start installation>
Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2. <Check that hardware components are installed>
Select (CL) [OK] after making sure that all hardware components are installed correctly in response to “Please install the units in the system before starting this process. If installation has been completed, push OK.”.



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3. <Include physical drives>
   “Upgrading the physical device...”
   “The physical device is being blocked...”
   “Changing the subsystem configuration data...”
   “Upgrading the logical device...”
   “Changing the subsystem configuration data...” are displayed.

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4.

Blank

5.

"DKU PATH INLINE is now running..." and
"Spinning up the physical devices..." are displayed.

6. <Execute DKU INLINE test>
"DKU INLINE is now running..." repeat the process for each installed Physical device.

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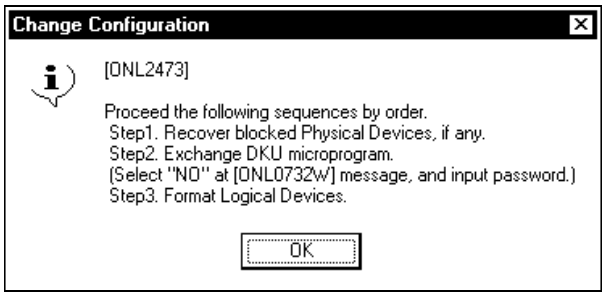
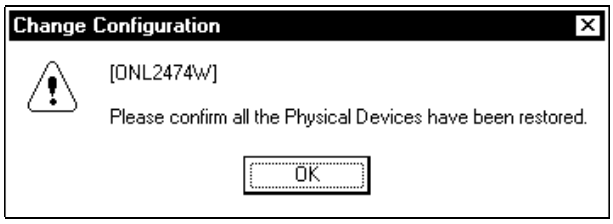
6-1.

Select (CL) [OK] in response to "Proceed the following sequences by order. Step1. Recover blocked Physical device, if any. Step2. Exchange DKU Microprogram. (Select "NO" at [ONL0732W] message, and input the password.) Step3. Format Logical devices."



If the following message is displayed, go to INST05-723.6-7.



6-2. <Check the end of installation procedure>

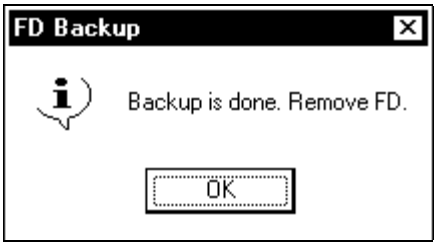
Select (CL) [OK] in response to "Renewal process has completed. Please check subsystem status."
And check subsystem status.

6-3. <FD back up>

Insert the configuration FD into FDD, select (CL) [OK].

6-4.

When this procedure is completed, message "Back up is done. Remove FD." is displayed. Remove the FD, select (CL)[OK].



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6-5. <Exchange Microprogram>

Please perform DKU micrprogram exchange.
See MICRO FC section (MICR-FC00-00)
After exchange DKU microprogram, go to 6-6.

6-6. <Logical Device format>

Please perform Logical Device format.
See SVP section (SVP02-610)

Go to INST05-730.

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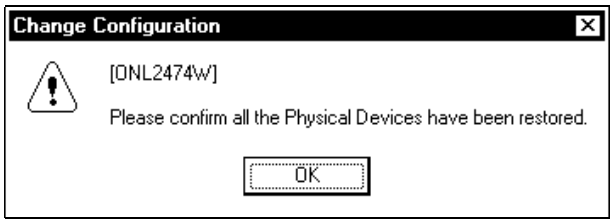
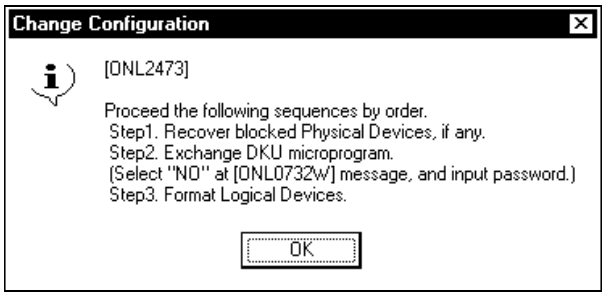
6-7. <Check of restoring physical device>

Select (CL) [OK] in response to "Please confirm all the Physical Devise has been restored."



6-8.

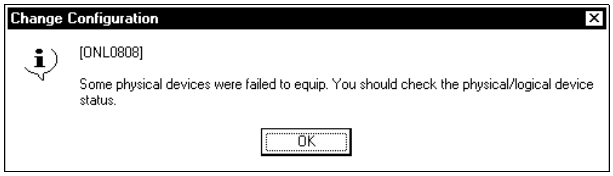
Select (CL) [OK] in response to "Proceed the following sequences by order. Step1. Recover blocked Physical device, if any. Step2. Exchange DKU Microprogram. (Select "NO" at [ONL0732W] message, and input password.) Step3. Format Logical Devices".



6-9. <Check the physical/logical device status>

Select (CL) [OK] in response to "Some physical devices were failed to equip. You should check the physical/logical device status."

And please check the physical device and logical device status.



6-10. <FD back up>

Insert the configuration FD into FDD, select (CL) [OK].

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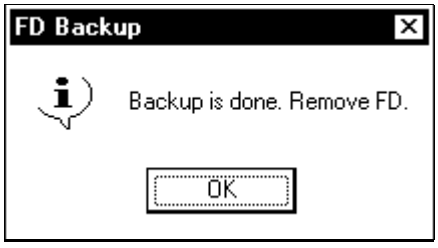
6-11.

When this procedure is completed, message “Back up is done. Remove FD.” is displayed. Remove the FD, select (CL) [OK].



6-12. <Replace Physical Device>

Please replace the blockade Physical device.

See Replace section 1.PRE-PROCEDURE B (REP02-30)
2.HARDWARE A (REP03-10)
3.POST-PROCEDURE C (From REP04-150 to REP04-180 .7)

After replacement, go to 6-13.

6-13. <Exchange Microprogram>

Please perform exchange DKU micrprogram.
See MICRO FC section (MICR-FC00-00)

After exchange DKU microprogram, go to 6-14.

6-14. <Logical Device format>

Please perform Logical Device format.
See SVP section (SVP02-610)

Go to INST05-730.

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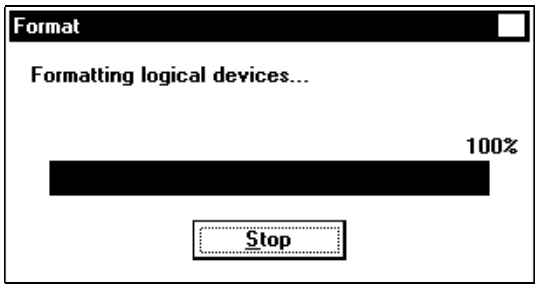
7. <LDEV FORMAT>
"Formatting the logical device..." is displayed.



8. <End of system update processing>
"Renewal process has completed. Please check subsystem status." is displayed when recovery processing on all installed components is completed. Select (CL) [OK] in response to this message.

9.
"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

10.
When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].

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11. <Return to General flow page>

[In case of HDD Installation in change of the Device control value]

Non-Disruptive Installation : Go to INST02-23 step (10)-7.

Disruptive Installation : Go to INST02-44 step (23)-6.

[In case of HDD Installation in no change of the Device control value]

Non-Disruptive Installation : Go to INST02-23 step (10)-14.

Disruptive Installation : Go to INST02-44 step (23)-13.

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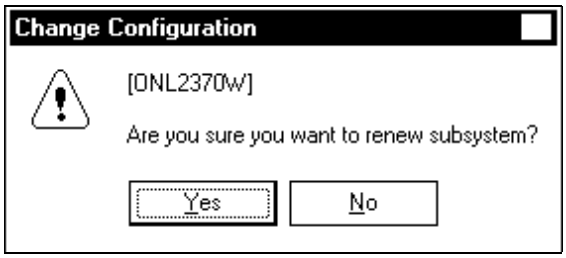
5.3.3.2 De-installation system update processing

(a) HDD de-installation

1. <Start de-installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2.
   Blank

3.
   Blank

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4. <Maintenance-block of PCBs other than cache or shared memory>
   At this moment, maintenance blocking is performed on PCBs other than memory systems with message “Checking the physical device status...”.

5. <Update device structure information about PCBs other than cache or shared memory>
   “De-installation of the logical device...” and “Lighting LED of the PCB...” are displayed and the device structure information update processing is performed on the current component. When the update processing is completed, the device structure information on the current component is set to [EMPTY] and the shut down LED on the PCB is lit.

   When the update of device structure information on all PCBs other than those on the memory systems is completed, automatically one of the two following message is displayed.
   Then proceed with the related procedure for each message.

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6. <Physical Drive blocking>
   “The physical device is being blocked...”
   “Spinning down the physical devices...”
   “De-installation of the physical devices...”
   “Changing the subsystem configuration data...”
   “Blocking the logical device...”
   “De-installation of the logical device...”
   “Changing the logical device configuration data...”
   are displayed.

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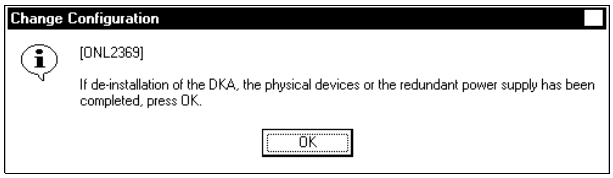
7.

Blank

8.

Select (CL) [OK] in response to “If de-installation of the DKA, the physical devices or the redundant power supply has been completed, press OK.” shown in the right figure.



Selecting [OK] causes the next message to be displayed.

“Processing to enable the environment check...” is displayed.

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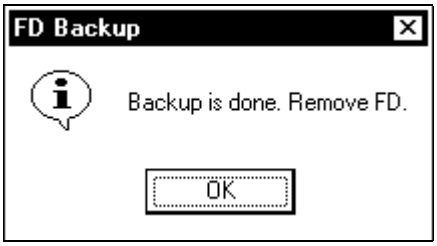
9. <Check the end of de-installation procedure>
"Renewal process has completed. Please check subsystem status." shown in the right figure displayed. Select (CL) [OK] in response to this message.

10.
"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

11.
When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



12. <Return to General flow page>
[In case of HDD canisters De-Installation]
Non-Disruptive De-Installation : Go to INST02-30 step (2)-3.
Disruptive De-Installation : Go to INST02-50 step (2)-3.

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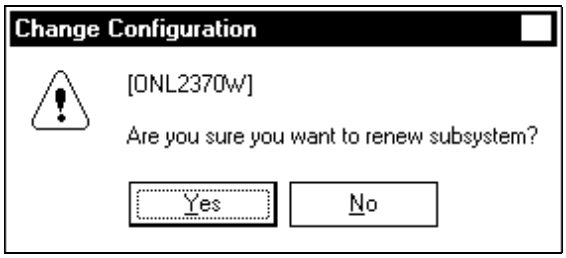
(b) CHA (DKA) de-installation

1. <Start de-installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2. Blank

3. Blank

4. <Maintenance-block of PCBs other than cache or shared memory>
   At this moment, maintenance blocking is performed on PCBs other than memory systems with message “The CHA (DKA) is being blocked...” is displayed.
   This processing is carried out on each component that is subject to de-installation.

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5. <Update device structure information about PCBs other than cache or shared memory>
“The CHA (DKA) is being blocked...” and “Lighting LED of the PCB...” are displayed and the device structure information update processing is performed on the current component. When the update processing is completed, the device structure information on the current component is set to [EMPTY] and the shut down LED on the PCB is lit.

When the update of device structure information on all PCBs other than those on the memory systems is completed, automatically one of the two following message is displayed.

6.

Blank

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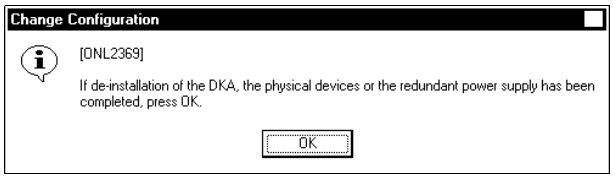
7.

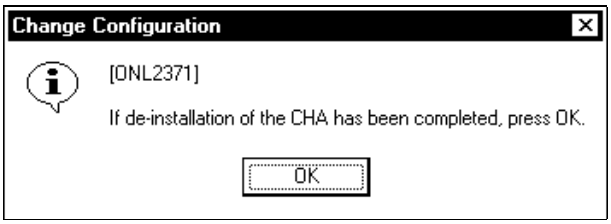
[In case of DKAs De-installation]

Select (CL) [OK] in response to "If de-installation of the DKA, the physical devices or the redundant power supply has been completed, press OK." shown in the right figure.



[In case of CHAs De-installation]

Select (CL) [OK] in response to "If de-installation of the CHA has been completed, press OK." shown in the right figure.



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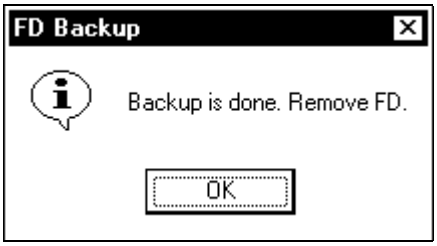
8. <Check the end of de-installation procedure>
"Renewal process has completed. Please check subsystem status." shown in the right figure displayed. Select (CL) [OK] in response to this message.

9.

"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

10.

When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



11. <Return to General flow page>
[In case of DKAs De-Installation]
Non-Disruptive De-Installation : Go to INST02-31 step (3)-3.
Disruptive De-Installation : Go to INST02-51 step (3)-3.
[In case of CHAs De-Installation]
Non-Disruptive De-Installation : Go to INST02-33 step (8)-3.
Disruptive De-Installation : Go to INST02-51 step (6)-3.

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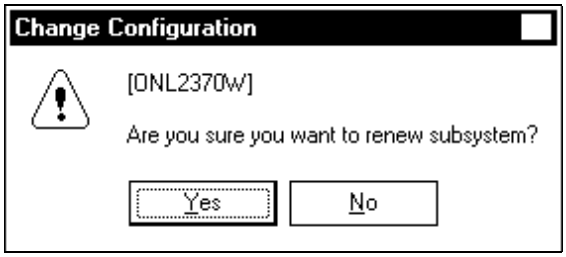
(c) Cache de-installation

1. <Start de-installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2.
   Blank

3.
   Blank

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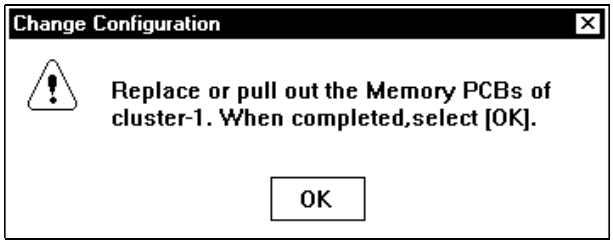
4. <Memory blocking on one side>
When blocking of one side of shared memory and Cache memory is completed, “The Cache Memory PCB is being blocked...” “The Shared Memory PCB is being blocked...” are displayed.

5.
“Lighting LED of the PCB...” is displayed.

6. <Perform cache hardware de-installation>
When “Replace or pull out the Memory PCBs of cluster-x. When completed, select [OK].” is displayed, perform hardware de-installation steps according to the cache hardware de-installation procedure.



Go to the pages listed in the table below.

Cluster No.	Flowchart Page
Cluster 1	INST02-59C step ②
Cluster 2	INST02-59C step ④

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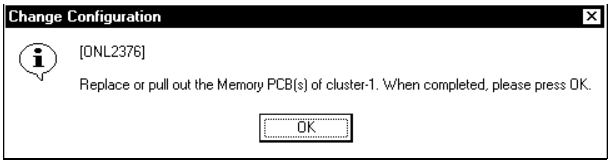
7.

After the hardware procedure for one side of cache memory is completed, select (CL) [OK] in response to “Replace or pull out the Memory PCBs of cluster-x. When completed, select [OK].”.



8. <Cache CUDG executes>
“INLINE CUDG is running...” is displayed.

9.

When CUDG is completed, recovery processing is automatically started with message.

“Restoring the Cache Memory PCB...”

“Shared memory renewal is in progress...”

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10.

When the recovery processing is complete, processing proceeds to blocking of the other side of shared memory.

Subsequently, repeat steps 5 to 9 for the other side of cache.

11.

When all cache recovery operations are completed, “Renewal process has completed. Please check subsystem status.” message appears.

12. <Check the end of de-installation procedure>
“Renewal process has completed. Please check subsystem status.” shown in the right figure displayed. Select (CL) [OK] in response to this message.

13.

“Reading subsystem configuration data...” is displayed.
“Please insert config FD in FDD.” is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

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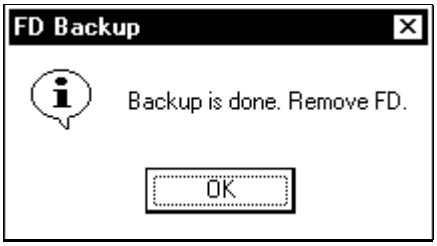
14.

When this procedure is completed, message “Back up is done. Remove FD.” is displayed.
Remove the FD, select (CL) [OK].



15. <Return to General flow page>

[In case of Cache Memory and Shared Memory De-Installation]

Go to INST02-59C step ⑥.

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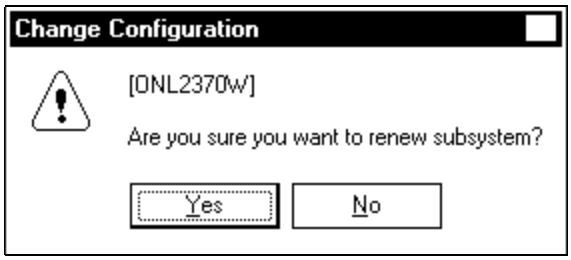
(d) SM de-installation

1. <Start de-installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2.

Blank

3.

Blank

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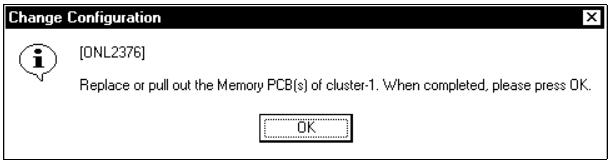
4. <Memory blocking on one side>
When blocking of one side of shared memory is completed, “The Shared Memory PCB is being blocked...” are displayed.

5.
“Lighting LED of the PCB...” is displayed.

6. <Perform cache hardware de-installation>
When “Replace or pull out the Memory PCBs of cluster-x. When completed, select [OK].” is displayed, perform hardware de-installation steps according to the cache hardware de-installation procedure.



Go to the pages listed in the table below.

Cluster No.	Flowchart Page
Cluster 1	INST02-59D step ⑩
Cluster 2	INST02-59D step ⑫

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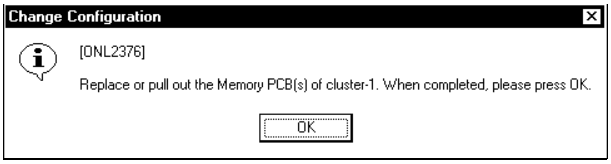
7.

"Changing the configuration data, for equipment of shared/cache memory..." is displayed.

8.

After the hardware procedure for one side of cache memory is completed, select (CL) [OK] in response to "Replace or pull out the Memory PCBs of cluster-x. When completed, select [OK].".



"INLINE CUDG is running..." is displayed.

9.

When CUDG is completed, recovery processing is automatically started with message.

"Restoring the Cache Memory PCB..."

"Restoring the Shared Memory PCB..."

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10.

When the recovery processing is complete, processing proceeds to blocking of the other side of shared memory.

Subsequently, repeat steps 5 to 9 for the other side of cache.

11.

When all shared memory recovery operations are completed, “Renewal process has completed. Please check subsystem status.” message appears.

12. <Check the end of de-installation procedure>
“Renewal process has completed. Please check subsystem status.” shown in the right figure displayed. Select (CL) [OK] in response to this message.

13.

“Reading subsystem configuration data...” is displayed.
“Please insert config FD in FDD.” is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

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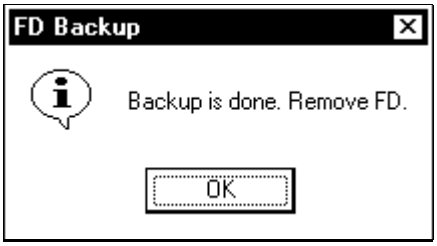
14.

When this procedure is completed, message “Back up is done. Remove FD.” is displayed.
Remove the FD, select (CL) [OK].



15. <Return to General flow page>

[In case of Cache Memory and Shared Memory De-Installation]

Go to INST02-59D step ⑭.

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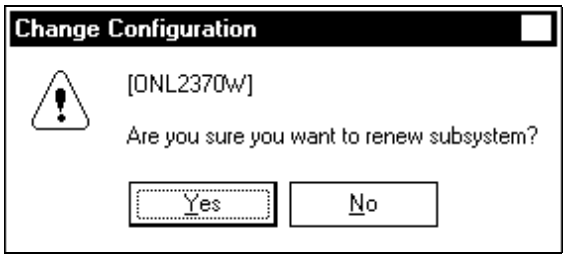
(e) Power supply de-installation

1. <Start de-installation>
   Select (CL) [Yes] in response to “Are you sure you want to renew subsystem?”.



2.
   Blank

3.
   Blank

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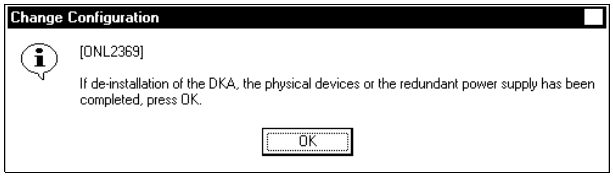
4.

Select (CL) [OK] in response to "If de-installation of the CHA/DKA, the physical devices or the redundant power supply has been completed, press OK." shown in the right figure.



Selecting [OK] causes the next message to be displayed.

"Processing to enable the environment check..." is displayed.

5. <Check the end of de-installation procedure>

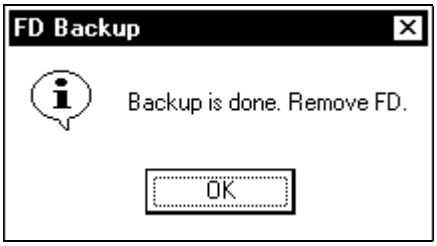
"Renewal process has completed. Please check subsystem status." shown in the right figure displayed. Select (CL) [OK] in response to this message.

6.

"Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

7.

When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



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8. <Return to General flow page>

[In case of DKC additional power supplies and CL redundant power supplies De-Installation]

Non-Disruptive De-Installation : Go to INST02-33 step (9)-3.

Disruptive De-Installation : Go to INST02-51 step (7)-3.

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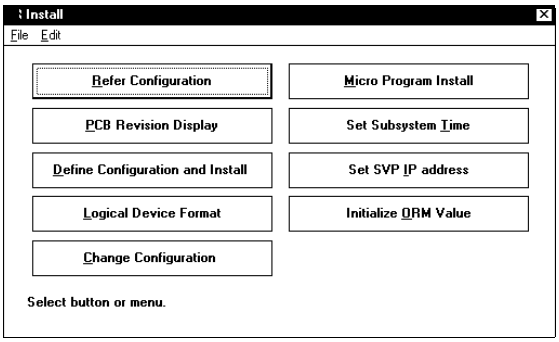
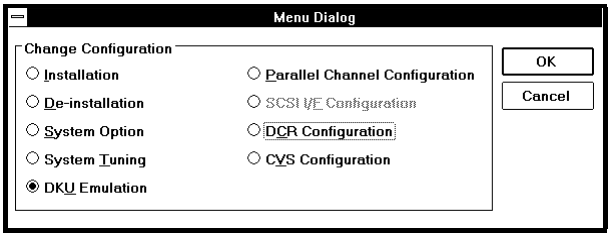
5.3.4 Emulation Type Change

1. <Mode Change>
   Change the mode to Modify Mode.
   Select (CL) [Install].

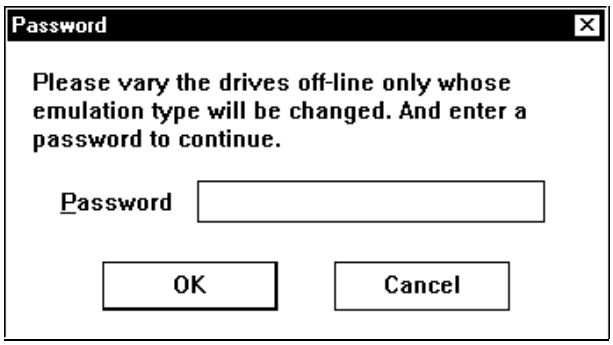
2. <Start 'Menu Dialog' screen>
   Select (CL) [Change Configuration].



3. <Start Device Structure Setup screen>
   Select (CL) [DKU Emulation] in the 'Menu Dialog' dialog box and select (CL) [OK].



4. <Input password>
   Enter the password and select (CL) [OK].



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong drive for which the emulation type is to be changed is selected, and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

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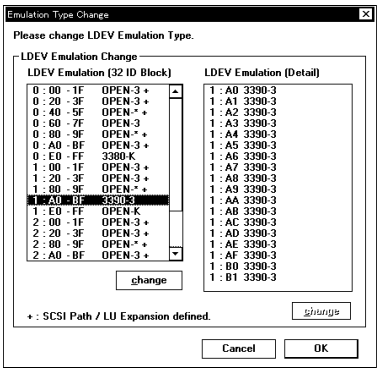
5. Emulation Change Procedure

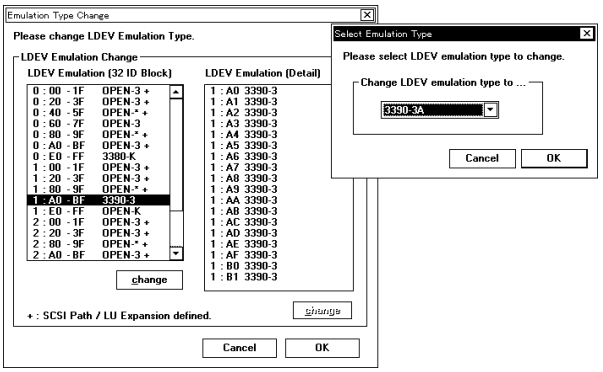
5.1 Emulation Type Change for Single Block

(1) Select (CL) a block including an LDEV for which you want to change an emulation type in the LDEV Emulation (32 ID Block) list box.



---

(2) Select (CL) the [Change] beneath the LDEV Emulation (32 ID Block) list box to open the dialog box for choosing an emulation type to be changed, and select (CL) the changed emulation type.



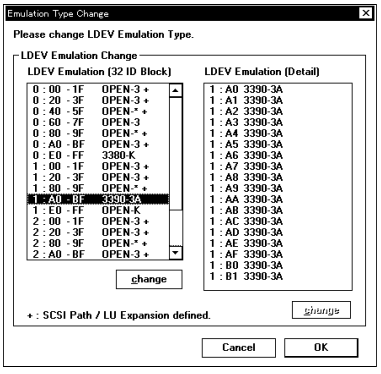
In the following case, [Change] button is not available. (It's concerned with "+" indicated LDEV.)

a) Block including volumes with SCSI path is selected.

b) Block including LU Expanded volumes is selected.

---

(3) Select (CL) the [OK] to set the changed emulation type. Then, the type of LDEV (selected in step (1)) having the emulation type to be changed varies to the one specified in step (2). When selecting the same LDEV block after setting the change, you can check details of the changes in the LDEV Emulation (Detail) list box.



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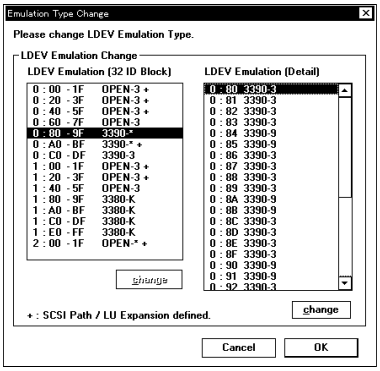
5.2 Emulation Type Change for Single LDEV

(1) Select (CL) a block including an LDEV for which you want to change an emulation type in the LDEV Emulation (32 ID Block) list box.

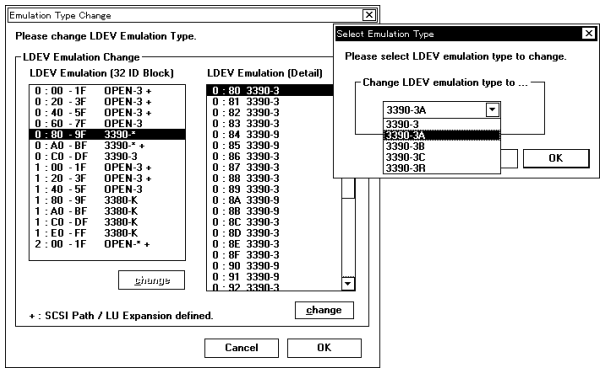


(2) In the LDEV Emulation (Detail) list box, select (CL) an LDEV of which emulation type is to be changed.

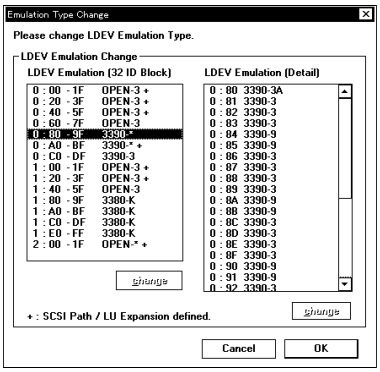
(3) Select (CL) the [Change] beneath the LDEV Emulation (Detail) list box to open the dialog box for choosing an emulation type to be changed, and select (CL) the changed emulation type.

In the following case, [Change] button is not available. (It's concerned with "+" indicated LDEV.)

a) Volume with SCSI path is selected.
b) LU expanded volume is selected.



(4) Select (CL) the [OK] to set the changed emulation type.
Then, the type of LDEV (selected in step (2)) varies to the one specified in step (3).



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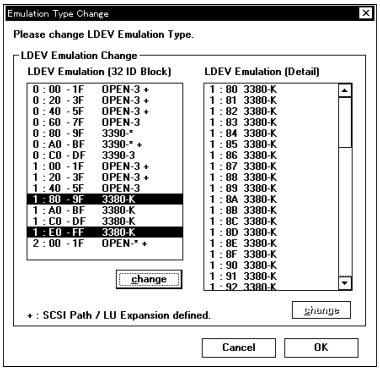
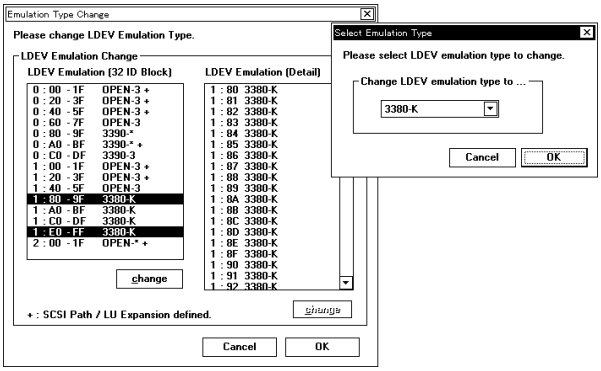
5.3 Emulation Type Change for Multiple Blocks

(1) Select (CL) blocks including an LDEV for which you want to change an emulation type in the LDEV Emulation (32 ID Block) list box.



(2) Select (CL) the [Change] beneath the LDEV Emulation (32 ID Block) list box to open the dialog box for choosing an emulation type to be changed, and select (CL) the changed emulation type.

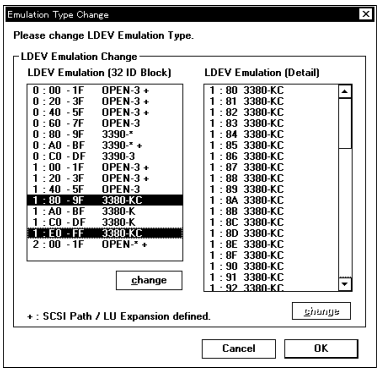


In the following case, [Change] button is not available. (It's concerned with "+" indicated LDEV.)

a) Blocks including volumes with SCSI path are selected.

b) Blocks including LU expanded volumes are selected.

(3) Select (CL) the [OK] to set the changed emulation type. Then, the type of LDEV (selected in step (1)) having the emulation type to be changed varies to the one specified in step (2). When selecting the same LDEV block after setting the change, you can check details of the changes in the emulation LDEV Emulation (Detail) list box.



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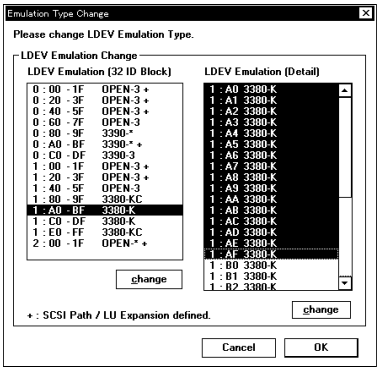
5.4 Individual Emulation Type Change for Multiple LDEVs

(1) Select (CL) a block including LDEVs for which you want to change an emulation type in the LDEV Emulation (32 ID Block) list box.

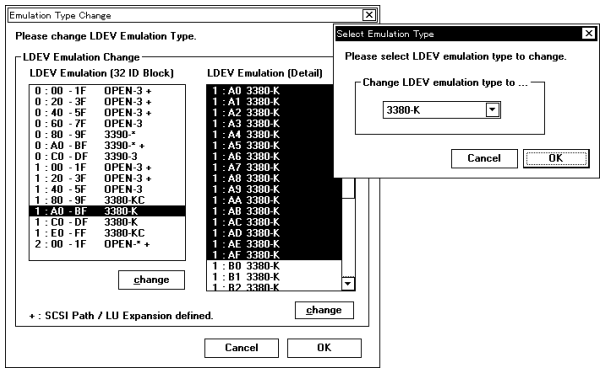


(2) In the LDEV Emulation (Detail) list box, select (CL) LDEVs of which emulation types are to be changed.

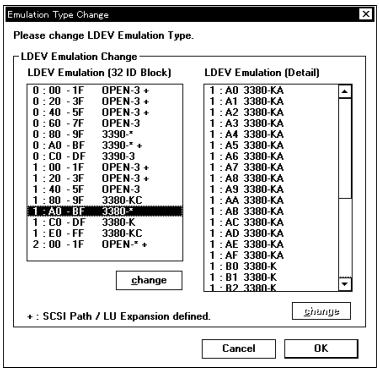
(3) Select (CL) the [Change] beneath the LDEV Emulation (Detail) list box to open the dialog box for choosing an emulation type to be changed, and select (CL) the changed emulation type.

In the following case, [Change] button is not available. (It's concerned with "+" indicated LDEV.)

a) Volumes with SCSI path are selected.
b) LU expanded volumes are selected.



(4) Select (CL) the [OK] to set the changed emulation type.
Then, the type of LDEV (selected in step (2)) varies to the one specified in step (3).



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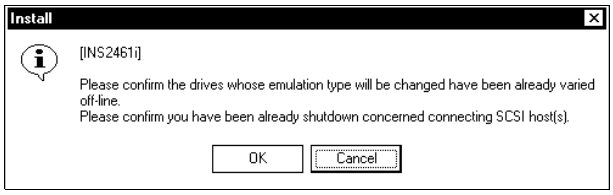
6.

Select (CL) [OK] to decide the emulation type change.
Select (CL) [Cancel] to cancel the operation.

7.

Before changing the emulation type, confirm that the drive has already been set to Vary Off-line and that the SCSI host concerned has been shut down, and then select (CL) [OK].



When [Cancel] is selected (CL), the processing is aborted.

8.

"Changing DKU Emulation" is displayed.

9. <Drive Vary On-line>

When the emulation type change processing terminates normally, the message "Changing emulation type is normal end. Please vary the drives on-line." is displayed.
Vary the drive on-line and select (CL) [OK].

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5.4 System Tuning SVP Procedure

5.4.1 System Tuning

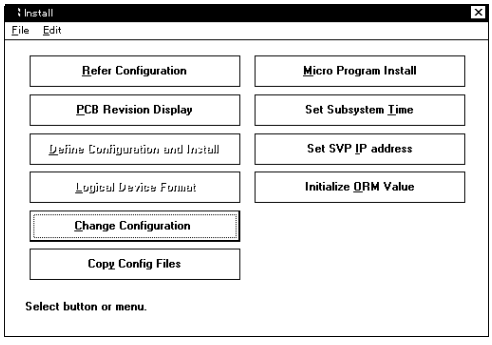
NOTICE
Powering off/on is required owing to the performance of this operation.

Overview
This function modify the part of established subsystem configuration data.
The data to be modified is control data closely related to a host device, so the data can not be modified on on-line.
After modification of the data, power DKC off and on.
The data to be modified is listed below.

'DKC Configuration' ---------- DKC Serial Number/Sub System ID/DKC Emulation Type
'Channel Configuration' -------- Channel Speed/Device Address/LDEV Control Drives
'System Option Setup' ---------- Spare Disk Recovering/Dynamic Sparing

1. <Start [Install]>
   Select [Install] from 'SVP' (CL).

2.
   Select [Change Configuration] (CL) from 'Instal'l'.



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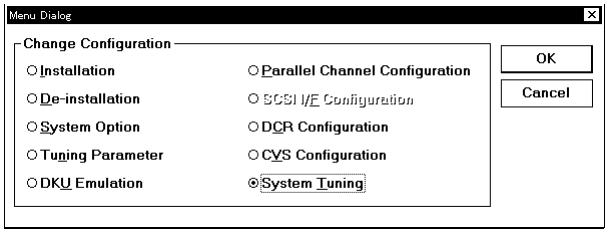
3. <Specify beginning of installation>
Select [System Tuning] from 'Menu Dialog' (CL), and select [OK] (CL).

Message "You need agreement of Technical Support Center, and entering the password.".

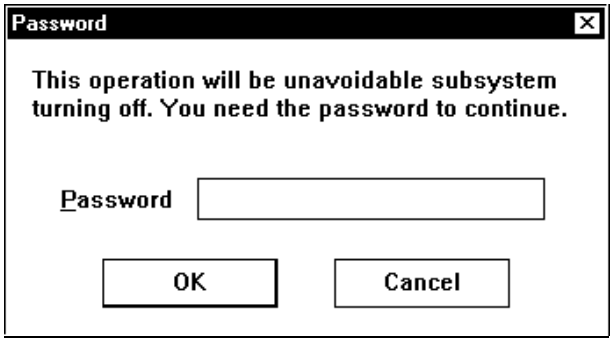


NOTICE
Powering off/on is required owing to the performance of this operation.
Ask the technical support center about the appropriateness of the operation, and input a password after getting an approval of executing the operation.

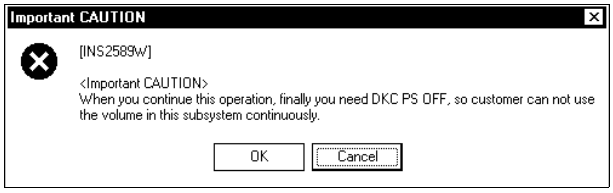
4.

(1) Enter the password and select [OK] (CL).
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.

If [Cancel] is selected (CL), terminate the installation procedure.
'DKC Configuration' is automatically displayed next.

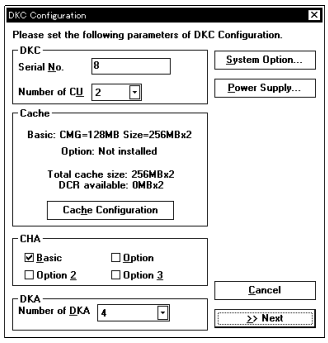


(2) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you continue this operation, finally you need DKC PS OFF, so customer can not use the volume in this subsystem continuously.".



5. <Define configuration information>
Define the device configuration information from 'DKC Configuration' according to the device configuration worksheet.
When you select [>>Next] (CL), 'DKC Emulation Configuration' is automatically displayed.
This procedure finishes when you select [Cancel] (CL).

If [System Options...] is selected (CL), 'System Option' is automatically displayed.
If [Power Supply...] is selected (CL), 'Redundant Power Supply' is displayed.



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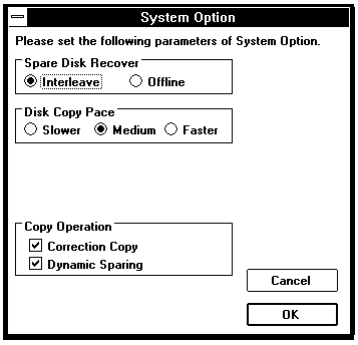
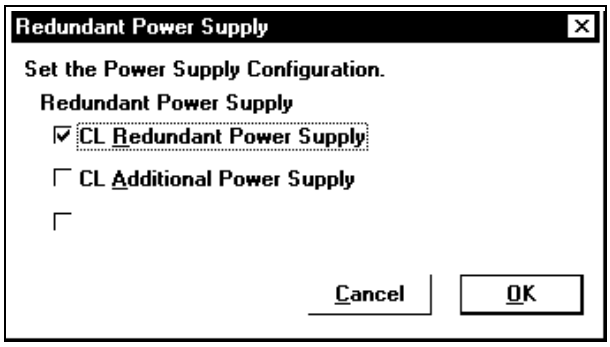
6. <System option setup>
Define the device configuration information from 'System Option' according to the device configuration worksheet.
After setting up all items, select [OK] (CL).
The next message screen is displayed.
When you select [Cancel] (CL), 'System Option' is closed and 'DKC Configuration' appears again.
Return to step 5.

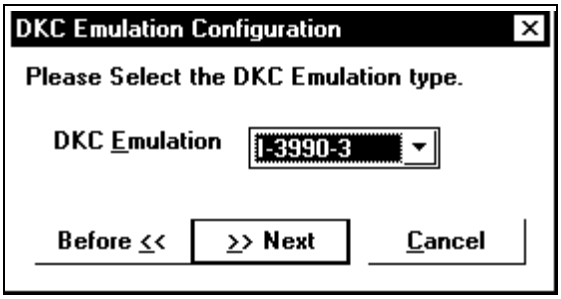


7. <Set Power Supply>
Set the power supply information in the 'Redundant Power Supply' dialog box, and select (CL) [OK].

Return to step 5.



8. <Set DKC emulation type>
Define the device configuration information from 'DKC Emulation' according to the device configuration worksheet.
Selecting (CL) [>>Next] or [Before<<] returns the screen to step 5.



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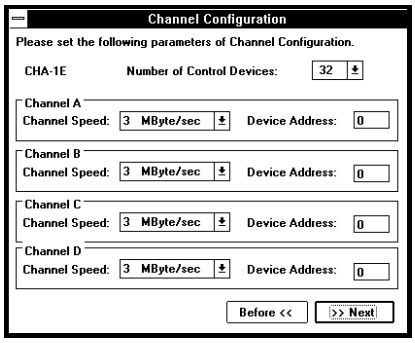
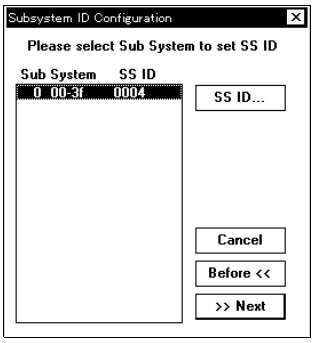
9. <Set Parallel CH>

Define the device configuration information from 'Channel Configuration' according to the device configuration worksheet.
After setting up all items, select (CL) [OK].
The next message screen is displayed.
Selecting (CL) [Cancel] returns the screen to step 8.



10. <Define Subsystem ID>

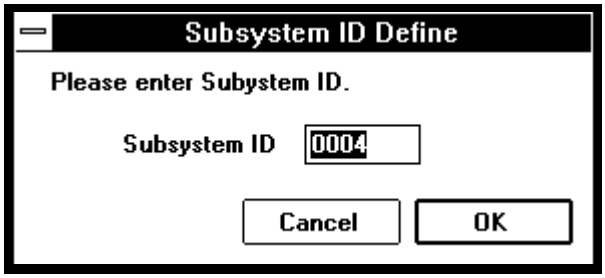
To define Subsystem ID, select (CL) [SSID].
After setting, select (CL) [>>Next].
This procedure is terminated by selecting (CL) [Cancel].



11.

Define Subsystem ID and select (CL) [OK].
Return to step 10.

"Checking subsystem configuration..." is displayed.



12. <Include configuration information>

(1) Select (CL) [Yes] in response to the confirmation message "Are you sure you want to install the defined configuration?".
"Wait..." is displayed, then "Turn off the subsystem" is displayed.
Selecting (CL) [No] suppresses the configuration inclusion processing and terminates the installation procedure.

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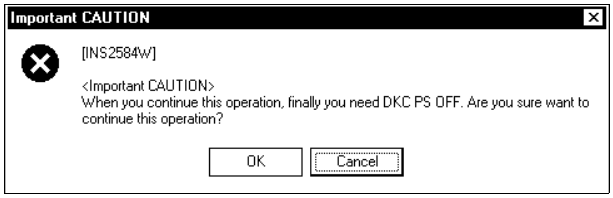
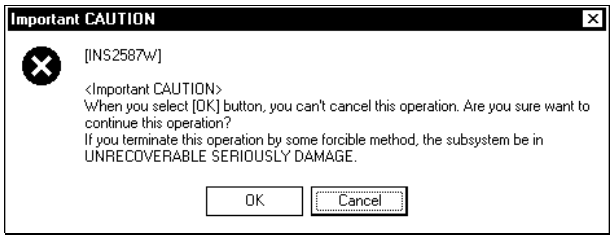
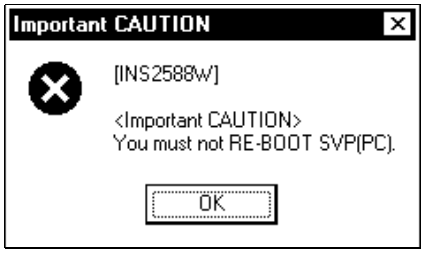
(2) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you continue this operation, finally you need DKC PS OFF. Are you sure want to continue this operation?".



(3) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
When you select [OK] button, you can't cancel this operation. Are you sure want to continue this operation?
If you terminate this operation by some forcible method, the subsystem be in UNRECOVERABLE SERIOUSLY DAMAGE.".



(4) Select (CL) [OK] in response to the confirmation message "<Important CAUTION>
You must not RE-BOOT SVP(PC).".



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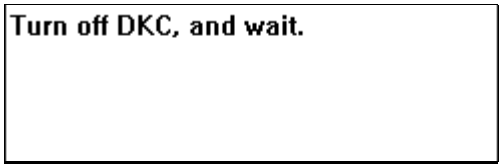
13.

Make sure that “Turn off DKC, and wait.” is displayed and perform the power-off procedure from the DKC maintenance panel.
After a while “Wait...” is displayed.



14.

This step causes the contents of the SVP HD to be loaded into SM and FM.
When this procedure is completed, message “Please insert config FD in FDD.” is displayed.

15.

Insert the configuration FD into FDD, select [OK].

16.

When this procedure is completed, message “Backup is done. Remove FD.” is displayed.
Remove the FD, select [OK].

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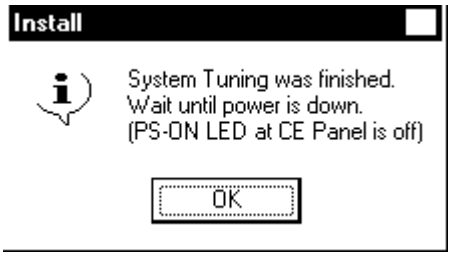
17.

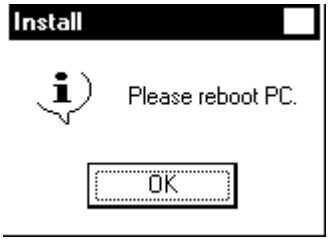
After making sure that DKC power is turned off, select [OK] (CL) in response to “System Tuning was finished.”. The initial INSTALL screen is restored.

Note : SVP power will not turn off even when DKC is powered off.



18.

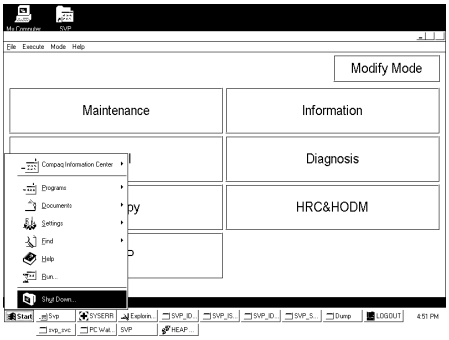
“Please reboot PC” is displayed.
Select [OK] (CL).



19.

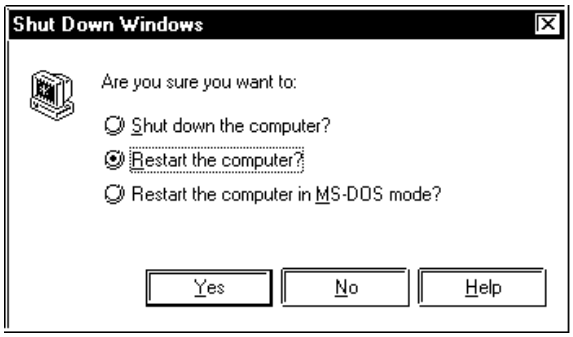
Close ‘Install’.

(1) <Shut Down Windows>
Select (CL) [Start].
Select (CL) [Shut Down].



(2) <Reboot the PC>
Select (CL) “Restart the computer” from Shut Down Windows, and select (CL) [Yes] in response to “Are you sure you want to:”.

Turn the “POWER ON/OFF” switch on the CE panel PCB to “ON”.



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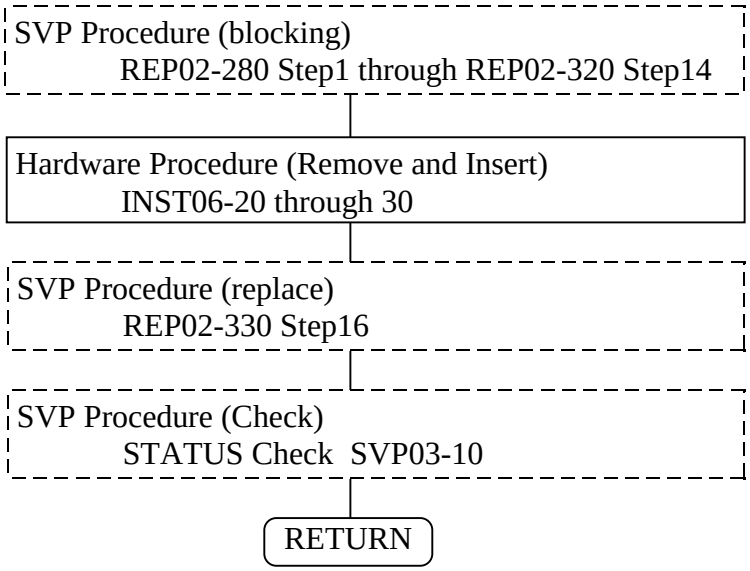
6 Remove and Insert the PCB

6.1 Procedure to Remove and Insert the PCB



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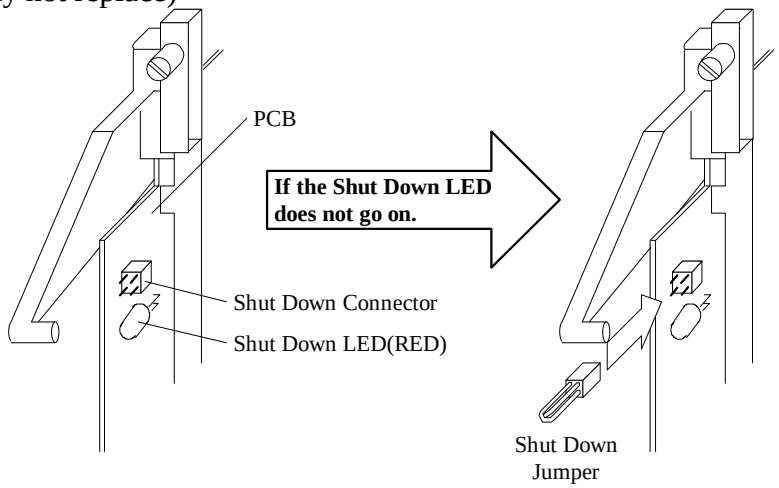
<Hardware Procedure>

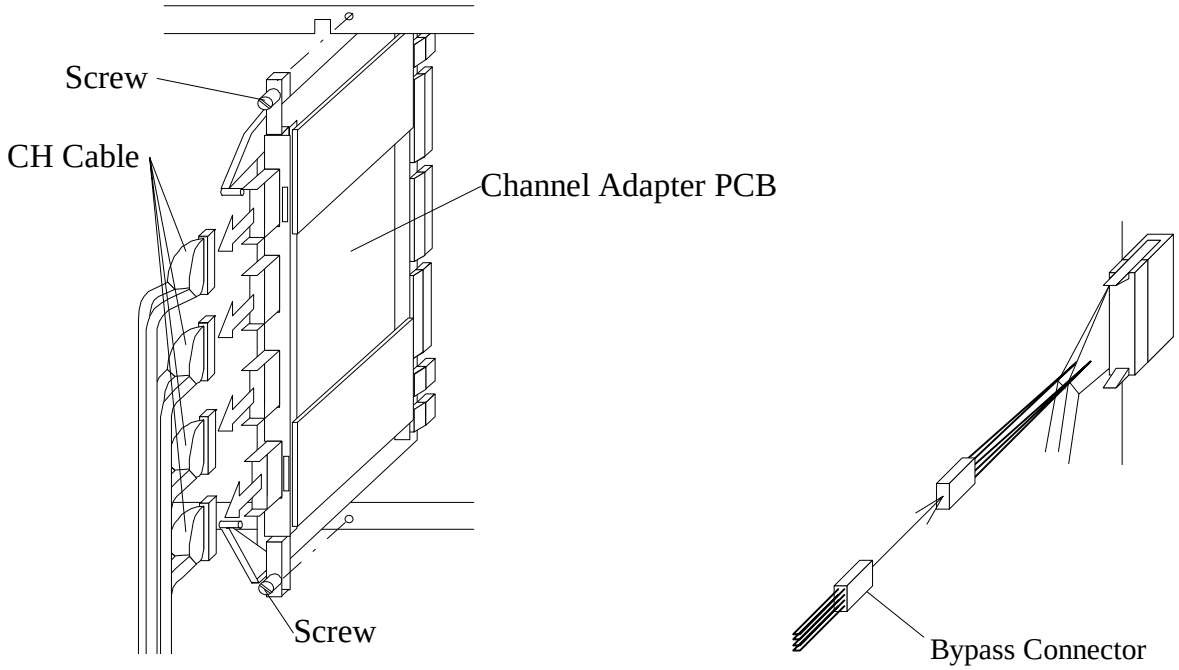
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)



2. Remove the PCB.

Note: If the DKC is connecting with the other DKC, the bypass connectors must be inserted to all CH cables that connect to the PCB to be removed.

a. Disconnect the CH cables from the target Channel Adapter PCB.
b. Remove the two screws and remove the target Channel Adapter PCB.
c. If the Shut Down Jumper is used, remove it.



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3. Insert the target PCB to the correct location and fasten the two screws.

4. Connect the CH cables to the target PCB.

Note: If the bypass connectors are used, remove them.

5. Return to INST06-10.

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7 HRC & HODM

7.1 HRC/HODM Components

(1) HRC Components

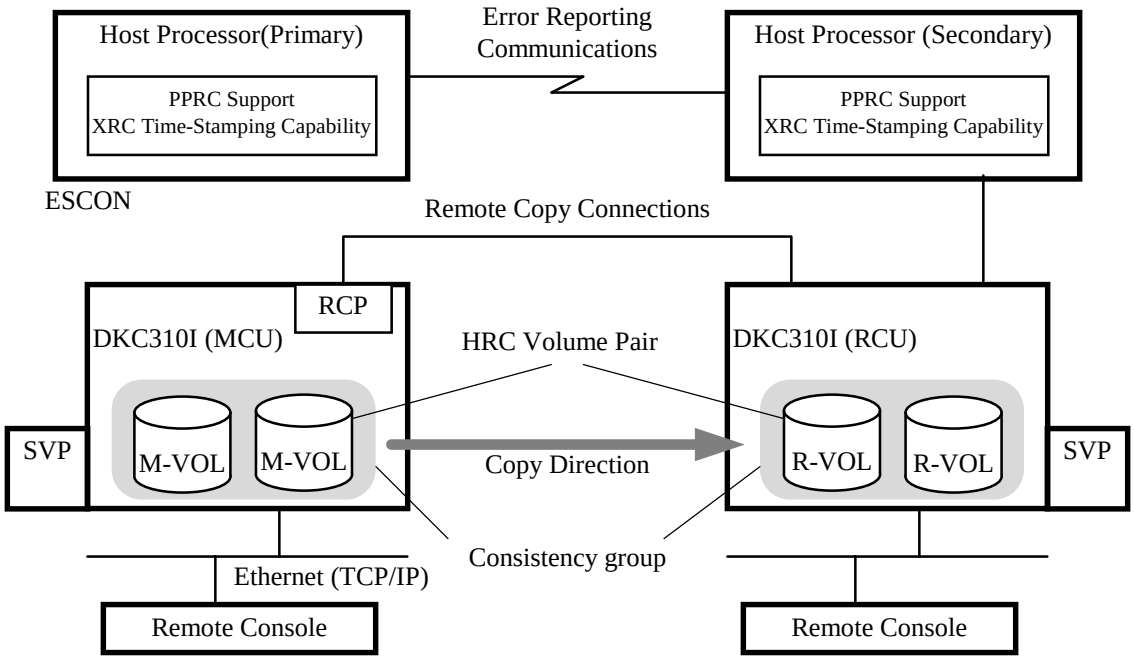

Fig. 7-1 HRC Components

(a) HRC Volume Pair

An **HRC volume pair** consists of two logical volumes, an M-VOL and an R-VOL, in different DKC310I subsystems.

An **M-VOL** (main volume) is a primary volume. It can be read or written by I/O operations from host processors.

An **R-VOL** (remote volume) is a secondary or a mirrored volume. Under control of the DKC310I subsystems, contents of an M-VOL and updates from host processors are copied to an R-VOL. Read or write I/O operations from host processors to R-VOLs are rejected.

The M-VOLs of the HRC volume pairs and the R-VOLs of other HRC volume pairs can be intermixed in one DKC310I subsystem.

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(b) MCU and RCU

An **MCU** (main disk control unit) and an **RCU** (remote disk control unit) are disk control units in the DKC310I subsystems to which the M-VOLs and the R-VOLs are connected respectively.

An MCU controls I/O operations from host processors to the M-VOLs and copy activities between the M-VOLs and the R-VOLs. An MCU also provides functions to manage HRC status and configuration.

An RCU executes write operations directed by the MCU. The manner to execute write operations is almost same as that of I/O operations from host processors. An RCU also provides a part of functions to manage HRC status and configuration.

Note that an MCU/RCU is defined on each HRC volume pair basis. One disk control unit can operate as an MCU to control the M-VOLs and an RCU to control the R-VOLs.

(c) Remote Copy Connections

An MCU and an RCU must be connected with serial interface (ESCON) cables. Only multi mode ESCON cables whose length is up to 3km can be connected to the DKC310I subsystems. In order to locate the DKC310I subsystems more than 3km apart, IBM 9032/9033 ESCON directors or 9036 ESCON repeaters are required. Furthermore, the distance between an MCU and an RCU becomes unrestricted by connecting a Channel Extender (CX5000 manufactured by CNT).

At least two independent remote copy connections should be established between an MCU and an RCU.

(d) RCP

An **RCP** (remote control port) is a serial interface port to which an RCU is connected. Any serial interface port of the DKC310I subsystems can be configured as an RCP.

When an MCU communicates with an RCU through ESCON interface protocol, the RCP plays the role of a host processor channel. The RCP supports ESCON dynamic connection. A serial interface port of the RCU to which the MCU is connected can be connected to host processor channels by using dynamic switching capability provided by ESCON directors.

However an RCP can not communicate with host processor channel. Channel interface paths must be connected to other serial interface ports.

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(e) SVP and Remote Console

An **SVP** provides functions to set up, modify and display HRC/HODM configuration and status.

A **remote console** is a personal computer compatible with the PC/AT. It should be connected to DKC310I subsystems with an Ethernet network(TCP/IP). A remote console provides same managing HRC/HODM functions as an SVP. Several DKC310I subsystems can be connected with one Ethernet network.

For remote console, Hitachi provides only two software components, an HRC/HODM application program and dynamic link library. Both of them require Microsoft Windows operating system. A personal computer, Ethernet materials and other software products are not provided by Hitachi.

(f) Error Reporting Communications

Error reporting communication is a communication means between host processors. An MCU generates the sense information when it fails in keeping synchronization of HRC volume pair. The sense information causes the corresponding message to be displayed on the host processor console. For the reference during disaster recovery at the secondary (recovery) site, this console message should be transferred to the secondary site through the error reporting communication.

The error reporting communications may be configured by using channel-to-channel communications, Netview technology or other interconnect technologies, depending on installation. Hitachi does not provide any product for error reporting communications.

(g) PPRC Support

HRC provides a host processor interface compatible with IBM PPRC. TSO commands, DSF commands and disaster recovery PTFs provided for PPRC can be used for HRC.

Note. Although HRC asynchronous is not fully compatible to PPRC, it can be controlled and monitored with PPRC host facilities, PPRC TSO commands, ICKDSF PPRC commands and some console messages. For this purpose, MVS/DFP 3.2.0 or higher level and ICKDSF release 16 or upper are available.

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(h) XRC Time-Stamping Capability (For HRC Asynchronous)

In case of N-to-1 configuration, the XRC time-stamping capability requires to be installed in the primary host system. MVS/DFP 3.2.0 or higher level is required.

In order to get benefit of time-stamping capability during copy-back process (pair establishment from the secondary to the primary subsystem), the XRC time-stamping capability recommends to be installed in the secondary system.

If the primary system (and the secondary system) consists of several CPU complexes, SYSPLEX timer must be installed for common time reference.

(i) Consistency group

HRC asynchronous ensures update-sequence-consistency across several volume pairs. It also provides some group-based operations. A set of volume pairs treated by such group-based functions is called a consistency group.
HRC asynchronous supports 16 consistency groups at maximum. Every HRC asynchronous volume pair belongs to one consistency group.

HRC/HODM operations from an SVP or a remote console and the corresponding TSO commands are shown in Table 7.1-1. Before using TSO commands or DSF commands for PPRC, the serial interface ports to which the RCU(s) will be connected must be set to the RCP mode. Refer to page INST07-160 for this operation. Table 7.1-2 shows the value of the SAID (system adapter ID) parameters required for CESTPATH command. For full description on TSO commands or DSF commands for PPRC, refer to the appropriate manuals published by IBM corporation.

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Table 7.1-1 HRC operations and corresponding TSO commands for PPRC

Function	HRC/HODM operations	TSO commands
Registering an RCU and establishing remote copy connections	Add RCU	CESTPATH (note)
Adding or removing remote copy connection(s)	Edit Path	CESTPATH
Deleting an RCU registration	Delete RCU	CDELPATH
Registering consistency groups	Add Group	—
Deleting consistency group registration	Delete Group	—
Establishing an HRC volume pair	Add Pair	CESTPAIR MODE (COPY)
Suspending an HRC volume pair	Suspend Pair	CSUSPEND
Disestablishing an HRC volume pair	Delete Pair	CDELPAIR
Recovering an HRC volume pair from suspended condition	Resume Pair	CESTPAIR MODE (RESYNC)
Controlling HRC volume groups	—	CGROUP

note; Required Parameters
(How to set up LINK PARAMETER for CESTPATH command)

LINK PARAMETER | a | a | a | a | b | b | c | c |

aaaa : SAID (refer to Table 7.1-2)
bb : destination address
cc : CUI# of RCU

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Table 7.1-2 SAID (system adapter ID) required for CESTPATH command

Port in RCP mode		SAID value	Port in RCP mode		SAID value
cluster	port		cluster	port	
1	CH ‘A’	X’0000’	2	CH ‘A’	X’0010’
	CH ‘B’	X’0001’		CH ‘B’	X’0011’
	CH ‘C’	X’0002’		CH ‘C’	X’0012’
	CH ‘D’	X’0003’		CH ‘D’	X’0013’
	CH ‘E’	X’0004’		CH ‘E’	X’0014’
	CH ‘F’	X’0005’		CH ‘F’	X’0015’
	CH ‘G’	X’0006’		CH ‘G’	X’0016’
	CH ‘H’	X’0007’		CH ‘H’	X’0017’
	CH ‘J’	X’0008’		CH ‘J’	X’0018’
	CH ‘K’	X’0009’		CH ‘K’	X’0019’
	CH ‘L’	X’000A’		CH ‘L’	X’001A’
	CH ‘M’	X’000B’		CH ‘M’	X’001B’
	CH ‘N’	X’000C’		CH ‘N’	X’001C’
	CH ‘P’	X’000D’		CH ‘P’	X’001D’
	CH ‘Q’	X’000E’		CH ‘Q’	X’001E’
	CH ‘R’	X’000F’		CH ‘R’	X’001F’

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(2) HODM Components

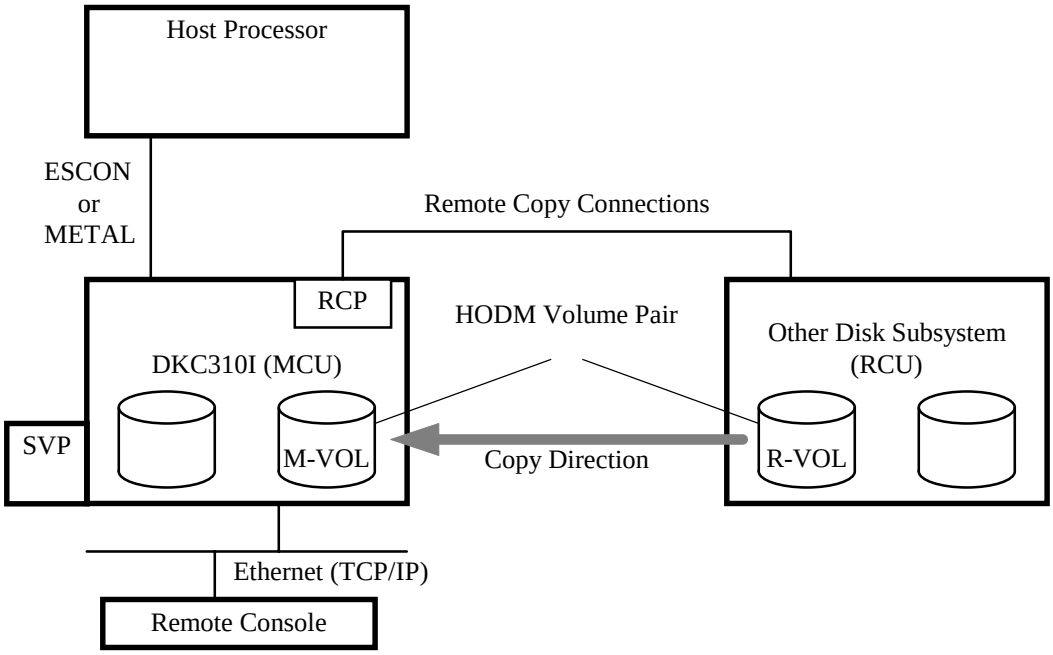

Fig. 7-2 HODM Components

(a) HODM Volume Pair

An **HODM volume pair** consists of one logical volume in a DKC310I subsystem and another disk volume in another disk subsystem, called an **M-VOL** and an **R-VOL** respectively. But you can not establish HODM volume pair on condition that R-VOL is Dual Copy volume.

HODM copies the data written in the R-VOL into the M-VOL. Responding to read I/O operations from host processors to the M-VOL, HODM transfers the data read from the R-VOL if the requested data has not yet copied.

Except for MCU,R-VOL should be protected from being updated during HODM. An operating environment must ensure this requirement because HODM does not protect it.

(b) MCU and RCU

An **MCU** is the disk control unit of a DKC310I subsystem. An **RCU** is the disk control unit of another disk subsystem in the HODM configuration.

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(c) Remote Copy Connections

An MCU and an RCU must be connected with serial interface (ESCON) cables. Only multi mode ESCON cables whose length is up to 1km can be connected to the DKC310I subsystems. Although IBM 9032/9033 ESCON directors and 9036 ESCON repeaters are supported, the longer distance is not recommended because of performance reasons.

(d) RCP

An **RCP** is a serial interface port to which an RCU is connected. Any port of DKC310I subsystems can be configured as an RCP.

When an MCU communicates with an RCU through an ESCON interface protocol, an RCP plays the role of a host processor channel. An RCP supports ESCON dynamic connection. A serial interface port of an RCU to which an MCU is connected can be connected to host processor channels by using dynamic switching capability provided by ESCON directors.

However an RCP can not communicate with a host processor channel. Channel interface paths must be connected to other serial interface ports.

(e) SVP and Remote Console

An **SVP** provides functions to set up , modify and display HRC/HODM configuration and status.

A **remote console** is a personal computer compatible with a PC/AT. It should be connected to the DKC310I subsystems with an Ethernet network (TCP/IP). A remote console provides same managing HRC/HODM functions as an SVP. Several DKC310I subsystems can be connected with one Ethernet network.

For a remote console, Hitachi provides only two software components, an HRC/HODM application program and dynamic link library. Both of them require Microsoft Windows operating system. A personal computer, Ethernet materials and other software products are not provided by Hitachi.

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7.2 HRC Software Requirements

Minimum level for HRC is MVS/DFP 3.2.0 + PTF or VM/ESA 2.1.0 + PTF.

- Optional error recovery procedure (ERP) functions - MVS/DFP 3.2.0 or above.
- ICKDSF R16 + PTF functions - VM/ESA 2.1.0 or above.

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7.3 HRC/HODM Hardware Requirements

(1) HRC Supported Models

Table 7.3-1 HRC Supported Models (1/2)

HA Models							HRC Support
MCU & RCU				M-VOL & R-VOL			
Emulation	Port Adapter	CHA Type	DKA Type	Drive	RAID Level	Emulation	
DKC310I (3990-6E) (3990-6) (3990-3)	WP207	SRAM	SRAM	DK308-90 DK309-90	RAID5	3390-9	Y
						3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
						3380-E	Y
						3380-J	Y
					RAID1	3390-9	Y
						3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
						3380-E	Y
						3380-J	Y
				DK309-180	RAID5	3390-9	Y
						3390-3	Y
						3390-3R	Y
						3380-K	Y
					RAID1	3390-9	Y
						3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
						3380-E	Y
						3380-J	Y

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Table 7.3-1 HRC Supported Models (2/2)

HA Models							HRC Support
MCU & RCU				M-VOL & R-VOL			
Emulation	Port Adapter	CHA Type	DKA Type	Drive	RAID Level	Emulation	
DKC310I (3990-6E) (3990-6) (3990-3)	WP207	SRAM	SRAM	DK3F1-60	RAID5	3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
					RAID1	3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
						3380-E	Y
						3380-J	Y

Y: Supported
N: Not supported

- Emulation type of an MCU and RCU can be different.
- Emulation type of an M-VOL and R-VOL must be same.
- CVS/DCR is able to define on the M-VOL and R-VOL.
- The 3990-6E DKC emulation supports only 3390 DKU emulation.
- The M-VOL must have the same track sizes, and the same or larger volume capacities, as the R-VOL. (note (1))
- When T-VOL of HMRCF is established as M-VOL of HRC, the T-VOL must be “Split” state. If not so, an equipment check error will occur in establishing HRC pain.

Note;

(1) When executing an HRC between volumes with different capacities, take notice of the following.
  ① State of the subsystem when executing the HRC
  All M-VOL data including the VTOC is physically copied by executing the HRC. Accordingly, the R-VOL is recognized as having the same capacity as that of the M-VOL in the HRC execution.
  ② Expansion of the VTOC
  It is needed to expand the VTOC to make the R-VOL simplex and be accessed as having the normal capacity by the host. The VTOC is expanded by issuing the ICKDSF REFORMAT (REFVTOC) command.
  * The system environment is required to support the REFVTOC parameter. This parameter can be executed only by the ICKDSF which supports the PPRC function.

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(2) HODM Supported models

Table 7.3-2 HODM Supported Models (MCU & M-VOL)

HA Models							HODM Support
MCU				M-VOL			
Emulation	Port Adapter	CHA Type	DKA Type	Drive	RAID Level	Emulation	
DKC310I (3990-6E) (3990-6) (3990-3)	WP207	SRAM	SRAM	DK308-90 DK309-90	RAID5	3390-9	Y
						3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
						3380-E	Y
						3380-J	Y
				DK309-180	RAID5	3390-9	Y
						3390-3	Y
						3390-3R	Y
						3380-K	Y
				DK3F1-60	RAID5	3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y
					RAID1	3390-3	Y
						3390-3R	Y
						3390-2	Y
						3390-1	Y
						3380-K	Y

Y : Supported

- The M-VOL must have the same track sizes, and the same or larger volume capacities, as the R-VOL. (note (7))
- CVS/DCR is able to define on the M-VOL.
- The 3990-6/6E DKC emulation supports only 3390 DKU emulation.

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Table 7.3-3 HODM Support Models (RCU & R-VOL)

RCU	R-VOL	DEVICE TYPE	HODM Support
DKC80I-3 (1)	DKU98I	3380-A	N
	DKU85I-D	3380-D	N
	DKU85I-E	3380-E	Y
	DKU86I-J	3380-J	Y
	DKU86I-G	3380-E	Y
	DKU86I-K	3380-K	Y
	DKU87I-K	3380-K Compati	N
	DKU87I-1C	3380 Track Compati	N
	DKU87I-1N	3390-1	Y
	DKU87I-2C	3380 Track Compati	N
	DKU87I-2N	3390-2	Y
	DKU87I-3C	3380 Track Compati	N
	DKU87I-3N	3390-3	Y
DKC90I-3 (1)	DKU87I-1C	3380 Track Compati	N
	DKU87I-1N	3390-1	Y
	DKU87I-2C	3380 Track Compati	N
	DKU87I-2N	3390-2	Y
	DKU87I-3C	3380 Track Compati	N
	DKU87I-3N	3390-3	Y
	DKU88I-3	3390-3	Y
	DKU88I-9	3390-9	Y
DKC210I (1)(2)(5)	DKU205I	3380-J	Y
		3380-E	Y
		3380-K	Y
		3390-1	Y
		3390-2	Y
		3390-3	Y
		3390-3R	Y
		3390-9	Y
DKC310I (1)	DKU305I (6)	3380-J	Y
		3380-E	Y
		3380-K	Y
		3390-1	Y
		3390-2	Y
		3390-3	Y
		3390-3R	Y
		3390-9	Y

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RCU	R-VOL	DEVICE TYPE	HODM Support
IBM 3990-3 (1)	3380-J	3380-J	Y
	3380-D	3380-D	N
	3380-E	3380-E	Y
	3380-K	3380-K	Y
	3390-1	3390-1	Y
		3380 Track Compati	N
	3390-2	3390-2	Y
		3380 Track Compati	N
	3390-3	3390-3	Y
		3380 Track Compati	N
	RAMAC	3390-3	Y
	3390-9	3390-9	Y
IBM 3990-6 (1)	3390-1	3390-1	Y
		3380 Track Compati	N
	3390-2	3390-2	Y
		3380 Track Compati	N
	3390-3	3390-3	Y
		3380 Track Compati	N
	RAMAC1	3390-3	Y
	RAMAC2	3390-3	Y
	RAMAC3	3390-3	Y
	3390-9	3390-9	Y
IBM 9390-1	RAMAC3	3390-3	Y
IBM 9390-2	RAMAC3	3390-3	Y
IBM 9393 (1)(3)	RVAZ Turbo	3380-K	Y
		3390-3	Y
IBM 9394 (1)	RAMAC1	3380-K	N
		3390-3	Y
	RAMAC2	3380-K	N
		3390-3	N
EMC 5700	—	3390-3	Y
		3390-1	Y
EMC 5500 (1)(3)	—	3390-3	Y
		3390-1(Hyper Volume)	Y
		Others	N
EMC 5430 (1)(3)	—	3390-3	Y
		Others	N
EMC 5200	—	3390-1	Y
		3390-3	Y

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RCU	R-VOL	DEVICE TYPE	HODM Support
STK ICEBERG (1)(3)(4)	—	3390-3	Y
		3390-2	Y
		3380-K	Y
		3380-J	Y
		3380-KE	Y
		Others	N
AMDAHL SPECTRIS (1)(3)	—	3390-3	Y
		3390-2	Y
		Others	N
AMD 6690 (1)(3)	—	3390-3	Y
Others	—	—	N

Y : Supported

N : Not support (“Not support” means as “Not operative” and “Not certified”.)

Note;

(1) HODM via CNT Converter (CX5000) supports only for HITACHI models and IBM 3990-3/3990-6 models which are described on Table 2-5. The other models is not certified.

(2) In case of HODM from DKC210I/205I, the DKC emulation type (RCU) is only allowed 3990-3/6/6E.

(3) Cache/NVS status (SUBSYSTEM CACHE, NVS, DFW and DEV CACHE) of the RCU must be On.

(4) STK/ICEBERG consists 4 CU Image per 64 Volumes. It is necessary to define each CU Image as one RCU. (Do Add RCU for each CU Image.)

(5) No SC model is supported.

(6) CVS/DCR is able to define on the R-VOL.

(7) When executing an HODM between volumes with different capacities, take notice of the following after a migration is completed.

① State of the subsystem when the migration is completed
All data in the migration source volume including the VTOC is physically copied by executing the HODM. Accordingly, the destination volume is recognized as having the same capacity as that of the source volume when the migration is completed.

② Expansion of the VTOC
It is needed to expand the VTOC to use the destination volume as having the normal capacity. The VTOC is expanded by issuing the ICKDSF REFORMAT (REFVTOC) command.

* The system environment is required to support the REFVTOC parameter. This parameter can be executed only by the ICKDSF which supports the PPRC function.

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(3) Remote Console Requirements

An HRC/HODM application software and dynamic link library require Microsoft Windows 95.

(4) Distance between MCU and RCU

An MCU and an RCU must be connected with serial interface (ESCON) cables. Only multi mode ESCON cables whose length is up to 3km can be connected to the DKC310I subsystems. In order to locate disk subsystems more than 3km apart, IBM 9032/9033 ESCON directors (ESCDs) or 9036 ESCON repeaters are required.

IBM 9032/9033 ESCON director supports an extended distance facility (XDF). The XDF uses single mode ESCON cables of which length is up to 20km. IBM 9036 ESCON repeater supports single mode - to - single mode connection or single mode - to - multi mode connection. In order to locate disk control units more than 9km apart, the XDF connections provided by the ESCON directors or ESCON repeaters are required.

Maximum distance between disk subsystems is 43km.

Furthermore, the distance between an MCU and an RCU becomes unrestricted by connecting a Channel Extender (CX5000 or ULTRANET manufactured by CNT). (refer to INST07-150 Appendix B)

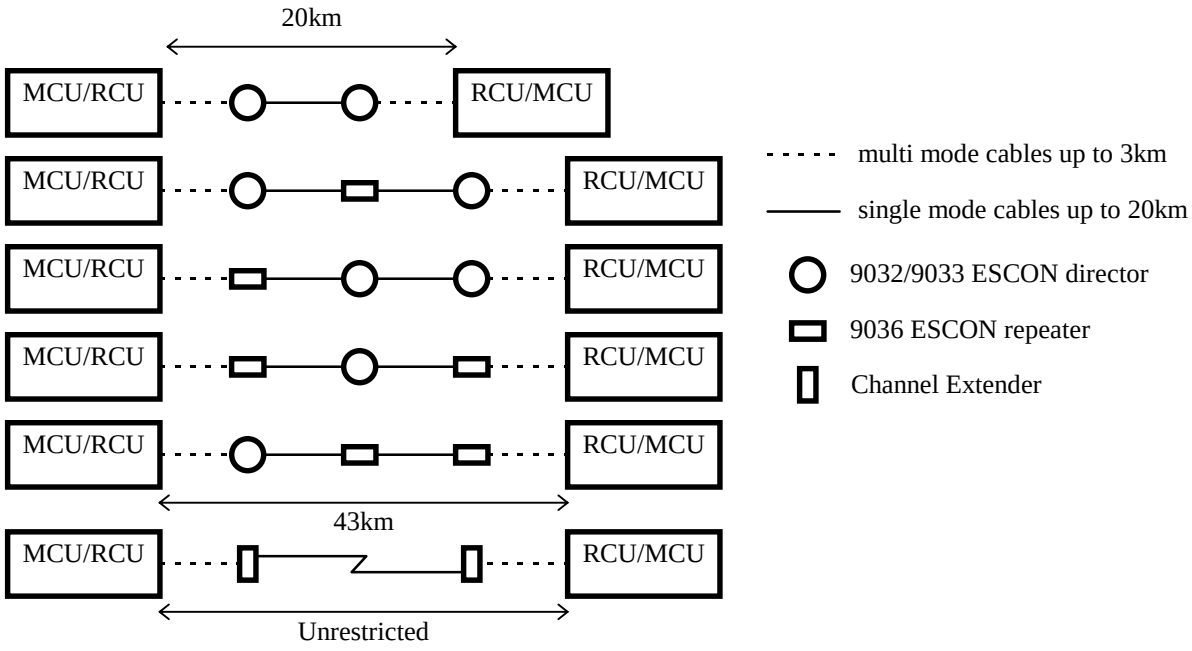

Fig 7.3-1 Distance between Disk subsystems

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(5) Recommendation of MIH time and HRC/HODM configuration

Recommendation of MIH time is 60 sec. for HRC, and 120 sec. for HODM. In addition that, MIH time had better be set in consideration of the following factor.

- The number of pair volumes
- Cable length between MCU and RCU
- Volume status (Initial copy status)
- Under maintenance operation

When HRC/HODM configuration is instructed, take notice of as follows.

- The logical paths between MCU and RCU had better be established independent of the logical paths between Host and RCU.
- The logical paths between MCU and RCU had better be established maximum paths.
- RCP port had better be set in consideration of the host I/O rate and remote copy procedure.
- The Only important volumes had better be established HRC pair.
- Under the situation where the number of paths between MCU and RCU is decreased due to path failure, the traffic of the remaining paths is raised. It may cause some time-out I/O operation to RCU, and a lot of the time-out might cause suspension of HRC/HODM pair.

When HRC asynchronous configuration is instructed, take notice of as follows in addition to above.

- The cache amount of MCU had better be set two times of the RCU's

(6) Requirements for Track format, Cache, NVS, DASD Fast Write

Track format Cache, NVS, DASD Fast Write must satisfy following conditions for both of M-VOL and R-VOL of HRC/HODM.

		HRC		HODM	
		M-VOL	R-VOL	M-VOL	R-VOL
Track format	Track format of record zero	Standard format			
	Key length of record zero	Zero			
	Data length of record zero	Eight			
	CCHH of record zero	Identical to physical cylinder address and physical head address of a track			
	CCHH of each user records	Unique in a track			
Cache		Depends on HRC pair option*	Depends on HRC pair option*	No restriction	No restriction
NVS		Depends on HRC pair option*	Depends on HRC pair option*	No restriction	No restriction
DASD Fast Write		Depends on HRC pair option*	Depends on HRC pair option*	No restriction	No restriction

* : Required if "DFW to R-VOL" option is set.

(7) HRC available CU image

CU#0 ~ CU#3

(8) HODM available CU image on MCU

CU#0 ~ CU#3

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AppendixA: HRC/HODM Installation check list

Table 7.3-4 HRC/HODM Installation Check List

No.	Item	Check
1	MCU/RCU emulation type must be correct. (See Table 7.3-1 and Table 7.3-2)	
2	M_VOL/R_VOL emulation type must be correct. (See Table 7.3-1 and Table 7.3-2)	
3	OS version must be as followed. • Optional error recovery procedure (ERP) functions - MVS/DFP 3.2.0 or above. • ICKDSF R16 + PTF functions - VM/ESA 2.1.0 or above.	
4	RCP port must be set. (See INST07-170 SECTION)	
5	ESCON cable between MCU and RCU must be connected.	
6	ESCON cable test between MCU and RCU must be executed.	

AppendixB: Guide for HRC via EXTENDER(CHANNELink(CX5000), ULTRANET)

0. Preliminary remarks

This is the guide for HRC operation via Computer Network Technology's (CNT's) CHANNELink and UltraNet Storage Director products. These two CNT products provide channel extension (store and forward functionality) between a Hitachi MCU and RCU used in an HRC configuration. The channel extension provided by the CNT products allows the ESCON connection between the MCU(s) and the RCU(s) to be greater than the ESCON standard 43 km apart but still provide near native data transfer between the MCU and RCU.

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1. Summary of Specification

Table 7.3-5 Summary of Specification

		CHANNELink(CX5000)		ULTRANET	
Copy Mode		Sync/Semisync	Asynchronous	Sync/Semisync	Asynchronous
u-code Version	RAID300	52-35-xx or later	52-39-xx or later	52-36-xx or later	52-39-xx or later
	Extender	CHANNELink Release 4.3 with SSDX at version 4.9 or later	CHANNELink Release 4.3 with SSDX at version 4.B or later	UltraNet Release 2.2 with SSDX at version 4.9 or later	UltraNet Release 2.2 with SSDX at version 4.B or later
Link Types(between local and remote Extenders)		T3		ATM T3	
Maximum Number of physical ESCON paths(between RAID300 and EXTENDER)		3 or 4 ESCON Interfaces (*1)		8 ESCON Interfaces(*2)	
Combination of MCU and RCU		The following combination are available. (for example, refer to Fig 7.3-2, 7.3-3, 7.3-4) MCU:CU#n <=> RCU:CU#m (0<=n<=3, 0<=m<=3) [restriction] A CU image of the RCU can not be shared by more than one CU images of the MCU(s) that are connected to the same ESCON port(s) of the local extender.(Fig 7.3-5) If the CU image of the RCU requires to be shared, the CU images of the MCU(s) must be connected to the different ESCON port(s) as shown in Fig 7.3-6.			

*1: if the CHANNELink has 11 slots, the maximum number of ESCON interfaces is 3. If the CHANNELink has 13 slots, then the maximum is 4 ESCON interfaces.

*2: The stated maximum number of ESCON interfaces in an UltraNet Storage Director is 8.

Notes;

- One ESCON port of Extender supports up to 254 volumes. For HRC installations with requirements for greater than 254 pairs, additional ESCON interfaces are required in both the local and remote channel extenders.
- HRC via Extender does not support P/DAS function.

Figures 7.3-2 to 7.3-6 on the following pages describe various valid and invalid HRC with channel extension configurations.

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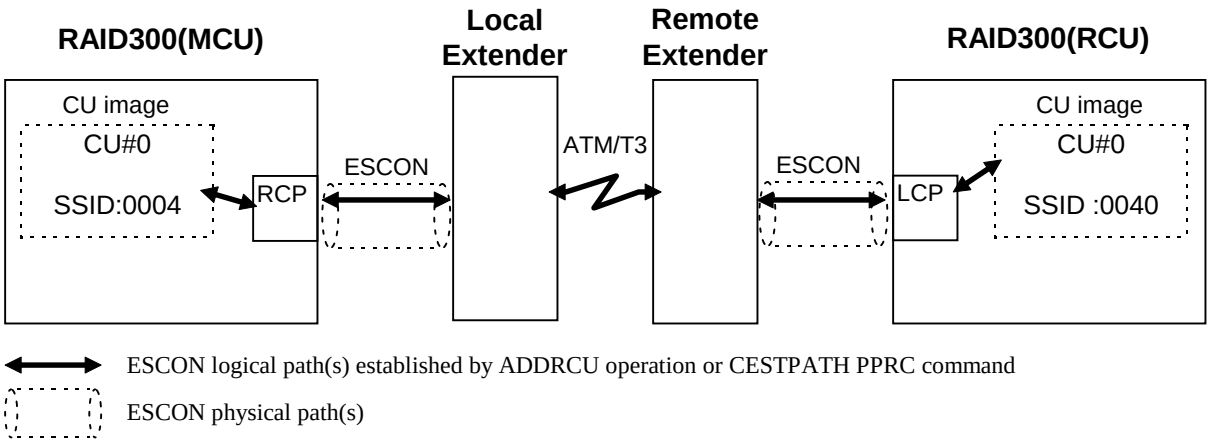

Fig 7.3-2 MCU:CU#0 <--> RCU:CU#0 (valid configuration)

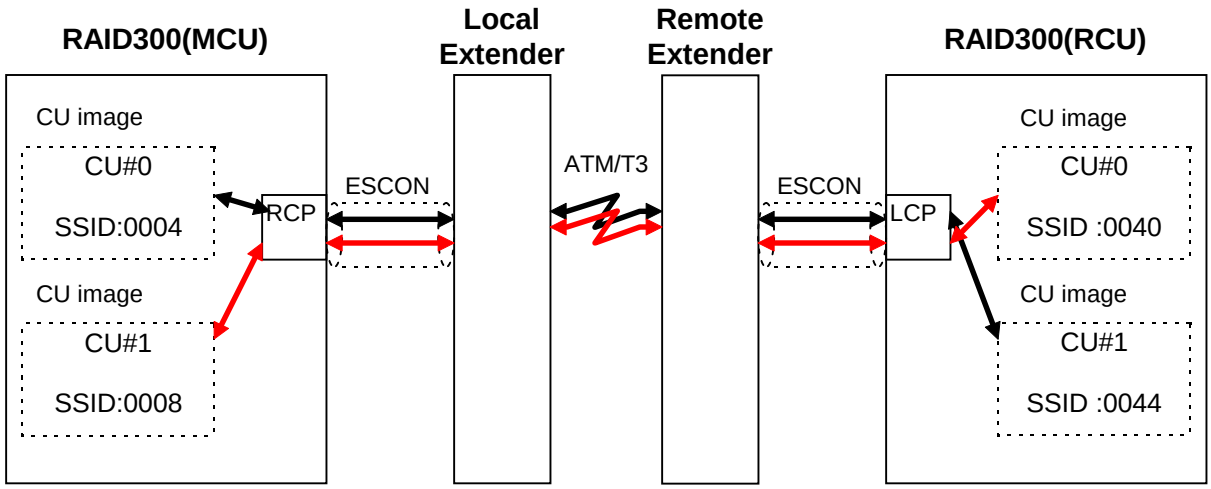

Fig 7.3-3 MCU:CU #0 <--> RCU:CU #1, MCU:CU #1 <--> RCU:CU #0 (valid configuration)

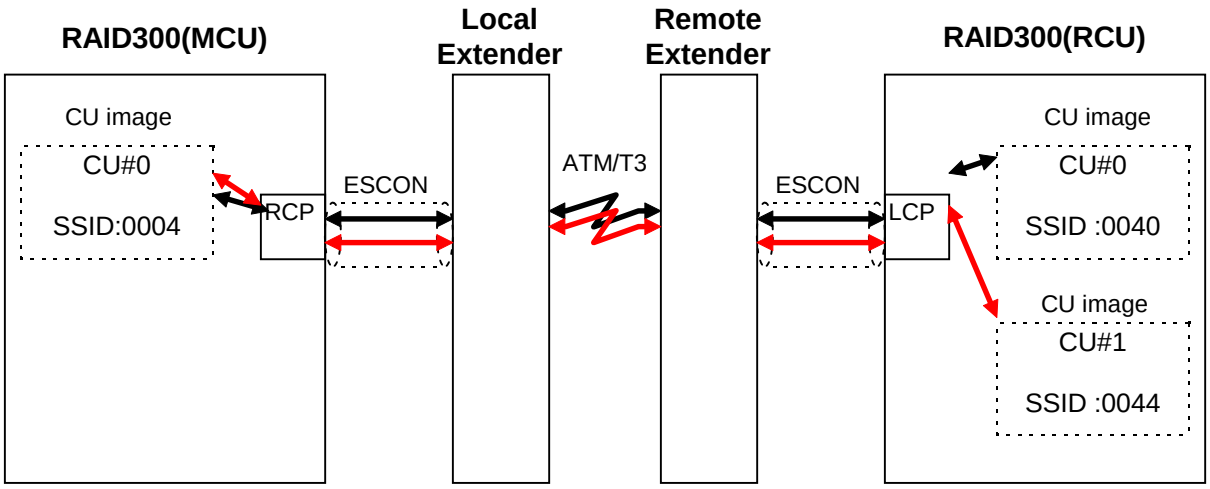

Fig 7.3.-4 MCU:CU #0 <--> RCU:CU #0, MCU:CU #0 <--> RCU:CU #1 (valid configuration)

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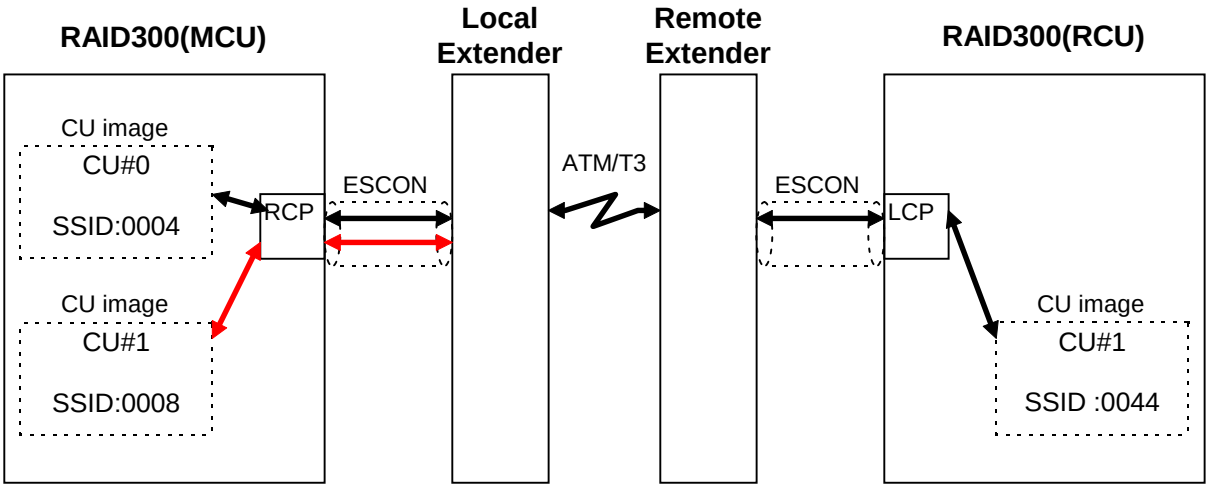

Fig 7.3-5 MCU:CU #0 <--> RCU:CU #1, MCU:CU #1 <--> RCU:CU #1 (invalid configuration)
(2 CU Images of MCU and 1 CU Image of RCU using same ESCON port)

The above diagram is an invalid configuration as 2 CU Images of an MCU are configured to utilize 1 RCU CU Image via the same ESCON port. Unique remote ESCON ports are required to enable concurrent access to a RCU Image.

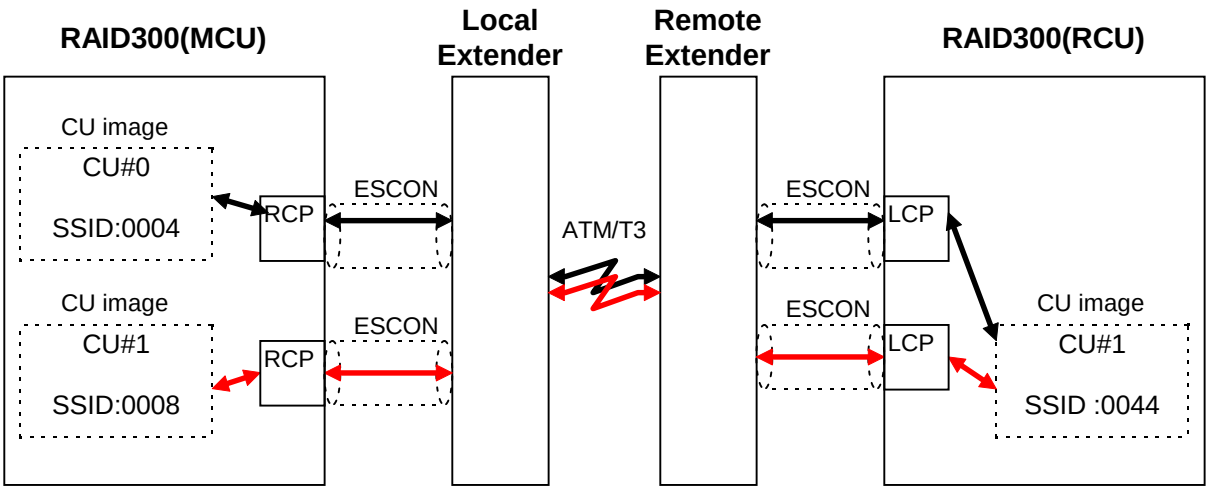

Fig 7.3-6 MCU:CU #0 <--> RCU:CU #1 , MCU:CU #1 <--> RCU:CU #1 (valid configuration)
(2 CU Images of MCU and 1 CU Image of RCU using different ESCON ports)

The above diagram is a valid configuration as 2 CU Images of an MCU are configured to utilize 1 RCU CU Image via different remote Extender ESCON ports.

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2. Operation for HRC via Extender

2.0 Planning the configuration of HRC via Extender

Please determine the number of Extenders and the number of ESCON paths from the configuration of HRC.
There are some restrictions in planning the configuration of HRC via Extender.
[restriction]
- One ESCON port of an Extender supports up to 254 volumes. For HRC connections between more than 254 pairs, add the additional physical ports as required.
- Some combination of MCU and RCU are not available. Please refer to page INST07-150 ~ INST07-153.

2.1 Preliminary arrangement on Extender.

(1) Change the configuration information in Extender.
There is a necessity that configuration information is set according to the configuration of HRC. Before setting HRC via Extender, please request the modification of configuration information of Extender from CNT. The information that should be given to CNT prior to installation is listed below.
- CU# of RCU
- R-VOL#
- Indication whether or not an ESCD (ESCON director) will be included in the configuration. (*3)
- ESCON link address (if using ESCD)
- A request to set serial number(s) of Local Extender (*4)

Notes:
*3: If an ESCD (ESCON director) is put between an MCU & local Extender, or between an RCU & remote Extender, there occurs a necessity to have Extender configuration information set by CNT specially. (According to CNT's specification, it is allowed to locate one ESCD in master and remote site, respectively, and define all link ports as ‘Dynamic Connection’.)

*4: The Extender can be set any serial numbers to every ESCON ports independently. At ADDRCU (/CESTPATH) operation, the serial number of Local Extender should be set as the serial number of RCU. So, in advance, the same serial number should be set to ESCON physical paths that make the logical paths to same RCU. For an example, refer to Figure 7.3-7. When 2 RCUs are connected via Extender, different serial numbers should be set. But such configurations have not certified yet. Please use a MCU and a RCU.

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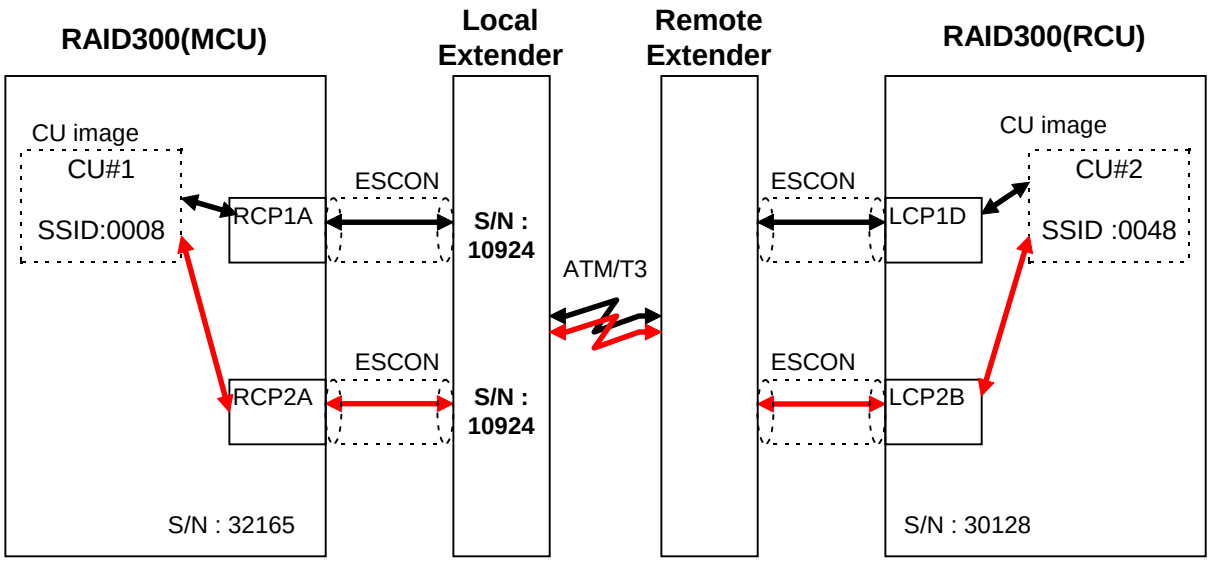

These parameters are required in ADD RCU operation of RAID300 from SVP.
(cf. DKC310I/DKU305I Maintenance Manual THEORY03-500)

RCU		Path		
Serial number	SSID	PORT#	Link Address	Logical Address
10924	0040	1A	00	02
10924	0040	2A	00	02

Without connecting CNT, this parameter is 30128.

Fig 7.3-7 reference for notice *4

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2.2 Operation of RAID300

(1) Setting of Special mode (Mode 21=ON)
There is a necessity that Mode21 is set, which is a special mode for HRC via Extender. In detail, when the MCU restarts the WRFBA (HRC special command) CCW chain, it will be in incomplete domain pattern from the beginning.

(2) ADD RCU
At ADDRCU (/CESTPATH) operation, input the serial number (S#) of Local Extender as the serial number of RCU. The procedure to seek the Local Extender's serial number is as follows.

<Procedure to seek Extender's S#>
To begin with, please connect MCU to RCU via CX5000 directly with no ESCD (ESCON director).

a) Please open the icon "MAINTENANCE" of SVP (MCU).
b) Please click the button "LCP/MCP Path" in General Status Display.
c) Please select "Physical Path Status".
d) Please notice the information of RCP port to connect to local CNT. The last five digits of "SEQNUMBER" correspond to the target manufacturing number to input.

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3. Configuration Setup Example

(1) MCU/RCU Example Pair Configuration
Table 7.3-5 Example M-VOL and R-VOL Pair Configuration Matrix

Table 7.3-6 Pair configuration matrix

MCU/ CU Image	M-VOL#	SSID		RCU/ CU Image	R-VOL#	SSID
CU#0	0x00-0x3F	0x0004	------>	CU#0	0x00-0x3F	0x0040
CU#1	0x00-0x3F	0x0008	------>	CU#2	0x00-0x3F	0x0048
	0x40-0x7F	0x0009	------>	CU#3	0x00-0x3F	0x004C
CU#3	0x00-0x3D	0x0010	------>		0x40-0x7D	0x004D

The table above includes the MCU to RCU pairs as included below in Figure 7.3-8.

(2) Configuration of HRC via Extender

The following figure (Figure 7.3-8) includes a configuration that matches the configuration that is described in Table 7.3-6.

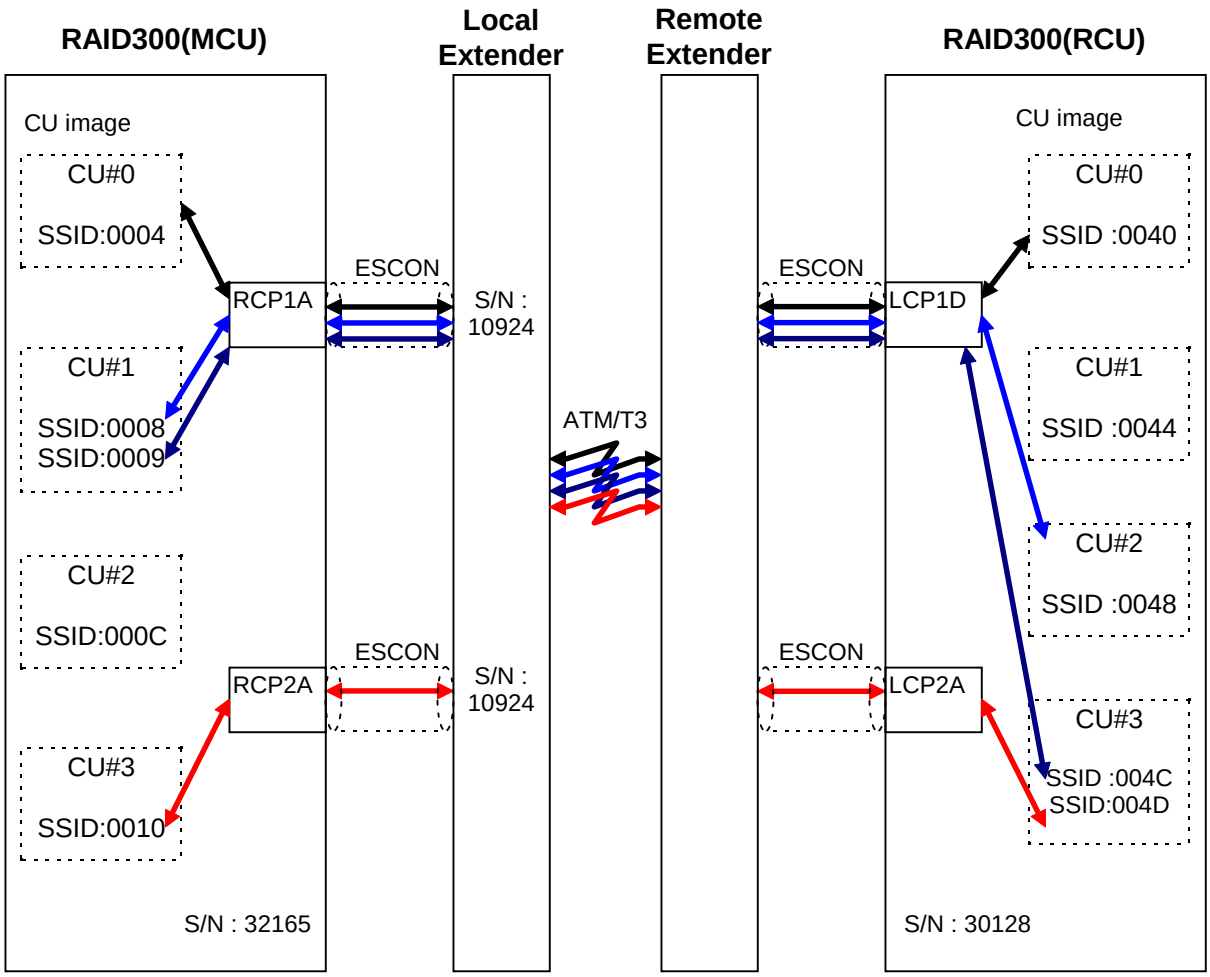

Fig 7.3-8 configuration of HRC via Extender

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(3) ADD RCU parameter

These parameters are required in ADD RCU operation of RAID300 from SVP in case of example in this section. (for additional MCU information, please refer to: DKC310I/DKU305I Maintenance Manual THEORY03-500---for additional ADD RCU information, please refer to SVP 04-60 and later about ADD RCU operation).

Table 7.3-7 ADD RCU parameter

RCU		Path		
Serial number	SSID	PORT#	Link Address	Logical Address
10924	0040	1A	00	00
10924	0048	1A	00	02
10924	004C	1A	00	03
10924	004D	2A	00	03

Without connecting EXTENDER, this parameter is 30128.

4. Notes

(1) When one of HRC paths between the remote EXTENDER and the RCU is blocked, the blocked path will not be recovered voluntarily. And then, "PATH STATUS" of this path may be abnormal(-) status, otherwise the HRC will suspend due to any failure of paths(SSB F/M=8F, EC=C8Ax). If C8Ax status is indicated, then the failure path is determined by the information as follows.
- CL1/2 : (it is known by MP# detecting SSB)
- LPN in CL1/2 : (SSB log byte42 means LPN in CL1/2)

In these cases, please confirm the connection of the physical path and do the following procedure to recover the path.

[Recover procedure]

a) Please delete the failed HRC path by way of "EDIT PATH" menu.

b) Please edit the path again to select "EDIT PATH" menu.

(2) When using the procedure of switching the M-VOL and the R-VOL (M.M THEORY03-690) for disaster recovery of HRC via Extender, the configuration of Local/Remote Extender should be set again because the Local Extender and Remote Extender are reversed each other. And, when a CU image of the original MCU and plural CU image of the original RCU are connecting through the same physical path, the above mentioned disaster recover procedure is inapplicable. In this case, please recover the combination of 1 CU Image of the new MCU and 1 CU Image of the new RCU according to the procedure of switching the M-VOL and the R-VOL (M.M THEORY03-690). After that, please try to recover the remaining CU Images one by one.

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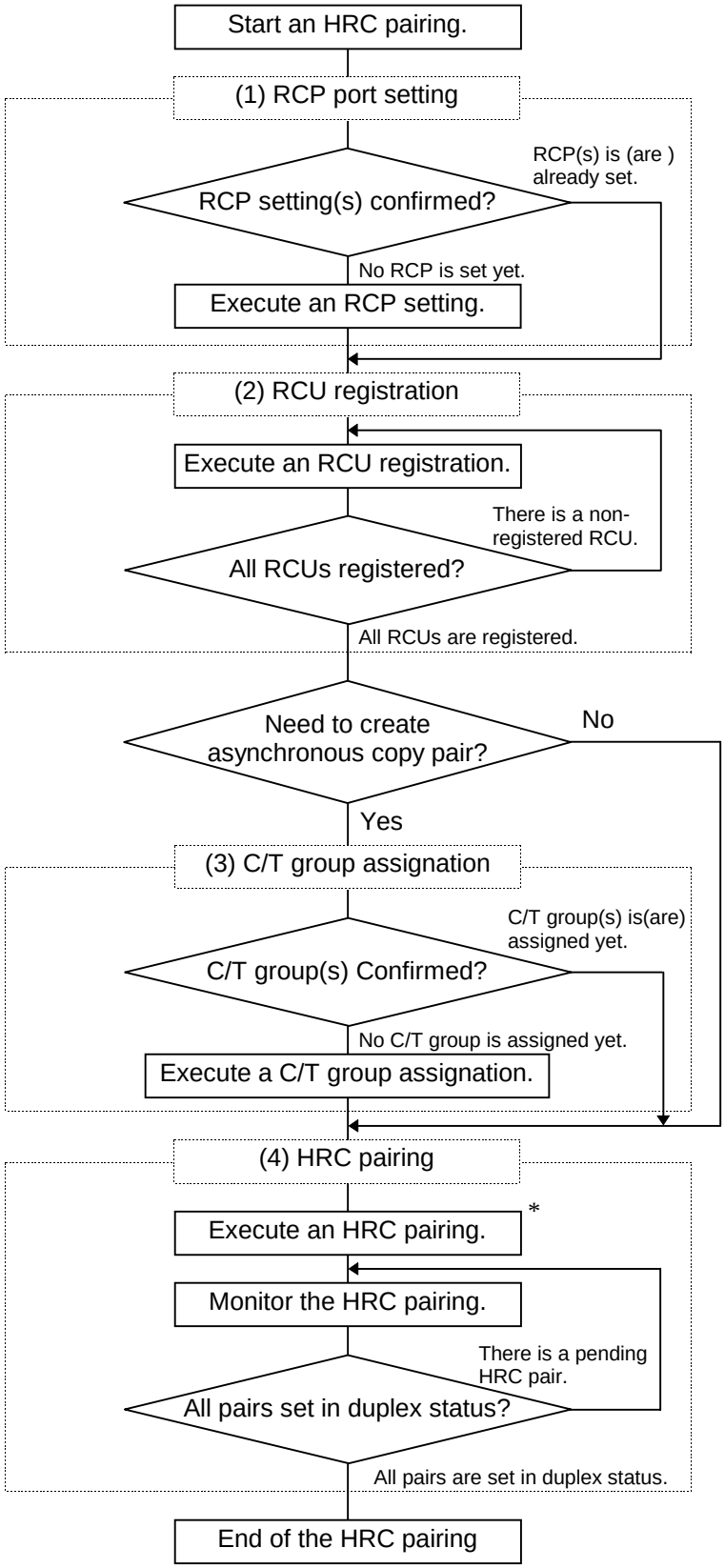
7.4 Creating New HRC Pair(s)

HRC Pairing Flow



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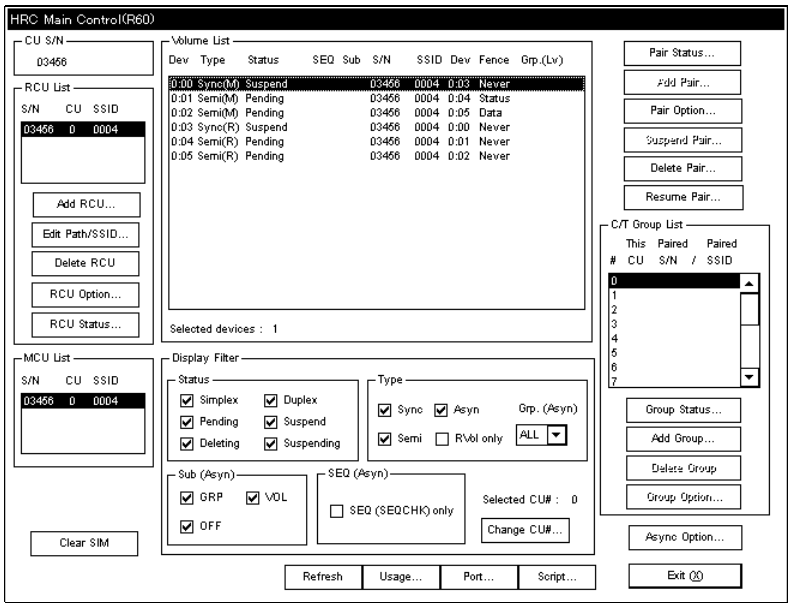
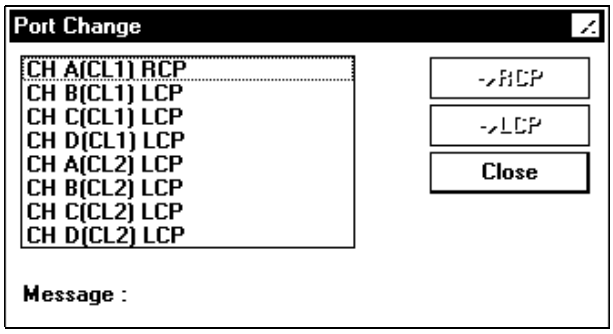
(1) RCP Port Setting

1. Display the HRC screen.
   Select (CL) [HRC] in the 'SVP' window.

2. Open the Port Setting window on the HRC screen.
   Press (CL) the [Port...] button (see the figure) on the HRC screen.



3. Confirming the port type(s)
   Compare the port setting(s) displayed on the screen with that(those) described on the work sheet. If the port setting(s) is(are) confirmed to be the same as that(those) on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".



4. Changing the port type(s)
   Select all the ports desired to be changed to the RCP type, then press (CL) the [-> RCP] button (see the figure).
   - The port(s) to be changed to the RCP type must be disconnected from the host beforehand.
   - When a cable connection change instruction is displayed, connect the cable(s) to the object RCU(s). If the connection is(are) to be made via the ESCD(s), connect the cable to the ESCD(s).

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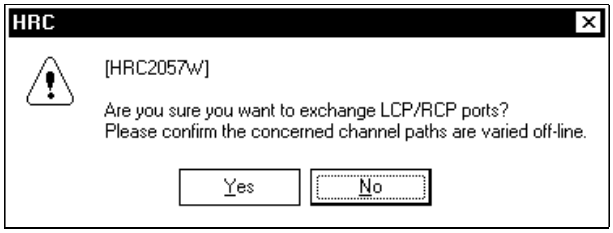
5. Confirm the channel path
Confirm the changed path(s) is(are) varied off-line, and press (CL) [Yes] button.



6. Terminating the RCP port setting
Compare again the port setting(s) displayed on the screen with that(those) described on the work sheet.
Make sure that the port setting(s) has(have) been done as described on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".

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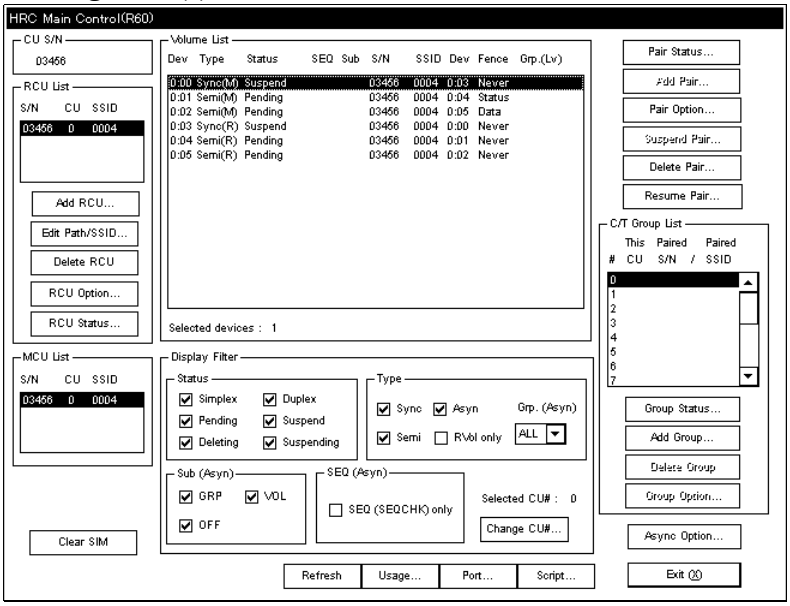
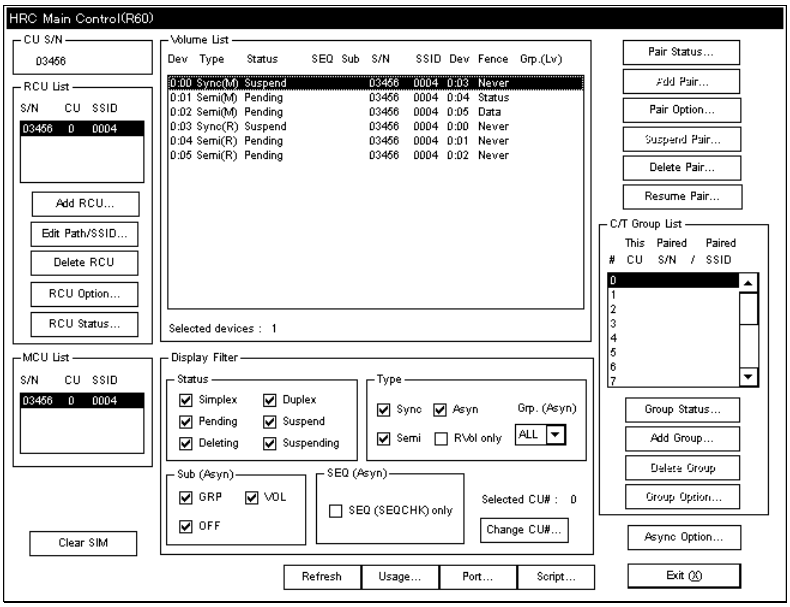
(2) RCU Registration

1. Confirming the registration of the existing RCU(s)
   In the display filter, set the CU# corresponding to the CU image address of the subsystem (To change the CU#, press (CL) the [Change CU#...] button.). Compare the RCU(s) currently registered with the RCU(s) described on the work sheet referring to the RCU list (see the figure) on the HRC screen. When there is no need to register new RCU(s), go to Item (3) "C/T group assignation".



2. RCU registering screen
   Press (CL) the [Add RCU...] button (see the figure) on the HRC screen.



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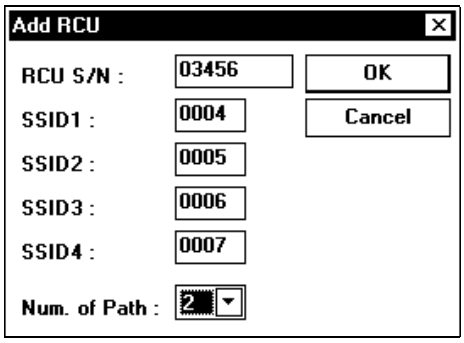
3. Inputting RCU parameters



On the Add RCU screen (see the figure), perform the following.
Input a 5- character RCU serial number in RCU S/N.
Input a 4- digit hexadecimal RCU SSID number in SSID 1 ~ 4.
Input SSID specified at the Define Configration and Install of RCU.
Select a number of the MCU-RCU logical paths from the combo-box at Num. of Path. The number can be either of 1 to 4.
When all the above operations are finished, press (CL) the [OK] button (see the figure).

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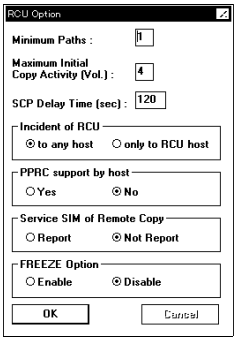
4. Setting the RCU option



On the RCU Option Setting screen (see the figure), perform the following.
Input the minimum number of paths to be used in succession in Minimum Paths.
Input Maximum Initial Copy Activity (1 through 4).
Set one of the following in Incident of RCU as the incident of the RCU.
- To any host
- Only to RCU host

Set one of the following in PPRC support by host.
- Yes
- No

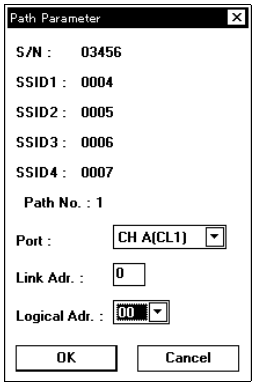
Set one of the following in Service SIM of Remote Copy as handling the Service SIM of Remote Copy.
- Report
- Not Report

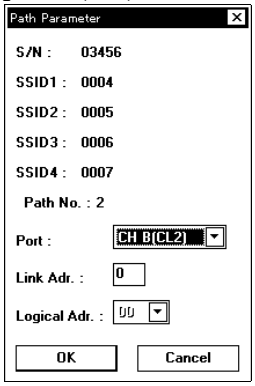
Set one of the following in FREEZE option.
- Enable
- Disable

Input SCP Delay Time (0 through 600). SCP Delay Time is available for HRC only.
When all the above operations are finished, press (CL) the [OK] button (see the figure).

5. Inputting logical path parameters

This screen appears for each logical path inputted in step 3.
On each Logic Path Parameter Input screen, perform the following.
Select the RCP port to be connected to the object RCU from the combo-box in Port.
Input a 2-digit hexadecimal number of the link destination address in Link Adr. for the object RCU. When no ESCD is to be used, input '00' in Link Adr.
Select the logical address of the object RCU from the combo-box at Logical Adr.
Please select a logical address which are defined as CU images (00 through 03) in the RCU.
(Notes) DKC210I : It has only #00 as CU image.
DKC80I-3 : When the RCU is MPSD, select “00”. When the RCU is SPSD, select “00” or “01” according to the device position.
Other DKC : There are some DKCs that have four CU images (00 through 03). In this case, please select corresponding logical address according to the device position.
After all the above operations are finished, press (CL) the [OK] button (see the figure).





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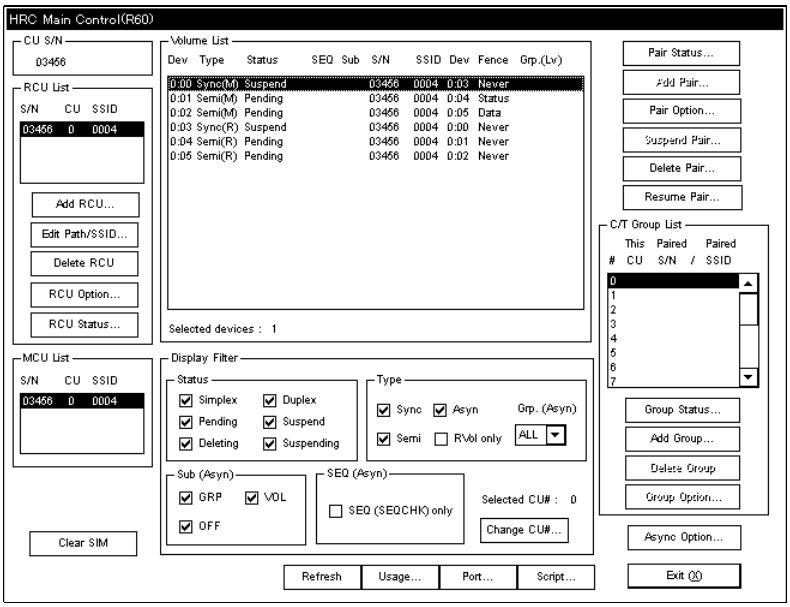
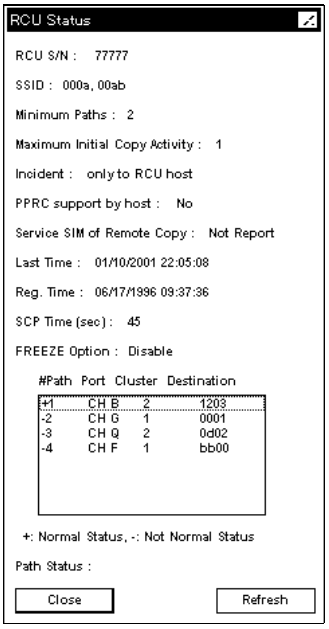
6. Select the RCU(s) currently registered from the RCU list displayed on the HRC screen, then select (CL) the [RCU Status...] screen.



7. Verifying the logical path(s)

Select one of the logical paths from the path list (see the figure) on the RCU Status screen. Make sure "Normal" is displayed in the “Status" field (see the figure).

After verifying the status of all the paths, press (CL) the [Close] button (see the figure).



8. Registering the next RCU(s)

After registering the RCU(s), go to Item (3) "C/T group assignation". If there is(are) other RCU(s) to register, go back to step 2 to register it(them).

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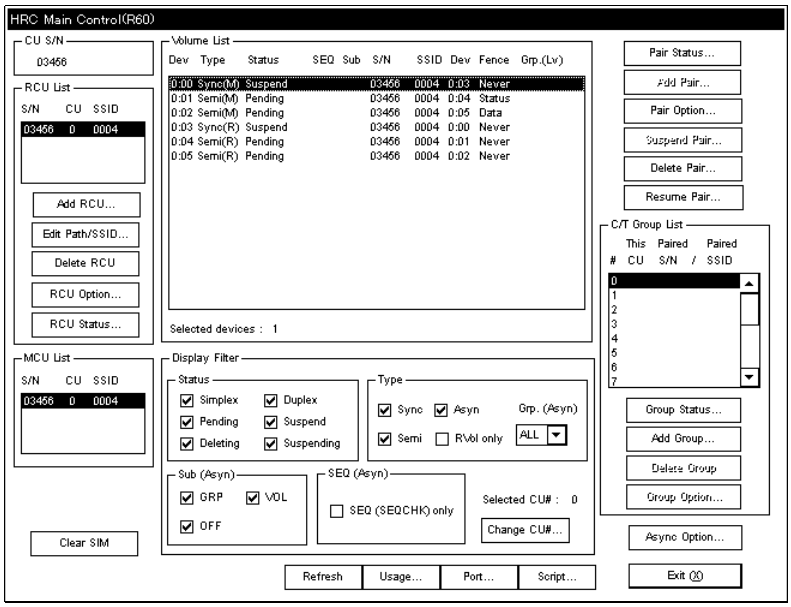
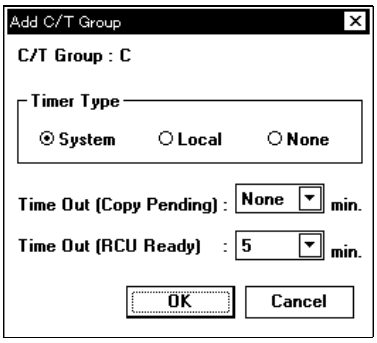
(3) C/T group assignation

1. Selecting a C/T group
   C/T group assignation is necessary before HRC asynchronous pairing.
   So, if there is no need to create HRC asynchronous copy pair(s), go to Item (4).
   If there is no need to assign more C/T group(s), go to Item (4) “HRC Pairing”.
   Select one of the C/T group that never used (shown as blank) from C/T Group List on the HRC screen.
   Press (CL) the [Add Group...] button on the HRC screen.



2. Inputting C/T group parameters
   On the Add C/T Group screen (see the figure), perform the following.
   Set one of the following in Timer Type as the timer type of the C/T.
   - System
   - Local
   - None

   Select maximum delay time of update data from combo-box at Time Out (Copy Pending).
   Select maximum waiting time for the RCU gets ready from combo-box at Time Out (RCU Ready).
   When all the above operations are finished, press (CL) the [OK] button.



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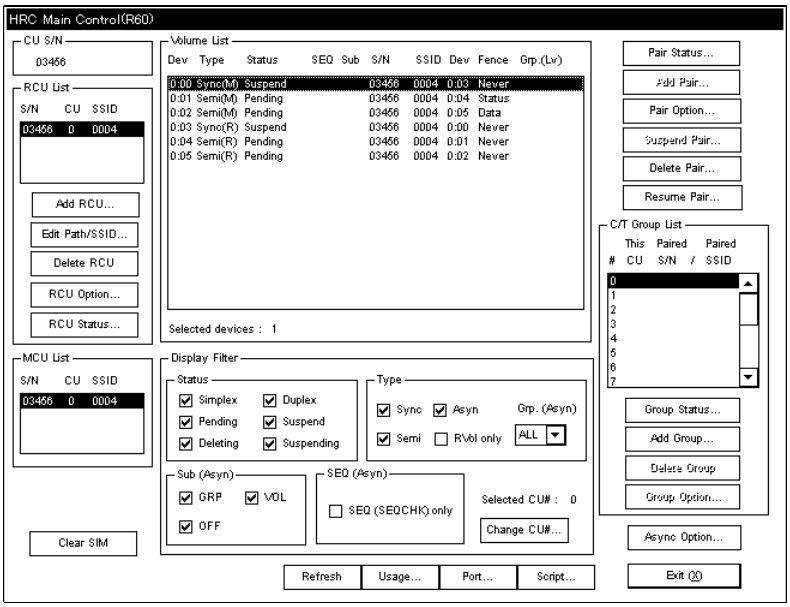
3. Confirming a C/T group assigned

Confirm a C/T group currently assigned is displayed as “Used” in the C/T Group List on the HRC screen.

Select the C/T group from the C/T Group List, then press (CL) [Group Status...] button.



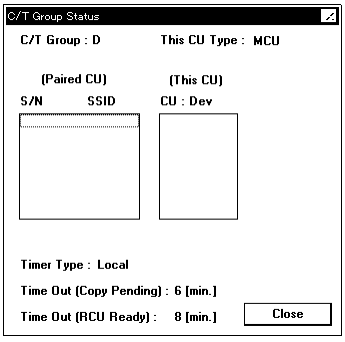
4. Confirm the C/T group parameters

Confirm the C/T group parameters are correctly displayed.

After confirming the parameters, press (CL) [Close] button.

If there is(are) other C/T group(s) to assign, go back to step 1 to assign it(them).

If not, go to Item (4) “HRC Pairing”.



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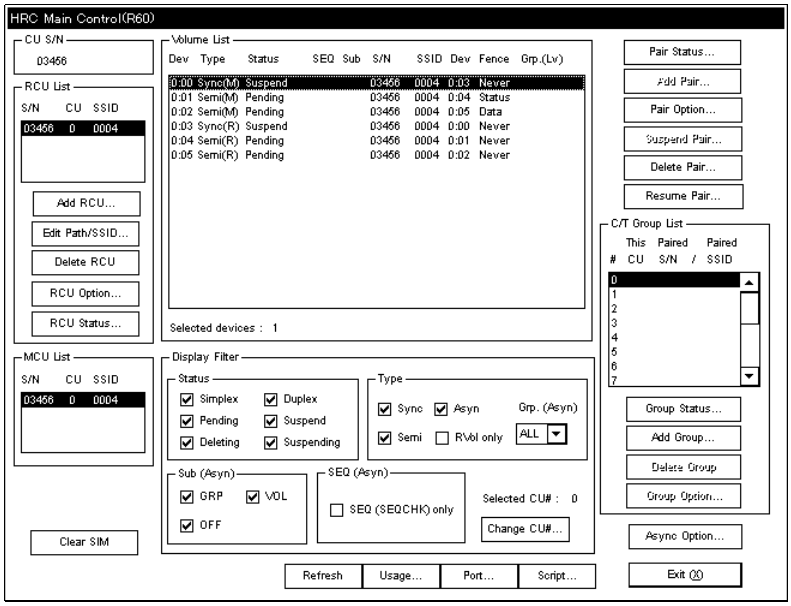
(4) HRC Pairing

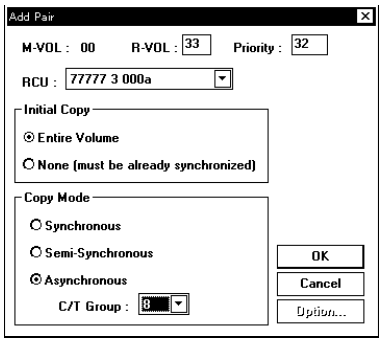
1. Confirming the volume status
Set the CU# corresponding to the CU image address of the subsystem (To change the CU#, press (CL) the [Change CU#...] button). Make sure all the volumes to be paired are in the simplex status referring to the volume list (see the figure) on the HRC screen.



2. Selecting the volume(s) (M-VOL(s))
Select all the volumes to be paired from the volume list (see the figure) on the HRC screen and press (CL) the [Add pair...] button (see the figure) in “HRC Operation”.

Note : Don’t select HODM R-Vol(s) as the HRC M-Vol(s).

3. Inputting the HRC pairing parameters
On the HRC Pairing Parameter Input screen, perform the following.
Input the volume number of the R-VOL in R-VOL corresponding to the M-VOL.
Input the Initial Copy Priority to the Priority.
Select the RCU from the combo-box at RCU.
Select one of the copy types indicated at Initial Copy.
Select one of the copy mode indicated at Copy Mode.
When all the above operations are finished, press (CL) the [OK] button (see the figure).



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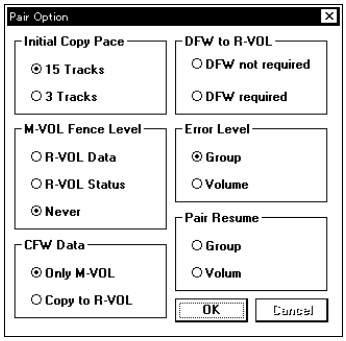
4. Setting HRC pair option



On the Pair Option screen, perform the following.
Set one of the following in Initial Copy Pace.
- 15 Tracks
- 3 Tracks

Set one of the following in DFW to R-VOL.
(Ineffective when asynchronous copy pairing)
- DFW not required
- DFW required

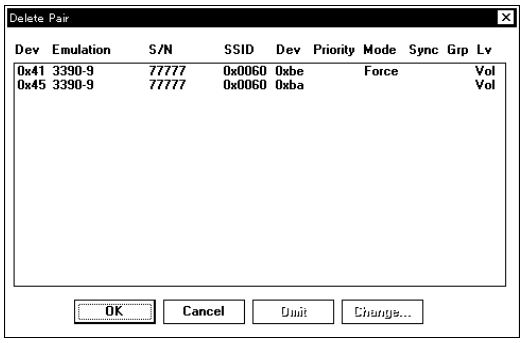
Set one of the following in CFW data
- Copy to R-VOL
- Only M-VOL

Set one of the following in M-VOL Fence Level.
(Fixed “Never” when asynchronous copy pairing)
- R-VOL Data
- R-VOL Status
- Never

Set one of the following in Error Level.
(Effective only asynchronous copy pairing)
- Group
- Volume

When all above operations are finished, press (CL) [OK] button.

5. Confirm the parameter of an HRC paired



Confirm the volumes to be paired from the volume list (see the figure) on the Add Pair screen and select (CL) [OK] button.
- If you want to change an HRC paired parameters of volumes, select the volumes from Add Pair screen and select (CL) [Change...] button.
- If you want to omit an HRC pair create, select the volumes from Add Pair screen and select (CL) [Omit] button.

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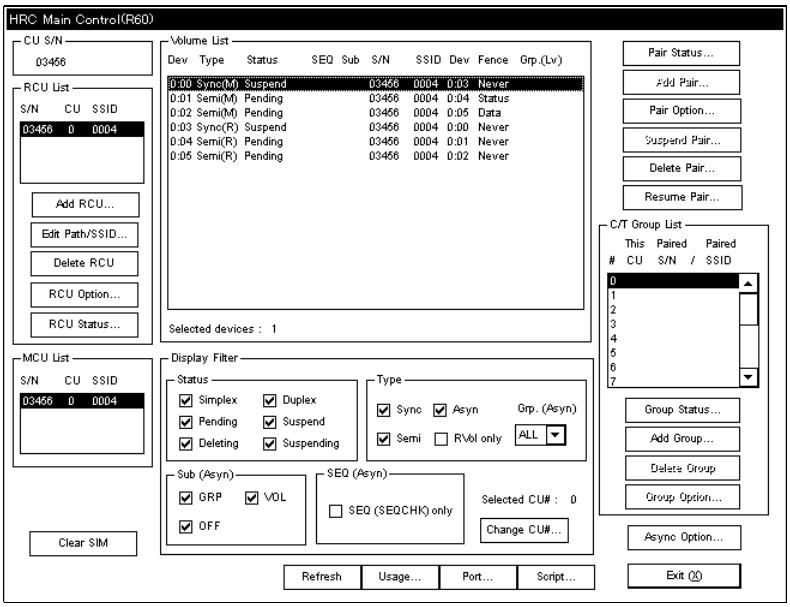
6. Verifying the status of an HRC paired

Select one of the volumes to be paired from the volume list (see the figure) on the HRC screen and press (CL) the [Pair Status...] button (see the figure).



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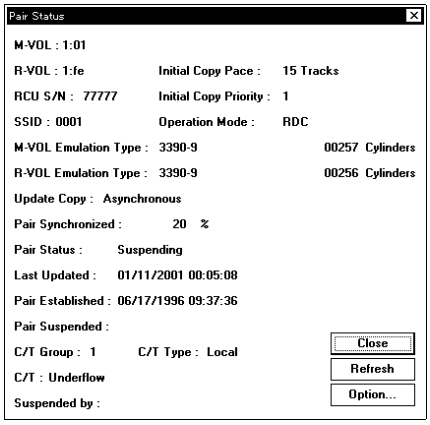
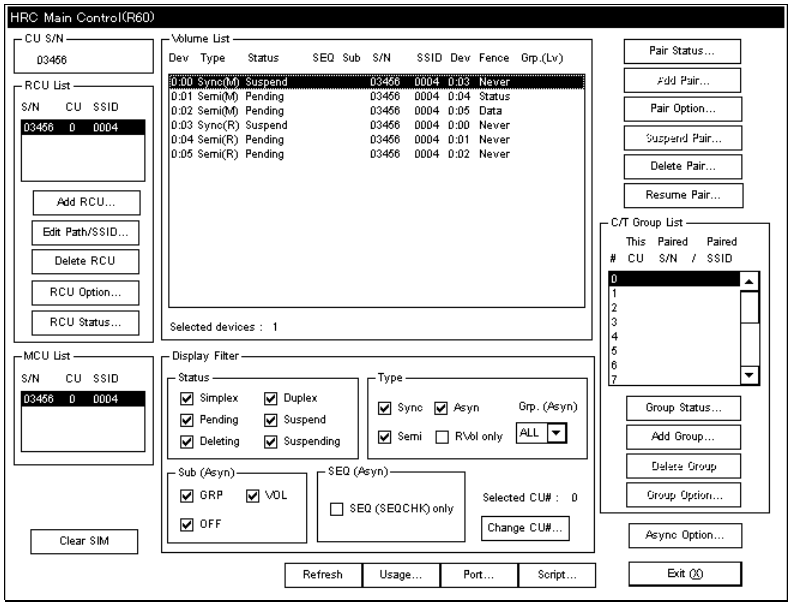
7. Checking the pairing matching rate check
Make sure “100%” is displayed for “Pair Synchronized” on the Pair Status screen. If not, wait for a while and press (CL) the [Refresh] button (see the figure) to update the display. After this, check the matching rate again. To refer to another VOL, press (CL) the [Close] button (see the figure) to go back to step 5. Repeat steps 5 and 6 until the matching rate of every volume to be paired reaches “100%”.



8. Final verification
Press (CL) the [Refresh] button (see the figure) on the HRC screen to update the screen display and make sure all the volumes to be paired and displayed in the volume list (see the figure) are in the duplex status.



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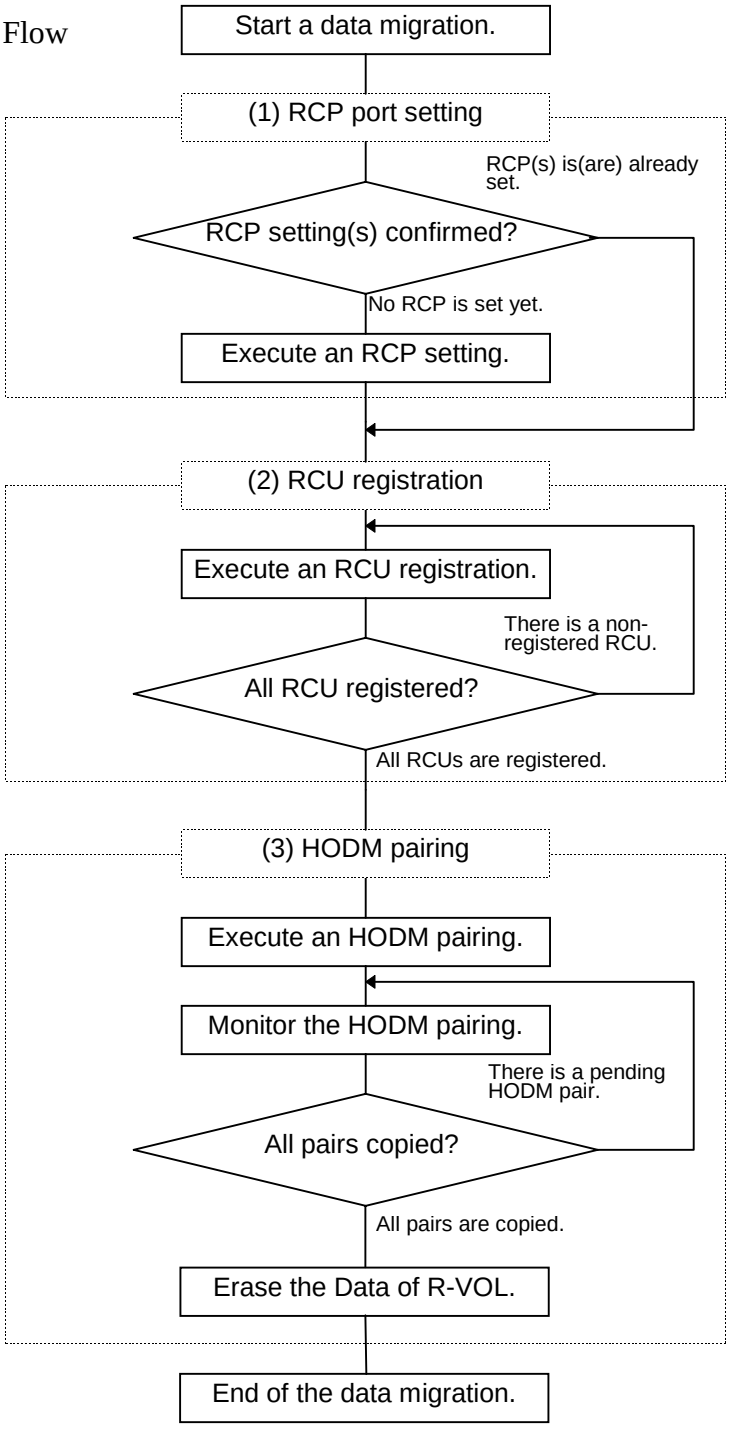
7.5 Migrating Data (New HODM Pairing(s))

Data Migrating Flow



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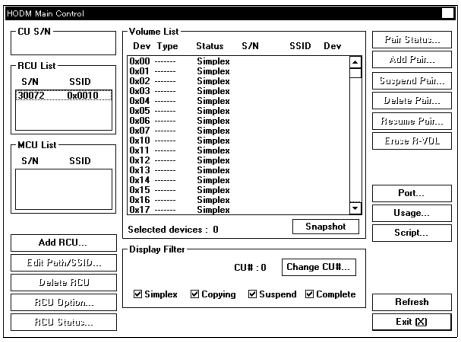
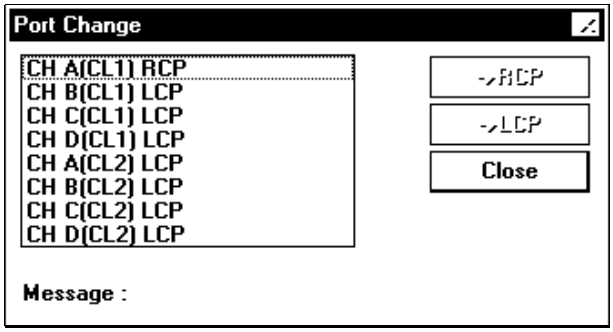
(1) RCP Port Setting

1. Display the HODM screen.
   Select (CL) [HODM] in the 'SVP' window.

2. Open the Port Setting window on the HODM screen.
   Press (CL) the [Port...] button (see the figure) on the HODM screen.



3. Confirming the port type(s)
   Compare the port setting(s) displayed on the screen with that(those) described on the work sheet. If the port setting(s) is(are) confirmed to be the same as that(those) on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".



4. Changing the port type(s)
   Select all the ports desired to be changed to the RCP type, then press (CL) the [-> RCP] button (see the figure).
   - The port(s) to be changed to the RCP type must be disconnected from the host beforehand.
   - When a cable connection change instruction is displayed, connect the cable(s) to the object RCU(s). If the connection is(are) to be made via the ESCD(s), connect the cable to the ESCD(s).

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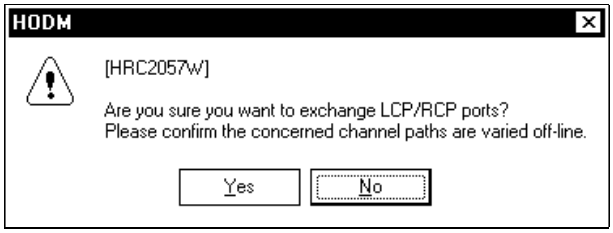
5. Confirm the channel path
Confirm the changed path(s) is(are) varied off-line, and press (CL) [Yes] button.



6. Terminating the of RCP port setting
Compare again the port setting(s) displayed on the screen with that(those) described on the work sheet.
Make sure that the port setting(s) has(have) been done as described on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".

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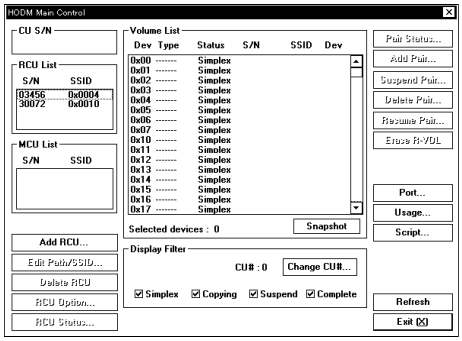
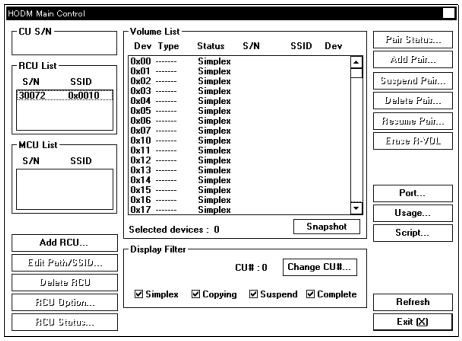
(2) Registering the RCU(s)

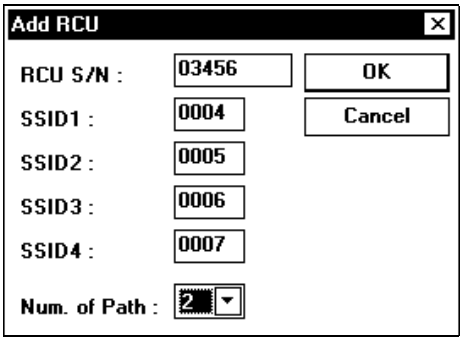
1. Confirming the RCU registration of the existing RCU(s)
In the display filter, set the CU# corresponding to the CU image address of the subsystem (To change the CU#, press (CL) the [Change CU#...] button). Compare the RCU(s) currently registered with the RCU(s) described on the work sheet referring to the RCU list (see the Figure) on the HODM screen. When there is no need to register new RCU(s), go to Item (3) "HODM Pairing".



2. RCU registering screen
Press (CL) the [Add RCU...] button (see the figure) on the HODM screen.



3. Inputting RCU parameters
On the RCU Registering screen (see the figure), perform the following.
Input a 5- character RCU serial number in RCU S/N.
Input a 4- digit hexadecimal RCU SSID number in SSID 1 ~ 4.
Input SSID specified at the Define Configration and Install of RCU.
Select a number of the MCU-RCU logical paths from the combo-box at Num. of Path. The number can be either of 1 to 4.



When all the above operations are finished, press (CL) the [OK] button (see the figure).

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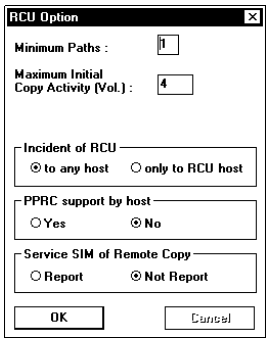
4. Setting the RCU option



On the RCU Option Setting screen (see the figure), perform the following.
Input the minimum number of paths to be used in succession in Minimum Paths.
Input Maximum Initial Copy Activity (1 through 4).
Set one of the following in Incident of RCU.
- To any host
- Only to RCU host

Set one of the following in PPRC support by host.
- Yes
- No

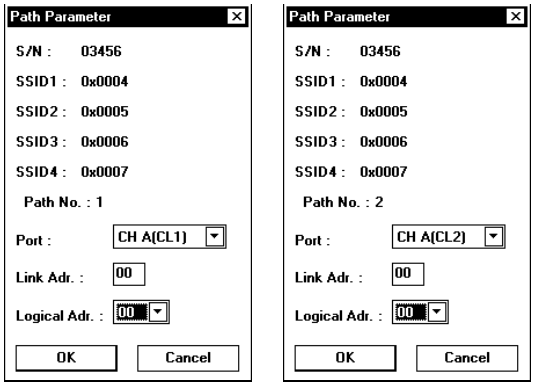
Set one of the following in Service SIM of Remote Copy as handling the Service SIM of Remote Copy.
- Report
- Not Report

When all the above operations are finished, press (CL) the [OK] button (see the figure).

5. Inputting logical path parameters

This screen appears for each logical path inputted in step 3.
On each Logic Path Parameter Input screen, perform the following.
Select the RCP port to be connected to the object RCU from the combo-box in Port.
Input a 2-digit hexadecimal number of the link destination address in Link Adr. for the object RCU. When no ESCD is to be used, input '00' in Link Adr.
Select the logical address of the object RCU from the combo-box at Logical Adr.
Please select a logical address which are defined as CU images (00 through 03) in the RCU.
(Notes) DKC210I : It has only #00 as CU image.
DKC80I-3 : When the RCU is MPSD, select “00”. When the RCU is SPSD, select “00” or “01” according to the device position.
Other DKC : There are some DKCs that have four CU images (00 through 03).). In this case, please select corresponding logical address according to the device position.

After all the above operations are finished, press (CL) the [OK] button (see the figure).



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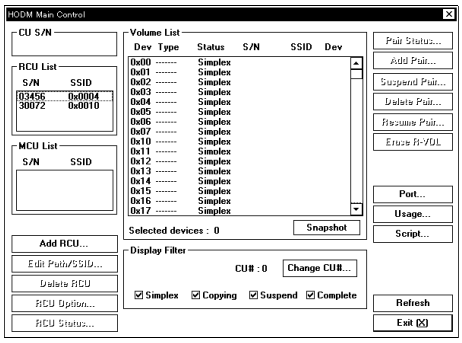
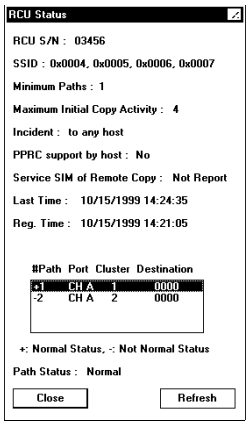
6. Select the RCU(s) currently registered from the RCU list displayed on the HODM screen, then press (CL) the [RCU Status...] button.



7. Verifying the logical path(s)
   Select one of the logical paths from the path list (see the figure) on the RCU Status screen. Make sure "Normal" is displayed in the “Path Status" field (see the figure).
   After verifying the status of all the paths, press (CL) the [Close] button (see the figure).



8. Registering the next RCU(s)
   After registering the RCU(s), go to Item (3) "HODM Pairing". If there is(are) other RCU(s) to register, go back to step 2 to register it(them).

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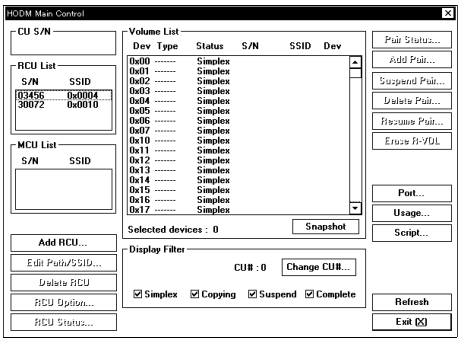
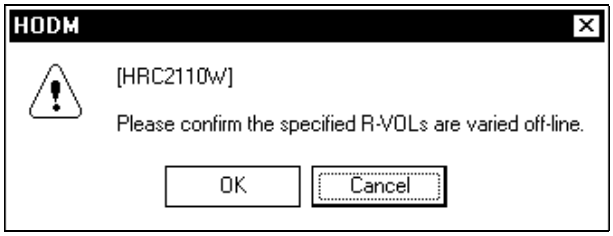
(3) HODM Pairing (Starting Data Migration)

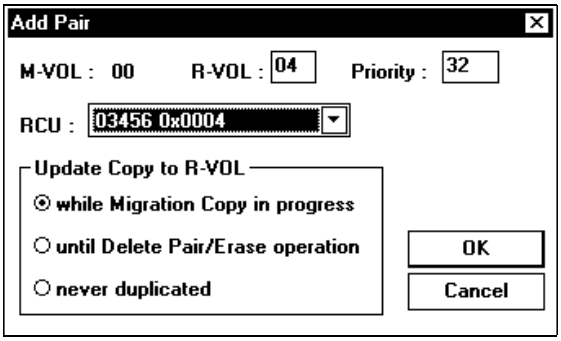
1. Confirming the volume status
Set the CU# corresponding to the CU image address of the subsystem (To change the CU#, press (CL) the [Change CU#...] button). Make sure all volumes to be paired are in the simplex status referring to the volume list (see the figure) on the HODM screen.



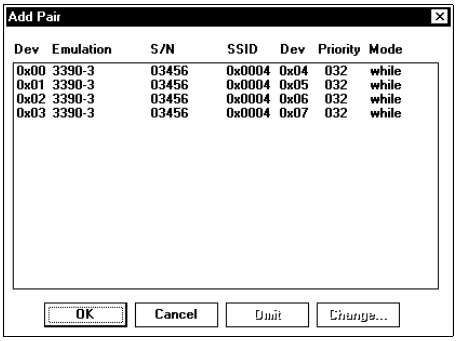
2. Selecting the volume(s) (M-VOL(s))
Select all volumes to be paired from the volume list (see the figure) on the HODM screen and press (CL) the [Add pair...] button (see the figure) in “HODM Operation”.
Then, confirm the R-Vols are varied off-line, press (CL) [OK] button.



3. Inputting the HODM pairing parameters
On the HODM Pairing Parameter Input screen, perform the following.
Input the volume number of the R-VOL in R-VOL corresponding to the M-VOL.
Input the initial copy priority to the Priority.
Select the RCU from the combo-box at RCU.
Select one of the update copy mode indicated at Update Copy to R-VOL.
When all operations above are finished, press (CL) the [OK] button (see the figure).
Note : Don’t use the R-VOL of HODM as the M-VOL of HRC.



4. Confirm the parameter of an HODM paired
Confirm the volumes to be paired from the volume list (see the figure) on the Add Pair screen and select (CL) [OK] button.
• If you want to change an HODM paired parameters of volumes, select the volumes from Add Pair screen and select (CL) [Change...] button.
• If you want to omit an HODM pair create, select the volumes from Add Pair screen and select (CL) [Omit] button.



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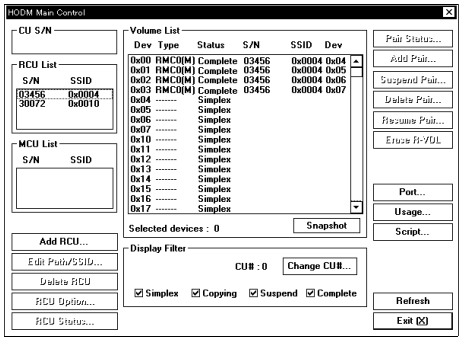
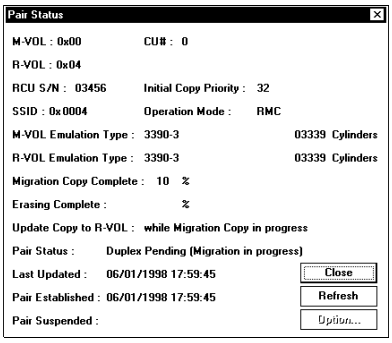
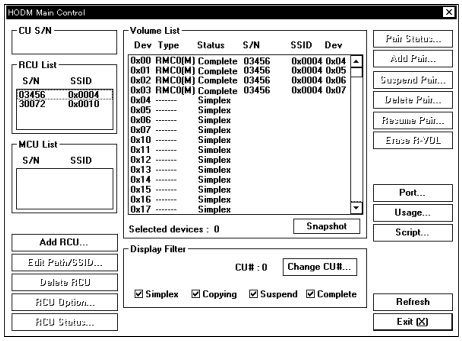
5. Verifying the status of an HODM paired
Select one of the volumes to be paired from the volume list (see the figure) on the HODM screen and press (CL) the [Pair Status...] button (see the figure).



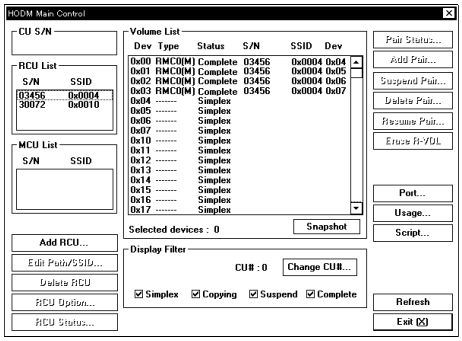
6. Checking the data migration progress rate
Make sure "100%" is displayed for "Migration Copy Complete" on the Pair Status screen. If not, wait for a while and press (CL) the [Refresh] button (see the figure) to update the display. After this, check the matching rate again. To refer to another VOL, press (CL) the [Close] button (see the figure) to go back to step 5. Repeat steps 5 and 6 until the matching rate of every volume to be paired reaches "100%".



7. Verifying completion of the data migration
Press (CL) the [Refresh] button (see the figure) on the HODM screen to update the screen display and make sure all the volumes to be paired and displayed in the volume list (see the figure) are in the simplex(waiting for erasure) status (displayed as "Complete").



8. Erasing the source data of volume pair(s) completed migration Select all the volume(s) to be erased from the volume list on the HODM screen and press (CL) the [Erase R-VOL] button (see the figure).



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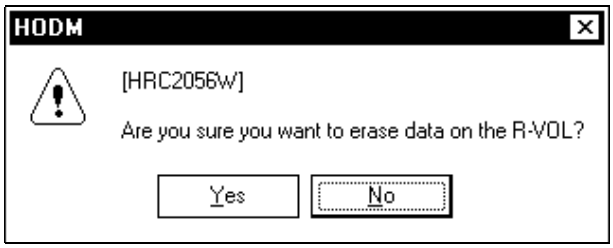
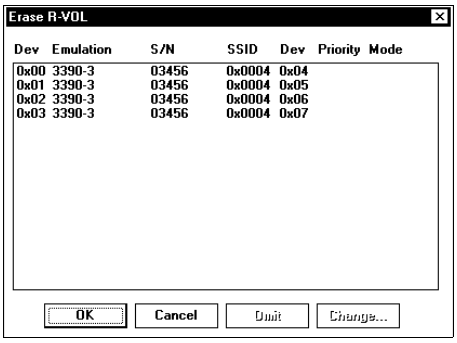
9. Instruction a erasing

Press (CL) the [Erase R-VOL] button on the HODM screen. The confirmation message will appear. To delete the pair(s) really, press (CL) the [Yes] button.



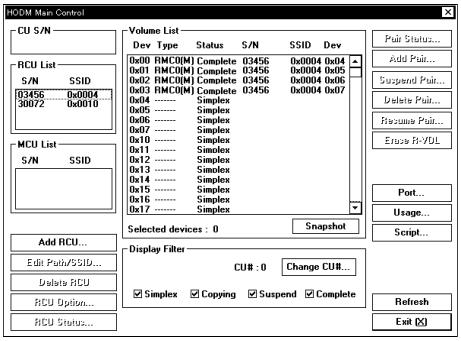
10. Confirm the erasure volumes

Confirm the erasure volumes that are displayed to the Erase R-VOL screen and select (CL) [OK] button.
If you want to omit the volume erasure, select (CL) the volumes from the list and select (CL) [Omit] button.



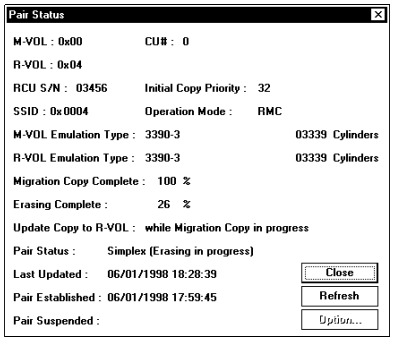
11. Verifying the status of an HODM paired

Select one of the volumes to be erased from the volume list (see the figure) on the HODM screen and press (CL) the [Pair Status...] button (see the figure).



12. Checking the data erasing progress rate

Make sure "100%" is displayed for "Erasing Complete" on the Pair Status screen. If not, wait for a while and press (CL) the [Refresh] button (see the figure) to update the display. After this, check the matching rate again. To refer to another VOL, press (CL) the [Close] button (see the figure) to go back to step 10. Repeat steps 10 and 11 until the matching rate of every volume to be paired reaches "100%".



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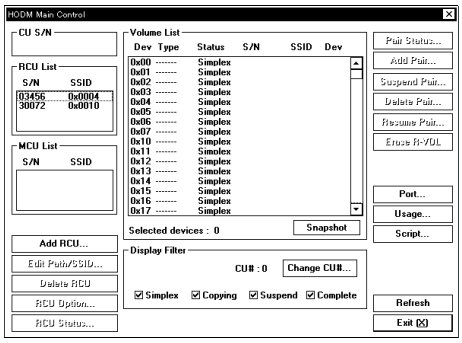
13. Verifying the data erase.

Verify if the volume(s) selected from the volume list (see the figure) is(are) in the simplex status by pressing (CL) the [Refresh] button on the HODM screen.



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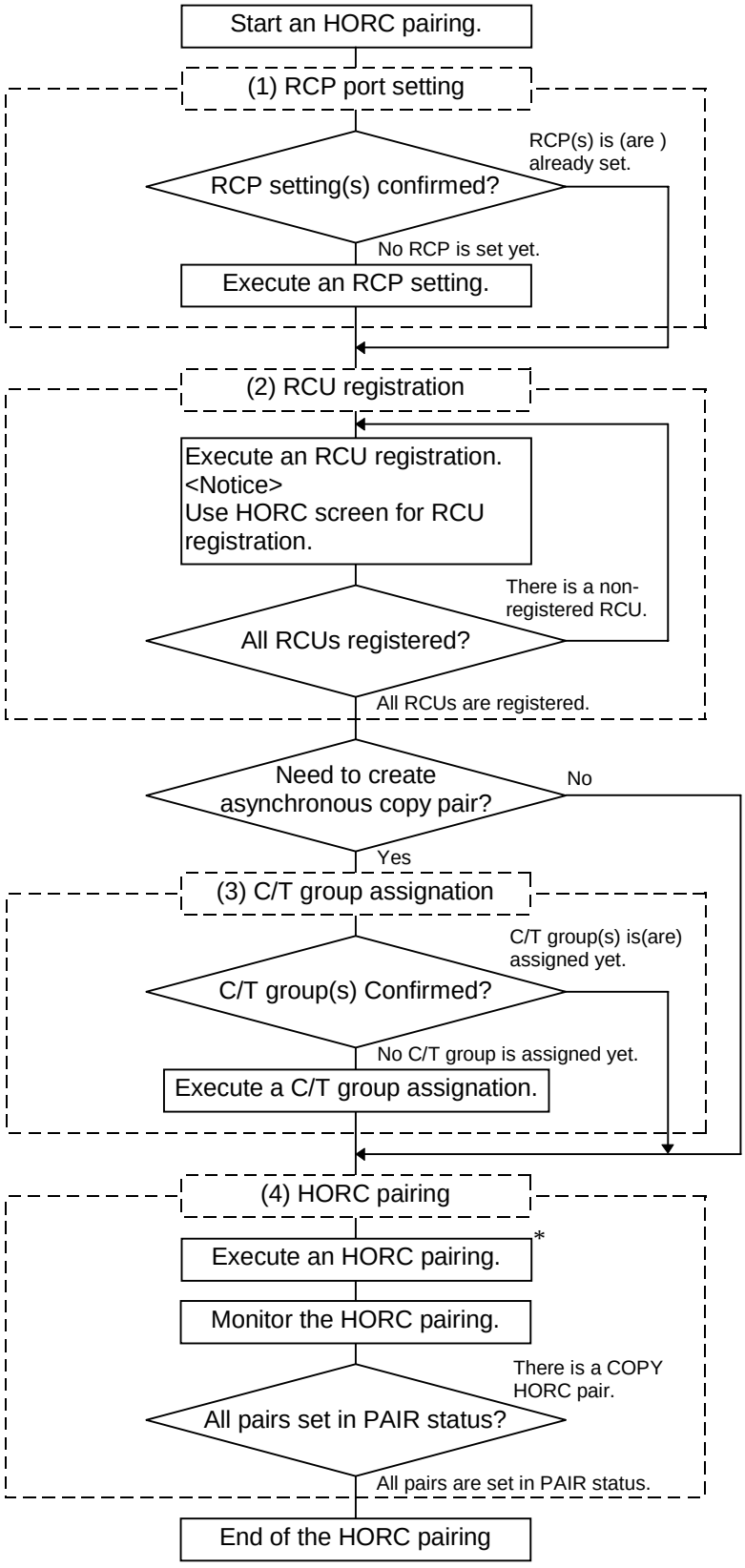
7.6 Creating New HORC Pair(s) (for OPEN VOL)

HORC Pairing Flow



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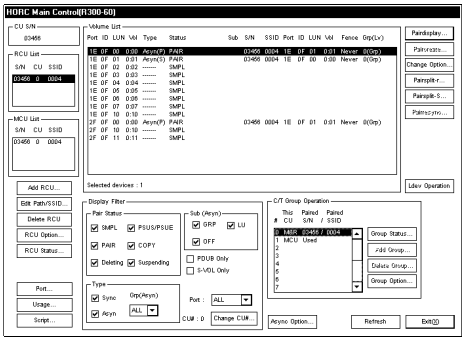
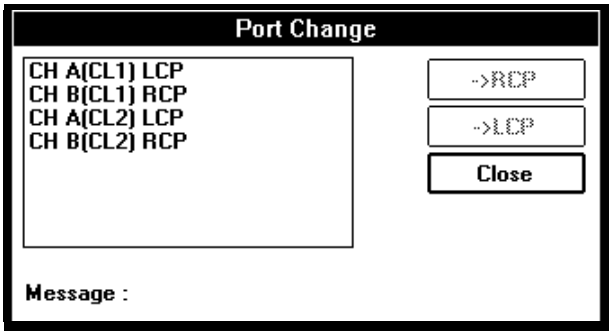
(1) RCP Port Setting

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.
   If SVP Micro-program version is not over "51-36-01", refer to the "7.7 Creating New HORC Pair(s) (for LDEV) (INST07-440)".

2. Open the Port Setting window on the HORC screen.
   Press (CL) the [Port...] button (see the figure) on the HORC screen.



3. Confirming the port type(s)
   Compare the port setting(s) displayed on the screen with that(those) described on the work sheet. If the port setting(s) is(are) confirmed to be the same as that(those) on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".



4. Changing the port type(s)
   Select all the ports desired to be changed to the RCP type, then press (CL) the [-> RCP] button (see the figure).
   - The port(s) to be changed to the RCP type must be disconnected from the host beforehand.
   - When a cable connection change instruction is displayed, connect the cable(s) to the object RCU(s). If the connection is(are) to be made via the ESCD(s), connect the cable to the ESCD(s).

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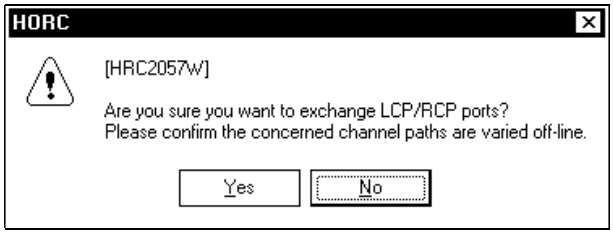
5. Confirm the channel path
   Confirm the changed path(s) is(are) varied off-line, and press (CL) [Yes] button.



6. Terminating the RCP port setting
   Compare again the port setting(s) displayed on the screen with that(those) described on the work sheet.
   Make sure that the port setting(s) has(have) been done as described on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".

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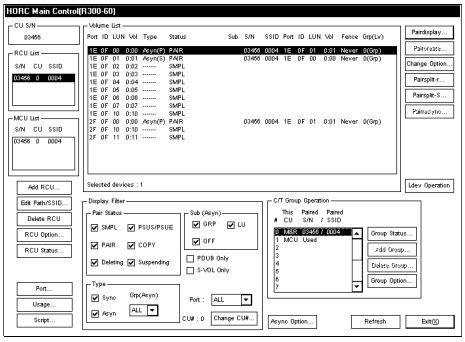
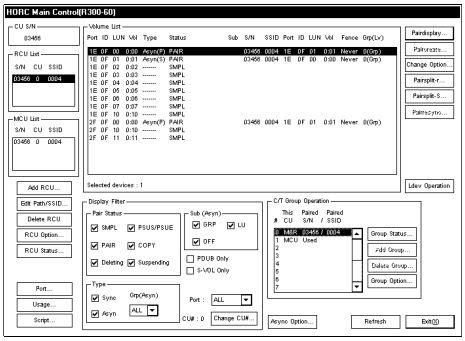
(2) RCU Registration

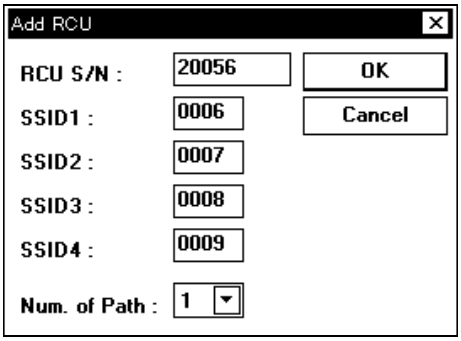
1. Confirming the registration of the existing RCU(s)
In the display filter, set the CU# corresponding to the CU image address of the subsystem (To change the CU#, press (CL) the [Change CU#...] button.). Compare the RCU(s) currently registered with the RCU(s) described on the work sheet referring to the RCU list (see the figure) on the HORC screen. When there is no need to register new RCU(s), go to Item (4) "HORC Pairing".



2. RCU registering screen
Press (CL) the [Add RCU...] button (see the figure) on the HORC screen.



3. Inputting RCU parameters
On the Add RCU screen (see the figure), perform the following.
Input a 5- character RCU serial number in RCU S/N.
Input a 4- digit hexadecimal RCU SSID number in SSID 1 ~ 4.
Input SSID specified at the Define Configration and Install of RCU.
Select a number of the MCU-RCU logical paths from the combo-box at Num. of Path. The number can be either of 1 to 4.



When all the above operations are finished, press (CL) the [OK] button (see the figure).

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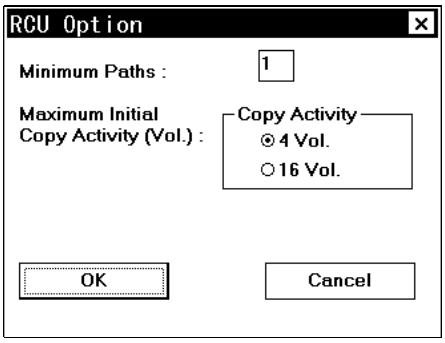
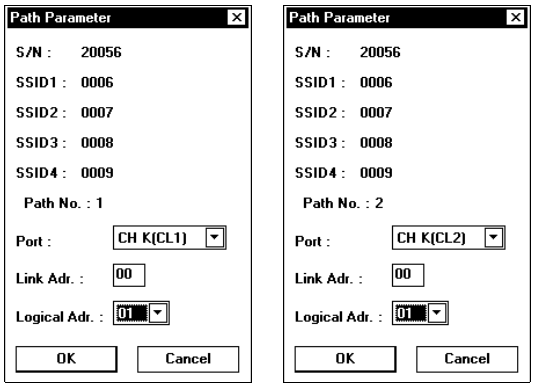
4. Setting the RCU option

On the RCU Option Setting screen (see the figure), perform the following.
Input the minimum number of paths to be used in succession in Minimum Paths.
Specifies the maximum number of Initial Copy execution. Defined 4 or 16.
When all the above operations are finished, press (CL) the [OK] button (see the figure).



5. Inputting logical path parameters

This screen appears for each logical path inputted in step 3.
On each Logic Path Parameter Input screen, perform the following.
Select the RCP port to be connected to the object RCU from the combo-box in Port.
Input a 2-digit hexadecimal number of the link destination address in Link Adr. for the object RCU. When no ESCD is to be used, input '00' in Link Adr.
Select the logical address of the object RCU from the combo-box at Logical Adr.
Please select a logical address which are defined as CU images (00 through 03) in the RCU.
After all the above operations are finished, press (CL) the [OK] button (see the figure).



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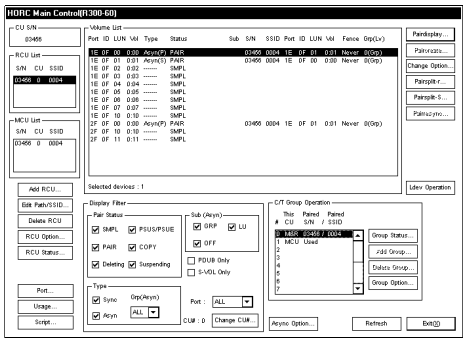
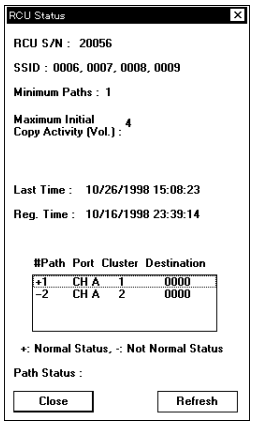
6. Select the RCU(s) currently registered from the RCU list displayed on the HORC screen, then select (CL) the [RCU Status...] screen.



7. Verifying the logical path(s)

Select one of the logical paths from the path list (see the figure) on the RCU Status screen. Make sure "Normal" is displayed in the “Status" field (see the figure).

After verifying the status of all the paths, press (CL) the [Close] button (see the figure).



8. Registering the next RCU(s)

After registering the RCU(s), go to Item (3) "HORC Pairing". If there is(are) other RCU(s) to register, go back to step 2 to register it(them).

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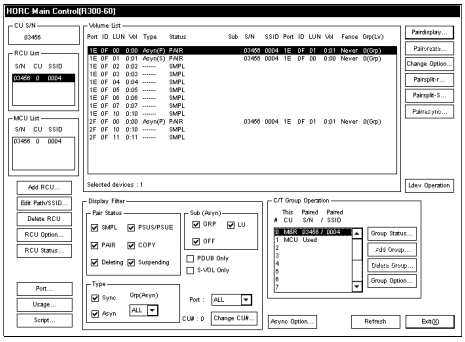
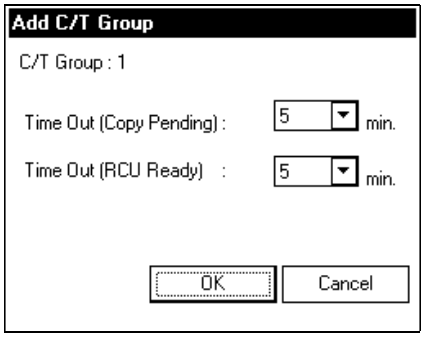
(3) C/T group assignation

1. Selecting a C/T group



C/T group assignation is necessary before HORC asynchronous pairing. So, if there is no need to create HORC asynchronous copy pair(s), go to Item (4).
If there is no need to assign more C/T group(s), go to Item (4) "HORC Pairing". Select one of the C/T group that never used (shown as blank) from C/T Group List on the HORC screen.
(Note: C/T groups which are assigned by HRC are not displayed on the list.)
Press (CL) the [Add Group...] button on the HORC screen.

2. Inputting C/T group parameters



On the Add C/T Group screen (see the figure), perform the following.
Select maximum delay time of update data from combo-box at Time Out (Copy Pending).
Select maximum waiting time for the RCU gets ready form combo-box at Time Out (RCU Ready).
When all the above operations are finished, press (CL) the [OK] button.

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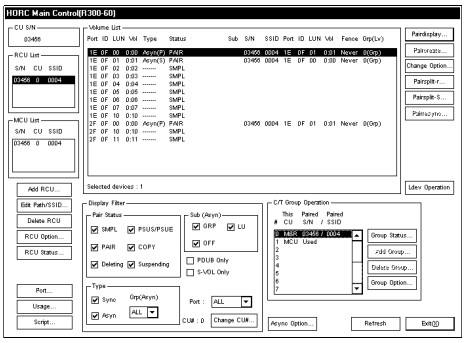
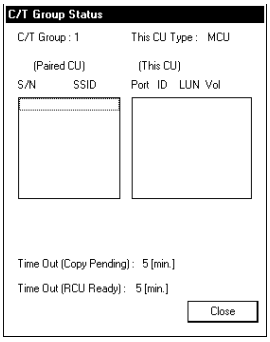
3. Confirming a C/T group assigned

Confirm a C/T group currently assigned is displayed as "Used" in the C/T Group List on the HORC screen.
Select the C/T group form the C/T Group List, then press (CL) [Group Status...] button.



4. Confirm the C/T group parameters

Confirm the C/T group parameters are correctly displayed After confirming the parameters, press (CL) [Close] button.
If there is(are) other C/T group(s) to assign, go back step 1 to assign it(them).
If not, go to Item (4) "HORC Pairing".



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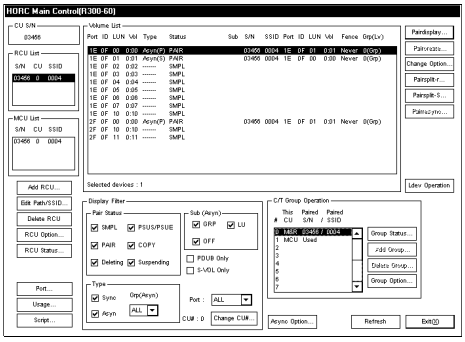
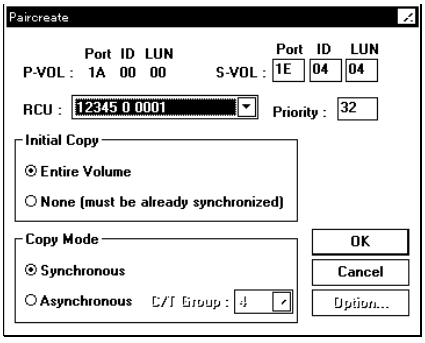
(4) HORC Pairing

1. Confirming the volume status
   Make sure all the volumes to be paired are in the SMPL status referring to the volume list (see the figure) on the HORC screen.



2. Selecting the volume(s) (P-VOL(s))
   Select all the volumes to be paired from the volume list (see the figure) on the HORC screen and press (CL) the [Paircreate...] button (see the figure) in “HORC Operation”.

3. Inputting the HORC pairing parameters
   On the Paircreate screen, perform the following.
   Input the PORT Number, SCSI ID Number and LUN Number of OPEN VOL in S-VOL corresponding to the P-VOL.
   Input the Initial Copy Priority to the Priority.
   Select the RCU from the combo-box at RCU.
   Select one of the copy types indicated at Initial Copy.
   Select one of the copy mode indicated at Copy Mode.
   Select a C/T group number from the combo-box at C/T Group if the copy mode is “Asynchronous”.
   When all the above operations are finished, press (CL) the [OK] button (see the figure).



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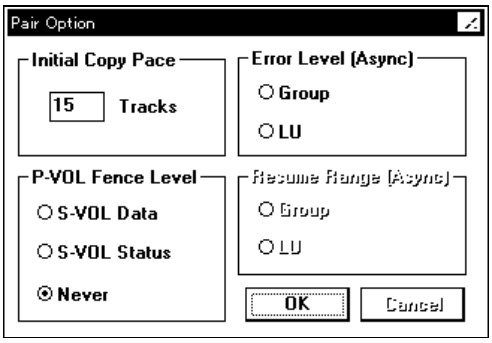
4. Setting HORC pair option



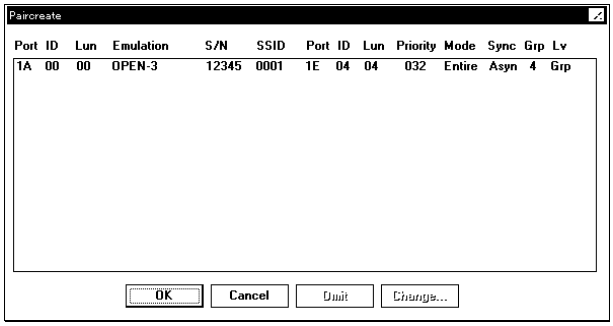
On the Pair Option screen, perform the following.
Set one of the following in Initial Copy Pace.
- 1 ~ 15 Tracks

Set one of the following in P-VOL Fence Level.
(Fixed “Never” when asynchronous copy pairing)
- S-VOL Data
- S-VOL Status
- Never

Set one of the following in Error Level.
(Effective only asynchronous copy pairing)
- Group
- LU

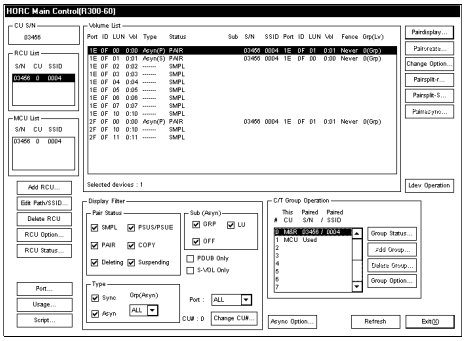
When all above operations are finished, press (CL) [OK] button.

5. Confirm the parameter of an HORC paired



Confirm the volumes to be paired from the volume list (see the figure) on the Paircreate screen and select (CL) [OK] button.
- If you want to change an HORC paired parameters of volumes, select the volumes from Paircreate screen and select (CL) [Change...] button.
- If you want to omit an HORC pair create, select the volumes from Paircreate screen and select (CL) [Omit] button.

6. Verifying the status of an HORC paired



Select one of the volumes to be paired from the volume list (see the figure) on the HORC screen and press (CL) the [Pairdisplay...] button (see the figure).

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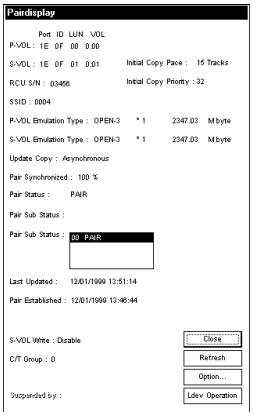
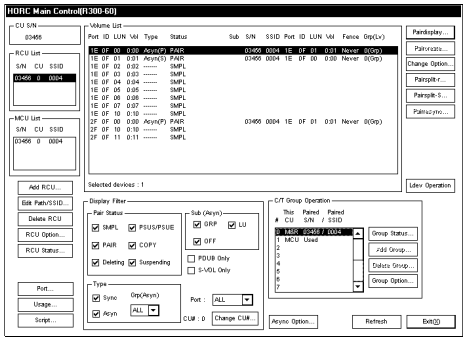
7. Checking the pairing matching rate check

Make sure "100%" is displayed for "Pair Synchronized" on the Pairdisplay screen. If not, wait for a while and press (CL) the [Refresh] button (see the figure) to update the display. After this, check the matching rate again. To refer to another VOL, press (CL) the [Close] button (see the figure) to go back to step 6. Repeat steps 6 and 7 until the matching rate of every volume to be paired reaches "100%".



8. Final verification

Press (CL) the [Refresh] button (see the figure) on the HORC screen to update the screen display and make sure all the volumes to be paired and displayed in the volume list (see the figure) are in the Pairdisplay.



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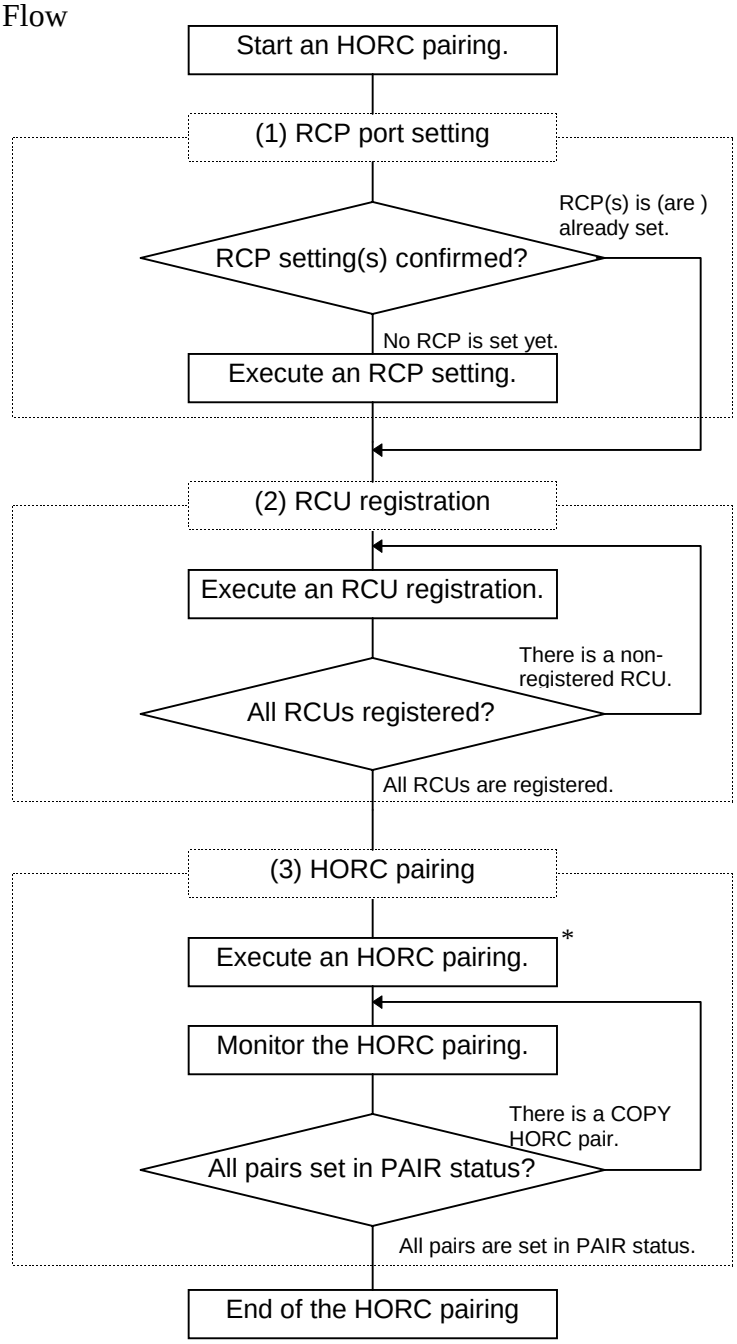
7.7 Creating New HORC Pair(s) (for LDEV)

HORC Pairing Flow



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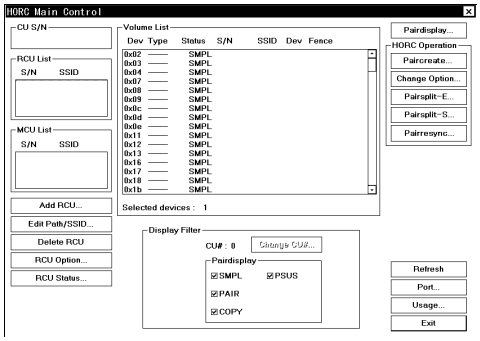
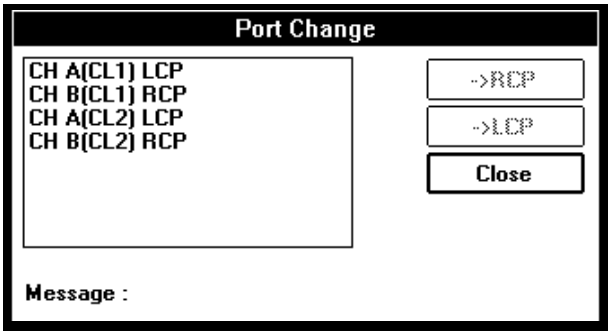
(1) RCP Port Setting

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.
   If SVP Micro-program version is over "51-36-01", refer to the "7.6 Creating New HORC Pair(s) (for OPEN VOL) (INST07-350)".

2. Open the Port Setting window on the HORC screen.
   Press (CL) the [Port...] button (see the figure) on the HORC screen.



3. Confirming the port type(s)
   Compare the port setting(s) displayed on the screen with that(those) described on the work sheet. If the port setting(s) is(are) confirmed to be the same as that(those) on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".



4. Changing the port type(s)
   Select all the ports desired to be changed to the RCP type, then press (CL) the [-> RCP] button (see the figure).
   - The port(s) to be changed to the RCP type must be disconnected from the host beforehand.
   - When a cable connection change instruction is displayed, connect the cable(s) to the object RCU(s). If the connection is(are) to be made via the ESCD(s), connect the cable to the ESCD(s).

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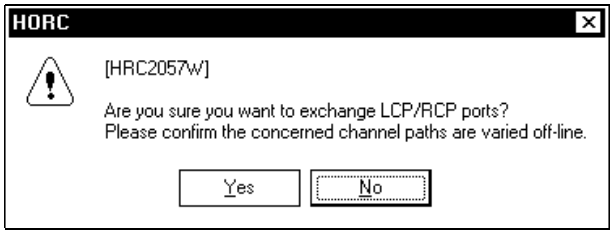
5. Confirm the channel path
   Confirm the changed path(s) is(are) varied off-line, and press (CL) [Yes] button.



6. Terminating the RCP port setting
   Compare again the port setting(s) displayed on the screen with that(those) described on the work sheet.
   Make sure that the port setting(s) has(have) been done as described on the work sheet, press (CL) the [Close] button (see the figure) and go to Item (2) "Registering the RCU(s)".

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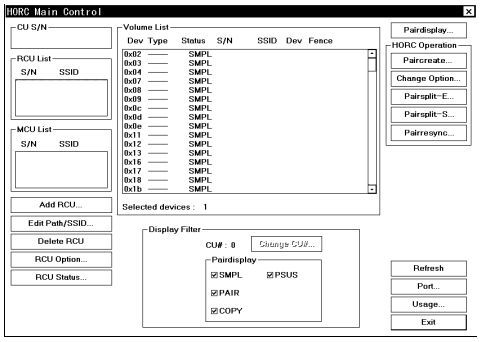
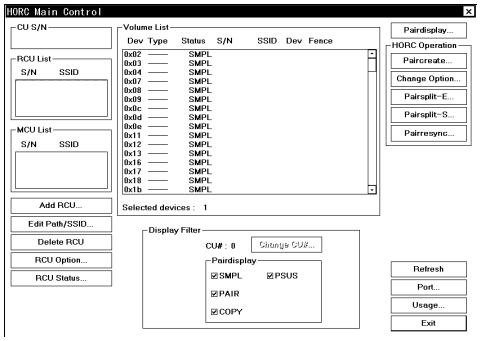
(2) RCU Registration

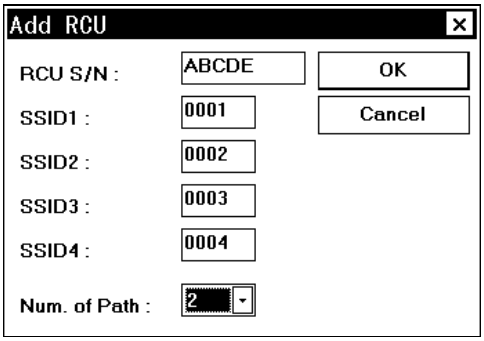
1. Confirming the registration of the existing RCU(s)
Compare the RCU(s) currently registered with the RCU(s) described on the work sheet referring to the RCU list (see the figure) on the HORC screen. When there is no need to register new RCU(s), go to Item (3) "HORC Pairing".



2. RCU registering screen
Press (CL) the [Add RCU...] button (see the figure) on the HORC screen.



3. Inputting RCU parameters
On the Add RCU screen (see the figure), perform the following.
Input a 5- character RCU serial number in RCU S/N.
Input a 4- digit hexadecimal RCU SSID number in SSID 1 ~ 4.
Input SSID specified at the Define Configration and Install of RCU.
Select a number of the MCU-RCU logical paths from the combo-box at Num. of Path. The number can be either of 1 to 4.



When all the above operations are finished, press (CL) the [OK] button (see the figure).

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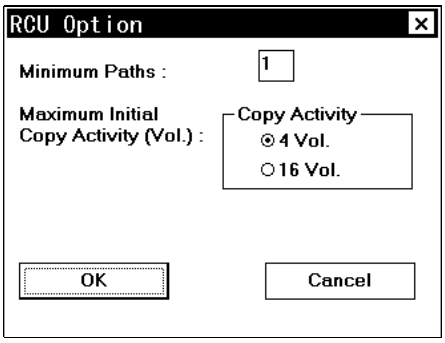
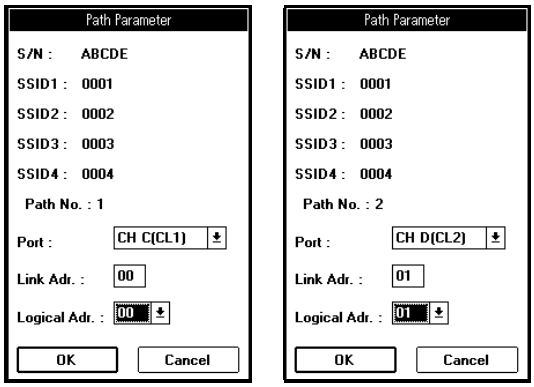
4. Setting the RCU option

On the RCU Option Setting screen (see the figure), perform the following.
Input the minimum number of paths to be used in succession in Minimum Paths.
Specifies the maximum number of Initial Copy execution. Defined 4 or 16.
When all the above operations are finished, press (CL) the [OK] button (see the figure).



5. Inputting logical path parameters

This screen appears for each logical path inputted in step 3.
On each Logic Path Parameter Input screen, perform the following.
Select the RCP port to be connected to the object RCU from the combo-box in Port.
Input a 2-digit hexadecimal number of the link destination address in Link Adr. for the object RCU. When no ESCD is to be used, input '00' in Link Adr.
Select only 00 as the logical address.
After all the above operations are finished, press (CL) the [OK] button (see the figure).



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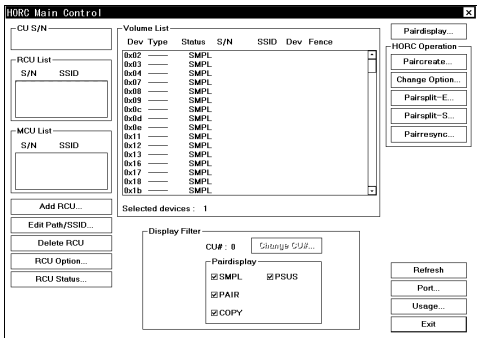
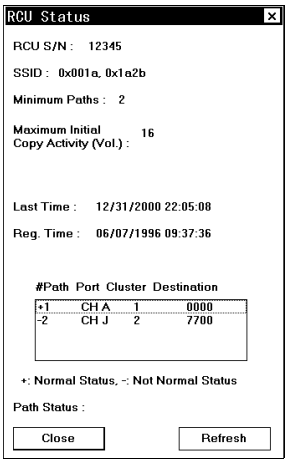
6. Select the RCU(s) currently registered from the RCU list displayed on the HORC screen, then select (CL) the [RCU Status...] screen.



7. Verifying the logical path(s)

Select one of the logical paths from the path list (see the figure) on the RCU Status screen. Make sure "Normal" is displayed in the “Status" field (see the figure).

After verifying the status of all the paths, press (CL) the [Close] button (see the figure).



8. Registering the next RCU(s)

After registering the RCU(s), go to Item (3) "HORC Pairing". If there is(are) other RCU(s) to register, go back to step 2 to register it(them).

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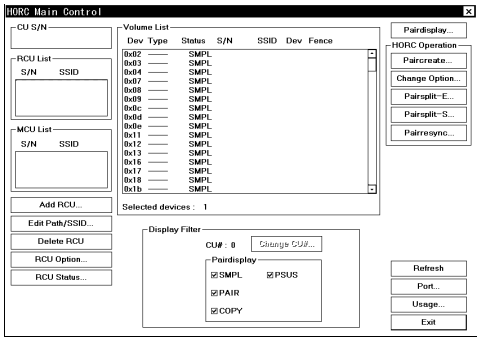
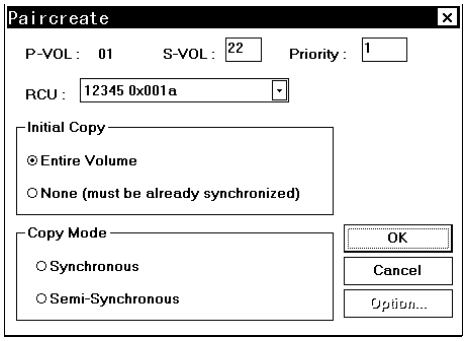
(3) HORC Pairing

1. Confirming the volume status
   Make sure all the volumes to be paired are in the SMPL status referring to the volume list (see the figure) on the HORC screen.



2. Selecting the volume(s) (P-VOL(s))
   Select all the volumes to be paired from the volume list (see the figure) on the HORC screen and press (CL) the [Add pair...] button (see the figure) in “HORC Operation”.

3. Inputting the HORC pairing parameters
   On the HORC Pairing Parameter Input screen, perform the following.
   Input the volume number of the S-VOL in S-VOL corresponding to the P-VOL.
   Input the Initial Copy Priority to the Priority.
   Select the RCU from the combo-box at RCU.
   Select one of the copy types indicated at Initial Copy.
   Select one of the copy mode indicated at Copy Mode.
   When all the above operations are finished, press (CL) the [OK] button (see the figure).



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4. Setting HORC pair option

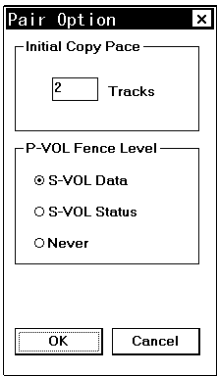
On the Pair Option screen, perform the following.
Set one of the following in Initial Copy Pace.

- 1 ~ 15 Tracks

Set one of the following in P-VOL Fence Level.

- S-VOL Data
- S-VOL Status
- Never

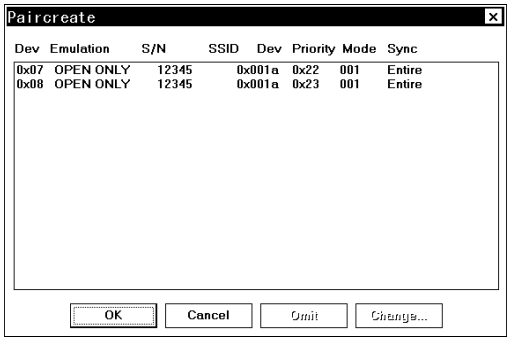
When all above operations are finished, press (CL) [OK] button.



5. Confirm the parameter of an HORC paired

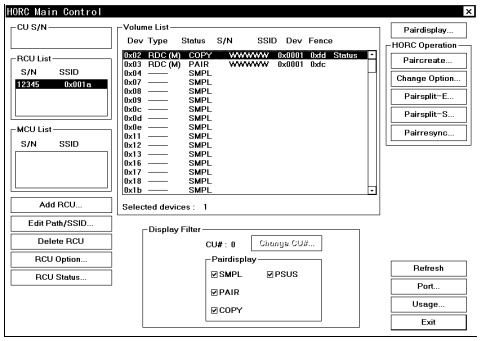
Confirm the volumes to be paired from the volume list (see the figure) on the Add HORC Pair screen and select (CL) [OK] button.

- If you want to change an HORC paired parameters of volumes, select the volumes from Add HORC Pair screen and select (CL)[Change...] button.
- If you want to omit an HORC pair create, select the volumes from Add HORC Pair screen and select (CL) [Omit] button.



6. Verifying the status of an HORC paired

Select one of the volumes to be paired from the volume list (see the figure) on the HORC screen and press (CL) the [Pairdisplay...] button (see the figure).



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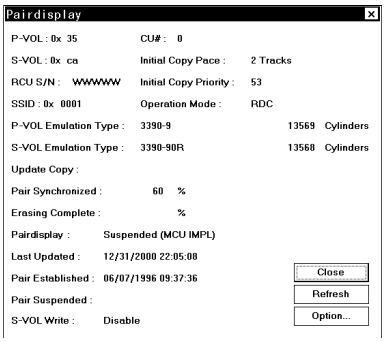
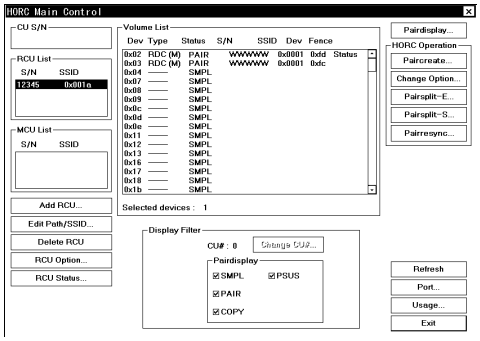
7. Checking the pairing matching rate check
Make sure "100%" is displayed for "Pair Synchronized" on the Pairdisplay screen. If not, wait for a while and press (CL) the [Refresh] button (see the figure) to update the display. After this, check the matching rate again. To refer to another VOL, press (CL) the [Close] button (see the figure) to go back to step 5. Repeat steps 5 and 6 until the matching rate of every volume to be paired reaches "100%".



8. Final verification
Press (CL) the [Refresh] button (see the figure) on the HORC screen to update the screen display and make sure all the volumes to be paired and displayed in the volume list (see the figure) are in the Pairdisplay.



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8 TPF installation procedures

8.1 Preparations

(a) To get one additional SM parts (SH100-B (only 64Mbit DRAM)) according to INST01-40.
(b) To get 7700E Floppy Disks which support MPLF/RC function from T.S.C.

8.2 Operations

(a) To add additional SM parts.
- Power off 7700E and drop breakers.
- To add the SM (Shared Memory) in 7700E box.
  (Refer to INST01-40 for the number of SM parts.)
- Turn on breakers, and power switch on.

(b) To execute config.
- Set “Configuration” floppy disk.
- Execute “ini_conf.bat” in floppy disk. (Refer to MICRO-FC08-10 (Config Exchange Procedure))

(c) To switch “TPF-mode” on
- Set the Modify mode.
- Select the [Install] (CL) in the ‘SVP’ window.
- Select the [Define configuration and Install] (CL), and set each configuration item (i.e. Cache capacity/Drive type/Emulation... etc.) to meet the expected configuration of the box.
- Select [>Next](CL) button if you require “Configuration FD”.(Don’t insert FD)
  FD reading is made to fail. And, push [Cancel]button if retry is required.
- Select [>Next](CL) buttons until “Turn off” message comes out.
- 7700E power switch off as the directions of SVP.
- Unplug the battery jumpers and wait 5 minutes. (volatile CACHE, SM)
- Plug in battery jumpers and 7700E power switch on.

(d) To exchange micros from MVS to TPF.
Refer to MICRO-FC04-10 (Micro-program Exchange Procedure(On-line)).
But [Debug-mode]*1 should be used for this operation, instead of [Modify-mode].

(e) To start TPF microcode.
- 7700E power switch off.
- Unplug the battery jumpers and wait 5 minutes. (Volatile CACHE & SM)
- Plug in battery jumpers and 7700E power switch on.

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9 HMRCF

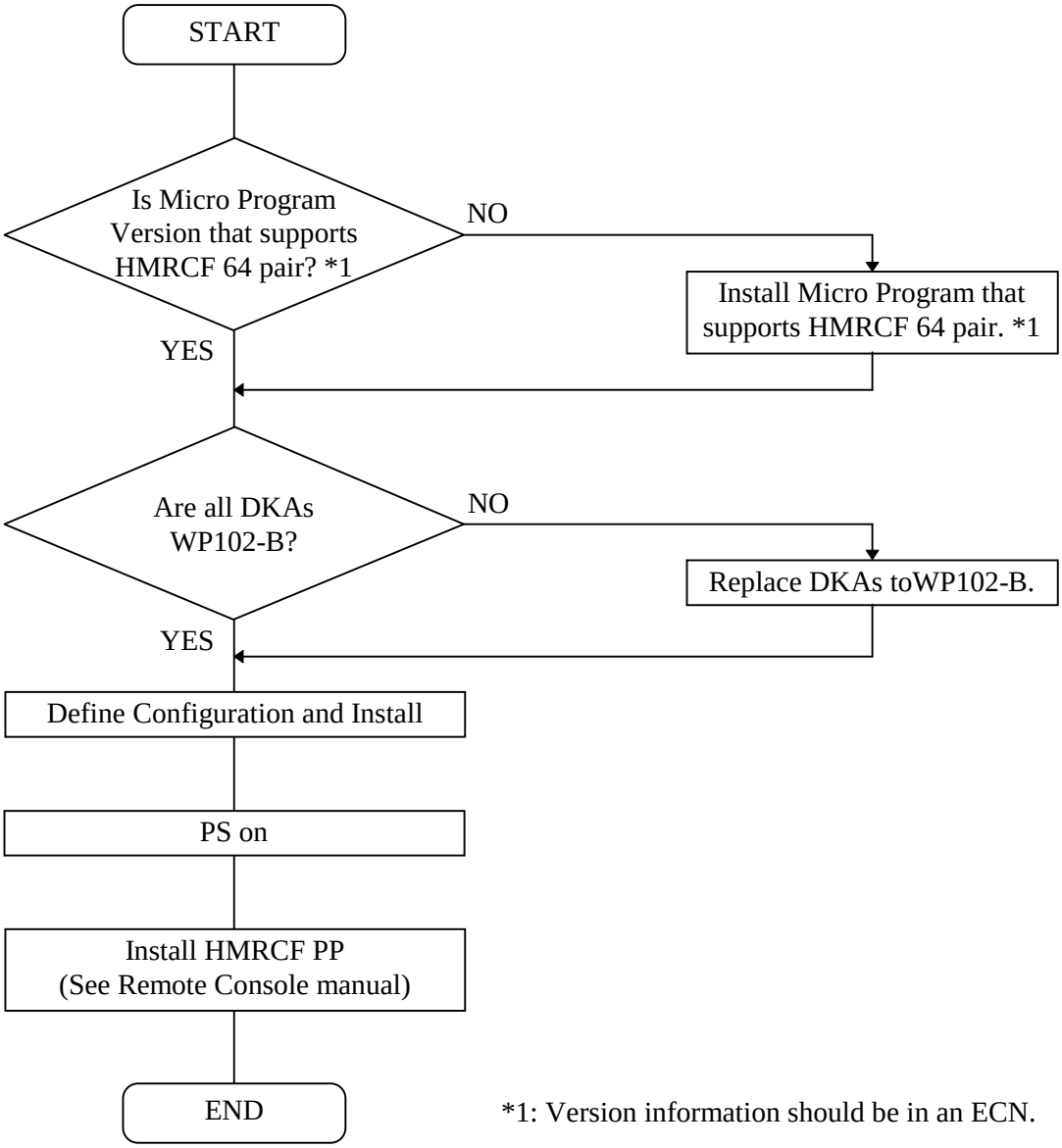
9.1 Installation of HMRCF

1. New installation of HMRCF

(1) In case of a new system

There is no change for installation procedure. But DKAs should be WP102-B instead of usual DKAs.

DKA (WP102-B) is registered as a option (DKC-F310I-50E). WP132-B is available instead of WP102-B.



*1: Version information should be in an ECN.

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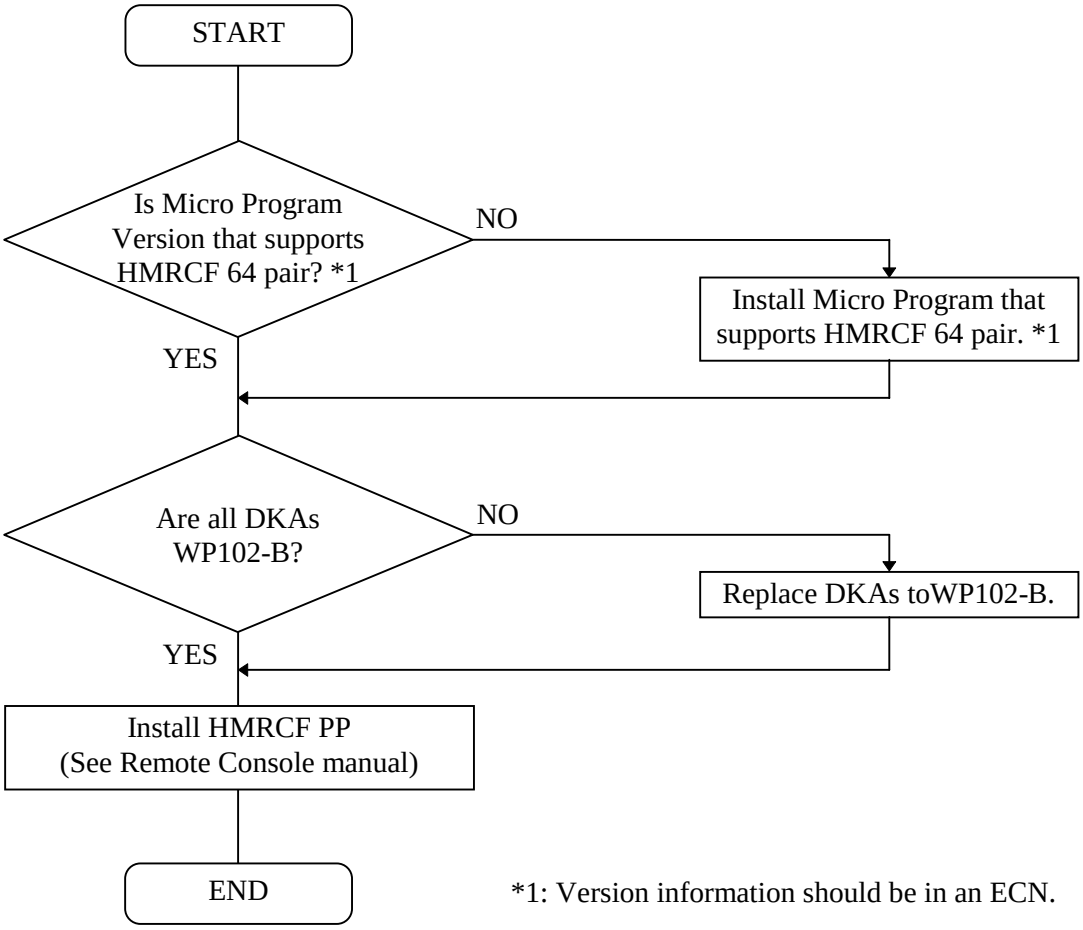
(2) In case of a system already using.
These procedure have to be done before user use HMRCF function.

NO	Item	Contents
1	Micro Program exchange	Micro program have to be upgraded first.
2	Replacement of DKAs	ALL DKAs in the Subsystem have to be replaced to DKA (**WP102B** *a). Use PCB Replace procedure to replace DKA.
3	PP installation	HMRCF is a option product. So it is necessary to install PP before using HMRCF. It is able to install PP, if all DKAs are WP102-B. See Remote Console manual.

*a: DKA (WP102-B) is registered as a option (DKC-F310I-50E). WP132-B is available instead of WP102-B.



*1: Version information should be in an ECN.

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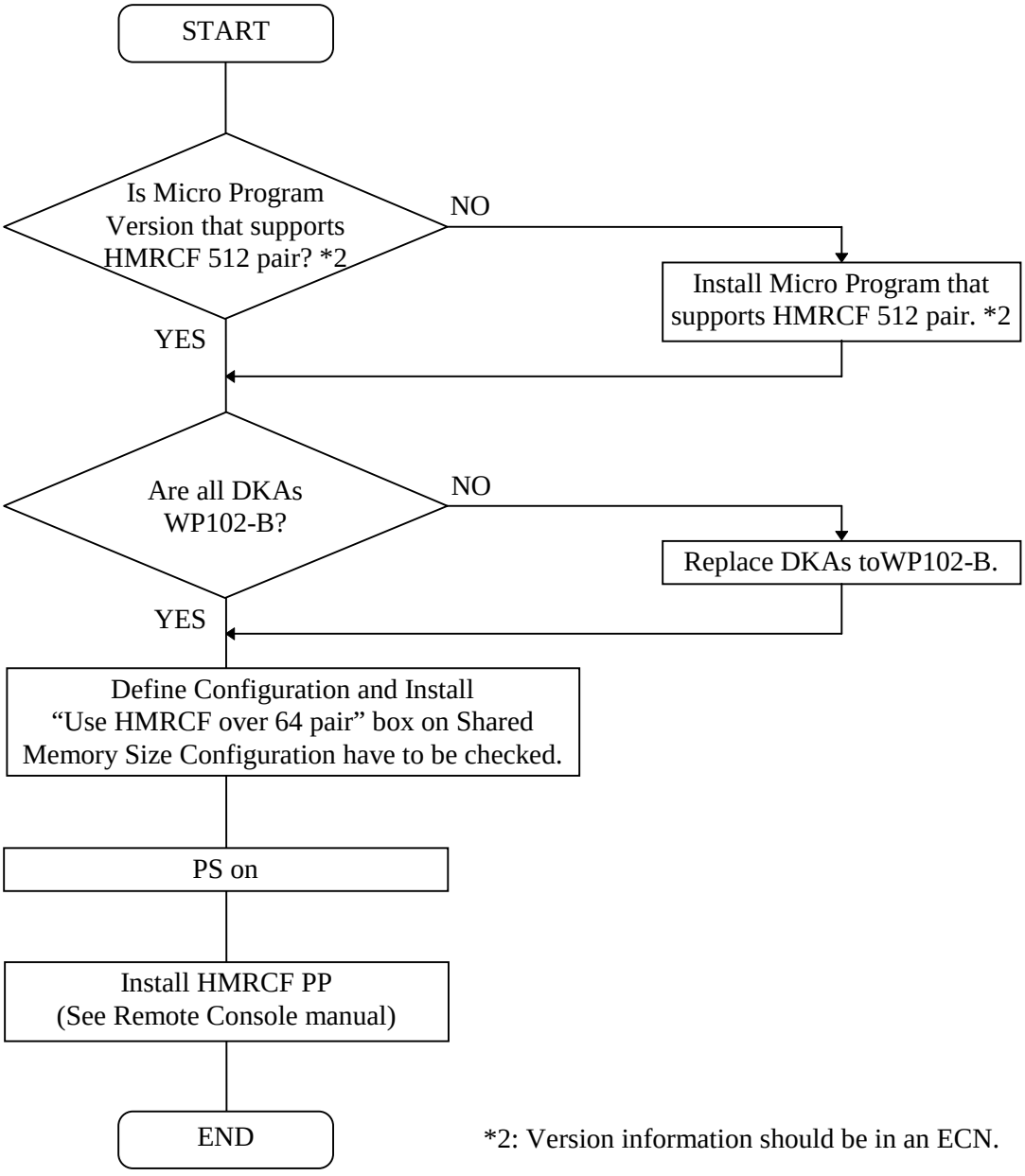
2. Procedure for increment of max. pair number

(1) In case of a new system
It is needed that DKAs should be WP102-B instead of usual DKAs.
And check “Use HMRCF over 64 pair” box on the Shared Memory Size Configuration panel at the end of Define Configuration and Install procedure.
Be sure to check the shared memory capacity that showed at the Shared Memory Size Configuration panel and shared memory hardware that is on the DKC are the same.



*2: Version information should be in an ECN.

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(2) In case of a system already using HMRCF
In this case SM incrementation is needed. Follow the flowchart on the next page.
Shared memory capacity have to be increased to store HMRCF control information for 512 pairs.
<<Caution>> Shared Memory have to be SH100-B(64MB).
Because capacity of SM is over 192 MB X 2 after installation.

NO	Item	Contents
1	Micro Program exchange	Micro program have to be upgraded first.
2	Installation of Shared Memory	Increment Shared Memory capacity. If there is SH024(16MB), it have to be exchange to SH100-B (64MB) before SM installation.
3	Create additional control table	Push the “Set over 64” button of HMRCF screen on SVP.

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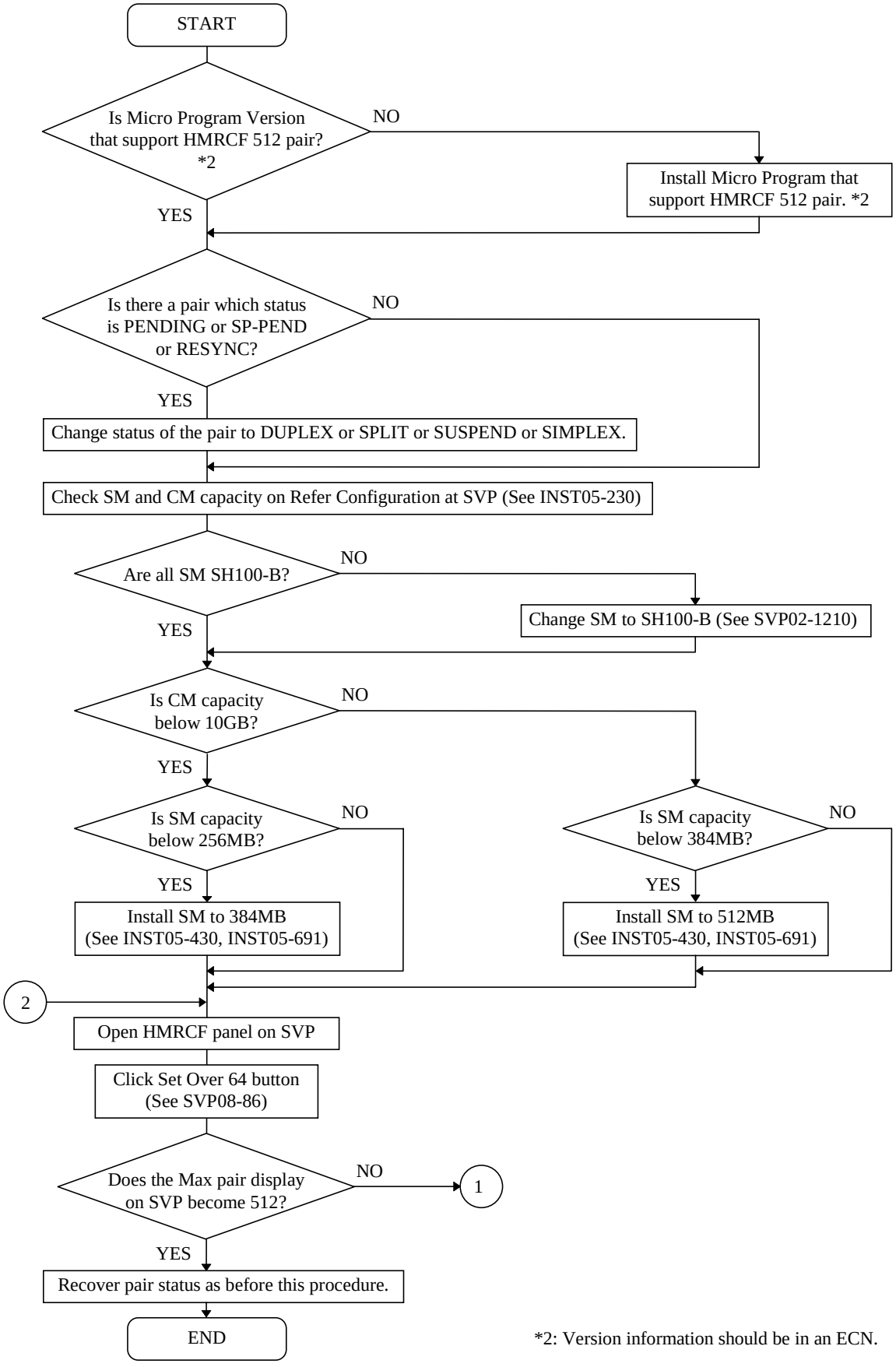

*2: Version information should be in an ECN.

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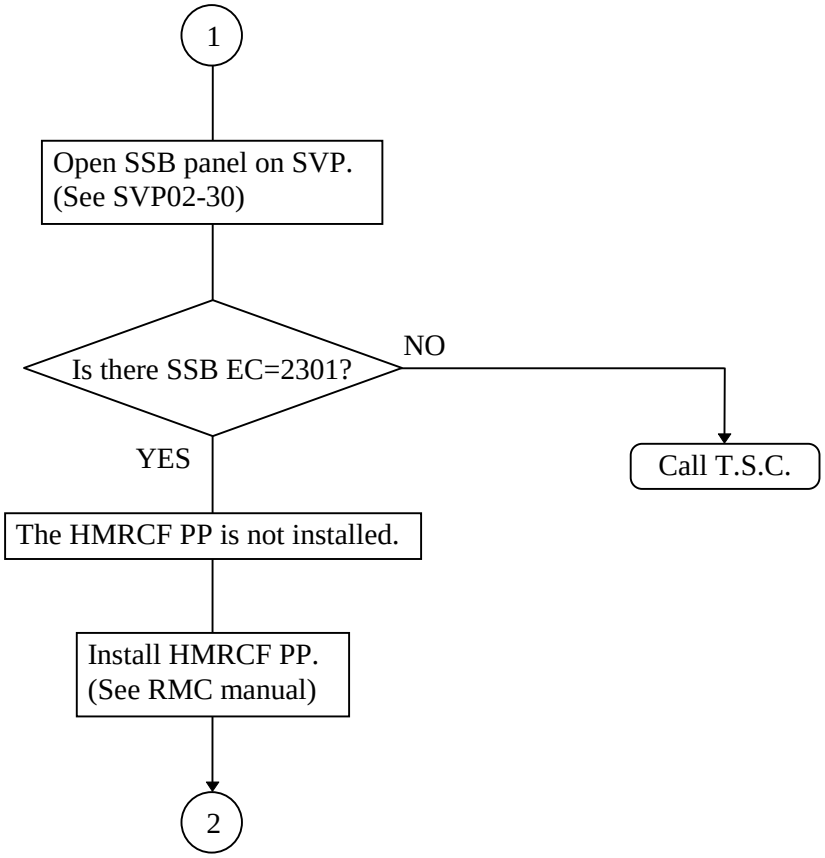

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MICRO-FC SECTION

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1.2 Micro-program Exchange Flow MICRO-FC01-20
1.3 Micro-program Exchange MICRO-FC01-20
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2 Micro-program substitution in the SVP MICRO-FC02-10

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3.2 Storing the micro-programs to be substituted in the SVP MICRO-FC03-20
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MICRO-FC

Two types of MICRO-FCs are provided with micro-program exchange and on-line patch. Micro-program exchange is explained in chapter 1 to 5.4, and on-line patch in chapter 5.

1 Overview

1.1 Micro-program Types

The micro-programs listed below can be exchanged via the SVP. Therefore, the exchange of micro-programs requires operational knowledge of the SVP.

Micro-program	Written to
Setup installer	—
DKCMAIN	FM
MAIN DIFF	FM
SVP	Hard disk in the SVP
LCP/MCP/LCDG	FM
CUDG4	Hard disk in the SVP
FOP	FM
DKU (308/309/3F1/3F2/30A)	HDU
SSVP	Hard disk in the SVP
RAM BOOT	FM
CONFIG	Hard disk in the SVP

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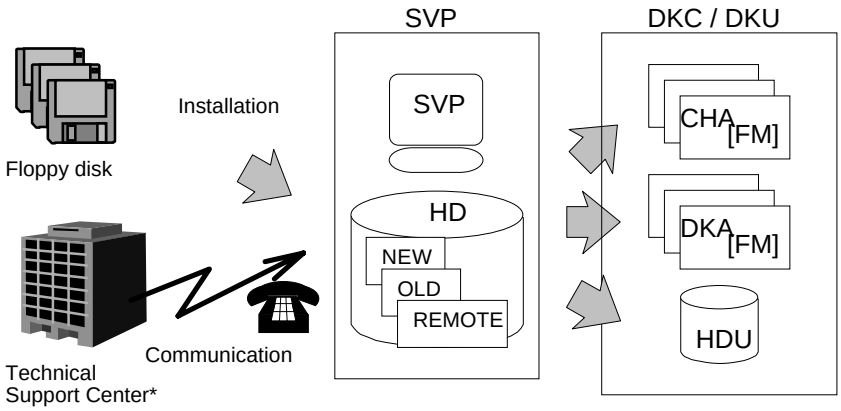
1.2 Micro-program Exchange Flow



The SVP keeps two generations (new and old versions) of micro-programs.

* Technical Support Center : A base of maintenance service and technical support

Micro-programs can be exchanged in four ways.
(1) Downloading after storing the micro-programs from floppy disk to the hard disk
(2) Downloading of the most versions on the hard disk in the SVP
(3) Remote (downloading of the micro-programs transferred from the maintenance center)
(4) Version Down (downloading of old versions on the hard disk)

1.3 Micro-program Exchange

Micro-programs can be exchanged off-line or on-line.
(1) Off-line
All processors are blocked for maintenance. → Micro-programs are rewritten. → All processors are recovered. → The DKC is turned off then on again.
(2) On-line
The processor is blocked for maintenance. → Micro-programs are rewritten. → The processor is recovered.

This is performed for each exchanging unit.

NOTE: • The SVP checks the version of the micro-program to be substituted before rewriting it. When the SVP determines that the micro-program cannot be rewritten, it displays an error message and cancels the exchange of the micro-program.
• The SVP terminates the exchange of micro-programs when the error status is displayed (i.e. when a message " ..... error ..... " or "..... failed ....." is displayed) or when the [Cancel] button is selected.
If you want to retry the exchange, please start from the first step of the MICRO-FC procedure.
However, when the error status is displayed in downloading from SVP to DKC (FM) or DKU by 3.3 Transferring micro-program to the DKC or by 5.4.3 Transferring micro-program, you can retry by 3.4 Hard Disk Download or by 4.4 Hard Disk Download.

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⚠ CAUTION

In case of HMRCF/HOMRCF, Differential bit map data on shared memory of DKC is lost by offline micro exchange operation.

To avoid loss of differential bit map, online micro exchange should be used.

1.4 Remote Console Program Download from SVP

This function is to correspond with the SVP version and Remote Console version. SVP can install the appropriate Remote Console programs. When the Remote Console connects to this SVP, the Remote Console will check the installed program version in this SVP and the current executing version in the Remote Console. If the version in the Remote Console is not appropriate, the Remote Console will transfer the installed programs in the SVP and execute setup automatically.

When you want to exchange the SVP micro programs, please do the following operations. If your customer does not use the Remote Console, you does not need to do these operations except SVP exchange.

(1) Exchange the SVP micro programs.
(2) De-install the old Remote Console programs if they have already installed.
    -> Refer to 9.2 Program De-installation.
(3) Install the new appropriate Remote Console programs.
    -> Refer to 9.1 Program Installation.

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2 Micro-program substitution in the SVP

We remove replace procedure of PC from SVP section to Replace section, Because the procedure is held right after replacing PC.

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3 Micro-program Exchange Procedure (Off-line)

If an error occurs during a micro-program exchange, retry the exchanging procedure from the beginning.

3.1 Processing before exchange

- Check the subsystem status through the entire status display. (Check the versions of the all programs through the version display.
- Make sure that collection copy and other processing are not in progress.)
- Perform postprocessing for PIN data.
- Check that all processors are normal.
- Check that all CHL pass to the subsystem are off-line (to block all micro-programs).
- LCP, MCP, LCDG, FOP, DKCMAIN, MAIN DIFF, RAMBOOT micro-programs can be exchanged on off-line.
- In the case of HRC Asynchronous components, Suspending all volume pairs is required prior to the **RCU's** off-line micro-program exchange. Refer 3.17.8.1 Managing HRC Asynchronous Subsystems (5) Micro-program Exchange:THEORY03-1395.

Off-line Micro-program Exchange time (approximate)

(unit : minutes)

	FD → HDD		Downloading
LCP	10	CHA	2
MCP			
LCDG			
FOP			
DKCMAIN		DKA	2
MAIN DIFF			
RAMBOOT		Reboot	3
TOTAL	10	Total	7

NOTE: After you execute this operation, DKC will clear the condition that DKC reports SIM to the host. Therefore, DKC will report the next SIM to the host when the host accesses 16K I/O, and after you will wait for an hour if P/S on is executed.

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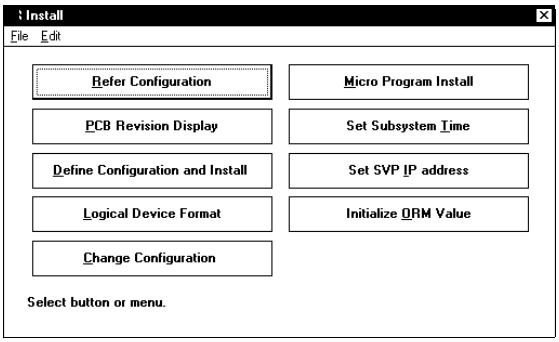
3.2 Storing the micro-programs to be substituted in the SVP

(1) <Initial screen>

(2)
Change the mode to [Modify Mode] (CL).
Select (CL) [Install].

(3) In the 'Install' window, select (CL) [Micro Program Install].



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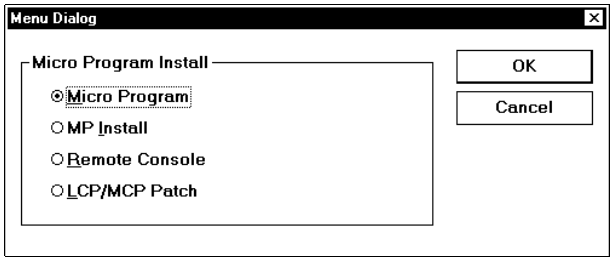
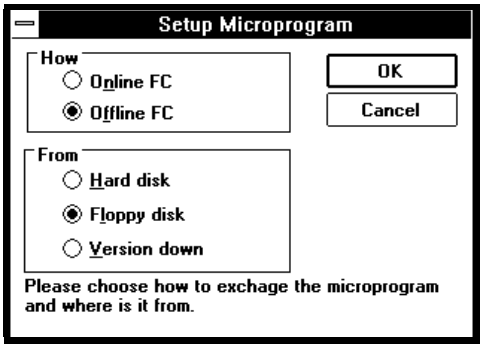
(4)

Select (CL) [Micro Program] and select (CL) [OK].



(5)

In the 'Setup Microprogram' dialog bax,
[From]: select (CL) the source from which to store the micro-programs.



Hard Disk: The latest versions on the SVP hard disk are downloaded.--- Go to 3.4 (1). (MICRO-FC03-120)

Floppy Disk: After being stored on the hard disk from floppy disks, the micro-programs are downloaded. --- Select(CL) [OK] and Go to (6).

Version Down: Old versions on the hard disk are downloaded. --- Go to 3.5 (1). (MICRO-FC03-140)

Selecting (CL) [Cancel] returns you to be step (4).

<<Error>>
When the target file is not found, processing is terminated with the error message "Old files erase failed, copy stop."

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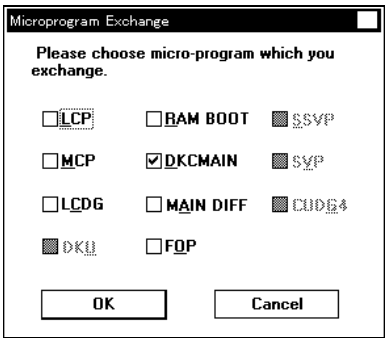
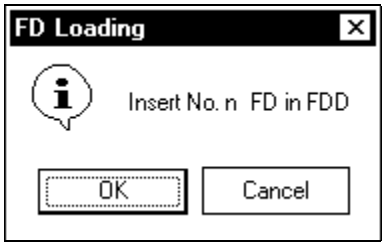
(6) The 'Micro-program Exchange' dialog box appears. Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

☒ : Micro-programs to be substituted.



After you confirm that you have already varied the all CHL paths to off-line, select (CL) [OK].

(7) In response to the message "Insert No.n FD in FDD", remove the inserted floppy disk and insert the appropriate floppy disk and select (CL) [OK].
(n = 2,3, ... ,N N: Number of floppy disks)



<<Error>>
No floppy disk and uncorrect floppy disk in the floppy disk drive:
The same message is displayed again, returning you to (6).
Internal error:

- "Old files erase failed, copy stop."
- "Memory error has occurred."
- "File I/O error has occurred."
- "Logical error has occurred."
- "The directory create error and copy stop."
- "The file size is Wrong and copy stop."

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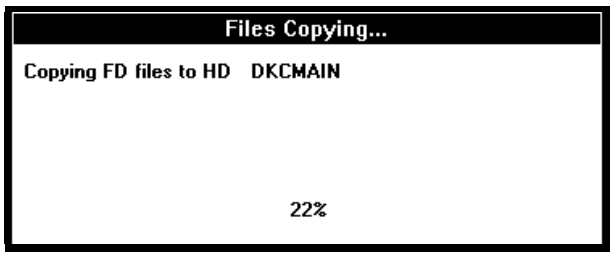
(8) The message “Copying FD files to HD DKCMAIN” appears.



Execute the steps (7) to (8) once for each floppy disk.

<<Error>>
Internal error:

- “The file size is Wrong and copy stop.”
- “The directory create error and copy stop.”
- “Micro-program version disagreement and copy stop.”
- “Logical error has occurred.”
- “File I/O error has occurred.”
- “Memory error has occurred.”

Note : When the error message “File I/O error has occurred.” or “Memory error has occurred.” is displayed, power SVP off and on again if the same message appears after reexecuting the micro-program exchange (see SVP01-50 in the SVP SECTION).
Then execute the same micro-program exchange again. If the same error occurs (the same error message is displayed), replace SVP hardware (see REP01-150 in the REPLACE SECTION).

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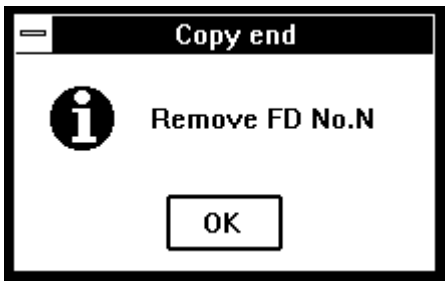
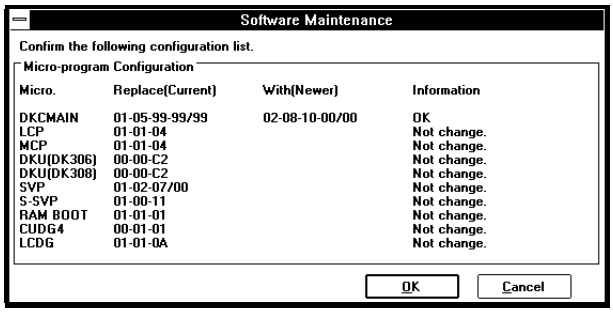
(9) Upon completion of reading from all floppy disks, the message“Remove No.N FD” appears. In response to this message, remove the floppy disk and select (CL) [OK]. (N : Number of floppy disks)



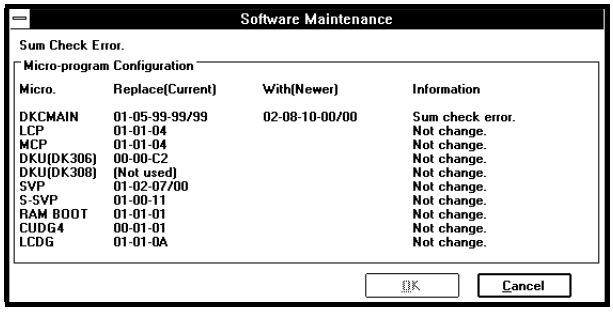
After copy end, sum checker starts.
While checking, the message appears.

(10) On the 'Software Maintenance' dialog box, the micro-program types, current versions, new versions, and message are displayed.

<Display with no error>
The message “Confirm the following configuration list.” is displayed below the title bar. The micro-program can be replaced only when all rows in the information column show “OK”.
To make processing progress, select (CL) [OK].
To terminate micro-program replacement, select (CL) [Cancel].



<Display with an error>
A sample display at occurrence of an error is shown on the right. An error message is displayed below the title bar. At the same time, error information is displayed in the information column.
Select (CL) [Cancel] to terminate micro-program replacement. (Note: The [OK] button is not displayed.)



Before making an attempt to rerun, be sure to correct the cause of the error by referring to the entire status
(SVP SECTION), action code (ACC SECTION), and other information.

Below are messages and information that may be displayed in the Information column.

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Version Check Message Table.

	Message :	Contents and Maintenance
1	Confirm the following configuration list.	Check the version (Normal or Warning). If Warning, it is necessary to be approved by TSC (Technical Support Center).
2	Version error.	Incorrect version. Confirm the micro-program version.
3	Can't read the configuration of the micro-program.	Error caused while the micro-program configuration is being read. Blockade processor exists, recover it.
4	Internal error. (On SVP Logic)	Inconsistent logic. (SVP logic) Retry exchange. If same message is displayed, power SVP off and on.
5	Internal error. (On SVP Memory)	Inconsistent logic. (SVP memory) Retry exchange. If same message is displayed, power SVP off and on.
6	Internal error. (On Temporary Files)	Inconsistent logic. (temporary file) Retry exchange. If same message is displayed, power SVP off and on.
7	Version error. (Previous maintenance needed)	Incorrect version. (partial replacement) Confirm the micro-program version.
8	Version error. (Incompatible MP exists)	Incorrect version. (partial replacement) Confirm the micro-program version.
9	Sum Check error.	Sum check code is incorrect. Micro-program data in FD isn't correct, exchange FD.
10	Revision error	Incorrect revision. Confirm the micro-program revision.
11	The micro-program is incompatible with the system.	Incorrect micro-program. Confirm the micro-program version and system. Contact TSC (Technical Support Center).
12	Combination error	Incorrect micro-program exchange process. Confirm the combination of micro-program version and exchange process.

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	Information	Contents
1	OK	The micro-program is replaceable.
2	Version error [#xxxx]	MP has an incorrect micro-program version. [processor number]
3	FC Condition [#xxxx]	MP has an incorrect micro-program version with partial replacement. [processor number]
4	Internal error [#xxxx]	Inconsistent logic error has occurred. [internal error code]
5	Not change	The micro-program will not be replaced.
6	Read error	Error has occurred while reading the current configuration.
7	Sum Check error	Sum check code is incorrect.
8	Warning	It is necessary to contact TSC (Technical support center) for approval.
9	Revision error	MP has incorrect micro-program revision.
10	Package condition	The combination error of micro-program and package has occurred.
11	Facility condition [#xxxx]	MP has incorrect micro-program version with function of system. [Facility condition error code]
12	Combination error [#xxxx]	The combination error of more than two micro-program has occurred. [Combination error code]

	Internal error code	Contents
1	0001	Parameter error.
2	0002, 0003	Memory allocation error.
3	0005	File I/O error.

	Combination error code	Contents
1	8000	High Speed Adapter error
2	8001	Compressed LCDG error

	Facility condition error code	Contents
1	C000 ~ C011	Reserve
2	C012	Compressed DKCMAIN error

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Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HODM	Update copy to R-VOL function support	Please delete all HODM pairs and retry exchanging again.
0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HRC/HODM	1024 LDEVs Support	Please delete RCU and retry exchanging again.
0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HORC	HORC Support	Please delete all HORC pair and retry exchanging again.
0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	DKC-F310I-4F	DKC-F310I-4F Support	Please de-install DKC-F310I-4F P/K and retry exchanging again.
0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	LUSE	LUSE Support	Please be free all Open VOL and retry exchanging again.
0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Archival Function	Archival Function Support	Please release Archival Function and retry exchanging again.
0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRCF	HMRCF Support	Please delete all HMRCF pair and reset all Reserve volume setting. Then retry exchanging again.

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Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRS	Emulation types OPEN-K and 3390-3C(KC) support.	Please de-install OPEN-K volume or HMDE volume, and retry exchanging again.
0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HRC	3380-E, 3380-J Type Support	Please delete all HRC Pairs for 3380-E, 3380-J volume type and retry exchanging again.
0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HORC	Extended LU Support	Please delete all HORC Pairs and retry exchanging again.
0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FM data format	Configuration data is written on FM at high compression rate. Old microprogram can't expand that data.	You can't exchange.
0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Performance	Performance (Sequential Read) improvement	Please stop HOST I/O (JOB) and retry exchange again.
0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Extended function bit map	Some bits after bit31 are ON.	Be all bits after bit31 OFF. To be them OFF, see other rows in this table.
0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HRC	Async Support	Please delete all Async Groups and retry exchanging again.

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Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRCF	HMRCF Max.512 support	Please delete all HMRCF pair and reset all Reserve volume setting. Then retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMDE	CVS/DCR function for HMDE support.	Please delete the setting of CVS/DCR and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FIBRE-LUNE	FIBRE-LUNE Support	Please delete SCSI Path definition more than LUN=08 and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	DKC-F310I-4FE	DKC-F310I-4FE Support	Please de-install DKC-F310I-4FE P/K and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRS	CVS/DCR function for SCSI volume support.	Please delete the setting of CVS/DCR and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	DKC-F310I-4GS	DKC-F310I-4GS Support	Please de-install DKC-F310I-4GS P/K and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Multiplatform	Dynamic LUN Addition support	An error message is not displayed for this function.

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Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HORC	OPEN-K Emulation Type Support	Please delete all HRC Pairs for OPEN-K volume type and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HOMRCF	HOMRCF support	Please delete all HOMRCF pair and reset all Reserve volume setting. Then retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HRC	H-6593 Emulation Type Support	Please delete all HRC Pairs and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Multiplatform	Dynamic LUN deletion support	An error message is not displayed for this function.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HOMRCF	Cascade support.	Please delete all Cascade pair and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRS	CVS/DCR function for OPEN-K emulation type support.	Please delete the setting of CVS/ DCR and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRCH, HOMRCF	High Speed Resync support.	Please complete all Resync Copy and retry exchanging again.

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Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Multiplatform	LUSE combined uncontinuous LDEVs	Please delete LUSE for uncontinuous LDEVs and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HORC	Async support	Please delete all Async Groups and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HMRCH, HOMRCF	Reverse Copy support.	Please complete all Reverse Copy and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HRC	CGROUP/GEOPLEX ASYNC Stage-3 support.	Please delete all HRC Pairs and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000	Multiplatform	Emulation type OPEN-8 support.	Please de-install OPEN-8 volume, and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000	HRCA, HORC	R-VOL Read/Write support	Please delete all HRCA and HORC Pairs and retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000	HIHSM	HIHSM support	Please delete all HIHSM pair and reset all Reserve volume setting. Then retry exchanging again.

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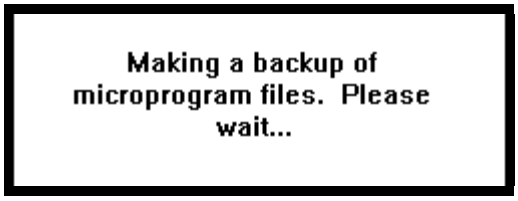
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000	HOMRCF	Hidden Secondary Volume Support	Please delete all HOMRCF pair and reset all Reserve volume setting. Then retry exchanging again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000	HRC, HODM, HORC	Logical address reassignment for using of muliple CU and CHL Extender	Please delete all RCUs and retry exchanging again.

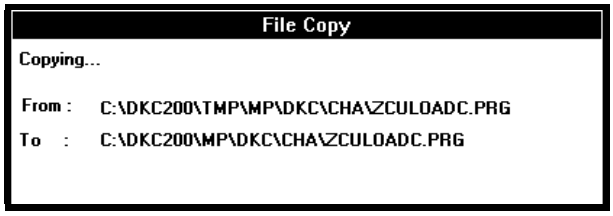
(*1) If SVP displayed an error message as 2179 during microcode exchange, please check which function is detected by this message, and do the corresponding action. After , please retry exchanging again.

(11) The message “Making a backup of micro-program files. Please Wait...” appears.



(12) File copy in SVP

Go to 3.3 (1).



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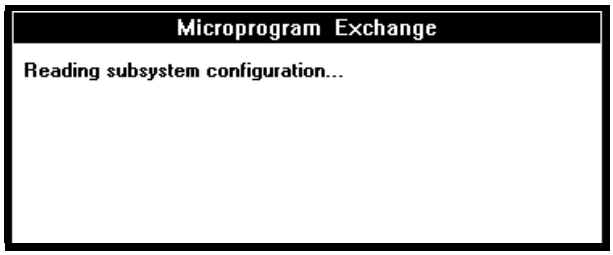
3.3 Transferring micro-programs to the DKC

(1) The message “Reading subsystem configuration...” appears.



<<Error>>

- “On exchanging a micro-program, An error has occurred. XX processing is stopped”
- “The processor of an obstacle blockade exits. XX processing is stopped”
- “The processor that failed in an exchange of micro-program exists”
- “An error had occurred in XX blockade processing”
- “File size check error”
- “Invalid file contents”

(2) The message “Downloading *** micro-program...” (***: MAIN, ...) appears.

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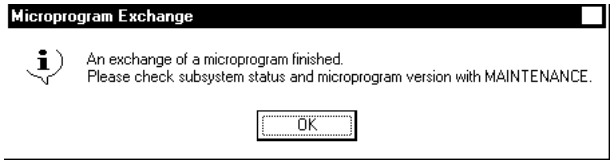
(3) The message “Now MP Rebooting... Group# n/N” appears.
All processors are recovered.

(4) After downloading the micro-programs, SVP makes the sub-system to be enable and displays the following message “An exchange of a microprogram finished. Please check subsystem status and microprogram version with MAINTENANCE.”, select (CL) [OK].
Go to 3.6 (MICRO-FC03-150).



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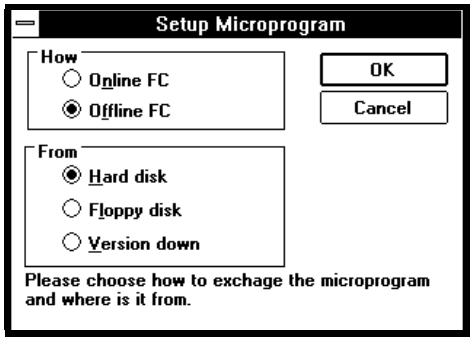
3.4 Hard Disk Download

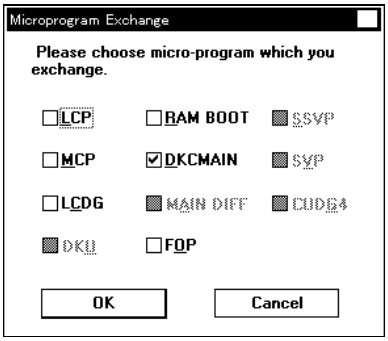
The latest version of the DKCMAIN micro-program on the SVP hard disk is downloaded to the DKC.

(1) Select (CL) [Hard Disk] in the 'Setup Microprogram' dialog box.
And select (CL) [OK].



The 'Micro-program Exchange' dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

☒ : Micro-programs to be substituted.



After you confirm that you have already varied the all CHL paths to off-line, select (CL) [OK].

Go to 3.2 (11). (MICRO-FC03-90)

If an error occurs in downloading micro-programs to DKC, remove the cause of an error using Maintenance Display (SVP section), Action Code (Action Code section), and other information to execute the exchange again. Then start from the first step of MICRO-FC procedure. At this time, you can select [Hard Disk] at 3.4 (MICRO-FC03-120) or [Floppy Disk] at 3.2 (5) (MICRO-FC-03-30).

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(2)

Go to 3.3 (1) (MICRO-FC03-100).

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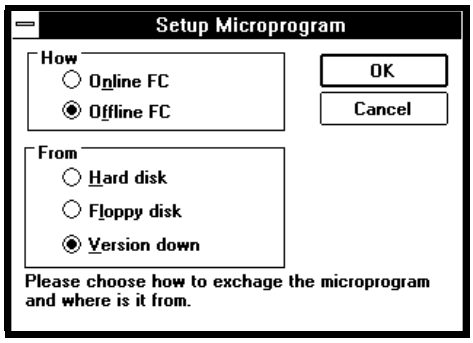
3.5 Version Down

NOTICE
Please ask your TSC if you can operate this.

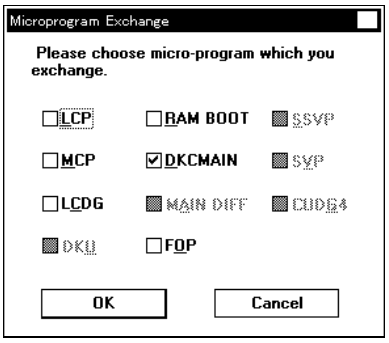
If you want to restore the DKCMAIN micro-program to the previous version of the micro-program after the exchange (by Floppy Disk or Remote function) , execute the Version Down function.

(1) Select (CL) [Version Down] in the 'Setup Microprogram' dialog box.
And select (CL) [OK].



The 'Micro-program Exchange' dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

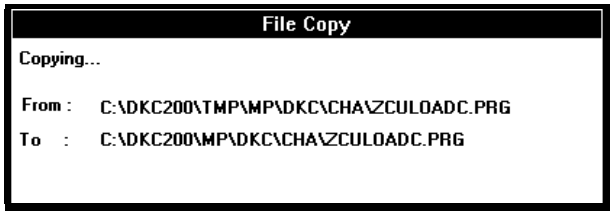
☒ : Micro-programs to be substituted.



After you confirm that you have already varied the all CHL paths to off-line, select (CL) [OK].

Go to 3.2 (11). (MICRO-FC03-90)

(2) Copy source and copy destination are displayed.



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3.6 Checking the functions after exchange

Check that the version of the recently installed micro-program is the same as that of the replaced micro-program by using version display in the MAINTENANCE function.
(See SVP SECTION.)

Note: If you find "??-??···" or incompatibility version, recover at the section 7.2.

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4 Micro-program Exchange Procedure (On-line)

If an error occurs during a micro-program exchange, retry the exchanging procedure from the beginning or execute the procedure explained in Chapter 7 “Trouble Recovery Procedure in Exchanging Micro-programs”.

Note : In case an error occurs during an exchange of the DKU micro-programs, make a note on the number of the DKU in which the error occurred when the error is recovered.

4.1 Processing before exchange

- Check the subsystem status through the entire status display. (Check the versions of all the programs through the version display. Make sure that, (collection copy) and other processing are not in progress.)
- Perform postprocessing for PIN data.
- Check that all processors are normal.

On-line Micro-Program Exchange time (approximate)

(unit : minutes)

	FD → HDD	Download HDD → SM/(HDD → FM)	MP Reboot
LCP	10	1/(3)	6
MCP		1/(3)	
LCDG		1/(3)	
FOP		1/(3)	
DKCMAIN		4	
MAIN DIFF		4	
RAM BOOT		1	
DKU		60	—
SSVP	5	15	—
SVP		3	—
CUDG4		0	—
Total	15	86/(92)	6

(Processors : 16, Drive capacity : 180GB)

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4.2 Storing the micro-programs to be substituted in the SVP

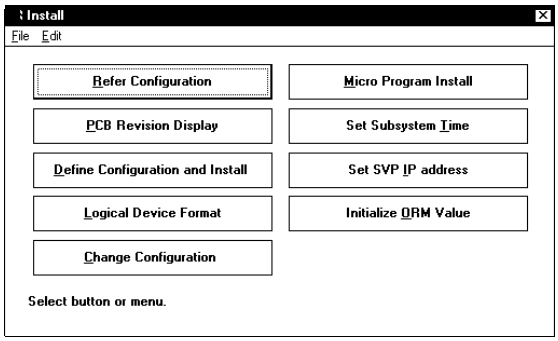
(1) <Initial screen>

(2)

Change the mode to [Modify Mode] (CL).
Select (CL) [Install].

(3)

In the 'Install Subsystem' window, select (CL) [Micro Program Install].



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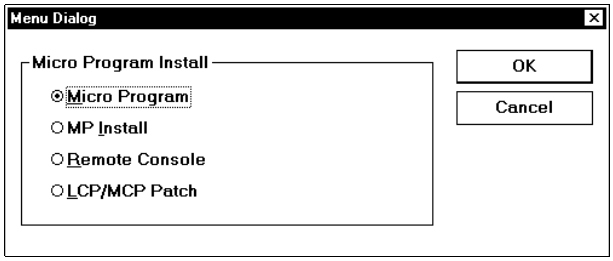
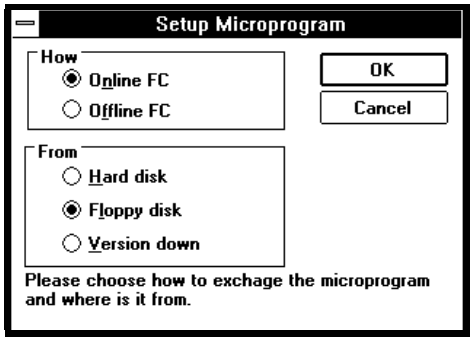
(4)

Select (CL) [Micro Program].
Select (CL) [OK].
Selecting (CL) [Cancel] returns you to step (3).



(5)

In the 'Setup Microprogram' dialog box,
[How] : select (CL) [Online].
[From]: select (CL) the source from which to store the micro-programs.

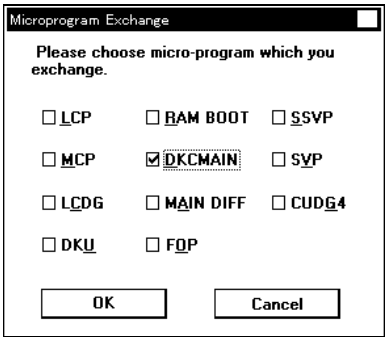


Hard Disk: The latest versions on the SVP hard disk aredownloaded. --- Go to 4.4 (1). (MICRO-FC04-140)
Floppy Disk: After being stored on the hard disk from floppy disks, the micro-programs are downloaded. --- Select (CL) [OK] and Go to (6).
Version Down: Old versions on the hard disk are downloaded. --- Go to 4.5 (1). (MICRO-FC04-150)
Selecting (CL) [Cancel] returns you to be step (4).

<<Error>>
When the target file is not found, processing is terminated with the error message "Old files erase failed, copy stop."

(6) The 'Micro-program Exchange' dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

☒ : Micro-programs to be substituted.



Note : SVP changed the message in FM download process. If an operator selected "LCP", "MCP" or "LCDG", SVP displayed a message as "LCP/LCDG" or "MCP/LCDG" during the download.

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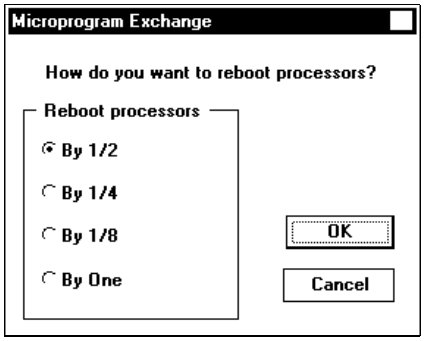
(7)

When DKCMAIN, MAIN DIFF, FOP or RAMBOOT were selected, You can select the reboot pattern from the list. Please select (CL) one of these patterns and select (CL) [OK].
If the SVP version is earlier than 51-34-XX, go to (10).



By 1/2 : Reboot by half MPs in the DKC sub system.
By 1/4 : Reboot by quarter MPs in the DKC sub system.
By 1/8 : Reboot by 1/8 MPs in the DKC sub system.
By One : Reboot by minimum reboot unit MPs in the DKC sub system.

NOTICE

Please select a reboot pattern by taking the following table into account.

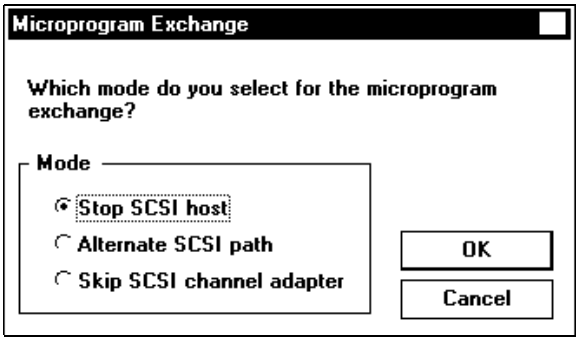
Reboot Pattern		By 1/2	By 1/4	By 1/8	By One
Exchange Time	Standard value(*) [minute](approx.)	14	19	37	78
		Short ◄——————► Long			
Effect on performance of DKC		Big ◄——————► Small			

(*)measure condition : 24MP (CHA(serial) × 4, DKA × 4), no I/O.

NOTICE

Sometimes “error” message is displayed temporarily in [Reboot status display].
But, there is no problem if the reboot is finished without error.

(8) <If SCSI channel adapter is equipped>
Select (CL) one of the exchange mode of DKCMAIN micro-program as follows, and select (CL) [OK].



- “Stop SCSI host” : exchange micro-programs by varying off-line the SCSI host paths.

  NOTICE
  You should request your custmer to shut down the SCSI host.

- “Alternate SCSI path” : exchange micro-programs by changing the SCSI host path to the alternative path.
- “Skip SCSI channel adapter” : exchange micro-programs without SCSI channel adapter.

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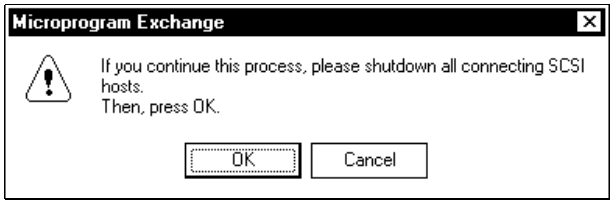
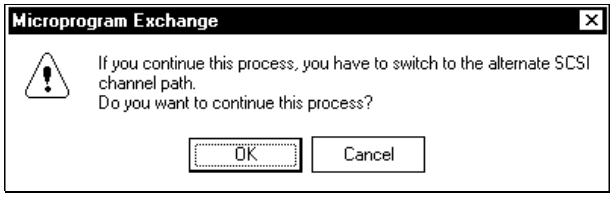
(8-1) <If "Stop SCSI host" is selected>

Shut down all the SCSI hosts and Select (CL) [OK]. Go to step (9).
When [Cancel] is selected (CL), the processing step is returned to (8).



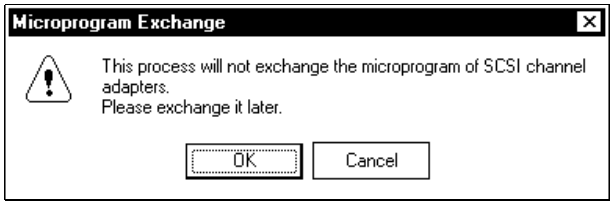
(8-2) <If "Alternate SCSI path" is selected>

It is necessary to switch the SCSI path to the alternate path before executing the microprogram FC for the CHA (SCSI) PCB.
To continue the processing, select (CL) [OK]. Go to step (10).
When [Cancel] is selected (CL), the processing step is returned to (8).



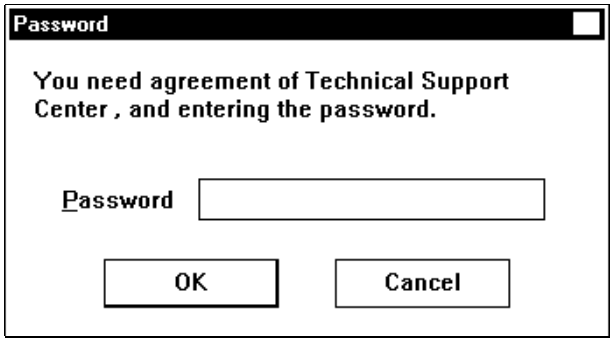
(8-3) <If "Skip SCSI channel adapter" is selected>

The microprogram FC for the CHA (SCSI) PCB will not be executed. Execute it in the future in the Stop SCSI host mode or the Alternate SCSI path mode.



NOTICE
Ask the technical support center about the appropriateness of the operation, and input a password after getting an approval of executing the operation.

If you want to continue this process, select (CL) [OK] and enter the password, and select (CL) [OK].



(9) <If SCSI channel adapter is installed, when DKCMAIN or RAMBOOT were selected.>
After you confirm that you have stopped all SCSI channel paths, select (CL) [OK].

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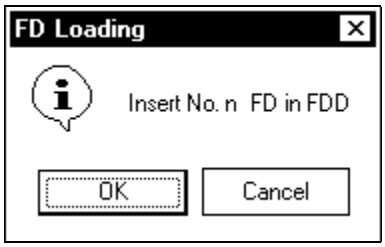
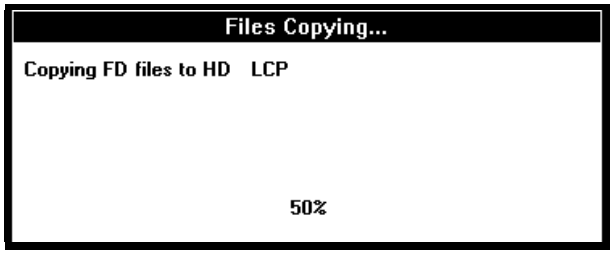
(10) In response to the message “Insert No.n FD in FDD”, remove the inserted floppy disk and insert the appropriate floppy disk and select (CL) [OK].
(n = 2,3, ... ,N, N : Number of floppy disks)



<<Error>>
No floppy disk and uncorrect floppy disk in the floppy disk drive:
The same message is displayed again, returning you to (10).
Internal error:
- “Old files erase failed, copy stop.”
- “Memory error has occurred.”
- “File I/O error has occurred.”
- “Logical error has occurred.”
- “The directory create error and copy stop.”
- “The file size is Wrong and copy stop.”

(11) The message “Copying FD files to HD” appears.
Execute the steps (10) to (11) once for each floppy disk.



<<Error>>
Internal error:
- “The file size is Wrong and copy stop.”
- “The directory create error and copy stop.”
- “Micro-program version disagreement and copy stop.”
- “Logical error has occurred.”
- “File I/O error has occurred.”
- “Memory error has occurred.”

Note : When the error message “File I/O error has occurred.” or “Memory error has occurred.” is displayed, power SVP off and on again if the same message appears after reexecuting the micro-program exchange (see SVP01-50 in the SVP SECTION).
Then execute the same micro-program exchange again. If the same error occurs (the same error message is displayed), replace SVP hardware (see REP01-150 in the REPLACE SECTION.).

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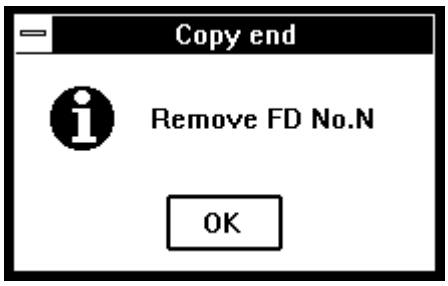
(12) Upon completion of reading from all floppy disks, the message“Remove No.N FD” appears.
In response to this message, remove the floppy disk and select (CL) [OK].

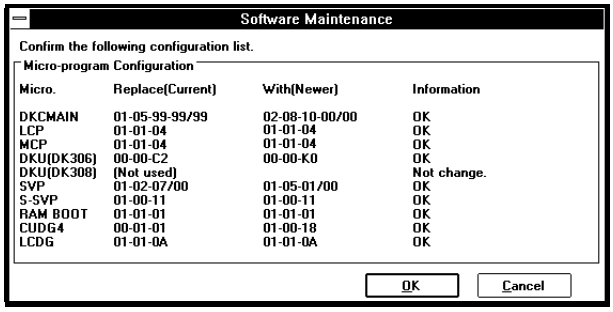
N : Number of floppy disks.



After copy end, sum checker starts.
While checking, the message appears.

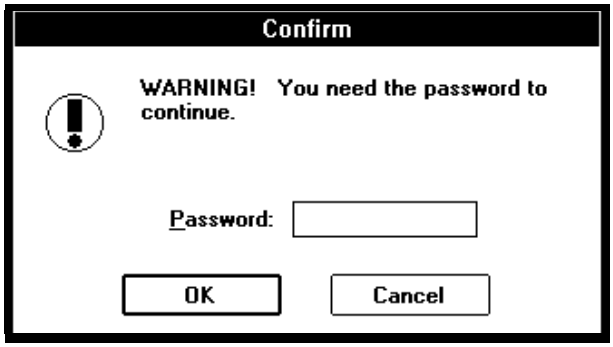
(13) On the ‘Software Maintenance’ dialog box, the micro-program types, current versions, new versions, and message are displayed.

<Display with no error>
The message “Confirm the following configuration list.” is displayed below the title bar. The micro-program can be replaced only when all rows in the information column show “OK” or “Warning”.
To continue processing, select (CL) [OK].
To terminate micro-program replacement, select (CL) [Cancel].



<<NOTICE>> If “Warning” is displayed.

NOTICE
Refrain from selecting (CL) "OK" or "Cancel". Take a note of the display contents and ask the technical support center for a decision for selecting "OK" or "Cancel" according to the contents.



To make processing progress, input the password and select (CL) [OK].
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.

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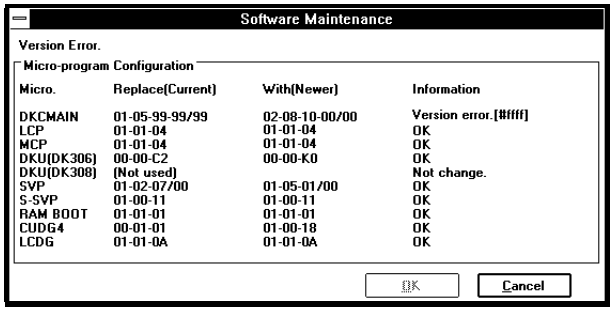
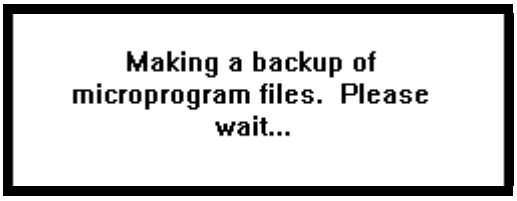
<Display with an error>
A sample error display is shown at the right. An error message is displayed below the title bar. At the same time, error information is displayed in the information column.
Select (CL) [Cancel] to terminate the micro-program replacement. (Note: The [OK] button is not displayed.)
Before attempting to rerun, be sure to correct the cause of the error. Refer to the entire status (SVP SECTION), action code (ACC SECTION), and other information.



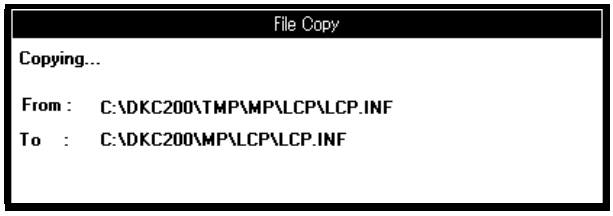
See Version Check Message Table (MICRO-FC03-70).

(14) The message "Making a backup of micro-program files. Please Wait..." appears.



(15) File copy in SVP

Go to 4.3.1 (1) (MICRO-FC04-70) or
4.3.2 (1) (MICRO-FC04-110) or
4.3.2 (5) (MICRO-FC04-120).



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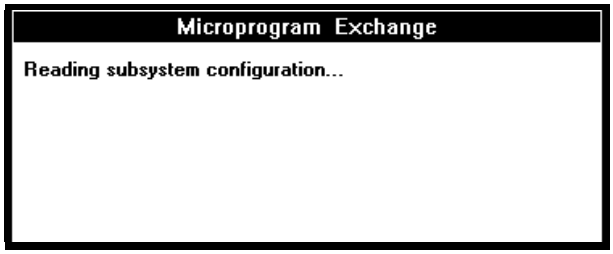
4.3 Transferring micro-programs

4.3.1 Transferring micro-programs to the DKC/DKU

(1) The message “Reading subsystem configuration...” appears.

Read the current DKC configuration.



Note : When a match is not found in the version and revision between the micro-program in the DKC and that on the SVP hard disk, the micro-program cannot be exchanged on on-line. In this case, the message “Is the device off-line?” appears, and the exchange is canceled. When a processor is blocked due to a failure, the message “Processing cannot be continued because of a processor blocked due to a failure” appears, and the exchange is canceled.

If an error occurs in downloading micro-programs, resolve the cause of an error using Maintenance Display (SVP section), Action Code (Action Code section), and other information to execute the exchange again. Then start from the beginning of the MICRO-FC procedure. At this time, you can select [Hard Disk] at 4.4 (MICRO-FC04-140) or [Floppy Disk] at 4.2 (5) (MICRO-FC04-30).

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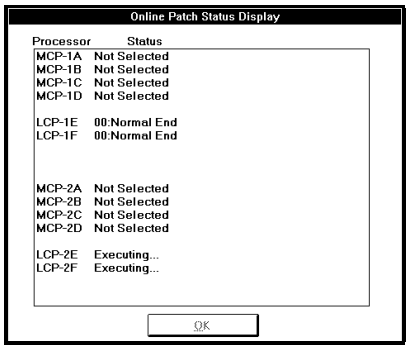
<MCP/LCP Micro code Exchange>

If MCP/LCP Micro code Exchange, the following message appears.

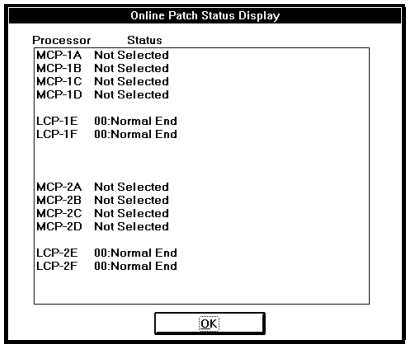
(a) The message displays the execution status of the online patch in the installed MCP or LCP.



<Explanation of status>

Not selected	Not selected as the target.
Waiting for Execution	Execution is awaited.
Executing...	Execution is in progress.
XXXX Blockade Error	Processor XXXX is blockaded.

(b) When execution is competed for all targets, you will go to step (2). If some errors occur, you can now select the [OK] button.
Select (CL) [OK].
You will return to 4.2 (3).



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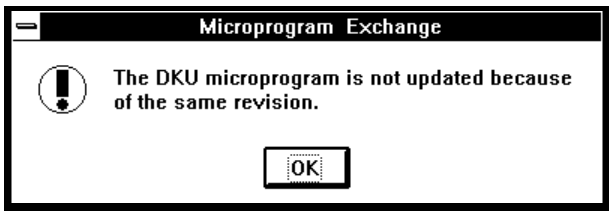
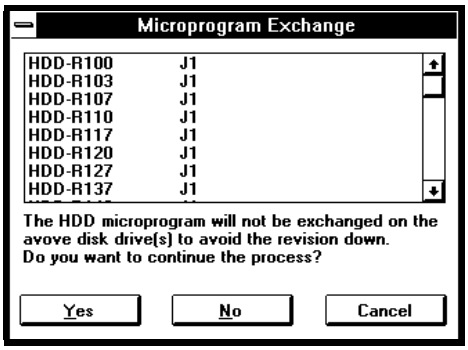
(2) The message “Downloading *** micro- program...” (***: MAIN, LCP, ...) appears.

<Replacement of the DKU micro-program>

(a) When the SVP hard disk and the HDU have DKU micro-programs of the same revision, the replacement of the DKU micro-program ends with the following message on the screen:
“The DKU microprogram is not updated because of the same revision.”



(b) When the revision of the DKU micro-program in the HDU is older than that in the SVP hard disk, the HDD location number and the revision are displayed in the Revision Down HDU list.
When you select (CL) [Yes], the DKU micro-program in the revised HDU only is updated.



When you select (CL) [No], the message shown on the right is displayed.
When you select (CL) [Yes] in response to the message, DKU micro-programs of the HDUs having micro-programs of different versions are updated.

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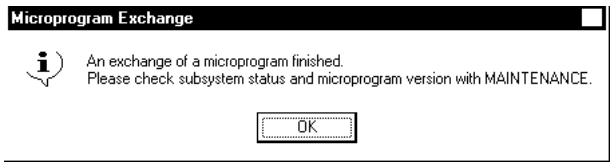
(3) The message “Now MP Rebooting... Group# n/N” appears.
The processor is recovered.
SVP executes steps (2) and (3) for each exchanging unit.

(4) In response to the message “An exchange of a microprogram finished. Please check subsystem status and microprogram version with MAINTENANCE”, select (CL) [OK].



Go to 4.6. (MICRO-FC04-170)

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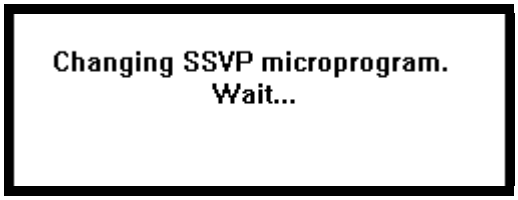
4.3.2 Transferring micro-programs to SVP/SSVP

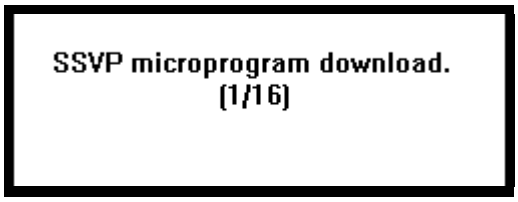
(1) Start of the exchange (SSVP).
The message “Changing SSVP microprogram. Wait...” is displayed.



<<Error>>
Internal error :

- “Read/Write error has occurred !”
- “Information file doesn’t exist or open error has occurred!”
- “SSVP RESET switch on.”
- “Communication Initialize error!”
- “Cannot change SSVP micro-program while following process is in action. SSVP micro-program download. SSVP memory dump. SVP-SSVP communication error.”
- “Information file doesn’t exist or open error has occurred!”

(2) The message “SSVP microprogram download.” is displayed.



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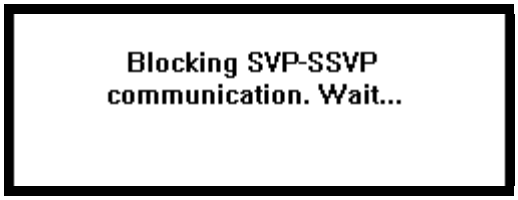
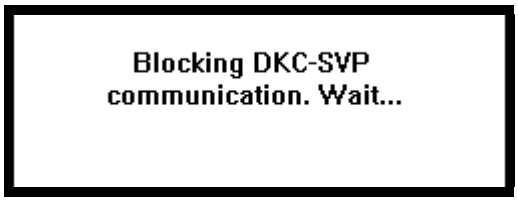
(3) Start of the exchange (SVP).
The message “Blocking SVP-SSVP communication Wait...” is displayed.



<<Error>>
Internal error :
- “Information file doesn’t exist or open error has occurred!”
- “SVP-SSVP communication blockade error has occurred.”

---

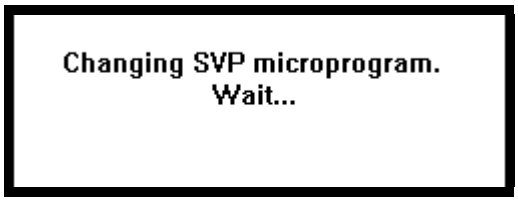
(4) The message “Blocking DKC-SVP communication. Wait...” is displayed.



<<Error>>
Internal error :
- “DKC-SVP communication blockade error has occurred.”
- “DKC-SVP communication restore error has occurred. Confirm the cables are connected correctly.”

---

(5) The message “Changing SVP microprogram. Wait...” is displayed.



<<Error>>
Internal error :
- “Read/Write error has occurred !”
- “Information file doesn’t exist or open error has occurred!”
- “Can’t find a file (BKTASK.DAT)!”

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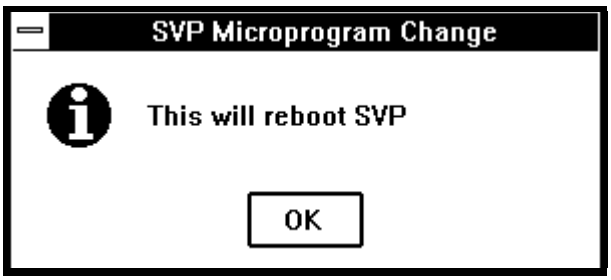
(6) End of the exchange (SVP).
Select (CL) [OK].
Terminate some application programs, so SVP is rebooted automatically.



Go to 4.6. (MICRO-FC04-170)

<<Error>>

- "The change of SVP microprogram has failed."
  <<Action>>
  - Stop SVP and Power off PC.
  - Power on PC again.

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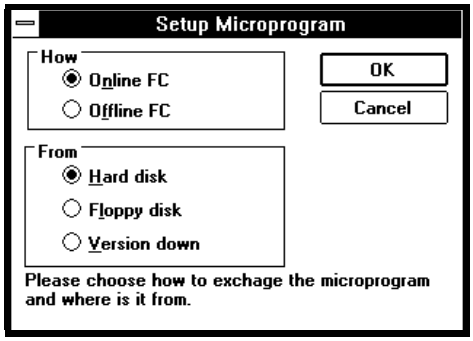
4.4 Hard Disk Download

The latest version of micro-programs on the SVP hard disk are downloaded to DKC.

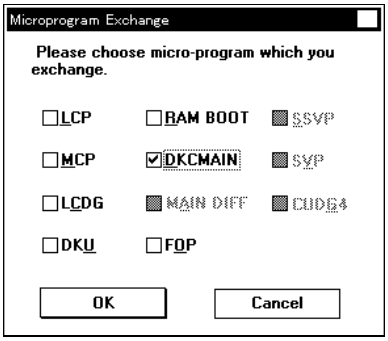
(1) Select (CL) [Hard Disk] in the 'Setup Microprogram' dialog box.
And select (CL) [OK].



---

(2) Select (CL) one or more items from the list of the type of micro-programs.
And select (CL) [OK].

☒ : Micro-programs to be substituted.



---

(3)
Go to 4.2 (7) (MICRO-FC04-33).

---

(4) Execute from 4.3.1 (1).
Go to 4.3.1 (1) (MICRO-FC04-70).

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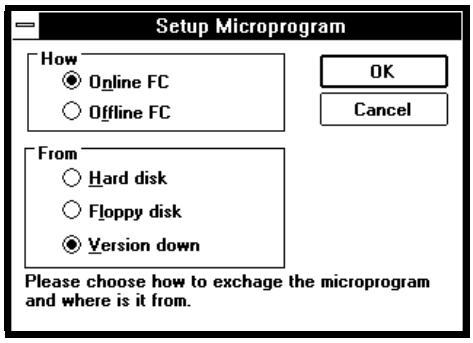
4.5 Version Down

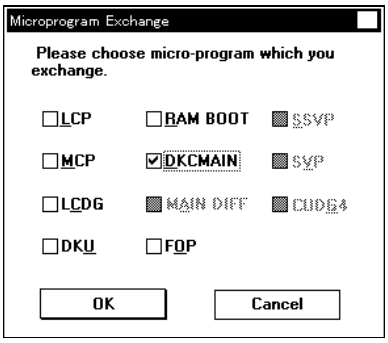
NOTICE
Please ask your TSC if you can operate this.

If you want to restore micro-programs to the previous versions of the micro-programs after the exchange (by Floppy Disk or Remote function), execute the Version Down function.

(1) Select (CL) [Version Down] in the 'Setup Microprogram' dialog box.
And select (CL) [OK].



(2) Micro-programs to be restored are displayed in the 'Micro-program Exchange' dialog box.



(3)
Go to 4.2 (7) (MICRO-FC04-33).

(4) Copy source and copy destination are displayed.

Execute 4.3 (1).
Go to 4.3.1 (1) (MICRO-FC04-70)

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Note : • The Version Down function can restore only micro-programs that have been exchanged by Floppy Disk or Remote function of the MICRO-FC.
When the MICRO-FC (Floppy Disk or Remote function) has not been executed the Version Down function cannot be executed until the next MICRO-FC is done.
• After LCP or MCP Version Down, replace the PCB.

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4.6 Checking the functions after exchange

Conduct the same testing performed installation.
Check that the version of the recently installed micro-program is the same as that of the replaced micro-program by using the version display in the MAINTENANCE function.
(See SVP SECTION.)

Note: If you find "??-??···" or incompatibility version, recover at the section 7.1.

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5 MP Install

5.1 Over view

This facility is used to restore a processor that failed to complete the rewrite of the micro-programs in FM (Flash Memory) due to an error occurring during the micro-program download.
Since a processor that encountered such a problem started without loading micro-programs successfully, it is loaded with FM write only programs. Whenever FM write only program are loaded, an SIM with reference code = 7900X0 is reported. The user must examine this SIM and perform MP Install on the processor that issued the SIM.
If MP Install has failed, please replace the PCB. (see REPLACE SECTION)

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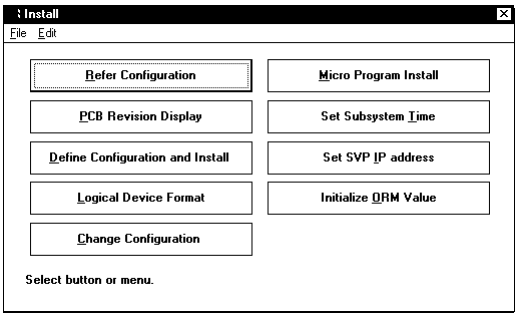
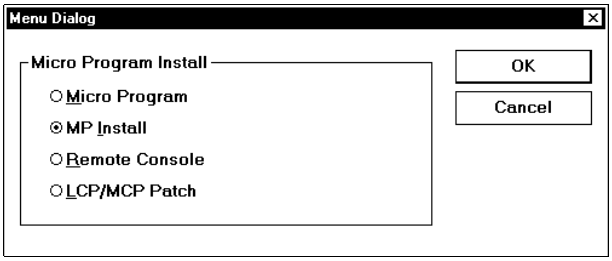
5.2 MP Install

(1) Select (CL) the [Install] icon in the ‘SVP’ window.

(2) Select (CL) [Micro Program Install] in the ‘Install. Subsystem’ window box



(3) Select (CL) the [Install] menu in the ‘Menu Dialog’ window and select (CL) [MP Install].



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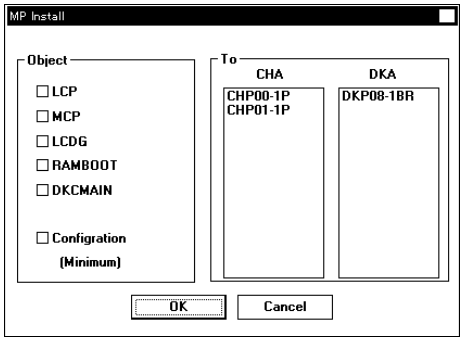
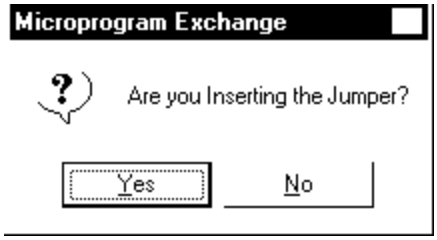
(4) Select (CL) processor in the 'Object' and select (CL) [OK].



(5) Make one of the following responses to message "Are you inserting the jumper?".

- When starting up DKC by connecting JP to TM-1N J9 and TM-2M J9:
  Select (CL) [Yes]. Then processor recovery processing is skipped and branches to (8).
- When starting up DKC as usual:
  Select (CL) [No].



(6) The message "Downloading Main micro-program..." appears.

(7) The message "Processor in now recovering..." appears.
The processor is recovered.

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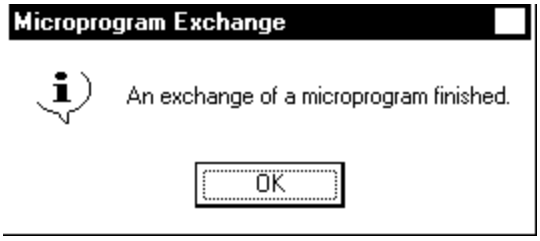
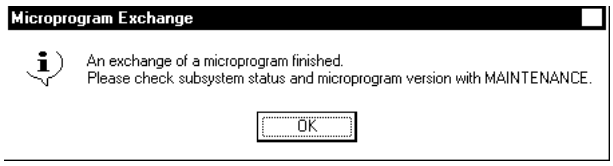
(8)

- When select (CL) [Yes] on step (5):
  In response to the message “An exchange of a microprogram finished.”, select (CL) [OK].



- When select (CL) [No] on step (5):
  In response to the message “An exchange of a microprogram finished. Please check subsystem status and microprogram version with MAINTENANCE.”, select (CL) [OK].



(10) You will return ‘Install’ screen.

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6 LCP/MCP Patch

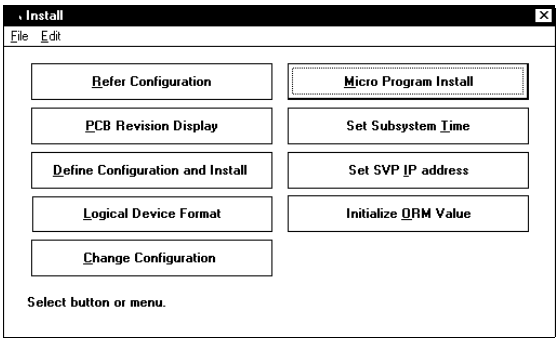
6.1 Methods of entering a patch file

6.1.1 Entering the patch file from the SVP by using a patch editor

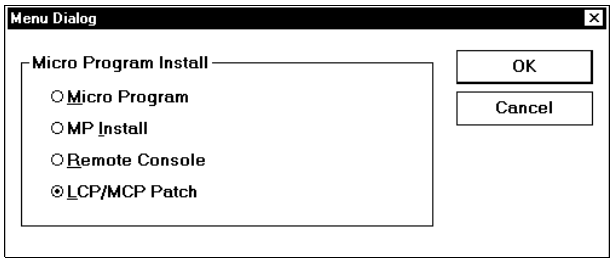
(1) <Mode Change>
Change the mode to [Modify Mode] (CL).

(2) Select (CL) [Install].

(3) Select (CL) [Micro Program Install].

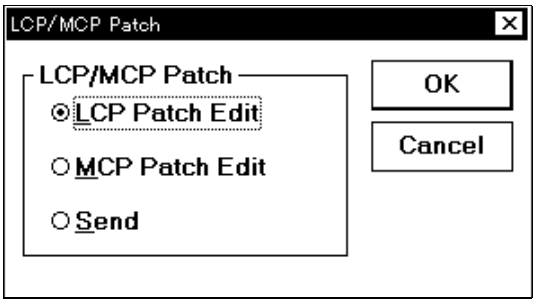


(4) Select (CL) [LCP/MCP Patch] and select (CL) [OK].



(5) Select (CL) [LCP Patch] and select (CL) [OK].

When you want to edit MCP patch file, select (CL) [MCP Patch] and select (CL) [OK].



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(6) Editing patch data

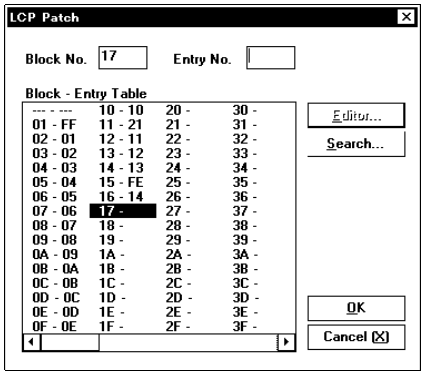
A procedure to edit the LCP patch data is shown below as an example. MCP patch data is the same as the LCP patch data.

(6-0) Entry No. selection screen
(6-1) Changing patch data
(6-2) Adding patch data
(6-3) Deleting patch data
(6-4) Inserting patch data
(6-5) Clearing patch data
(6-6) Copying patch data
(6-7) Cutting patch data
(6-8) Pasting patch data
(6-9) Printing patch data
(6-10) Stopping editing
(6-11) Searching patch data

(6-0) Entry No. selection screen

Execute “New addition (or insertion is allowed) of entry No.” or “Selection of entry No. of registered data” on the entry No. selection screen.

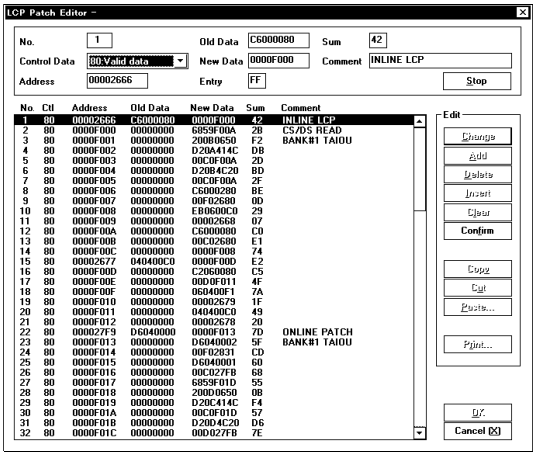
When the [Editor...] button is selected (CL), the ‘LCP Patch Editor -’ screen appears.



(6-1) Changing patch data

(1) Select (CL) the patch data to be edited from the patch data list in the lower part of the screen and select (CL) [Change] button. Edit it in the upper part of the screen.

(2) After editing, select (CL) the [Confirm] button and registered the patch data.



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(6-2) Adding patch data

(1) When the [Add] button is selected (CL), data all digits of it are "0" is added to the end of the data list. Edit the data in the upper part of the screen.

(2) After editing, select (CL) the [Confirm] button and registered the patch data.

(6-3) Deleting patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) [Delete] button.

(2) Selected patch data can be deleted.

(6-4) Inserting patch data

(1) Select (CL) an insert line in the patch list and select (CL) [Insert] button. All digits are "0" is inserted to the selected line. Edit the data in the upper part of the screen.

(2) After editing, select (CL) the [Confirm] button and registered the patch data.

(6-5) Clearing patch data

(1) Select (CL) [Clear] button.

(2) Deletion of patch data is done for each entry No.

(6-6) Copying patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) [Copy] button.

(2) Selected patch data can be copied.

(6-7) Cutting patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) [Cut] button.

(2) Selected patch data can be cut (copied and deleted).

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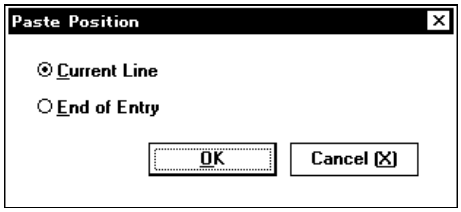
(6-8) Pasting patch data

(1) Select (CL) an one line to paste copied or cut patch data and select (CL) [Paste...] button. 'Paste Position' screen appears.

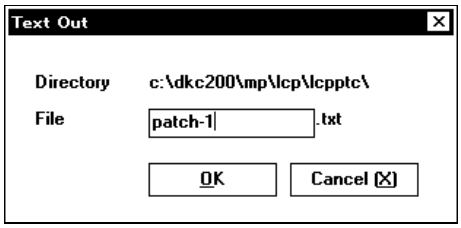
(2) [Current Line] : To paste patch data at the selected line.
[End of Entry] : To paste patch data at the end of the entry.



(6-9) Printing patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) [Print...] button. 'Text Out' screen appears.

(2) Input a file name of "*.txt" file and select (CL) [OK] button.



(6-10) Stopping editing

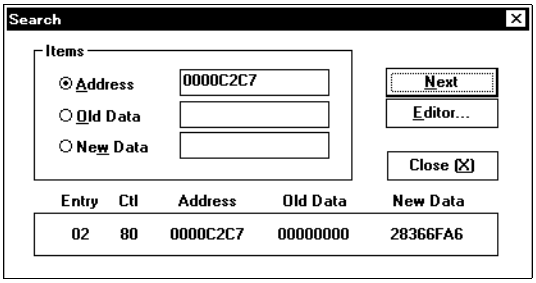
(1) Select (CL) [Stop] button to stop editing (changing, adding, or inserting) patch data.

(6-11) Searching patch data

(1) Select (CL) [Search...] button in entry No. selection screen. 'Search' screen appears. Address, Old Data or New Data searching can be done.

(2) Input an Address, an Old Data or a New Data, and select (CL) [Next] button. The found data is displayed at the bottom of this screen.

(3) If you need to edit the found patch data, select (CL) [Editor...] button. 'LCP Patch Editor -' screen appears. And (6-1)-(6-10) operation will be available.



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6.2 Methods of sending a patch file

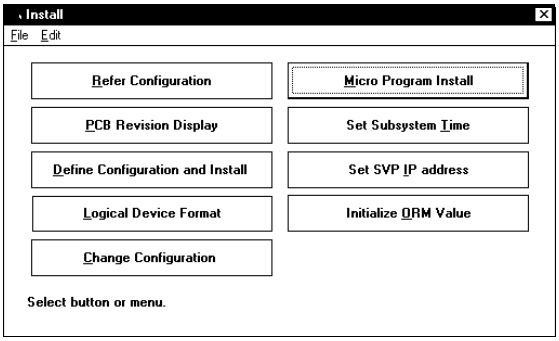
6.2.1 Rewriting LCP or MCP itself

Let's send the online-patch record specified by Execute Entry NO. to the processor specified by TARGET.

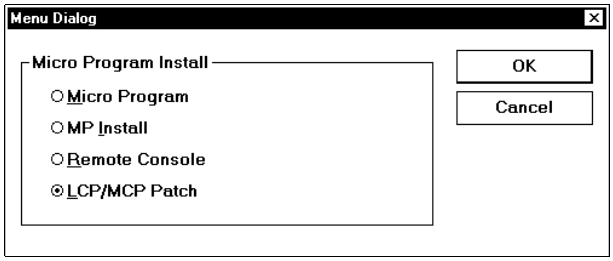
(1) <Mode Change>
Change the mode to [Modify Mode] (CL).

(2) Select (CL) [Install].

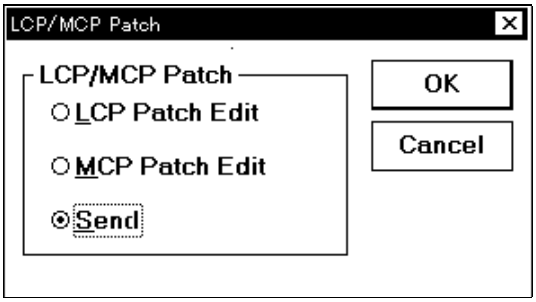
(3) Select (CL) [Micro Program Install].



(4) Select (CL) [LCP/MCP Patch] and select (CL) [OK].



(5) Select (CL) [Send] and select (CL) [OK].



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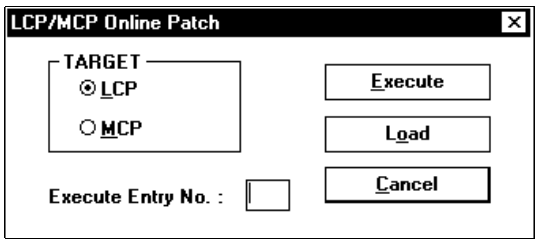
(6) Select (CL) the processor (LCP or MCP) to which to send the patch with TARGET on LCP/MCP Online Patch. Enter an execute entry number then select (CL) Execute.



Execute entry number : Specify the registration number (two-digit hexadecimal number) of the online-patch record.

---

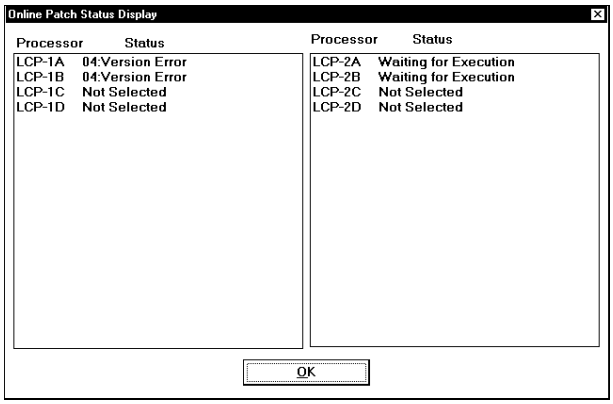
(7) The execution status of the online patch in the installed MCP or LCP is displayed.

<Explanation of status>

Not selected	Not selected as the target.
Waiting for Execution	Execution is awaited.
Executing...	Execution is in progress.
XXXX Blockade Error	Processor XXXX is blockaded.

---

(8) When execution is completed for all targets, you can now select the [OK] button.
Select (CL) [OK].
You will return to step (6).



<Explanation of status>
Sumcheck Error
Version Error
Data Error
Bank Error
Address Error
Level Error
Record Count Over Error
ID Error
Access Mode Error
CBF CHK2 Error
Busy Time Out Error *1
Not Ready Error
Time Out Error before Patch Transfer

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Time Out Error during Patch Transfer
Time Out Error after Patch Transfer
Status = “Dead”
Status = “HOLD”
Abnormal Error Check
Busy Retry Error *1
Other Frame Receive Error
Time Out Error
Abnormal Error
DMA Abnormal Error
Parameter Error
Asynchronous Error

*1 : When “Execute” is performed in the processor which is going along I/O, it turns into this error.
Then, till it becomes Normal End, “Execute” is performed.

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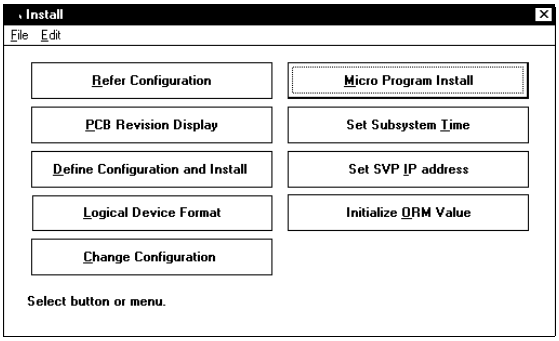
6.2.2 Including the patch into a load module and update FM

Let's download the load module contain all records in the online-patch file FM of the processor for which Execute has been executed. If Execute is not yet executed for processor, the load module is downloaded to the processor currently specified by TARGET.

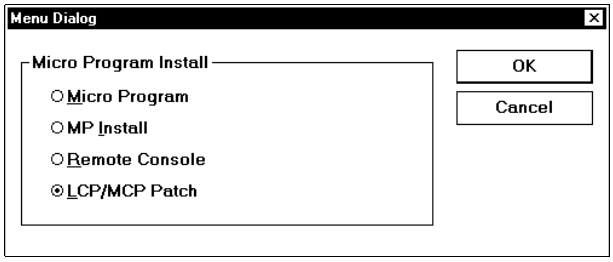
(1) <Mode Change>
Change the mode to [Modify Mode] (CL).

(2) Select (CL) [Install].

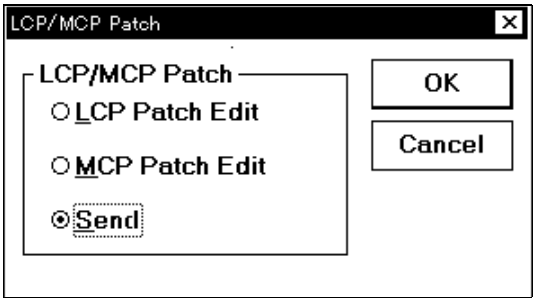
(3) Select (CL) [Micro Program Install].



(4) Select (CL) [LCP/MCP Patch] and select (CL) [OK].



(5) Select (CL) [Send] and select (CL) [OK].



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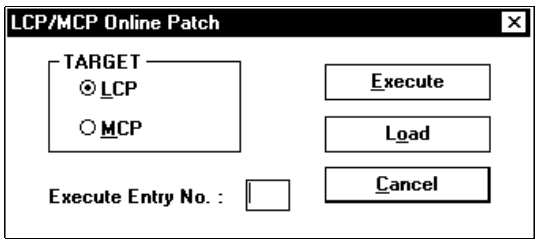
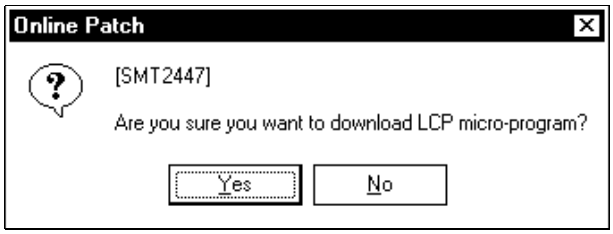
(6) When you have executed Execute on LCP/MCP Online Patch, select (CL) [Load]. Otherwise, select (CL) the processor to which to download the patch with TARGET then select (CL) [Load].



(7) The message "Are you sure you want to download XXX micro-program?" is displayed for the processor for which Execute has been executed or the processor specified by TARGET for which Execute is not yet executed.
In response to this message, select (CL) [Yes].



(8) SM is being updated.
"Now Down Loading..." is displayed.

(9) FM is being updated.
"Now Down Loading... [XXX]" (XXX : PCB location) is displayed.

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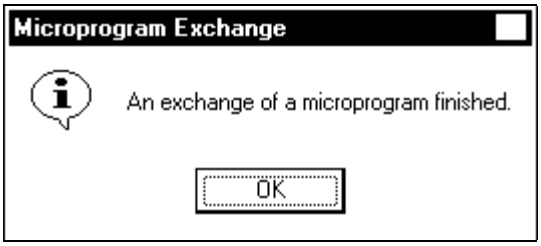
(10) Upon completion of downloading, the message "An exchange of a microprogram finished" is displayed.
In response to this message, select (CL) [OK].



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7 Trouble Recovery Procedure in Exchanging Micro-programs

7.1 Recovery procedure in on-line menu was selected

If trouble occurs while the micro-programs are being exchanged, symptoms (1) to (6) below can be observed apparently. In these cases, use the recovery procedures shown in flowcharts [A] to [D]. And if you want to return the version of micro-program to the previous version, use the procedure shown in (7) and flowchart [E].

(1) A power failure occurs.
→Go to [A] (MICRO-FC07-20)
(2) The time-out message is displayed on the SVP screen.
(a) Trouble in downloading the micro-program (the message "Downloading Main micro-program" is displayed).
→Go to [B] (MICRO-FC07-30)
(b) Trouble in blocking the processor (the message "Processor in now blocking" is displayed).
→Go to [C] (MICRO-FC07-40)
(c) Trouble in recovering the processor (the message "Processor in now recovering" is displayed).
→Go to [C] (MICRO-FC07-40)
(d) Trouble in downloading the micro-program (the message "Downloading DKU micro-program" is displayed).
→Go to [F] (MICRO-FC07-80).
(3) An error occurs in data transferred to the DKC.
(The message "It failed in the writing to the flash memory" is displayed.)
→Go to [B] (MICRO-FC07-30)
(4) An I/O error occurs on the SVP hard disk.
(The message "File I/O error has occurred" is displayed)
(The message "Memory error has occurred" is displayed)
→Go to [D] (MICRO-FC07-50)
(5) An AP error occurs, resulting in PC trouble (Key-in operations are disabled and the screen disappears).
→Go to [B] (MICRO-FC07-30)
(6) Recovery of a cache failure during the micro-program exchange of DKCMAIN Action.
→Go to MICRO-FC07-150
(7) Procedure for returning the micro-program version to the previous version.
→Go to [E] (MICRO-FC07-60)
(8) In case of uncorrect version display ("??-??···" or incompatibility).
→Go to [B] (MICRO-FC07-30)

[Sections to be referenced for recovery procedure]
(i) Status display : 3.4 Main screen on SVP section
(ii) Version display : 3.9 Micro-program version on SVP section
(iii) MP installation : 5 MP Install
(iv) Package exchange : 1 Hot Replace on REPLACE section
(v) PC exchange : 1 Hot Replace on REPLACE section

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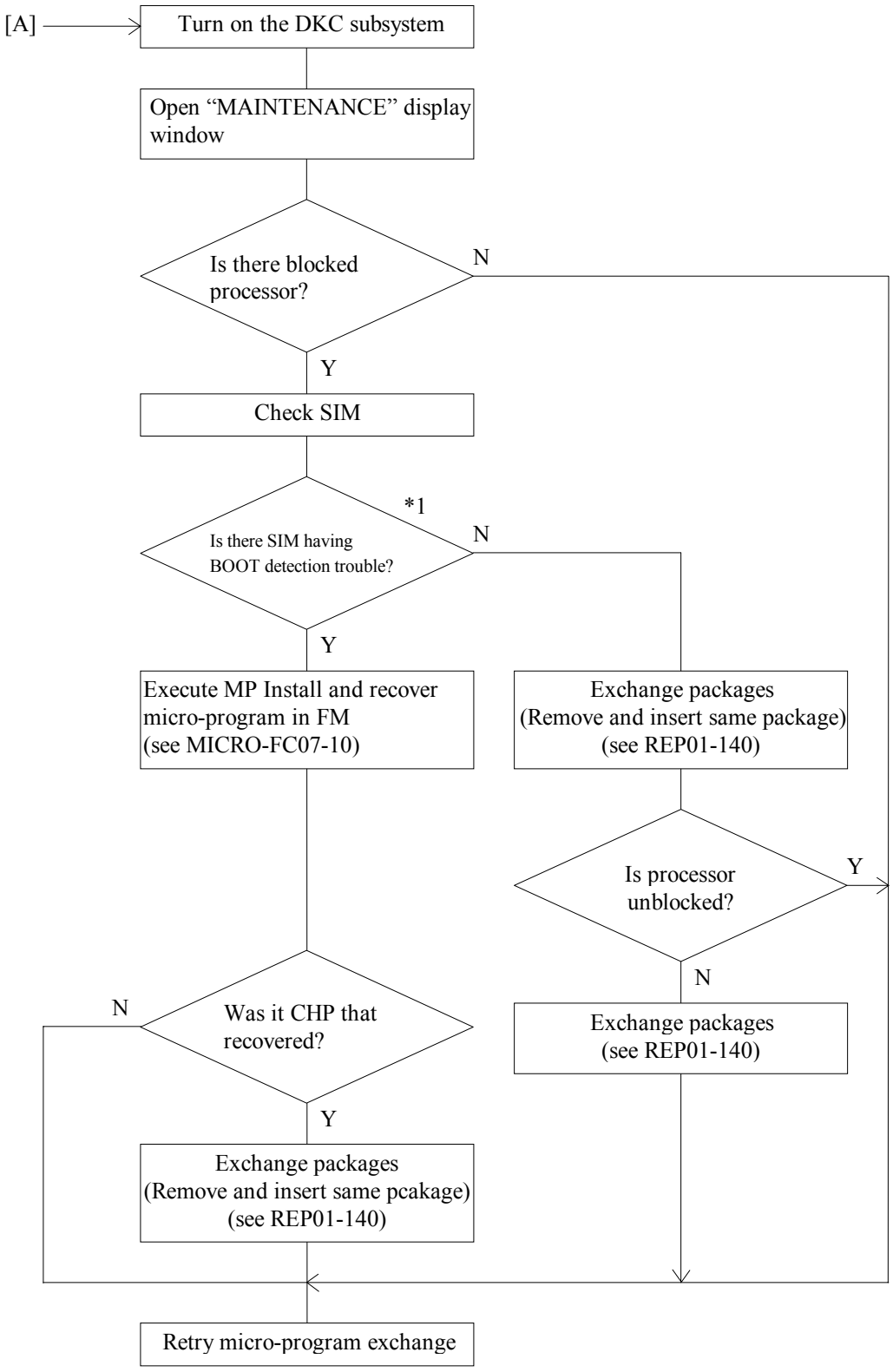
[Recovery Procedure for Power Failure]



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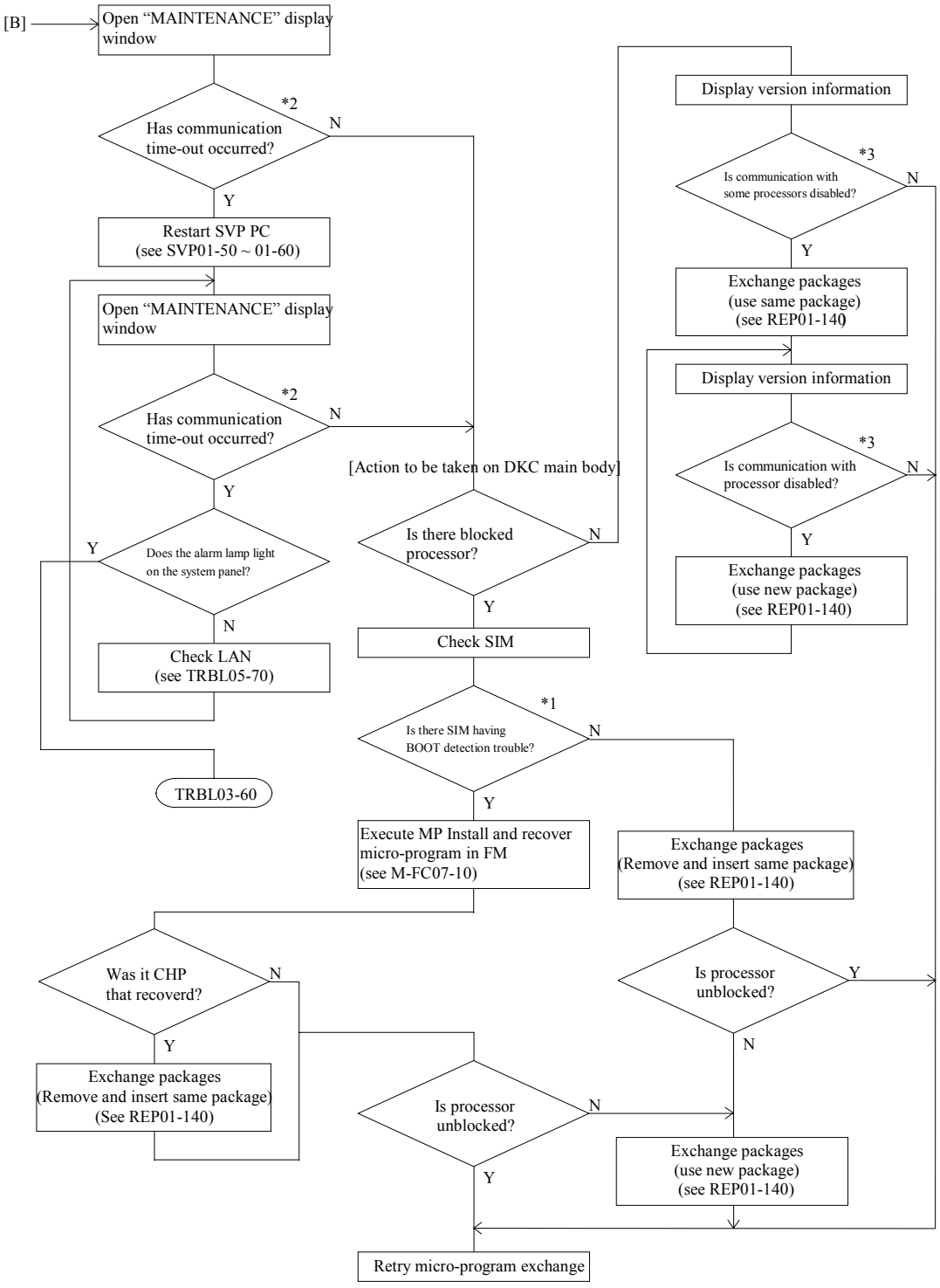
[Recovery Procedure for Communication Time-out/PC Trouble in Downloading Micro-program /Version incompatibility]



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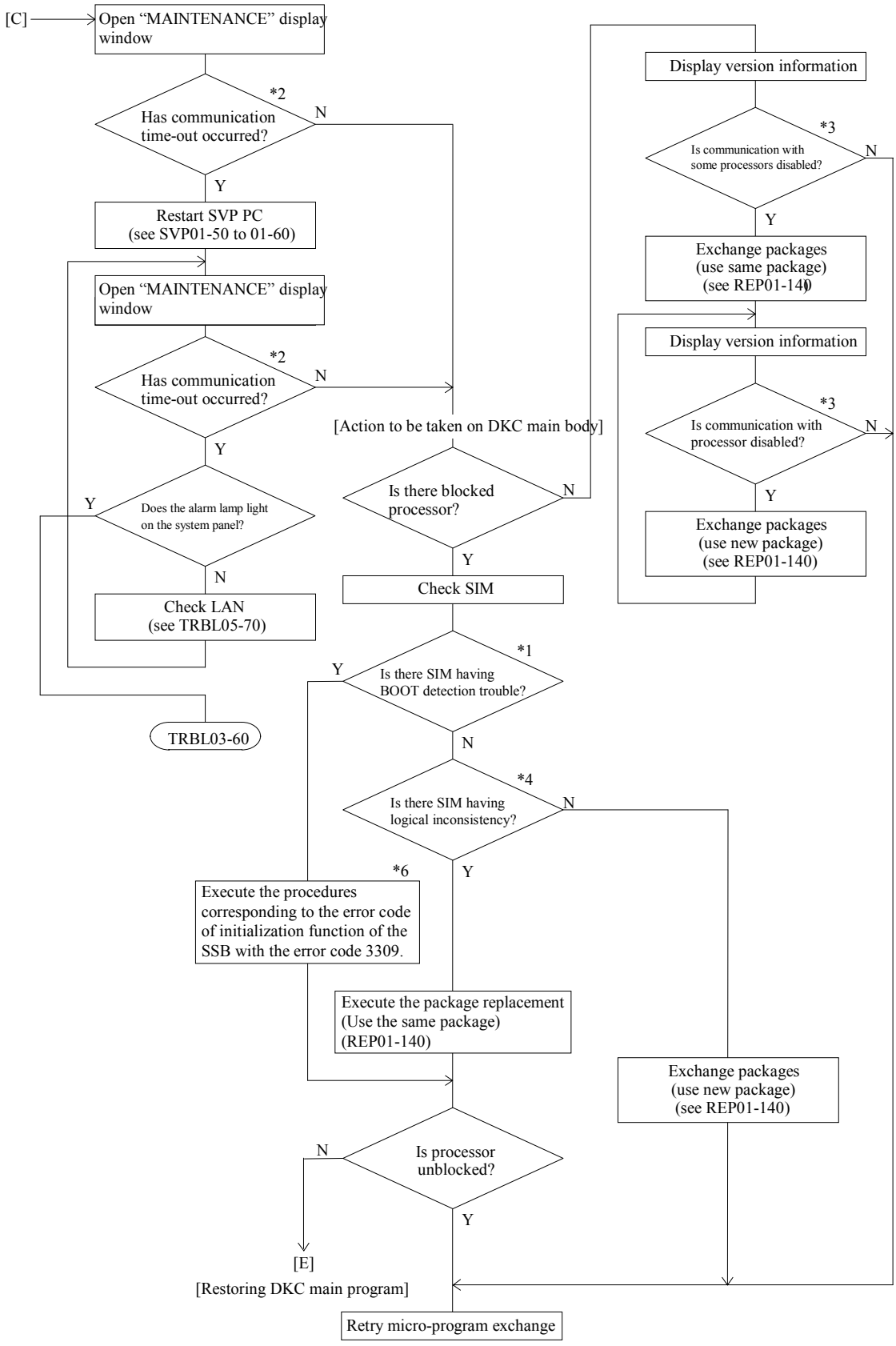
[Recovery Procedure for Communication Time-out in Blocking/Unblocking Processor]



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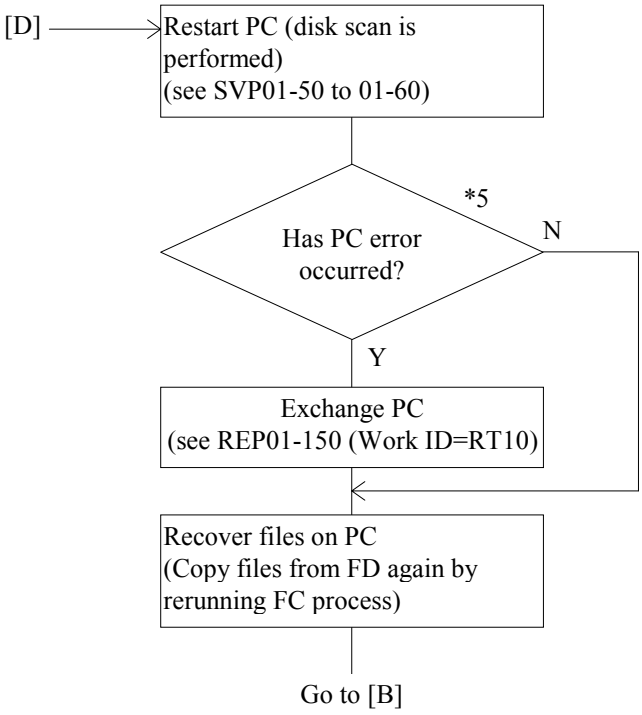
[Recovery Procedure for I/O Error on SVP Hard Disk]



*1) Reference code "7900X0" or "7901X0"
X: Shows processor id. (see SIM-RC02-150)
For details of the trouble, refer to the explanation about BOOT detected error at SSB (Byte27 =8C).
(see SSBLOG05-2370)
*2) The message "connection error occurred SVP-DKC" is displayed.
*3) "-" is displayed for each processor version.
*4) Reference code
3080x0:Indicates that a WCHK1 dump has occurred.
3081x0:Indicates that an ABEND dump has occurred.
x: Shows processor id.
*5) The message "Please turn off SVP and replace it" is displayed.
*6) Refer to "SSBLOG05-2370" for the SSB with the error code 3309.
Also, the error code of initialzation function is shown in 5C-5Fth byte of the SSB. The procedures corresponding to the error code of initialization function are as follows.

Error code of initialization function	Procedures	Note
56000041	① SVP Replace ② MP Install ③ Package Replace	Use the same package in ③. Refer to "REP01-150 (Work ID : RT10)" for SVP Replace.
others	① MP Install ② Package Replace	Use the same package in ②.

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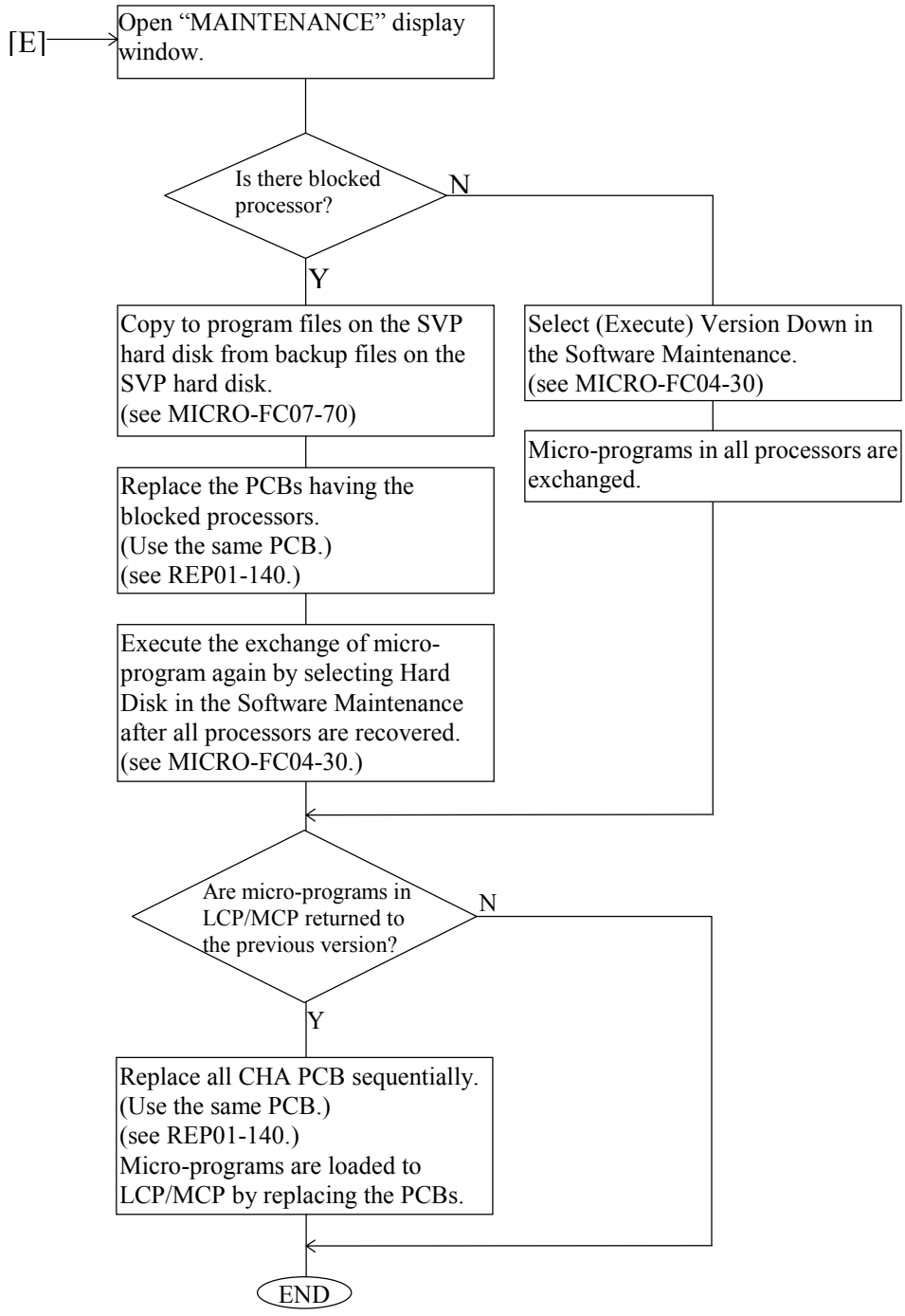
[Procedure for returning the micro-program version to the previous version]



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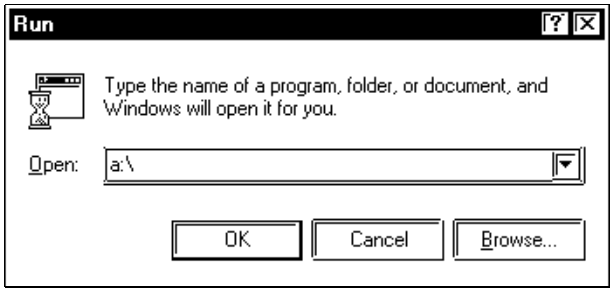
[Copy to program files from backup files on the SVP hard disk]

(1) Select (CL) the [Run...] from [Start] button.

(2) Insert Setup Installer (1/14) FD in FDD.

(3) Input file name “a=\mainbk.bat” in ‘Open’ and select (CL) [OK].



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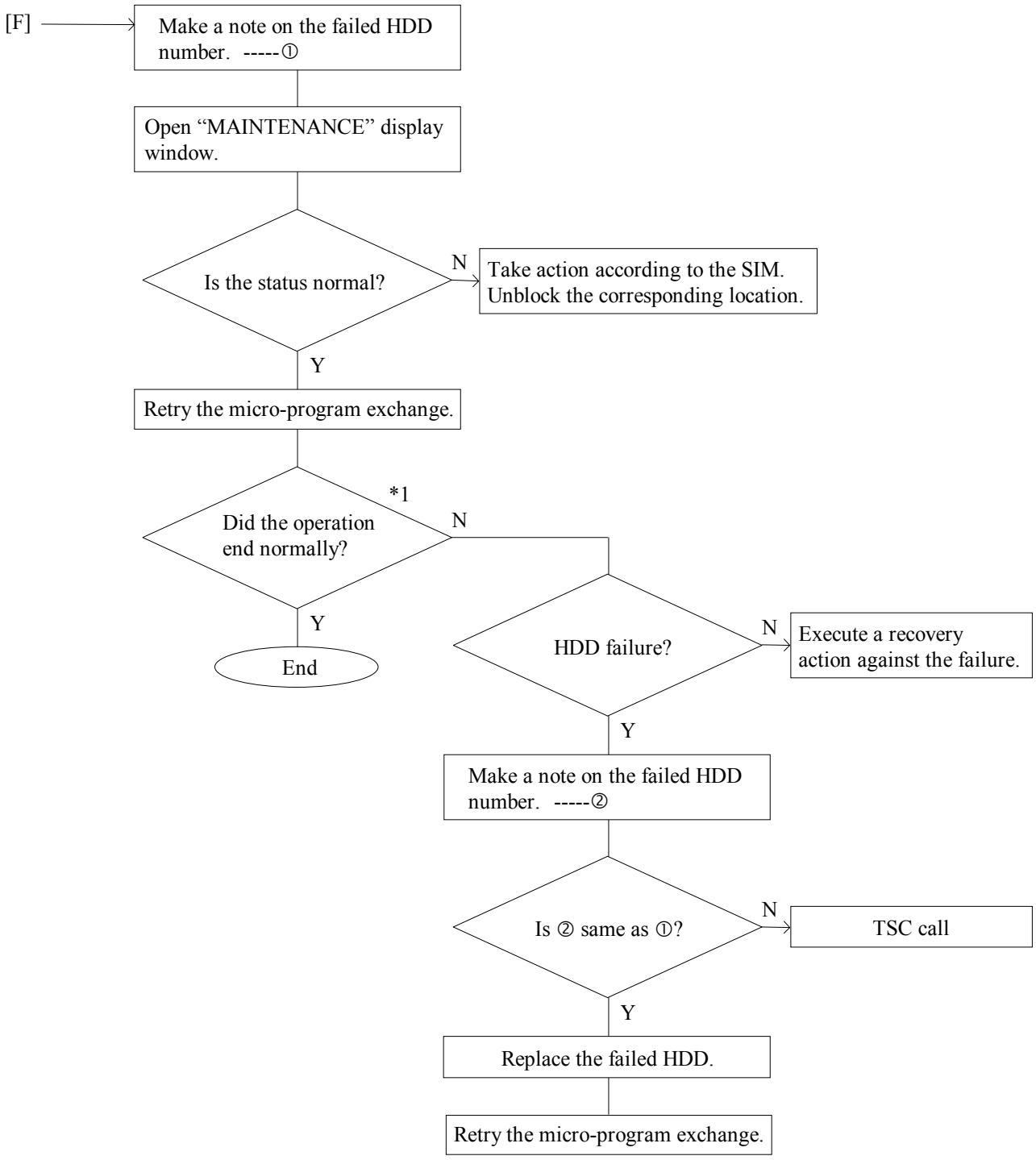
[Recovery procedure when a DKU error occurs during a downloading of the micro-program (DKU micro-program)]



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7.2 Recovery procedure in off-line menu was selected

If trouble occurs while the micro-programs are being exchanged, symptoms (1) to (8) below can be observed apparently. In these cases, use the recovery procedures shown in flowcharts [A] to [F].

(1) A power failure occurs.
→Go to [A] (MICRO-FC07-100)

(2) Time-out display appears on SVP screen. ("On exchanging a microprogram. An error has occurred. Processing is stopped. Confirm the status and Version of subsystem. Phase: xxxx" message is displayed.)
  (a) System block processing (phase: preprocedure display) error.
→Go to [B] (MICRO-FC07-110)
  (b) Micro-program downloading (phase: download display) error.
→Go to [C] (MICRO-FC07-110)
  (c) System recovery processing (phase: recover display) error.
→Go to [D] (MICRO-FC07-120)

(3) An error occurs in data transferred to the DKC.
(The message "It failed in the writing to the flash memory" is displayed.)
→Go to [E] (MICRO-FC07-130)

(4) An I/O error occurs on the SVP hard disk.
(The message "File I/O error has occurred" is displayed)
(The message "Memory error has occurred" is displayed)
→Go to [F] (MICRO-FC07-140)

(5) An AP error occurs, resulting in PC trouble (Key-in operations are disabled and the screen disappears).
→Go to [E] (MICRO-FC07-130)

(6) Interruption of micro-program exchange.
("File copy processing was interrupted. DKC subsystem will be recovered." message is displayed.)
Micro-program exchange processing was interrupted because a response to SVP was designated. DKC is automatically rebooted to return to the original status.

(7) Off-line micro-program exchange function not supported.
("The version of Main microprogram is inconsistent with the SVP." message is displayed.)

(8) Recovery of a cache failure during the micro-program exchange of DKCMAIN Action.
→Go to MICRO-FC07-150

(9) In case of uncorrect version display ("??-??···" or incompatibility).
→Go to [B] (MICRO-FC07-110)

[Sections to be referenced for recovery procedure]
  (i) Status display : 3.4 Main screen on SVP section
  (ii) Version display : 3.9 Micro-program version on SVP section
  (iii) MP installation : 5 MP Install
  (iv) Package exchange : 1 Hot Replace on REPLACE section
  (v) PC exchange : 1 Hot Replace on REPLACE section

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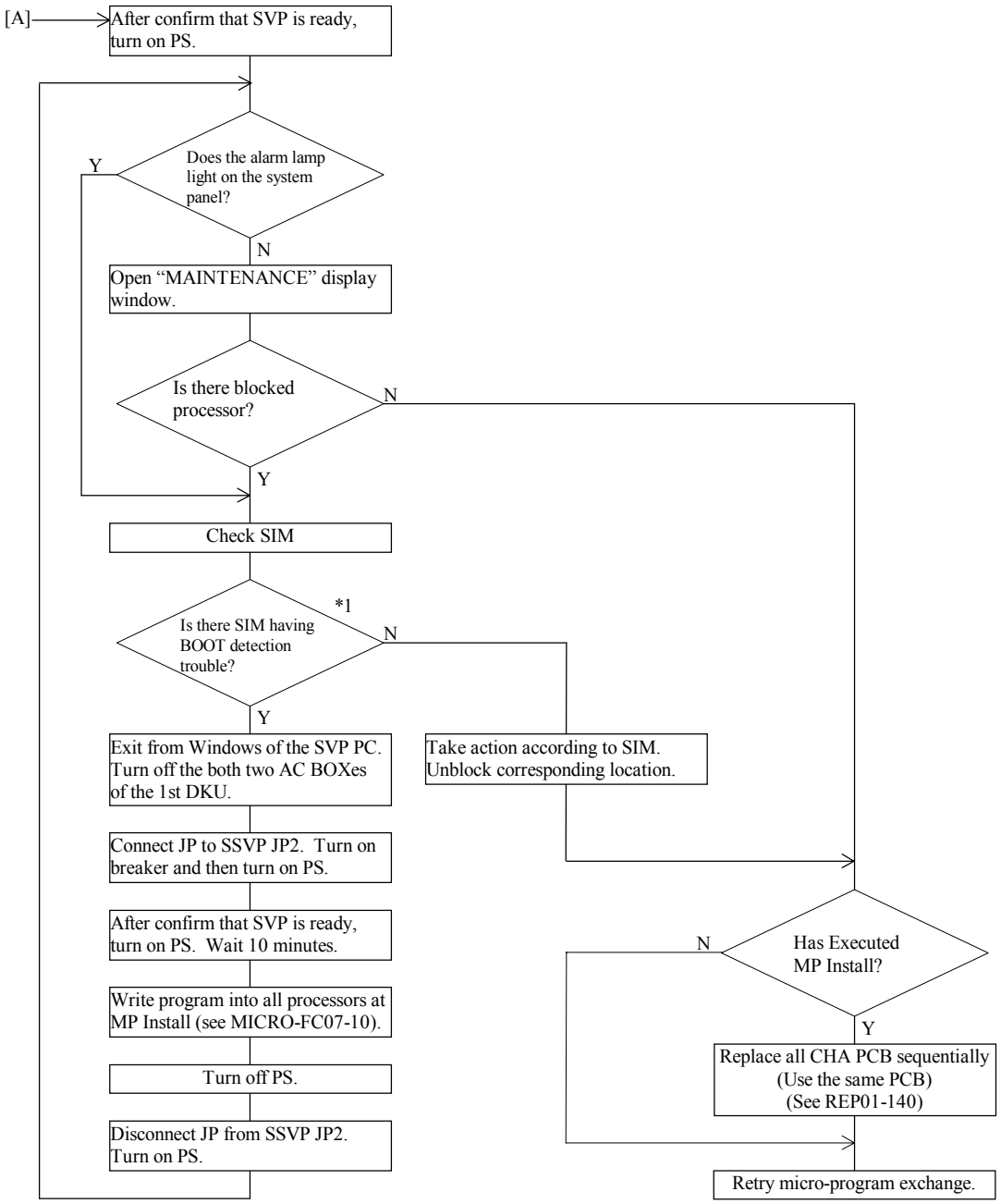
[Recovery Procedure for Power Failure]



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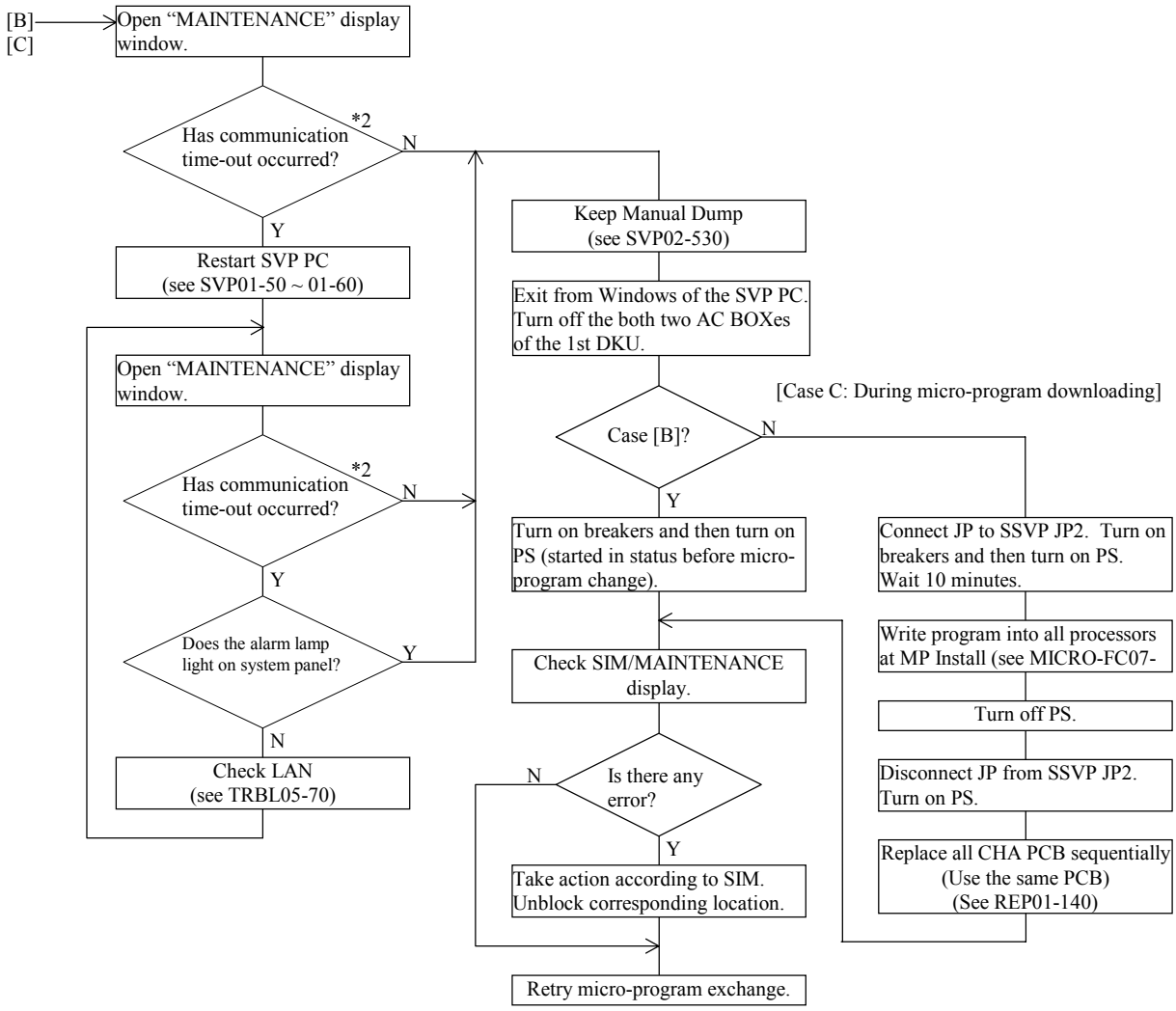
[Recovery procedure in case of time-out during system block processing/micro-program downloading/Version incompatibility]



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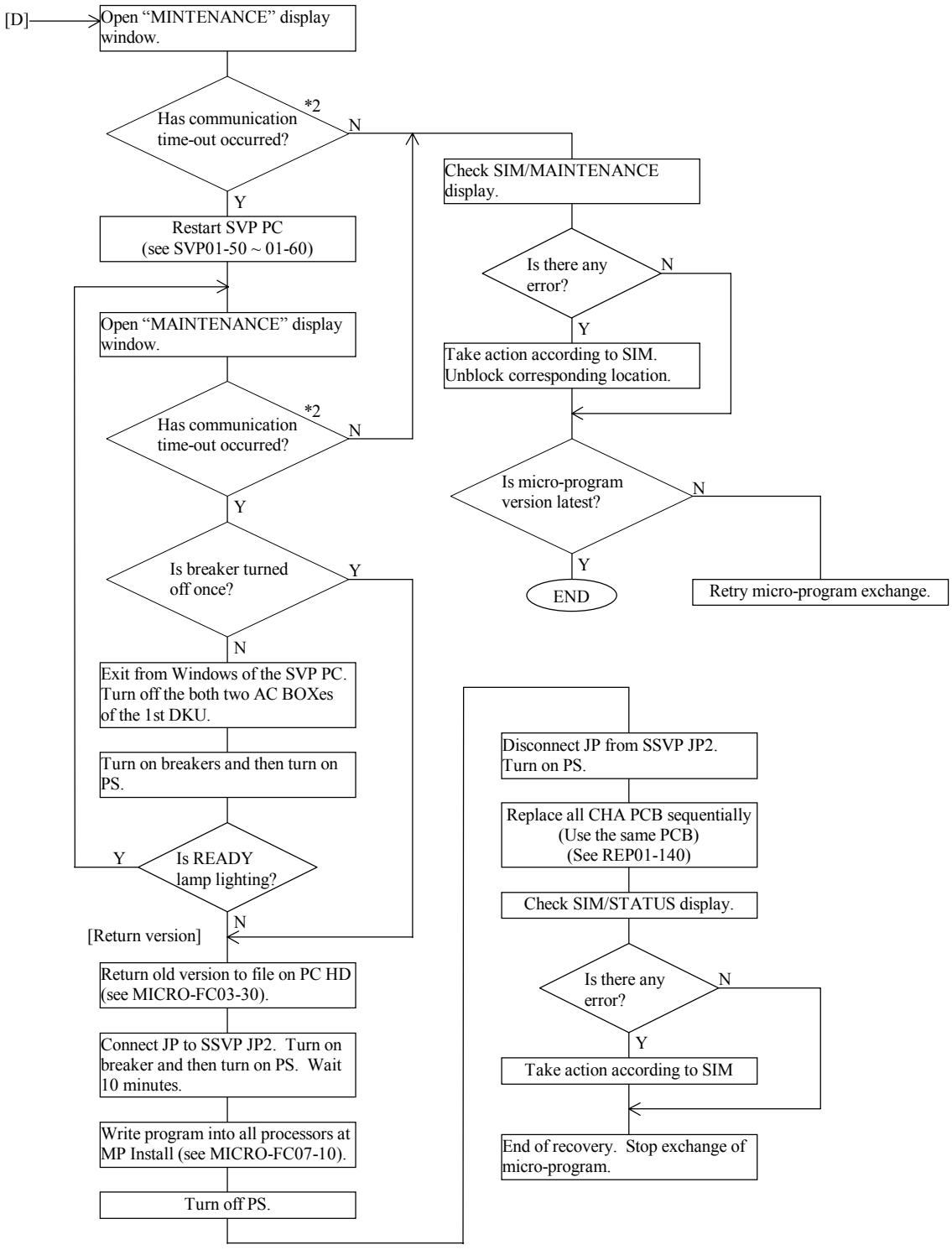
[Recovery procedure in case of time-out during system recovery processing]



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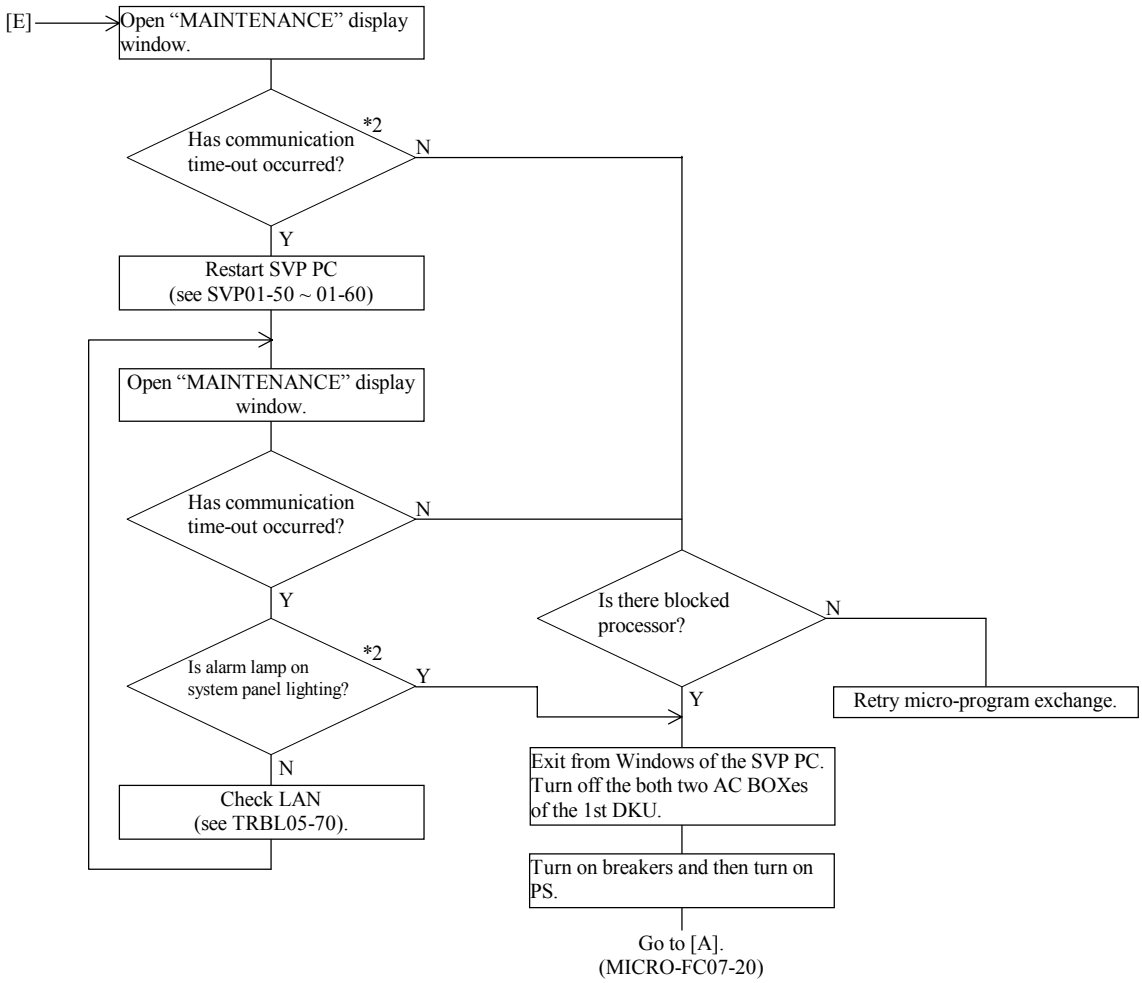
[Recovery Procedure for an error in data transferred to the DKC/AP error/PC error]



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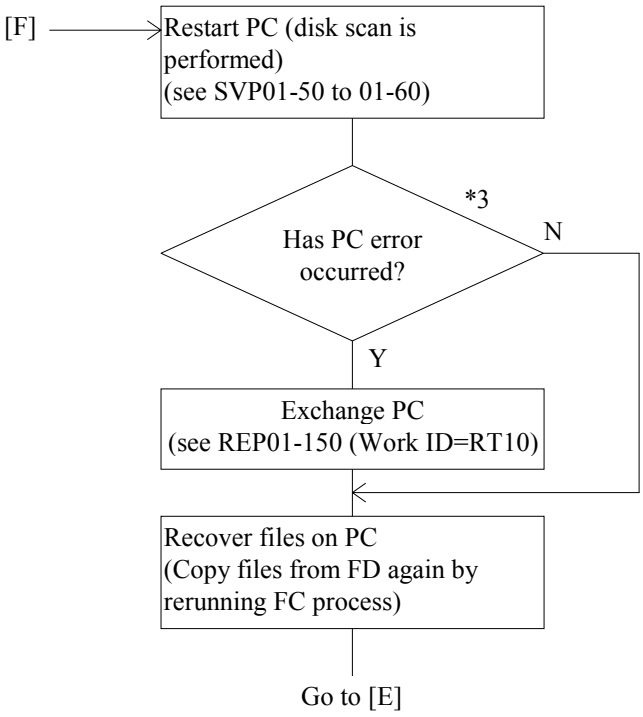
[Recovery Procedure for I/O Error on SVP Hard Disk]



*1) Reference code “7900X0” or “7901X0”
X: Shows processor id. (see SIM-RC02-150)
For details of the trouble, refer to the explanation about BOOT detected error at SSB (Byte27 =8C).
(see SSBLOG05-2370)
*2) The message “connection error occurred SVP-DKC” is displayed.
*3) The message “Please turn off SVP and replace it” is displayed.

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<Recovery of a cache failure during the micro-program exchange of DKCMAIN Action>

1. Retry micro-program exchange of DKCMAIN program.
   - For Version up by Offline FC : Refer to MICRO-FC03-120.
   - For Version up by Online FC : Refer to MICRO-FC04-140.
   - For Version down by Offline FC : Refer to MICRO-FC03-140.
   - For Version down by Online FC : Refer to MICRO-FC04-150.

   <Note>
   - The processors which had finished the micro-program exchange to new version will be skipped.
   - Password is necessary.

2. Then, replace the failure parts according to SIM message and M.M..

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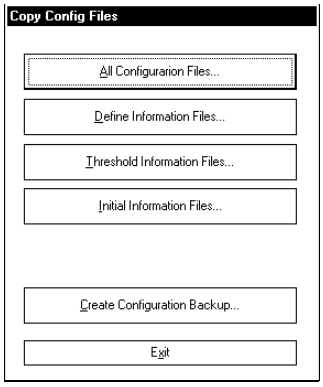
8 Config Exchange Procedure

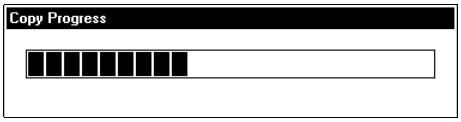
(1) Select (CL) the [Install] in the 'SVP' window and select (CL) [Copy Config Files] in the 'Install'.

---

(2) Select (CL) a button in 'Copy Config Files' (For detail, go to (3)).
Select (CL) [OK] in response to "Please insert config FD in FDD.".



'Copy Progress' window is displayed (This window may not be displayed.).



Select (CL) [OK] in response to "Please remove config FD.".

Select(CL) [Exit] to finish this operation.

---

(3)

(3-1) 'Config Version Up'

① Select (CL) [Initial Information Files...].
Please remove config FD.
② Please reboot SVP PC.
③ Select (CL) [Define Information Files...].
Please remove config FD.
④ Select (CL) [Threshold Information Files...].
⑤ Select (CL) [Install] in 'SVP'.
Select (CL) [Change Configuration] in the 'Install Subsystem' window.
Select (CL) [Tuning Parameter] in the 'Menu Dialog' window and select (CL) [OK] (See SVP02-1200).
⑥ Select (CL) [MAINTENANCE] in the 'SVP' windows (See SVP03-10).

(3-2) 'Config Backup'
Select (CL) [Create Configuration Backup...].

(3-3) 'Define Configuration & Install'
Select (CL) [All Configuration Files...] and execute 'Define Configuration & Install' (go to INST05-60).

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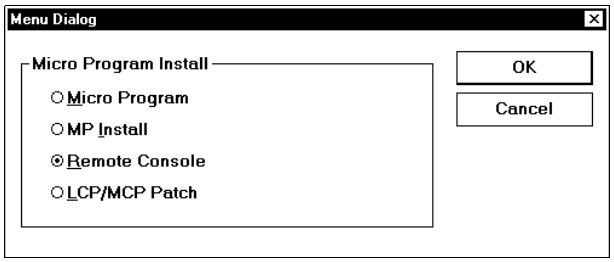
9 Remote Console Program Install from SVP

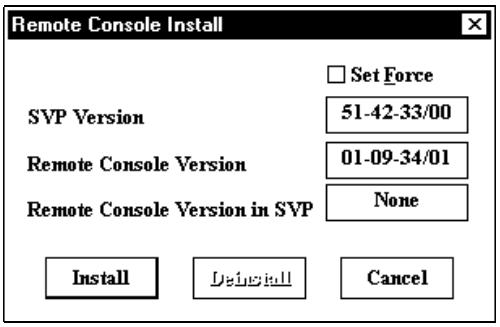
9.1 Program Installation

(1) Start the program install
Change the SVP mode to [Modify Mode] and start [Install].
Select (CL) [Micro Program Install] in the Install Screen.

(2) Select “Remote Console”
From the Micro Program Install, Select (CL) “Remote Console” and select (CL) [OK] button.



(3) Remote Console Install Screen
SVP will display Remote Console Install Screen.



In this screen, there are three versions.
(a) SVP Version
Current SVP Version
(b) Remote Console Version
Remote Console version which is the most appropriate version against the current SVP version.
(c) Remote Console Version in SVP
Remote Console version which has already been installed in the SVP. If the Remote Console program does not installed yet, SVP will display the column as “None”.

(4) Check the version
Check the Remote Console version to compare the appropriate version with the version which you want to install. If they are different, you could not install your remote console program. If your remote console program is the same as the appropriate version, go to (5), if others, go to (6) to install your program forcibly.

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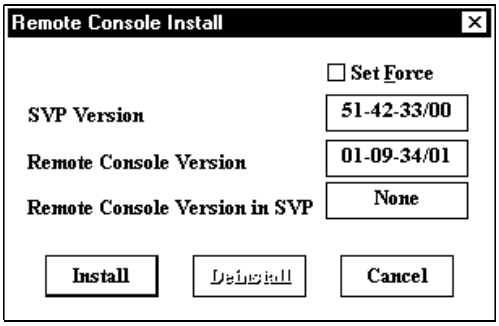
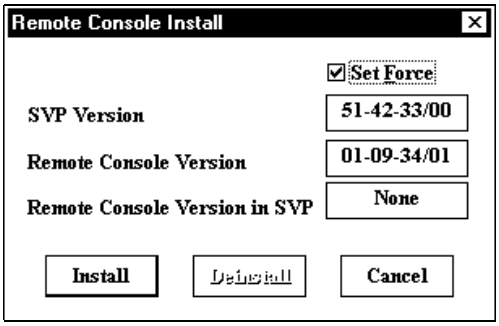
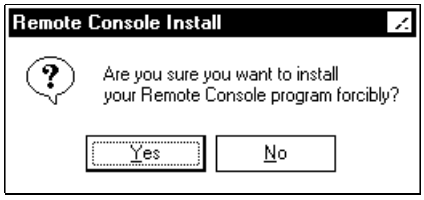
(5) Select Install
Select (CL) [Install] button. SVP will start the program installation. Go to (7).



(6) Installation by forcibly
Select (CL) "Set Force" option flag and select (CL) [Install] button. SVP will start the program installation forcibly.

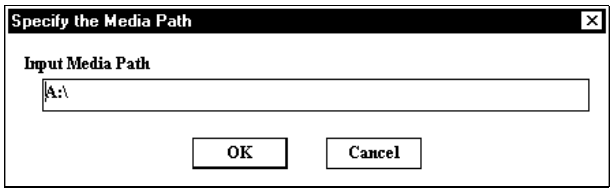


After, SVP will display the confirmation message so that you should check the contents and select (CL) [Yes].



Go to (7).

(7) Input the Remote Console FD path
Input the Remote Console FD path. SVP has already inputted the path by default value, "A:". If you want to change, input the appropriate path. After checking the input value, select (CL) [OK] button.



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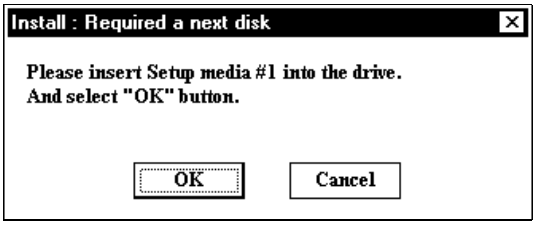
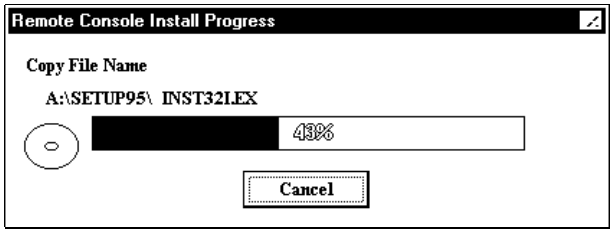
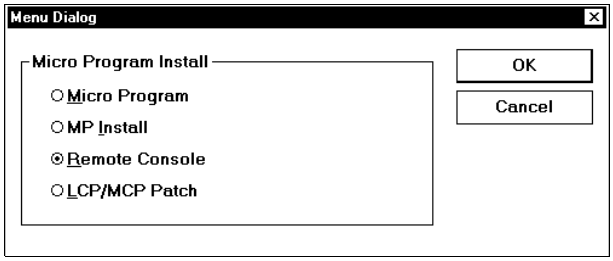
(8) Input the FD
SVP displays the FD Number to insert the FD drive. Insert the corresponding media into your inputted path at the (7) step and select (CL) [OK].



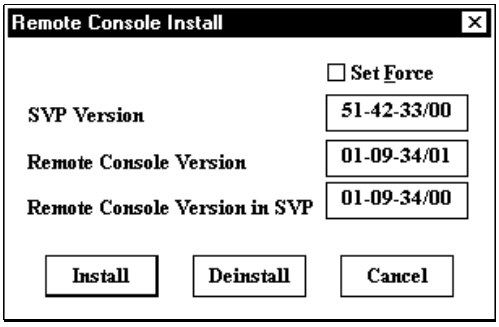
(9) Start installation
SVP starts coping the program from the FD to PC HDD. After finishing the copy for one media, SVP will display the message to change to the next FD. In this case, go back to (8) and insert the corresponding media, and repeat (8) (9). If all FDs are complete, SVP will finish this program.



(10) Restart the install program to check
Select (CL) [Install] button and select (CL) [Micro Program Install]. In the "Micro Program Install", select (CL) "Remote Console".



(11) Confirm the installed version
SVP will display installed Remote Console version. Check the version in "Remote Console Version in SVP" column.
If the version is wrong, go to the next "Remote Console program de-install form SVP" to de-install the program, and retry the same install operations.



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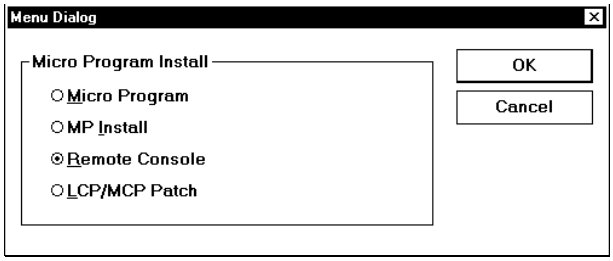
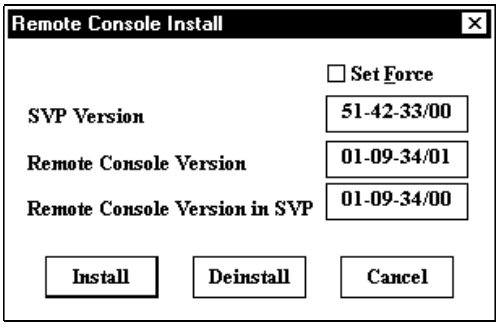
9.2 Program de-installation

(1) Start the program install
Change the SVP mode to [Modify Mode] and start [Install].
Select (CL) [Micro Program Install] in the Install Screen.

(2) Select “Remote Console”
From the Micro Program Install, Select (CL) “Remote Console” and select (CL) [OK] button.



(3) Remote Console Install Screen
SVP displays the installed Remote Console version in the Remote Console Install Screen.
Select (CL) [Deinstall] button.



(4) Complete message
After de-installing the remote console program, SVP will display the complete message.
Select (CL) [OK].

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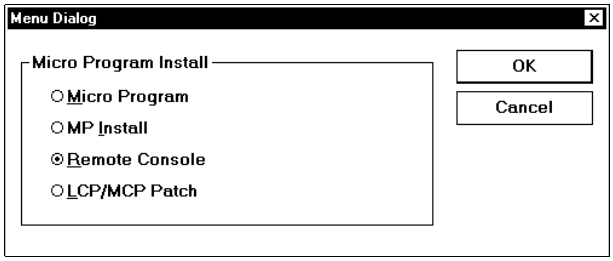
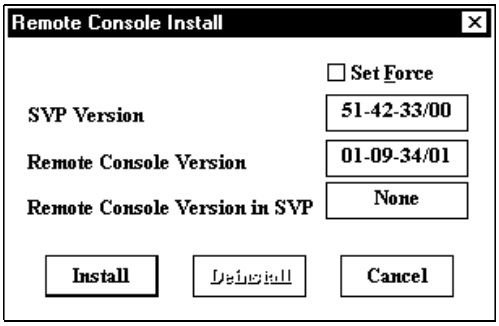
(5) Re-start the function to check your operations
Select (CL) [Install] and select (CL) [Micro Program Install] in the Install Screen. From the Micro Program Install, Select (CL) "Remote Console" and select (CL) [OK] button.



(6) Confirm the de-installed result
SVP will display Remote Console Install Screen. Check the "Remote Console Version in SVP" as "None". If the result is not "None", retry these de-install operations again.



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TROUBLE SHOOTING SECTION

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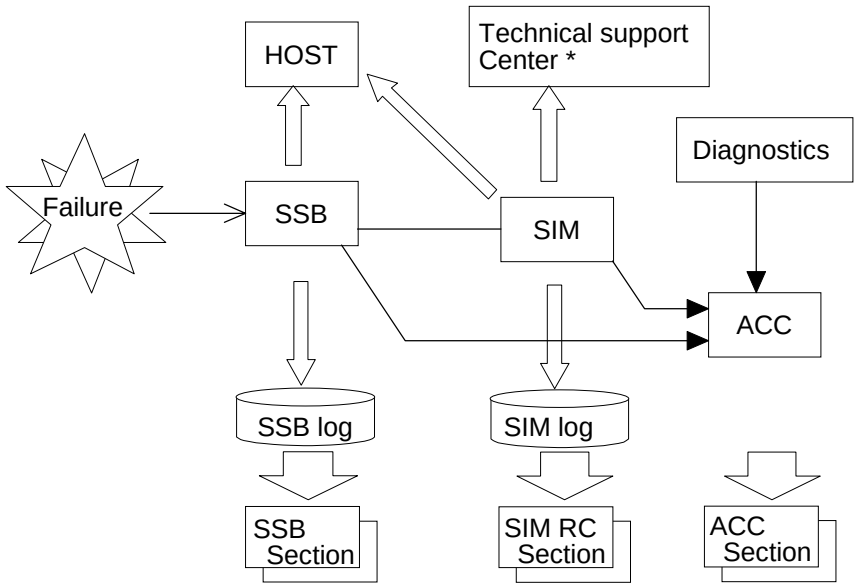
1 Overview of TRBL

The figure below shows the flowchart of creating and reporting the SIM and SSB after the DKC microprogram has detected a failure. It also shows the section of maintenance manual which should be referred to.



Since the subsystem starts its maintenance work based on the SIM and ACC, if a failure occurs check the ACC first and start troubleshooting.
For the failure which does not produce the ACC, isolate the failed part depending on its phenomenon.

* Technical Support Center: Responsible section of maintenance service and technical support.

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2 Point out a Failed Part

[1] The ACC has been collected ----------See TRBL03-10
[2] The ACC has not been collected----------See TRBL03-20

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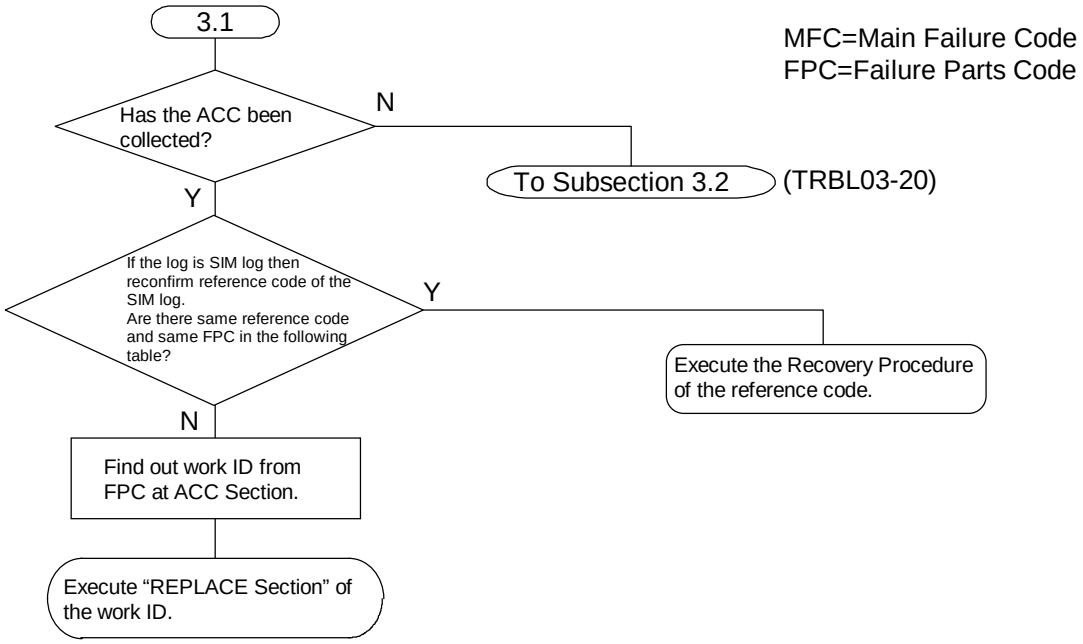
3 Isolating a Failed Part

3.1 Analyze the SIM log, SSB log or Remote Diagnostic Data



Reference Code	FPC	Recovery Procedure
DF7XYZ	80000000	5.2 Isolation and Recovery Procedures for Common SCSI Bus Error (TRBL05-30)
DF8XYZ	80000000	
FFEA0X	80000000	5.1 Error Recovery Procedure for Bus Blocking (TRBL05-20)
FFFA0X	80000000	
BF2XYY	80000000	5.12 Voltage alarm (TRBL05-340)
BF4XXX	80000000	5.14 PS warning error (TRBL05-420)
BFA1XX	80000000	5.13 Environment monitors disagreement error (TRBL05-370)
CF90XY	80000000	5.11 Recovery Procedure for LDEV Blocking (TRBL05-330)
DF9YXX	80000000	
DFA0XY	60D0	Collect Dump/Log and T.S.C call
EF50XY		
EF90XX	80000000	5.11 Recovery Procedure for LDEV Blocking (TRBL05-330)
D4XYYY	80000000	6 HRC/HODM/HORC Error Recovery (TRBL06-10)
DBXYYY	80000000	
DCXYYY	80000000	
2180XY	80000000	
2190XY	80000000	11 Recovery procedure of AL_PA confliction
399FX0	80000000	12 CHT PCB type inconsistency [4GL ↔ 4GS] (TRBL12-10)

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3.2 A failure has been reported to the customer but the DKC has not been connected to the Remote Maintenance

Isolate the failed part depending on the following phenomenon.

[1] The SIM has been reported. ---------- TRBL03-30
[2] The SSB has been reported. ---------- TRBL03-30
[3] The OS cannot recover the subsystem error. (MIH, Job ABEND, etc.)---------- TRBL03-40
[4] The OS has detected the subsystem error. (ICC, CC=3) ---------- TRBL03-50
[5] The lamp on the subsystem panel has failed. ---------- TRBL03-60
[6] PC failure---------- TRBL03-70
[7] A failure has occurred when turning on the power on. ---------- TRBL03-80
[8] The power cannot be turned off. ---------- TRBL03-90
[9] The plurel parts has failed.---------- TRBL03-95
[10] SSVP alarm lamp has been blinking or has lighted on.---------- TRBL03-97

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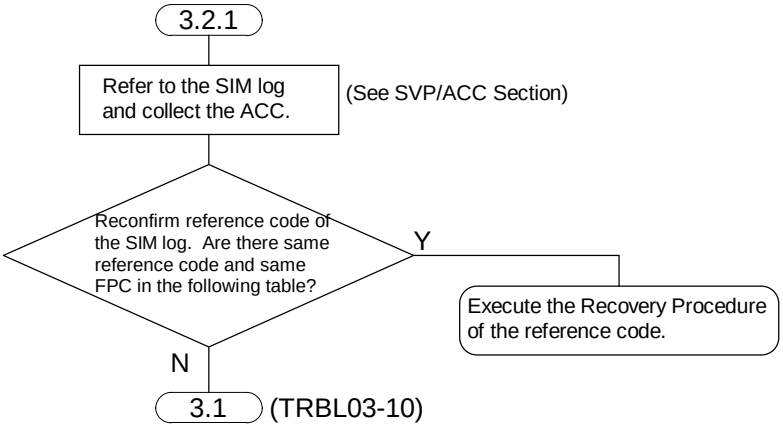
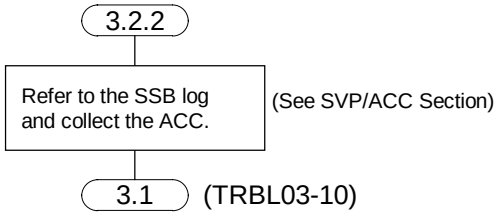
3.2.1 SIM has been reported



Reference Code	FPC	Recovery Procedure
DF7XYY	80000000	5.2 Isolation and Recovery Procedures for Common SCSI Bus Error (TRBL05-30)
DF8XYY	80000000	
FFEA0X	80000000	5.1 Error Recovery Procedure for Bus Blocking (TRBL05-20)
FFFA0X	80000000	
BF2XYY	80000000	5.12 Voltage alarm (TRBL05-340)
BF4XXX	80000000	5.14 PS warning error (TRBL05-420)
BFA1XX	80000000	5.13 Environment monitors disagreement error (TRBL05-370)
CF90XY	80000000	5.11 Recovery Procedure for LDEV Blocking (TRBL05-330)
DF9YXX	80000000	
EF90XX	80000000	
D4XYYY	80000000	6 HRC/HODM/HORC Error Recovery (TRBL06-10)
DBXYYY	80000000	
DCXYYY	80000000	
2180XY	80000000	
2190XY	80000000	11 Recovery procedure of AL_PA confliction
399FX0	80000000	12 CHT PCB type inconsistency [4GL ↔ 4GS] (TRBL12-10)

3.2.2 SSB has been reported



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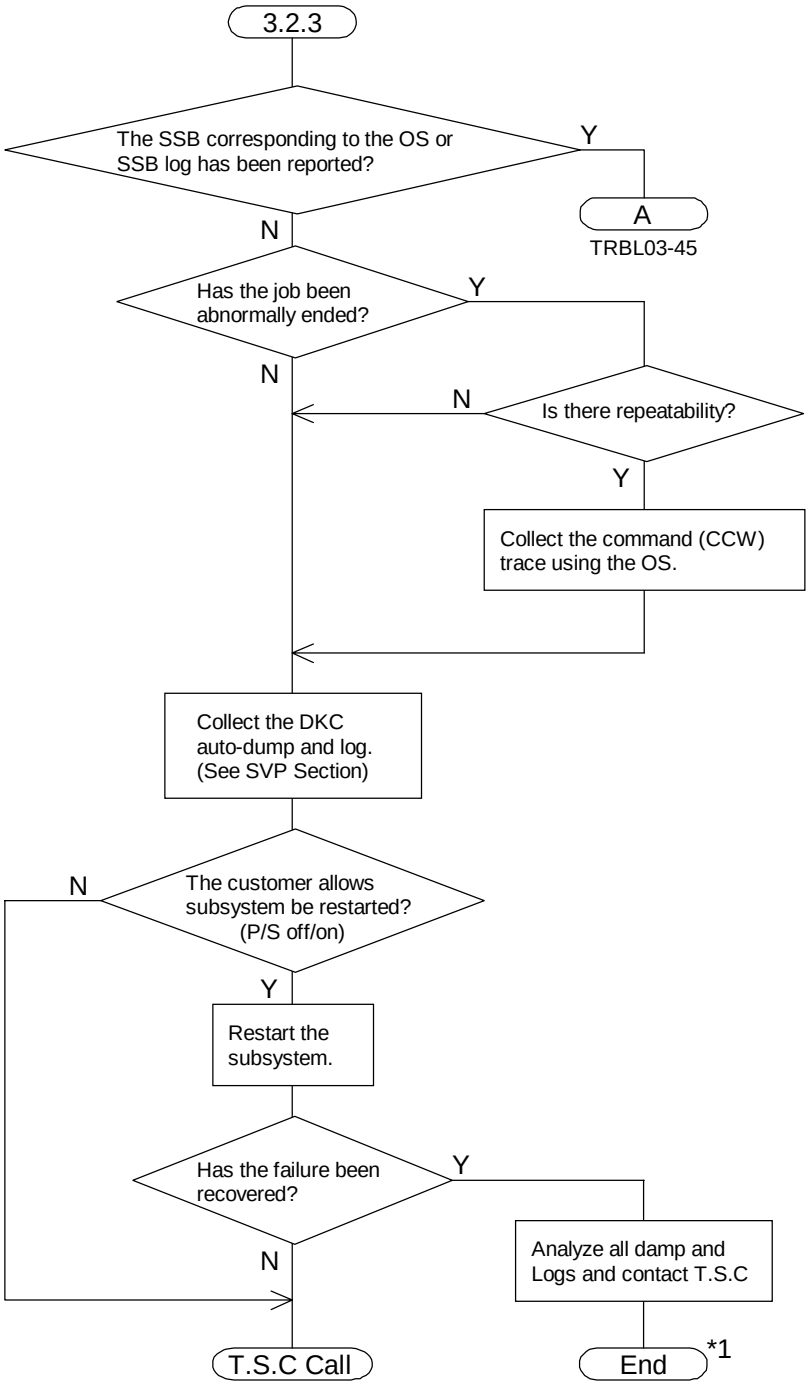
3.2.3 OS cannot recover the subsystem error.(MIH, Job ABEND)



*1 : If you finished the Maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500)

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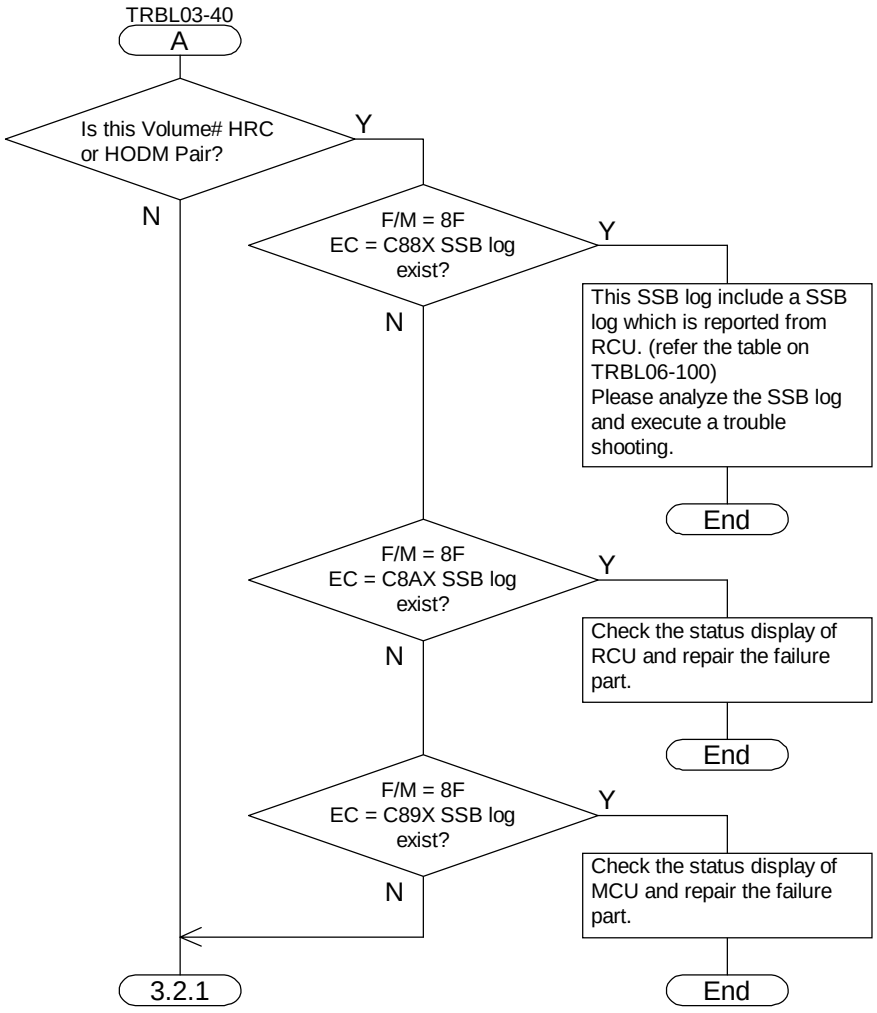

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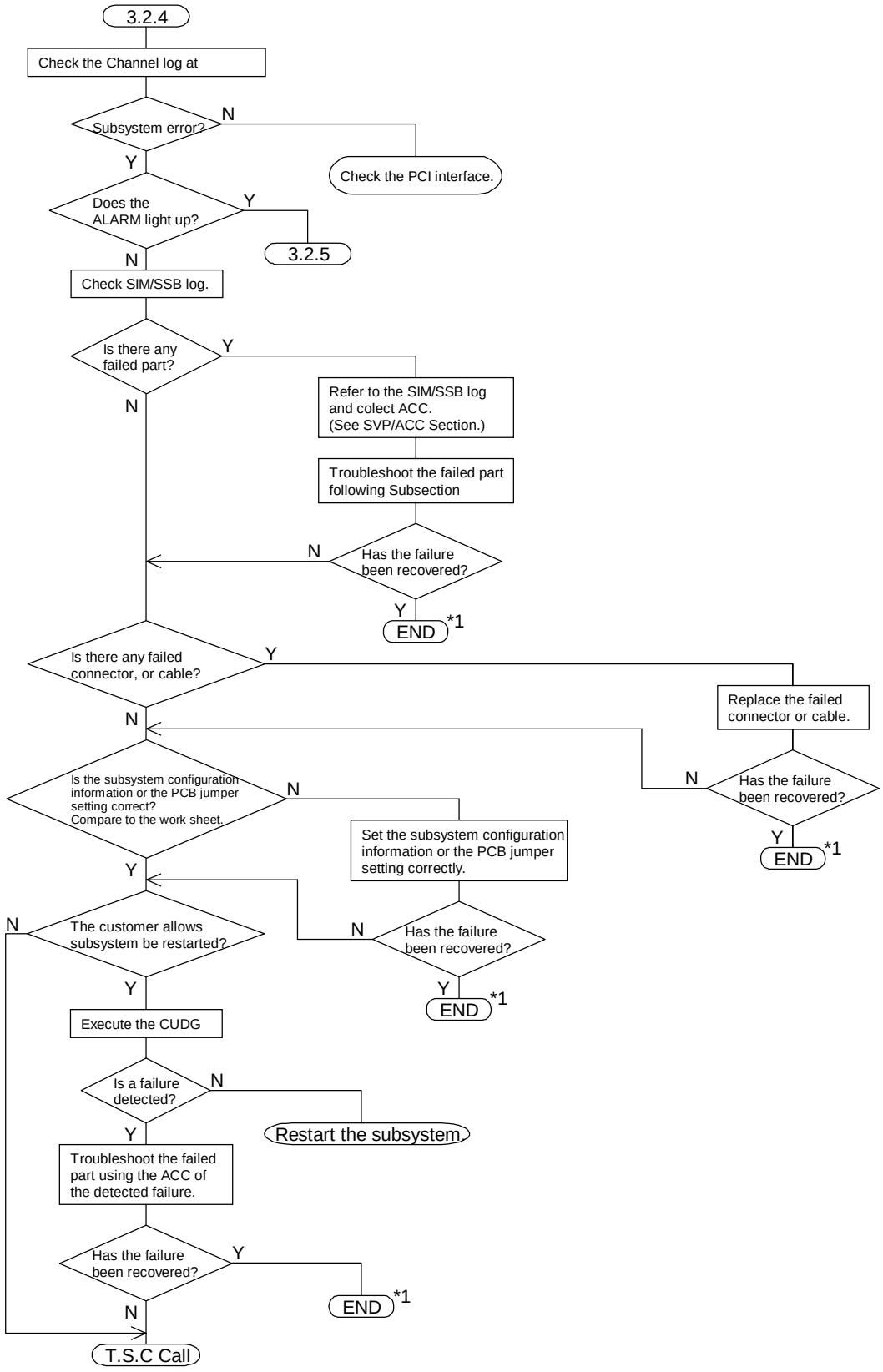
3.2.4 OS has detected the subsystem error (ICC, CC=3)



*1 : If you finished the Maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500)

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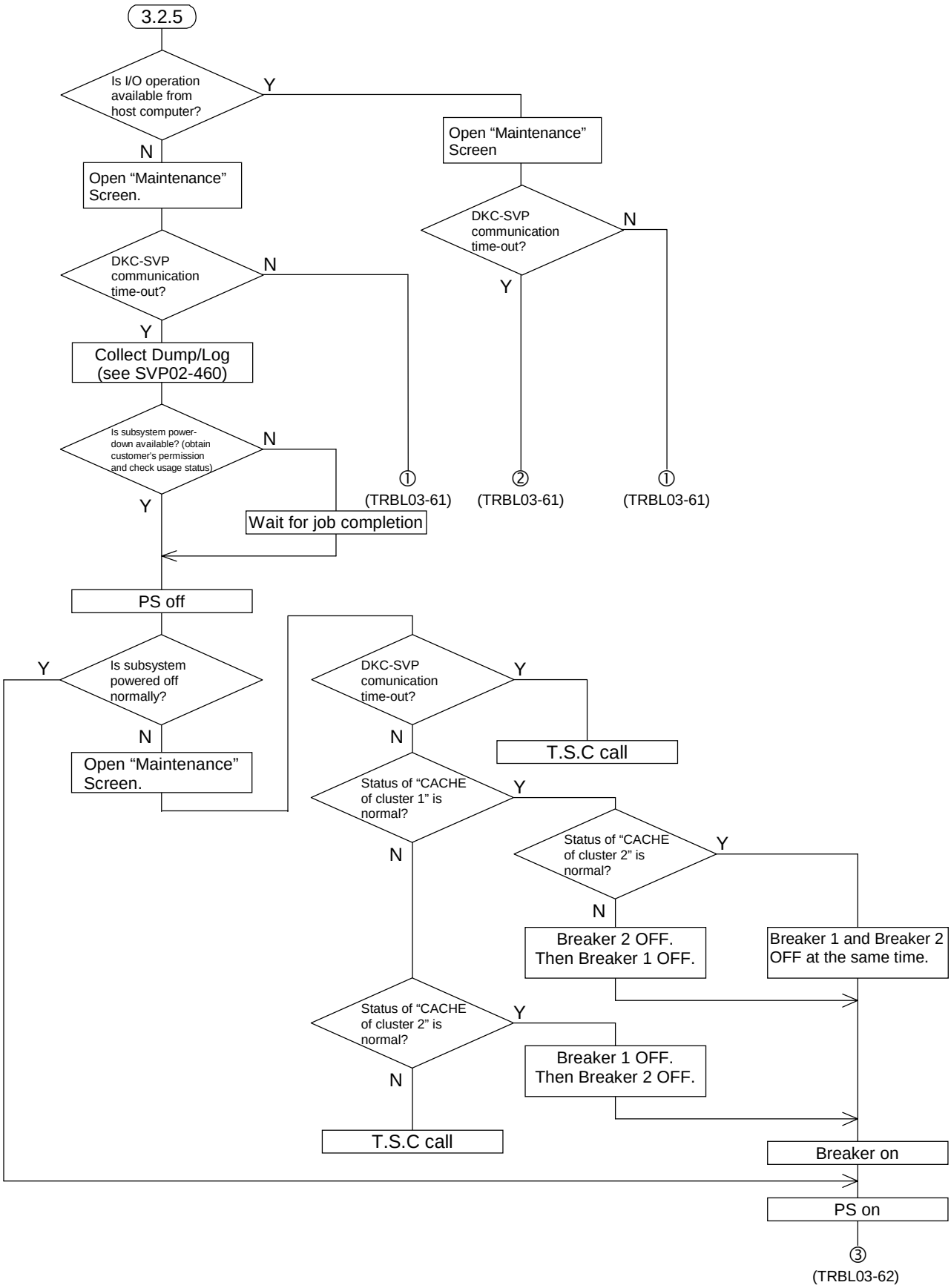
3.2.5 The lamp on the subsystem panel has failed



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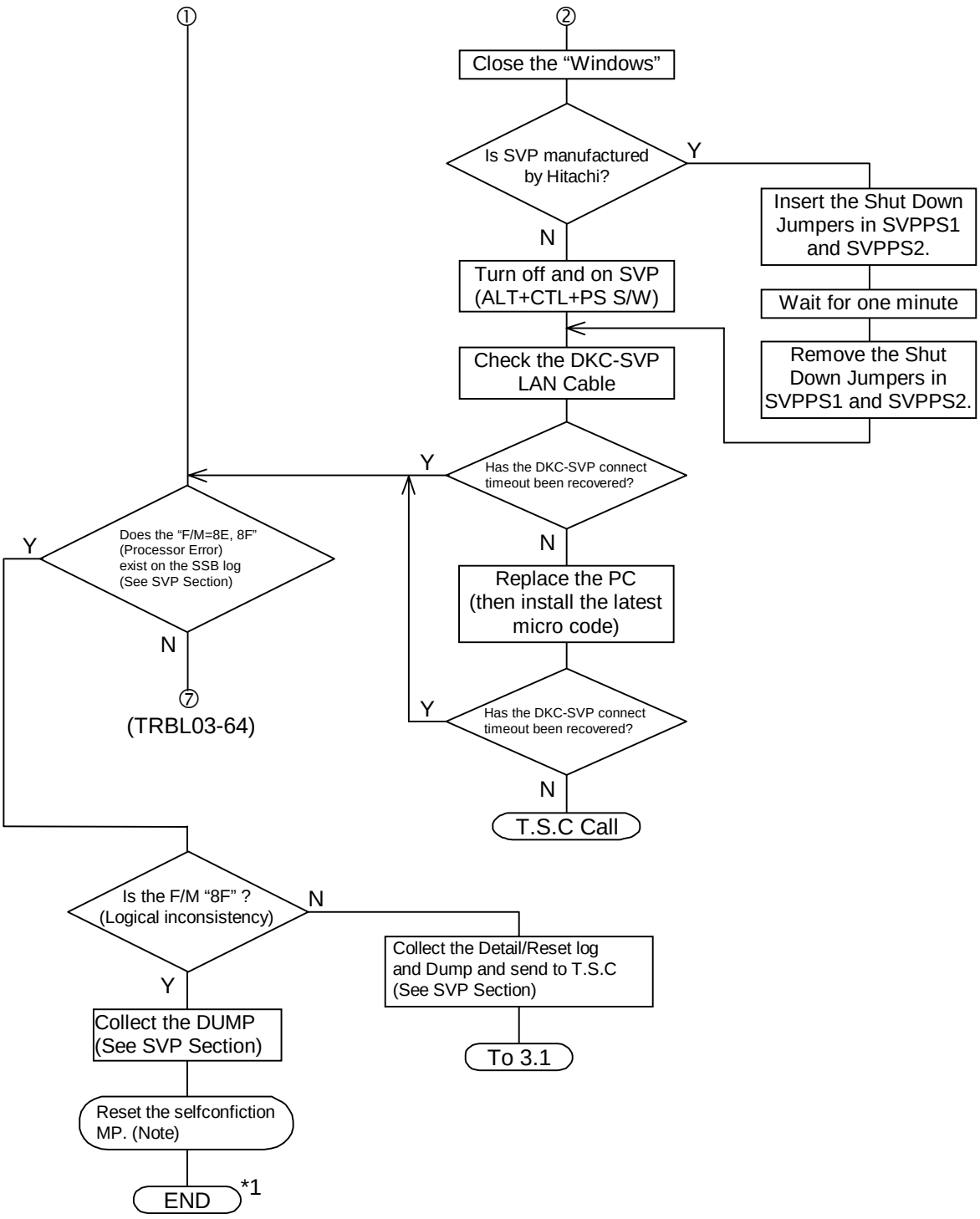

(Note) Replace the failure processor PCB.

*1 : If you finished the Maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500)

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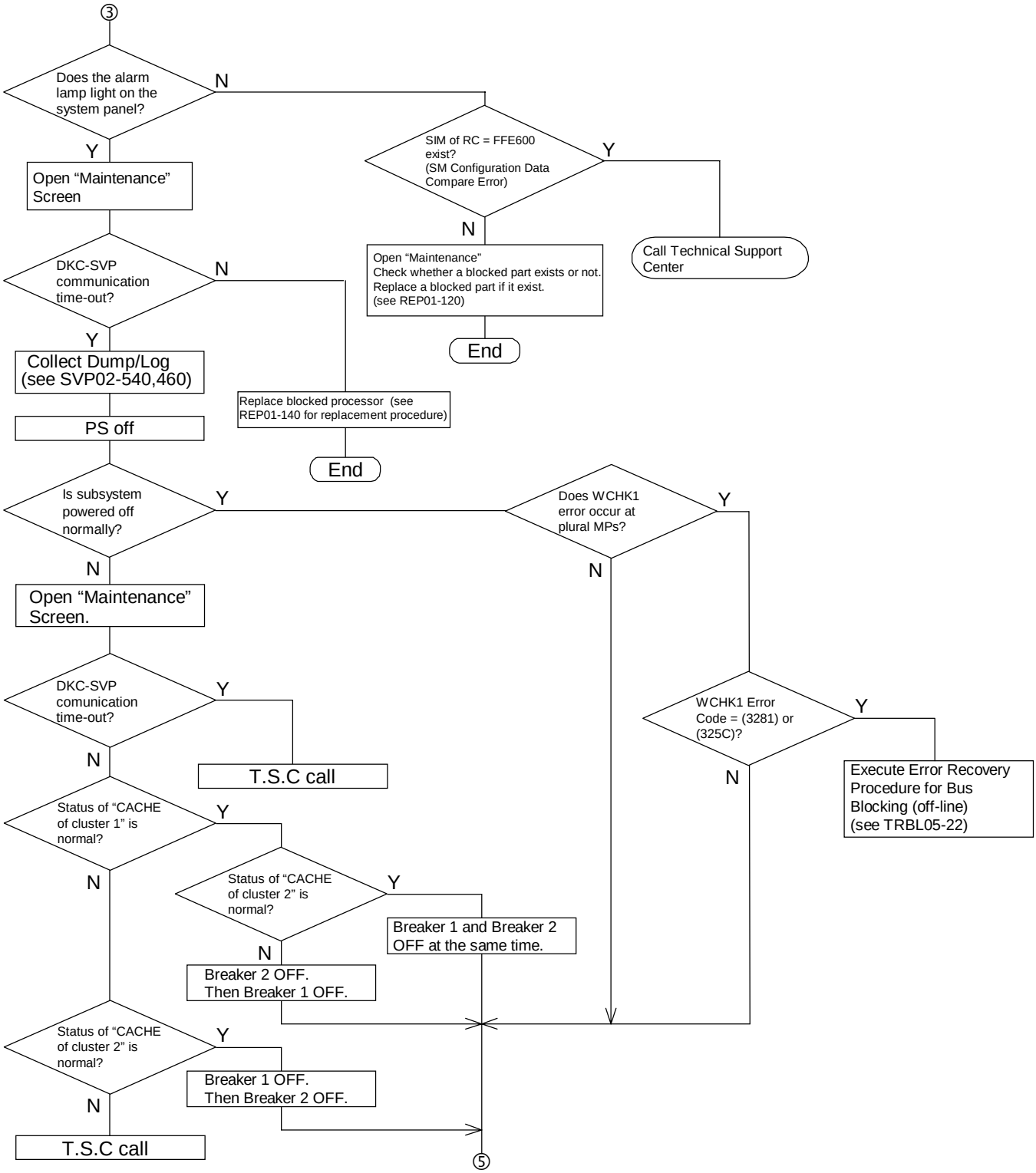

(TRBL03-63)

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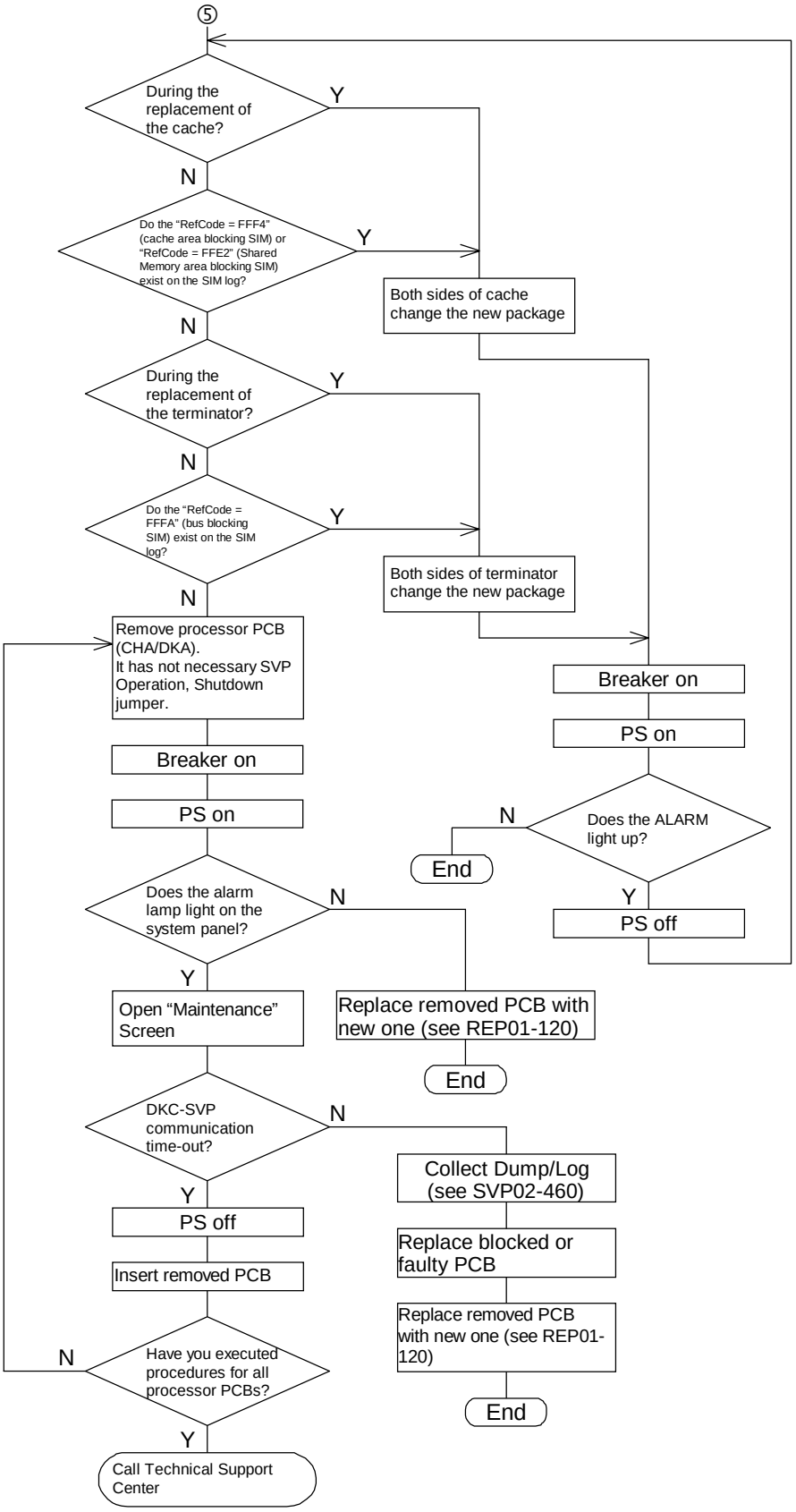

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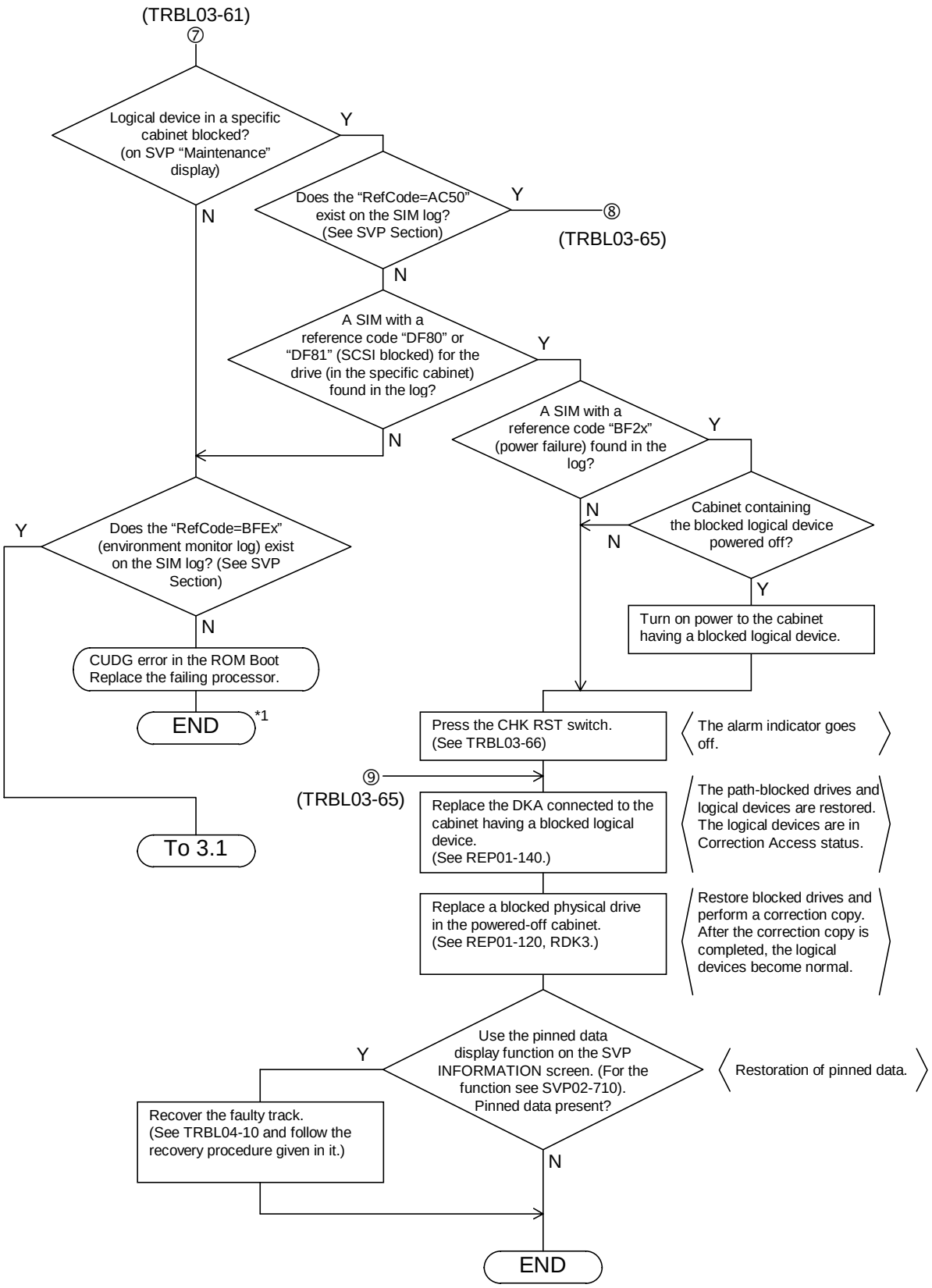

*1 If you finished the Maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500)

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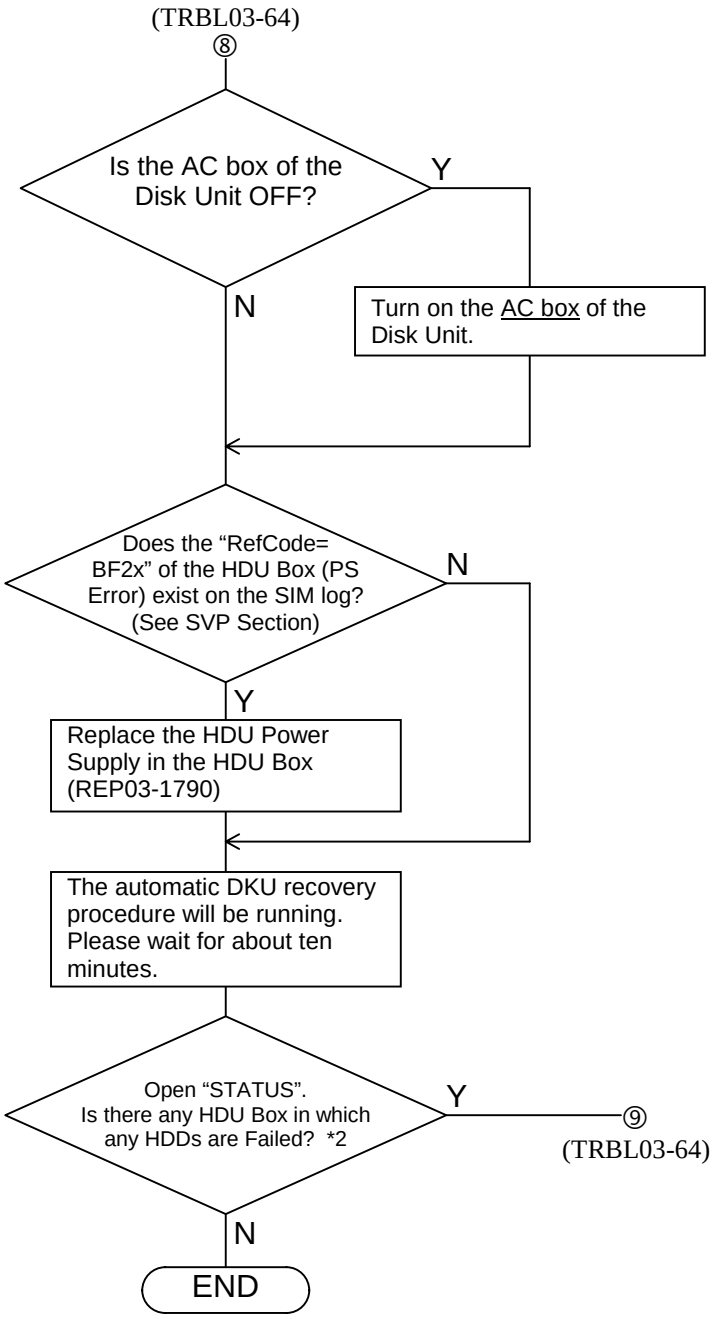

*2 The automatic DKU recovery procedure is not effective for some cases. ex, very short period power down.

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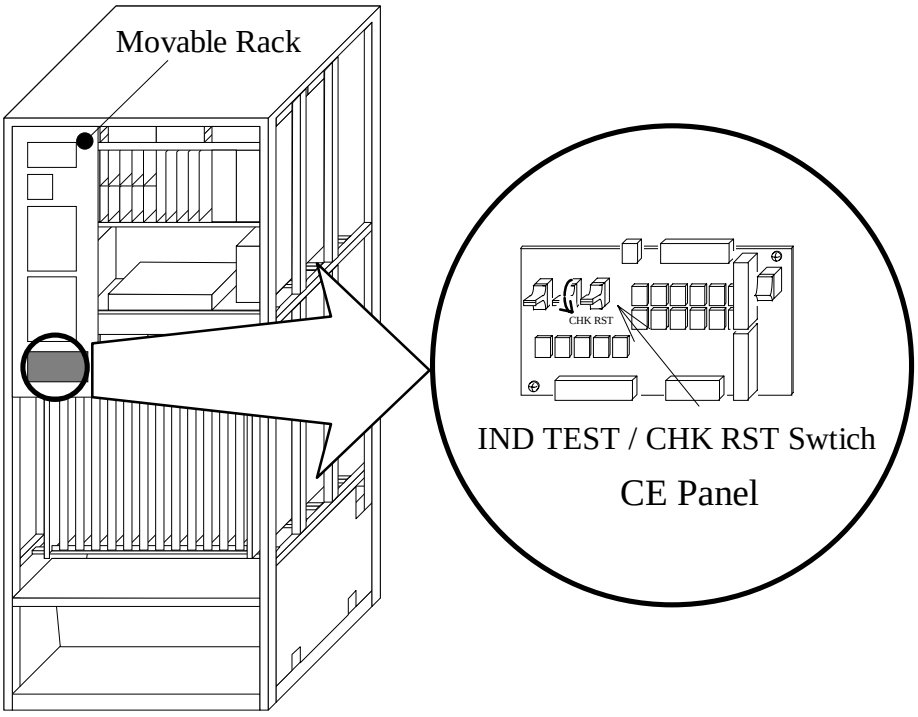
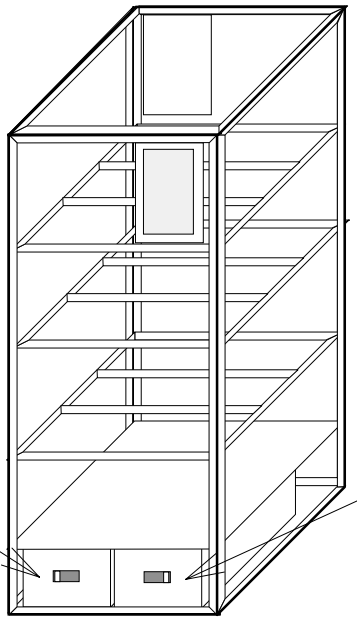
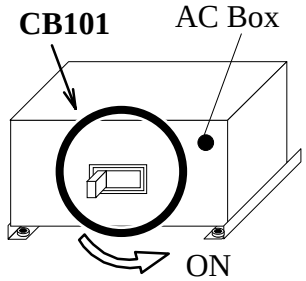


Front View



Disk Unit Front View



AC Box Front View

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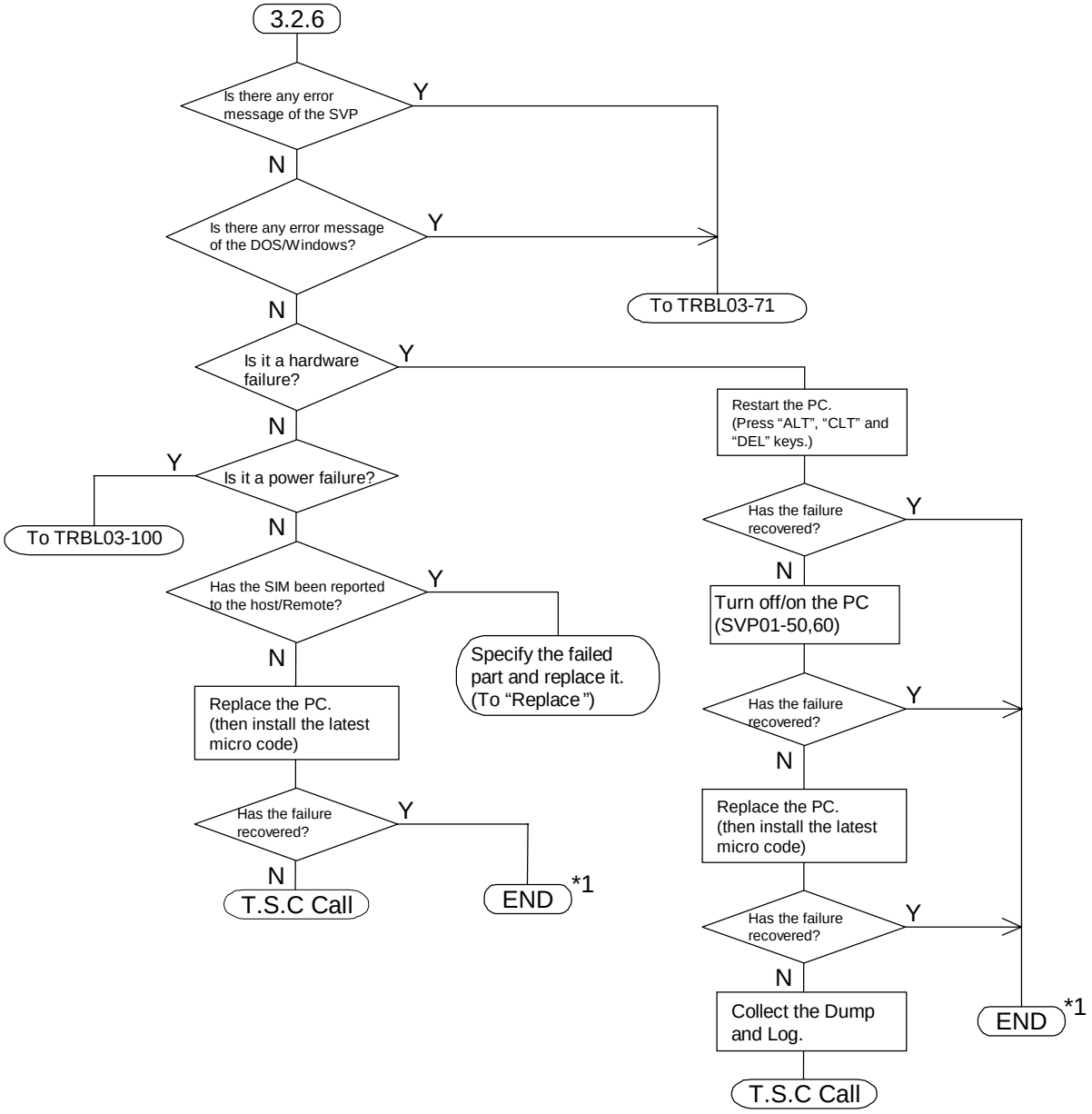
3.2.6 PC (SVP) failure recovery procedure



*1 : If you finished the Maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500)

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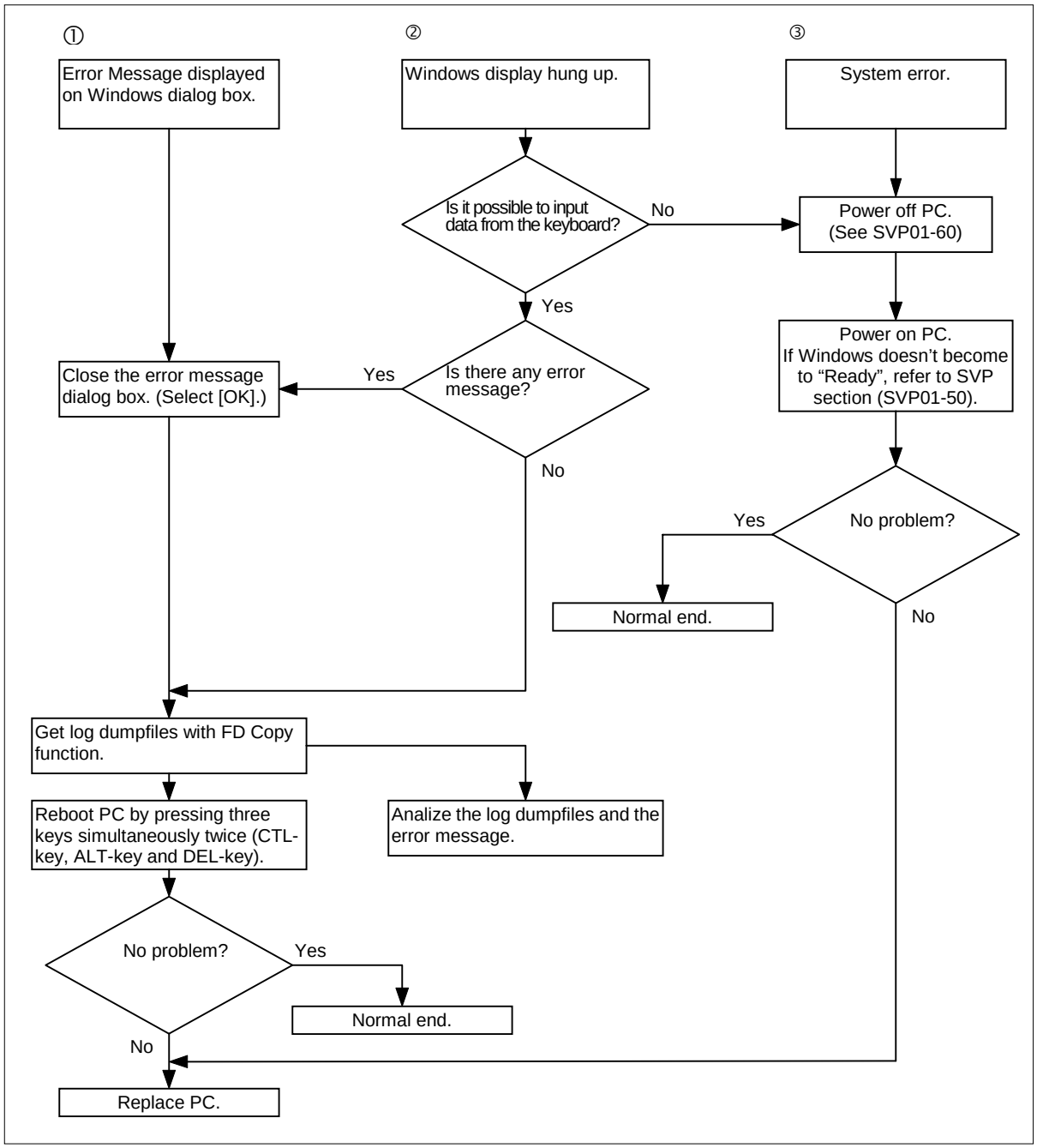
(1) Types of SVP failures

① Display of “Syserr’s Clues” windows dialog box.
② Windows display hang up.
  (i) Keyboard operation possible.
  (ii) Keyboard operation not possible.
③ Display of non windows error. (System error)

(2) Recovery procedure based on type of failure.



Note T.S.C: A base of maintenance server and technical support.

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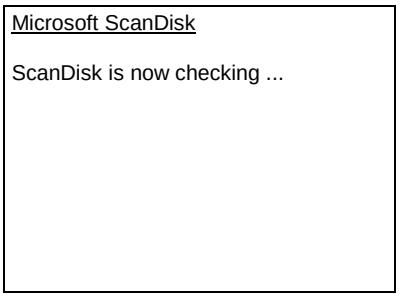
(3) SVP HD Diagnosis

If SVP HD (Hard Drive) may be failed, do as following procedures.

(i) What is running?
a. See what is displayed.
   If Windows is displayed, Go to (ii).
   If DOS prompt like “C:\” is displayed, Go to (iii).

(ii) Exit Windows (Stop SVP)
a. Select (CL) “Start button”.
b. Select (CL) “Shut Down”.
c. Select (CL) “Restart the computer in MS-DOS mode?”, and select (CL) [Yes].
d. Go to (iii).

(iii) SVP HD Diagnosis
a. Type the under-lined command and press Enter-key as following.
   C:\>\DKC200\OTHERS\SVPHDDG
b. Watch the diagnosis messages displayed on the screen.
   After the diagnosis, read messages, and do following action.



Diagnosis messages

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Message	Explanation	Action
SVP HD TEST:NORMAL END	Diagnosis has completed.	Go to (v).
SVP HD TEST:PROBLEM HAS DETECTED	There are some problems in SVP HD.	Read following message.
SVP HD TEST:ABNORMAL END	Diagnosis has incompleted.	Read following message.
SVP HD TEST:SYNTAX ERROR	Diagnosis program may be destroyed.	Read following message.
SVP HD TEST:PROBLEM HAS FIXED	Diagnosis has repaired SVP HD.	Go to (v).
SVP HD TEST:ABORTED	Diagnosis has aborted by operator.	Read following message.
SVP HD TEST:FIX START	Diagnosis has launched to repair SVP HD.	Go to (iv) b.
Do you want to try to fix SVP HD.[y,n]	Confirm your operation.	Press ‘y’ key to fix SVP HD. Press ‘n’ key not to fix SVP HD and to abort diagnosis.
Please turn off SVP and replace it.	SVP should be replaced.	Power off SVP. Replace SVP.

(v) Reboot SVP

a. Press 3 keys simultaneously —— Ctrl-key, Alt-key and Del-key —— to reboot SVP.
[End of SVP HD Diagnosis]

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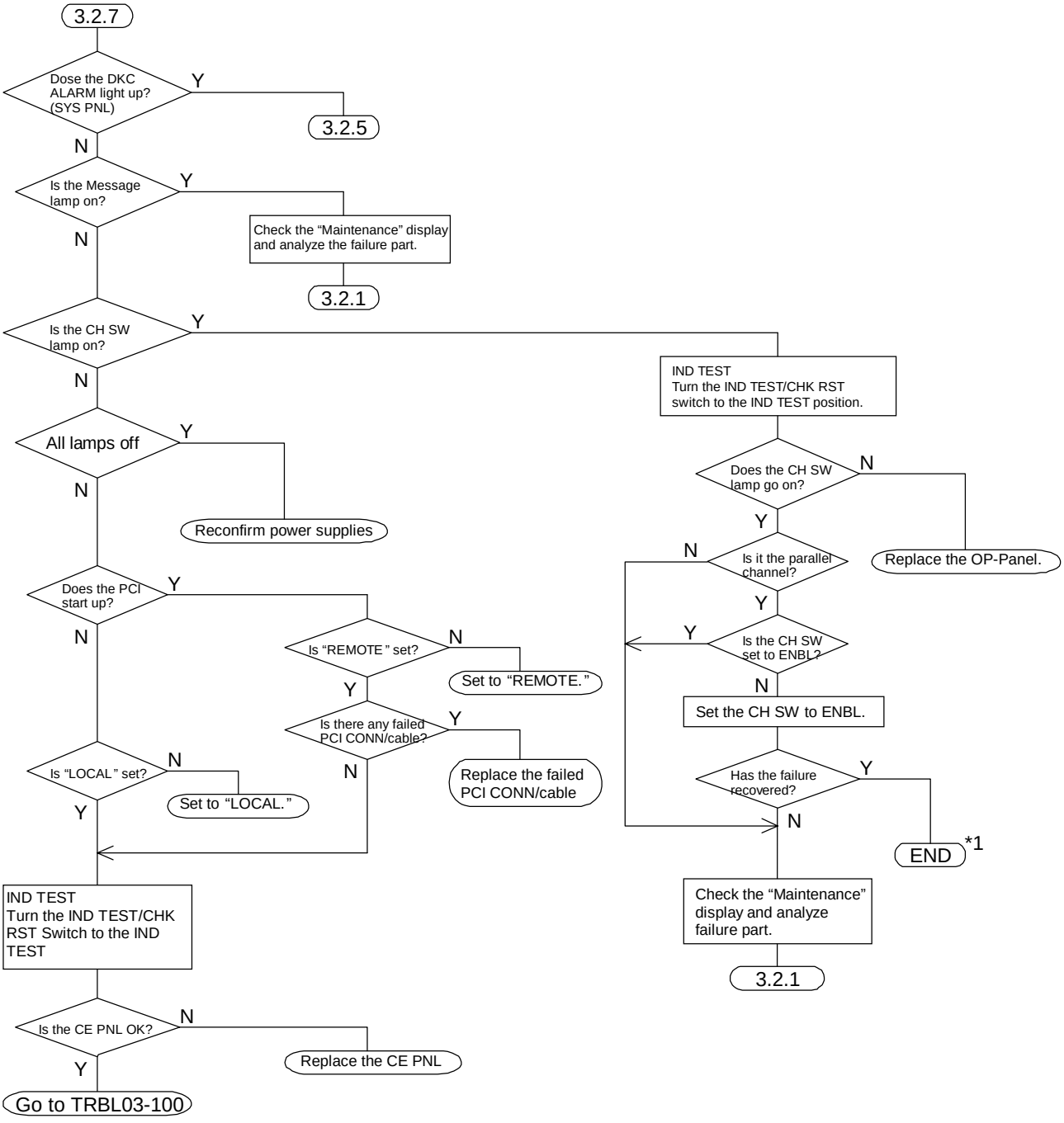
3.2.7 A failure has occurred when turning the power on



*1 : If you finished the Maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500)

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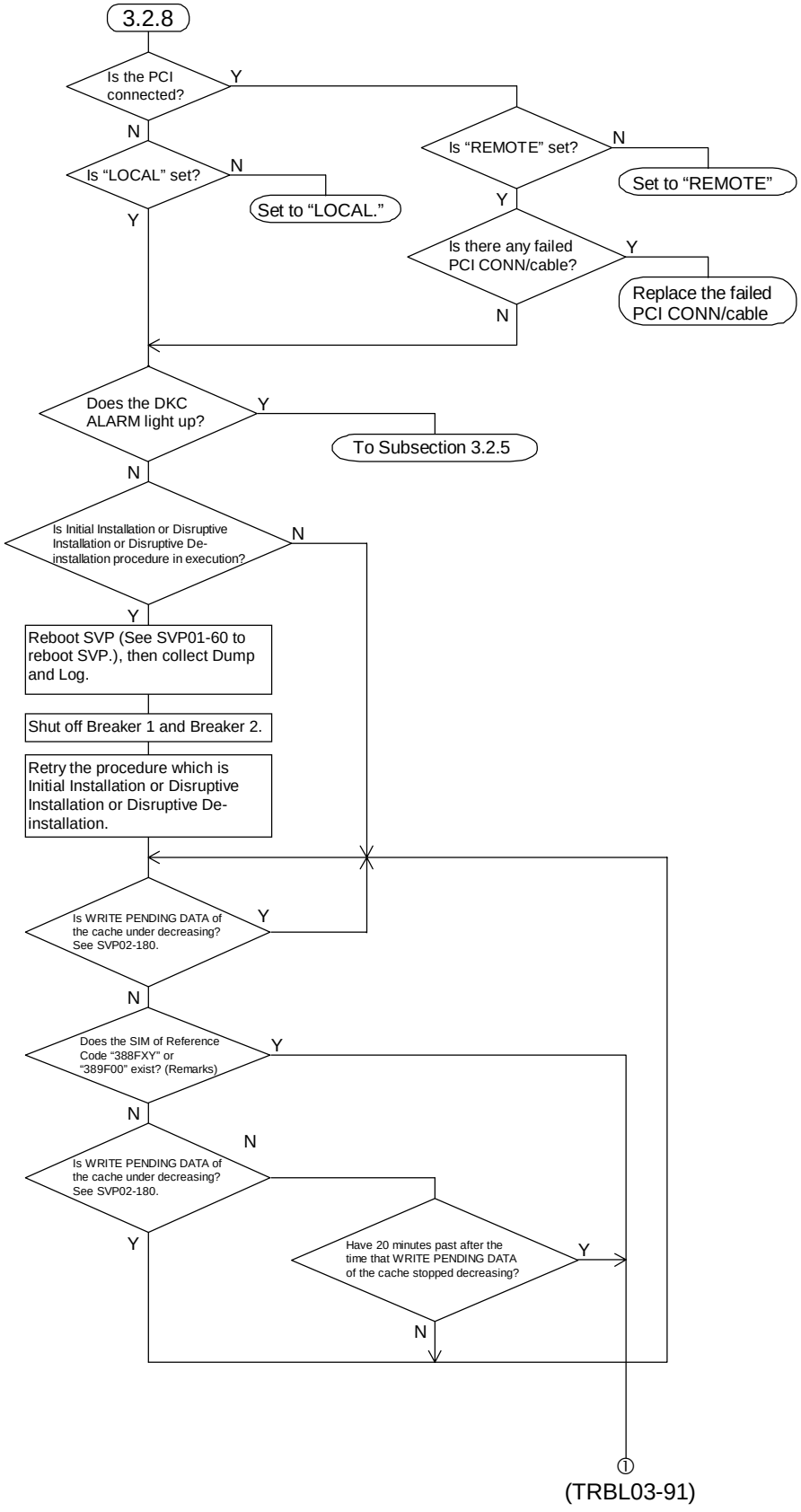
3.2.8 The power cannot be turned off



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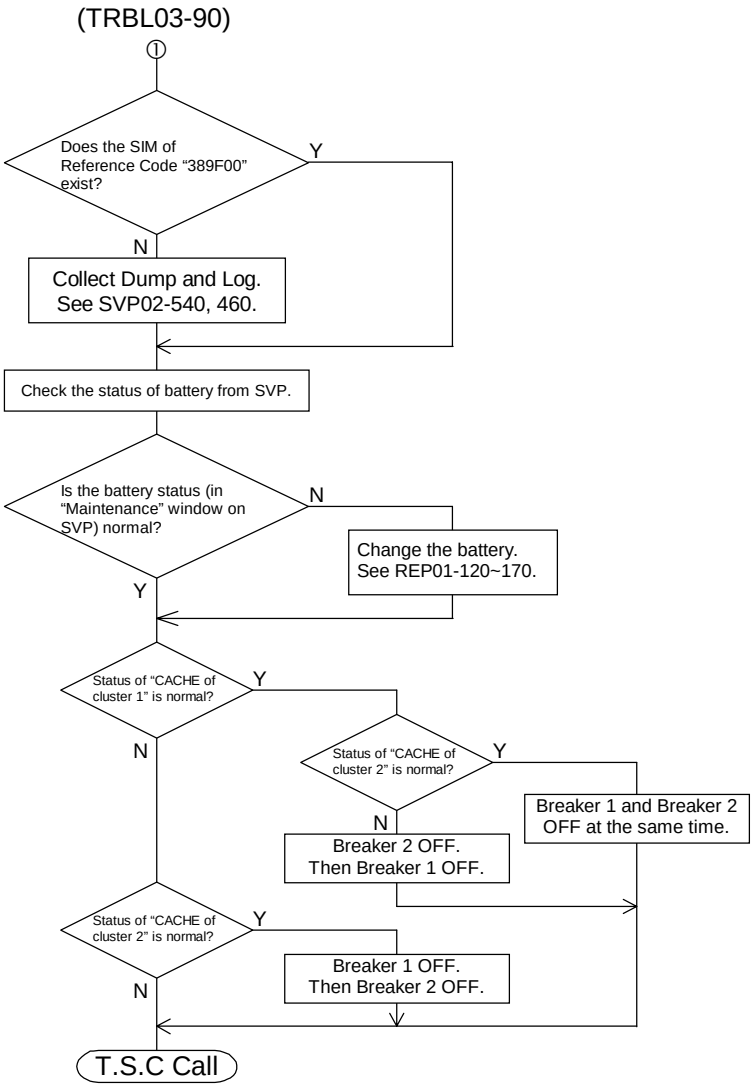

Remarks

- There is a case that it takes more than 10 minutes to report SIM of Reference Code “388FXY” or “389F00”, and that especially it takes about 1 hour in case that emergency destage does not complete.
- There is a case that p/s off procedure is normally finished, even after SIM of Reference Code “388FXY” or “389F00” is reported.

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3.2.9 Multiple parts have failed

Maintenance Priority

If there are many parts to maintenance in the system, you should plan the maintenance schedule under the priority which mentioned in this page.

If you have to maintenance two parts, first you should maintenance a part which priority is higher than the other.

A part has a higher priority which has a smaller priority number than others in the Table 1.

Table 1 Priority Table

Priority	Parts name	Maintenance method
1	DKA	Replace
2	CHA	Replace
3	Cache Memory	Replace
4	Shared Memory	Replace
5	Terminator	Replace
6	SCSI-buffer	Replace
7	HDD	Replace
8	LDEV	Format or Restore
9	Hardware etc.	Replace
10	Software	Exchange

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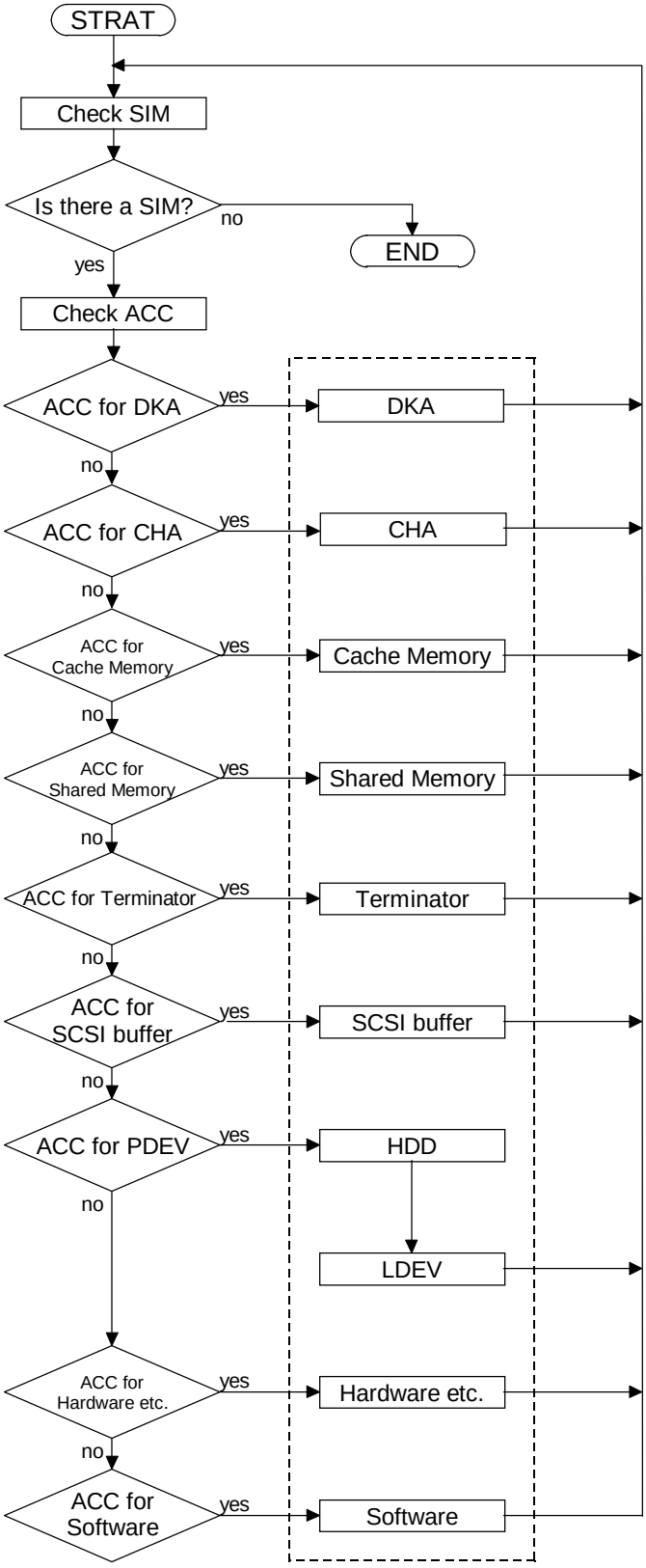
Maintenance priority chart



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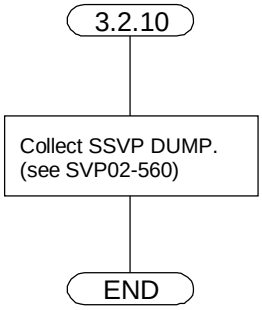
3.2.10 SSVP alarm lamp has been blinking or has lighted on.



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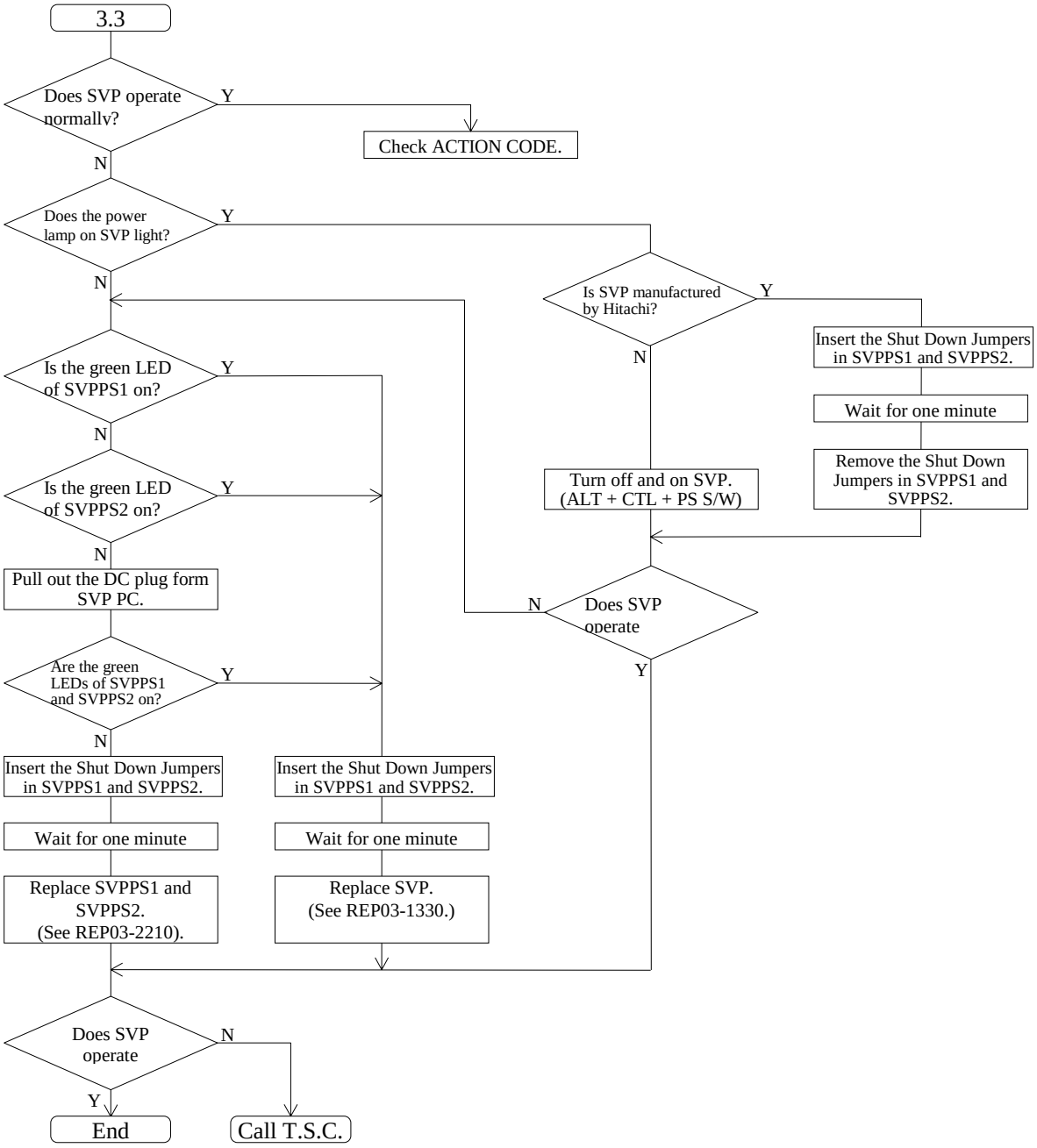
3.3 SVP Power Trouble Shooting



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4 Recovery for Pinned Tracks

Hardware errors will sometimes cause a pinned track.
This document explains what causes pinned tracks and how to recover from them.
The following reports indicate that a pinned track has occurred:
• Permanent Data Check.
• Repeated report of Host Adapter CHK2 on the same track
• SIM report of a pinned track.

SIM REF. CODE	Meaning	Comment
EF4X-XX	Unable to write a track to a PDEV	XXX=LDEV number
FF4X-XX	Unable to process a track to or from Cache	XXX=LDEV number

To recover pinned tracks the following information about the pinned track is necessary:
• Address in LDEV (LDEV number, Cylinder & Head address)
• First and last Cylinder & Head addresses of the stripe containing the pinned track
• The error type of the pinned track (Write or ECC/LRC)
• The PDEV number of the drive containing the pinned track
This information can be obtained from the “Pinned Data Display Function” (SVP02-710) of the SVP

There are 2 types of pinned track error:

Display on SVP	Meaning	Recovery
Write Error	Unable to write a track to a PDEV	Replacement of PDEV
ECC/LRC Error	Unable to process a track to or from Cache	Data recovery

Pages TRBL04-XX explain the error types of pinned track and have flowcharts for recovery.
In case of HRC or HODM volumes, the flowcharts for recovery are shown in TRBL06-160 through TRBL06-180.

In case of HMRCF volumes, the flowcharts for recovery are shown in TRBL09-10.
In case of OPEN volumes, the flowcharts for recovery are shown in TRBL07-70D.

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ECC/LRC Error

Causes:

(1) During a write operation new data is written into Cache. If less than a full stripe (6 or 3 data tracks & their parity track) are written, the corresponding old data and old parity tracks are staged into Cache to create a new parity track. When the new parity track is created, it and the new data tracks are ready to be destaged to the DKUs. These tracks are called "Dirty Data". An ECC/LRC pinned track will occur:
   (a) Dirty Data cannot be read from Cache by the host. This will result in Permanent Data Check and the data is lost. The data will have to be reconstructed by the host from back-up files, etc.
   (b) Dirty Data cannot be destaged to DKU (CHK2 errors). This type of pinned data can usually be read by the host.

(2) An ECC/LRC type of pinned track occurs when a new parity track cannot be properly reconstructed. If during the parity track creation any of the old data or old parity tracks cannot be staged to Cache to construct the new parity track, or a new parity track cannot destage due to a drive failure, the parity track will be pinned. Data can still be read by host.

(3) An ECC/LRC type of pinned track occurs when a track cannot be correctly reconstructed during Correction Copy. This will result in a Permanent Data Check and the original data is lost.

(4) An ECC/LRC type of pinned track occurs if; There is a write type pinned track due to drive failure, the DKC is powered down by manual operation of the P/S OFF switch, the batteries fail or are unplugged, then the Write pinned track will become an ECC/LRC pinned track.

Result of host I/O operation:

(1) When a track with an ECC/LRC error is accessed by a host I/O and the data can be read, the result will be a normal end.

(2) If the data cannot be read, there will be a failure reported of Permanent Data Check In this case the data is lost.

(3) Repeated Host Adapter CHK2 errors reported. Data is usually still readable but is not being destaged from cache.

Recovering ECC/LRC pinned tracks:

(1) Execute ICKDSF ANALYZE SCAN using LDEV, CC, HH information from SVP PINNED TRACK display to determine whether No Failure, or Failure is reported.
   (a) No Failure. Data can be read. Read data and save to tape, another volume, or memory, etc.
   (b) Failure. Data cannot be read. It must be reconstructed by host from backup files, etc.

(2) Run ICKDSF INSPECT NOPRESRVE (NOCHECK if 3390-3R) to the affected track. This will write all zeros to the track and will clear the pinned track indication.

(3) Restore the track with the saved data from step 1a or the reconstructed data 1b.

(4) If Pinned Track reoccurs, resolve hardware problem and repeat steps 1-3.

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Pinned Track disappearance:
Under certain circumstances, pinned tracks may disappear with no recovery action having been taken. This can occur from.

(1) The entire stripe is written. This discards all the old data & parity in the stripe.
(2) A Format Write from R1 was issued to the pinned track. This rewrites the entire stripe and all old data in the stripe is discarded.
(3) If dirty data that could not be destaged due to CHK2 error is read successfully by the host, pinned track is turned off.
(4) If a parity track is unable to destage due to a drive failure and the drive is replaced using Correction Copy (drive replacement by copying to spare and back will not clear Pinned Track).

Write Error

Cause:
A write error type of pinned track is caused when the data destaging process to a PDEV is unsuccessful due to a drive failure. When a drive failure occurs, the drive and the DKC both attempt to recover. If the recovery attempts are unsuccessful, a Write type pinned track is posted. The recovery attempts are:
(1) Media failure : Automatic reallocation of data to an alternate sector.
(2) Other failure : Alternate path retry.
Write error count for each PDEV is stored in the DKC. If the write error count for a PDEV exceeds the threshold value, the PDEV is blocked. Only one PDEV per parity group will be blocked. One blocked PDEV in a parity group will not stop DKC operation to that parity group. However, the parity group will be in correction access mode. If a write type pinned track is accessed by the host after its PDEV has been blocked, the pinned track status will reset.

Result of host I/O operation:
All access to write type pinned tracks will be successful and return a normal end.

Recovering Write Error pinned tracks:
Replace the PDEV with the pinned track. At this time if there is already a blocked PDEV in the same parity group, replace the blocked PDEV first. Then replace the PDEV with the pinned track. If more than one PDEV in a parity group has write error pinned tracks, check the ORM display on SVP Panel. Replace the PDEV with the highest error rate first, then second highest, etc. The pinned track(s) will be recovered by correction copy.

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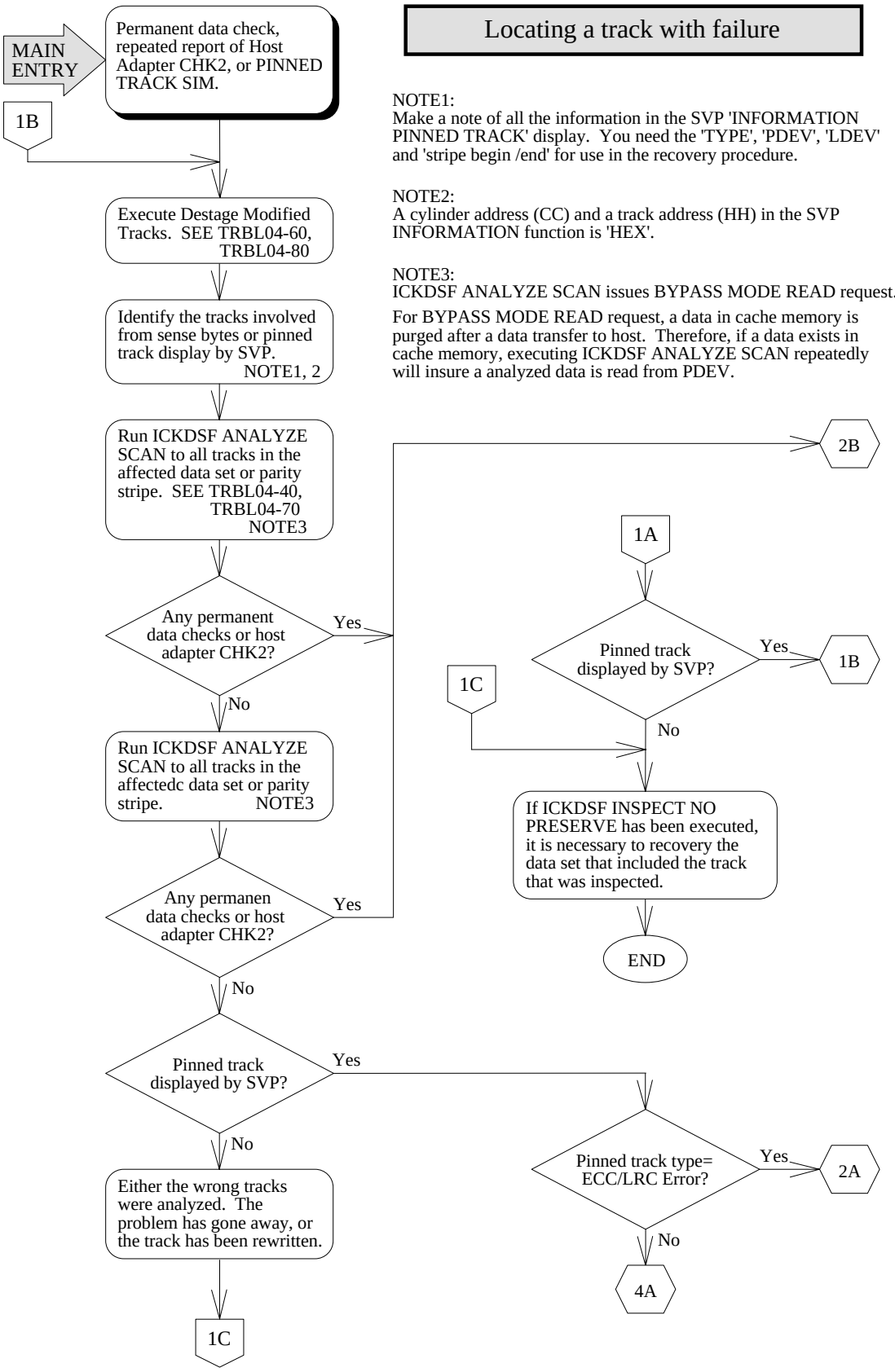
4.1 Recovery Procedure for Pinned Tracks



Locating a track with failure

NOTE1:
Make a note of all the information in the SVP 'INFORMATION PINNED TRACK' display. You need the 'TYPE', 'PDEV', 'LDEV' and 'stripe begin /end' for use in the recovery procedure.

NOTE2:
A cylinder address (CC) and a track address (HH) in the SVP INFORMATION function is 'HEX'.

NOTE3:
ICKDSF ANALYZE SCAN issues BYPASS MODE READ request.

For BYPASS MODE READ request, a data in cache memory is purged after a data transfer to host. Therefore, if a data exists in cache memory, executing ICKDSF ANALYZE SCAN repeatedly will insure a analyzed data is read from PDEV.

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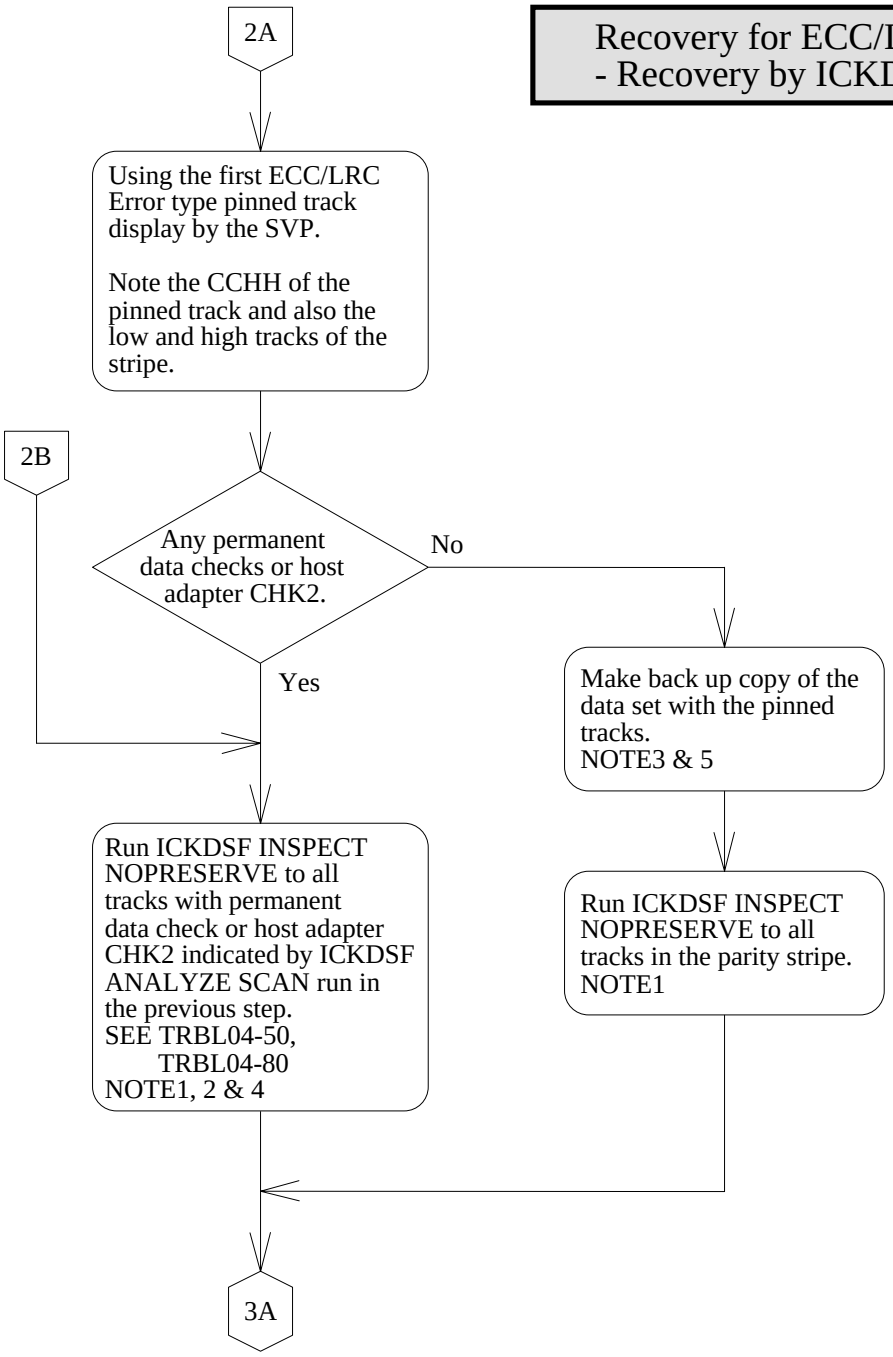
Recovery for ECC/LRC Error tracks - Recovery by ICKDSF INSPECT -



NOTE1 Remember all tracks on the which ICKDSF INSPECT NO PRESERVE is run as costomer data has been lost. Customer will have to do file recovery for each data set involved which may be more than one data set.

NOTE2 If one of the tracks that needs to be inspected is in the VTOC ICKDSF will only work if the volume is varied offline. In this case the entire volume will have to be restored.

NOTE3
- During a file recovery from the backup procedure to the restore procedure of the data set, the data set can not be accessed until recovery is complete.
- If a file recovery for PDS data set, execute the backup/restore procedure to the data set (all members).

NOTE4 When the drive emulation type is 3390-3R, add NOCHECK to ICKDSF INSPECT parameter.

NOTE5
① Execute File Back up for dataset including pinned track. Store backed-up file to another media (tape or another dasd).
② After Inspect with NO PRESERVE has been done, restore backed-up file to original location.

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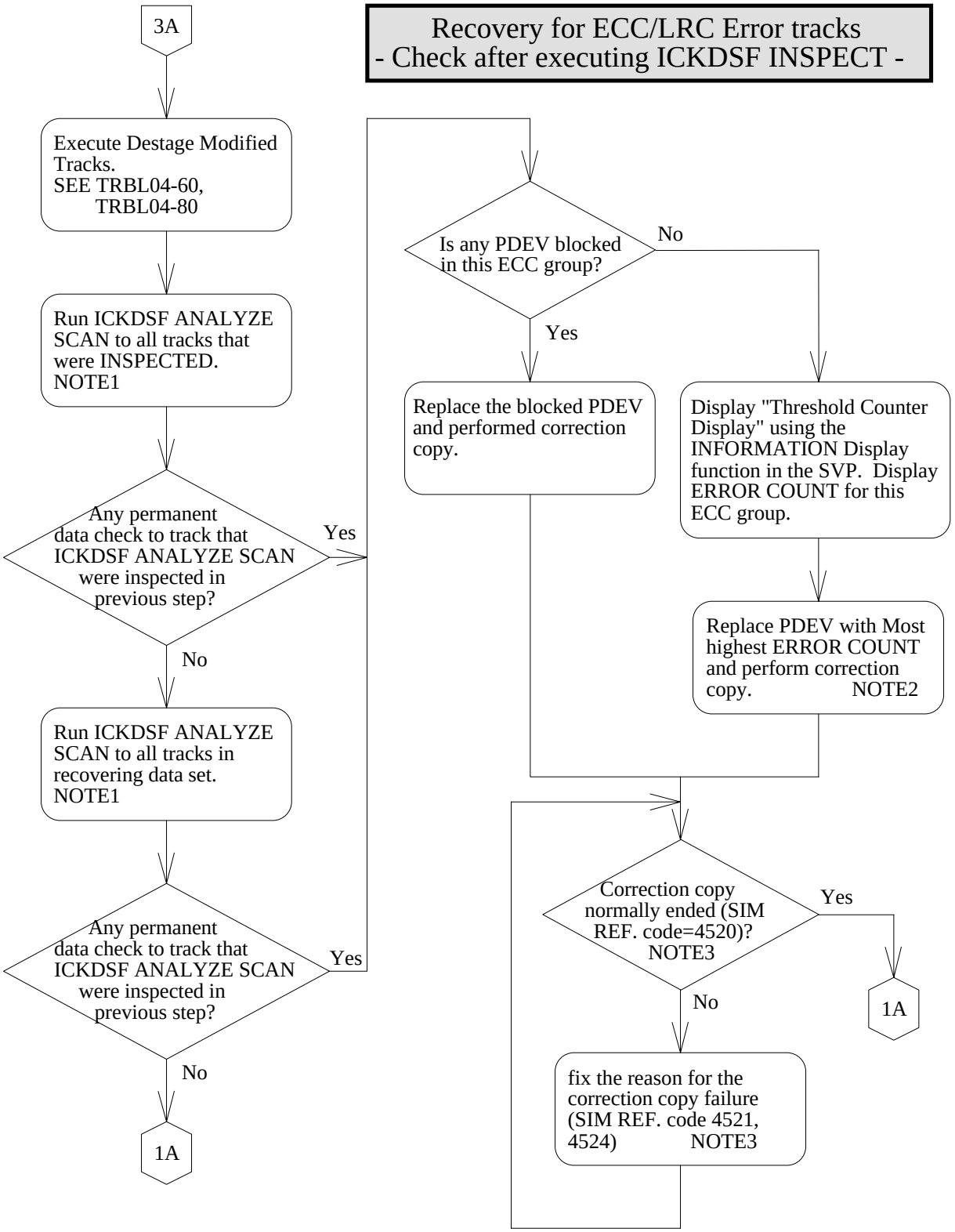

NOTE1 Repeat ICKDSF ANALYZE SCAN twice for the purpose verifying the data written on the physical device actually.
NOTE2 If Spare drives are available, you can perform Drive Copy instead of Correction copy.
NOTE3 In case of Drive copy abnormally ended, SIM REF. code is “4621” or “4624”.

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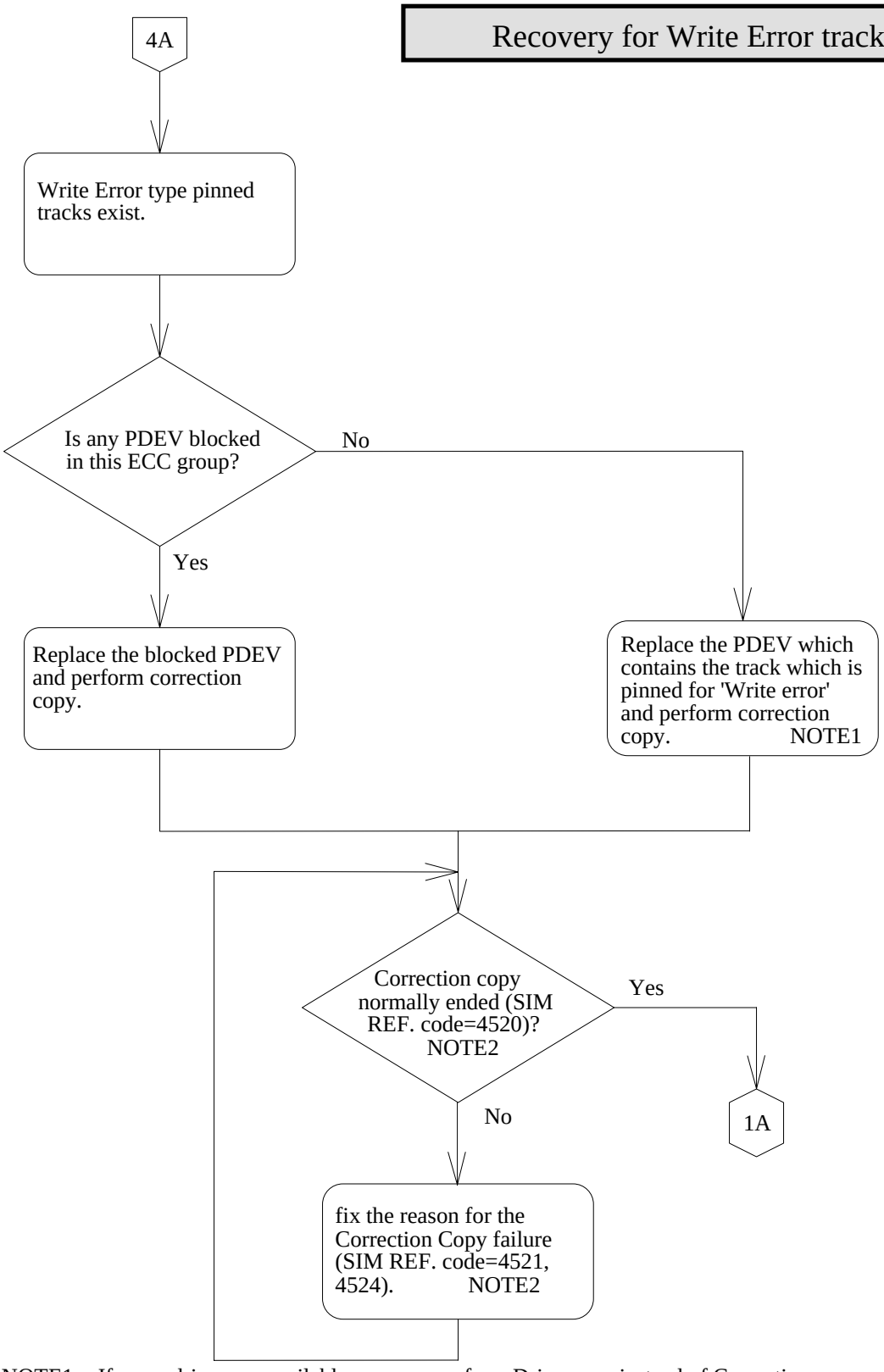
Recovery for Write Error tracks



NOTE1 If spare drives are available, you can perform Drive copy instead of Correction copy.
NOTE2 In case of Drive copy abnormally ended, SIM REF. code is “4621” or “4624”.

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JCL example (under MVS)

A. Check if any pinned track by using DSF (ANALYZE).

[in case target LDEV to be recovered is ONLINE state]

```
//ANALYZE  JOB  MSGCLASS=x,MSGLEVEL=(1,1)
//STEP    EXEC  PGM=ICKDSF
//SYSPRINT  DD  SYSOUT=*
//DASD      DD  UNIT=DASD,VOL=SER=xxxxxx,DISP=SHR
//SYSIN     DD  *
 ANALYZE DDNAME(DASD) SCAN
/*
//
```

[in case target LDEV to be recovered is OFFLINE state]

```
//ANALYZE  JOB  MSGCLASS=x,MSGLEVEL=(1,1)
//STEP    EXEC  PGM=ICKDSF
//SYSPRINT  DD  SYSOUT=*
//SYSIN     DD  *
 ANALYZE UNIT(cuu) SCAN
/*
//
```

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B. Recover pinned tracks by using DSF (INSPECT).

(1) When the drive emuration type is other than 3390-3R.

[in case target LDEV to be recovered is ONLINE state]

```
//INSPECT  JOB  MSGCLASS=x,MSGLEVEL=(1,1)
//STEP    EXEC  PGM=ICKDSF
//SYSPRINT  DD  SYSOUT=*
//DASD      DD  UNIT=DASD,VOL=SER=xxxxxx,DISP=SHR
//SYSIN     DD  *
 INSPECT DDNAME(DASD) NOVERIFY NOPRESERVE -
 FROM(X'ccc',X'h') TO(X'ccc',X'h')
/*
//
```

[in case target LDEV to be recovered is OFFLINE state]

```
//INSPECT  JOB  MSGCLASS=x,MSGLEVEL=(1,1)
//STEP    EXEC  PGM=ICKDSF
//SYSPRINT  DD  SYSOUT=*
//SYSIN     DD  *
 INSPECT UNIT(cuu) NOVERIFY NOPRESERVE -
 FROM(X'ccc',X'h') TO(X'ccc',X'h')
/*
//
```

(2) When the drive emuration type is 3390-3R.

[in case target LDEV to be recovered is ONLINE state]

```
//INSPECT  JOB  MSGCLASS=x,MSGLEVEL=(1,1)
//STEP    EXEC  PGM=ICKDSF
//SYSPRINT  DD  SYSOUT=*
//DASD      DD  UNIT=DASD,VOL=SER=xxxxxx,DISP=SHR
//SYSIN     DD  *
 INSPECT DDNAME(DASD) NOVERIFY NOPRESERVE NOCHECK -
 TRACKS(X'ccc',X'h')
/*
//
```

[in case target LDEV to be recovered is OFFLINE state]

```
//INSPECT  JOB  MSGCLASS=x,MSGLEVEL=(1,1)
//STEP    EXEC  PGM=ICKDSF
//SYSPRINT  DD  SYSOUT=*
//SYSIN     DD  *
 INSPECT UNIT(cuu) NOVERIFY NOPRESERVE NOCHKCK -
 TRACKS(X'ccc',X'h')
/*
//
```

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C. Execute Destage Modified Tracks

```
//DESTDATA JOB
MSGCLASS=x,MSGLEVEL=(1,1),REGION=nnnnK
//STEP1   EXEC  PGM=IDCAMS
//SYSPRINT  DD  SYSOUT=*
//SYSIN     DD  *
 SETCACHE VOLUME(xxxxxx) unit(DASD) DESTAGE
/*
//
```

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Operation example (under VM)

Note : This recovery procedure is executable only under VM/ESA 1.1 or higher release with DEVMAINT authority.

A. Check if any pinned track by using DSF (ANALYZE).

```
ickdsf
ICK030E DEFINE INPUT...
console
CONSOLE
ICK031E DEFINE OUTPUT...
console
CONSOLE
ICKDSF - CMS DEVICE SUPPORT FACILITY...

ENTER INPUT COMMAND:
analyze unit(cuu) scan
    .
    .
end
 END
```

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B. Recover pinned tracks by using DSF(INSPECT).

(1) When the drive emuration type is other than 3390-3R.

```
ickdsf
ICK030E DEFINE INPUT...
console
CONSOLE
ICK031E DEFINE OUTPUT...
console
CONSOLE
ICKDSF - CMS DEVICE SUPPORT FACILITY...

ENTER INPUT COMMAND:
inspect unit(cuu) norecovery nopriserve from(x'ccc',x'h'
to(x'ccc',x'h')
    .
    .
end
 END
```

(2) When the drive emuration type is 3390-3R.

```
ickdsf
ICK030E DEFINE INPUT...
console
CONSOLE
ICK031E DEFINE OUTPUT...
console
CONSOLE
ICKDSF - CMS DEVICE SUPPORT FACILITY...

ENTER INPUT COMMAND:
inspect unit(cuu) norecovery nopriserve nocheck tracks(x'ccc',x'h')
    .
    .
end
 END
```

C. Execute Destage Modified Tracks

```
destage rdev
```

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5 Error Recovery

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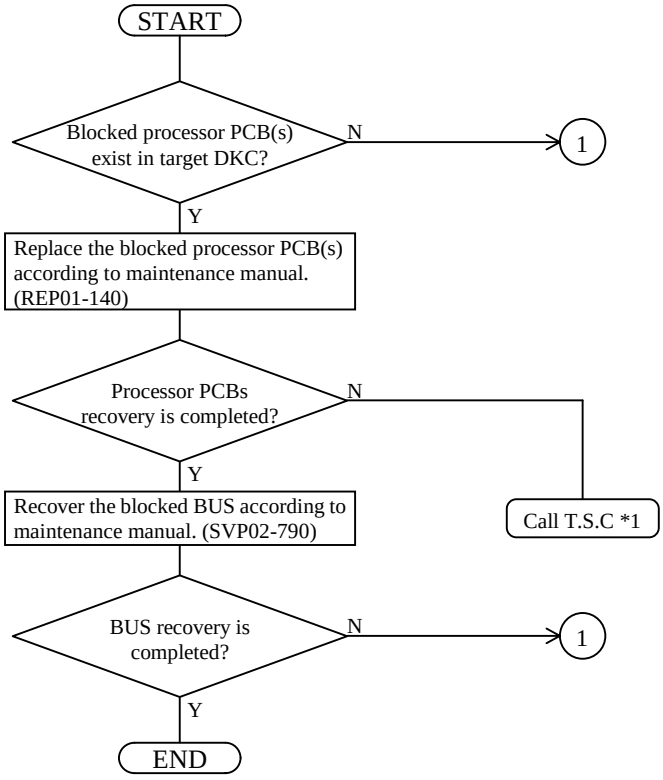
5.1 Error Recovery Procedure for Bus Blocking (SIM = FFEA0X, FFFA0X)

When bus is blockaded (SIM-REF CODE = FFEA0x or FFFA0x), perform following error recovery procedures.

- ON-LINE PROCEDURE

(1) Preparation parts:
As many spare PCBs (CHA, DKA, Cache, Terminator) as possible. Make sure the latest field change has been applied to the spare PCBs (check PCB revision).
(2) The way of checking the bus:
Bus recovered and not occurred CHK2, CHK3.
(3) Procedure



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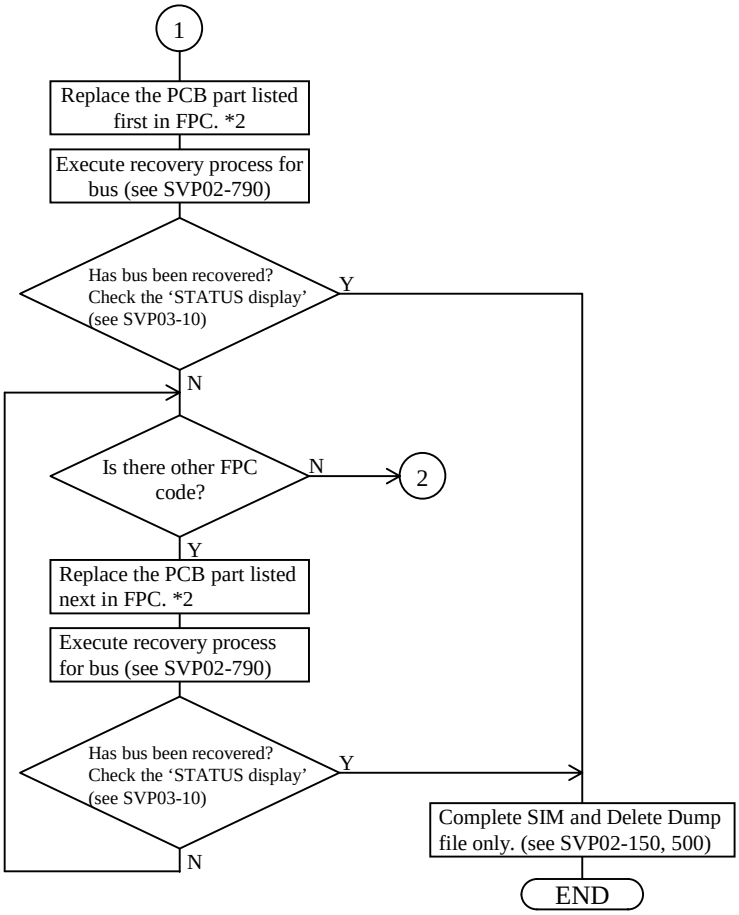

*1 : Technical support center.
*2 : Refer to the replace procedure “REP01-140”.

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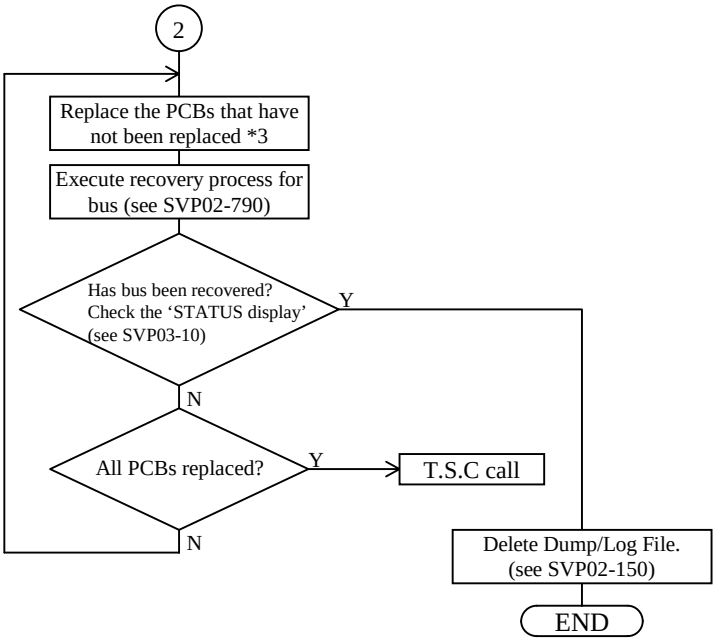
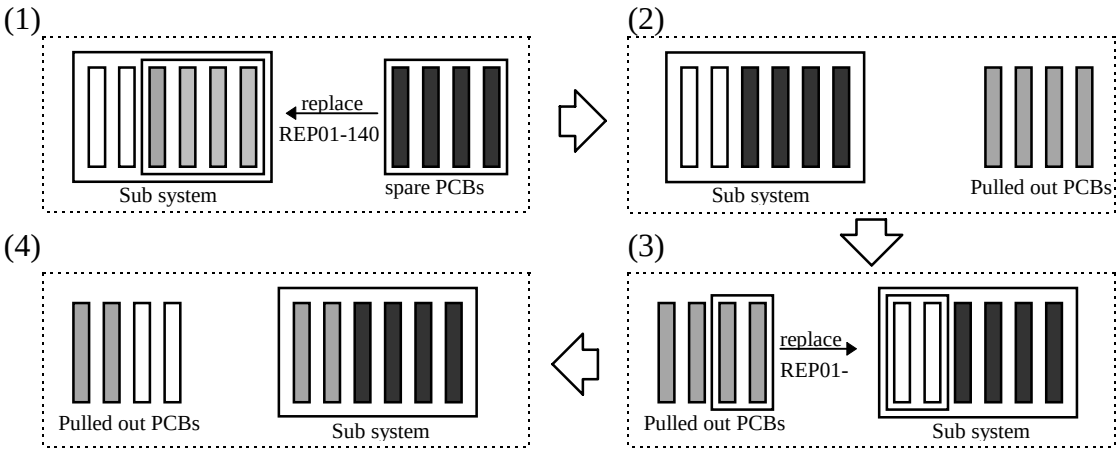


*3 : This is an example to isolate the field part by replacing PCBs at once, then executing BUS ACCESS TEST. In the figure shown below, we suppose that you have four spare PCBs at hand that you have used for replacement in (1), without success (result of replacement shown in (2)). Since the bus failure is not recovered the original PCBs are used in (3) to replace the remaining PCBs (not replaced PCBs). The result of replacement is shown in (4).



- Refer to the replace procedure "REP01-140".

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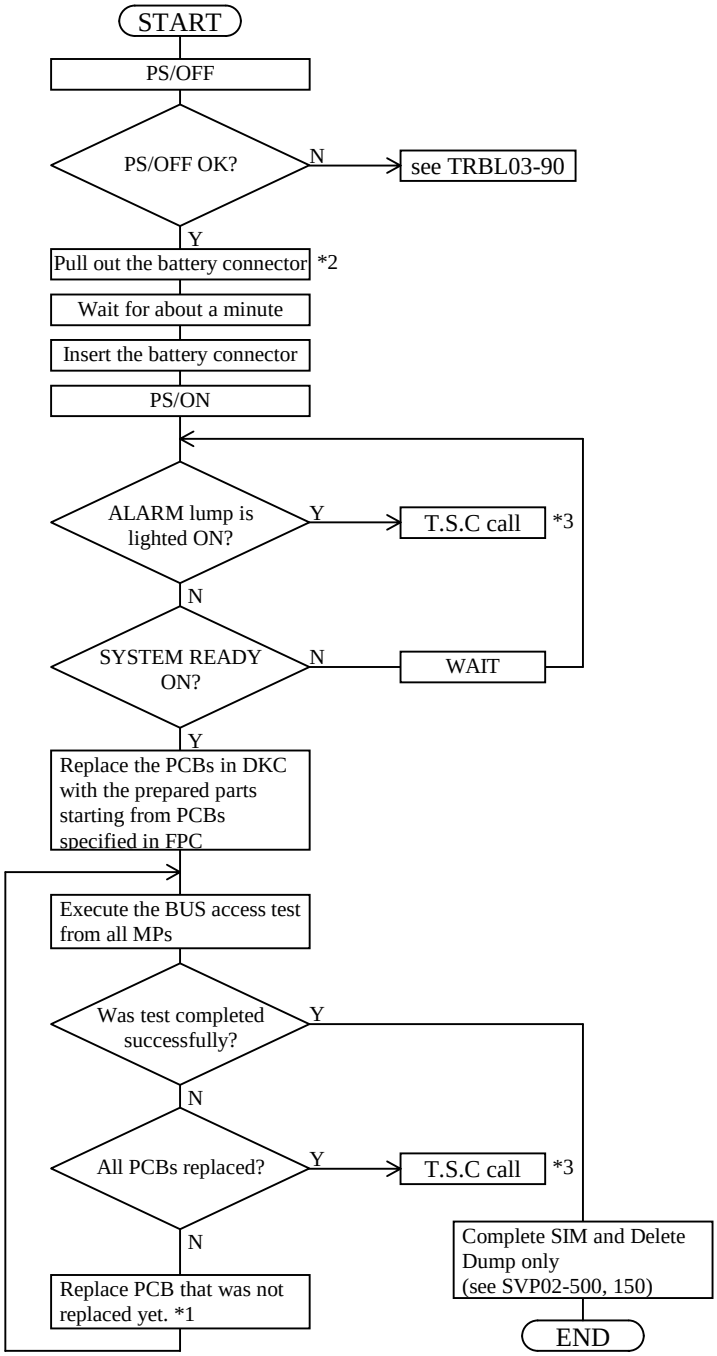
● OFF-LINE PROCEDURE

(1) Preparation parts:
Prepare the same numbers of parts as “CHA, DKA” already installed for failure DKC as possible.
(2) The way of checking the recovered BUS:
All of BUSs are not blocked after IMPL and no error occurs as a result of BUS access test.



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*1 : • Pulled out parts in failure DKC are normal. So these parts can be used for spare.
• Refer to the replace procedure “REP01-140”.
*2 : Refer to LOCATION 06-60.
*3 : Technical Support Center.

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5.2 Isolation and Recovery Procedures for Common SCSI Bus Error (SIM = DF7XYZ, DF8XYZ)

When a SCSI port error SIM for a drive (PDEV) is reported, this section provides the procedures for deciding whether the error is caused by the pertinent drive error or common SCSI bus error, and how to recover the error.

As a SCSI port error SIM is managed for each PDEV, a SCSI temporary error (REF code = DF7xyz) is reported when a warning is issued, and SCSI blocking (REF code = DF8xyz) is reported when the equipment is blocked (x: drive path#, yz: PDEV# (C#, R#)).

Possible causes for the malfunction are:

(1) Failure of drive specified in FPC
(2) Defects in SPC (SCSI controller) for DKA
(3) Defects in SCSI BUS (cable, SCSI buffer)
(4) Other drive failure
(5) HDU platter failure

Before performing the maintenance and replacement only for the failing drive, follow these isolation and recovery procedures to check that a common SCSI port error occurs on other PDEVs on the same SCSI path. If the common error exists, perform the appropriate recovery for the common error parts.

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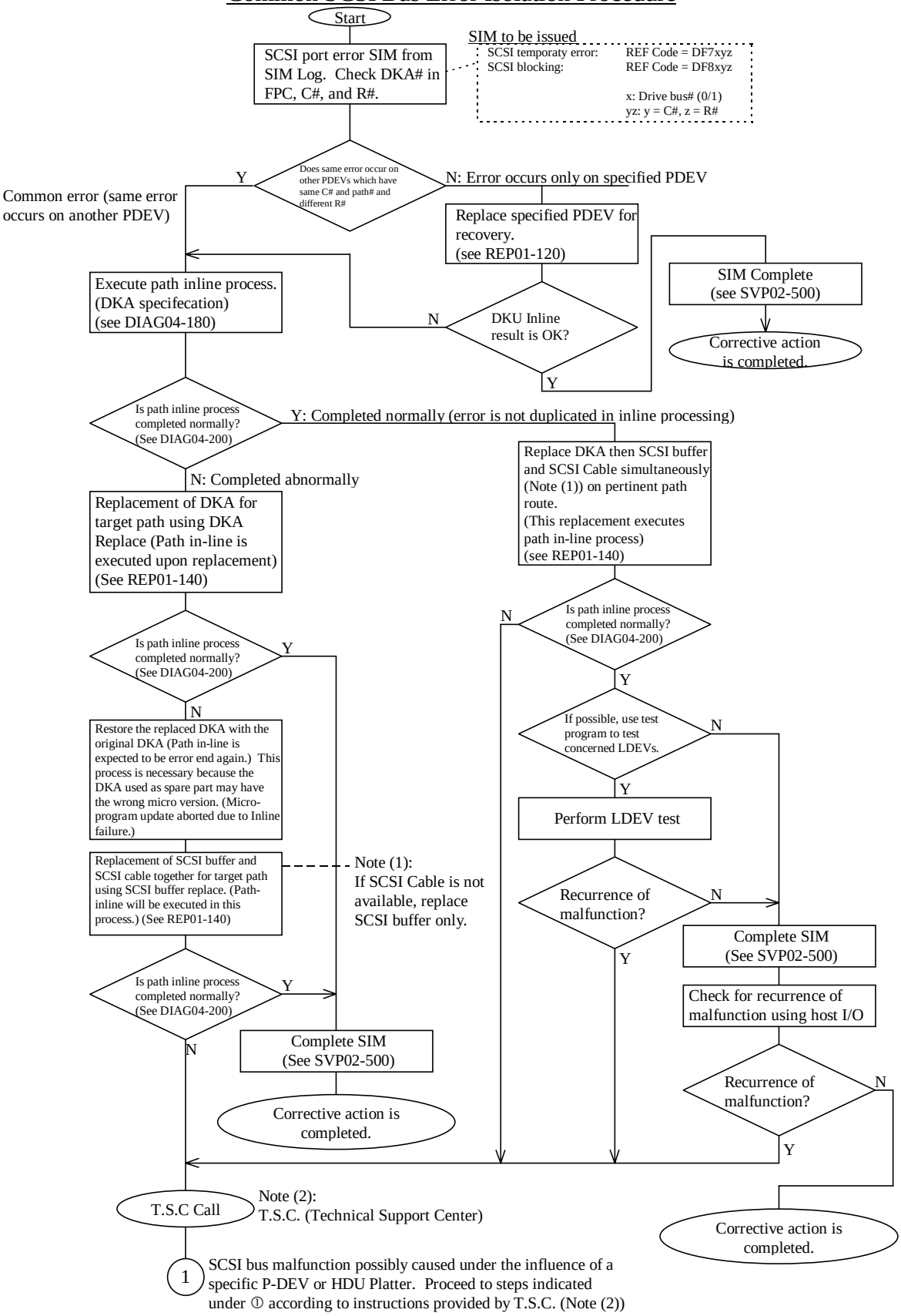
Common SCSI Bus Error Isolation Procedure



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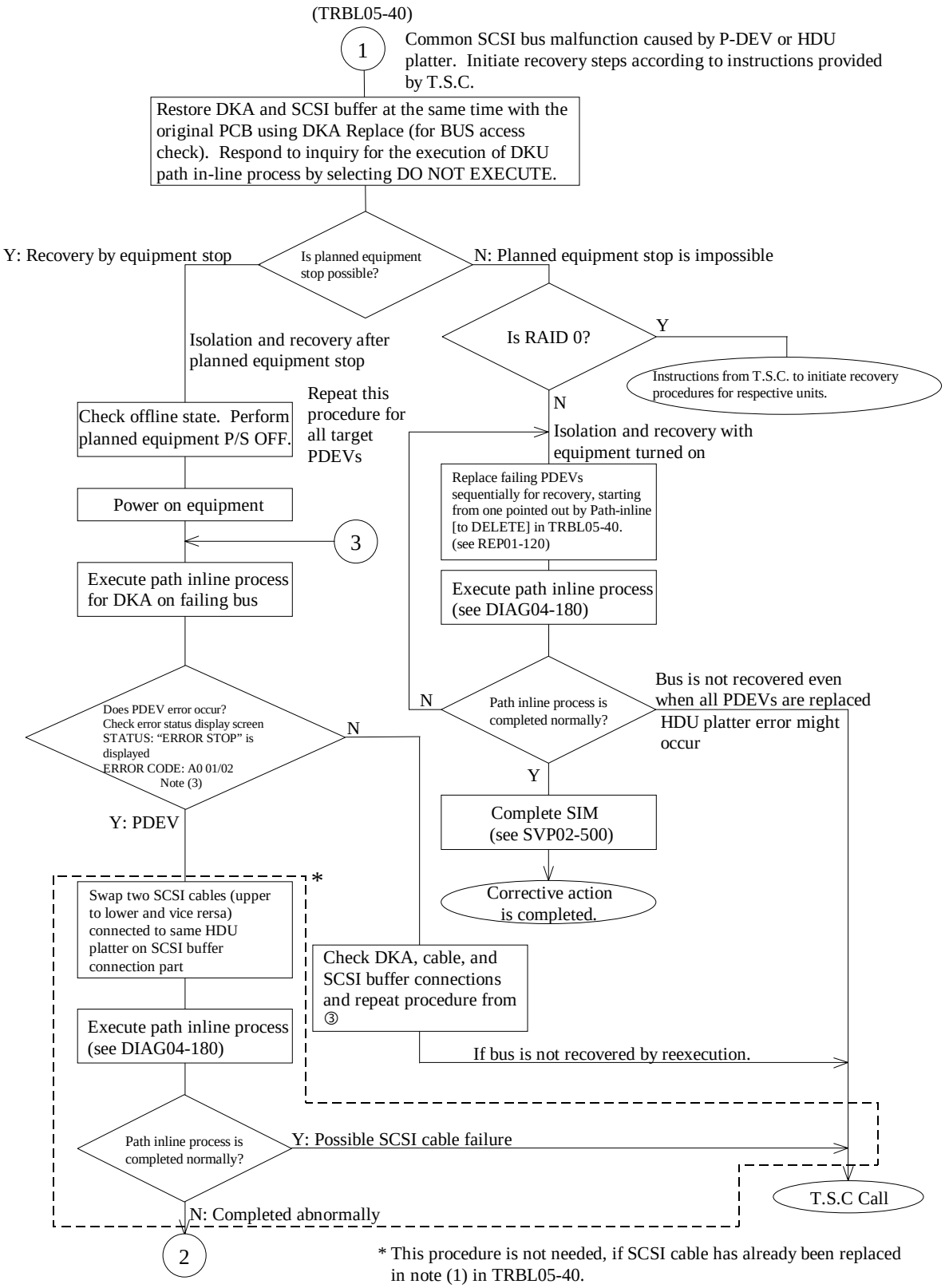
Common SCSI Bus Error due to PDEV or HDU Platter Error

(TRBL05-40)



* This procedure is not needed, if SCSI cable has already been replaced in note (1) in TRBL05-40.

Continue isolation

Note (3): Inline result message display.

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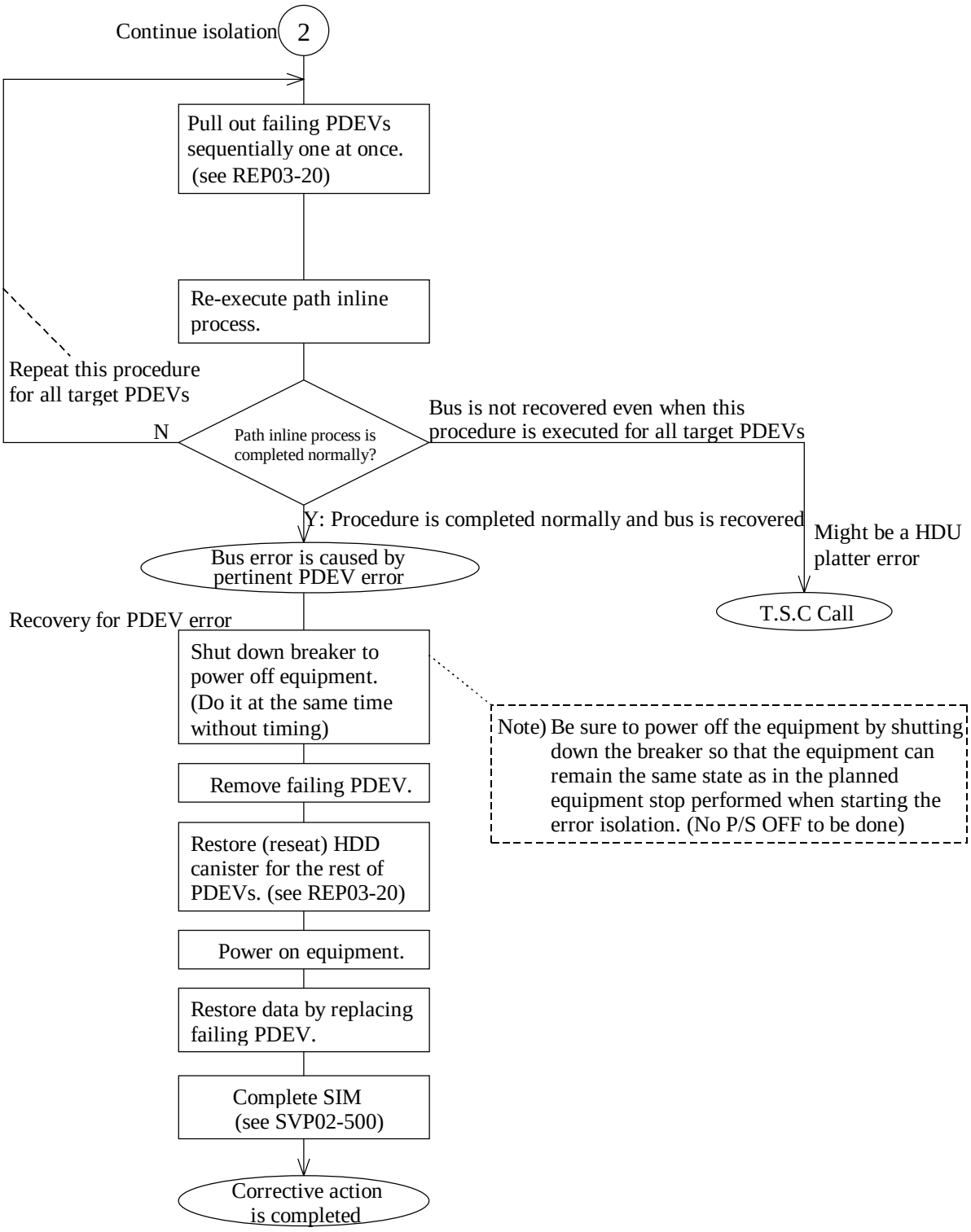

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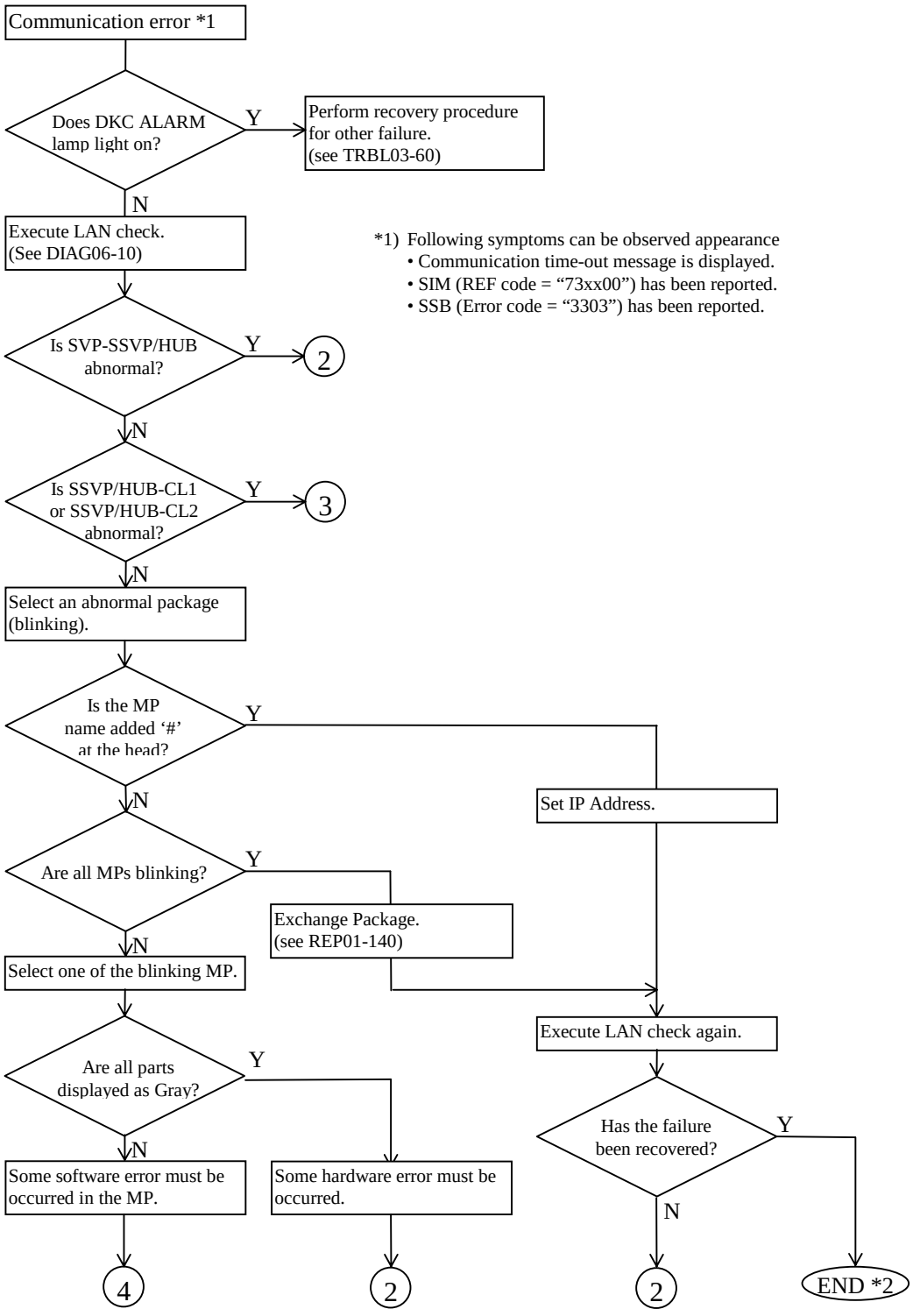
5.3 Recovery Procedure for LAN Error (SIM = 1400X0, 73XX00)



*1) Following symptoms can be observed appearance
- Communication time-out message is displayed.
- SIM (REF code = "73xx00") has been reported.
- SSB (Error code = "3303") has been reported.

*2) After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150, 500)

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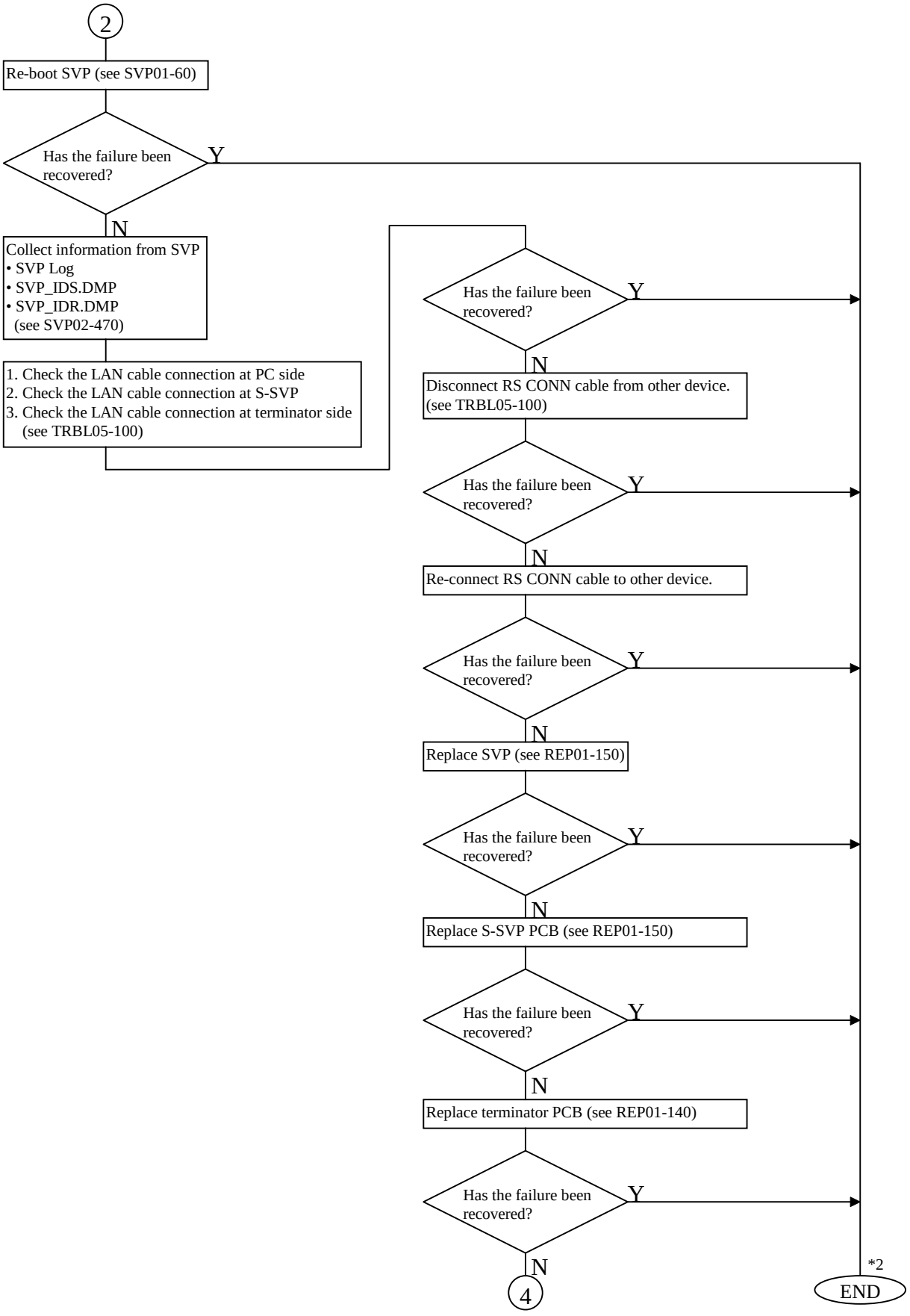

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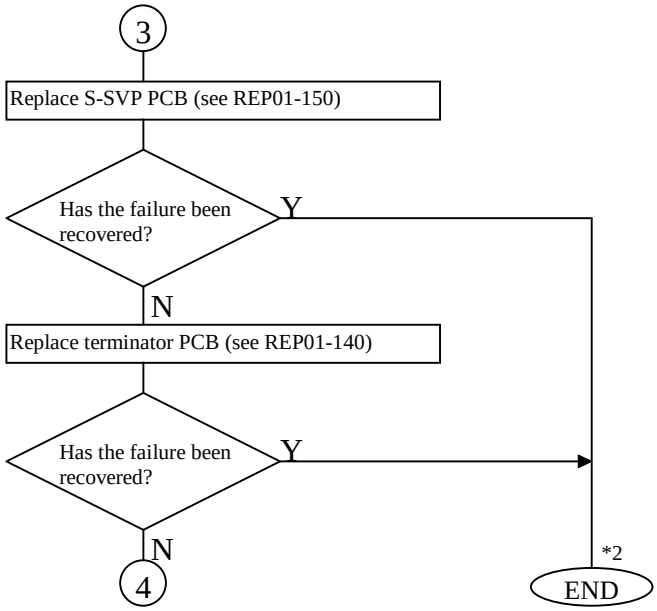
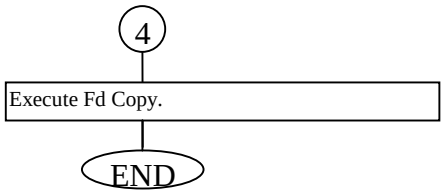


*2: After finishing the error recovery, do SIM complete and delete logs. (see SVP02-150)



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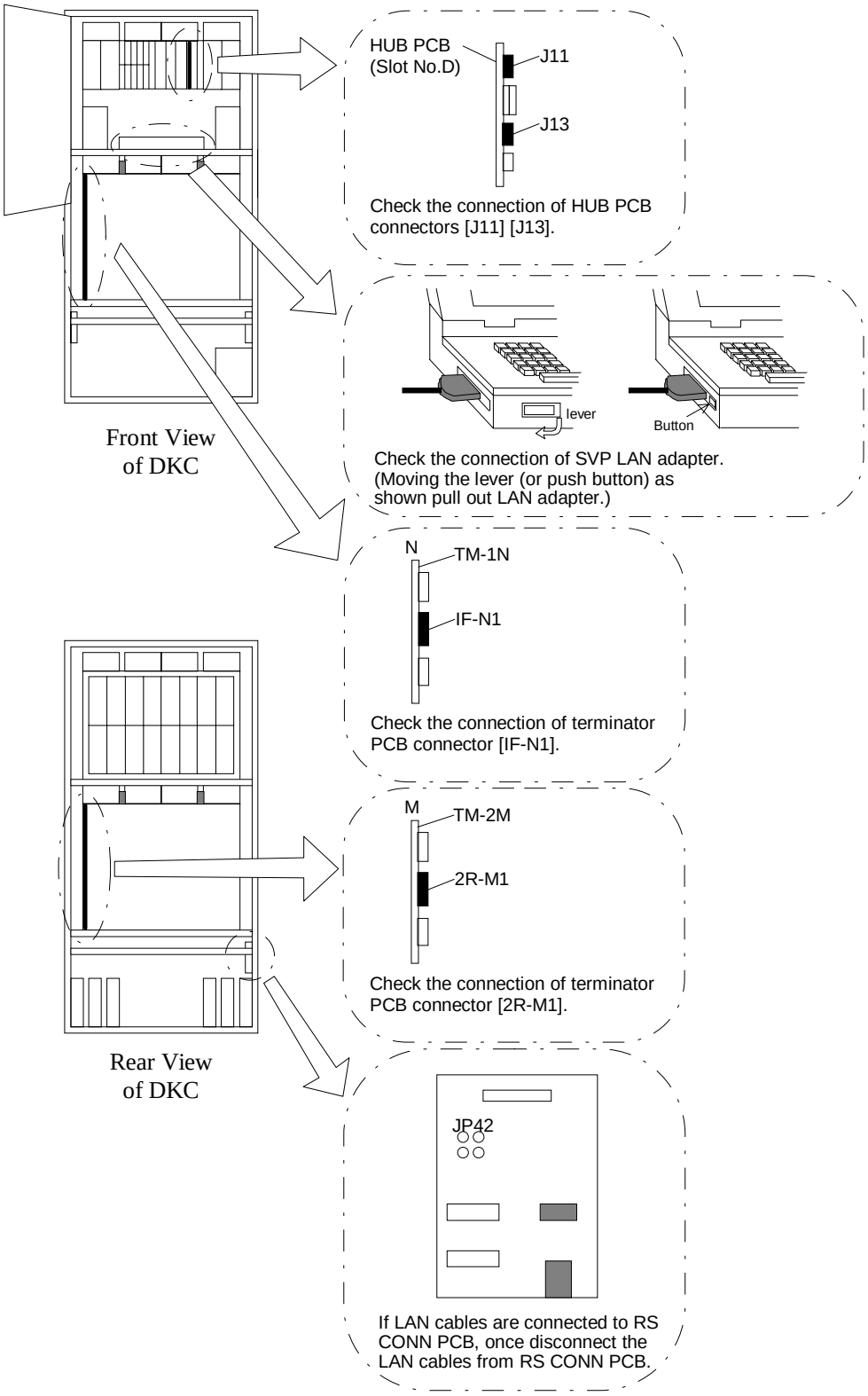
Check the connection of LAN cables

* If all MPs LAN is blocked, disconnect and connect LAN connectors.
  Do not connect/disconnect LAN connectors when LAN is working.



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5.4 Error Recovery Procedure during CHA/DKA replacement

Perform the appropriate recovery procedure according to case (1) or (2).

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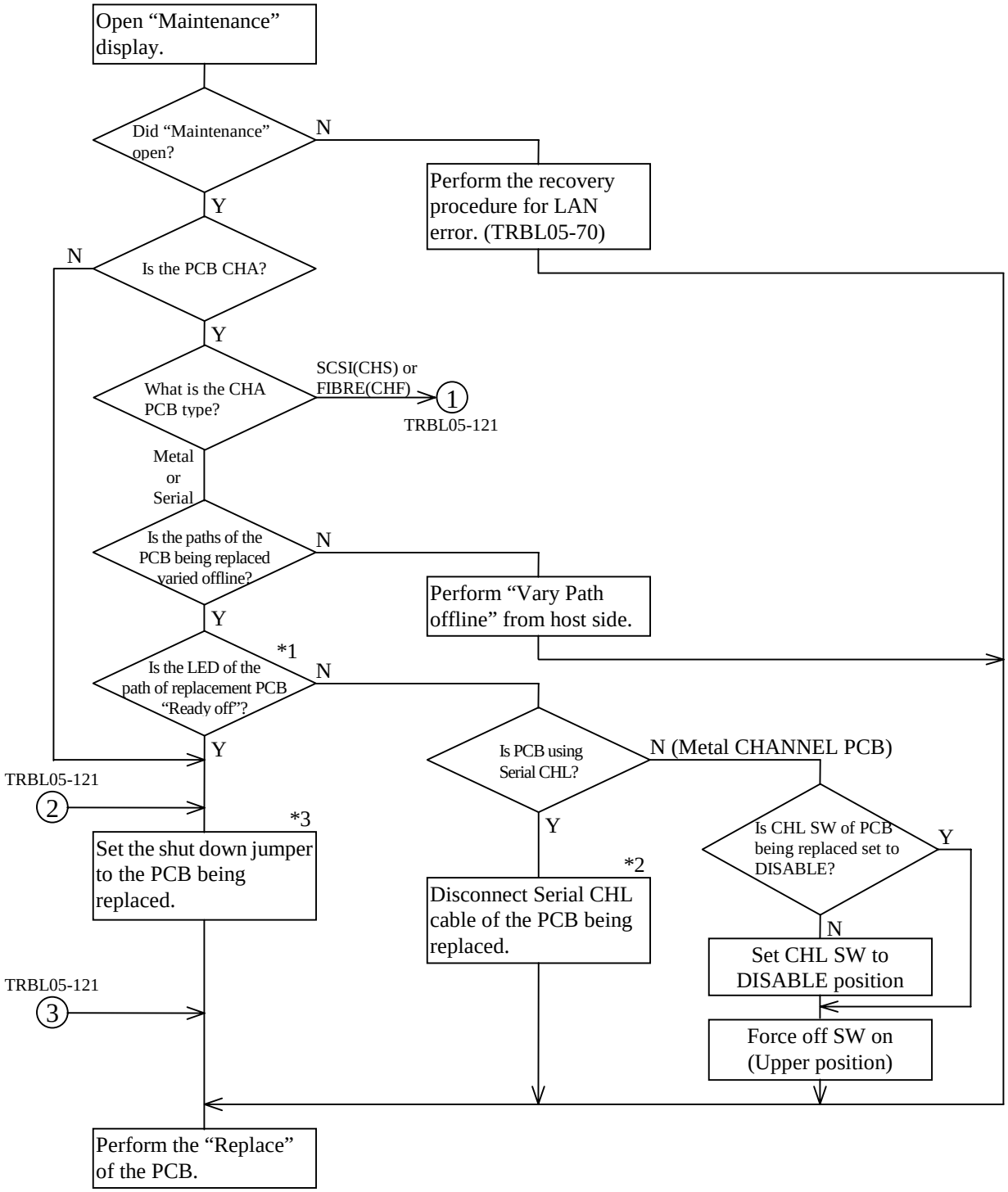
(1) Blocking error occurrence

If the following message is displayed when CHA/DKA is being blocked (when the message “The CHA is being blocked...” or “The DKA is being blocked...” is being displayed), perform the following recovery procedures.

“There is no response from DKC within the time limit.”



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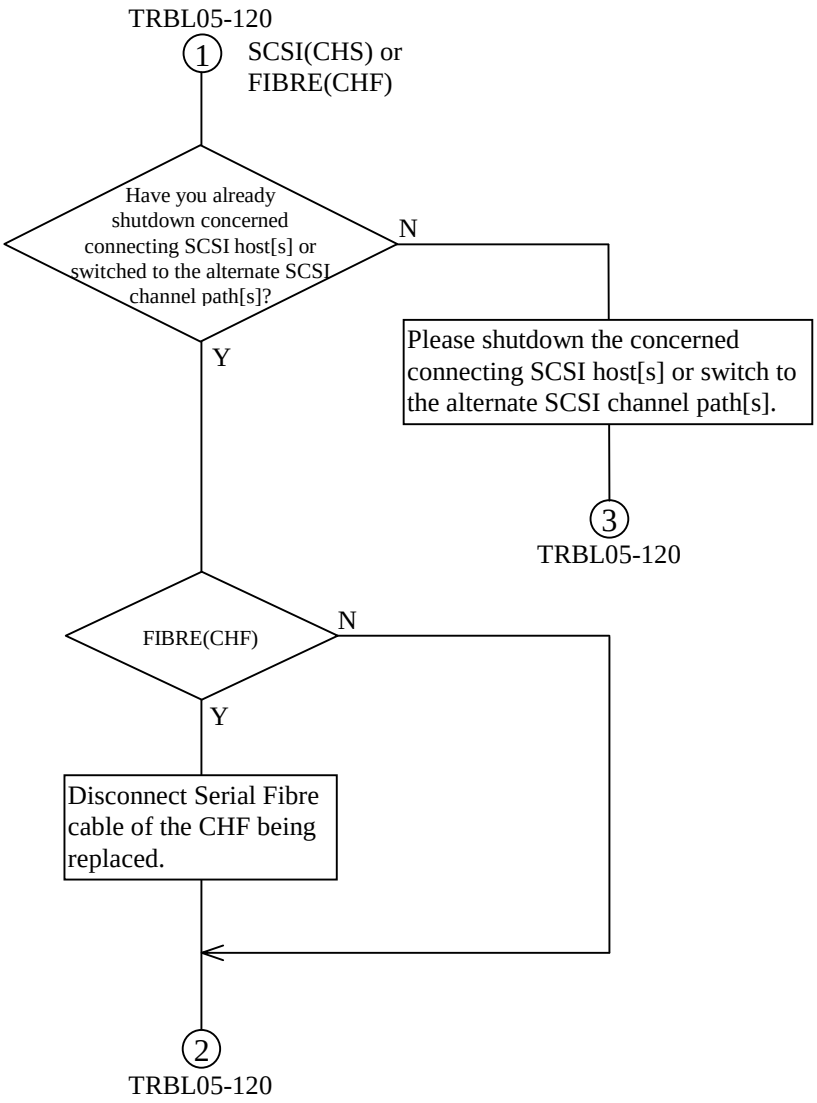

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*1) Verify that channel lamp of operating panel is turned off.
*2) After this operating, error message may be displayed at host side.
*3) After this operation, error SIM and SSB may occur. Refer to the following pages for shut down jumper insertion method depending on the type of PCB.
- Serial Channel CHA : see #1 in REP03-80
- Parallel Channel CHA : see #1 in REP03-110
- SCSI Channel CHA : see #1 in REP03-140
- Fibre Channel CHA : see #1 in REP03-170
- DKA : see #1 in REP03-200

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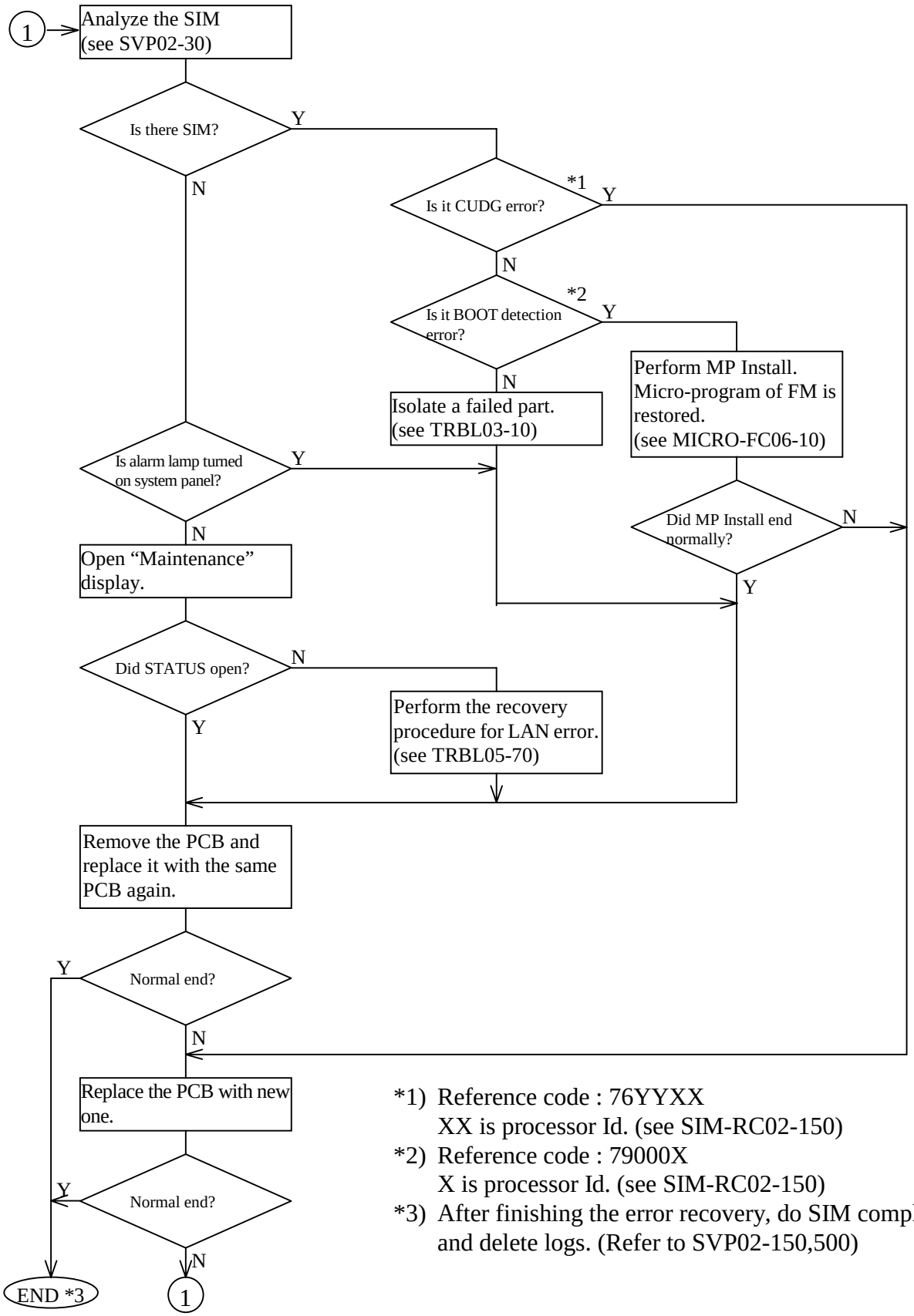
(2) Other cases



*1) Reference code : 76YYXX
XX is processor Id. (see SIM-RC02-150)

*2) Reference code : 79000X
X is processor Id. (see SIM-RC02-150)

*3) After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150,500)

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5.5 Recovery Procedure for Cache Replace Failure (SIM = 3993XX, FFE40X)

This recovery procedure is for during cache replacement, when replace failure SIM is reported.

- Cache replace failure caused by processor error
  (REF code = 3993XY : X = PK ID, Y = MP ID in PK)
  ① Insert the shut down jumper into the processor PCB shown in SIM REF code.
  (Serial channel CHA see #1 REP03-80).
  (Parallel channel CHA see #1 REP03-110).
  (SCSI channel CHA see #1 REP03-140).
  (Fibre channel CHA see #1 REP03-170).
  (DKA see #1 REP03-200).
  In this case, CHK3 or other equipment error are reported because no processing is performed. However, you should ignore these errors.
  ② Retry the suspended cache replacement.
  ③ Replace the PCB into which the shut down jumper inserted in Step ①.

- Cache replace failure caused by Shared Memory error
  (REF code = FFE40X : X:(0) = side A, (1) = side B)
  When this SIM occurs, SM failure is probable. But, when SM failure occurred without INLINE CUDG error, this error maybe caused by intermittent error. Therefore,
  ① Conduct cache replacement again.
  ② When normal end, cache replacement is completed.
  ③ When SM failure SIM is reported again, replace other cache P/K which was not replaced.

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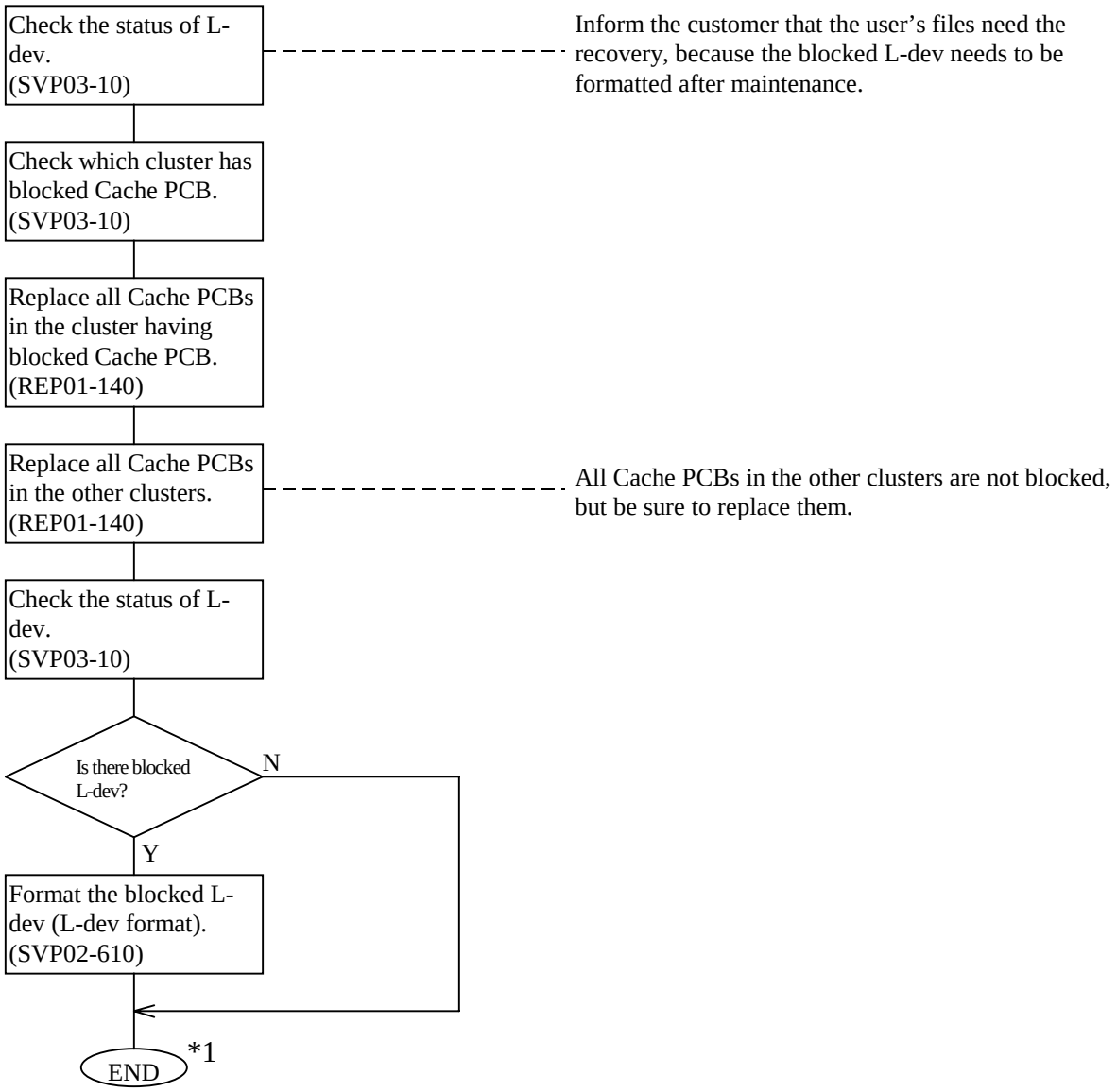
5.6 Recovery Procedure for Cache Error (Both sides) (SIM = FFF50X)

This procedure is to recover errors of the both sides of cache (SIM = FFF5) at powering on the subsystem.
At this time, it is necessary to format the drive (L-dev format).
Because if there is pending data (non-written data to the drive) on cache the drive is blocked.



*1) Delete Log after the end of this procedure. (SVP02-150)

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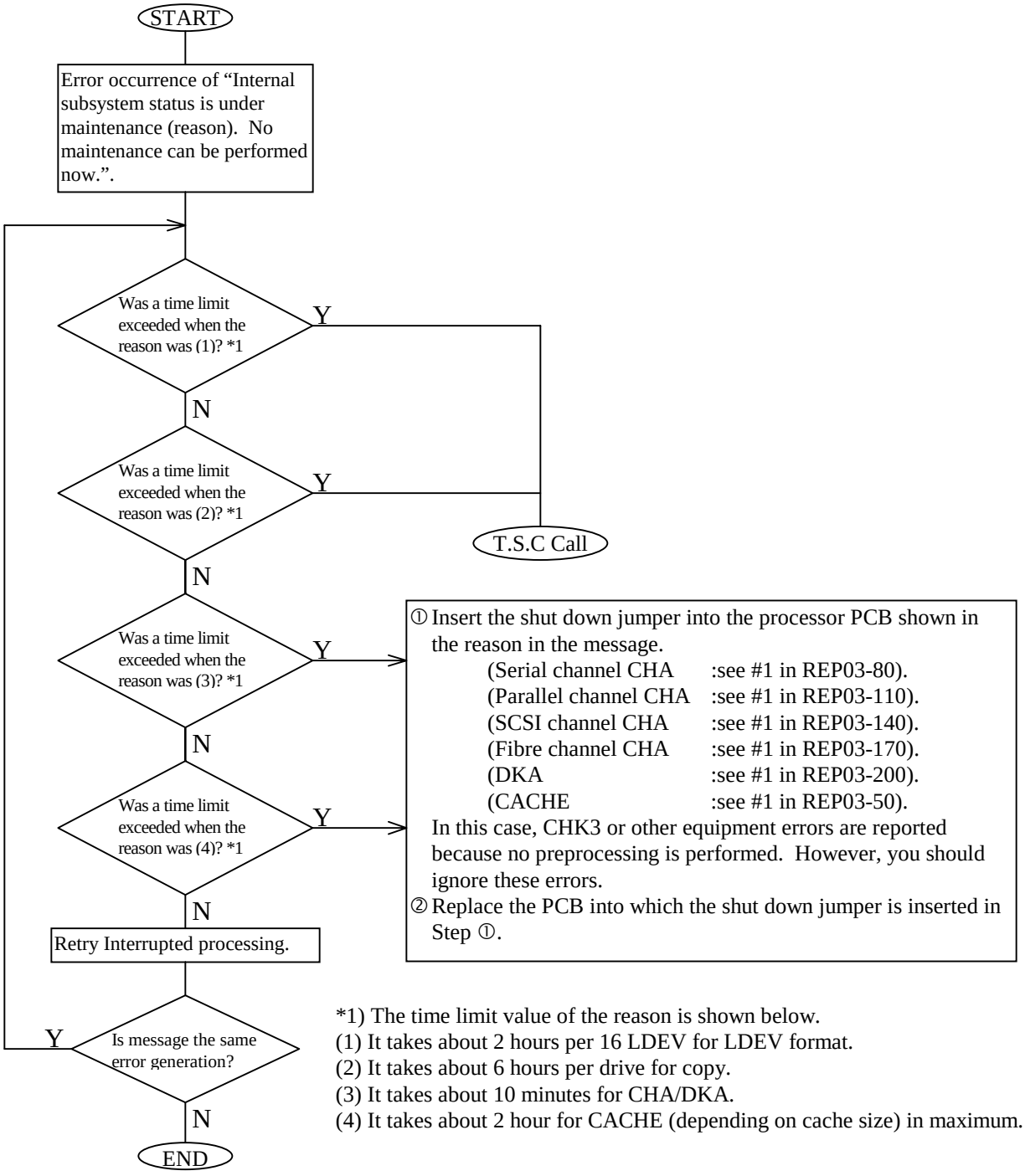
5.7 Recovery Procedures for Status in changing is not released

The SVP protects maintenance operation while the DKC is changing its status. If the SVP detects such condition before executing maintenance process, displays the messages as “Internal subsystem status is under maintenance (reason). No maintenance can be performed now.”. The reason is one of the following messages.

(1) LDEV format in progress.
(2) Copy in progress.
(3) CHA-xx (or DKA-xx) changing the status.
(4) Cache-xx changing the status.
xx:package number

If one of the above message appears, try the following recovery procedure.



*1) The time limit value of the reason is shown below.
(1) It takes about 2 hours per 16 LDEV for LDEV format.
(2) It takes about 6 hours per drive for copy.
(3) It takes about 10 minutes for CHA/DKA.
(4) It takes about 2 hour for CACHE (depending on cache size) in maximum.

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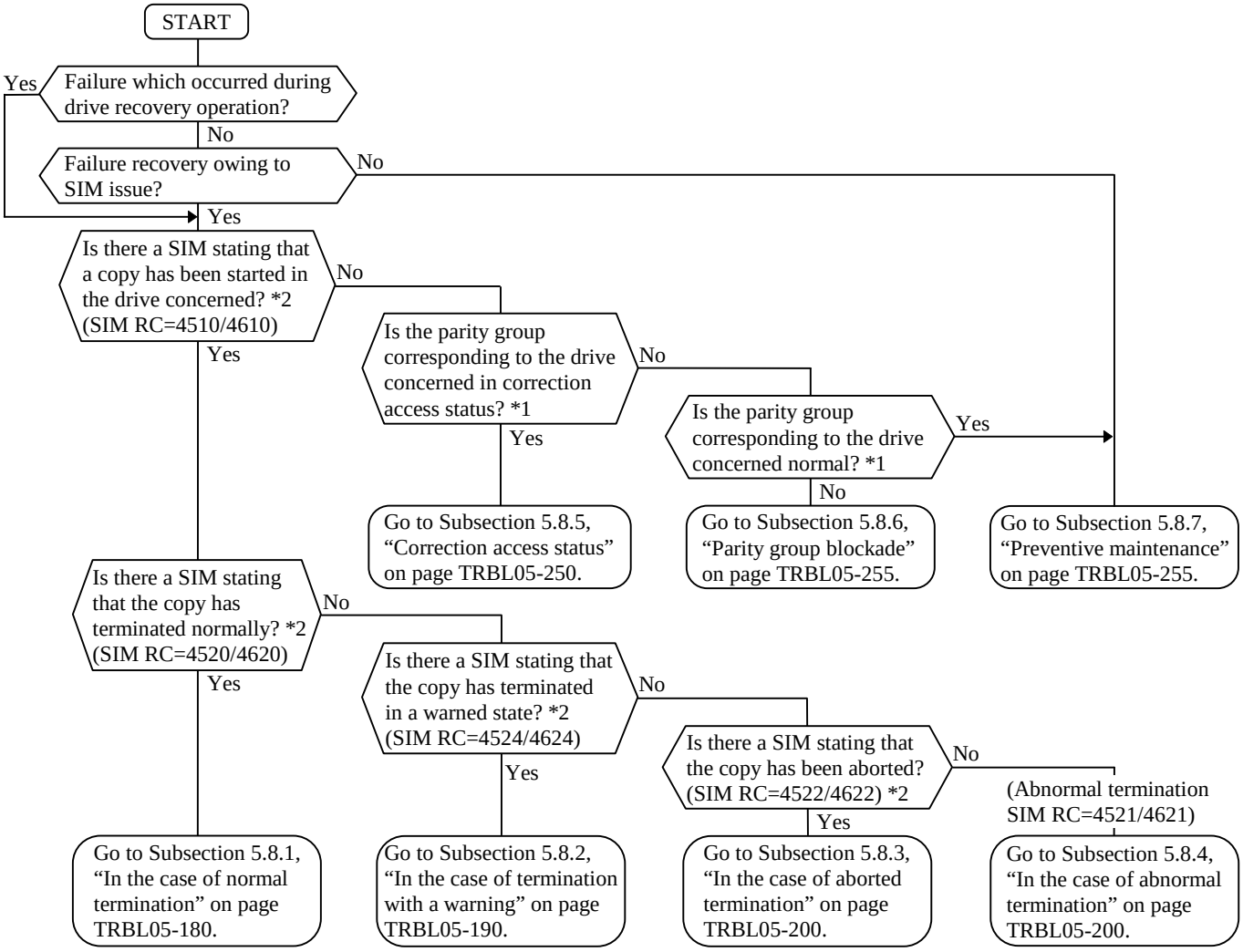
5.8 Drive failure recovery procedure

Explanation:

Types of the drive copy are shown below. Confirm the copy type and execute the drive recovery procedure.

Copy type	Description	Operation occasion
Correction copy	This is an operation to restore and copy, the data of the blocked drive using the data of another drive and parity data when the data drive is blocked. • A correction copy to the spare drive is referred to as another drive correction copy. • A correction copy to the replacement drive which has been installed instead of the blocked drive is referred to as a self-drive correction copy. * In the RAID0 configuration, no correction copy will be performed.	• Automatic operation owing to a failure • Operation instructed by the maintenance personnel
Drive copy	This is an operation to copy data to the spare drive from the data drive. A copy automatically performed owing to a warning level failure is referred to as dynamic sparing.	• Automatic operation owing to a failure • Operation instructed by the maintenance personnel
Copy back	This is a copy for returning data which has been copied to the spare drive by another drive correction copy or drive copy to the original data drive.	• Operation instructed by the maintenance personnel



*1: Confirm the status of the parity group corresponding to the drive concerned by means of the SVP status.
For the procedure for referring to the SVP status, refer to Section 3.8, "Logical device" on page SVP03-120.

*2: The term "copy" means drive copy, copy back, or correction copy.

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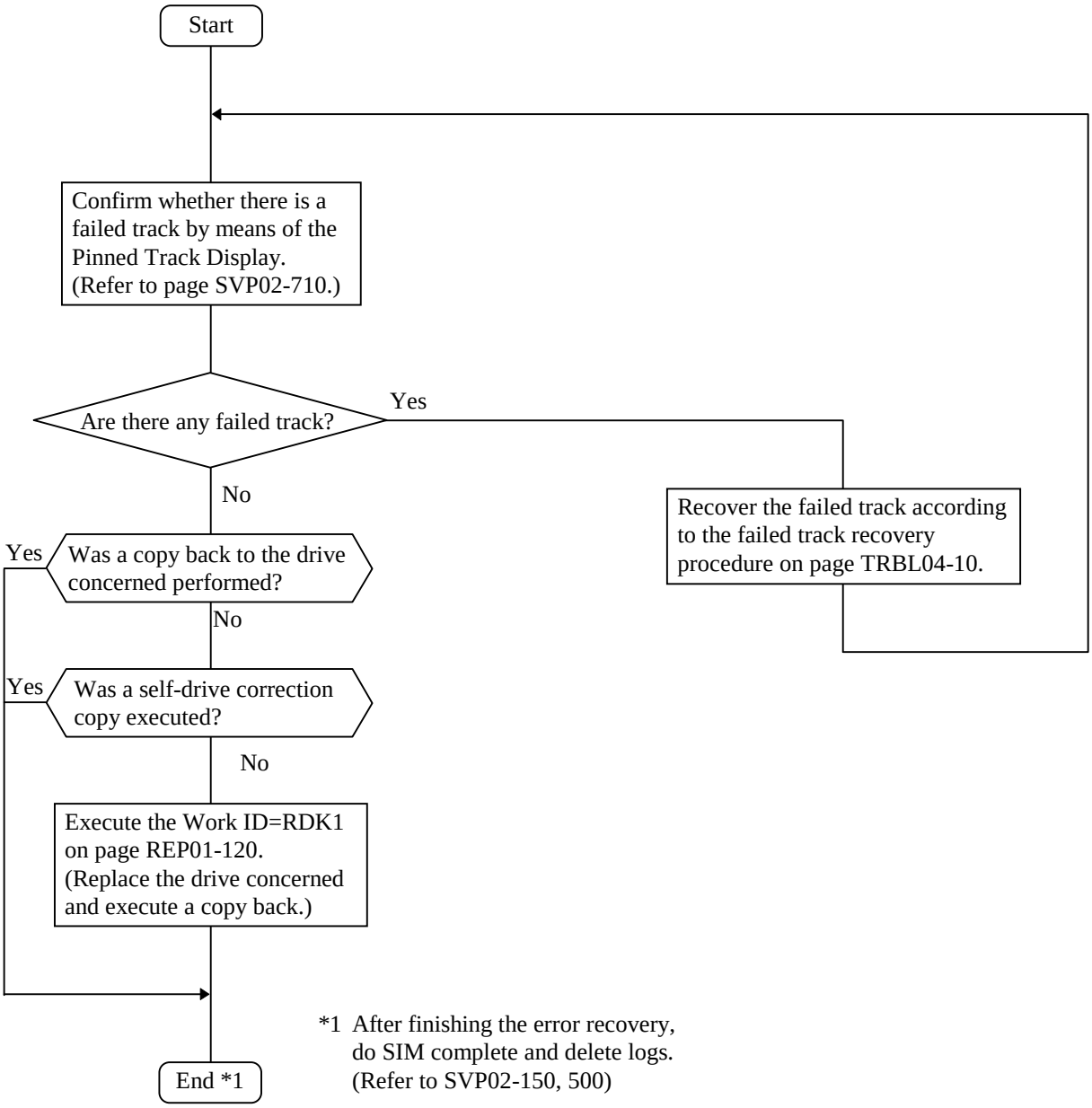
5.8.1 In the case of normal termination (SIM RC=4520/4620)

The procedure below is that used after a drive copy, copy back, or correction copy terminates normally.



*1 After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150, 500)

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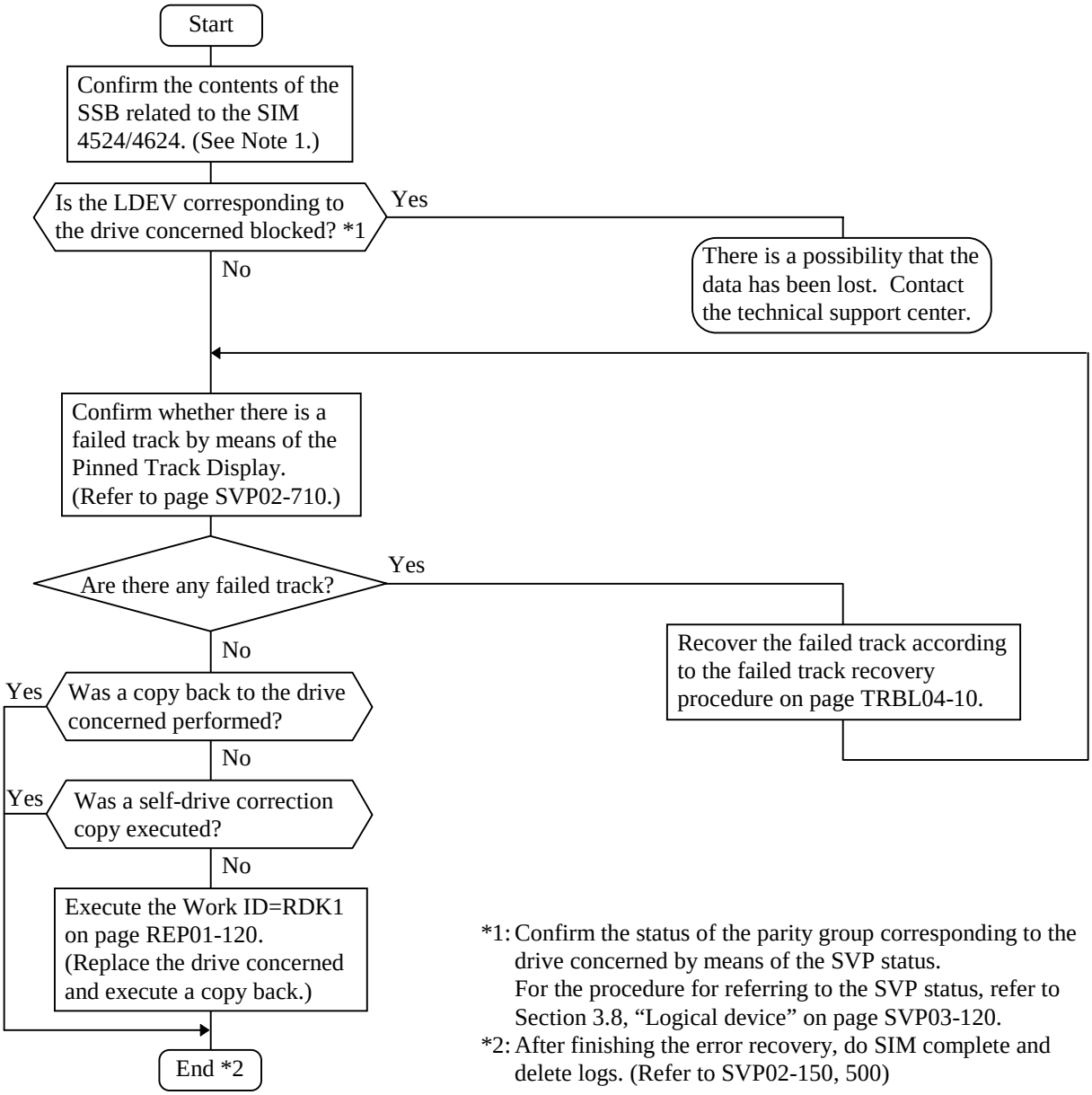
5.8.2 In the case of termination with a warning (SIM RC=4524/4624)

The procedure explains below is that used when the drive copy, copy back, or correction copy terminates but one of the following is detected:

(1) A failed track was detected, but the copy was continued.

(2) One or more blocked LDEVs were detected in the same parity group. Copy of data of the blocked LDEVs was skipped.



*1: Confirm the status of the parity group corresponding to the drive concerned by means of the SVP status.
For the procedure for referring to the SVP status, refer to Section 3.8, “Logical device” on page SVP03-120.

*2: After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150, 500)

Note 1: Meaning of bytes 41 to 52 of SSB F/M=9F EC=9355 related to SIM RC=4524/4624

Byte (Hex.)	Item	Meaning
41	Number of blocked LDEVs	Number of blocked LDEVs
42 : 50	Blocked LDEV #0 : Blocked LDEV #16	Blocked LDEV No. (Up to 16 LDEVs can be inputted from the top.) However, 0Xff is inputted in the unused part.
51	Number of failed tracks	Number of failed tracks
52	E.O.D	Means the end of data

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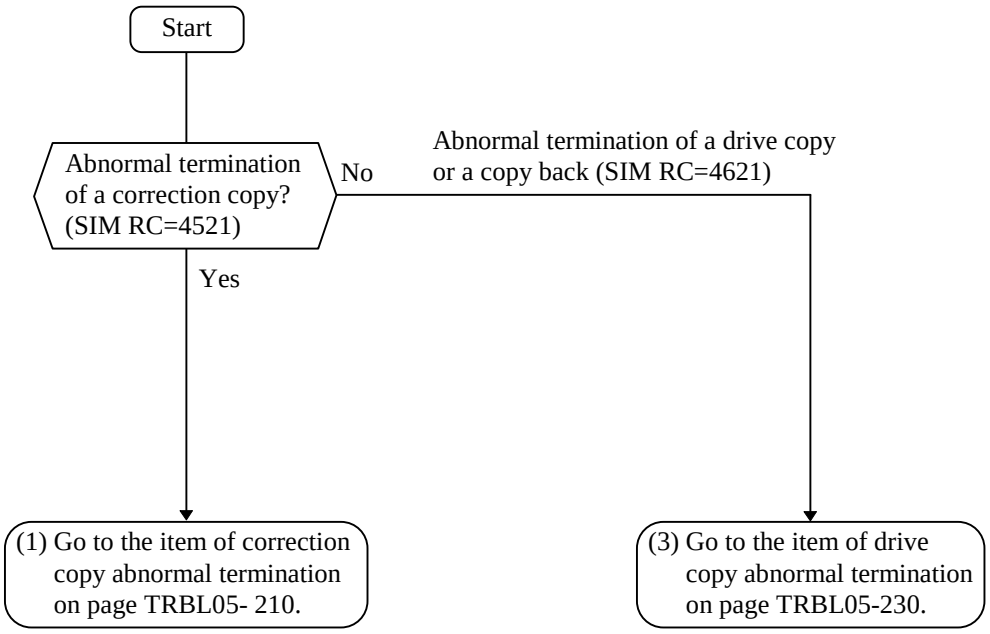
5.8.3 In the case of termination owing to abortion (SIM RC=4522/4622)

The procedure below is that used when a drive copy, copy back, or correction copy is aborted owing to the SVP operation by the service personnel. Since status of the drive concerned is that before starting copy, execute the recovery operation for the same drive once again.

5.8.4 In the case of abnormal termination (SIM RC=4521/4621)

The procedure below is that used when a drive copy, copy back, or correction copy terminates abnormally.
Since the recovery procedure may differ depending on the copy type, confirm the explanation on page TRBL05-170 and execute the following procedure.



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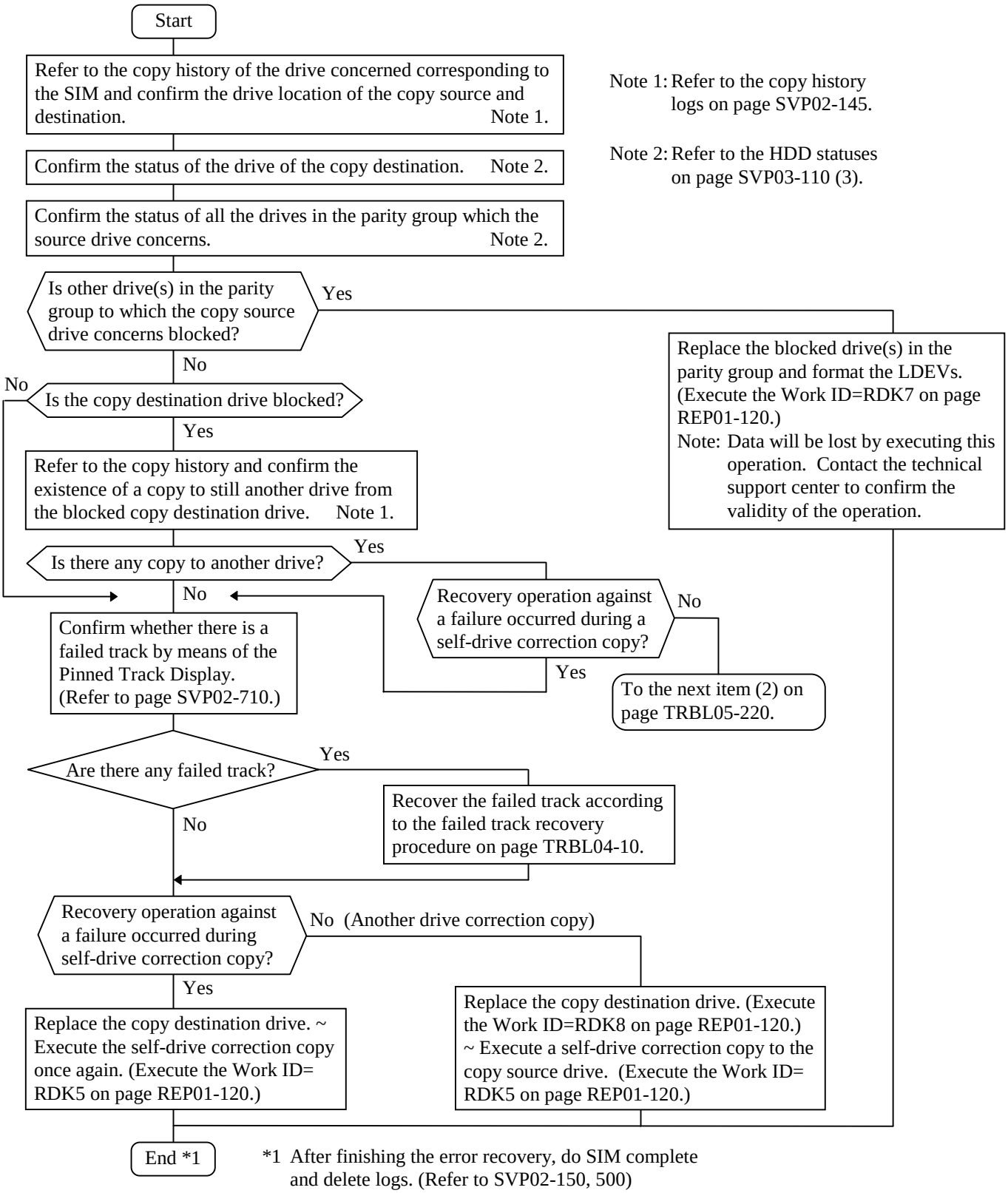
(1) In the case of correction copy abnormal termination
The procedure below is that used when a correction copy terminates abnormally.



Note 1: Refer to the copy history logs on page SVP02-145.

Note 2: Refer to the HDD statuses on page SVP03-110 (3).

*1 After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150, 500)

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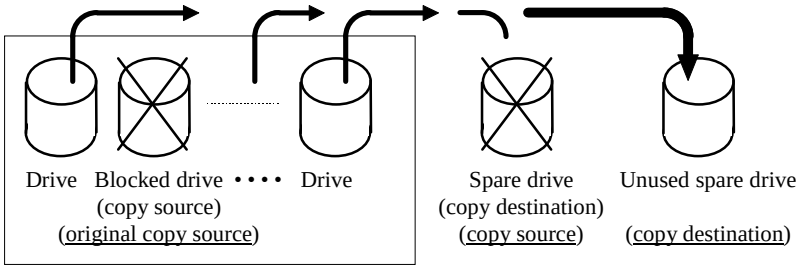
(2) In the case of correction copy abnormal termination (in which an unused spare drive is available)
This is a case in which a correction copy terminates abnormally owing to a failure in the copy destination drive. However, if an unused spare drive exists, the correction copy is automatically performed to the unused spare drive.
In the following procedure, the copy source is referred to as a original copy source, the copy destination is referred to as a copy source, and the unused spare drive is referred to as a copy destination.



Start

Is there a SIM stating that a copy terminated abnormally in the copy source drive? (SIM RC=4521)

No

Is there a SIM stating that a copy terminated normally in the copy source drive? (SIM RC=4520)

No

Is there a SIM stating that a copy terminated in a warned state in the copy source drive? (SIM RC=4524)

No

Yes

Go to Subsection 5.8.2, "In the case of termination with a warning" on page TRBL05-190.

Go to Subsection 5.8.3, "In the case of termination owing to abortion" on page TRBL05-200.

Yes

Confirm the drive status. Note 1.

Is other drive(s) in the parity group to which the original copy source drive concerns blocked?

Yes

No

(The copy destination drive is blocked.)

Confirm whether there is a failed track by means of the Pinned Track Display. (Refer to page SVP02-710.)

Is there any failed track?

No

Yes

Recover the failed track according to the failed track recovery procedure on page TRBL04-10.

Replace the original copy source drive and execute a self-drive correction copy. Execute the Work ID=RDK5 on page REP01-120.

Replace the blocked drive(s) in the parity group and format the LDEVs. (Execute the Work ID=RDK7 on page REP01-120.)
Note: Data will be lost by executing this operation. Contact the technical support center to confirm the validity of the operation.

Replace the original copy source drive and execute a copy back. Execute the Work ID= RDK2 on page REP01-120.

Replace the blocked spare drives (copy source and copy destination drives). Execute the Work ID= RDK8 on page REP01-120.

End *1

Note 1 : Confirm the following items.
- Confirm the location of the copy source and copy destination drives referring to the copy history. Refer to the copy history log on page SVP02-145.
- Confirm the status of the copy destination drive and the status of all the drives in the parity group which the original copy source drive concerns. Refer to Item (3), HDD status on page SVP03-110.

*1 After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150, 500)

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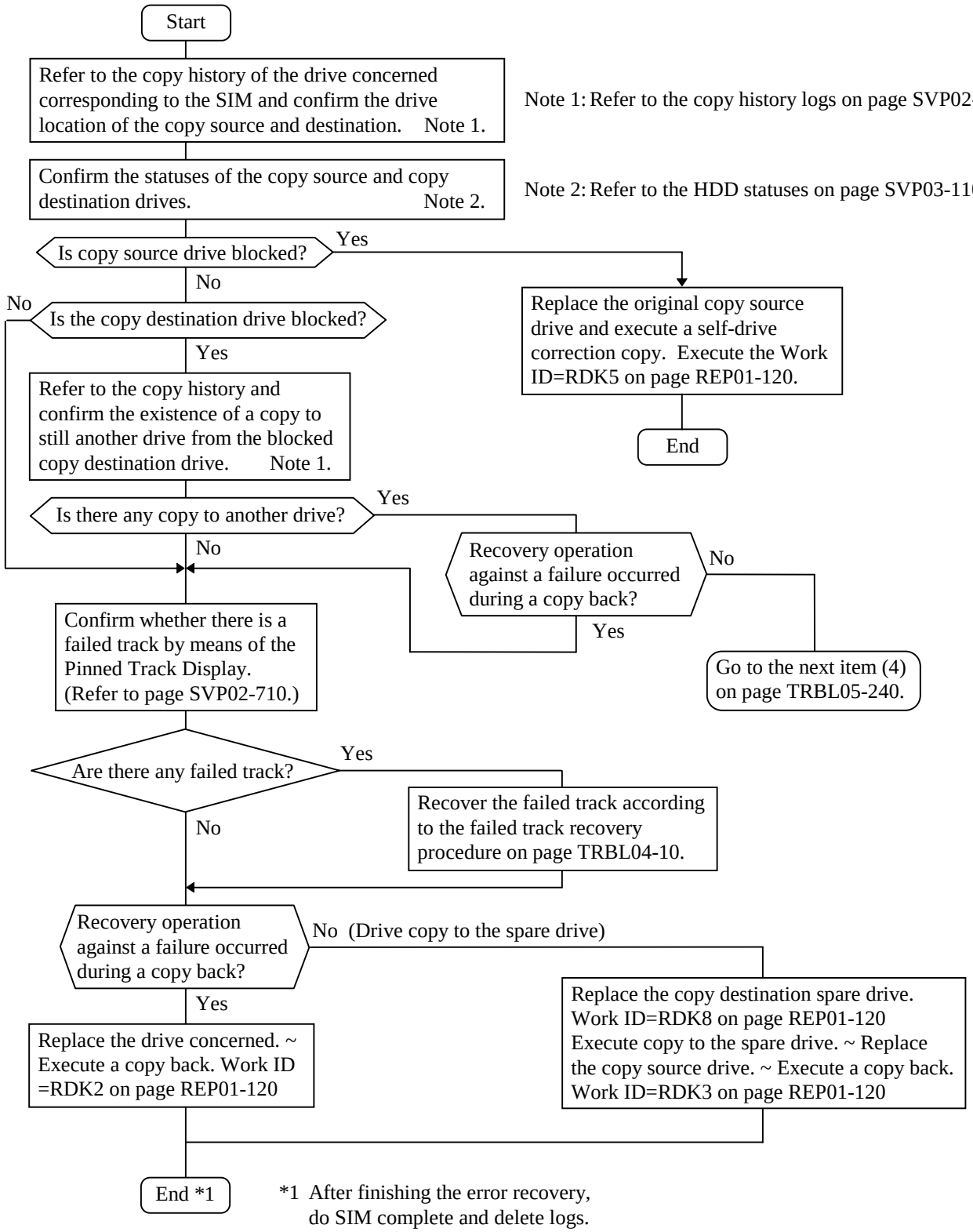
(3) In the case of drive copy abnormal termination

The procedure below is that used when a drive copy or a copy back terminates abnormally.



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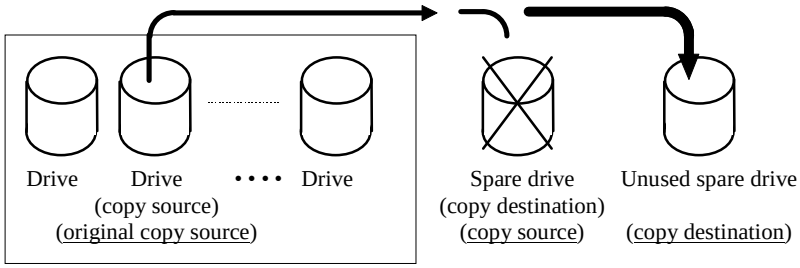
(4) In the case of drive copy abnormal termination (in which an unused spare drive is available)
This is a case in which a drive copy terminates abnormally owing to a failure in the copy destination drive. However, if an unused spare drive exists, the drive copy is automatically performed to the unused spare drive.
In the following procedure, the copy source is referred to as an original copy source, the copy destination is referred to as a copy source, and the unused spare drive is referred to as a copy destination.



Start

Is there a SIM stating that a copy terminated abnormally in the copy source drive? (SIM RC=4621)

No

Is there a SIM stating that a copy terminated normally in the copy source drive? (SIM RC=4620)

No

Is there a SIM stating that a copy terminated in a warned state in the copy source drive? (SIM RC=4624)

No

Yes

Go to Subsection 5.8.2, "In the case of termination with a warning" on page TRBL05-190.

Go to Subsection 5.8.3, "In the case of termination owing to abortion" on page TRBL05-200.

Yes

Yes

Confirm the drive status. Note 1.

Is the original copy source drive blocked?

Yes

No

No

Is the copy destination drive blocked?

Yes

Confirm whether there is a failed track by means of the Pinned Track Display. (Refer to page SVP02-710.)

Is there any failed track?

No

Yes

Recover the failed track according to the failed track recovery procedure on page TRBL04-10.

An automatic correction copy is performed to the copy destination spare drive.

(Since this is an automatic operation, no maintenance operation is required.)

Go to "start" on page TRBL05-170.

Replace the blocked spare drives (copy source and copy destination drives). Execute the Work ID= RDK8 on page REP01-120.

Execute a copy to the spare drive.
~ Replace the copy source drive.
~ Execute a copy back. Execute the Work ID=RDK3 on page REP01-120.

Replace the blocked spare drives (copy source and copy destination drives). Execute the Work ID= RDK8 on page REP01-120.

Replace the original copy source drive and execute a copy back. Execute the Work ID=RDK2 on page REP01-120.

End *1

Note 1
: Confirm the following items.
- Confirm the location of the copy source and copy destination drives referring to the copy history. Refer to the copy history log on page SVP02-145.
- Confirm the statuses of the copy destination and the original copy source drives. Refer to Item (3), HDD status on page SVP03-110.

*1 After finishing the error recovery, do SIM complete and delete logs. (Refer to SVP02-150, 500)

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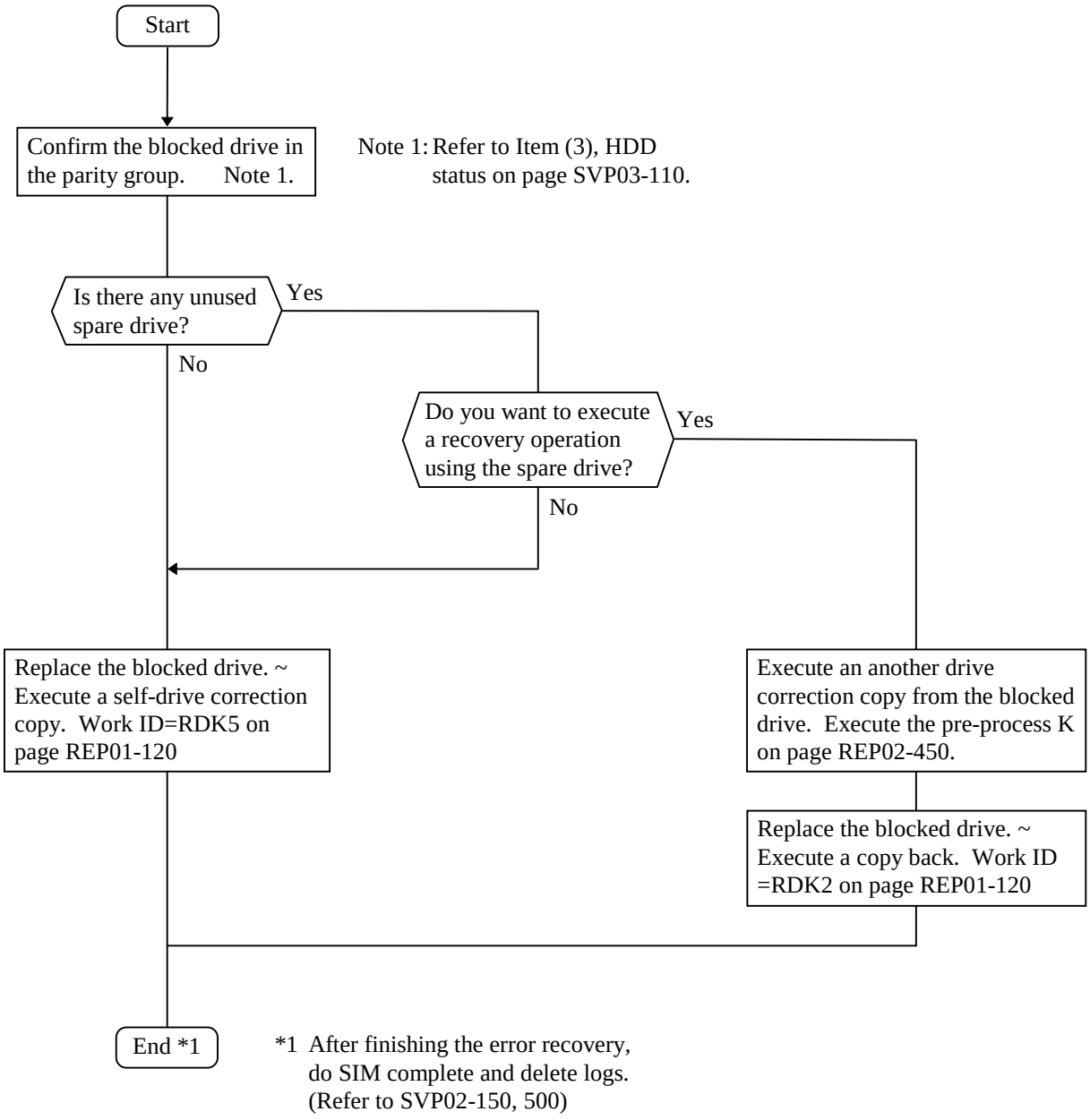
5.8.5 Correction access status

The procedure below is that used when one drive in the parity group is blocked.



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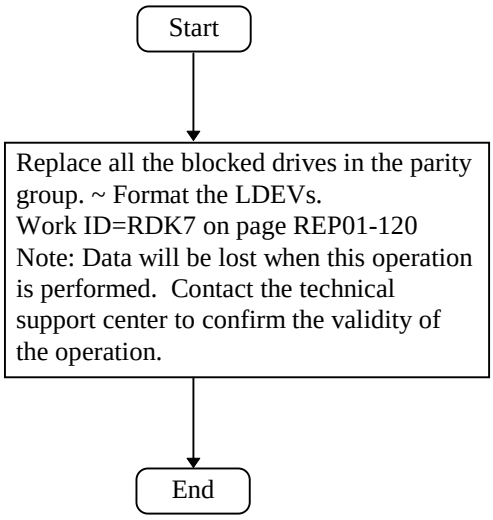
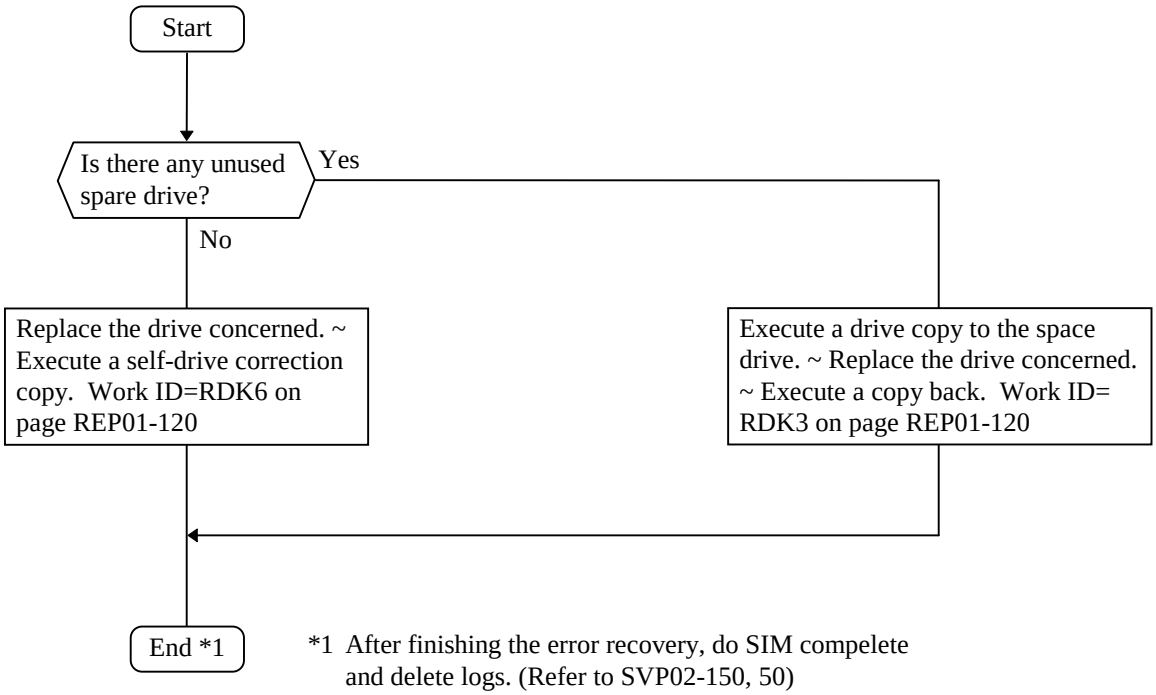
5.8.6 Parity group blockade

The procedure below is that used when the two or more drives are blocked in the parity group.



5.8.7 Preventive maintenance

The procedure below is that used when the drive is not blocked but it must be replaced.



*1 After finishing the error recovery, do SIM compelete and delete logs. (Refer to SVP02-150, 50)

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5.9 Recovery Procedure for SM Capacities Inequality (SIM = FFE3XY)

The mounted SM capacities inequality error (ffe3 xy/FPC = 80000000) should be recovered following the procedure below.
The number of CACHE-1F/CACHE-2G SM modules mounted is set in x/y respectively.
This error occurs if an SM is blocked because the mounted SM capacity differs between CACHE-1F and CACHE-2G (PCBs mounting SM modules). Therefore, the number of SM modules mounted must be adjusted correctly to recover this error.

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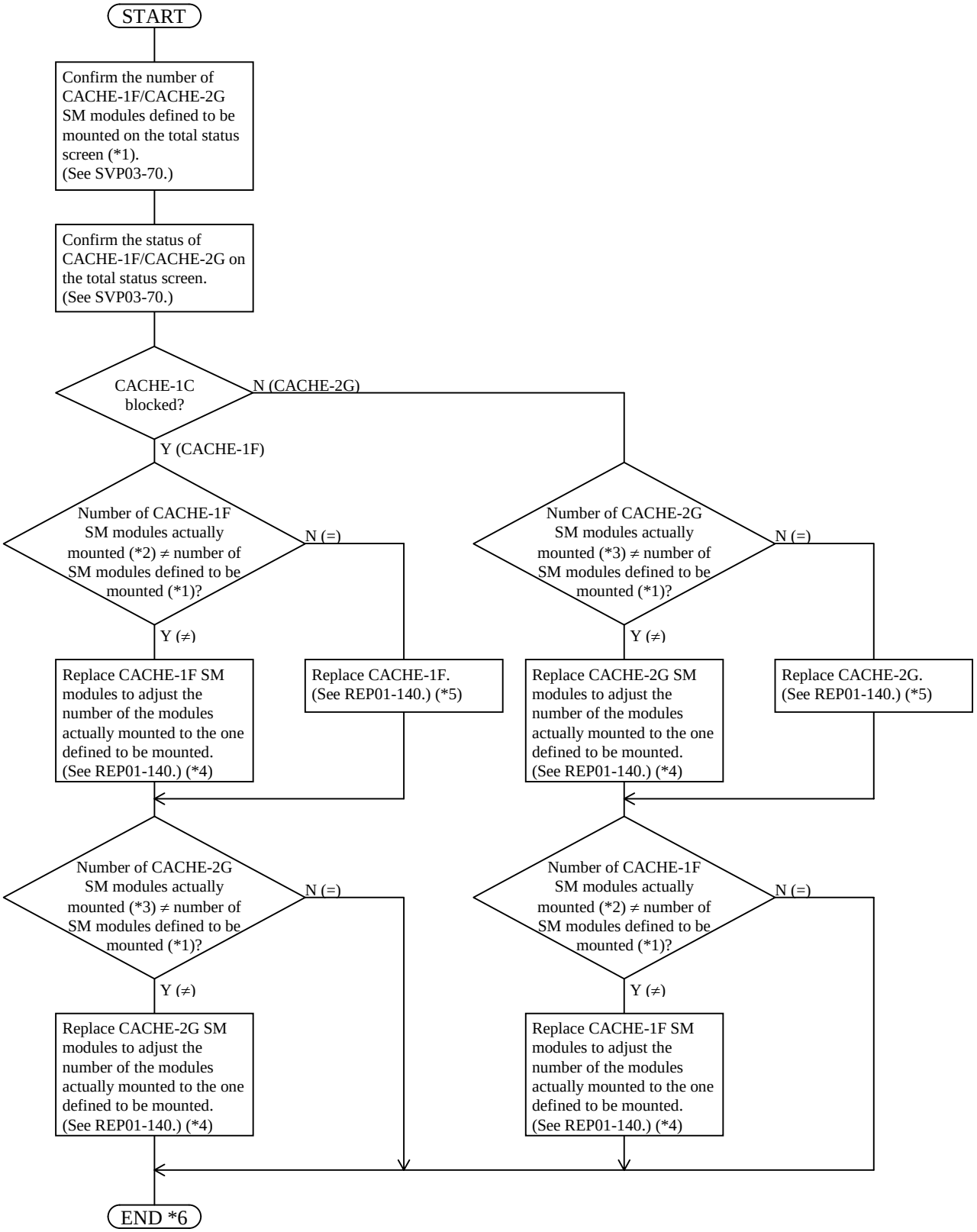

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*1: Number of SM modules indicated not to be “not-mounted” on the status screen.
*2: Value x (number of SM modules) in REF-CD = FFE3xy
*3: Value y (number of SM modules) in REF-CD = FFE3xy
*4: Confirm the number of mounted SM modules to adjust it.
*5: No need to adjust the number of SM modules mounted nor replace any of them.
*6: After finishing the error recovery, do SIM complete and delete logs.
(Refer to SVP02-150, 500)

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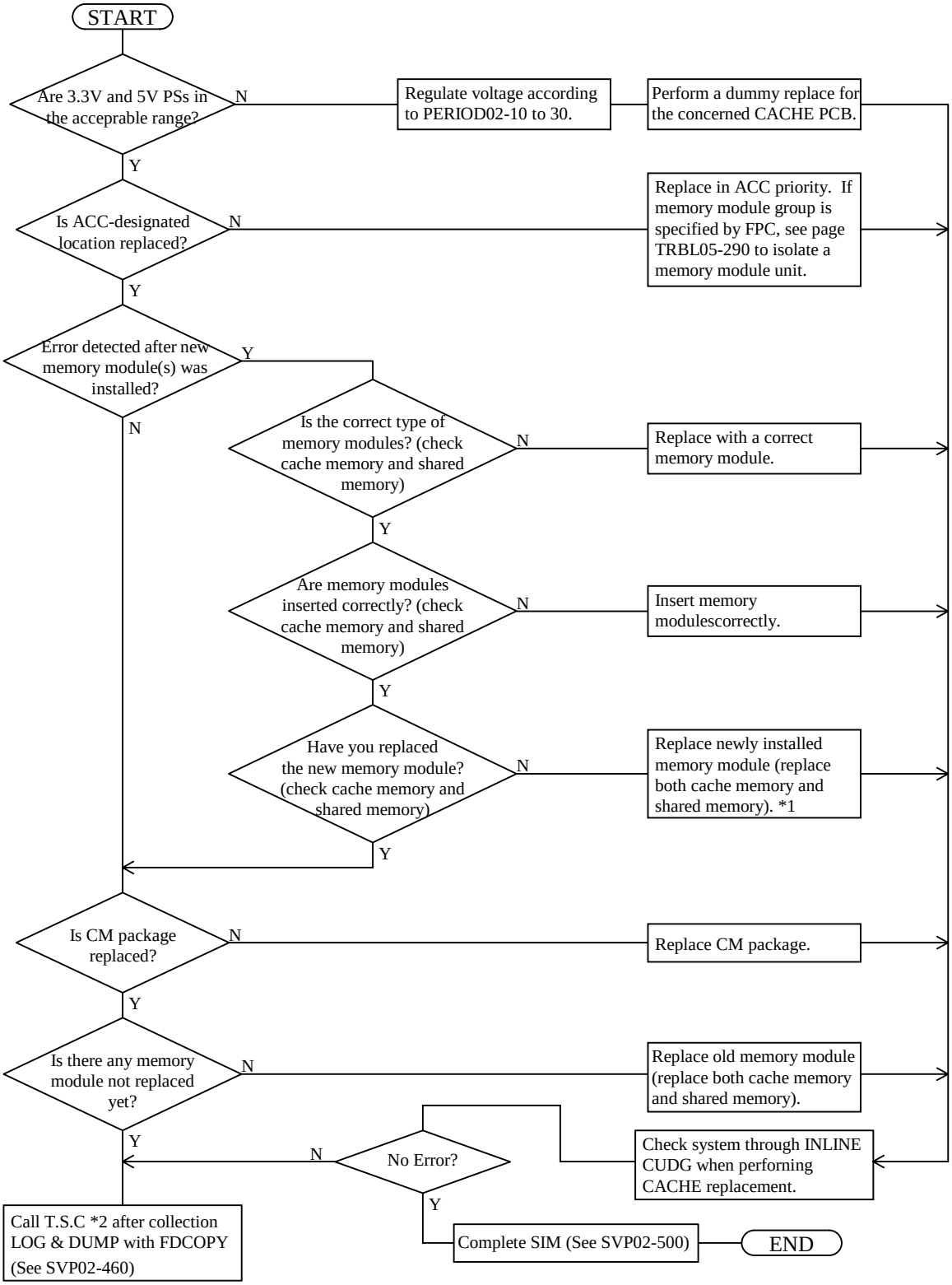
5.10 Cache Memory Error Isolation Procedure (SIM = FFF0XX, FFF1XX, FFF2XX)

(1) Error isolation

Isolate a cache memory or shared memory error according to the procedure given below.



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*1: If there are multiple module groups, replace one by one.
If the symptom is not cleared even after replacement, de-install newly installed memory modules to return to the original configuration.

*2: T.S.C : Technical Support Center

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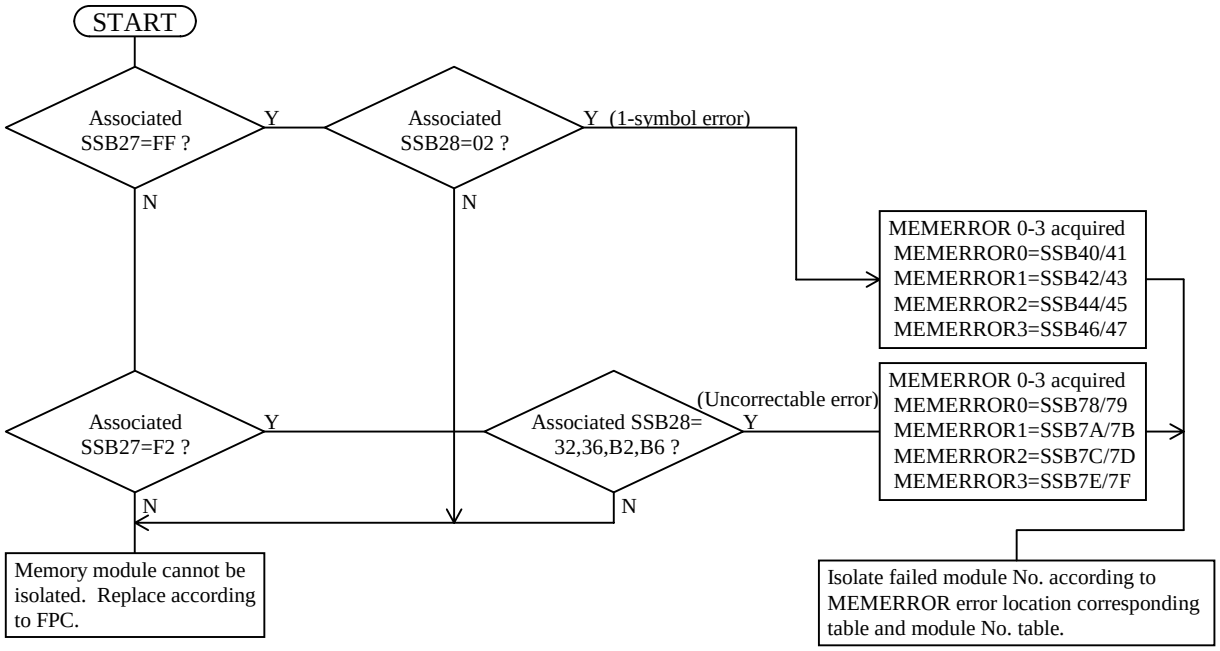
(2) Failed memory isolation procedure

Given below is the procedure for isolating a failed memory module from the associated SSBs in case of a memory error.



Each of MEMERROR 0 to 3 is a piece of information whose size is 2 bytes. For the meaning of each bit of MEMERROR 0 to 3, see the following table which shows relations between MEMERROR 0 to 3 and failed parts.

MEMERROR error location corresponding table

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Module group No			*1	*2	Error byte No. (1) (When uncorrectable error: '11111')					Not used					

*1 Module side No.

*2 0 : Indicates that subsequent error byte No. is invalid.
1 : Indicates that subsequent error byte No. is valid.

Module No. table

Module side No. (Bit 03)	0		1	
Value of Error byte No (Bit05-09) / Module group No. (Bit00-02)	00 ~ 07, 10 (HEX)	08 ~ 0F 11 (HEX)	00 ~ 07,10 (HEX)	08 ~ 0F,11 (HEX)
000	CM00	CM01	CM02	CM03
001	CM10	CM11	CM12	CM13
010	CM20	CM21	CM22	CM23
011	CM30	CM31	CM32	CM33
100	CM40	CM41	CM42	CM43
101	CM50	CM51	CM52	CM53
110	CM60	CM61	CM62	CM63
111	CM70	CM71	CM72	CM73

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Notes:
- Use module group No., module side No., and error byte No. to isolate 1-symbol errors (minimum unit of one module).
- When uncorrectable error, use module group No. and module side No. for isolation (minimum unit of two modules).
- MEMERROR records only 4 words. The system may not recover only by replacing an isolated module. In such a case, replace by unit of module group.

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5.11 Recovery Procedure for LDEV Blocking (SIM = CF90XY, DF9YXX, EF90XX)

When LDEVs are blocked in the case of blocking several PDEVs (SIM RC=EF90xx, DF90xx, DF91xx), or in the case of blocking SCA (SIM RC=CF90XY), perform following recovery procedures.
Be sure to call T.S.C. before you perform PDEV replace. It causes a DATA-LOSS in some cases.
Notice : When you execute a Recovery Procedure for LDEV Blocking, you must delete the HRC/HODM pair.
After recovering it, if necessary, you execute establish pair.

SIM FC=EF90, DF90, DF91,CF90

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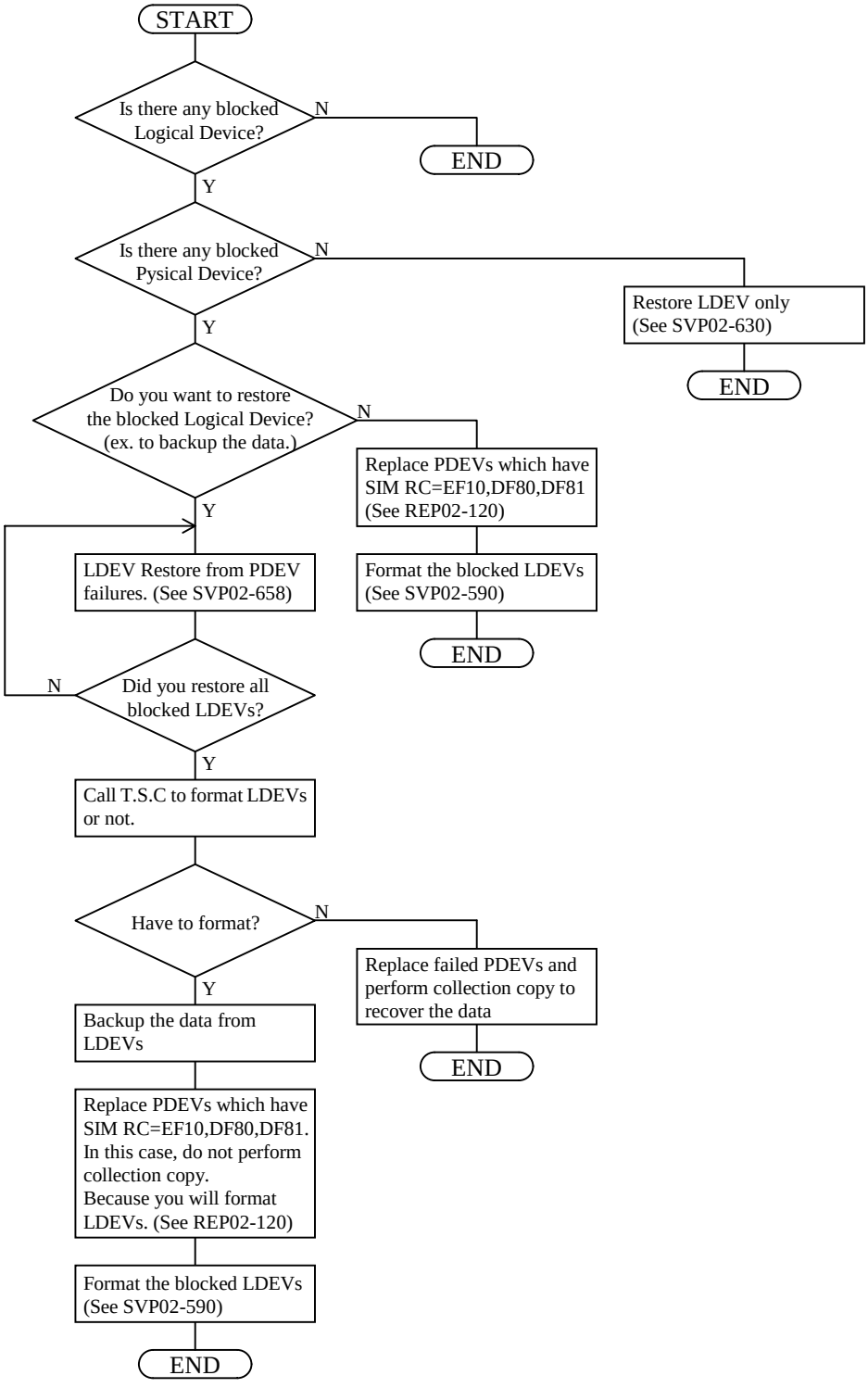

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5.12 Voltage alarm (SIM = BF2XYY)

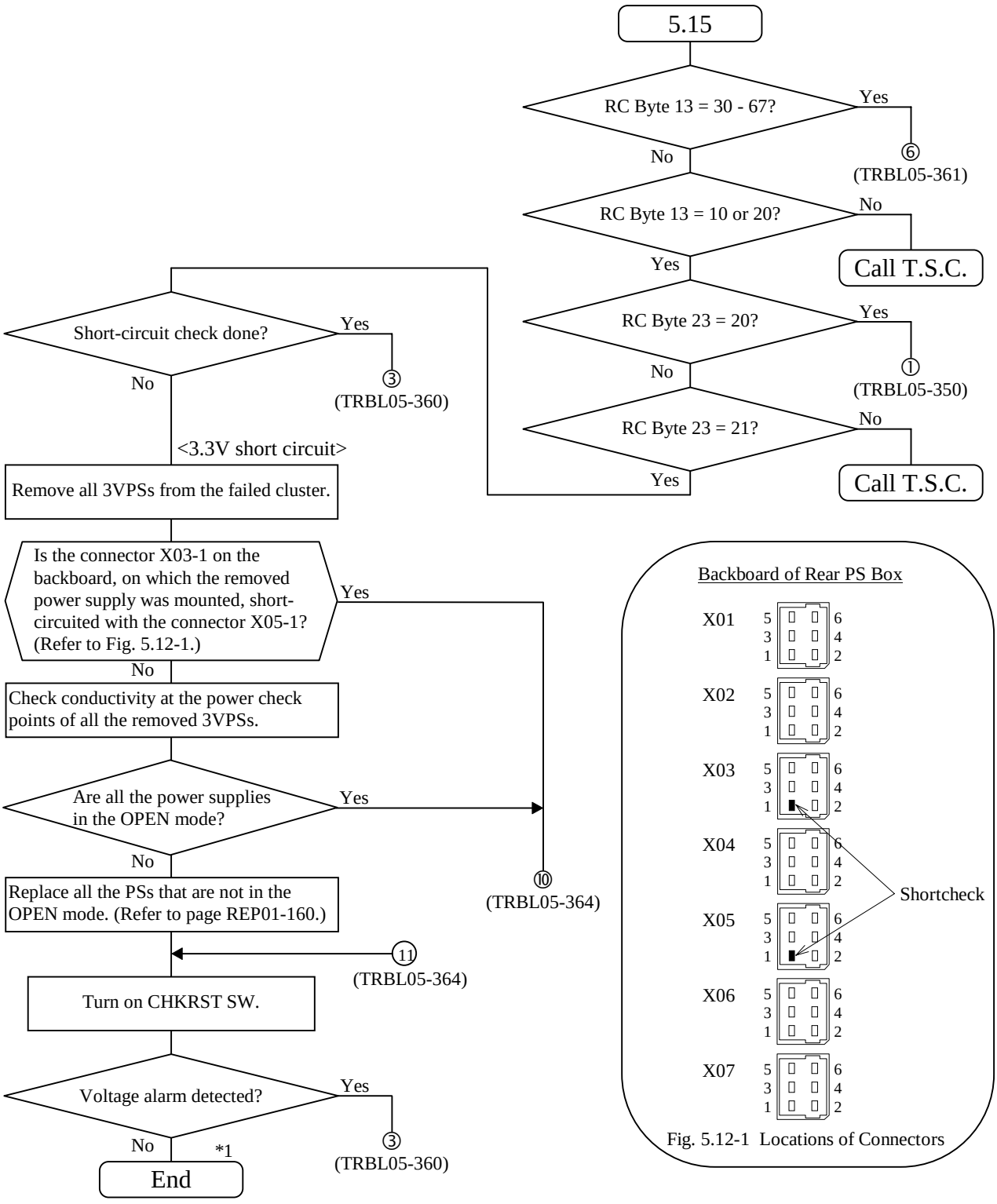

Fig. 5.12-1 Locations of Connectors

*1: If you finish the maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500.)
*2: Confirm that the failed cluster is inactive, prior to checking short-circuit.

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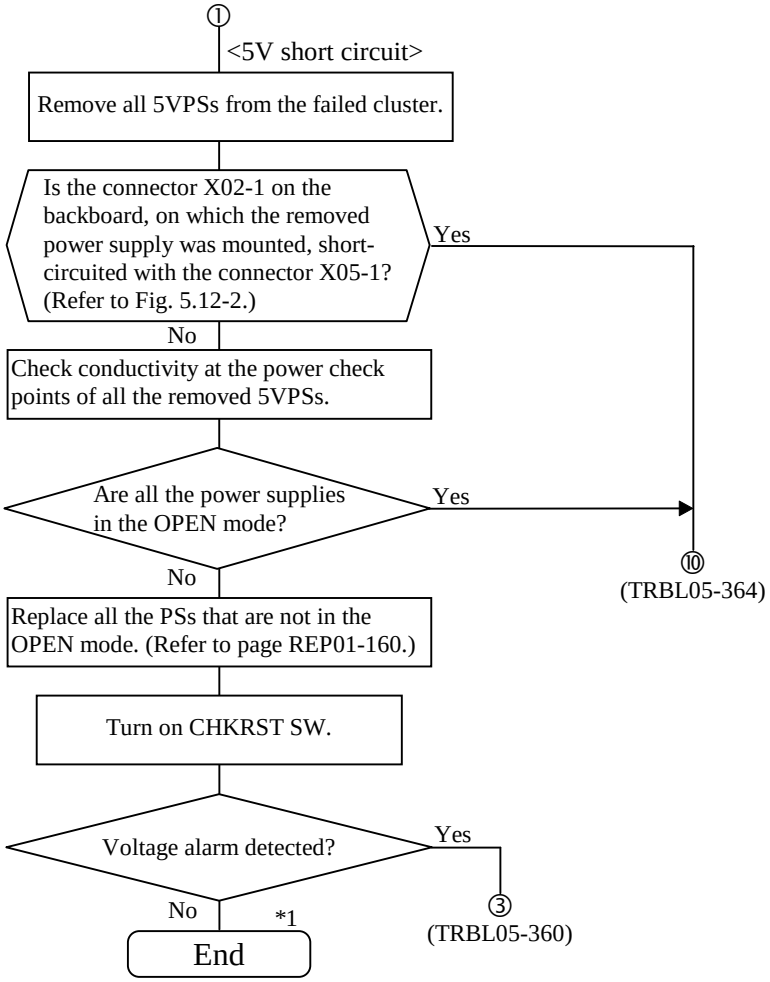

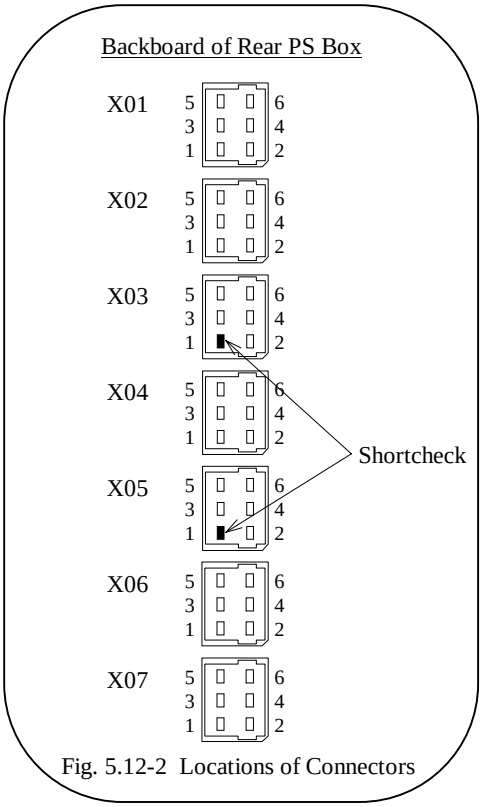

Fig. 5.12-2 Locations of Connectors

*1 : If you finished the maintenance, delete the log and SIM complete.(Refer to SVP02-150, 500.)

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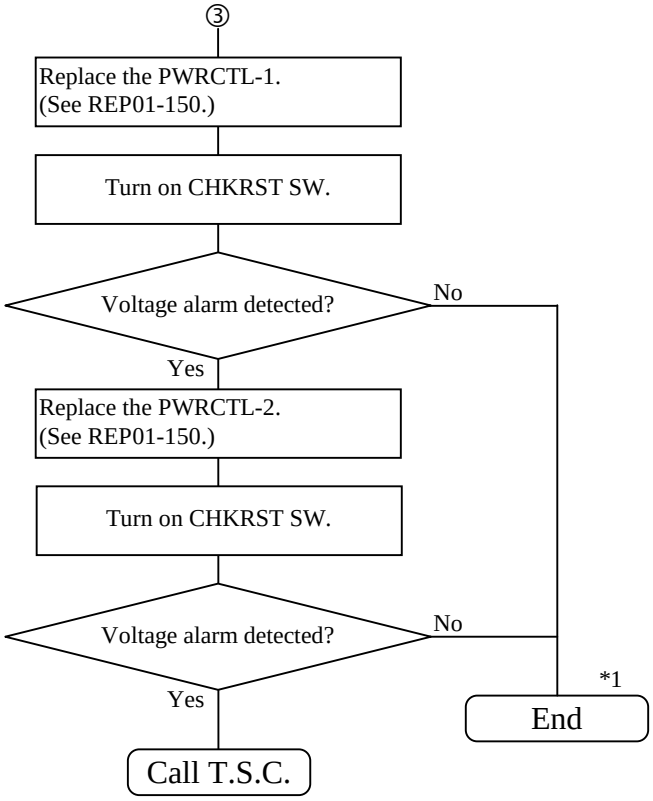

*1 : If you finished the maintenance, delete the log and SIM complete.(Refer to SVP02-150, 500.)

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Figure 5.12-3 Pin No. of DKUMN cable

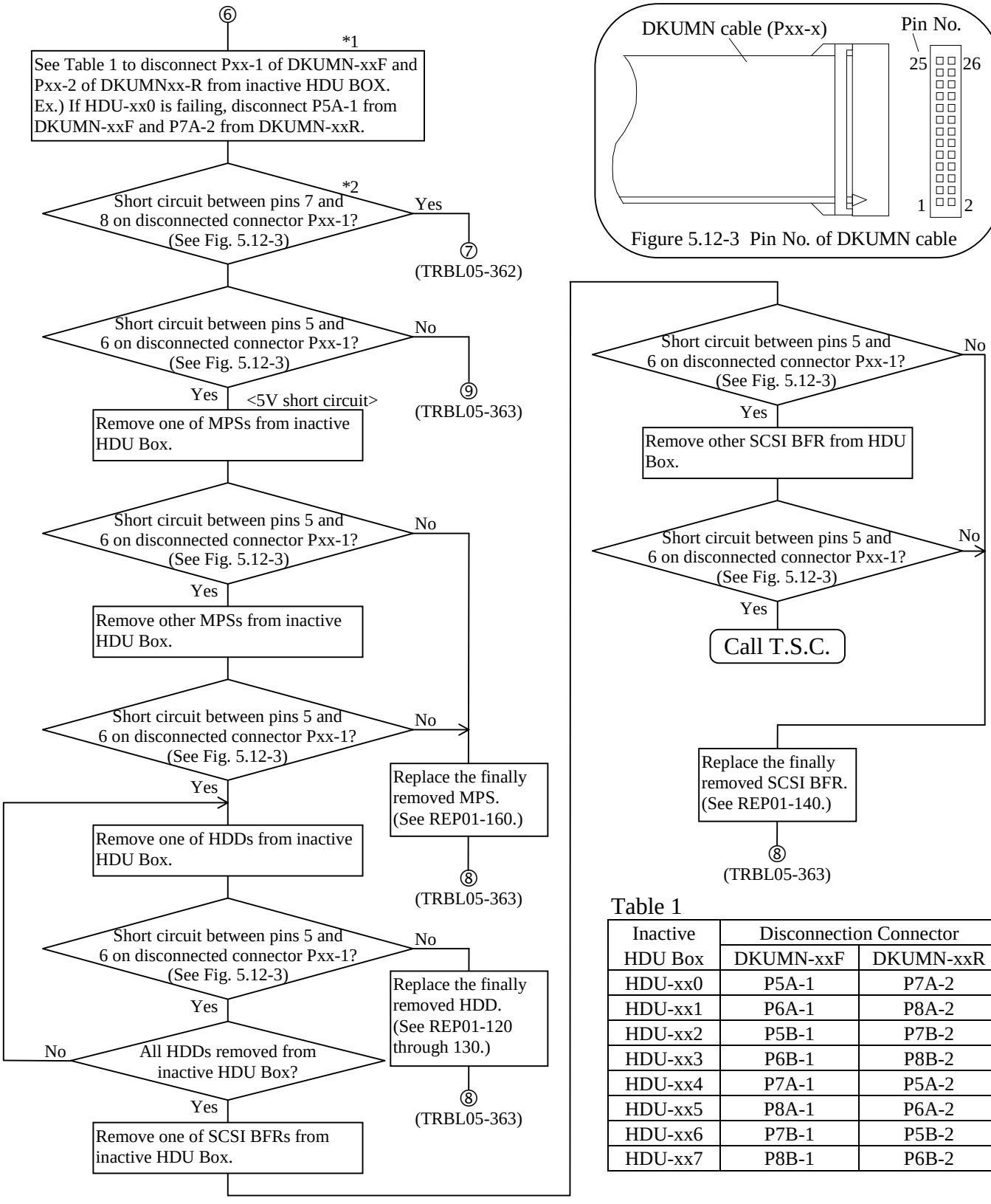

Table 1

Inactive HDU Box	Disconnection Connector	
	DKUMN-xxF	DKUMN-xxR
HDU-xx0	P5A-1	P7A-2
HDU-xx1	P6A-1	P8A-2
HDU-xx2	P5B-1	P7B-2
HDU-xx3	P6B-1	P8B-2
HDU-xx4	P7A-1	P5A-2
HDU-xx5	P8A-1	P6A-2
HDU-xx6	P7B-1	P5B-2
HDU-xx7	P8B-1	P6B-2

*1: When a connector is removed, SIM is detected in several. If you finish the maintenance, delete the log and SIM complete (Refer to SVP02-150, 500).

*2: Confirm that the failed HDU Box is inactive, prior to checking short-circuit.

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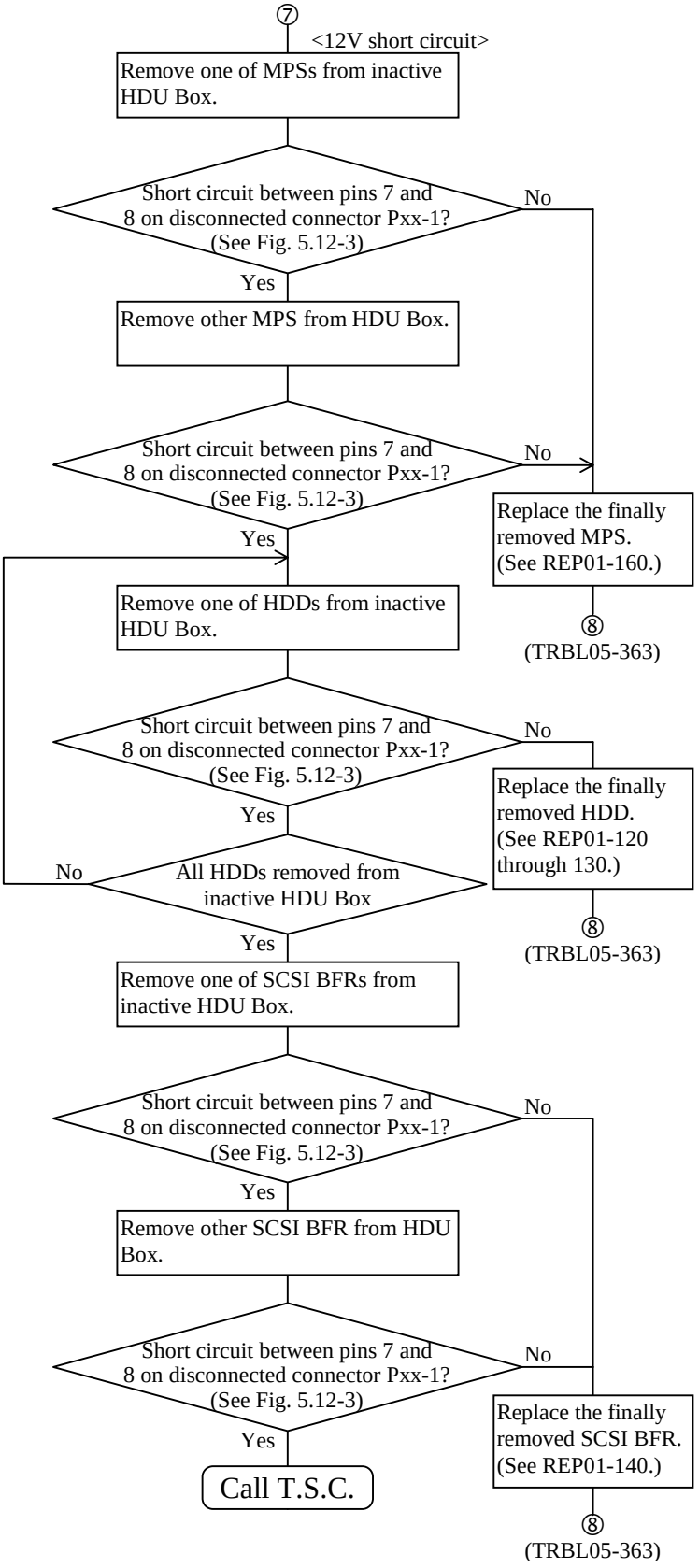

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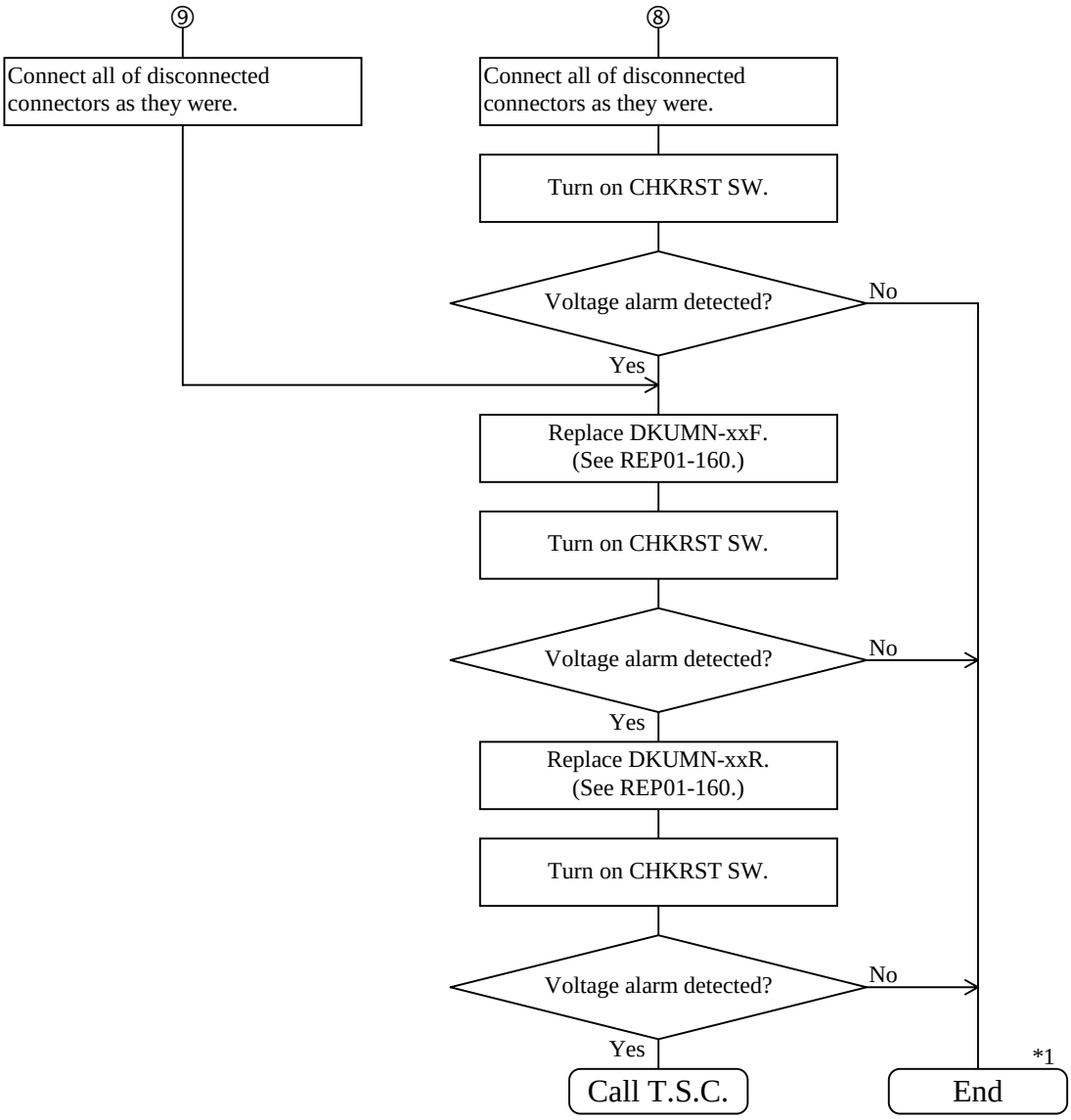

*1: If you finish the maintenance, delete the log and SIM complete. (Refer to SVP02-150, 500.)

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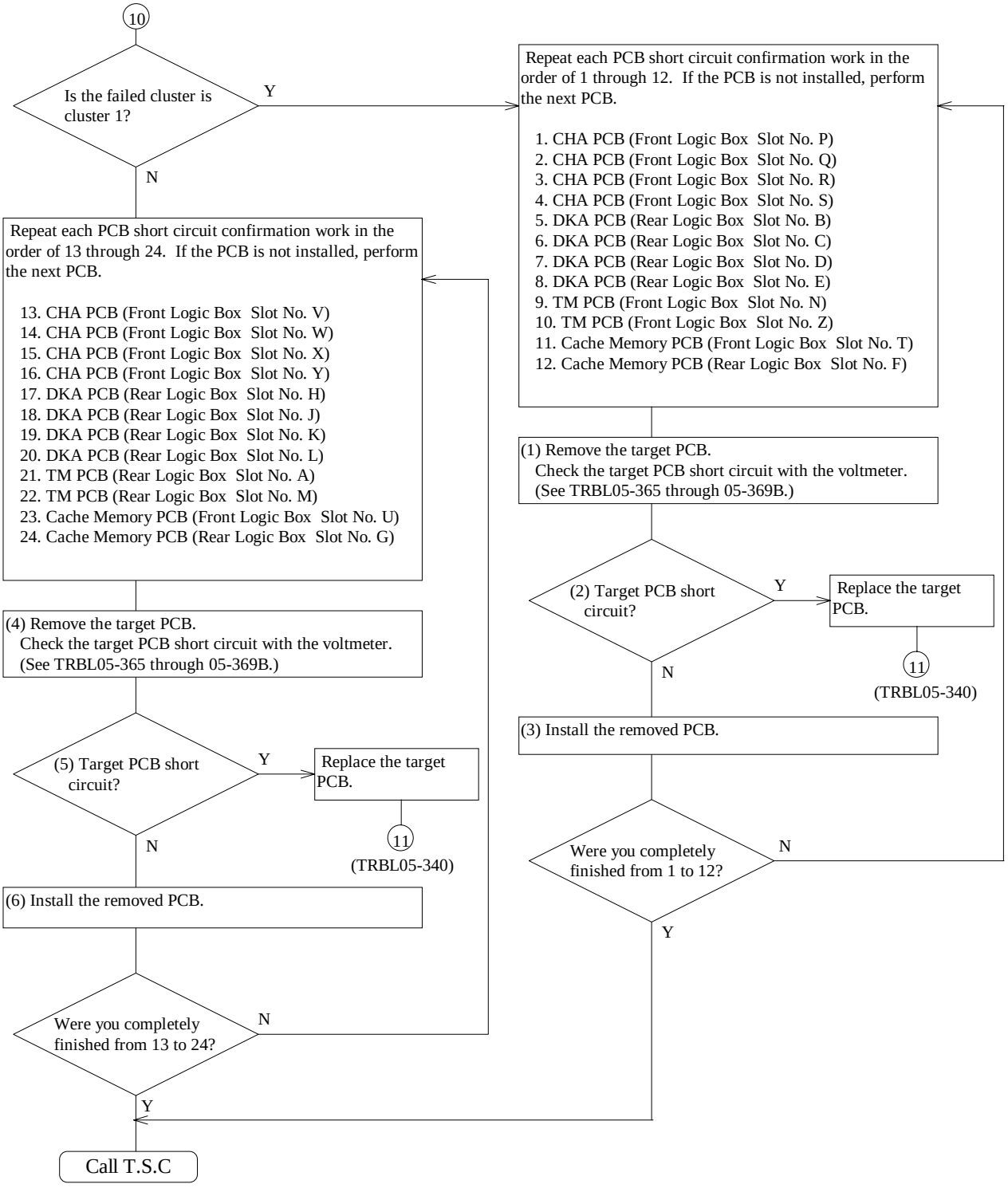

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SCSI 4-port Adapter PCB (WP204)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Point (GND)	Part Name	Normal Value
1	@5V	C232-1 (Sub-edge side)	C232-2 (Main-edge side)	Chip Condenser	100Ω or more
2	@5V(BTL)	C321-1 (Main-edge side)	C321-2 (Sub-edge side)	Chip Condenser	100Ω or more
3	@3V	C215-1 (Main-edge side)	C215-2 (Sub-edge side)	Chip Condenser	100Ω or more

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Fibre 2-port Adapter PCB (WP206)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Point (GND)	Part Name	Normal Value
1	@5V	C231-1 (Sub-edge side)	C231-2 (Main-edge side)	Chip condenser	100Ω or more
2	@5V(BTL)	C352-1 (Main-edge side)	C352-2 (Sub-edge side)	Chip condenser	100Ω or more
3	@3V	C228-1 (Main-edge side)	C228-2 (Sub-edge side)	Chip condenser	100Ω or more

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Parallel 4-channel Switch PCB (WP207)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Point (GND)	Part Name	Normal Value
1	@5V	06DR-20 PIN	06DR-10 PIN	TTL-IC	4Ω or more after 5 seconds
2	@5V(BTL)	C375-1	C375-2	Chip condenser	4Ω or more after 5 seconds
3	@3V	06CR-14 PIN	06CR-7PIN	TTL-IC	4Ω or more after 5 seconds

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DKA PCB (WP102)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Point (GND)	Part Name	Normal Value
1	@5V	28T-14PIN	28T-7 PIN	TTL-IC	100Ω or more after 5 seconds
2	@5V(BTL)	C644 (Sub-edge side)	C644(Main-edge side)	Chip condenser	100Ω or more after 5 seconds
3	@3V	17QR-20 PIN	17QR-10 PIN	TTL-IC	100Ω or more after 5 seconds

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Cache Memory PCB (WP108)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Part Name	Point (GND)	Part Name	Normal Value
1	@5V	Q385-3	2SK1622(FET)	29M-7	74LS02(TTL)	1KΩ or more
2	@5V(BTL)	Q374-3	2SK1622(FET)	29M-7	74LS02(TTL)	1KΩ or more
3	@3V	Q367-3	2SK1622(FET)	29M-7	74LS02(TTL)	1KΩ or more
4	@3VSM	Q2-3	2SK1622(FET)	29M-7	74LS02(TTL)	1KΩ or more
5	@3VCM	Q8-3	2SK1622(FET)	29M-7	74LS02(TTL)	1KΩ or more

FET PIN No.

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TM PCB (WP105)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Point (GND)	Part Name	Normal Value
1	@5V	C921 (Main-edge side)	C921 (Sub-edge side)	Chip condenser	100Ω or more after 5 seconds
2	@5V(BTL)	R403 (Main-edge side)	R403 (Sub-edge side)	Chip resistor	100Ω or more after 5 seconds
3	@3V	C483 (Main-edge side)	C483 (Sub-edge side)	Chip condenser	0.5Ω or more after 5 seconds

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TM PCB (WP100)

The check points of the PCB short circuit are shown in the following table.

No.	Voltage	Point (VCC)	Point (GND)	Part Name	Normal Value
1	@5V	C36 (Main-edge side)	C36 (Sub-edge side)	Chip condenser	100Ω or more after 5 seconds
2	@5V(BTL)	R127 (Main-edge side)	R127 (Sub-edge side)	Chip resistor	100Ω or more after 5 seconds
3	@3V	C175 (Main-edge side)	C175 (Sub-edge side)	Chip condenser	0.5Ω or more after 5 seconds

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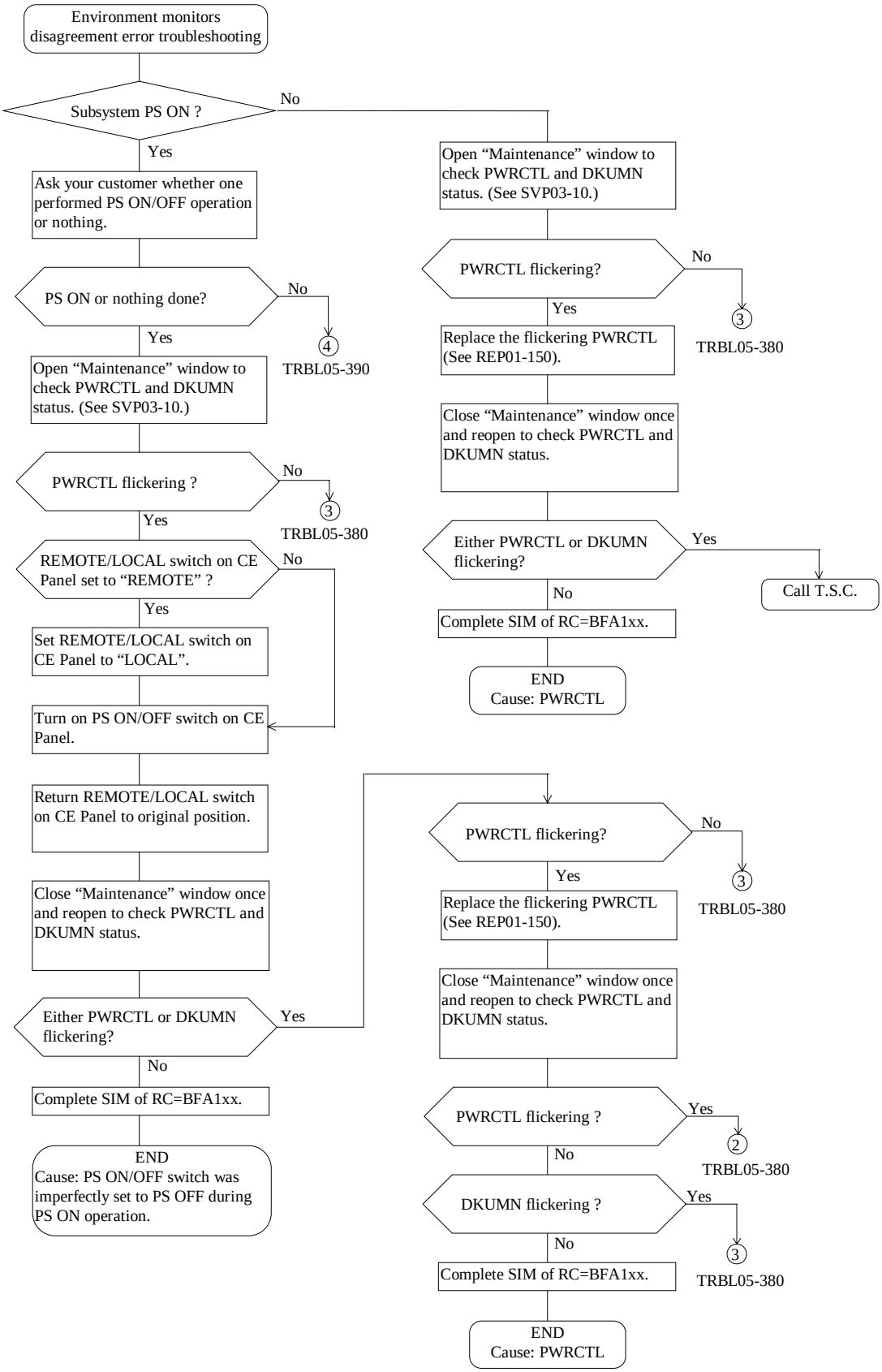
5.13 Environment monitors disagreement error (SIM = BFA1XX)



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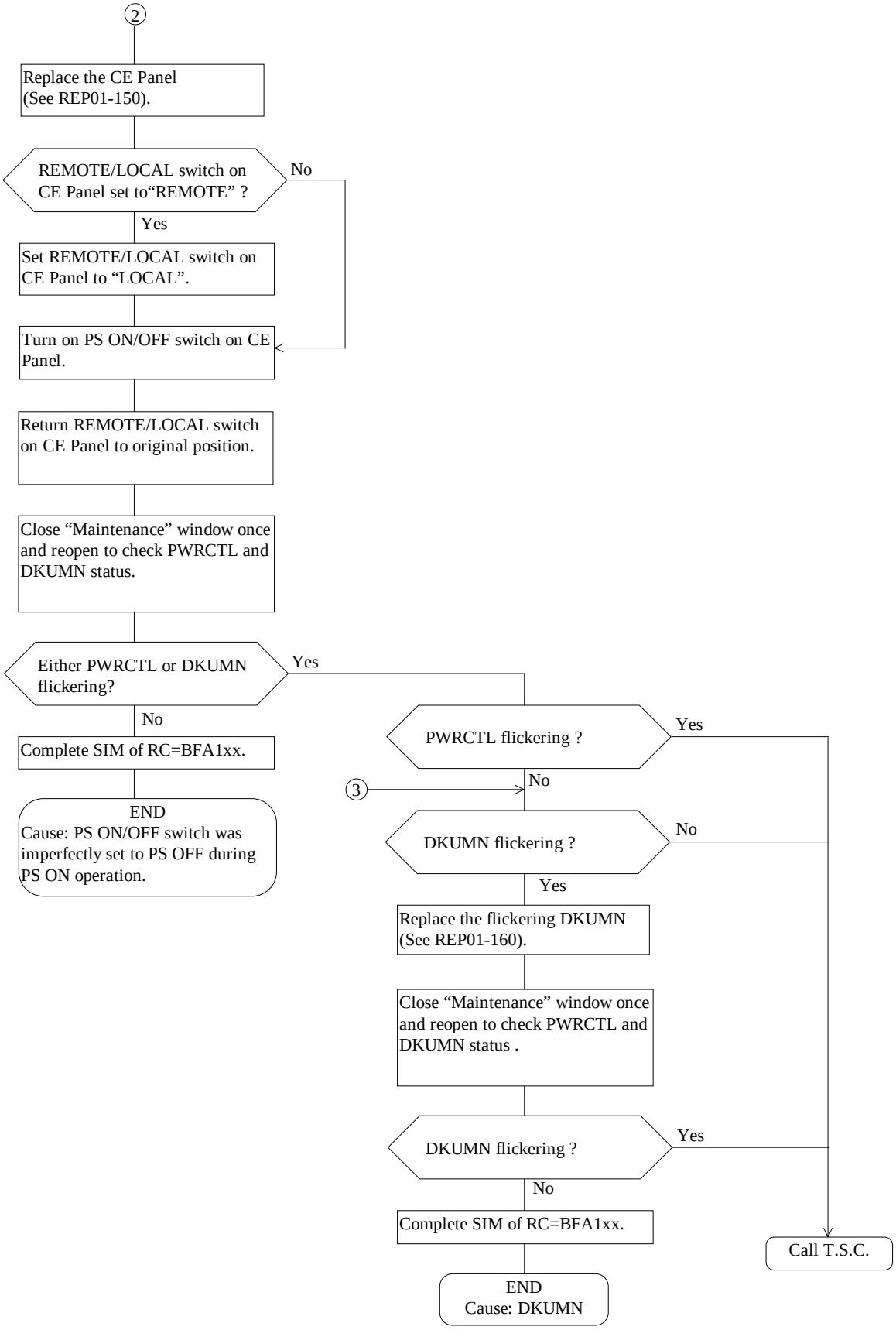

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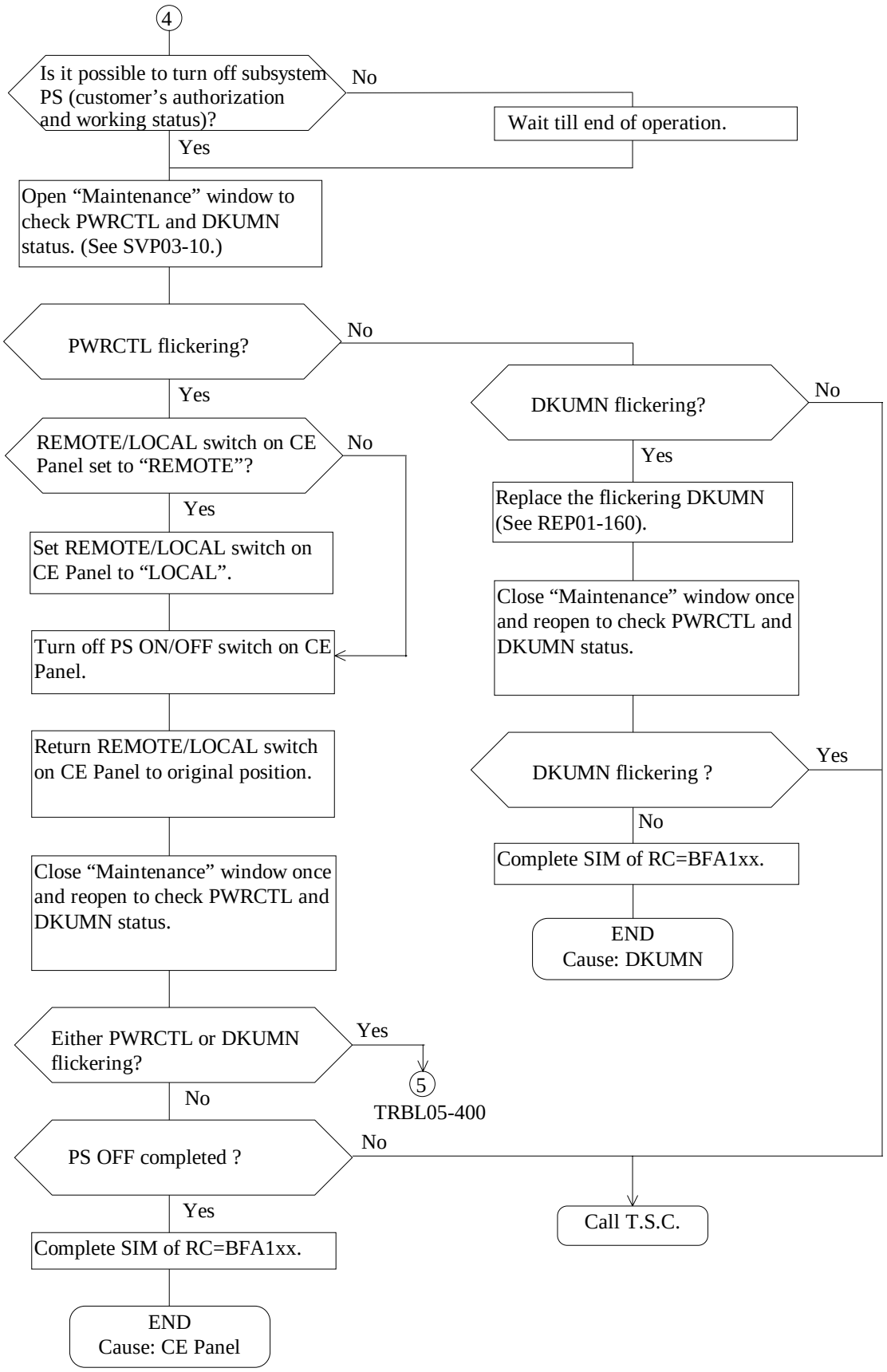

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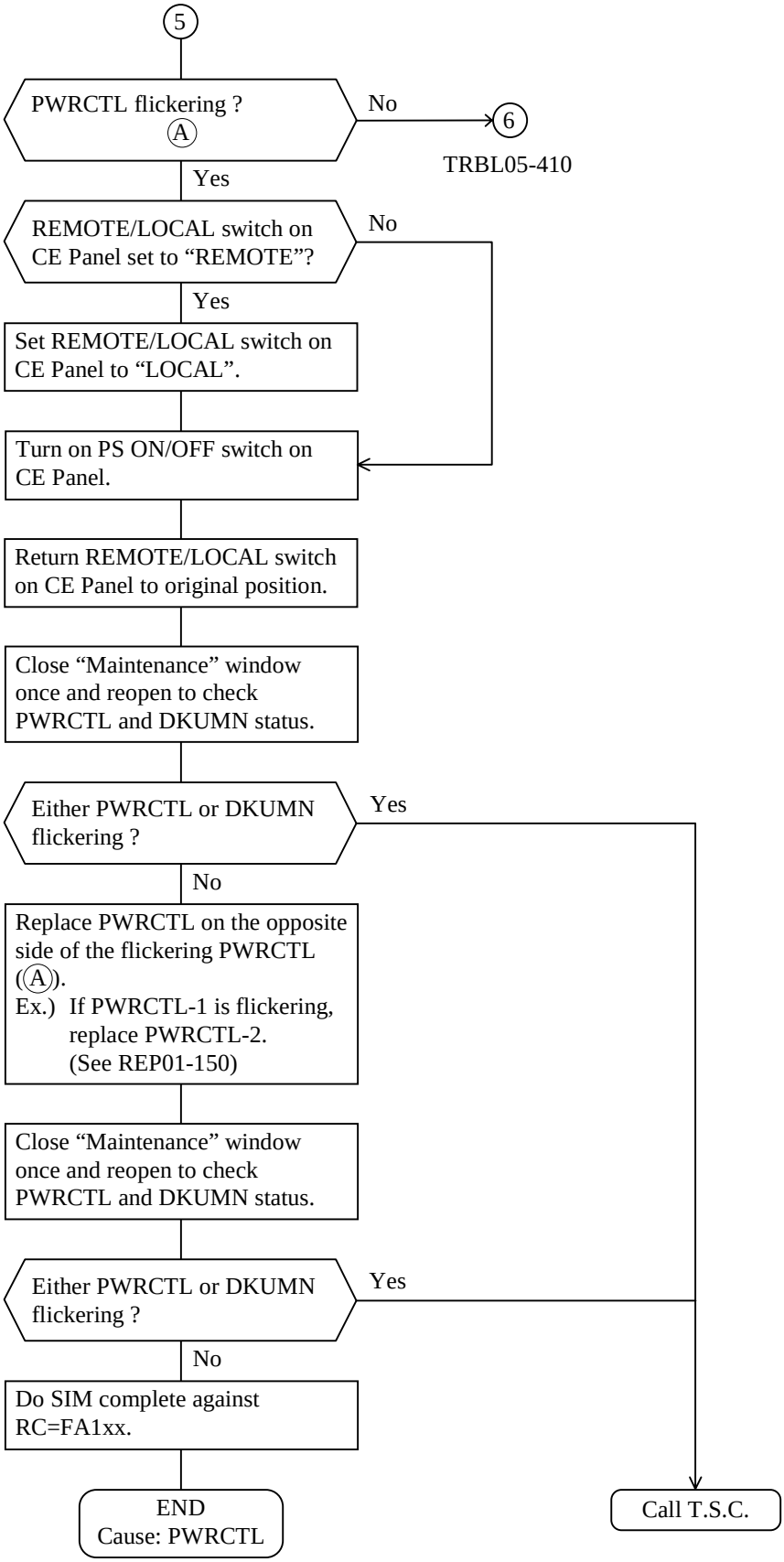

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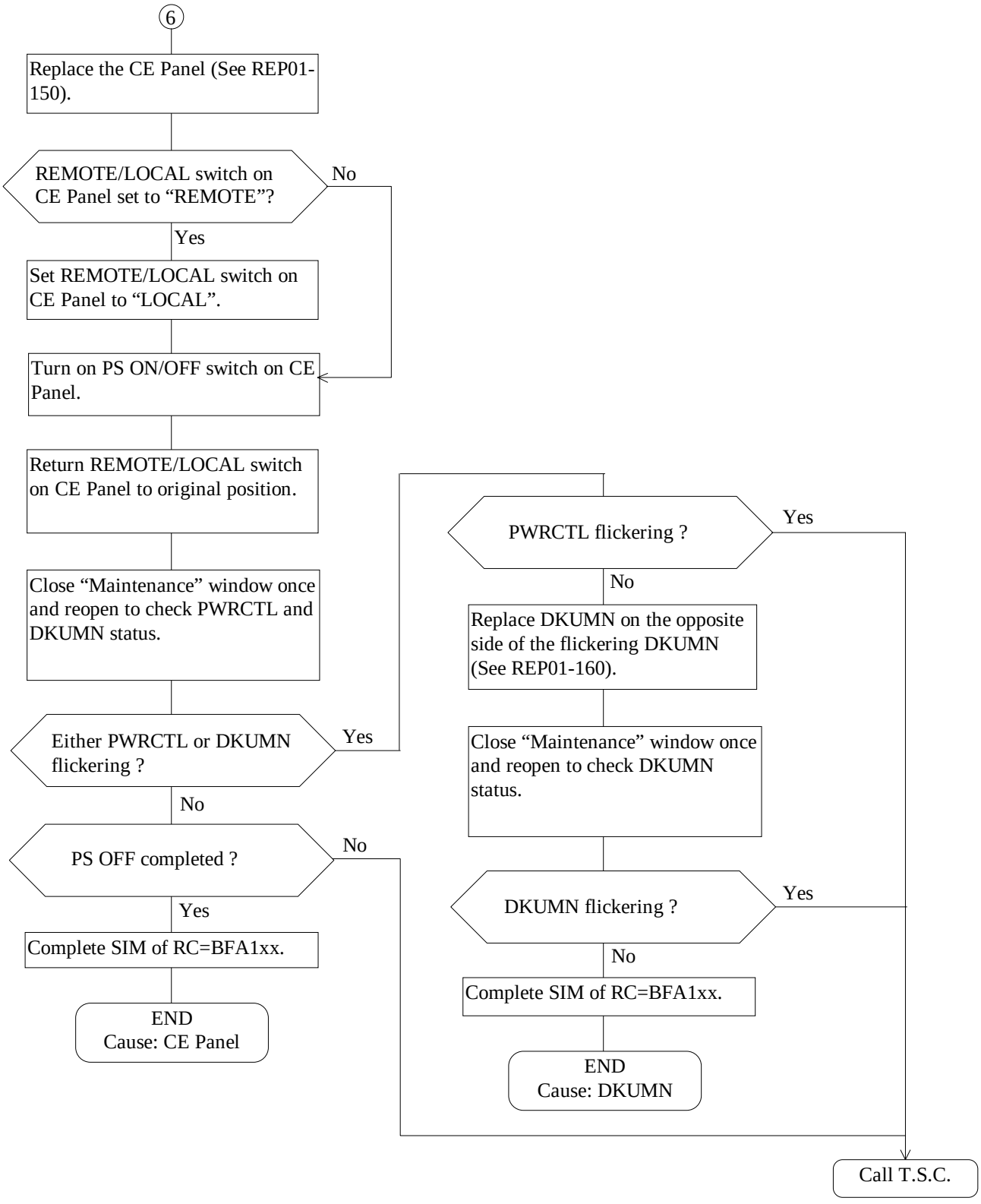

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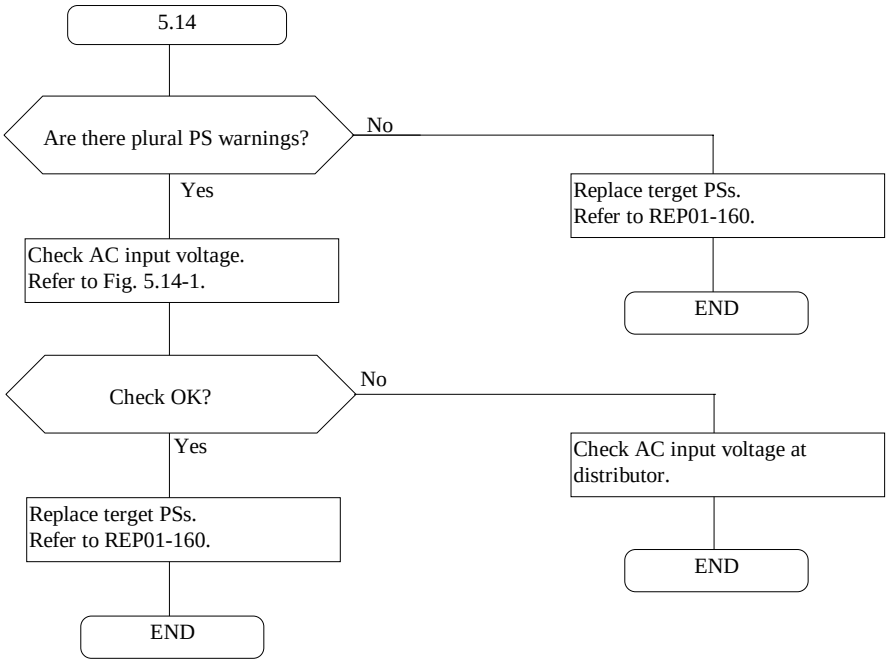
5.14 PS warning error (SIM=BF4XXX)



[AC Input voltage check]

a. Remove the INLET cable of target PS.
b. Measure AC Input voltage at INLET cable.

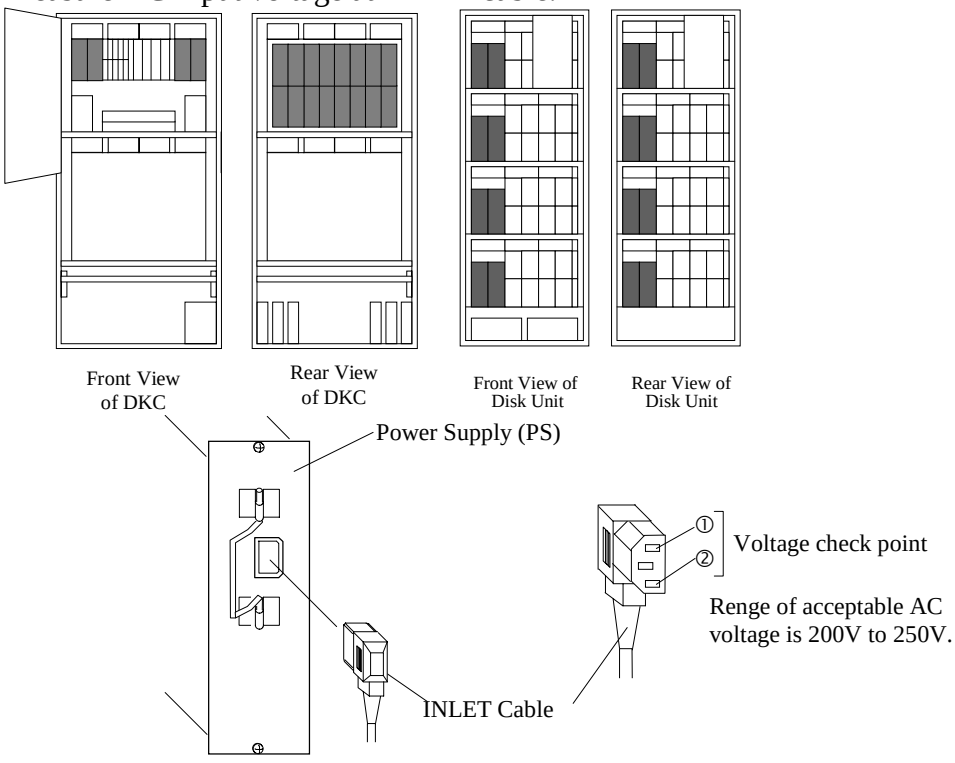


Fig. 5.14-1 AC Input Voltage Check

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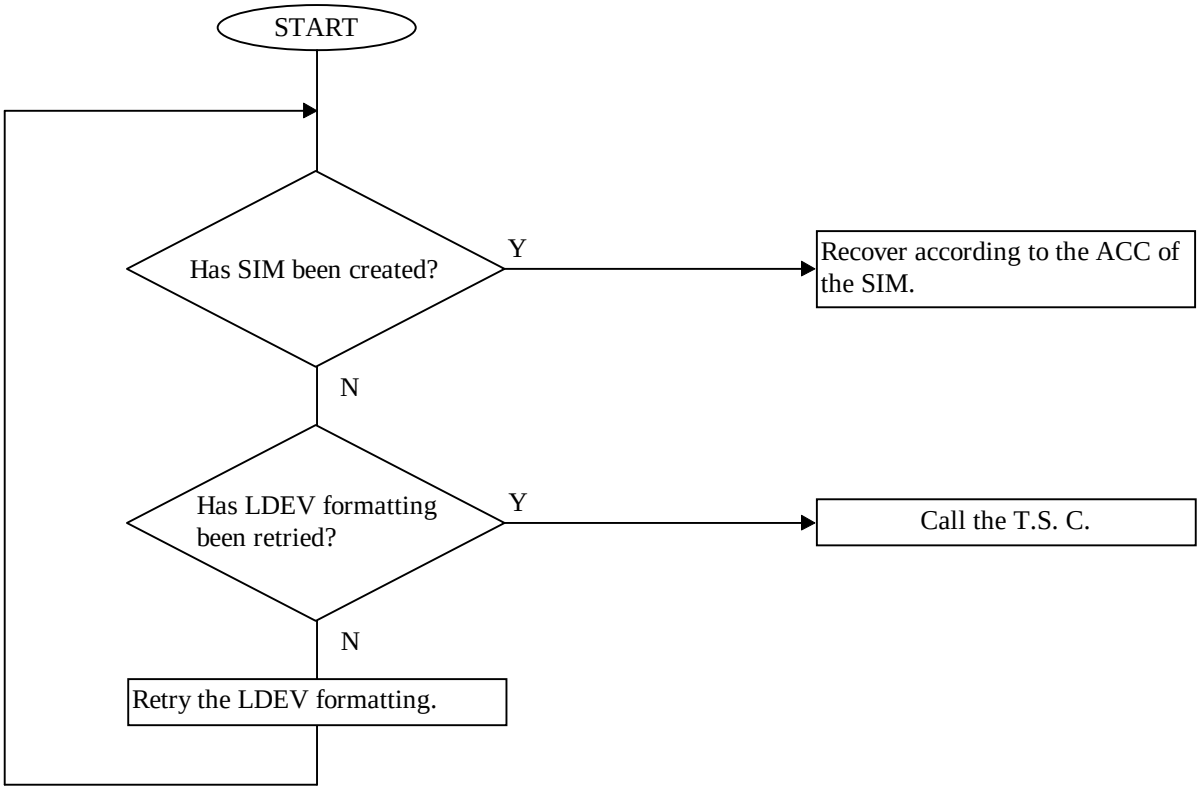
5.15 Recovery procedure when LDEV formatting failed

When “Formatting logical devices rejected by DKC.” or “Formatting the logical device is failed.” is displayed at the end of the LDEV formatting and when “Blocked” is displayed for the LDEV formatted by “Logical Device Status”, make a recovery according to the following procedure.



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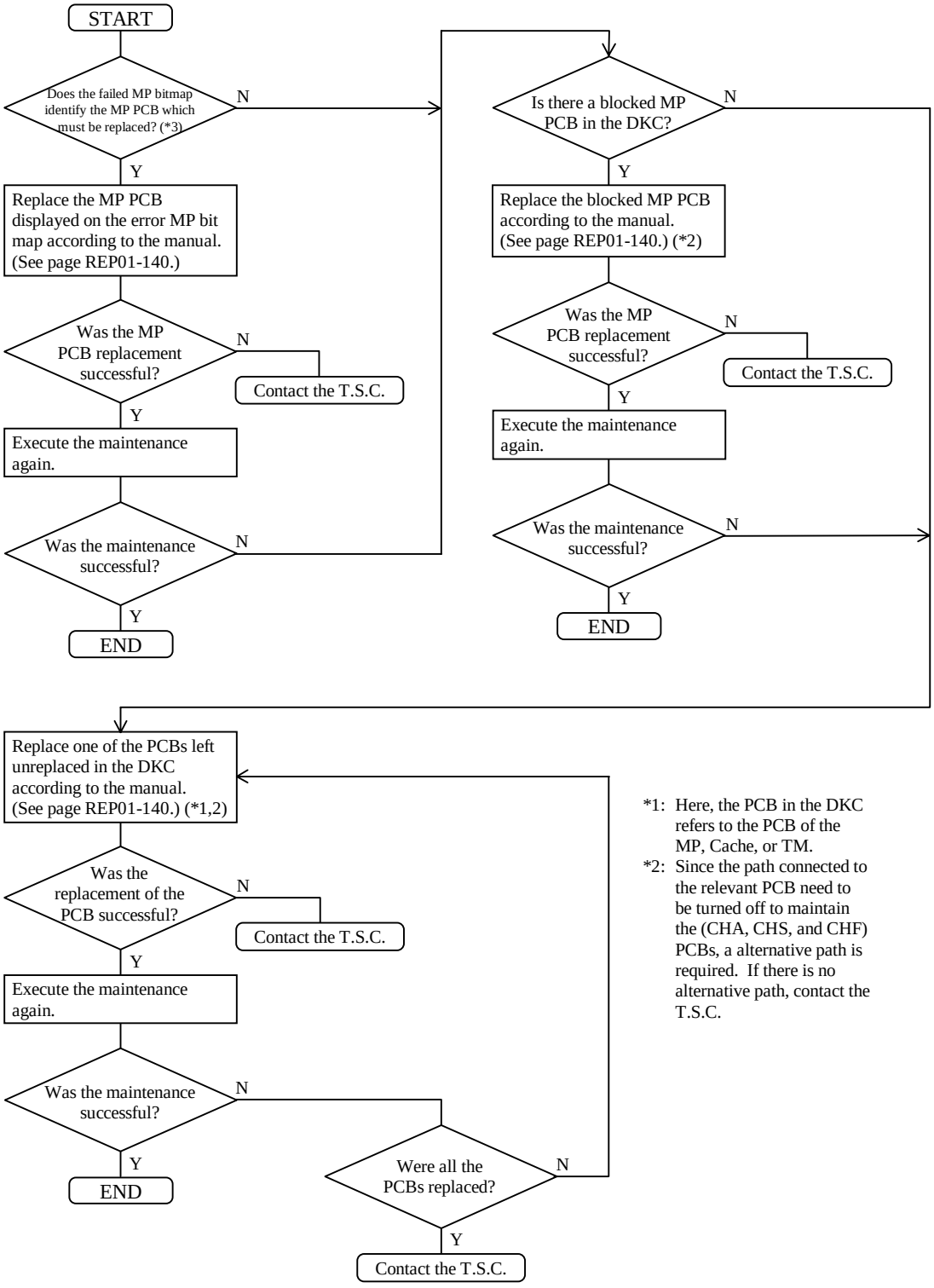
5.16 Recovery procedure when an error code is reported during bus maintenance

The recovery procedure when an error codes 7, 8, 9, A, B, or C is reported during bus maintenance is shown below.



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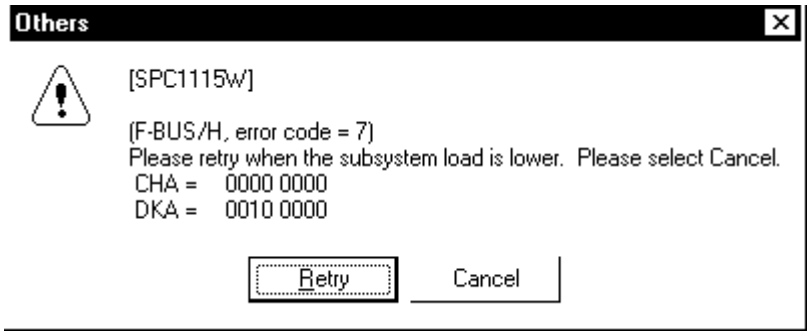
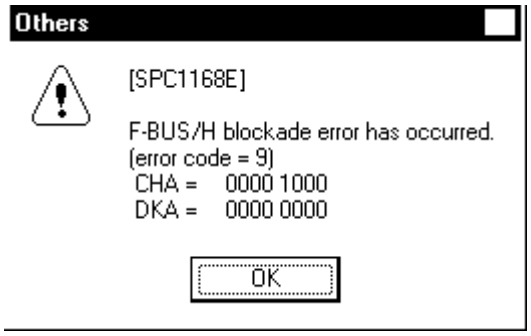
*3: When the failed MP bitmap is supported, the indications to report the error code 7, 8, 9, A, B, or C in the maintenance of the bus system are as follows.

(1) When the error code is 7 or 8



(2) When the error code is 9, A, B, or C



A guide to refer to the failed MP bitmap is shown below.

CHA =	CHA-1P	CHA-1Q	CHA-1R	CHA-1S	CHA-2V	CHA-2W	CHA-2X	CHA-2Y
DKA =	DKA-1B	DKA-1C	DKA-1D	DKA-1E	DKA-2H	DKA-2J	DKA-2K	DKA-2L

In the area corresponding to each MP PCB, “1” or “0” is displayed. When “1” is displayed, it shows that the MP PCB concerned must be replaced.

How to identify the MP PCB which must be replaced
When the error code is 7 or 8: If the appointed failed part is unchanged after performing retries three times, the requirement is needed.
When the error code is 9, A, B, or C: The MP PCB appointed in the bitmap must be replaced.
When not more than two MP PCBs must be replaced, they are considered to be identifiable.

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5.17 Recovery procedure when WDCP information is lost

(1) When only this SIM is reported
When this SIM is reported at the time of the subsystem powering on 192 hours or more after the previous breaker turning off, no maintenance is required.
When this SIM is reported at the time of the subsystem powering on less than 192 hours after the previous breaker turning off, (a) failure(s) may occur in the cache PCB, cache memory, battery, or battery charge. Replace the failed part(s).

(2) When another SIM is reported together with this SIM
When the SIM concerning the cache, shared memory, or battery, perform the maintenance of the failed part(s).
When the SIM not concerning the above is reported at the same time, perform the maintenance of the failed part(s) and see "(1) When only this SIM is reported".

(3) WDCP system recovery procedure
For the procedure for recovering the WDCP system, see the instruction manual of the OS concerned.

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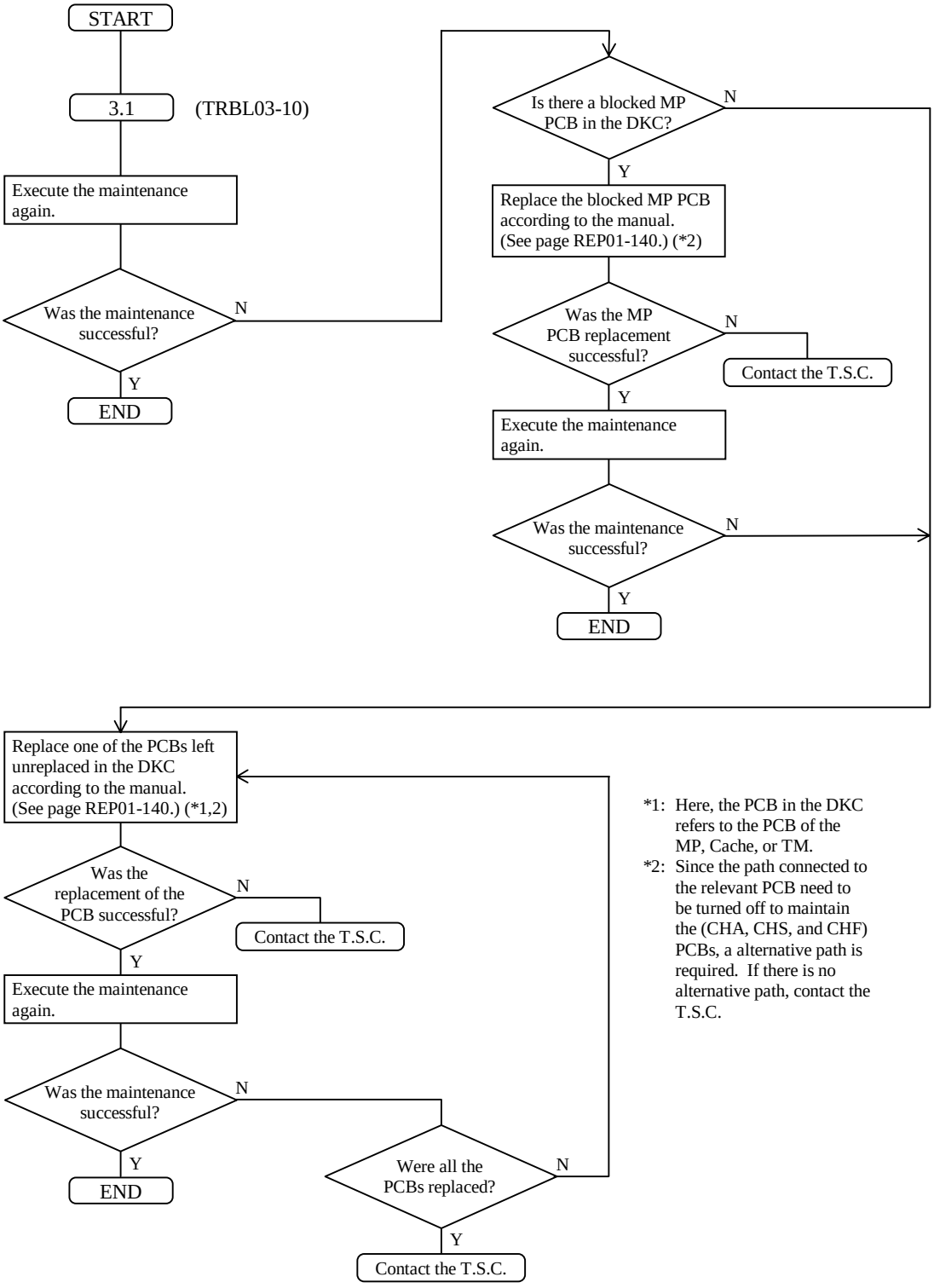
5.18 Recovery procedure when recovering SM is impossible

The recovery procedure when recovering SM is imposible during Cache PCB replacement, SM/CM installation/de-installation, or cluster recovery procedure is shown below.



*1: Here, the PCB in the DKC refers to the PCB of the MP, Cache, or TM.
*2: Since the path connected to the relevant PCB need to be turned off to maintain the (CHA, CHS, and CHF) PCBs, a alternative path is required. If there is no alternative path, contact the T.S.C.

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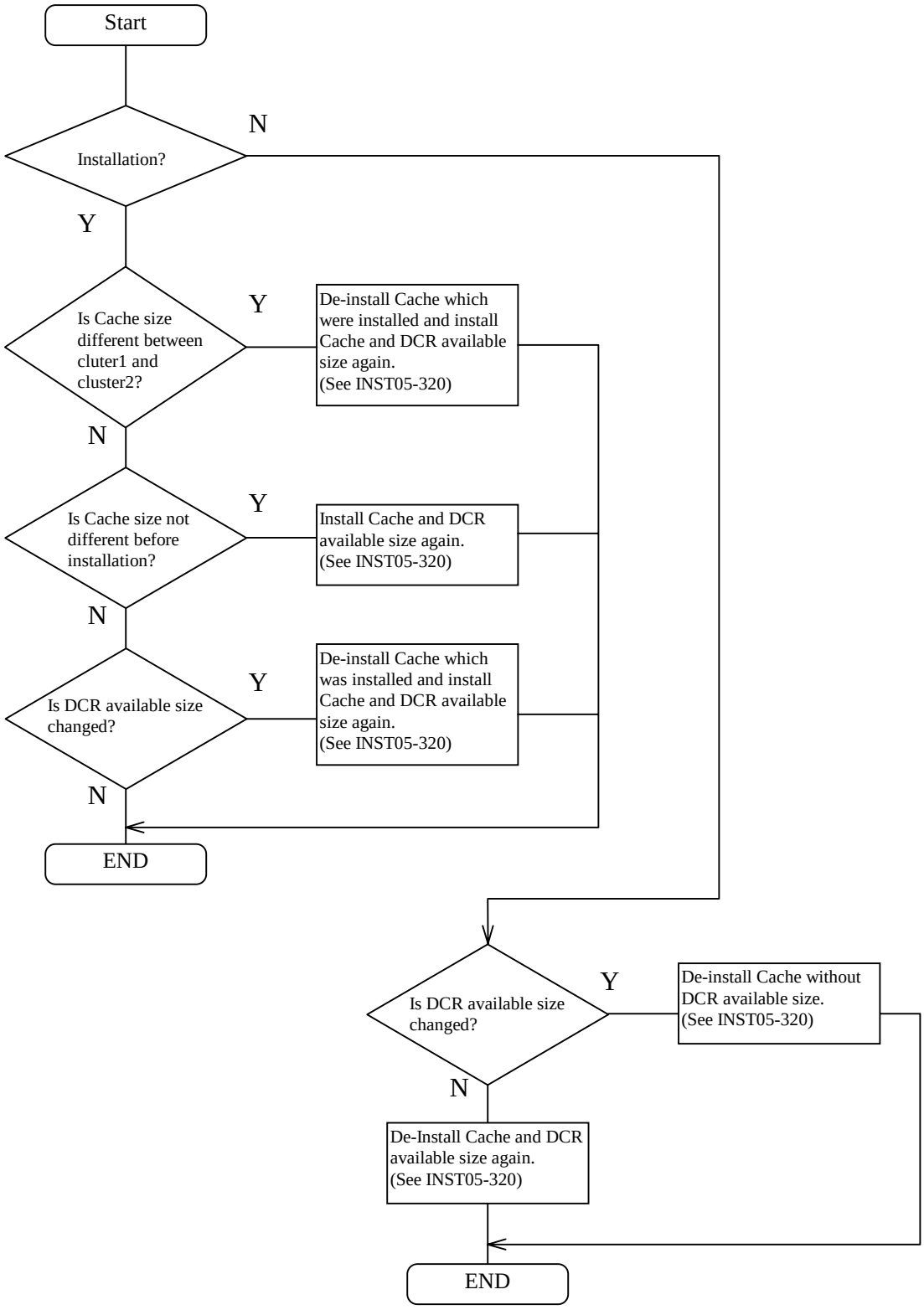
5.19 Recovery procedure when installation/de-installation Cache and DCR is impossible

The recovery procedure when installation/de-installation Cache and DCR available size simultaneously is impossible.



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6 HRC/HODM/HORC Error Recovery

6.1 Recovery Procedure for HRC/HODM Error

Hardware error sometimes causes HRC/HODM error which is a pair suspend or a path disable. This document explain the HRC/HODM Error and how to recover it.
Following reports indicate HRC/HODM error occurrence.

- SIM report of HRC/HODM path disable occurrence
- SIM report of HRC/HODM pair suspend occurrence
- SIM report of HODM Erase Error occurrence
- SIM report of RCU Acute or Serious Level SIM detection
- SIM report of RCU Moderate Level SIM detection

Table 6.1-1 HRC/HODM SIM REF.CODE

SIM REF. CODE	meaning	comment
D4XY-YY	HRC/HODM pair is suspended	X:0~5 or F YYY:LDEV number
DCXY-YY	HRC Semisynchronous pair is suspended	X:0~5 or F YYY:LDEV number
DBXY-YY	HRC Asynchronous pair is suspended	X:0~8 or F YYY:LDEV number
D48Y-YY	HODM Erase Error occurred	YYY:LDEV number
D4EY-YY	RCU Acute or Serious Level SIM reported	YYY:LDEV number
DBEY-YY	RCU (Asynchronous pair) Acute or Serious Level SIM reported.	YYY:LDEV number
D4DY-YY	RCU Moderate Level SIM reported	YYY:LDEV number
DBDY-YY	RCU (Asynchronous pair) Moderate Level SIM reported.	YYY:LDEV number
2180-XY	HRC/HODM path is disabled	X:Prosessor No. Y:LCP No.

Following pages explain each error type of HRC/HODM Error and recovery flow chart for the HRC/HODM Error is showed. Concerning to the Disaster Recovery Procedures, please refer to THEORY SECTION (THEORY03-660~720).

The delete pair operation with Delete Pair by Force option is supported for HRC asynchronous recovery procedure. If hung-up conditions may occur at HRC asynchronous, this operation can be executed from SVP or Remote Console. Refer to Forcible Delete Operation(TRBL06-152).

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Note: Please check a fence Level Parameter for the suspended pair by SVP Pair Option. And if M-VOL Fence Level is ‘R-VOL Data’ or M-VOL Fence Level is ‘R-VOL Status’ and suspended SIM is ‘D4FYYY/DCFYYY’, write I/O operations to the M-VOL will be rejected(Refer HRC&HODM01-190). So you must execute Delete Pair for the suspended pair, before execution of the recovery flow chart.
If you find out the F/M = ‘8F’ SSB log which have following error code (C870, C871, C872), it is not the original cause of the suspended pair. It means that the SSB log is created by the pair status change timing. So you have no need to execute a recovery action.

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6.2 HORC Error Recovery Procedure

A HORC pair suspension or a HORC pass blockade may occur owing to hardware errors.
This section explains the recovery procedure against them.
Occurrences of HORC errors can be known through the following.

- HORC error message on the Syslog outputted by the RAID manager/HORC (Note 1)
- Report of a HORC pass blockade occurrence by the SIM
- Report of a HORC pair suspension occurrence by the SIM

Table 6.2-1 HORC SIM REF.CODE

SIM REF. CODE	Meaning	Remarks
D4XY-YY	HORC pair suspend	X: 0 ~ 2, 4 ~ 5 or F YYY: LDEV number
DBXY-YY	HORC Asynchronous pair suspend	X: 0 ~ 8, F YYY: LDEV number
2180-XY	HORC pass blockade	X: Processor # Y: LCP#

SIM outputted when the HORC is suspended or the HORC pass is blocked has the same REF. CODE and meaning as those outputted when the HRC/HODM pair is suspended or the HRC/HODM pass is blocked.
Furthermore, the error recovery procedure is the same as that against an HRC/HODM error.
Therefore, follow the procedures shown in the flowcharts on page TRBL06-20 and succeeding pages to recover from a HORC pair error.

When a message indicating that a HORC pair error has occurred is displayed on the Syslog, check the SIM log of the connected DKC and confirm the conformance of the message on the Syslog with the SIM logged on the DKC side before starting the recovery using the above flow chart.

Note 1; When the HORC pair is suspended, the RAID manager/HORC displays the following message on the Syslog.

[HORCM_102] Detected a suspending status on this paired volume
(Volume: ○○○○, code: XXXX).
○○○○: Volume name
XXXX: Factor code

The delete pair operation with Delete Pair by Force option is supported for HORC asynchronous recovery procedure. If hung-up conditions may occur at HORC asynchronous, this operation can be executed from SVP or Remote Console. Refer to Forcible Delete Operation (TRBL06-152).

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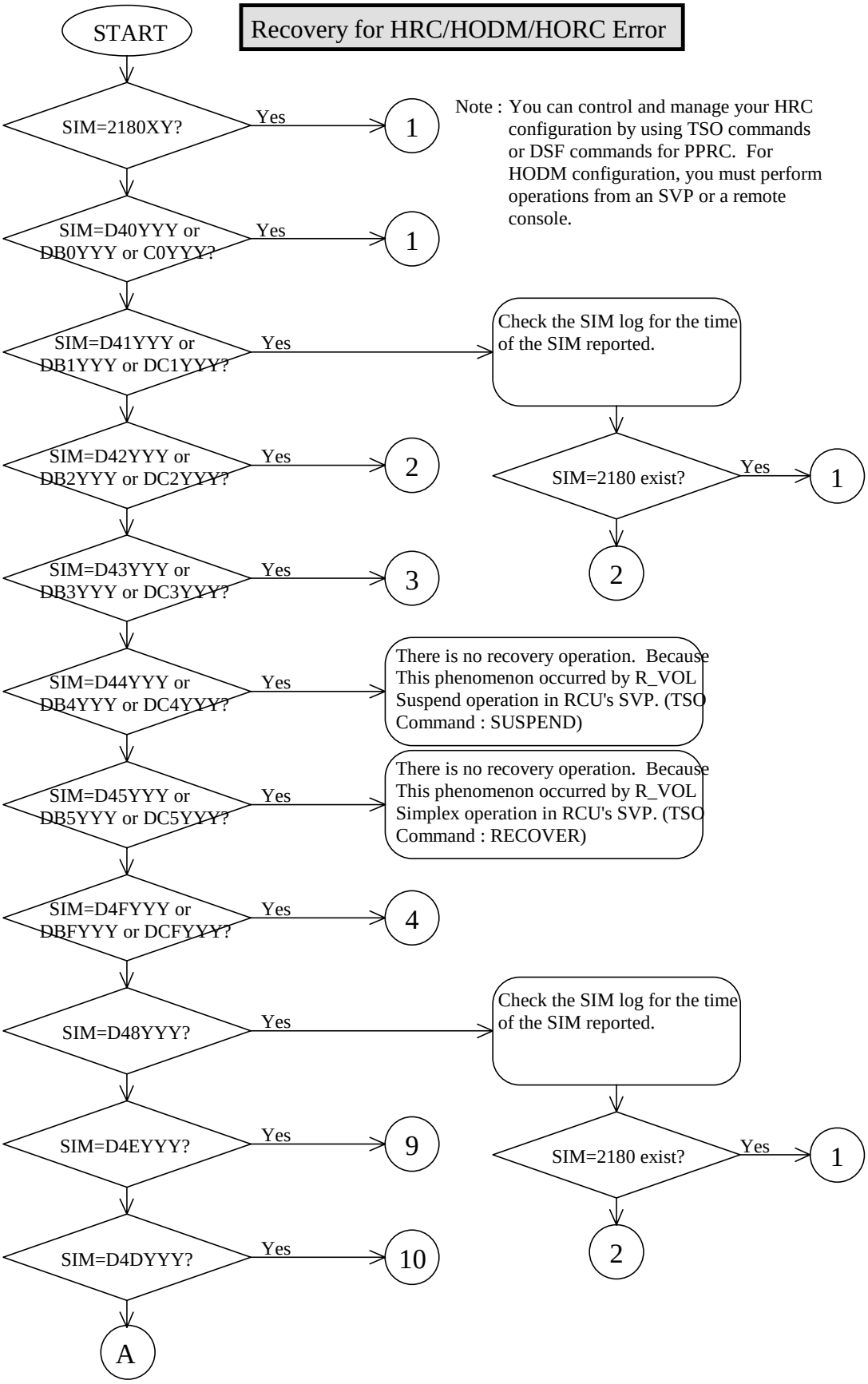
Recovery for HRC/HODM/HORC Error



Note : You can control and manage your HRC configuration by using TSO commands or DSF commands for PPRC. For HODM configuration, you must perform operations from an SVP or a remote console.

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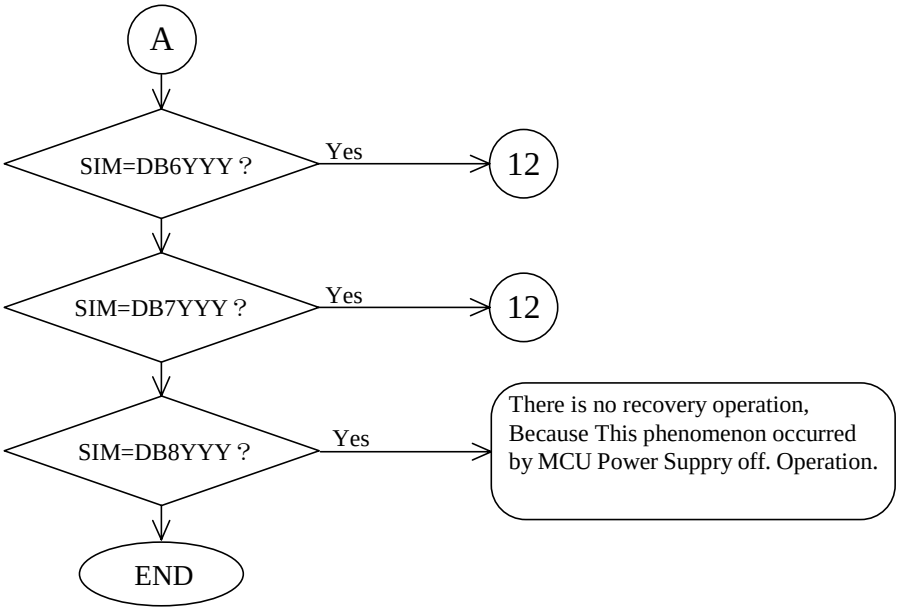

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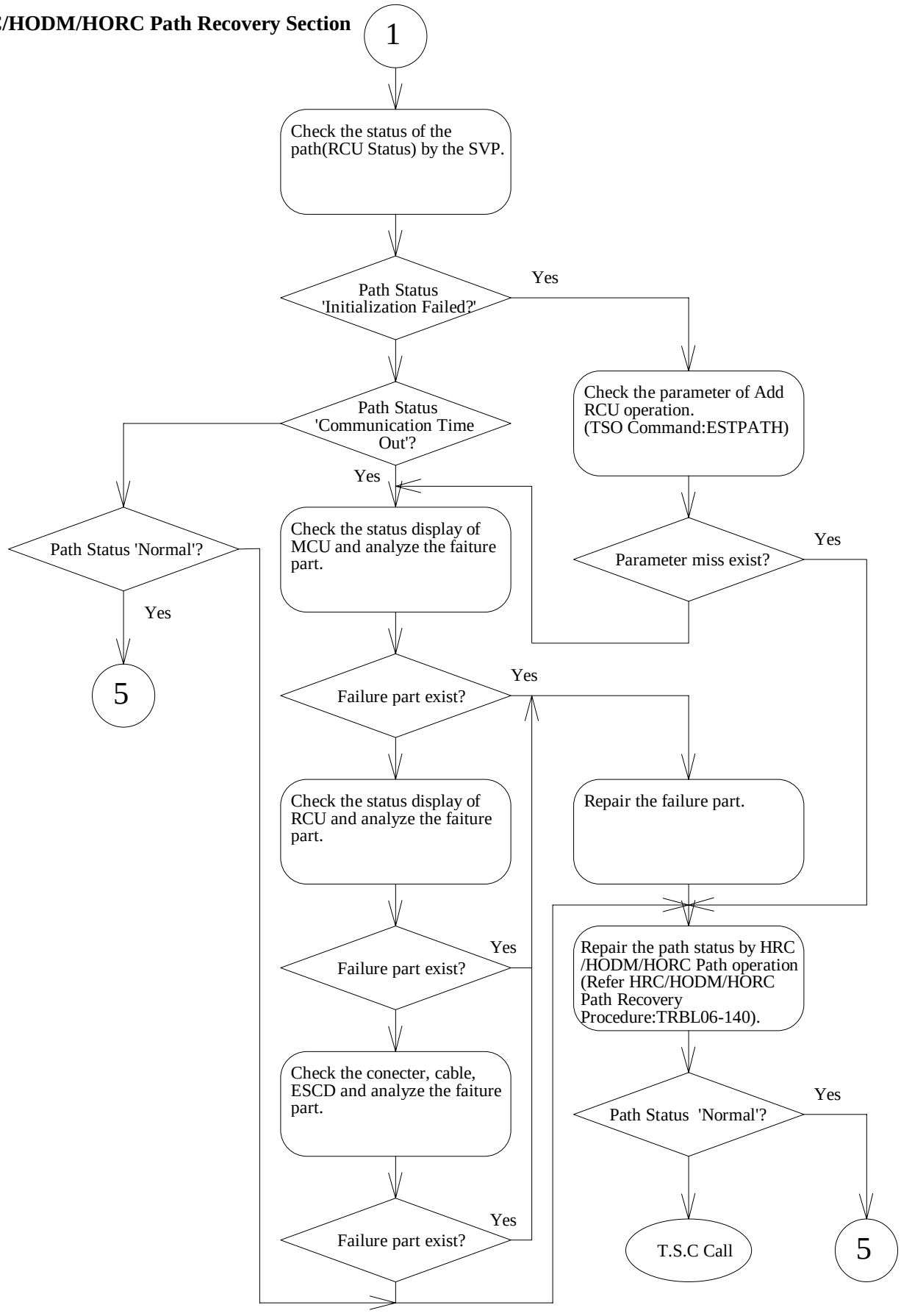
HRC/HODM/HORC Path Recovery Section



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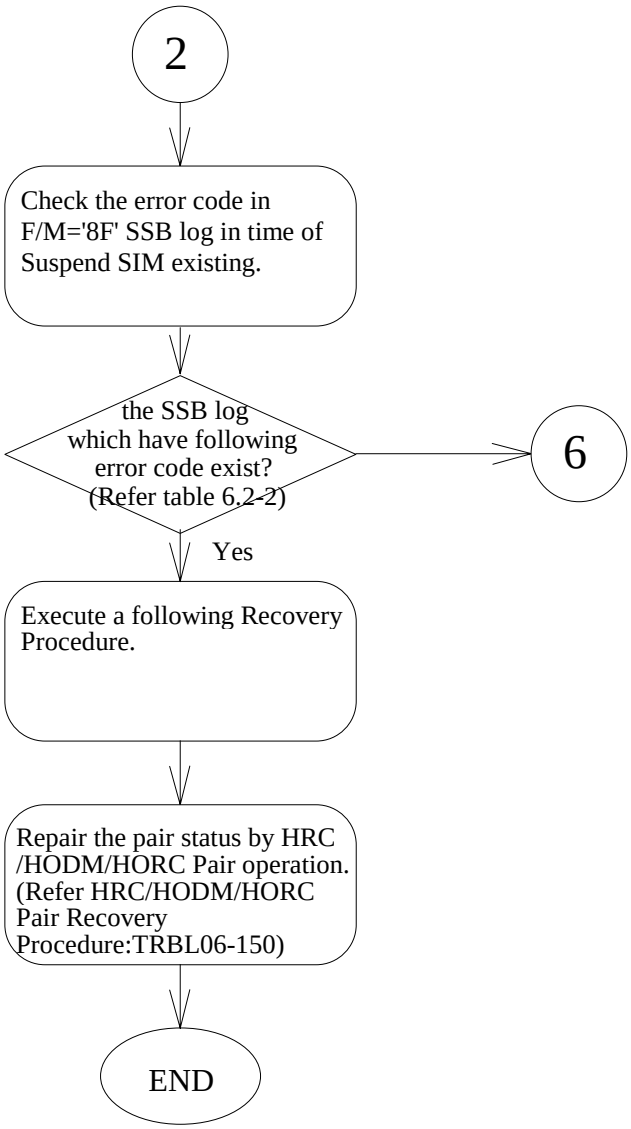

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Table 6.2-2 HRC/HODM Recovery Procedure for F/M = '8F'

No.	F/M	error code	mean	Recovery Procedure
1	8F	C969	Detect a nonstandard R0 track in R_VOL. (HODM operation)	Change the track format to standard R0 track for the following track. CCHD is as follows.* SSB log byte43:R_VOL# byte72/73:CYL# byte74/75:HD#
2	8F	C96F	(F/M) 8F (error code) C96F (mean) Detect a over run track in R-VOL. (HODM operation) (Recovery Procedure)	Recovery the following (over run) track. CCHD is as follows. SSB log byte43:R_VOL# byte72/73:CYL# byte74/75:HD#
3	8F	C4CE	Detect a nonstandard R0 track in M_VOL. (HRC or PPRC operation)	Change the track format to standard R0 track for the following track. CCHD is as follows.* (Note 1) LDEV in the 'SSB log' window : M_VOL# SSB log byte44/45:CYL# byte46:HD#
4	8F	C883	Detect time-over during retial for RCU detected error. (HODM operation)	*(Note 2)
5	8F	C884	An SCP reported from RCU. (HODM operation)	*(Note 2)
6	8F	C88E	Detect an I/O error for R-VOL not recoverable with retrial. (HODM operation)	*(Note 2)

* use DSF INSPECT NOPRESERVE

Note 1 If you canceled HODM Pair Operation before this phenomenon has occurred, you must execute format the blocked LDEVs (See SVP02-610) or DSF (Medial initialization) or DSF (INSTALL) for the Suspended Vol. Because this Volume data is incomplete. If the volume type is RAMAC, you can not change the track format to standard R0 track by DSF.

Note 2 Erase operation after migration copy from IBM RAMAC after migration copy may fail with SSB EC = C883, C884 or C88E due to SCP reported from RAMAC. In this case, reduce the concurrency of erase operation to 1 or 2 and retry the operation.

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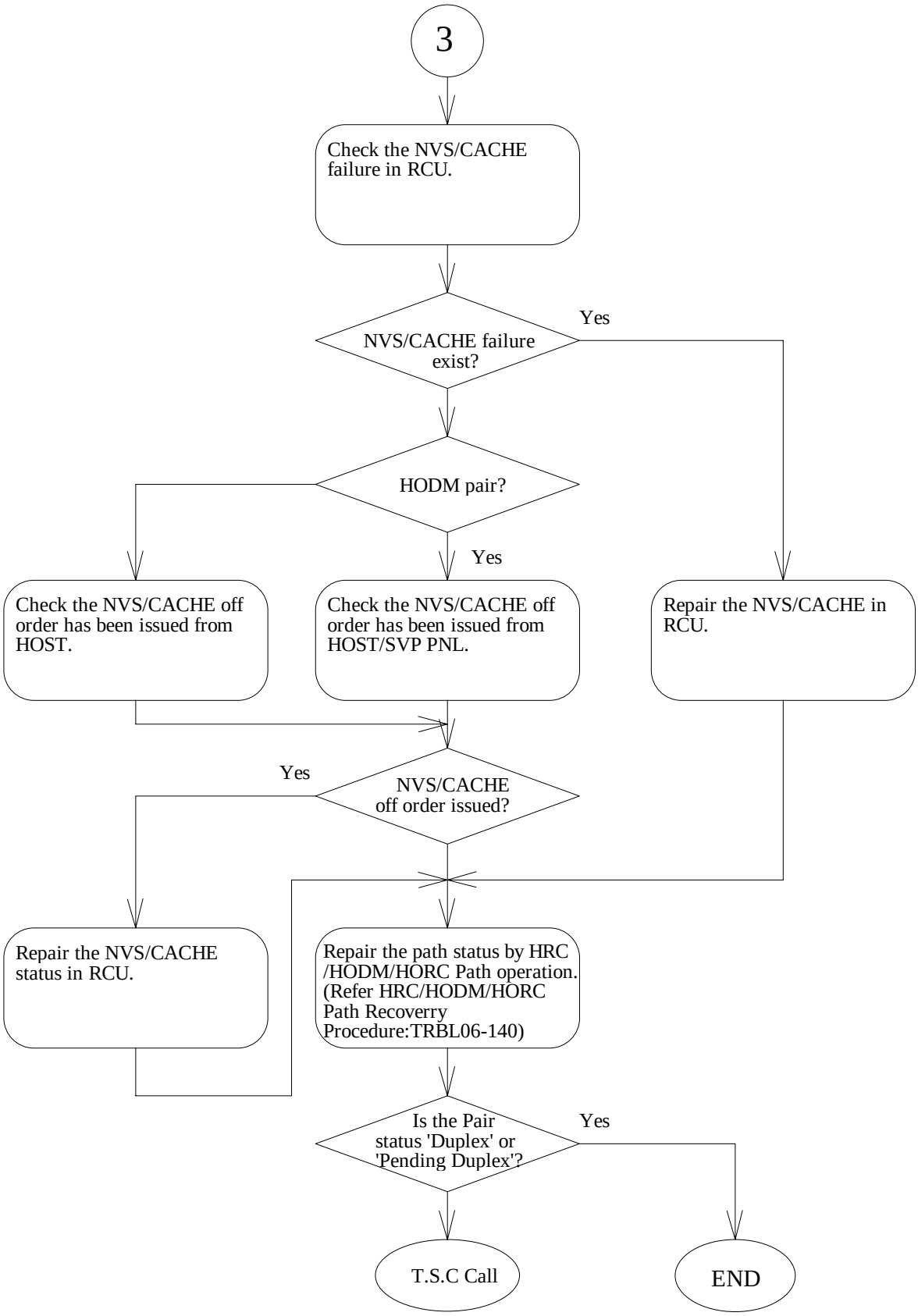

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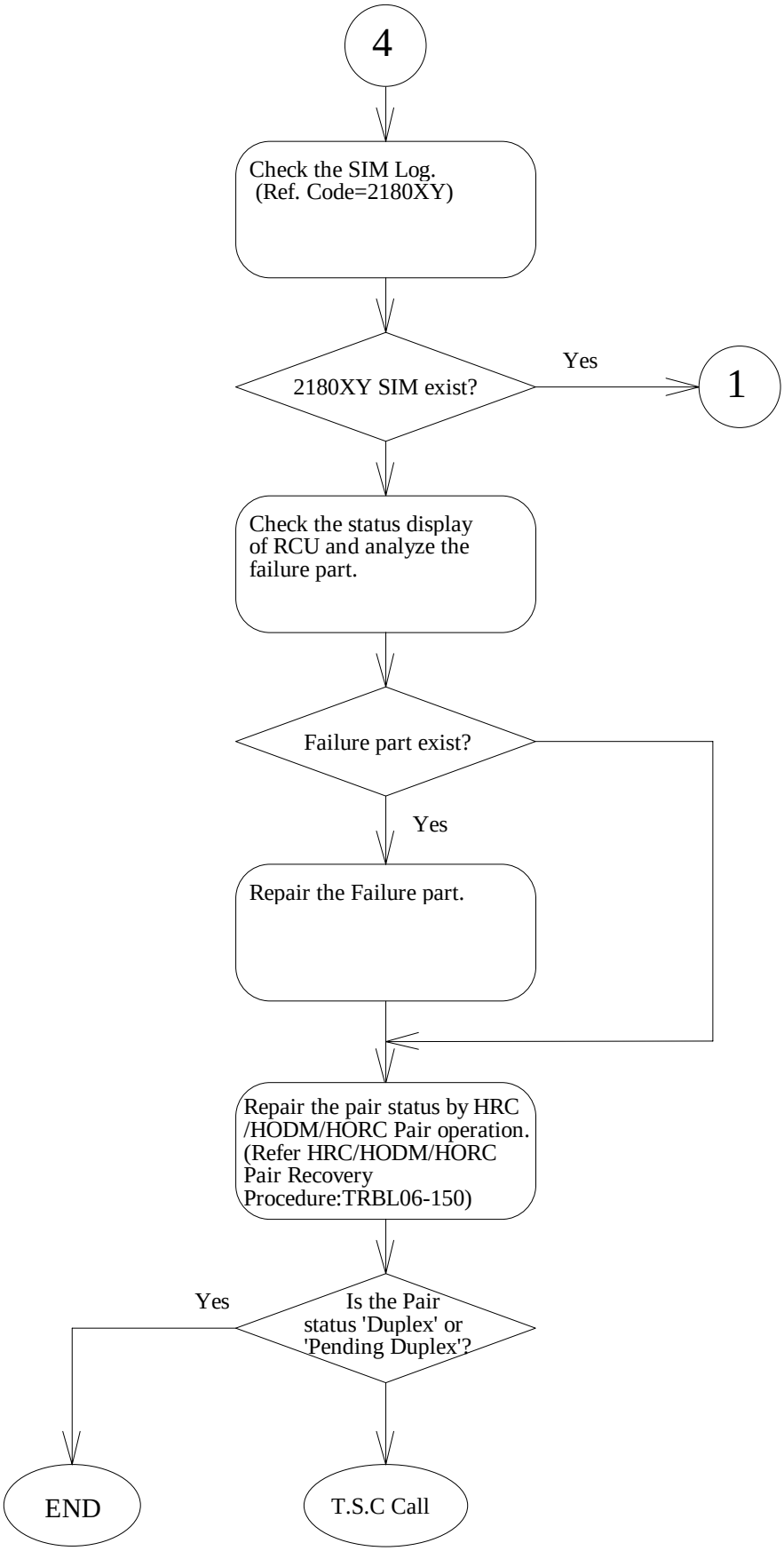

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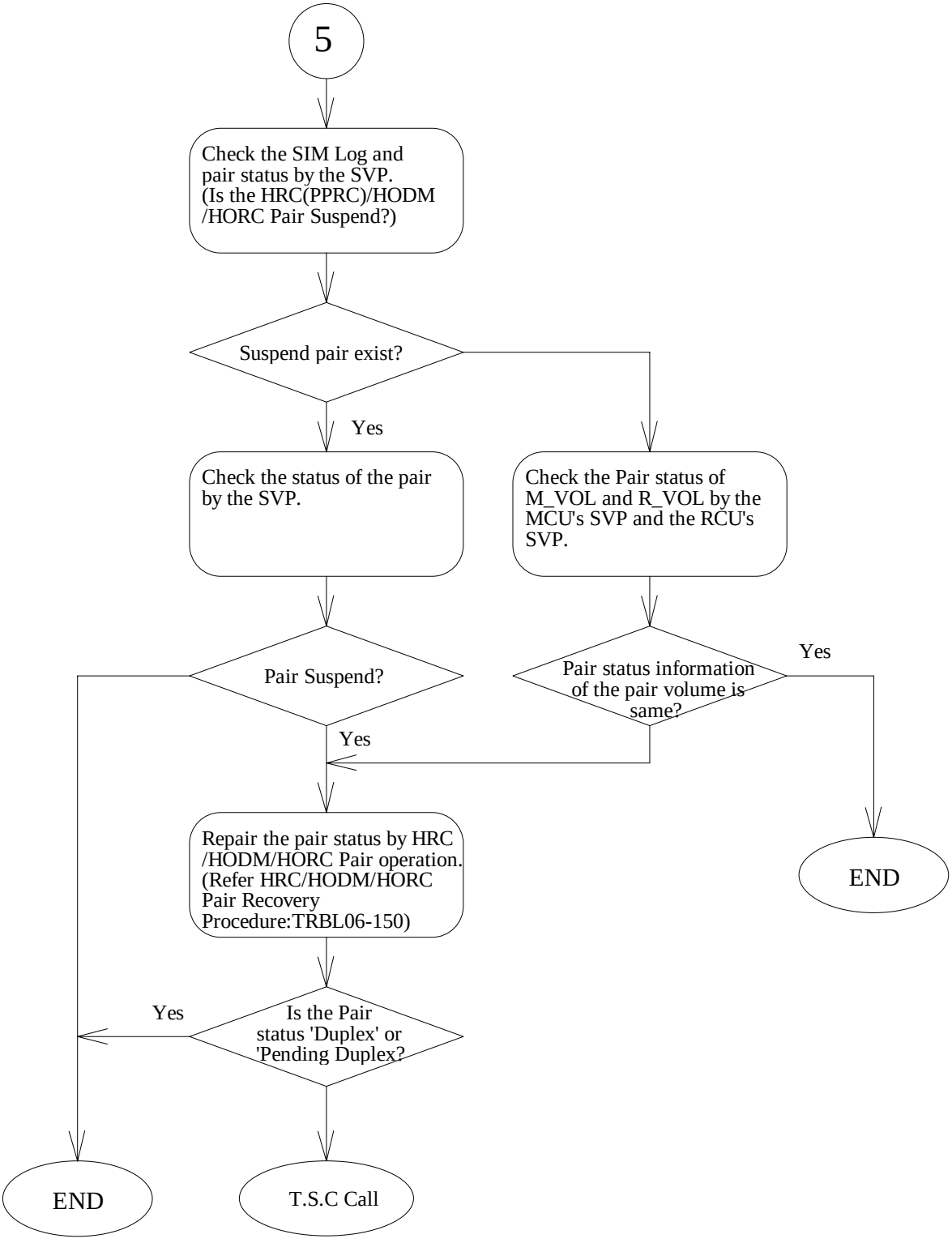

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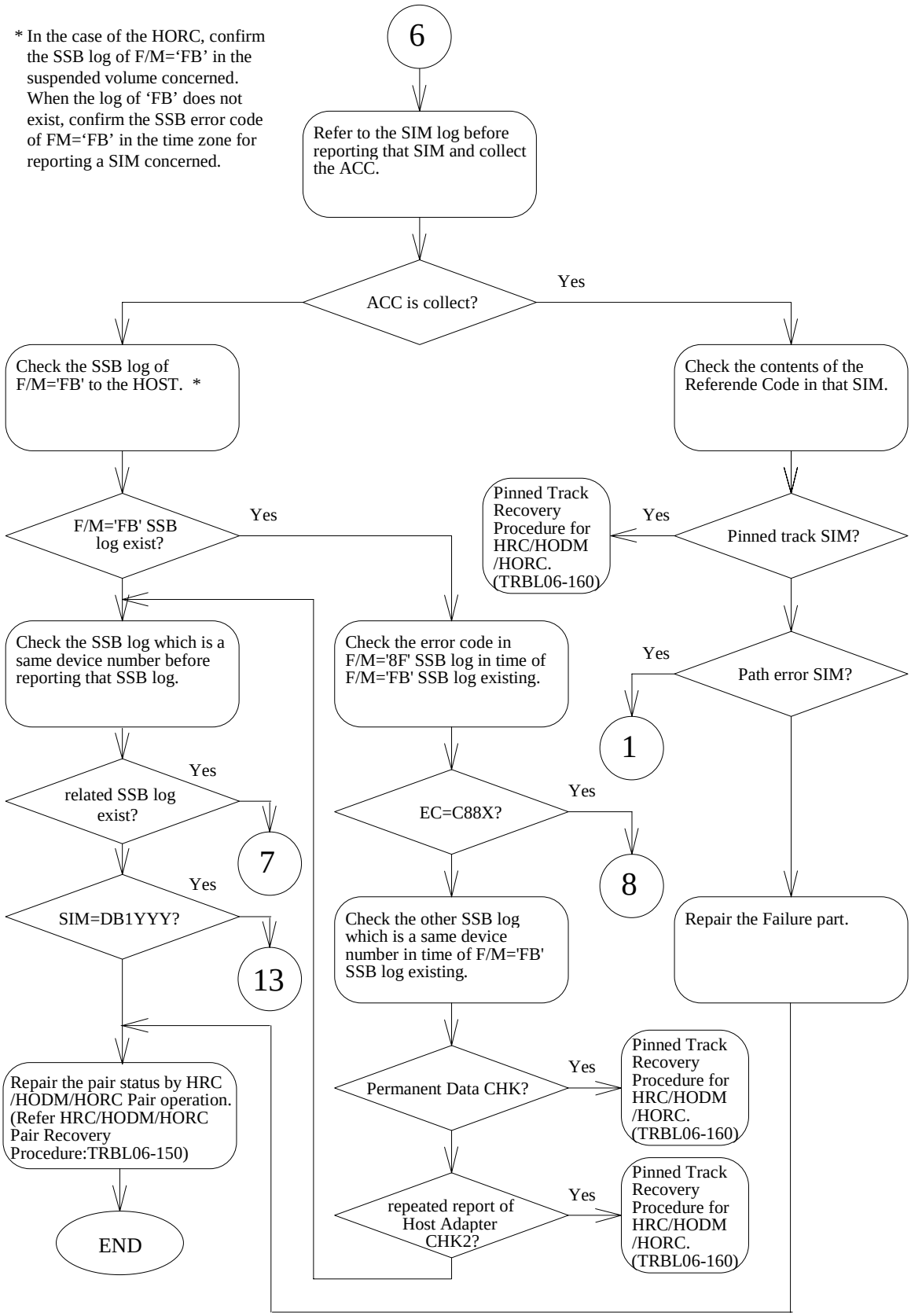

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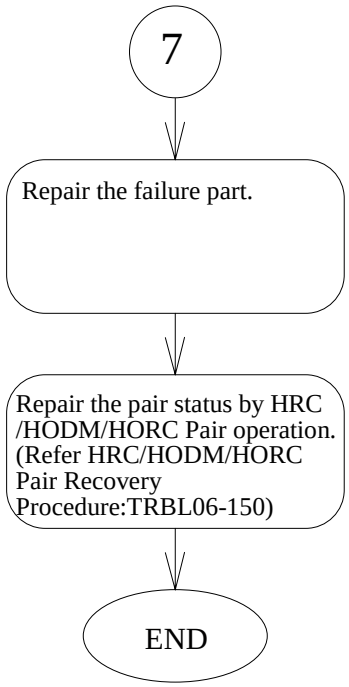

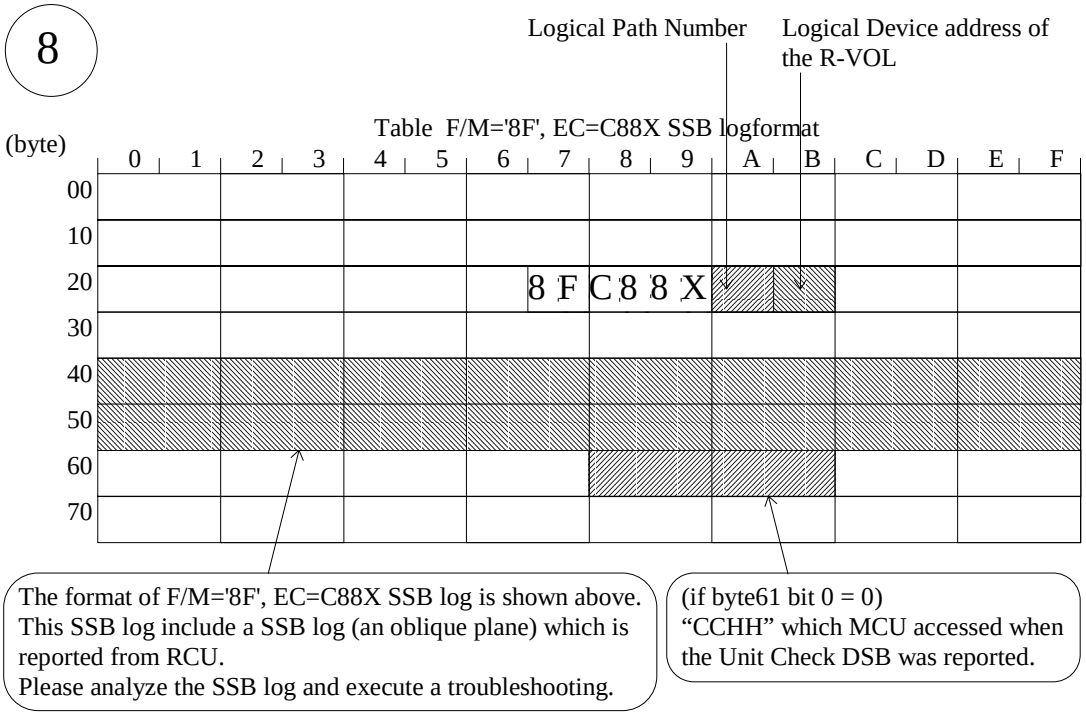

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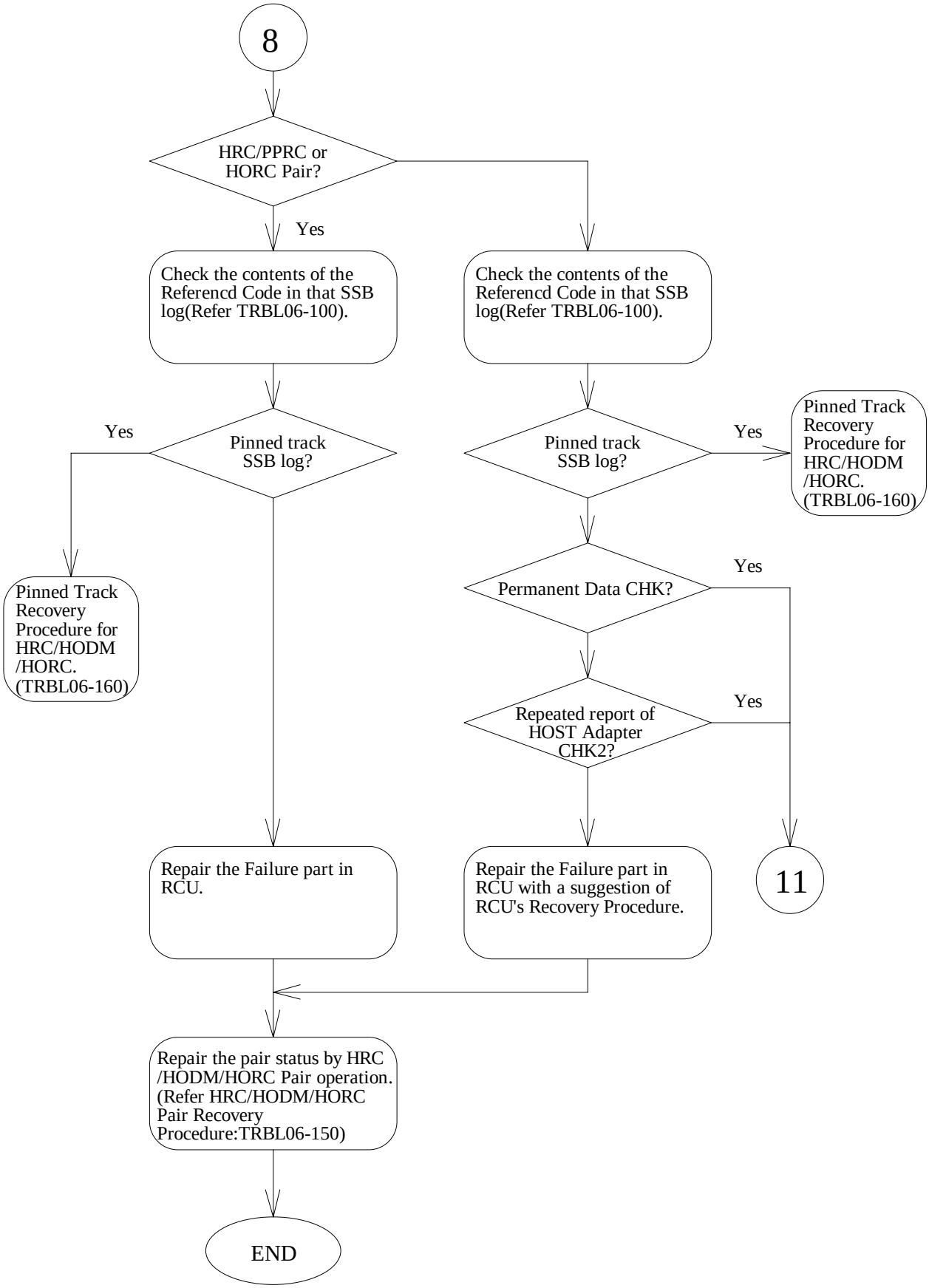

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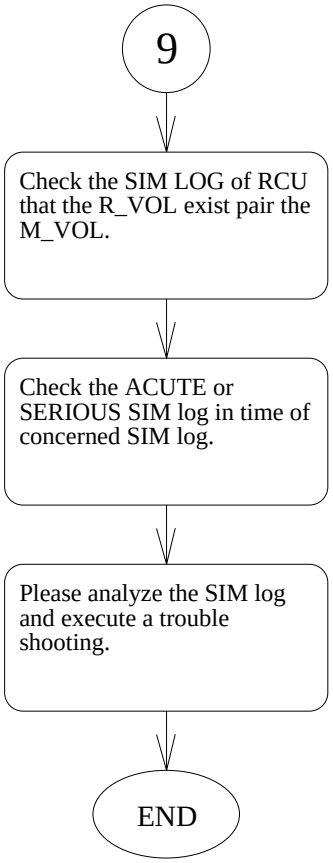

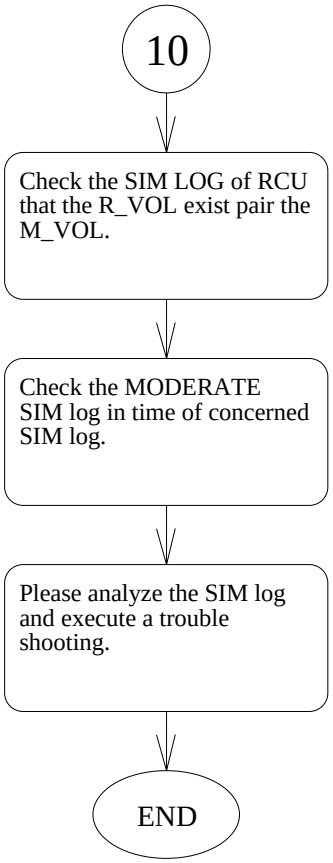

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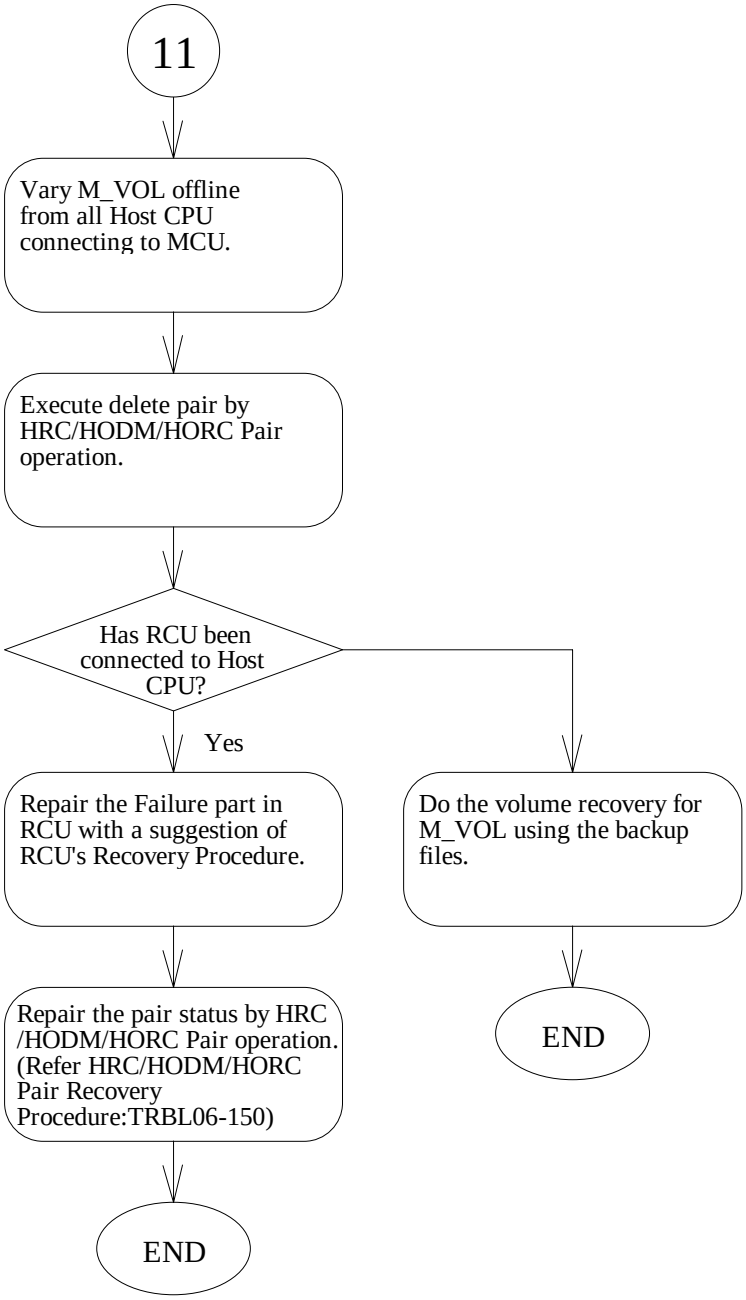

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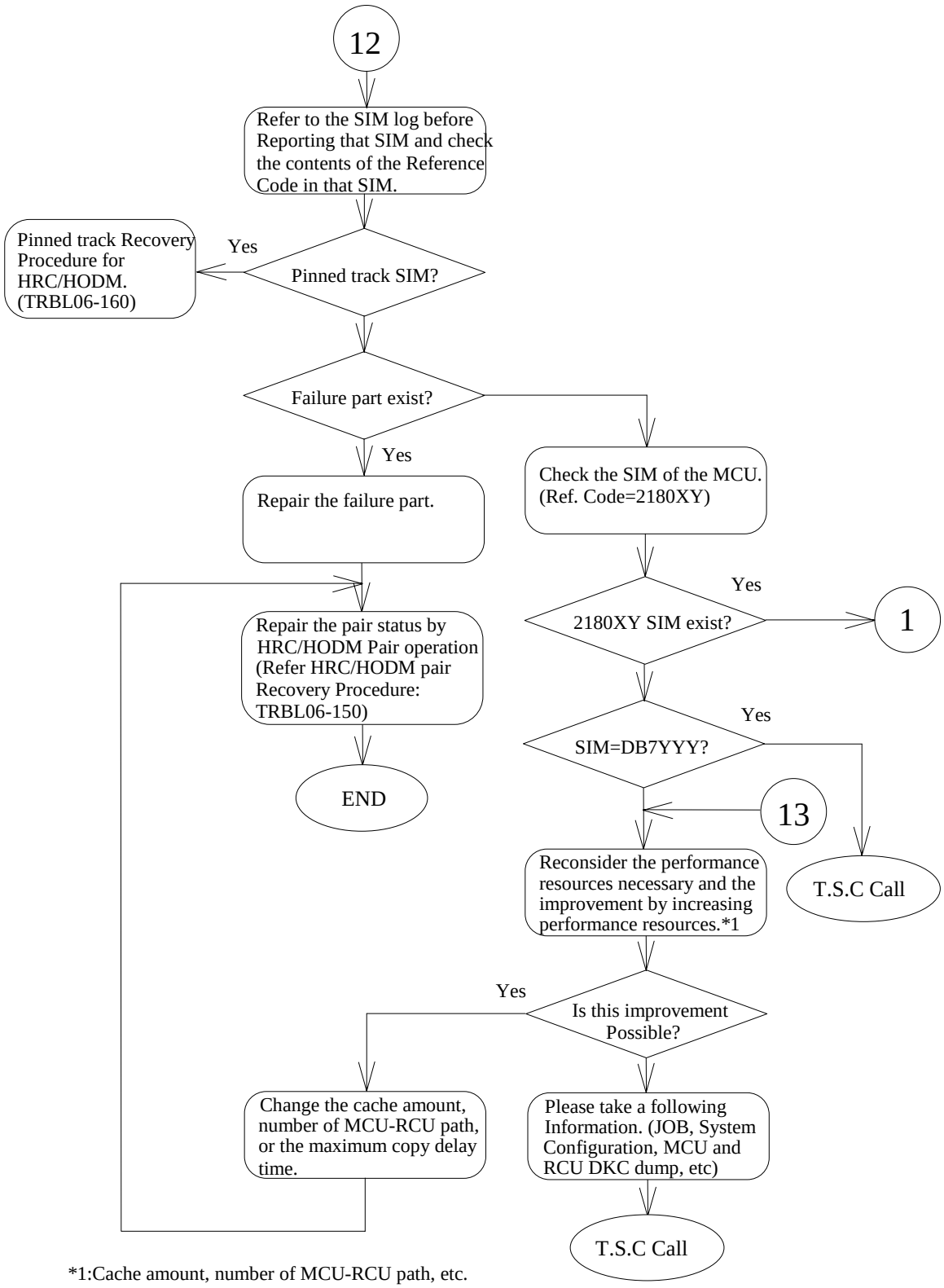

*1:Cache amount, number of MCU-RCU path, etc.

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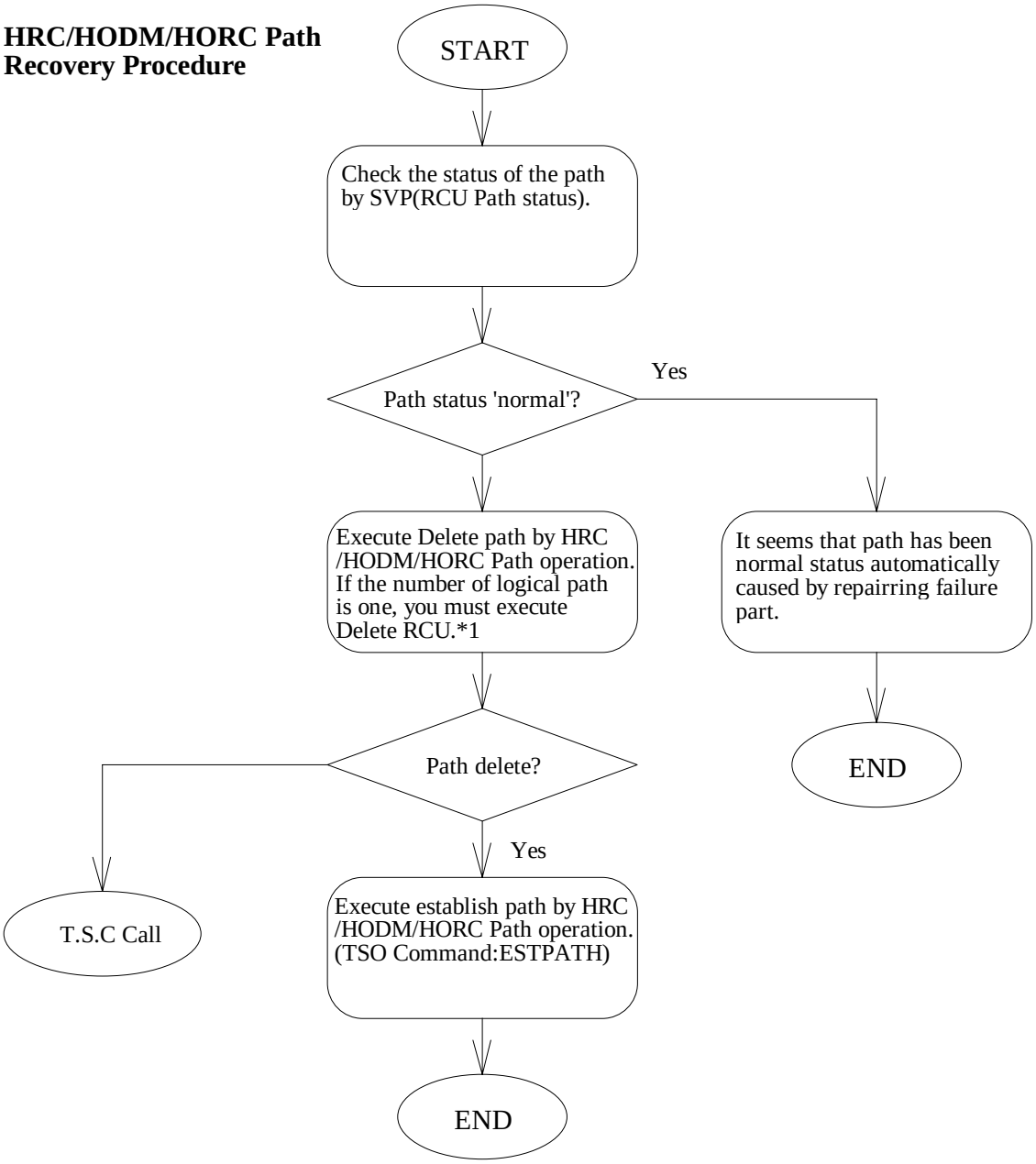
HRC/HODM/HORC Path Recovery Procedure



*1 For TSO Command operation, you issue ESTPATH Command, specified the path that established by the last ESTPATH Command issued except failed path. If the number of logical path is one, you must issue DELPATH Command. (Refer IBM PPRCOPY Commands Manual)

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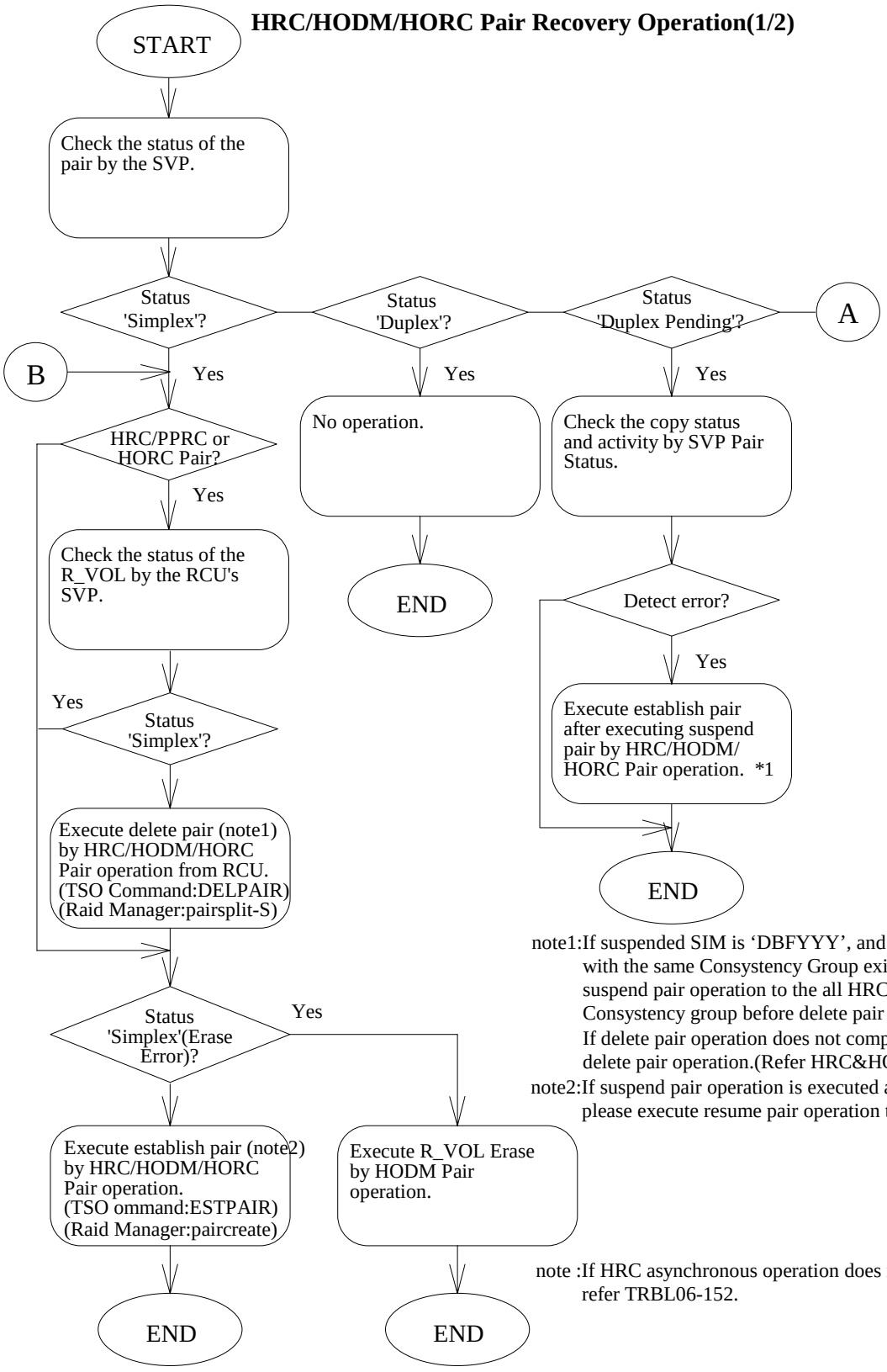
HRC/HODM/HORC Pair Recovery Operation(1/2)



note1:If suspended SIM is 'DBFYYY', and another HRC pair with the same Consystency Group existed, please execute suspend pair operation to the all HRC pair with the same Consystency group before delete pair operation.
If delete pair operation does not complete, please try force delete pair operation.(Refer HRC&HODM03-80)

note2:If suspend pair operation is executed according to note1, please execute resume pair operation to these HRC pairs.

note :If HRC asynchronous operation does not complete, please refer TRBL06-152.

*1 For TSO Commnad operation, you issue ESTPAIR Command after SUSPEND Command issued.
In the case of the Raid Manager, issue the Pairresync command after the Pairsplit command is issued.
*2 For TSO Command operation, you issue ESTPAIR Command after DELPAIR Command issued.
In the case of the Raid Manager, issue the Paircreate command after the Pairsplit-S command is issued.

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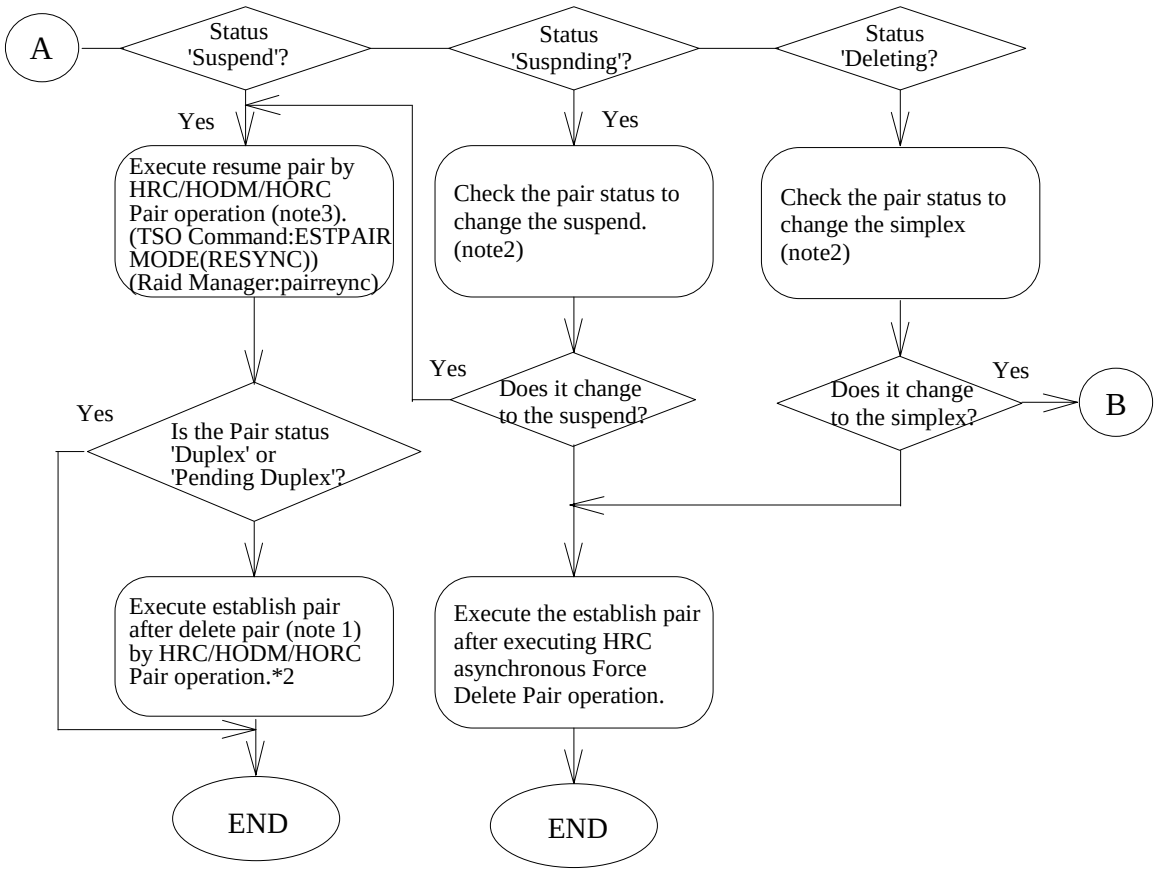
HRC/HODM/HORC Pair Recovery Operation(2/2)



note1:If delete pair operation does not complete, please try force delete pair operation.(Refer HRC&HODM03-80)
note2:Please waite a long time at least longer than specified by Mazimum Copy Delay Time parameter.
note3:If suspended SIM is 'DBFYYY', and another HRC pair with the same Consystency Group existed, please execute suspend pair operation to the all HRC pair with the same Consystency Group before resume pair operation.
After that, please execute resume pair operation with the Group option to these pairs.

note :If HRC asynchronous operation does not complete,
Please refer TRBL06-152.

*1 For TSO Commnad operation, you issue ESTPAIR Command after SUSPEND Command issued.
In the case of the Raid Manager, issue the Pairresync command after the Pairsplit command is issued.
*2 For TSO Command operation, you issue ESTPAIR Command after DELPAIR Command issued.
In the case of the Raid Manager, issue the Paircreate command after the Pairsplit-S command is issued.

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HRC/HORC asynchronous Pair Recovery Operation

HRC/HORC asynchronous pair recovery operation is the same as it of the HRC synchronous and HRC semi-synchronous pair basically. Please pay attention to the following.

(1) Extent of the suspend pair volume

When the volume pair which error level is Group is suspended due to the failure, all volume pairs in the same consistency group will be suspended together. In this case, All volume pairs in the same consistency group are in need of Resume Pair operation.
On condition that failure volume pair status is the Duplex pending(volume failure occur during Initial Copy), suspend is only this volume.

(2) Resume pair Operation

It specifies whether all suspended volume pairs, which belong to the same consistency group and whose M-VOLs are behind this MCU, should be resumed together or not.

(3) Force Delete Operation

This section describes the error recovery procedures to recover from the following hung-up conditions:

- The volume pairs were suspended due to some kind of failure. However the pair status of the affected volume pairs remained **unchanged from Suspending** for a long time (at least longer than specified by Maximum Copy Delay Time parameter).
- **Delete Pair** or **Suspend Pair** operation completed without error message. However the pair status of the volume pairs to be deleted or suspended remained **unchanged from Deleting or Suspending** for a long time (at least longer than specified by Maximum Copy Delay Time parameter).
- Add Pair operation failed with RMC messages **2742I** or **2769I** and the operation could not complete after several times of reties.
- **Suspend Pair, Delete Pair** or **Delete Group** operation failed with RMC messages **2749I, 2751I** or **2761I** respectively and the operation could not complete after several times of retries.

The recovery procedure is described in the next figure on TRBL06-154.

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(3-1) Operating Delete Pair with Delete Pair by Force option

Delete pair operation with Delete Pair by Force option is effective to recover from such hung-up conditions. Being specified with this option, the specified control unit (MCU or RCU) performs the forcible delete process as follows:

- Changes the volume status of all the volumes that are behind the specified control unit and belong to the consistency group to simplex.
- Discard all the record sets that are pending (not sent to the RCU or not settled yet) in the specified control unit.

Note that the specified control unit performs the forcible delete without communicating with the paired control unit. Since both the MCU and RCU manages volume pair status and can have the pending record set within, this operation **must be done at both the MCU and RCU**.

(3-2) Re-establishing Volume Pair

After completing delete pair operation at both the MCU and RCU, establish volume pair(s) again to check that hung-up conditions are recovered. Be sure that **the same consistency group number** must be specified as before. If the different consistency group number is specified, the result is unpredictable.

(3-3) Performing Dummy-Replacement of Cache PCB

If the delete pair operation can not recover from hung-up conditions (establishing volume pair results in failure with message 2742I or 2769I), some inconsistent condition may remain in the sidefile structure. To recover from this situation, dummy-replacement of cache PCB requires to be performed for **both A and B sides**. The operated control unit discards all the inconsistent sidefiles during replacement procedure.

Only the sidefiles of the deleted consistency group is discarded. Therefore dummy-replacement can be performed while other consistency groups are working at the control unit.

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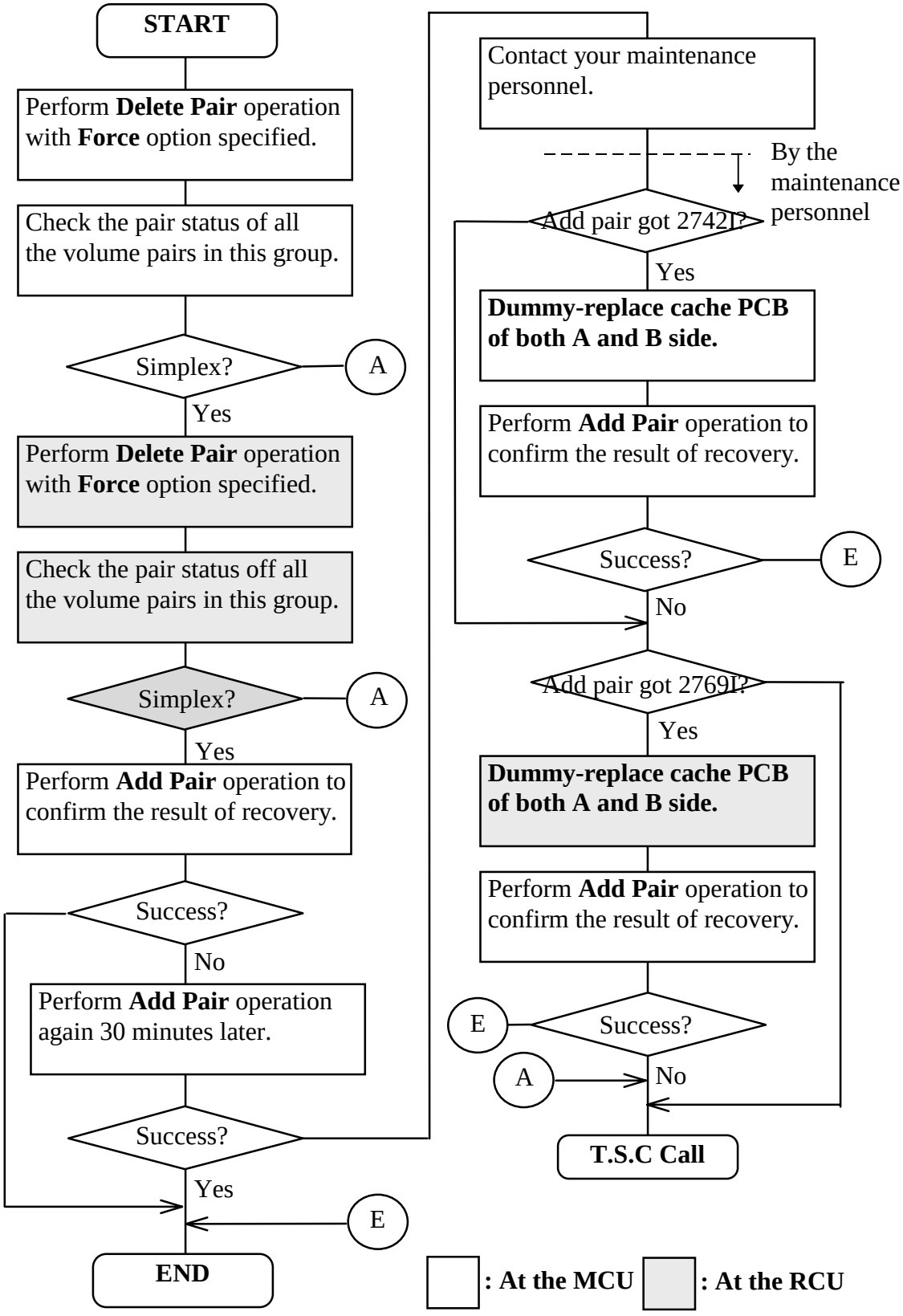
HRC asynchronous Force Delete Operation



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Recovery Operation of the Suspended HORC Pair

This document which is addition of the HRC/HODM/HORC Pair Recovery Operation (TRBL06-150) explain the recovery operation for the suspended HORC pair in the extended LU.

After repairing the failure part, execute a resume (pair resync) operation for the suspended pair. HORC resume operation can be executed from SVP, Remote Console, and Raid Manager. A means, an object and a procedure of the resume operation are shown in a following table. Refer SVP SECTION 7 References for HORC Operation Screen (SVP07-10).

Table HORC Resume Operation Procedure in the extended LU

means	object	procedure
SVP (Remote Console)	Volume	(1) Check the volume number of the suspend pair from the F/M="FB" SSB. (2) Check the LU pair status which comprises the suspended pair volume is a "Suspend", "Duplex (W)", or "Pending Duplex (W)". (3) Execute a resume pair operation to the suspended volume pair. (4) Check the pair status is a "Duplex" or a "Pending Duplex".
	Logical Unit	(1) Check the volume number of the suspend pair from the F/M="FB" SSB. (2) Check the LU pair status which comprises the suspended pair volume is a "Suspend", "Duplex (W)", or "Pending Duplex (W)". (3) Execute a resume pair operation to the suspended LU pair. (4) Check the pair status is a "Duplex" or a "Pending Duplex".
Raid Manager	Logical Unit	(1) Check the volume number of the suspend pair from the F/M="FB" SSB. (2) Check the LU pair status which comprises the suspended pair volume is a "PDUB". (3) A pairresync command issues to the suspended LU pair. (4) Check the pair status is a "Pair" ("Duplex") or a "Copy" ("Pending Duplex").

If pair status does not change "Duplex" or "Pending Duplex" after executing a resume operation, please try delete pair operation (pairsplit-s command for Raid Manager), and execute Add pair operation (paircreate command for Raid Manager) again.

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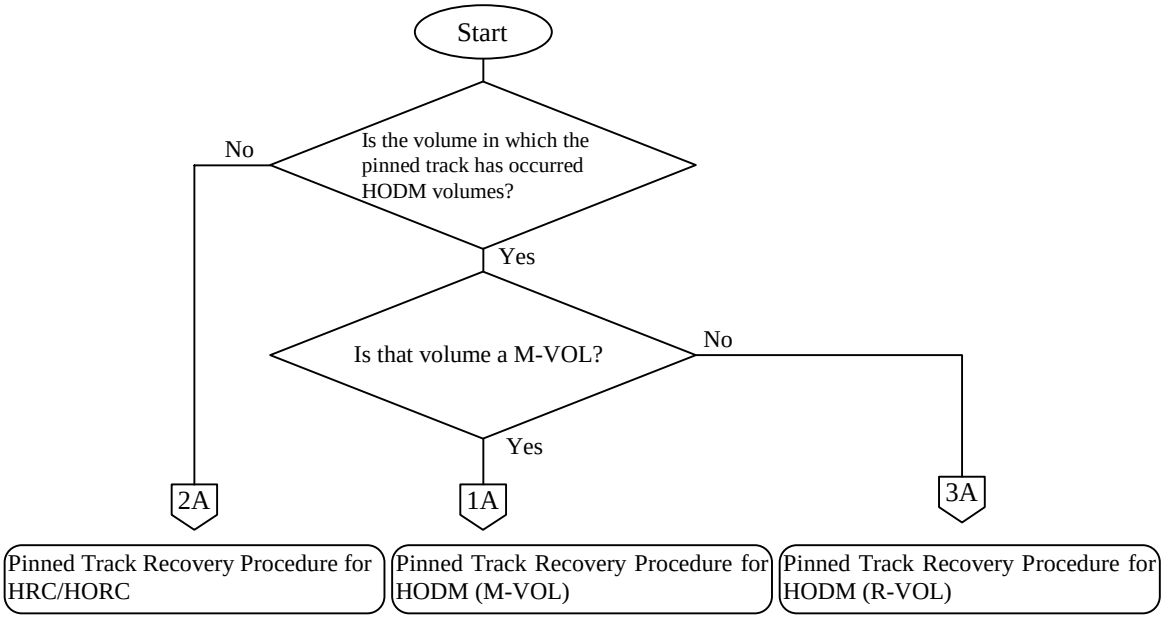
6.3 Pinned Track Recovery Procedure for HRC/HODM/HORC

Pinned track recovery procedure for HRC/HODM/HORC is as follows.



(Note)
If the pinned track has occurred in both M-VOL and R-VOL, recover the volumes according to the following sequence.

HRC/HORC : ① M-VOL → ② R-VOL
HODM : ① R-VOL → ② M-VOL

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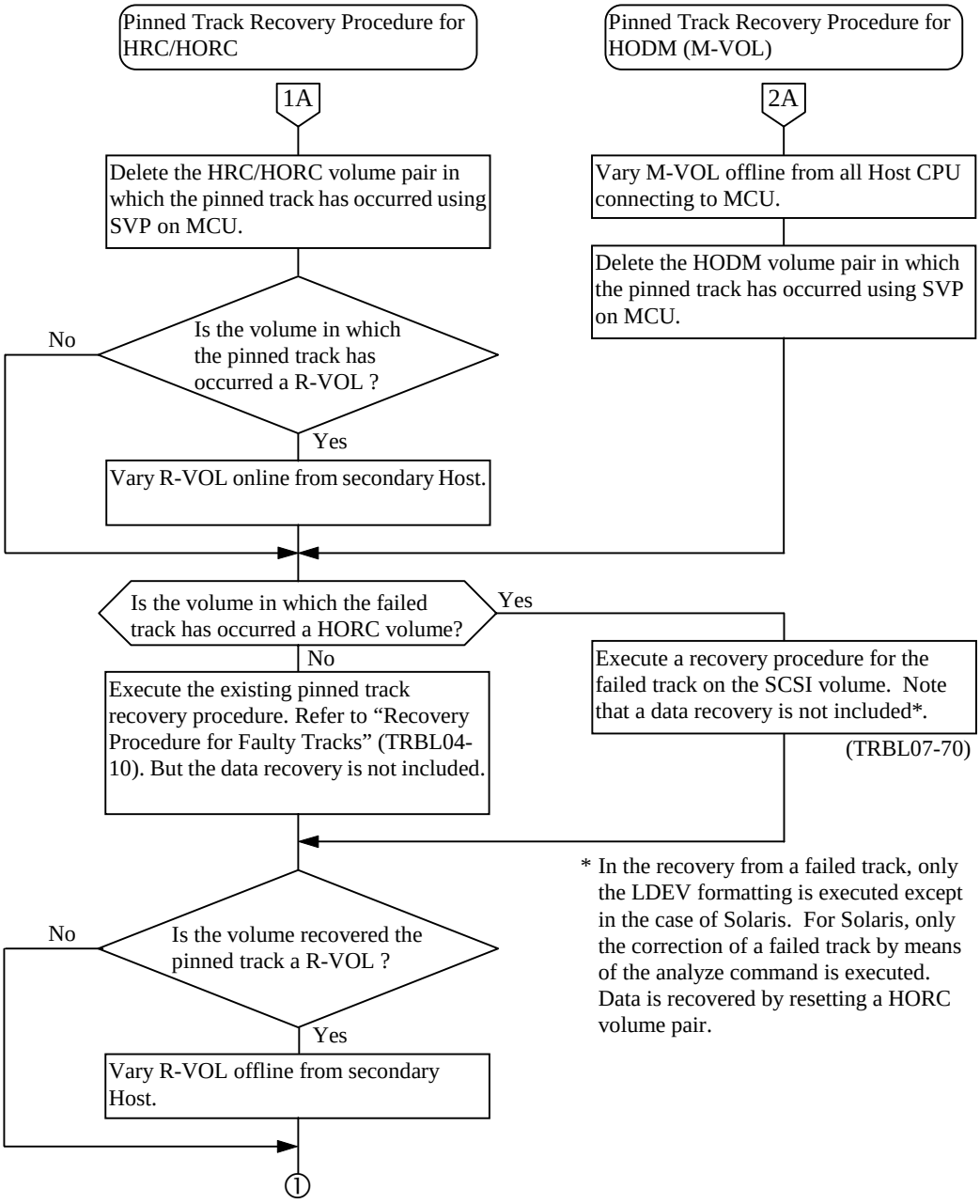

* In the recovery from a failed track, only the LDEV formatting is executed except in the case of Solaris. For Solaris, only the correction of a failed track by means of the analyze command is executed. Data is recovered by resetting a HORC volume pair.

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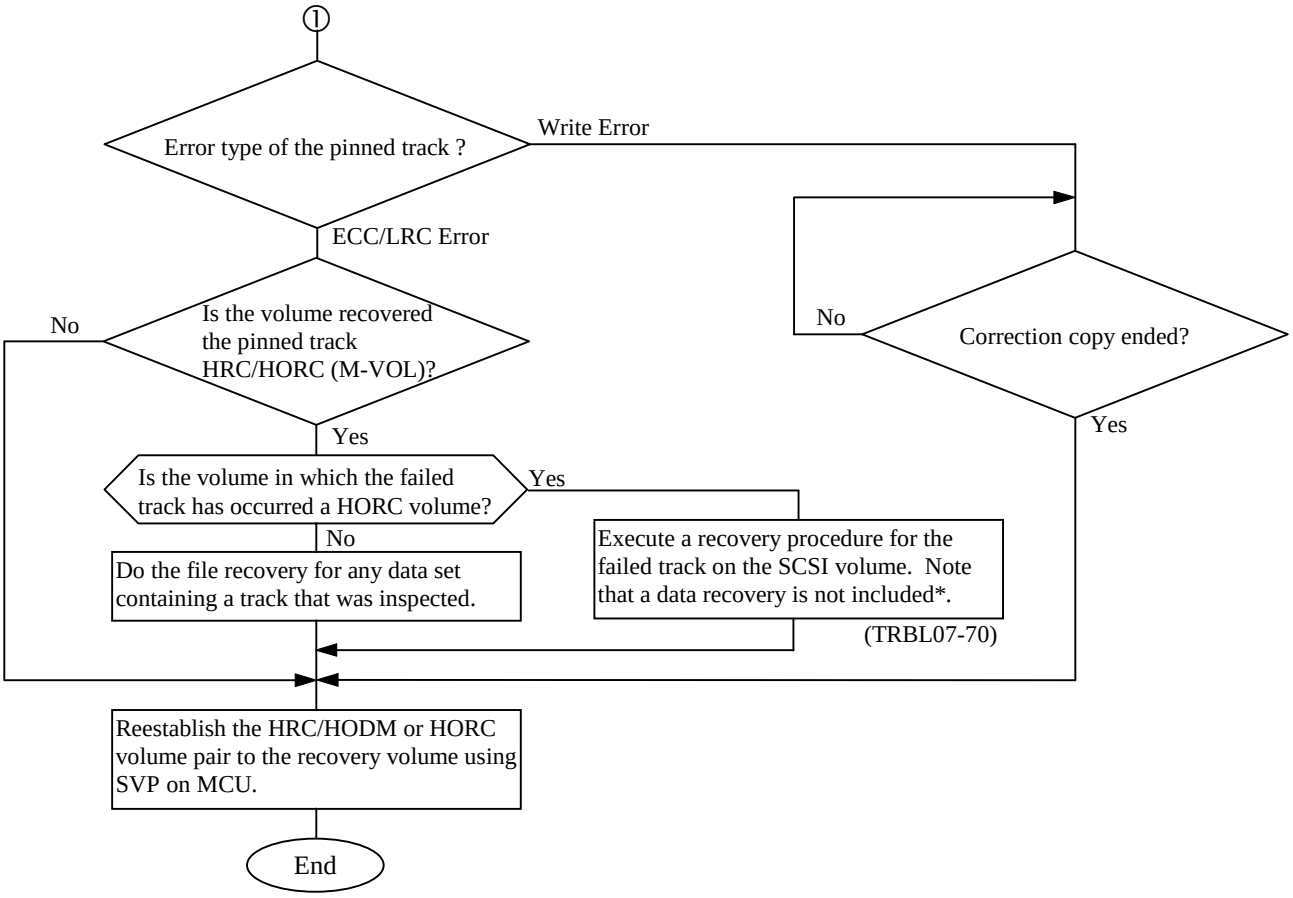

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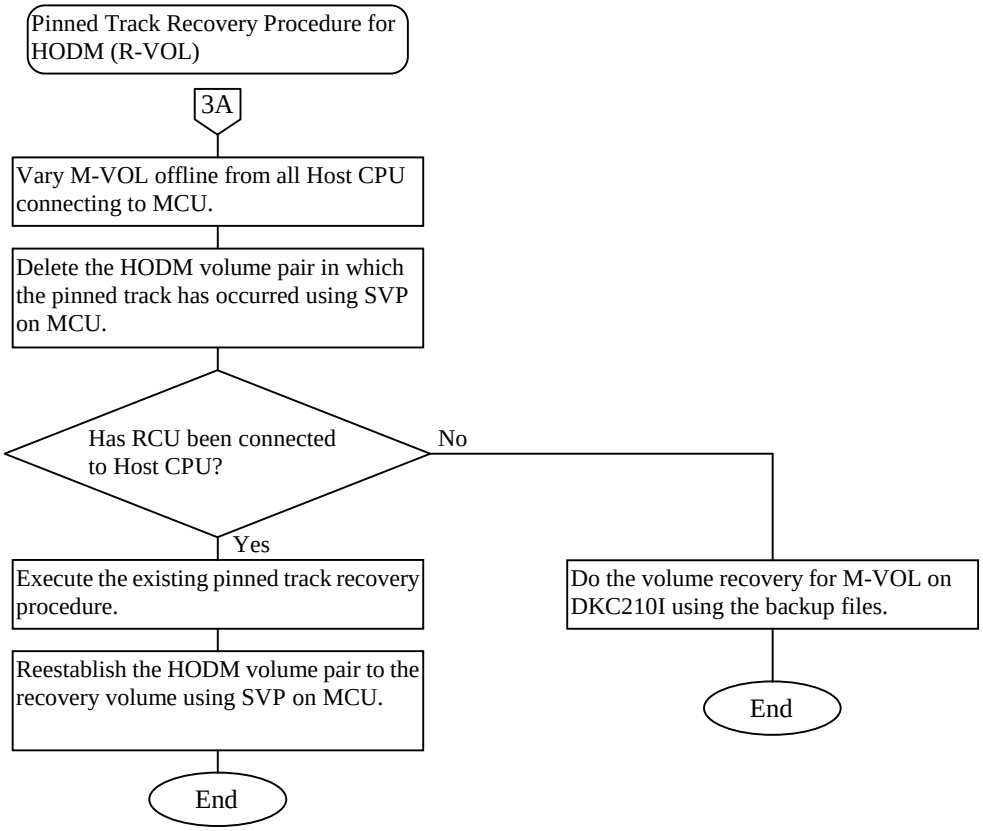

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6.4 Recovery Action of Path Status Error

Path Status	Recovery Action
"Nothing"	Delete the path with "Edit Path" or "Delete RCU", and add a new path with "Edit Path" or "Add RCU" again. (Refer to SVP04-30 "Path Operation".)
"Initialization Failed"	Refer to TRBL06-30 "HRC/HODM/HORC Path Recovery Section".
"Communication Time Out"	
"Resource Shortage (MCU)"	There are too many HRC/HODM/HORC paths on the MCU (RCU) side. Delete the path and the other useless paths with "Edit Path" or "Delete RCU", and add a new path with "Edit Path" or "Add RCU" again. (Refer to SVP04-30 "Path Operation".)
"Resource Shortage (RCU)"	
"Serial Number Mismatch"	Confirm the RCU serial number and the path connection, and delete the RCU with "Delete RCU". So add a new RCU with the correct serial number. (Refer to SVP02-1080 "Deleting an RCU Resistered".)
"Invalid Port"	This Status is occurred by the following two causes. (1) There are the same paths in the RCU. Then confirm the Port, the Link Address, and the Logical Address. And delete the path with "Edit Path". (Refer to SVP02-1110 "Reducing the Path(s) from the RCU".) (2) The Port isn't an RCP. Then confirm the Port, and delete the path with "Edit Path". Set the port to RCP, and add a new path with "Edit Path" again. (Refer to INST07-170 "RCP Port Setting" and SVP04-20 "Path Operation".)

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7 Trouble Shooting of Multiplatform

7.1 Trouble Shooting of error on host SCSI interface

This section describes trouble shooting of error on host SCSI interface.

7.1.1 Structure

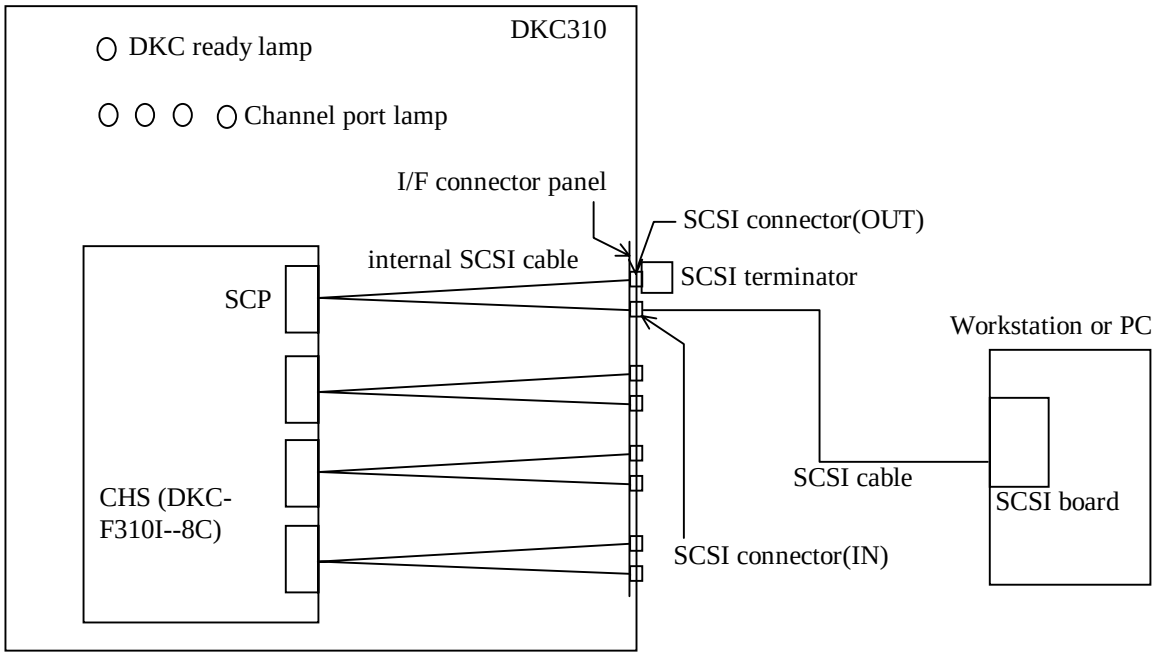

Fig. 7-1 Structure of SCSI path

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7.1.2 Possible error and cause

Table 7-1 Possible error and cause

No.	Possible error	Cause
1	DKC310 LDEV is not recognized by SCSI initiator	(1) SCSI installation, i.e. recognition and connecting procecure from SCSI initiator is not executed correctlry (2) Problem of SCSI cable or SCSI terminator or thier connection (3) Problem of SCSI initiator. SCSI board, device driver version, parameters (4) SCSI path definition from SVP (5) Problem of CHS or internal SCSI cable or connection of CHS and internal SCSI cable (6) Other
2	Parity error detected by SCSI initiator	(1) Unmatch of Wide/Sync negotiation (2) Problem of SCSI cable or SCSI terminator or their connection or environment
3	Parity error detected by DKC310	(1) Unmatch of Wide/Sync negotiation (2) Problem of SCSI cable or SCSI terminator or their connection or environment

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7.1.3 Checking item when some error occur on host SCSI path

Check item (correct value)

(1) Is the DKC ready lamp lit ? (ready lamp should be lit.)
(2) Is the concerned channel port lamp lit ? (concerned channel port lamp should be lit.)
(3) Is the concerned LDEV status normal ? (LDEV status should be normal or correction access.)
(4) Is the concerned SCP status normal ? (SCP status should be normal.)
(5) Is the concerned CHS status normal ? (CHS status should be normal.)
(6) Are the internal SCSI cable connected to the SCSI ports of CHS in right way ?
(7) Are the location of Basic/Additional 1/Additional 2/Additional 3 and Cluster 1/Cluster 2 of CHS and I/F connector panel location understood precisely?
Refer to pages LOCATION04-40, LOCATION04-70, LOCATION05-70 and INST03-970 through INST03-1030 on DKC310I Maintenance Manual for correct information.
(8) Is the concerned SCSI cable the one used without any problem ?
Do the concerned SCSI cable work well with other SCSI devices ?
Do another SCSI cable work well if it is replaced with the concerned SCSI cable ?
(9) Don‘t the SCSI connectors of SCSI cable have any problem ?
(10) Is the concerned SCSI cable connected to the I/F connector panel stably ?
(11) Is the concerned SCSI cable connected to the host SCSI board connector ?
(12) Is the concerned SCSI cable for 68-pin wide one ?
(13) Is the concerned SCSI terminator for Differential SCSI ?
(14) Are the two end of SCSI bus correctly terminated ?
(15) Isn’t the single-end type SCSI device connected to the concerned SCSI bus ?
(16) Isn’t there any duplication of SCSI ID ?
(17) Is the SVP SCSI path definition correct ?
(18) SCSI installation work from SCSI host done correctly ?

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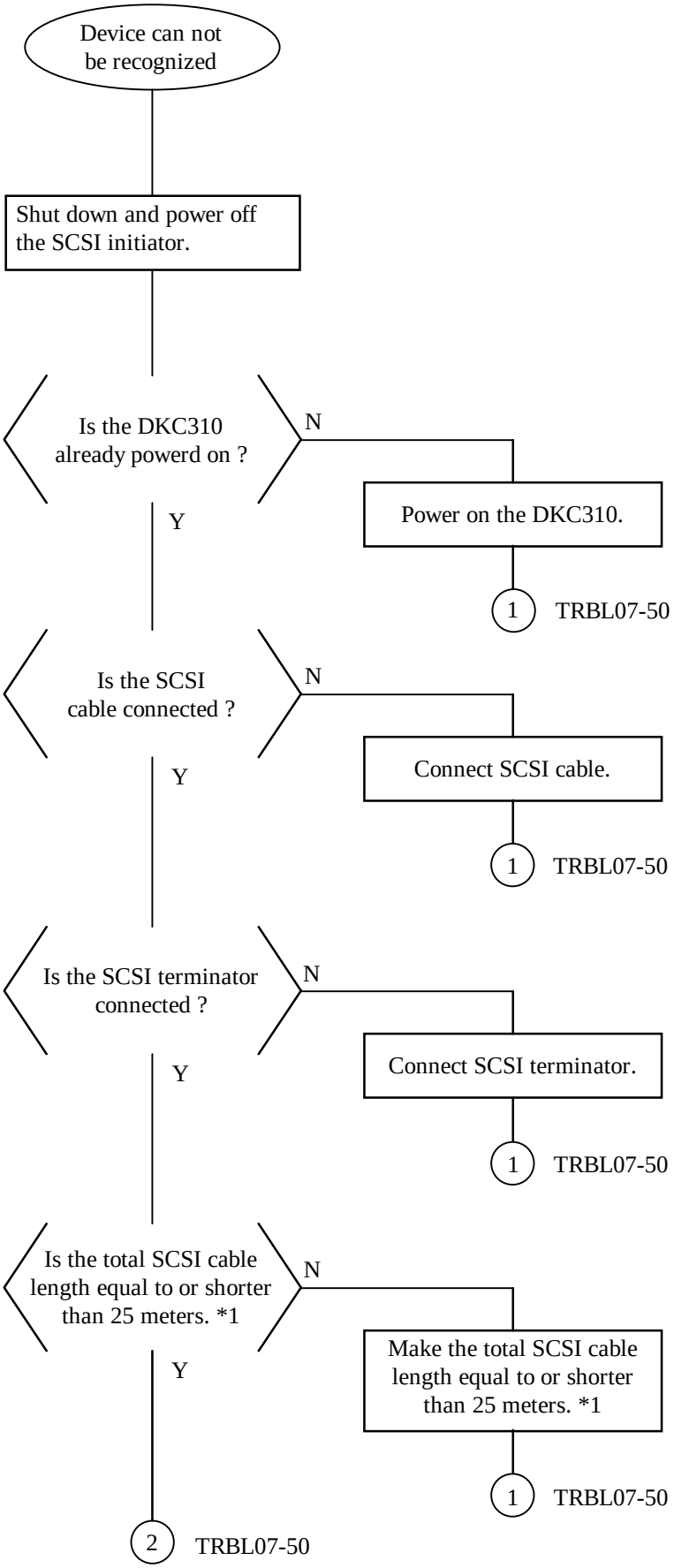

*1) 25 meters is maximum SCSI cable length of Differential type SCSI. DKC310 takes 5 meters for its internal SCSI cable for each SCSI port.

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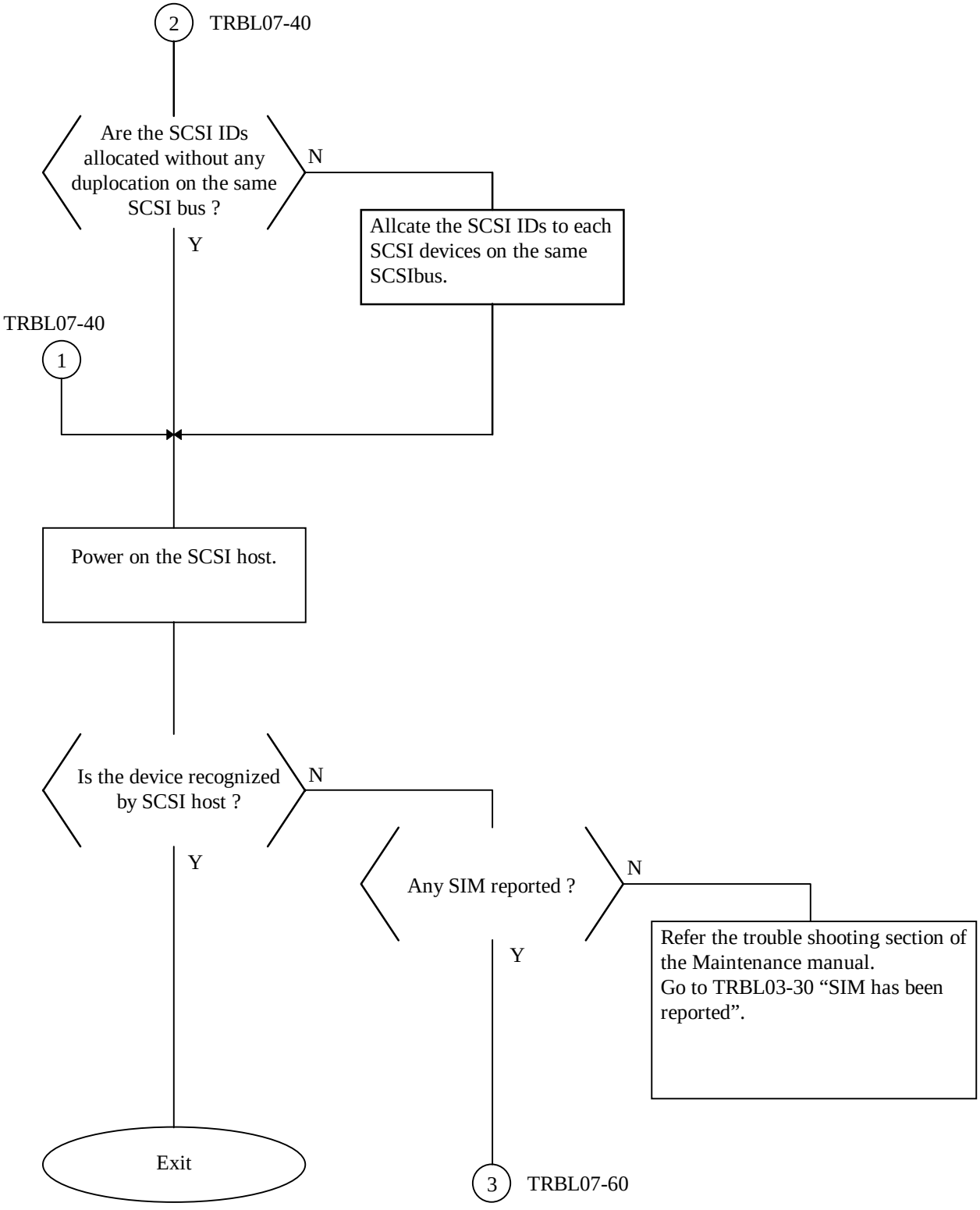

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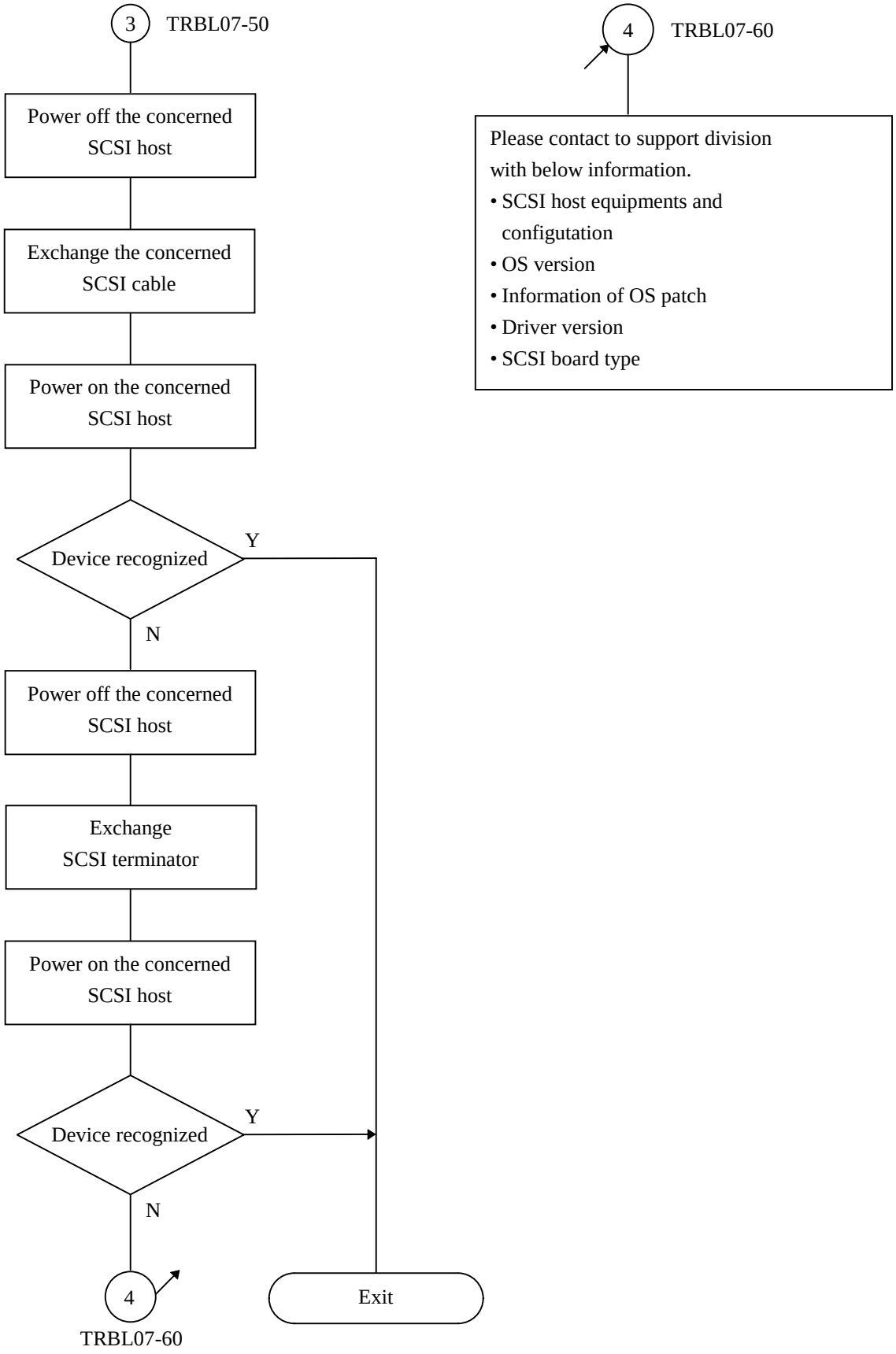

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7.2 Trouble Shooting of error on host Fibre channel interface

This section describes trouble shooting of error on host Fibre channel interface.

7.2.1 Possible error and cause

Table 7-2 Possible error and cause

No.	Possible error	Cause
1	DKC310 LDEV is not recognized by Fibre initiator	(1) SCSI installation, i.e. recognition and connecting procecure from SCSI initiator is not executed correctlry (2) Problem of Fibre cable or thier connection (3) Problem of Fibre initiator. Fibre board, device driver version, parameters (4) SCSI path definition from SVP (5) Other

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7.2.2 Checking item when some error occur on host SCSI path

Check item (correct value)

(1) Is the DKC ready lamp lit? (ready lamp should be lit.)
(2) Is the concerned channel port lamp lit? (concerned channel port lamp should be lit.)
(3) Is the concerned LDEV status normal? (LDEV status should be normal or correction access.)
(4) Is the concerned FCP/FOP status normal? (SCP status should be normal.)
(5) Is the concerned CHF/CHT status normal? (CHS status should be normal.)
(6) Are the location of Basic/Additional 1/Additional 2/Additional 3 and Cluster 1/Cluster 2 of CHF/CHT and I/F connector panel location understood precisely?
Refer to pages LOCATION04-40, LOCATION04-70, LOCATION05-70 and INST03-970 through INST03-1030 on DKC310I Maintenance Manual for correct information.
(7) Is the concerned Fibre cable the one used without any problem?
Do the concerned Fibre cable work well with other Fibre devices?
Do another Fibre cable work well if it is replaced with the concerned Fibre cable?
(8) Is the concerned Fibre cable connected to the I/F connector panel stably?
(9) Is the concerned Fibre cable connected to the host Fibre board connector?
(10) Isn’t there any duplication of AL-PA(port ID)?
(11) Is the SVP SCSI path definition correct?
(12) SCSI/Fibre installation work from Fibre host done correctly?

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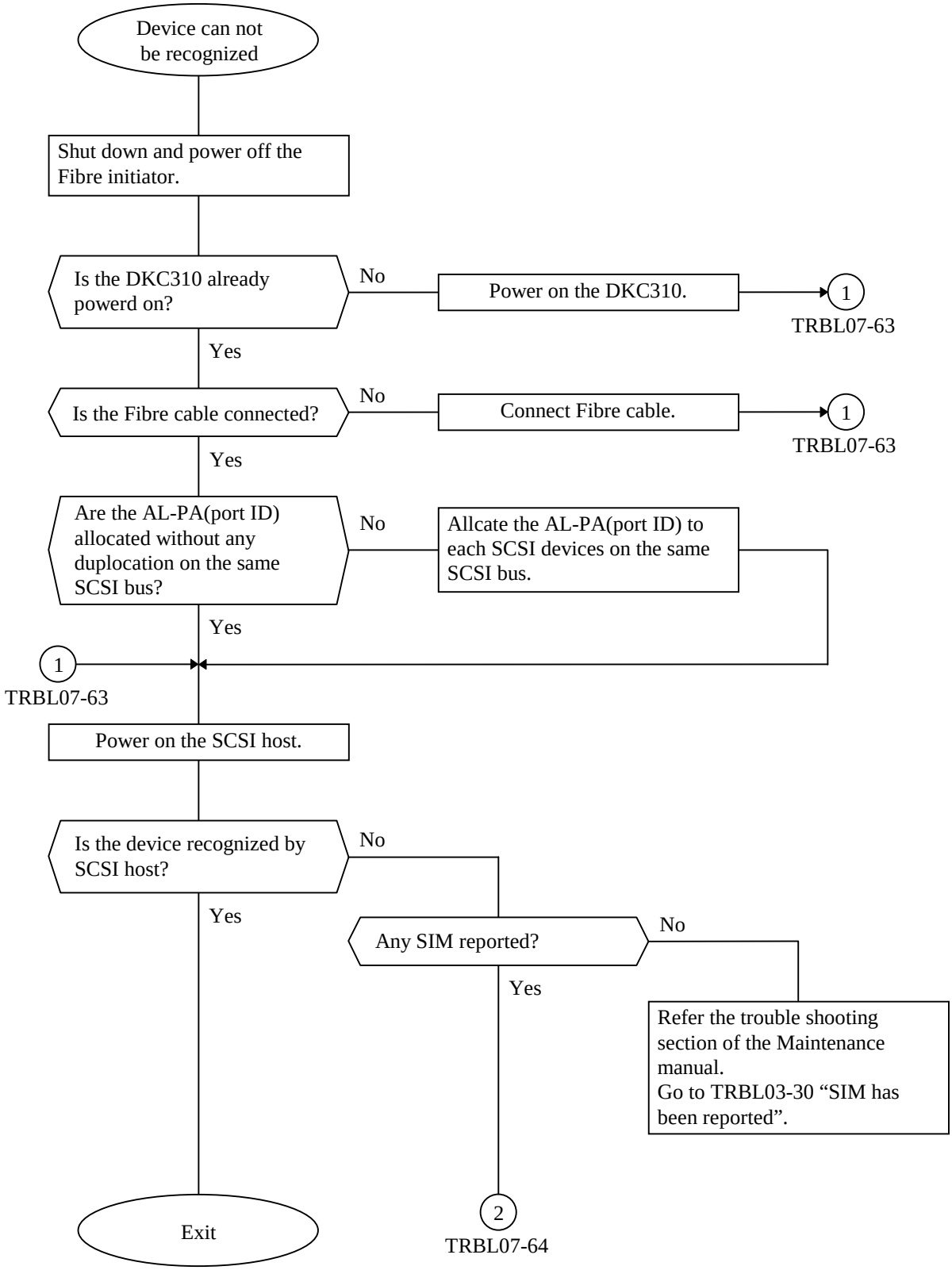

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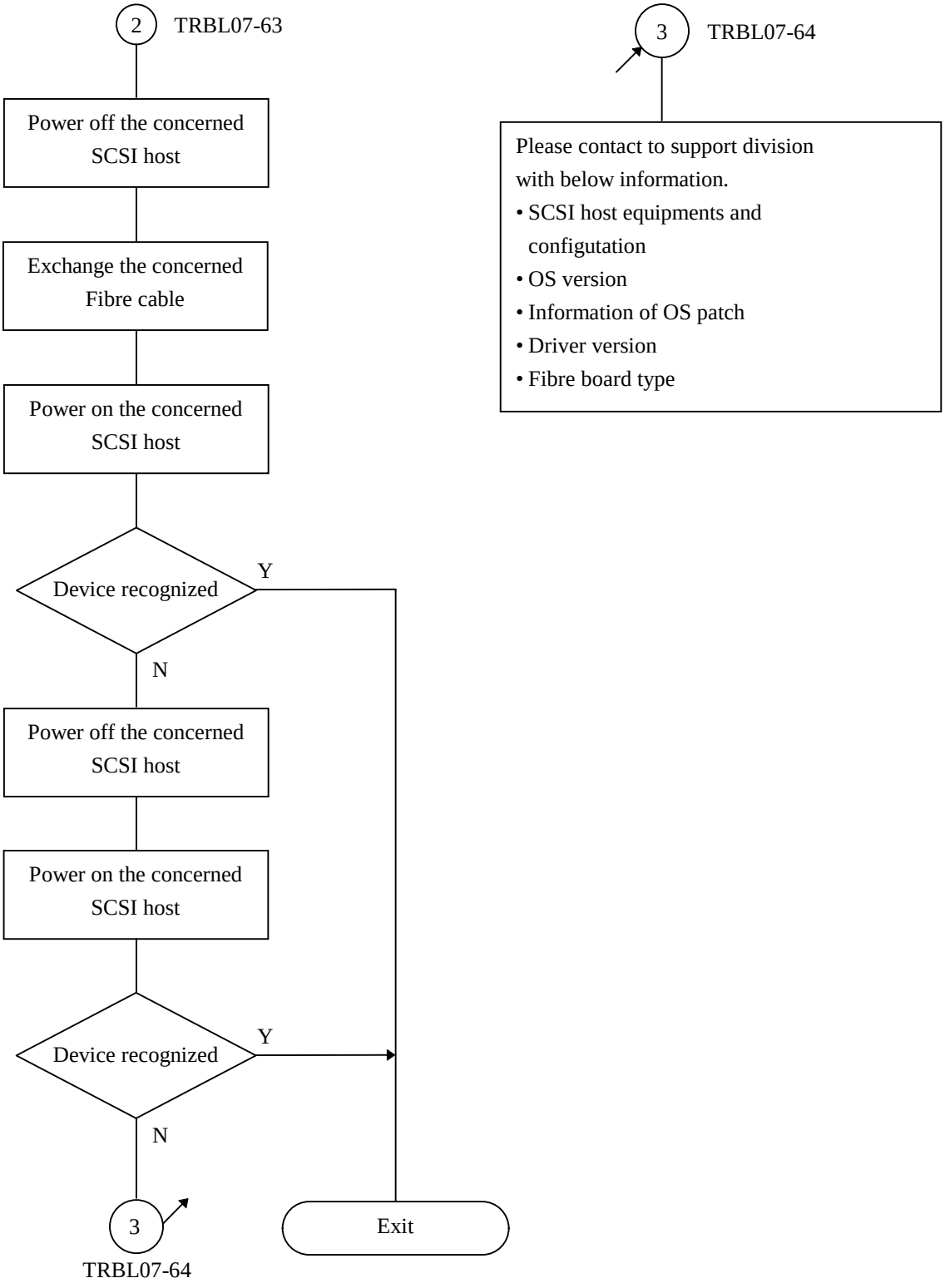

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7.3 Pinned track recovery of SCSI LDEV

This chapter shows about the explanation and the recovery procedure for faulty tracks in the OPEN-VOL.

7.3.1 Faulty Tracks

Hardware error sometimes causes pinned track occurrence.
Following reports indicate pinned track occurrence.

- The read-error report or the time-out error report from Application occurs..
- SIM report of pinned track occurrence.

SIM REF.CODE	Meaning	Comment
EF04-XX	Unable to write to PDEV on a track.	XX:LDEV number
FF04-XX	Unable to read from cache on a track.	XX:LDEV number

To recover pinned tracks, following information about the pinned track to be recovered are necessary.

- Address in LDEV(LDEV number)
- First and last LBA of stripe including the pinned track.
  * LBA : Logical Block Address
- Error type of the pinned track.
- PDEV number including the pinned track.

These information can be obtained by “Pinned Data Display Function”(SVP02-740) in SVP.

7.3.2 Error Types

Pinned track has 2 error types as follows.

Display on SVP	**Meaning**	**Cause**	**Recovery method**
Write Error	Unable to write to PDEV.	Drive error	Replacement of PDEV
ECC/LRC Error	Unable to read from Cache.	Cache error	File recovery

Following document explains each error type of pinned track and recovery flow chart for the ECC/LRC Error in the OPEN-VOL is showed. As for the pinned track except the ECC/LRC error condition in the OPEN-VOL, refer to TRBL04-10 section.

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7.3.2.1 ECC/LRC Error

Cause:

(1) An ECC/LRC type of pinned track is caused when a dirty data stored in both Cache side A/B can not be accessed correctly Also, during a dirty data de-stage process a data read from Cache side A/B is failed, an ECC/LRC Error is set. In this case, there exist a case in which the host I/O operation is processed normally. However, in case of host I/O access to Cache side A/B is failed, the original data for the track is lost.

(2) An ECC/LRC type of pinned track is caused when failed de-staging track occurs due to a drive failure etc, during a P/S Off and then P/S On without batteries. In this case, the original data for the track is lost.

(3) An ECC/LRC type of pinned track is caused when a track cannot be correctly reconstructed during a correction copy. In this case as stated above in (2), the original data for the track is lost.

(4) An ECC/LRC type of pinned track is caused when a parity track cannot be correctly reconstructed during a parity construction process. This means that all data tracks in the stripe does not match up with a parity track.
A factor involving a parity construction failure are as follows,

(a) When all necessary data required for a party reconstruction process not gathered correctly due to a failure drive etc. In a detail, when one or more data tracks(old data) within the stripe having a failed staging tracks due to a drive failure.

(b) When a parity data de-staging failed due to a drive failure.

Result of host I/O operation:

When a track with a ECC/LRC Error is accessed, result of host I/O operation is as the following.

(a) If the read in the track is possible, result of host I/O operation is normal end.

(b) If it isn't possible to read a track, it reports "(03)h: Medium Error" or "(0b)h: Abort" to I/O operation of the host. At this case, data is lost.

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The outline of the recovery procedure:

A track with ECC/LRC Error means that the original data for the track may be lost. Therefore, we will request to a customer that a recovery of the data for the track with ECC/LRC Error in the OPEN-VOL will be performed from a back-up file etc.
A recovery method for the track with ECC/LRC Error in the OPEN-VOL is as follows.

(1) It confirms CU-LDEV number which the pinned track occurred to by "Pinned Data Display Function"(SVP02-740) in SVP and LBA of the head and the last of the pinned track.
(2) Execute the "showrel" tool and examine relation in fault occurrence LDEV and the device which the file system recognizes.
(3) It judges a volume on the file system which is composed of the device and it checks data in the volume. (Using the command like **sum**)
(4) It requests the recovery of the data which "I/O error" or "read error" occurs to of the customer from a back-up file etc.
(5) It confirms pinned track information by "Pinned Data Display Function" (SVP02-740) in SVP.
If there is not a display of the pinned track and system tests result is normal, the recovery is ending.
If a new pinned track occurs, back to the process of hard error recovery.
(6) If a old pinned track display is left, execute the pin recovery tool.
(7) In case of "slot:PRTY" display, to input to the pin recovery tool isn't necessary.
It is automatically recovered when the pinned track of the "slot:DATA" display is recovered.

The cancellation of the faulty tracks

When data is written to the whole stripe, whole stripe data is fixed and a fault track is canceled.

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7.3.2.2 Write Error

Cause:

A Write Error type of pinned track is caused when the data de-staging process to the PDEV is failed due to a drive failure. When a drive failure occurs, the drive itself and the DKC perform a following recovery procedure. A write Error occurs when a following recovery procedure is failed.

(1) Medium failure : Automatic reallocation of alternate sector.
(2) Other failure : Alternate path retry.

A Write Error count information per PDEV is stored in DKC. When a Write Error count exceeds the threshold value, the PDEV is blocked. One PDEV blocked per parity Group will not stop the DKC operation to the parity group. When a track with Write Error is accessed by the host after the PDEV is blocked, the Write Error status will reset.

Result of host I/O operation:

Any access to a track with Write Error will be successful.

Recovery Method:

The PDEV containing a track with Write Error is replaced. At this time, if the blocked PDEV already exist within the parity group, first replace the blocked PDEV already exist. Next, replace the PDEV containing a track with Write Error. Also, if there are many PDEVs containing a track with Write Error check ORM Display on SVP Panel, then replace the PDEV with Highest Error Rate. A track with Write Error is recovered by a correction copy.

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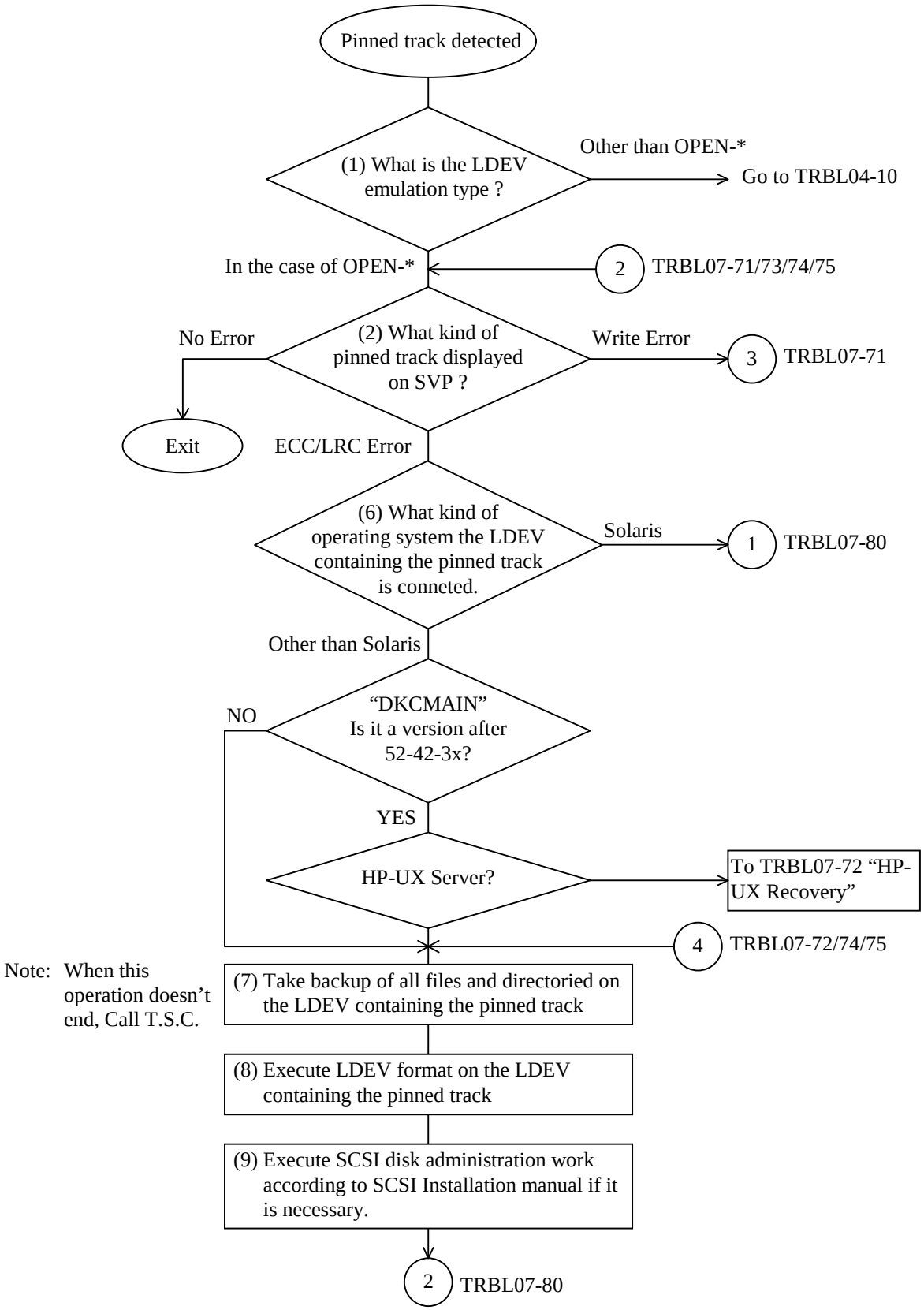
(1) Pinned track recovery procedure



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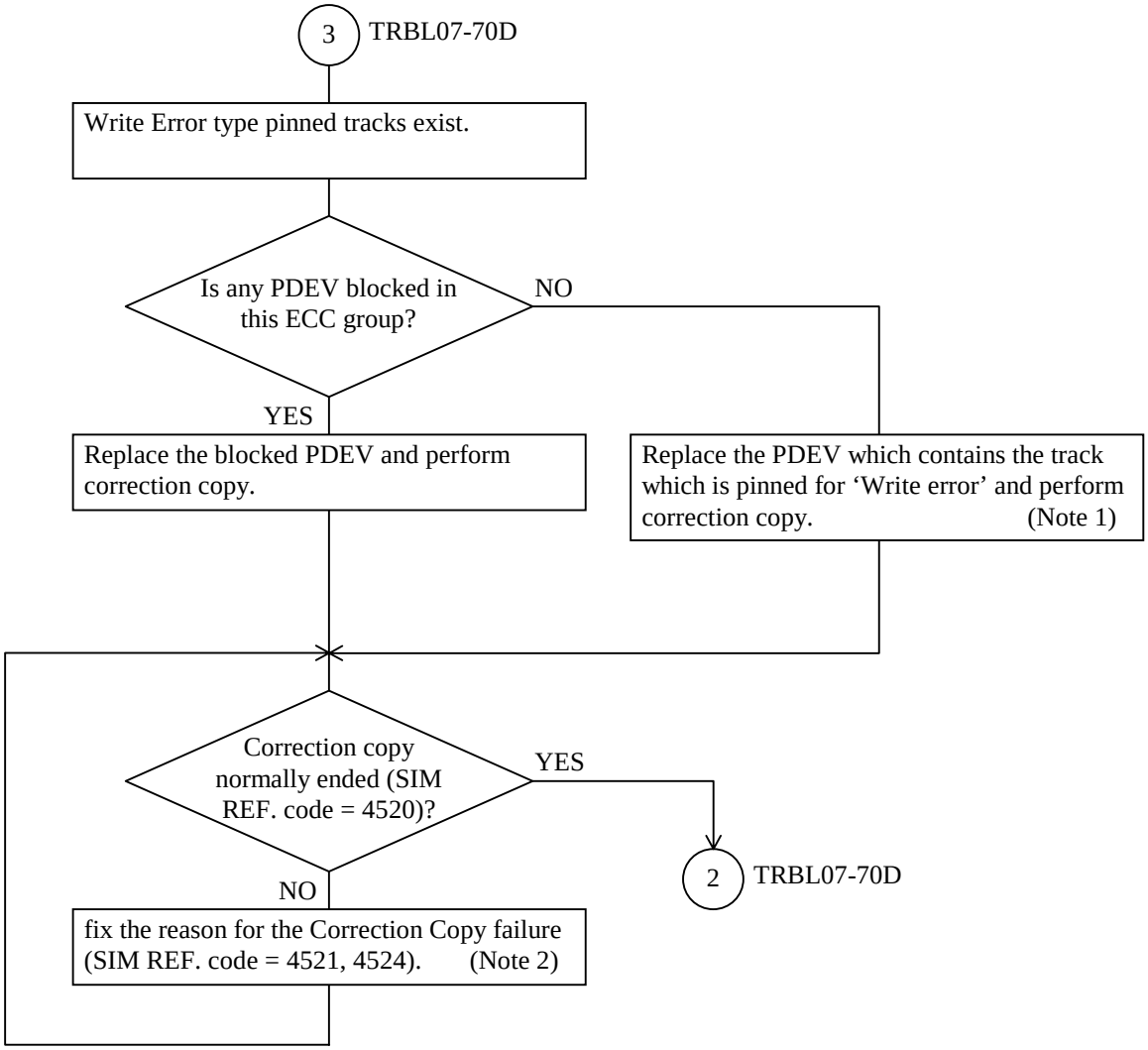

Note 1 If spare drives are available, you can perform Drive copy instead of Correction copy.
Note 2 In case of Drive copy abnormally ended, SIM REF. code is "4621" or "4624".

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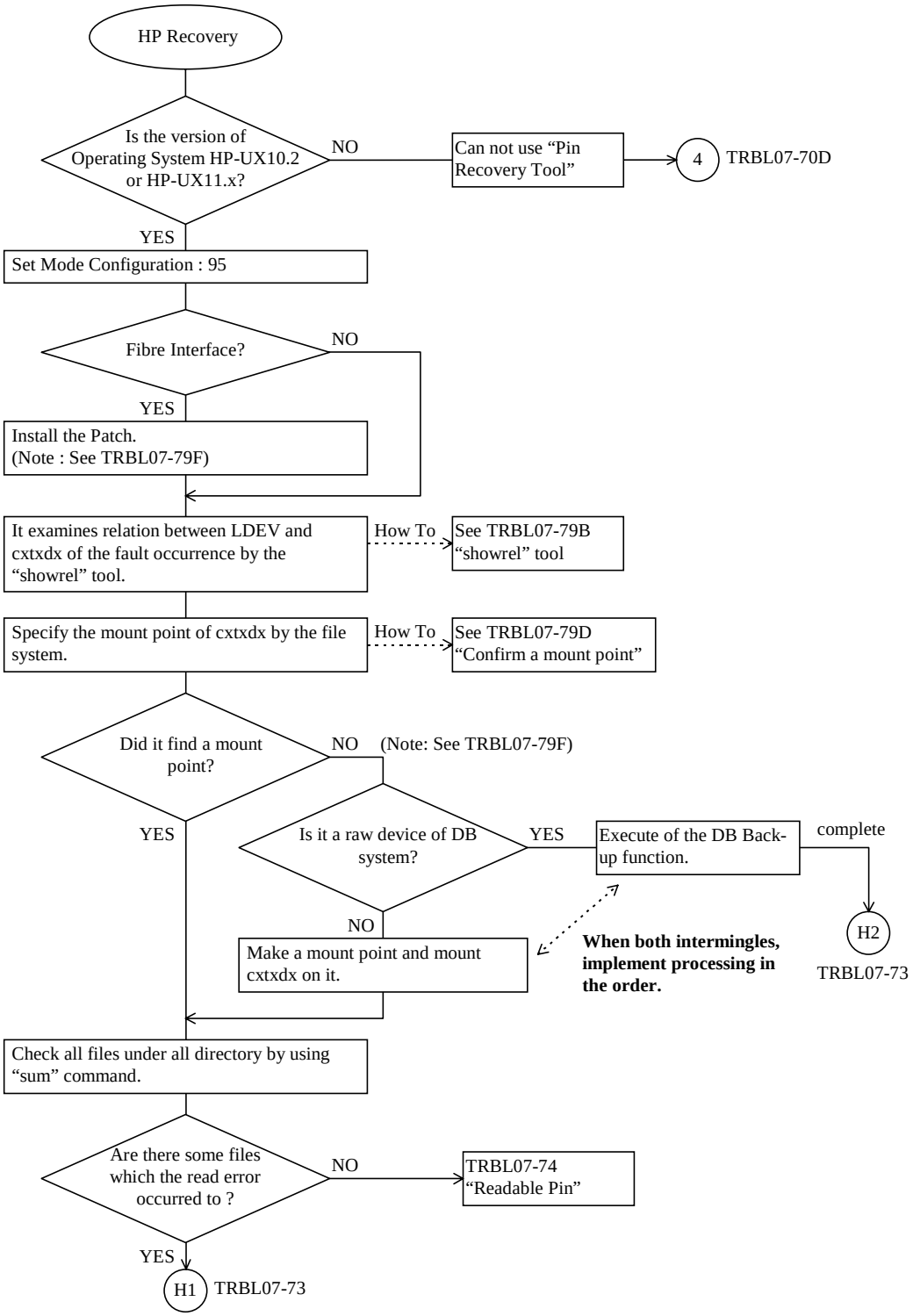
HP-UX Recovry

This chapter shows the pinned track recovery flow about the HP-UX10.2/11.x system.
Recovery FLOW



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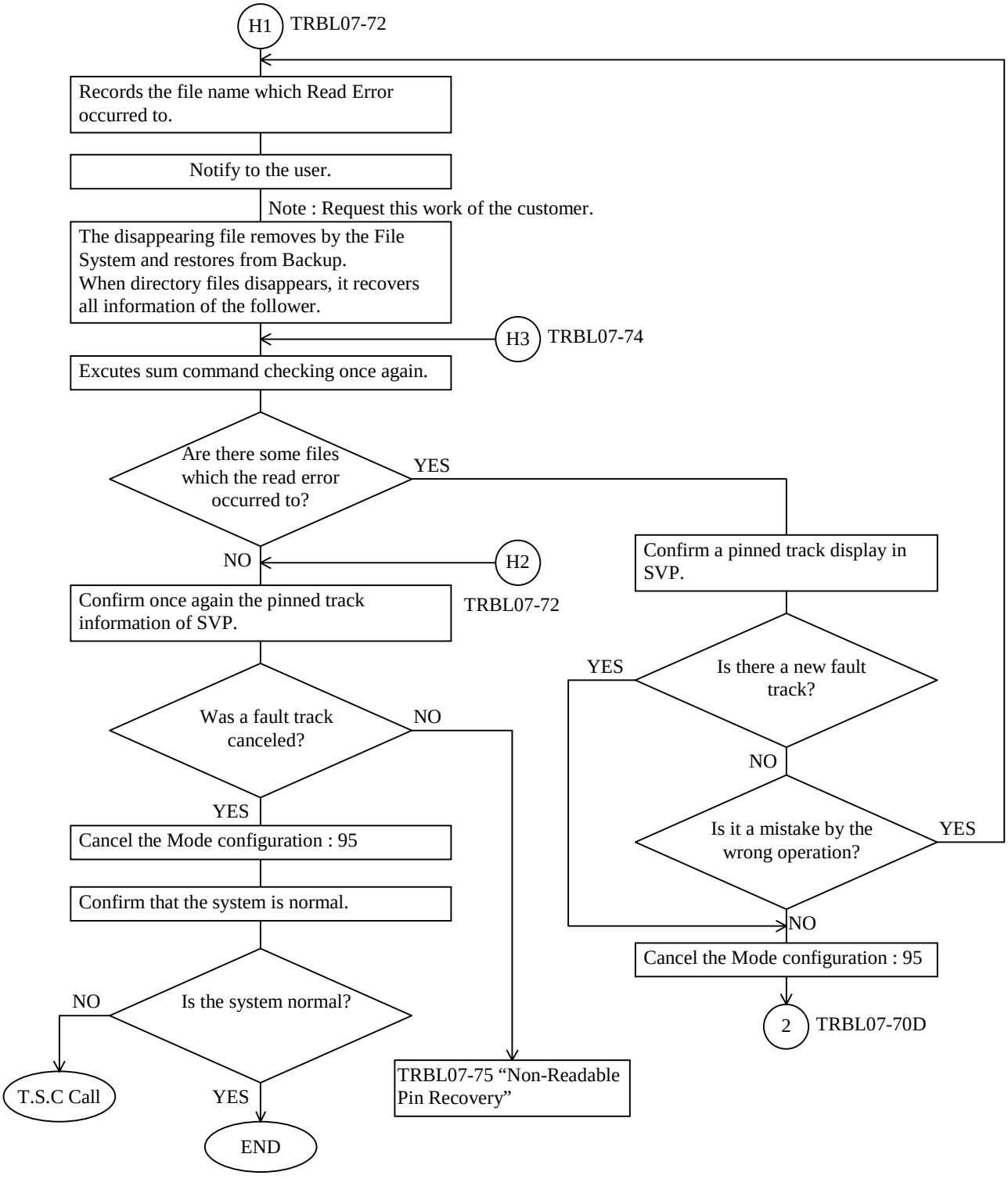

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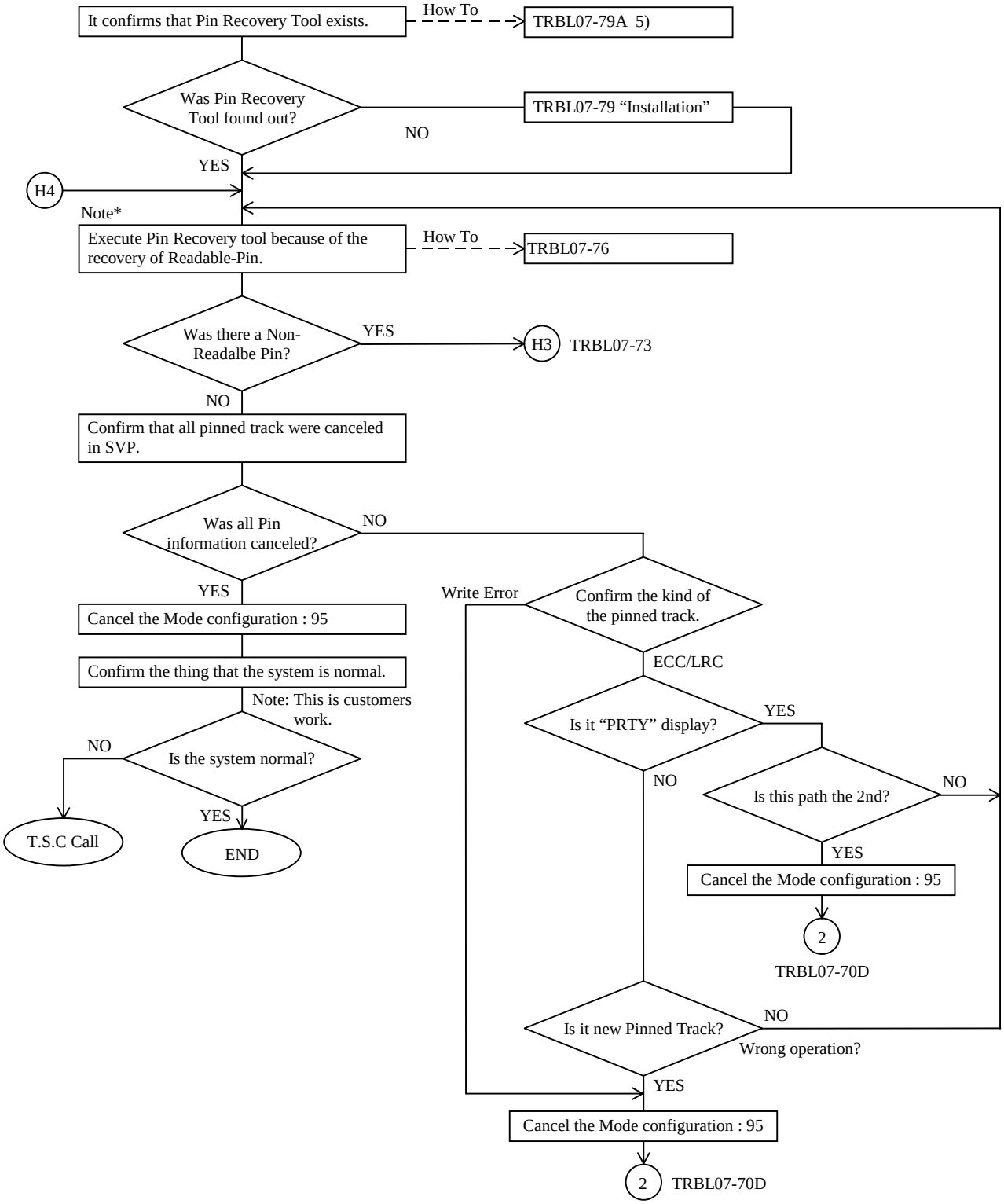
Readable Pin Recovery

The recovery flow in the readable pinned track by Pin Recovery Tool is as the following.



Note*: During Pin Recovery Tool execution, new Pin sometimes occurs to calculate a parity.
However, this Pin disappears when the recovery processing ends.
But, because SIM is left, complete SIM after all recovery is ended.

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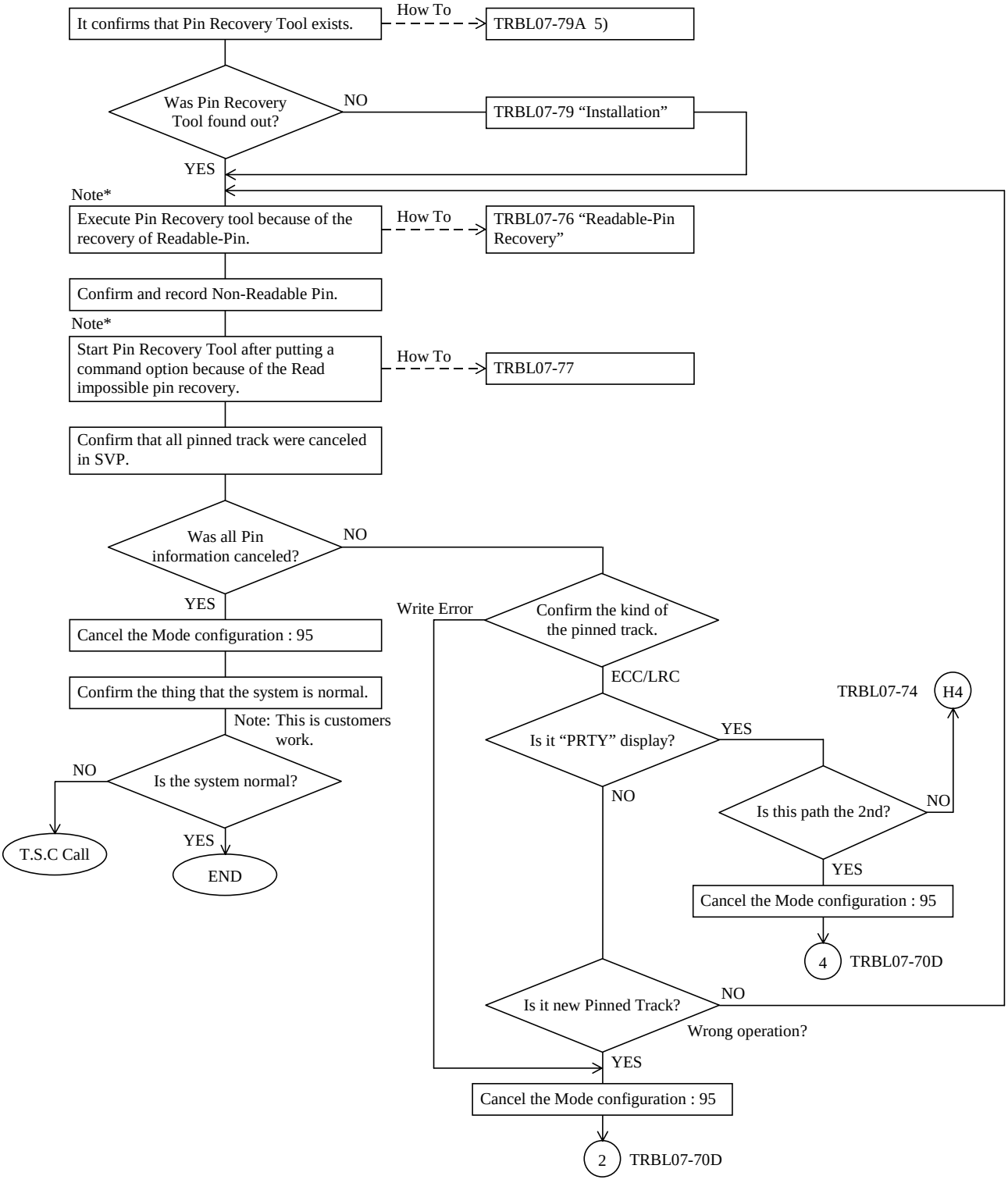
Non-Readable Pin recovery

The recovery flow in the non-readable pinned track by Pin Recovery Tool is as the following.



Note*: During Pin Recovery Tool execution, new Pin sometimes occurs to calculate a parity.
However, this Pin disappears when the recovery processing ends.
But, because SIM is left, complete SIM after all recovery is ended.

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Operation of Pin Recovery Tool for the Readable-Pin recovery.

This clause explains a way of operating Pin Recovery Tool to recover Readable-Pin.
<Operation>

1) Move to directory of the pin recovery tool.
   # cd /usr/raidopen/pintools/exe

2) Execute PinRecoveryTool without the command option.
   # ./pintool -log **(Put pass "./")**
   Note: This option "-log" gathers detailed log.
   It recommends to specify this option.
   However, when processing LBA with (60)h length, the log becomes about 400KB.
   Be careful of the available capacity of the disk.
   For the details of log, refer to TRBL07-79C.

3) According to the question, input information.
   # ./pintool -log
   Input Device Name -> **/dev/rdsk/c3t0d0**
   Input Start LBA Data -> **180**
   Input End LBA Data -> **1df**
   (**Input the LBA number which was acquired from SVP. Do not input the LBA of the "slot:PRTY" display.**)
   Input Next LBA ?(Y/N) -> **n** **(When there still is a fault track in the same Device, it inputs "y".)**
   Input Next Device ?(Y/N) -> **n** **(When recovering different Device at the same time, it inputs "y".)**

4) Because an input data list is displayed, check input information.

Device Name	Start LBA	End LBA
/dev/rdsk/c3t0d0	**00000180**	**000001DF**

Before you try to recovery the readable pin,
please check the pin information on SVP.
If the pin data have been recoveried, please do not try to recovery the pin data again.
Do you want to do the recovery of the readable Pin?
Please input[y/n(default n)] : **y**

   When mistaking by the input, it inputs "n" [Return] and then it redoes from (2).
   Confirm whether or not a pinned track is canceled from the display of SVP.
   When it cancels already, input "n" [return]. When not canceled, input "y".

5) When judged Non-Readable Pin, the following message is displayed.
   Non-Readable Pin:

Device Name	Start LBA	End LBA
/dev/rdsk/c3t0d0	00000180	000001DF

   Note: This tool recognizes an inputted range as the 1 processing unit.
   Therefore, the range where Non-Readable pin exists is displayed in the inputted range.

6) When Pin Recovery Tool ends, a log file (month -day -hour -minute -second .log) is made on the same directory. (ex:0614200552.log)

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Operation of Pin Recovery Tool for the Non-Readable Pin recovery.

This clause explains a way of operating Pin Recovery Tool to recover Non-Readable Pin.

<Operation>

1) Move to directory of the Pin Recovery Tool.
   # cd /usr/raidopen/exe

2) Put a command option and execute a pin recovery tool.
   # ./pintool -f -log **(Put command option "-f")**
   Note: This option "-log" gathers detailed log.
   It recommends to specify this option.
   However, when processing LBA with (60)h length, the log becomes about 400KB.
   Be careful of the available capacity of the disk.
   For the details of log, refer to TRBL07-79C.

3) According to the question, input information.
   # ./pintool -f -log
   Input Device Name -> **/dev/rdsk/c3t0d0**
   Input Start LBA Data-> **180**
   Input End LBA Data -> **1df**
   Input the LBA number which was acquired from SVP. Do not input the LBA of the "slot:PRTY" display.
   Input Next LBA ?(Y/N) -> **n** **(when there still is a fault track in the same device, it input "y".)**
   Input Next Device ?(Y/N) -> **n** **(When recovering different device at the same time, it inputs "y".)**

4) Because an input data list is displayed, check input information.

Device Name	Start LBA	End LBA
/dev/rdsk/c3t0d0	**00000180**	**000001DF**

Before you try to recovery the readable pin,
please check the pin information on SVP.
If the pin data have been recoveried, please do not try to recovery the pin data again.
Do you want to do the recovery of the readable Pin?
Please input[y/n(default n)]: **y**

When mistaking by the Input, it Input "n"[Return] and then it redoes From (2).
Confirm whether or not a pinned track is canceled from the display of SVP.
When it cancels already, input "n"[return]. When not canceled, input "y".

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5) When judged Non-Readable Pin, the following message is displayed.

```
Non-Readable Pin:
Device Name                Start LBA          End LBA
/dev/rdsk/c3t0d0           00000180           000001DF
Do you want to do the recovery of the non-readable Pin?
WARNING! if you input 'y', Pin Blocks will be over written by '0'.
Please input[y/n(default n)]: y
```

When recovering by the "0" writing to Non-Readable Pin, input "y"[Return].

Note: This tool recognizes an inputted range as the 1 processing unit.
Therefore, the range where Non-Readable pin exists is displayed in the inputted range.

6) When Pin Recovery Tool ends, a log file (month -day -hour -minute -second .log) is made on the same directory. (ex:0614200552.log)

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Installation of Pin Recovery Tool.

This clause explains the installation of Pin Recovery Tool.

The preliminary preparation

In directory that Pin Recovery Tool is done by the installation, confirm that there is a room area for the gathering in the work log.
An installation procedure from the tape device (ex: 4mmDDS-DAT) is shown in the following.

Installation

1) Log-in to the host as “root”.
2) Move to the install area by the “cd” command and make a directory “raidopen”.
   # cd /usr (ex: Move to the “/usr”)
   # mkdir raidopen (ex: Make the directory “raidopen”)
3) Move to made directory and copy a file from the tape by the "tar" command.
   # cd raidopen (ex: Move to the “raidopen”)
   # mt -t /dev/rmt/0m rew (ex: Rewing a tape. “0m”depend on each host.)
   # tar -xvf /dev/rmt/0m (ex: copy a file from the tape.)
4) Thaw a compressed file “pintools.tar.Z” by “zcat” command.
   # zcat pintools.tar.Z | tar -xvf

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5) After the thawing is complete, confirm a file name.

 # cd ./pintools/exe (ex: Move to directory which was made by the thawing.)
 # ls -l (ex: Display a file list.)

* Confirm foure files. **p83h(20531bytes), Cpintool(45240bytes), Cshowrel(1163bytes), pinformattool(45241bytes)**

File preservation and the way of removing Pin Recovery Tool.

Log-File preservation

1) Compress the log file which was made by the pin recovery.

 # cd /usr/raidopen/pintools/exe (ex: Move to the working directory.)
 # mkdir ./logdir (ex: Make to the directory for Log-file.)
 # mv *.log ./logdir (ex: Move logfiles to the directory for Log-file.)
 # tar -cvf pinlog.tar ./logdir (ex: Make tar file from logdir.)
 # compress pinlog.tar (ex: Compress “pinlog.tar” file.)

2) Preserve log file at the tape and rewind it..

 # tar -cvf /dev/rmt/0m pinlog.tar.Z (ex: Preserve log file)
 # mt -t /dev/rmt/0m rew (ex: rewind the tape)

The way of removing Pin Recovery Tool

The removal of the Pin Recovery Tool deletes all bottoms of install directory.

 # cd / (ex: Move to the root directory.)
 # \rm -r /usr/raidopen/pintools* (ex: deletes all bottoms of install directory)

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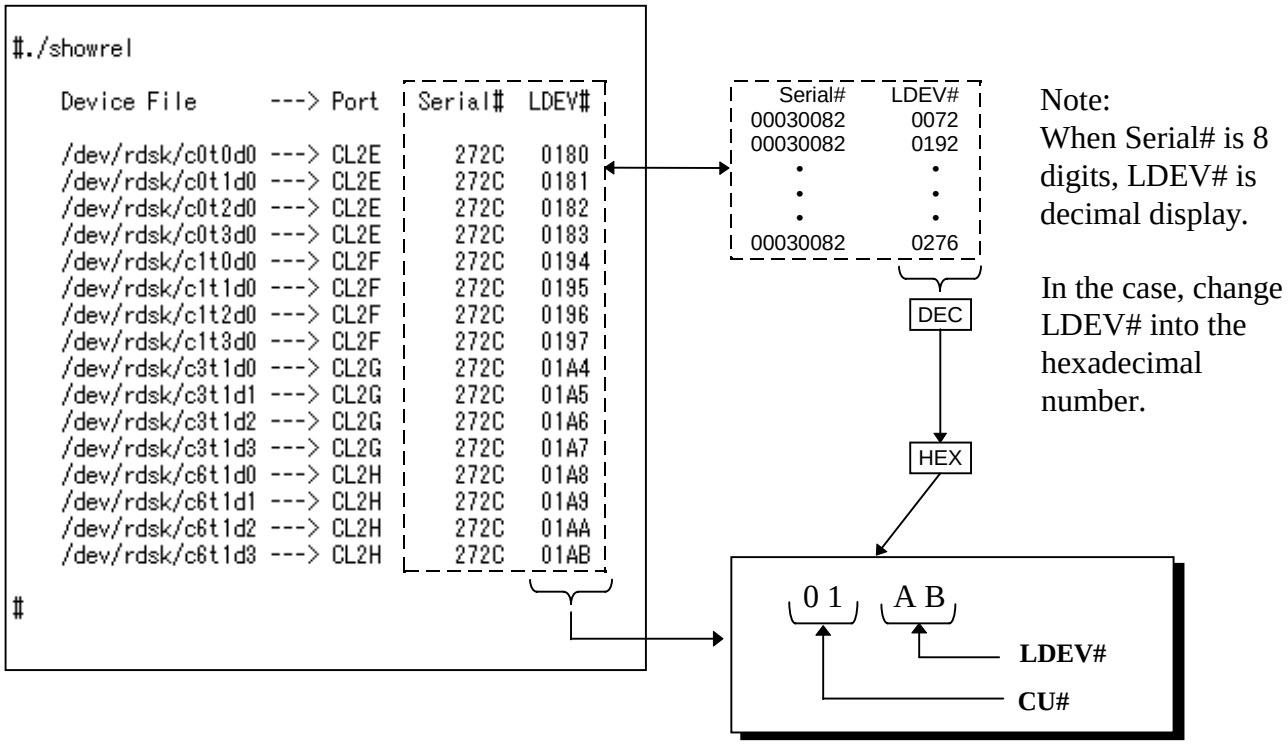
The acquisition of the device information

This chapter is the explanation of the tool “showrel” to acquire device information.

1) Move to the install directory.
   # cd /usr/raidopen/pintools/exe
2) Input command as follows.
   # ./showrel (Put the path “./”)

<Display Example>



Note:
When Serial# is 8 digits, LDEV# is decimal display.

In the case, change LDEV# into the hexadecimal number.

“LDEV#” is composed of CU number and LDEV number. Confirm CU# and LDEV# of the pinned track occurrence which is displayed in SVP and specify a recovering device file.
Device File name is input information to Pin Recovery Tool.

(Example)
LDEV# = **01AB** → Device File = **/dev/rdsk/c6t1d3**

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The way of gathering detailed information.

It is possible to do the gathering of the detailed information of the recovery when putting a command option to Pin recovery Tool and starting it.

 # ./ pintool (-f) -log

Like the following, it outputs read data and write data in the log file.
<Display Example>

LBA which could not be read is displayed by "*".

```
Input Device Name = /dev/rdsk/c1t0d0
Input Start LBA = 00000180
Input End LBA = 000001DF        Non-Readable data!
/dev/rdsk/c1t0d0, Start LBA = 00000180, End LBA = 000001df readable PIN Recovery read error
Read Data:  Top Pin No = 00000180 <-- Execute LBA!
  00000000: ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  00000010: ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  00000020: ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  00000030: ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  00000040: ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  •  •  •
Read Data:  Top Pin No=00000181
•  •  •
Read Data:  Top Pin No=00000182
•  •  •
Read Data:  Top Pin No=00000183
•  •  •
Read Data:  Top Pin No=000001DF
  000001A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  000001B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  000001C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  000001D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  000001E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  000001F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Write Data:  Top Pin No=00000180
•  •  •
  00000000: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  00000020: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  00000030: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  00000040: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
•  •  •
•  •  •
•  •  •
  0000BFC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0000BFD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0000BFE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0000BFF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
/dev/rdsk/c1t0d0, Start LBA=00000180, End LBA=000001DF PIN Recovery complete!!
```

Note: In the processed range, log information is recorded.

➡ This log is executing read processing by the 1 LBA unit.

➡ This log shows to have processed all ranges in the writing at once.

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The way of examining Mount Point which has a Pinned Track

Note : As for the following work, request a system administrator to operate.

1) Input the "vgdisplay" command and displaying a Volume Group list.

   # vgdisplay -v

2) Specify “lvol(/dev/vgx/lvolx)” which is composed of Physical Volume(cxtxdx) which the Pinned Track occurs to.

<Display Example>

```
--- Volume groups ---
VG Name                     /dev/vg11
VG Write Access             read/write
VG Status                   available
Max LV                      255
Cur LV                      1
Open LV                     1
Max PV                      16
Cur PV                      4
Act PV                      4
Max PE per PV               1016
VGDA                        8
PE Size (Mbytes)            4
Total PE                    2344
Alloc PE                    2000
Free PE                     344
Total PVG                   0
Total Spare PVs             0
Total Spare PVs in use      0

--- Logical volumes ---
LV Name                     /dev/vg11/lvol1
LV Status                   available/syncd
LV Size (Mbytes)            8000
Current LE                  2000
Allocated PE                2000
Used PV                     4


--- Physical volumes ---
PV Name                     /dev/dsk/c9t1d0
PV Status                   available
Total PE                    586
Free PE                     0

PV Name                     /dev/dsk/c9t1d1
PV Status                   available
Total PE                    586
Free PE                     0

PV Name                     /dev/dsk/c9t1d2
PV Status                   available
Total PE                    586
Free PE                     0

PV Name                     /dev/dsk/c9t1d3
PV Status                   available
Total PE                    586
Free PE                     344
```

Volume Group Name

"/dev/vgl1/lvol1" is a Volume Group("/dev/vgl1") made in.

PV(cxtxdx) which composes volume group "/dev/vgl1" is displayed.

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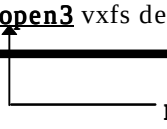
3) It displays "./etc/fstab".

#cat /etc/fstab

4) It specifies mount point for PV which was confirmed in "vgdisplay".

<Display Exsample>

```
# System /etc/fstab file.  Static information about the file systems
# See fstab(4) and sam(1M) for further details on configuring devices.
/dev/vg00/lvol3 / vxfs delaylog 0 1
/dev/vg00/lvol1 /stand hfs defaults 0 1
/dev/vg00/lvol4 /tmp vxfs delaylog 0 2
/dev/vg00/lvol5 /home vxfs delaylog 0 2
/dev/vg00/lvol6 /opt vxfs delaylog 0 2
/dev/vg00/lvol7 /usr vxfs delaylog 0 2
/dev/vg00/lvol8 /var vxfs delaylog 0 2
/dev/vg00/lvol10 /home1 vxfs rw,suid,nolargefiles,delaylog,datainlog 0 2
/dev/vg11/lvol1 /open3 vxfs delaylog 0 4
```



mount point

5) Input the "bdf" command and confirm the mount point.

#bdf

<Display Example>

```
Filesystem          kbytes    used   avail %used Mounted on
/dev/vg00/lvol3      86016   26109   56212   32% /
/dev/vg00/lvol1      67733   31932   29027   52% /stand
/dev/vg00/lvol8     512000  159876  331072   33% /var
/dev/vg00/lvol7     614400  428475  174362   71% /usr
/dev/vg00/lvol4      32768    1131   29663    4% /tmp
/dev/vg00/lvol6     258048  102174  146171   41% /opt
/dev/vg00/lvol1 01544192    2858 1445062    0% /home1
/dev/vg00/lvol5      20480    6078   13595   31% /home
/dev/vg11/lvol1    8192000 3149893 4726982   40% /open3
```

6) Mount Point to check by the "sum" command is decided.

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The attention item.

This clause explains the attention item when using Pin Recovery Tool.

The attention item about the Pin Recovery Tool use.

1) The pinned track LBA to input to Pin Recovery Tool put the value of the 1 slot unit which was displayed in SVP. 1 slot is composed of 96 LBA ((60)h LBA). At less than 96 values, the fault can not be canceled.
2) Pin Recovery Tool is not the tool to make data recover. Therefore, when Un-readable Pin occurs, it is necessary to be restored using the back-up data of the customer.
3) There is a case that O/S patch is prepared which has an influence to the fault track reed operation. In case of HP Server which has Fibre Interface, the following patch is necessary.
   - PHSS_18326 Fibre Channel Mass Storage Driver Patch. (HP-UX10.2/11.0)
   - PHCO_18217 Cumulative SAM/ObAM Patch. (HP-UX10.2)
   - PHKL_16751 SIG_IGN/SIGCLD,LVM,JFS,PCI/SCSI cumulative patch. (HP-UX10.2)

   These patch information is the Jun/99 present.
   The patch information of OS changes in the time. Confirm the latest information.
   Request the work to install patch in of the system administrator.
   When the system administrator judges an evil influence in the system, cancel the Mode Configuration:95 and return to TRBL07-70D ④.
4) When it isn't possible to use Pin Recovery Tool, it is recovery by LDEV Format.

The recovery of the DB

DB has two types of the following.

1) Raw device-based Data Base type :
   Without passing O/S, by the physical level, the data base soft wear is managing a disk. (It shows to be managing by the LBA unit with the physical level.)
   The device of local type isn't mounted on File System. Then, it has a powerful back-up function.
2) File system-based Data Base type :
   Therefore, it is recognized as the file which was made with file system.

In case of (2), because it is possible to be seen through File System, the "sum" checking can be executed but at (1), it must depend on the function of DB in all of the back-up work..

If a fault track is still left after back-up work is ended, recover by Pin Recovery Tool.
The work of the most priority is the execution of the DB back-up function.

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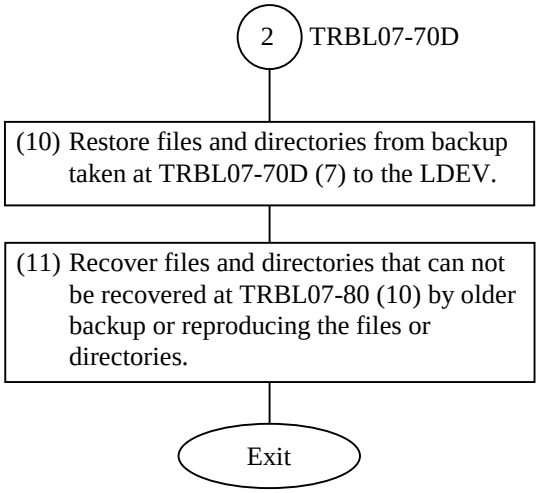
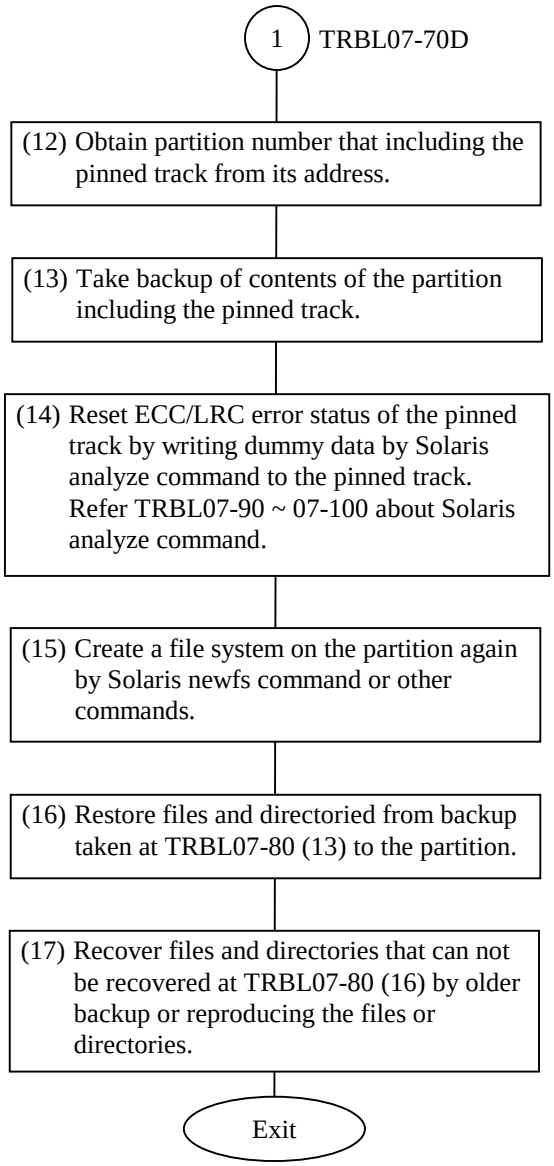


In case of Solaris



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(2) In case of Solaris : reset ECC/LRC error status of pinned track by Solaris analyze command

ECC/LRC error status of pinned track can be resetted by writing dummy data by analyze command in case of the LDEV containing the pinned track is connected to Solaris.
The procedure is described below. Input commands are shown by boldface characters.

1) Login to the Solaris as supseruser
Example

```
host console login: root↵
password: sorry↵
```

2) Writing dummy data to the pinned track by analyze command
Analyze command is subcommand of format command
Example

```
# format↵
Searching for disks...done

AVAILABLE DISK SELECTIONS:
  (recognized SCSI disks are listed here.)
Specify disk (enter its number):n↵              ...device number of the LDEV
                                                   including the pinned track.
selecting  n
[disk formatted]

FORMAT MENU:
  (format command menu is listed here.)
format> analyze↵
  (analyze subcommand menu is listed here.)
analyze> setup↵
Analyze entire disk[no]? no↵
Enter starting block number[0, 0/0/0]: starting LBA of the pinned track
Enter ending block number[5806479, 3336/14/115]: ending LBA of the track
Loop countinuously[no] no↵
Repair defective blocks[yes] ↵
Stop after first error[no] ↵
Use random bit parrerns[no] ↵
```

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```
Enter number of blocks per transfer[126, 0/1/10]: 1↵
Verify media after formatting [yes]? no↵
Enable extended messages[no]? yes↵
Restore defect list[yes]? ↵
Restore disk label[yes]? ↵

analyze> write↵
Ready to analyze (will corrupt data). This takes a long time,
but is interruptable with CTRL-C. Continue? y↵

    PASS 0 - pattern = c6dec6de
  cylinder number/head number/block counts

Total of 0 defective blocks repaired.
analyze> quit↵
```

(Note)

1) Above procedure and messages may be differ by Solaris versions.
2) Device number cxtxdx used for Solaris is different from DKC310 LDEV number.
   Device number cxtxdx should be obtained by DKC310 SCSI path configuration.
   (a) Isolate LDEV number of the LDEV containing the pinned track by SVP.
   (b) Obtain the SCSI port number (CL1A through CL2R) and SCSI target ID and LUN that constructing the SCSI path from Solaris to the LDEV.
   (c) Login to Solaris as superuser and execute format command.
   Determine device number cxtxdx by SCSI port number and SCSI target ID and LUN and the SCSI board installed into SUN to which the DKC310 SCSI port is connected.
3) Whole track range must be specified by starting LBA and ending LBA.
   1 track has 96 blocks in case of OPEN-3 and OPEN-9.
   It happens that pinned track is not correctly resetted if whole track range is not specified.
4) Data written on pinned track must be recovered by backup file because analyze command writes dummy data on pinned track.
5) The files or directories written with dummy data can not be determined because of structure of UNIX file systems.
   The whole files and directories on the partition containing pinned track must be recovered from backup file.

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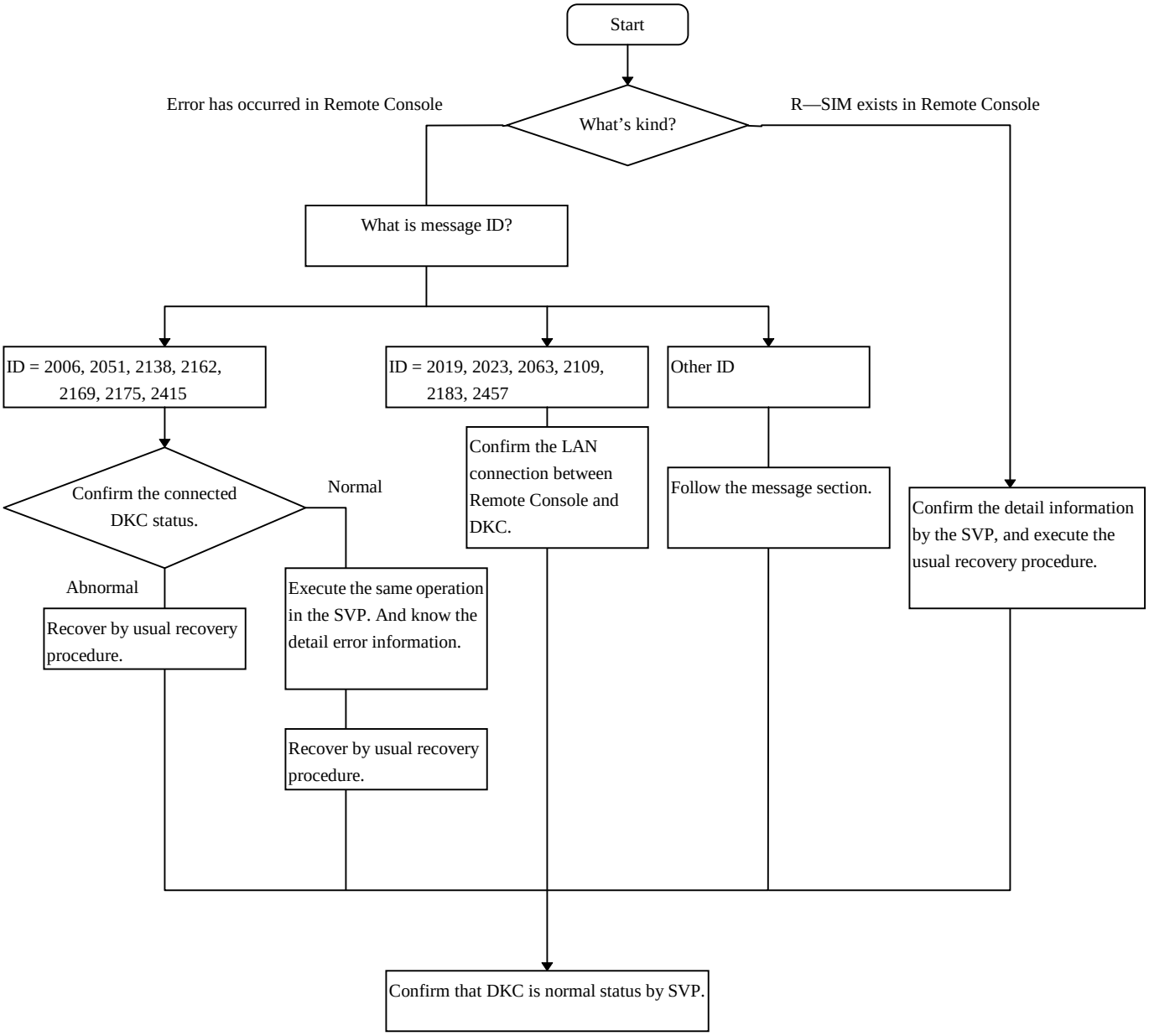
8. Recovery procedure for Remote Console



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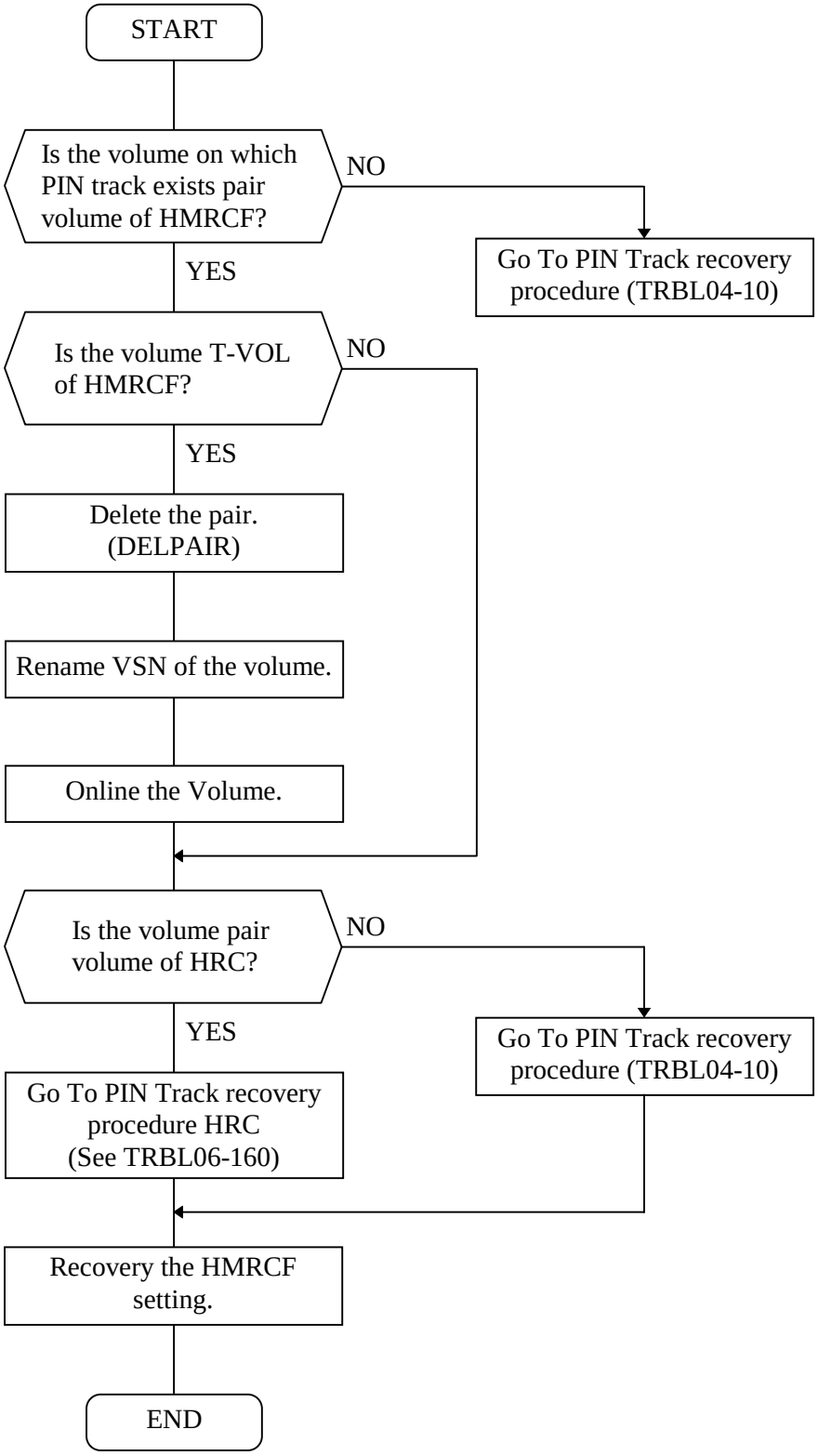
9 HMRCF & HOMRCF Error Recovery

9.1 PIN Track recovery procedure for HMRCF



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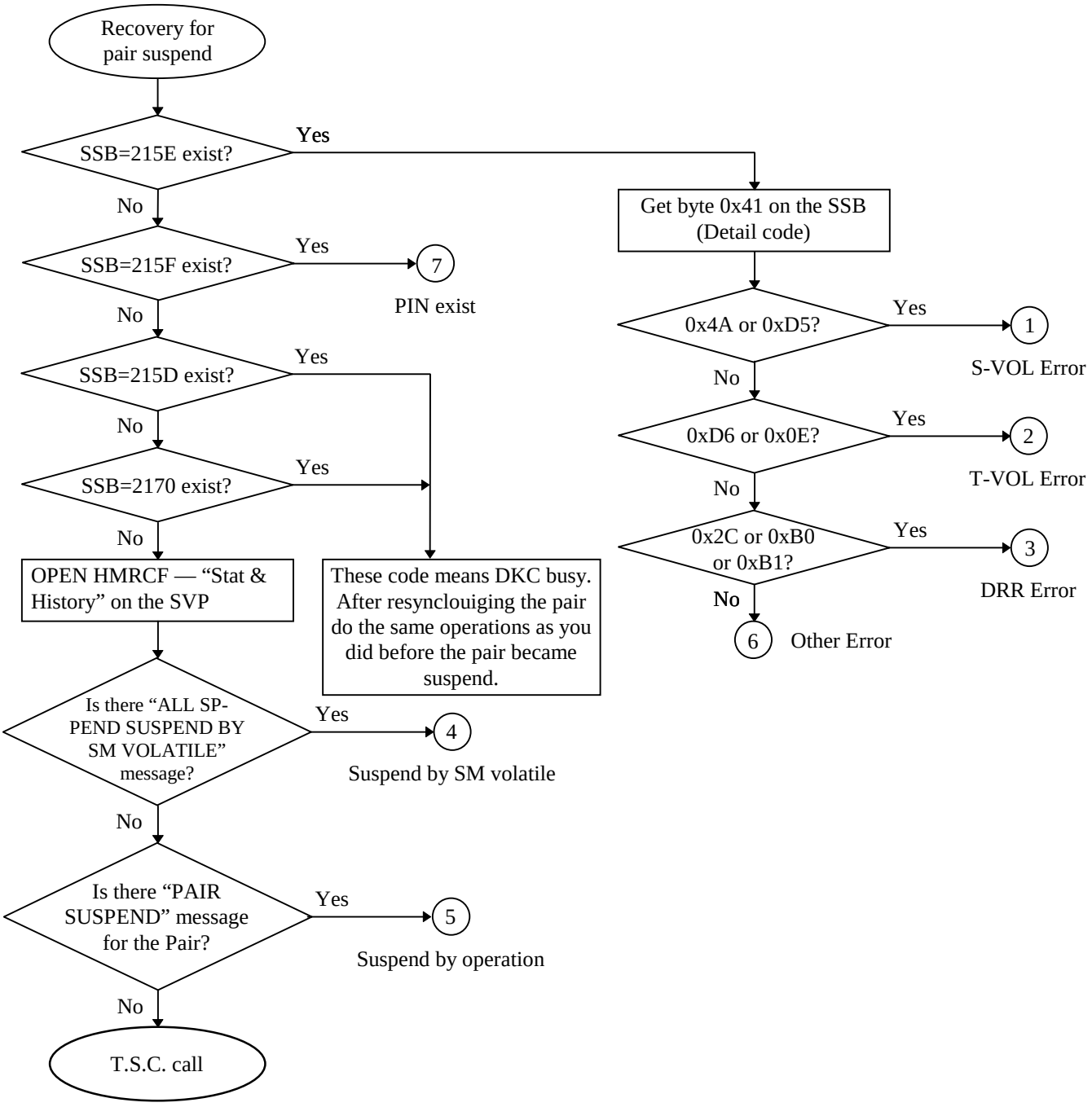
9.2 Recovery Procedure for Suspend Pair



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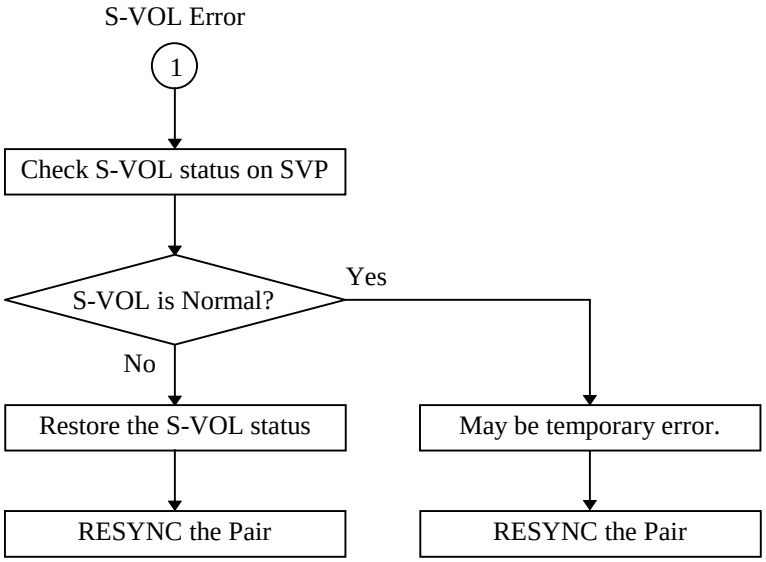

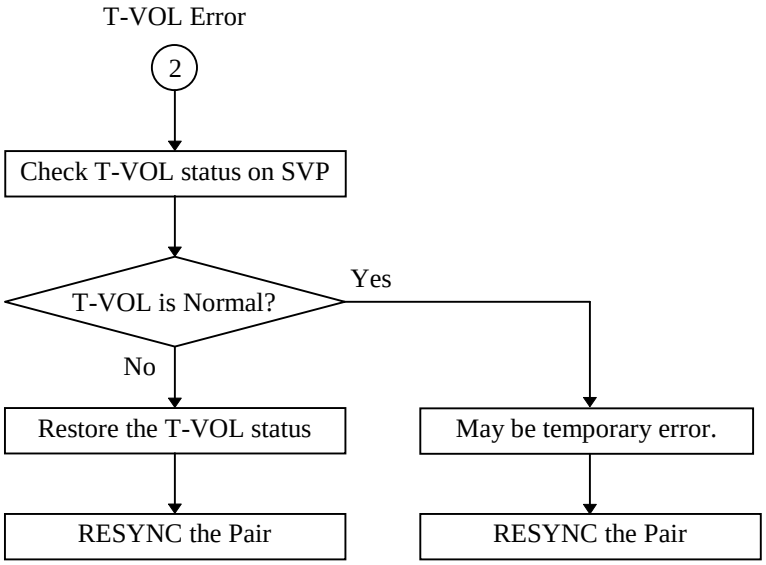

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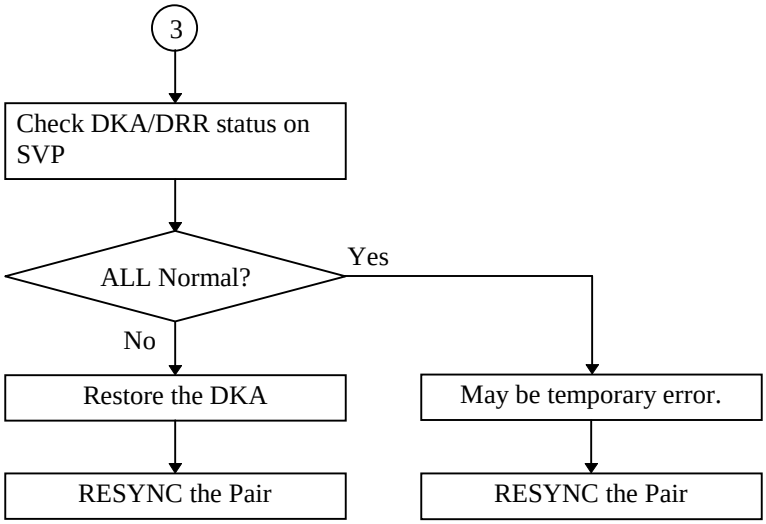
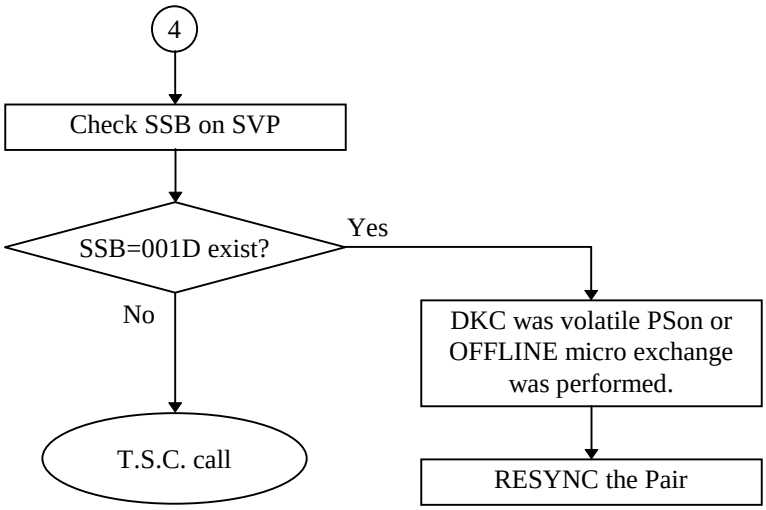
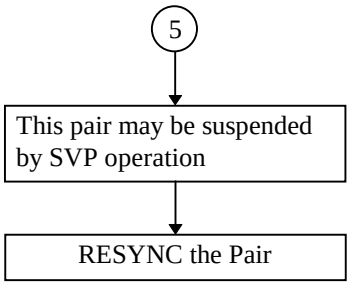
DRR Error



Suspend by SM volatile



Suspend by operation



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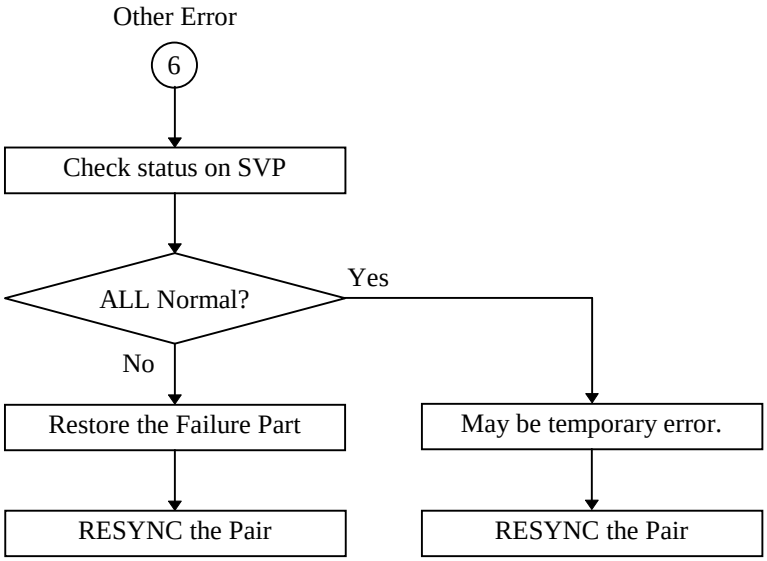

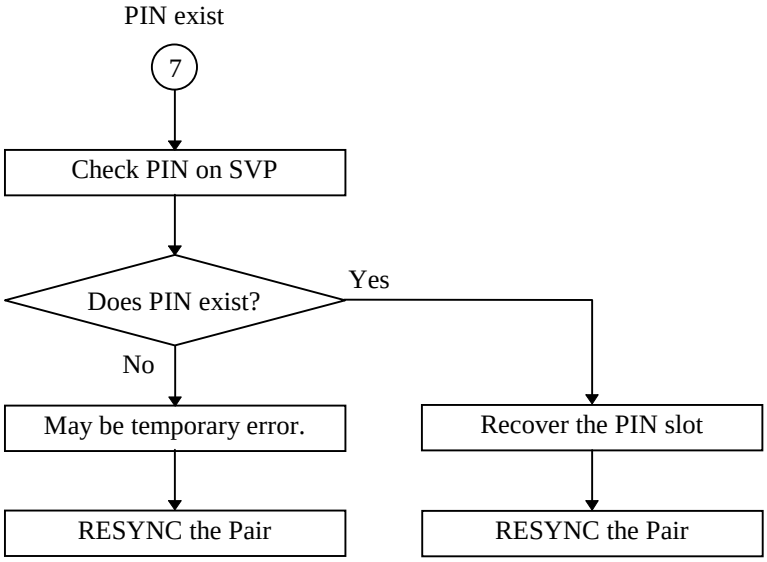

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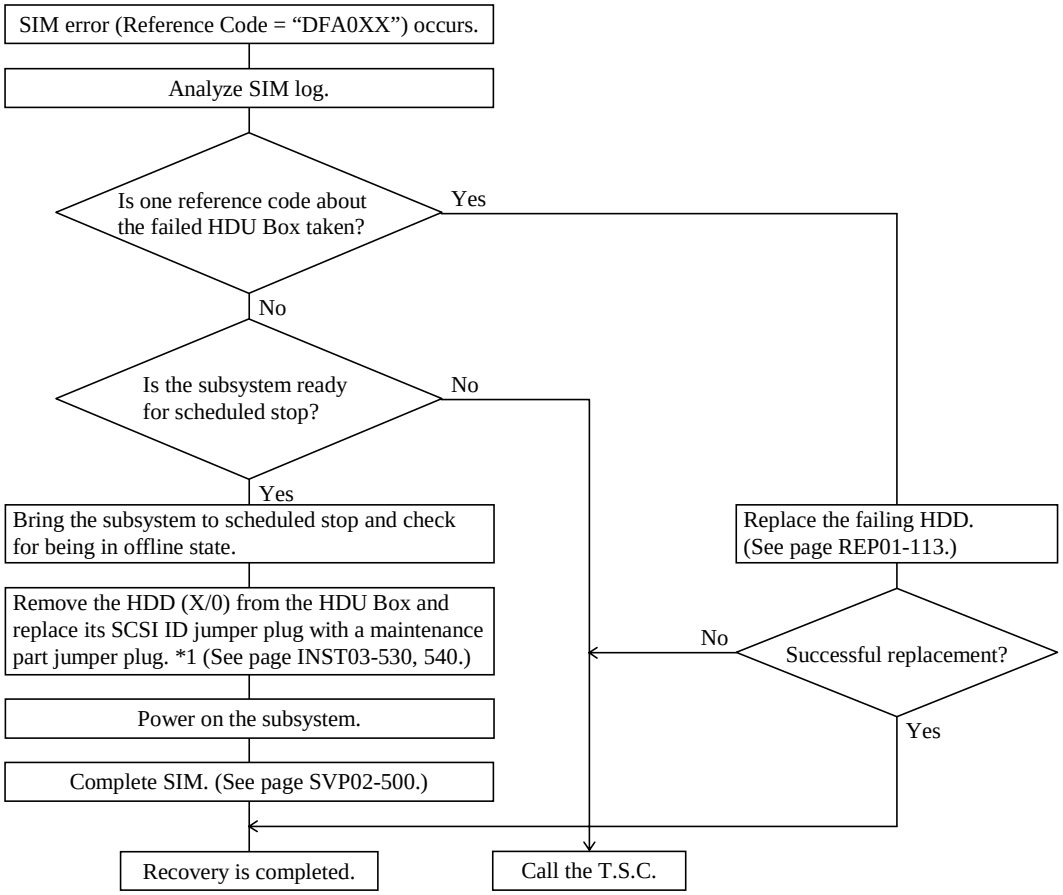
10 SCSI ID Error Isolation and Recovery Procedure (SIM = DFA0XX)

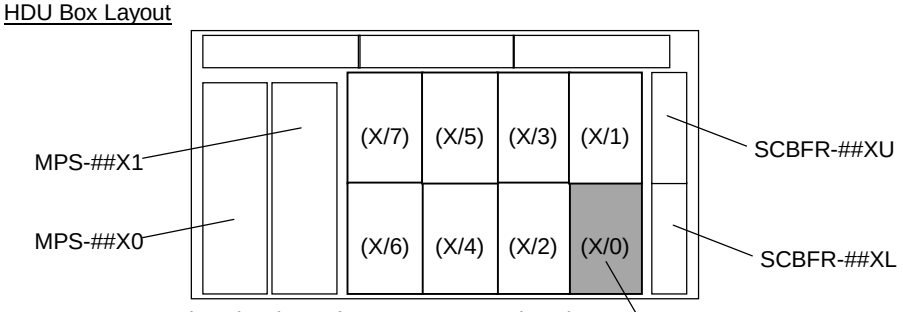
When a SCSI ID error occurs, isolate and recover the error according to the following flow chart.



*1: Before replacing a SCSI ID jumper plug, remove the HDD at the HDD canister location (X/0) in HDU Box. In addition, be sure to reinstall a removed HDD at the original canister location.

Caution: The jumper setting positions vary with the DKU location. A wrong setting can cause a serious problem. Take much care not to set the jumpers incorrectly.

HDU Box Layout



Note 1: ##X = HDU Box location (any of R01, R11, ..., and L27)
Note 2: The HDD canister location is represented in the "Column/Row" form in the SSB and SIM logs.
Column No.: Lower one digit of HDU Box locations
Row No.: 0, 1, 2, ..., or 7

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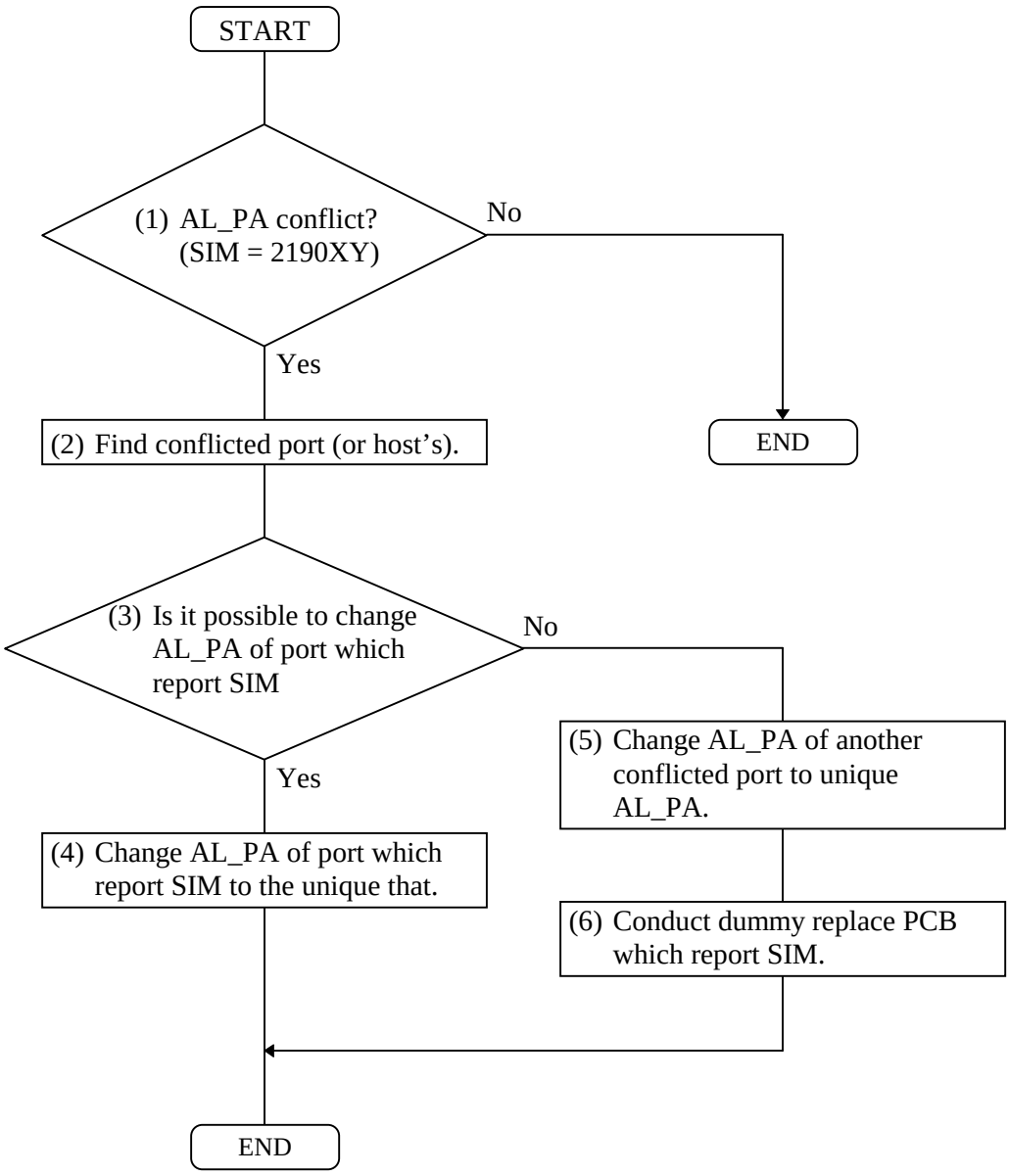
11 Recovery procedure of AL_PA conflict (SIM = 2190XY)

The recovery procedure is shown, when AL_PA of the node (CHT port, Host's Fibre channel port) which exists on the same loop overlaps. Before recovery procedure, AL_PA of port which reported SIM is automatically changed into the other AL_PA from previously given AL_PA. But AL_PA doesn't change on SVP.



The change AL_PA of *(3) propriety is the judgment in the use.

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12 CHT PCB type inconsistency [4GL ↔ 4GS] (SIM = 399FX0)

The following procedure shows the way of recovery when the SIM which means the PCB replacement impossible is reported.

- CHT PCB exchange impossible [4GL ↔ 4GS] (REF code = 0x399FX0:X = PCB#)
  ① Distinguish the type of CHT(4GL/4GS) from PCB product name for PCB# in REF code of SIM.
  [Product Name] WP256-A/x: Short Wave (for 4GS)
  [Product Name] WP256-B/x: Long Wave (for 4GL)
  ② When the PCB is 4GS → Following replacement procedure to 4GL
  When the PCB is 4GL → Following replacement procedure to 4GS

  * [Abbreviation] 4GS ---- DKC-F310I-4GS (for ShortWave)
  4GL --- DKC-F310I-4GL (for LongWave)

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REPLACE SECTION

⚠ SAFETY SUMMARY

Notes on the operation on the password inputting screen.
The password inputting screen is displayed on the SVP screen to arouse maintenance person's attention when the operation concerned can cause a serious failure such as a system down or a data loss.

- When the password inputting screen is displayed, be sure to observe the cautions given in the procedure concerned in the maintenance manual.
- When a confirmation by the technical support center is required in the maintenance manual, be sure to get it before executing the maintenance procedure concerned.
- Each PCB is operated by the microprogram owned by it individually.
  If the PCB is replaced in the procedure that makes the version of the microprogram disagree with that of the PCB, the subsystem cannot operate normally. Be sure to make the revisions consistent each other.

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[Pre C] -- REP02-90
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[Hardware D]-------REP03-110
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[Hardware F]-------REP03-170
[Hardware G] ------REP03-200
[Hardware H]-------REP03-221
[Hardware J] -------REP03-230
[Hardware K]-------REP03-260
[Hardware T1] -----REP03-1000
[Hardware T2] -----REP03-1030
[Hardware T3] -----REP03-1100
[Hardware T4] -----REP03-1150
[Hardware T5] -----REP03-1180
[Hardware T6] -----REP03-1220
[Hardware T7] -----REP03-1270
[Hardware T8] -----REP03-1290
[Hardware T9] -----REP03-1310
[Hardware T10]----REP03-1330
[Hardware T11]----REP03-1380
[Hardware T12]----REP03-1400
[Hardware T13]----REP03-1490
[Hardware T14]----REP03-1580
[Hardware T15]----REP03-1600
[Hardware T16]----REP03-1620
[Hardware T17]----REP03-1730
[Hardware T18]----REP03-1750
[Hardware T19]----REP03-1790
[Hardware T20]----REP03-1810
[Hardware T21]----REP03-1830
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[Post c]------ REP04-150
[Post d] ----- REP04-250
[Post e] ----- REP04-330
[Post f] ------ REP04-360
[Post h] ----- REP04-420
[Post i] ------ REP04-450
[Post t1]----- REP04-490
[Post t3]----- REP04-820
[Post t4]----- REP04-880
[Post u] ----- REP04-950

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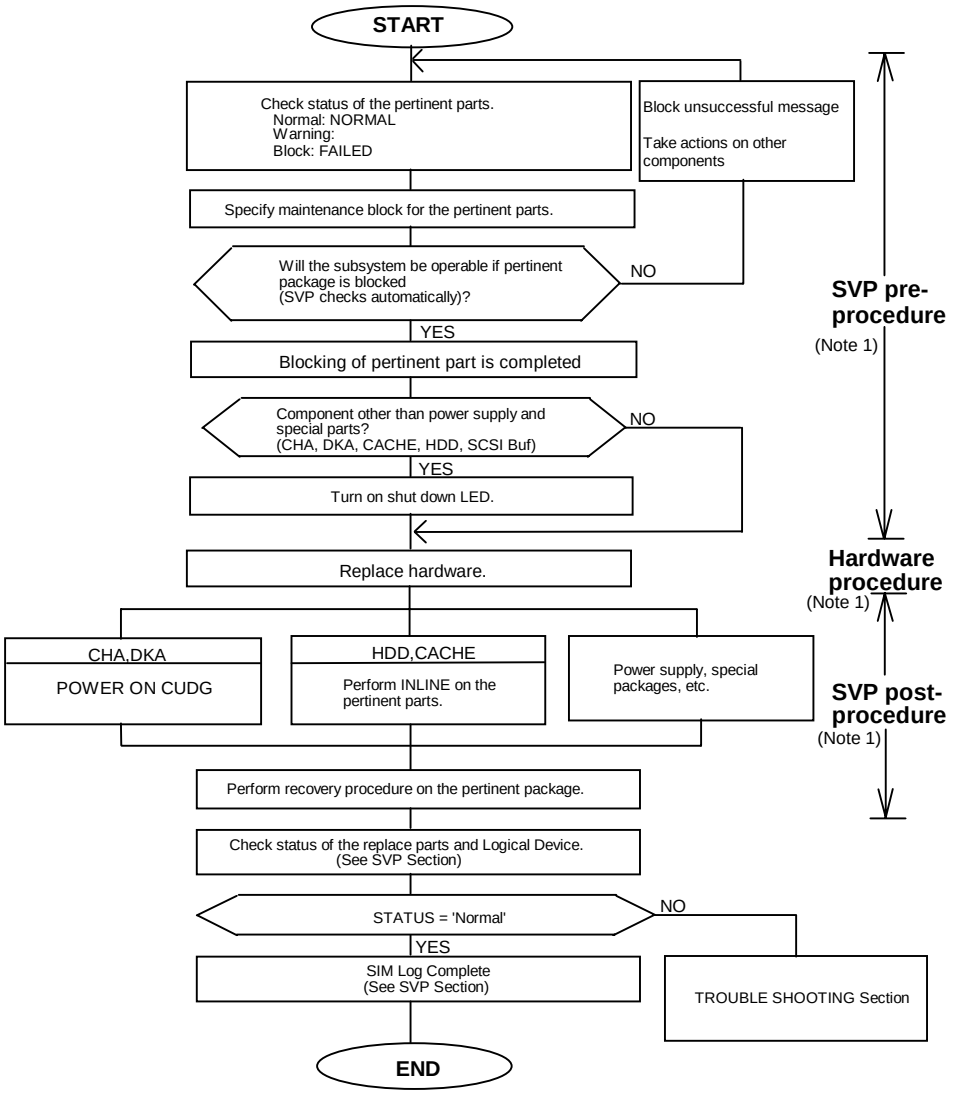
1 Hot Replace

1.1 Hot Replace Flowchart



Note 1:

SVP pre-procedure: An SVP (PC) process of issuing a maintenance block instruction after checking the status of the parts to be replaced so that the live parts can be removed and replaced.

Hard ware procedure: A process of removing a parts to be replaced (shut down LED on) and installing a maintenance package.

Be sure to wear your wrist strap, and attach to ground, prior to performing the following work.
This will insure that the IC and LSI on the PCB, are protected from static electricity.

SVP post-procedure: An SVP (PC) process of making functional checks (CUDG and INLINE) on the replacement package and building it into the subsystem.

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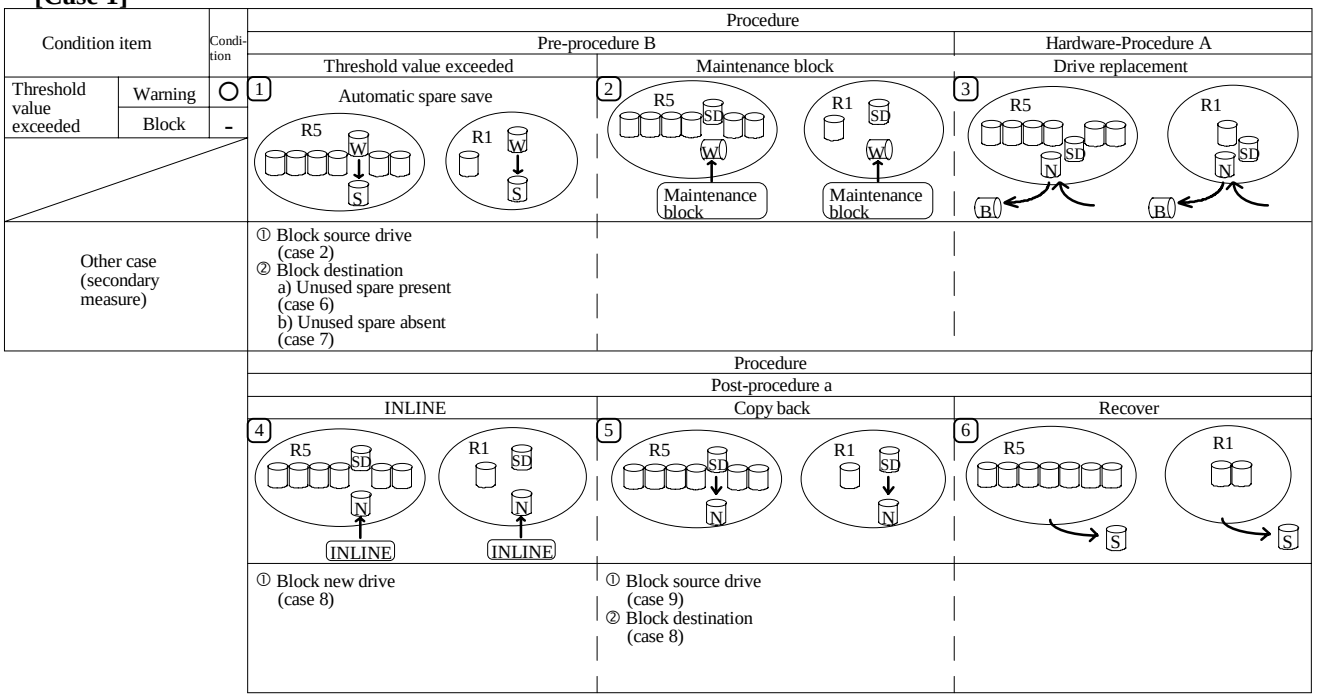
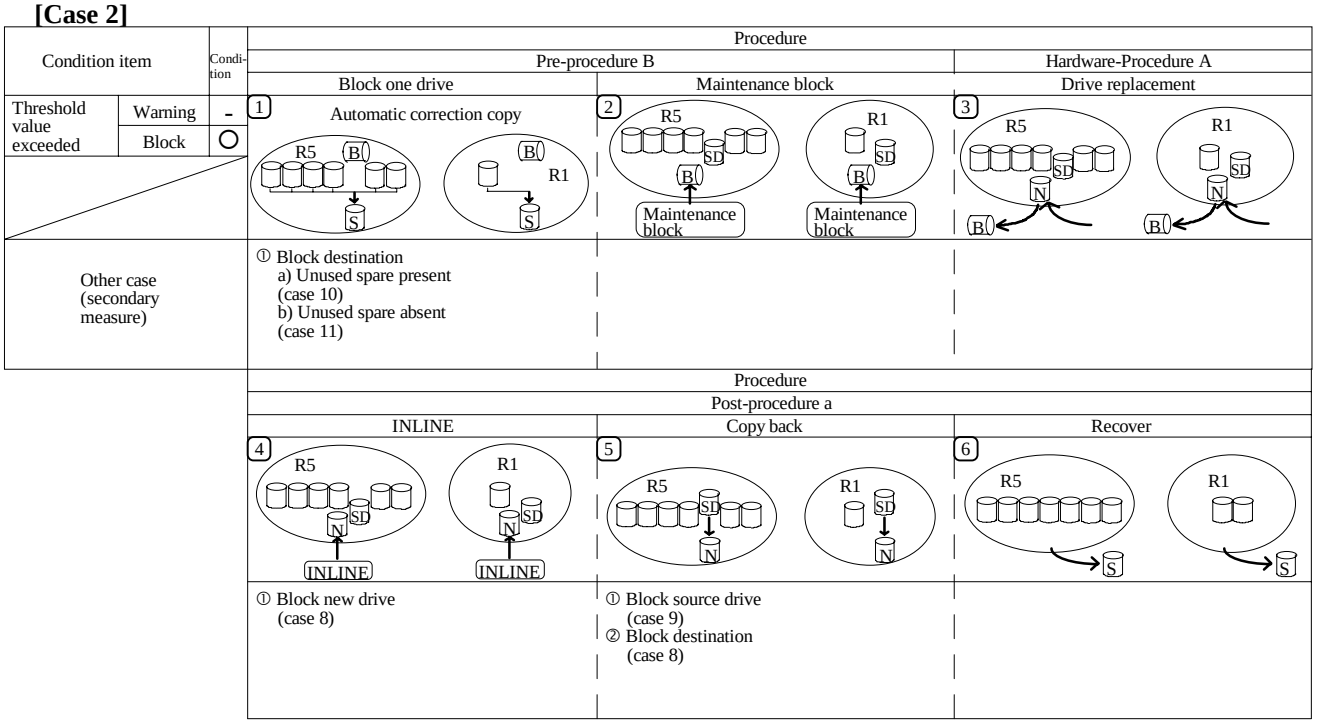
1.2 Concept of Drive Maintenance

[Spare drive present]

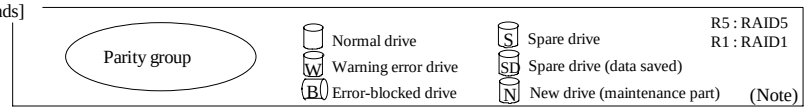
[Case 1]



[Case 2]



[Legends]



(Note) In RAID 1 method, Parity group consists of two drives.

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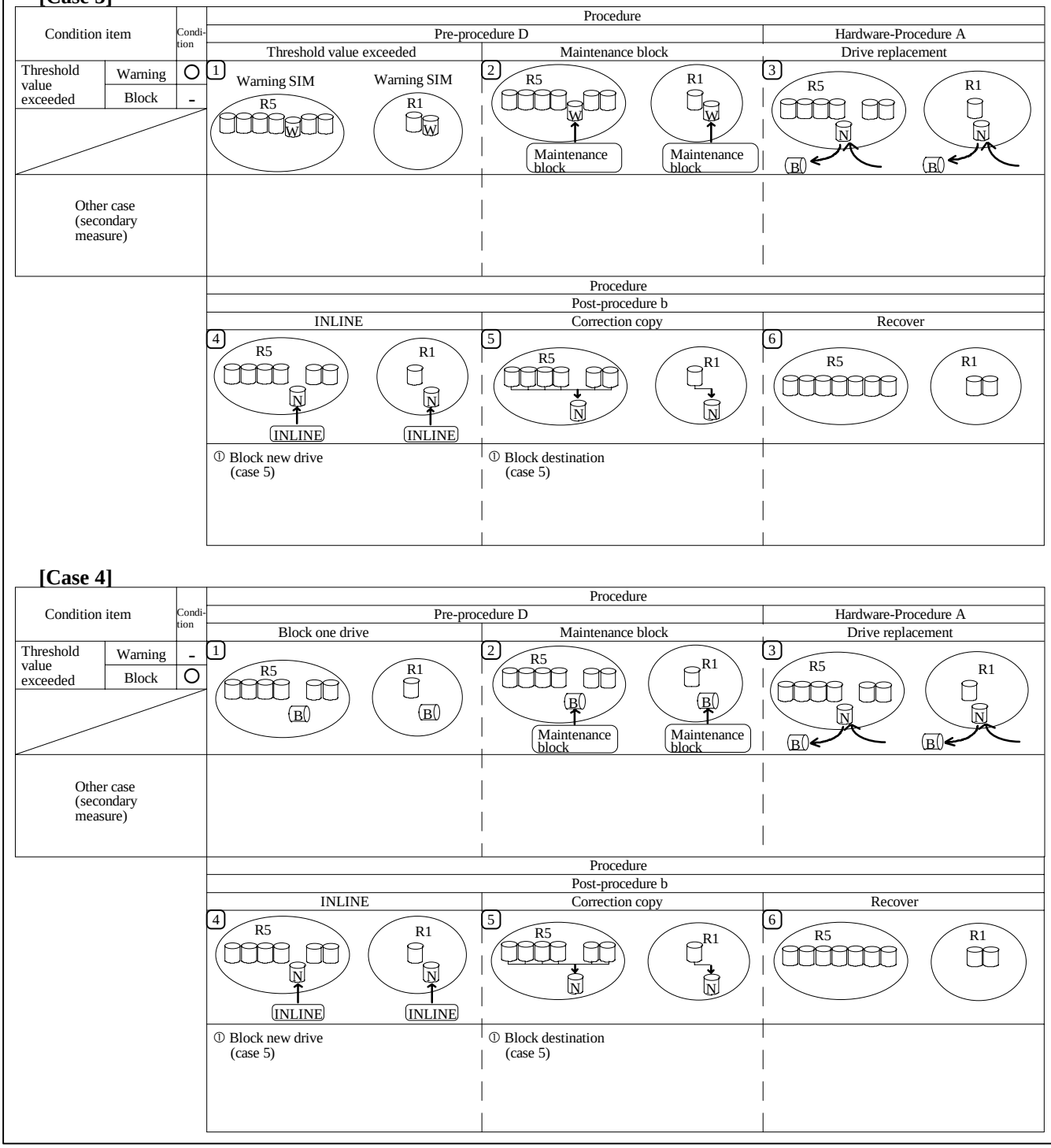
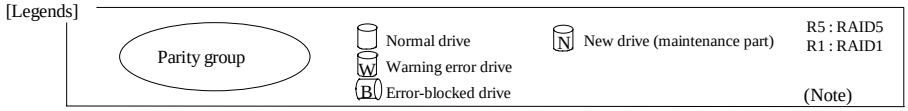
[Spare drive absent]

[Case 3]



[Case 4]



(Note) In RAID 1 method, Parity group consists of two drives.

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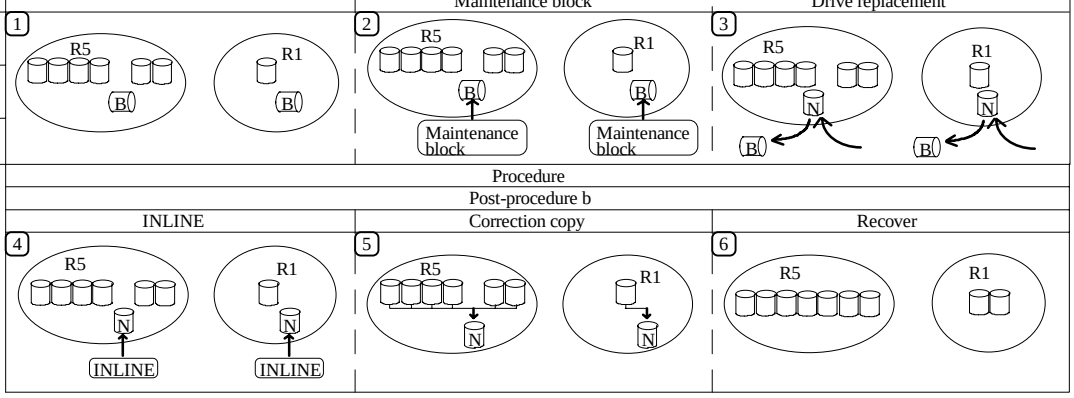
[Case in which a secondary error occurred during error]

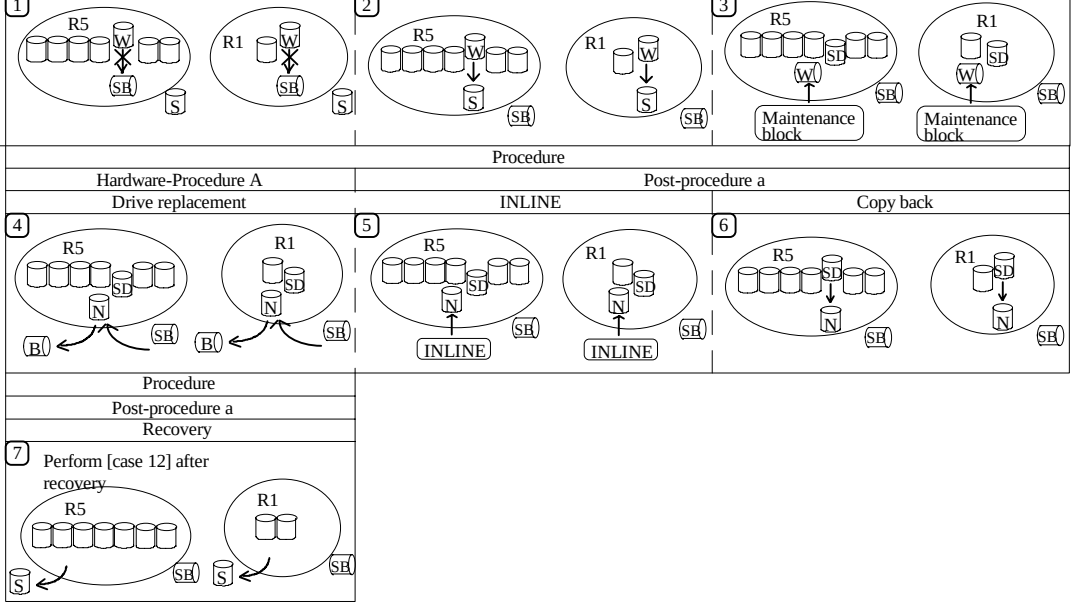
[Case 5]

Condition item	Procedure		
	Pre-procedure D	Maintenance block	Hardware-Procedure A / Drive replacement
Blocked during INLINE Destination blocked during correction copy	1	2	3
	Procedure		
	Post-procedure b		
	INLINE	Correction copy	Recover
	4	5	6

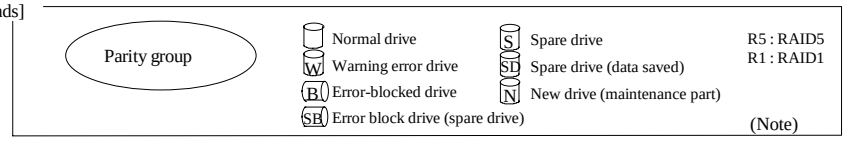


[Case 6]

Condition item	Procedure		
	Pre-procedure B	Re-automatic spare save	Maintenance block
Destination blocked during automatic spare save (unused spare present)	1	2	3
	Procedure		
	Hardware-Procedure A / Drive replacement	Post-procedure a / INLINE	Copy back
	4	5	6
	Procedure		
	Post-procedure a		
	Recovery		
	7 Perform [case 12] after recovery		



[Legends]



(Note) In RAID 1 method, Parity group consists of two drives.

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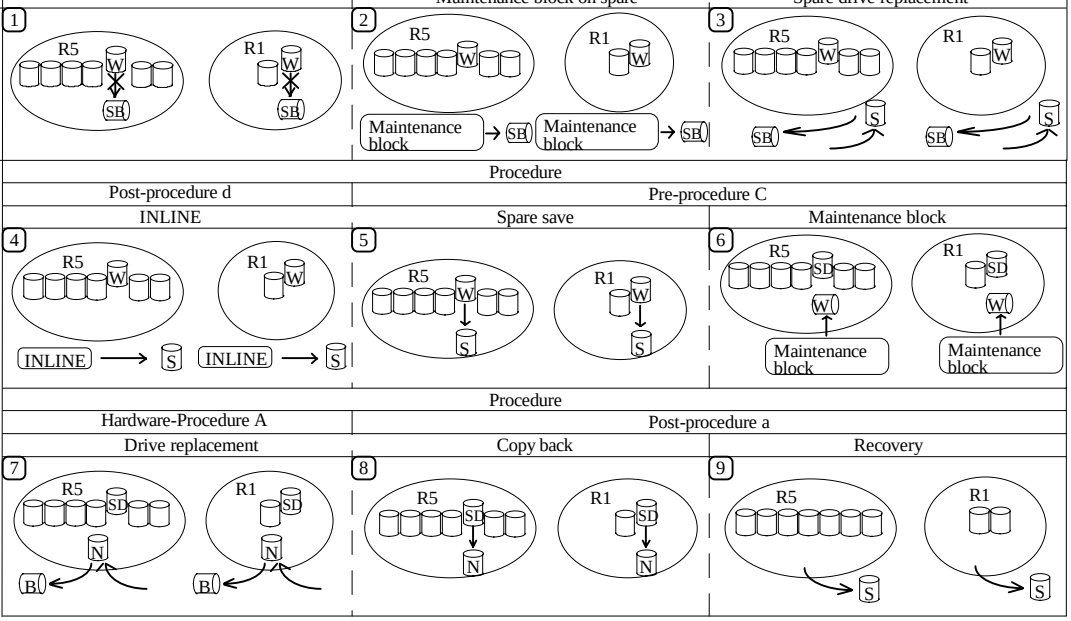
[Case in which a secondary error occurred during error recovery]

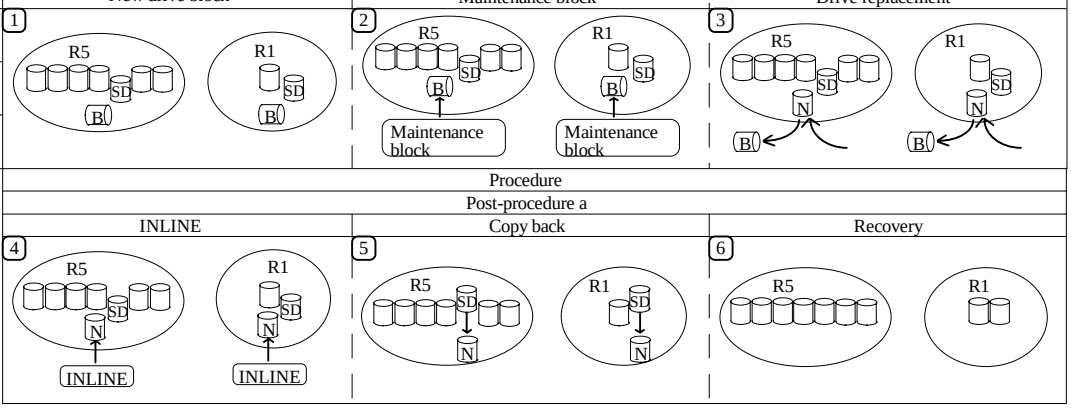
[Case 7]

Condition item	Procedure		
	Pre-procedure D		Hardware-Procedure A
	Maintenance block on spare		Spare drive replacement
Destination blocked during automatic spare save (unused spare absent)	1	2	3
	Procedure		
	Post-procedure d	Pre-procedure C	
	INLINE	Spare save	Maintenance block
	4	5	6
	Procedure		
	Hardware-Procedure A	Post-procedure a	
	Drive replacement	Copy back	Recovery
	7	8	9

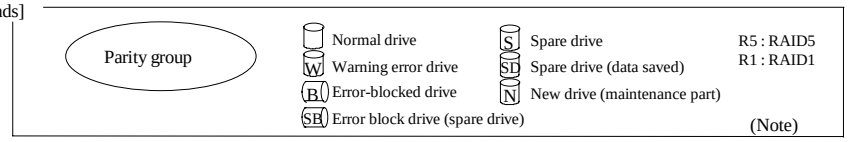


[Case 8]

Condition item	Procedure		
	Pre-procedure D		Hardware-Procedure A
	New drive block	Maintenance block	Drive replacement
New drive blocked (spare saved)	1	2	3
New drive blocked (correction copy performed)			
Destination blocked during copy back			
	Procedure		
	Post-procedure a		
	INLINE	Copy back	Recovery
	4	5	6



[Legends]



(Note) In RAID 1 method, Parity group consists of two drives.

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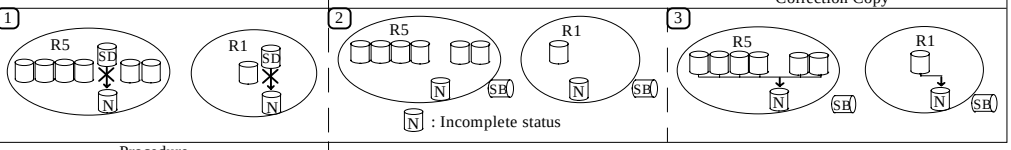
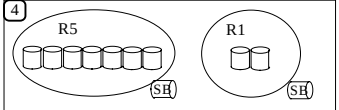
[Case in which a secondary error occurred during error recovery]

[Case 9]

Condition item	Procedure		
	Pre-procedure D		Post-procedure b
			Correction Copy
Source blocked during copyback	1	2	3



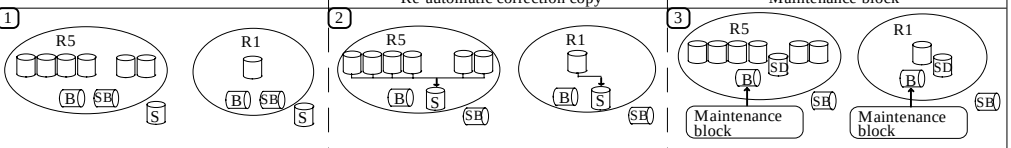
Procedure
Post-procedure b
Correction Copy
4



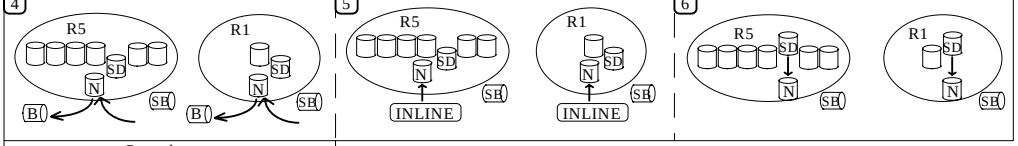
After recovering execute [Case 12].

[Case 10]

Condition item	Procedure		
	Pre-procedure B		
		Re-automatic correction copy	Maintenance block
Destination blocked during automatic correction copy (unused spare present)	1	2	3

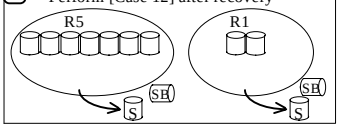


Procedure		
Hardware-Procedure A	Post-procedure a	
Drive replacement	INLINE	Copy back
4	5	6



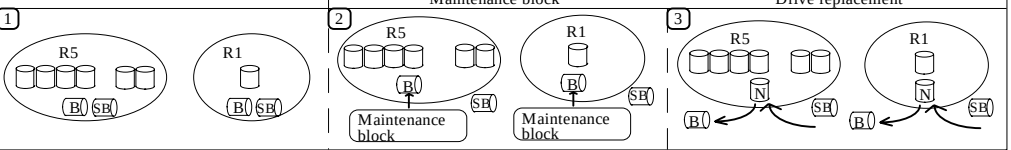
Procedure
Post-procedure g
Recovery
7

Perform [Case 12] after recovery



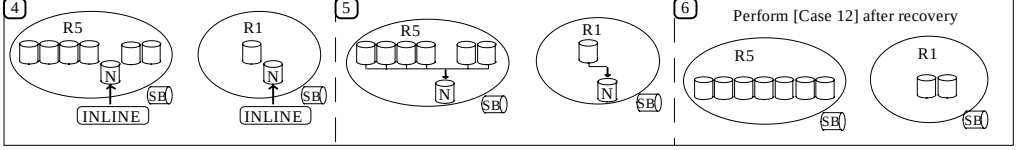
[Case 11]

Condition item	Procedure	
	Pre-procedure D	Hardware-Procedure A
	Maintenance block	Drive replacement
Destination blocked during automatic correction copy (unused spare absent)	1	2	3

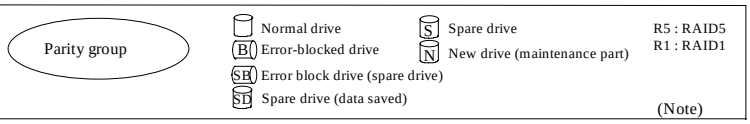


Procedure		
	Post-procedure b	
INLINE	Correction copy	Recovery
4	5	6

Perform [Case 12] after recovery



[Legends]



(Note) In RAID 1 method, Parity group consists of two drives.

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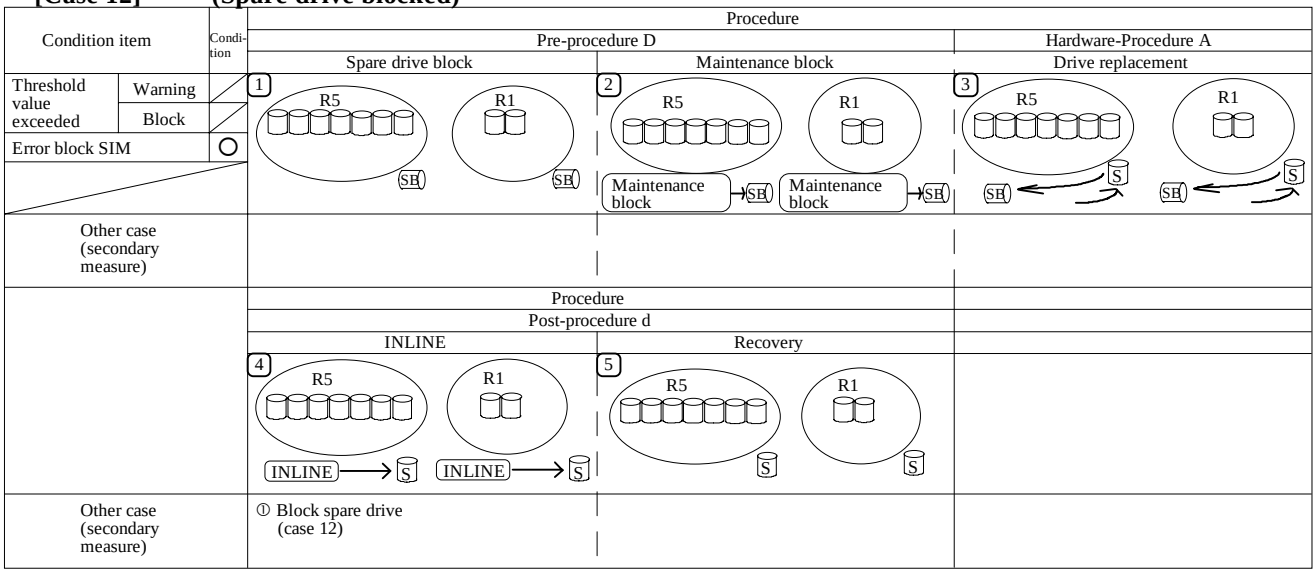
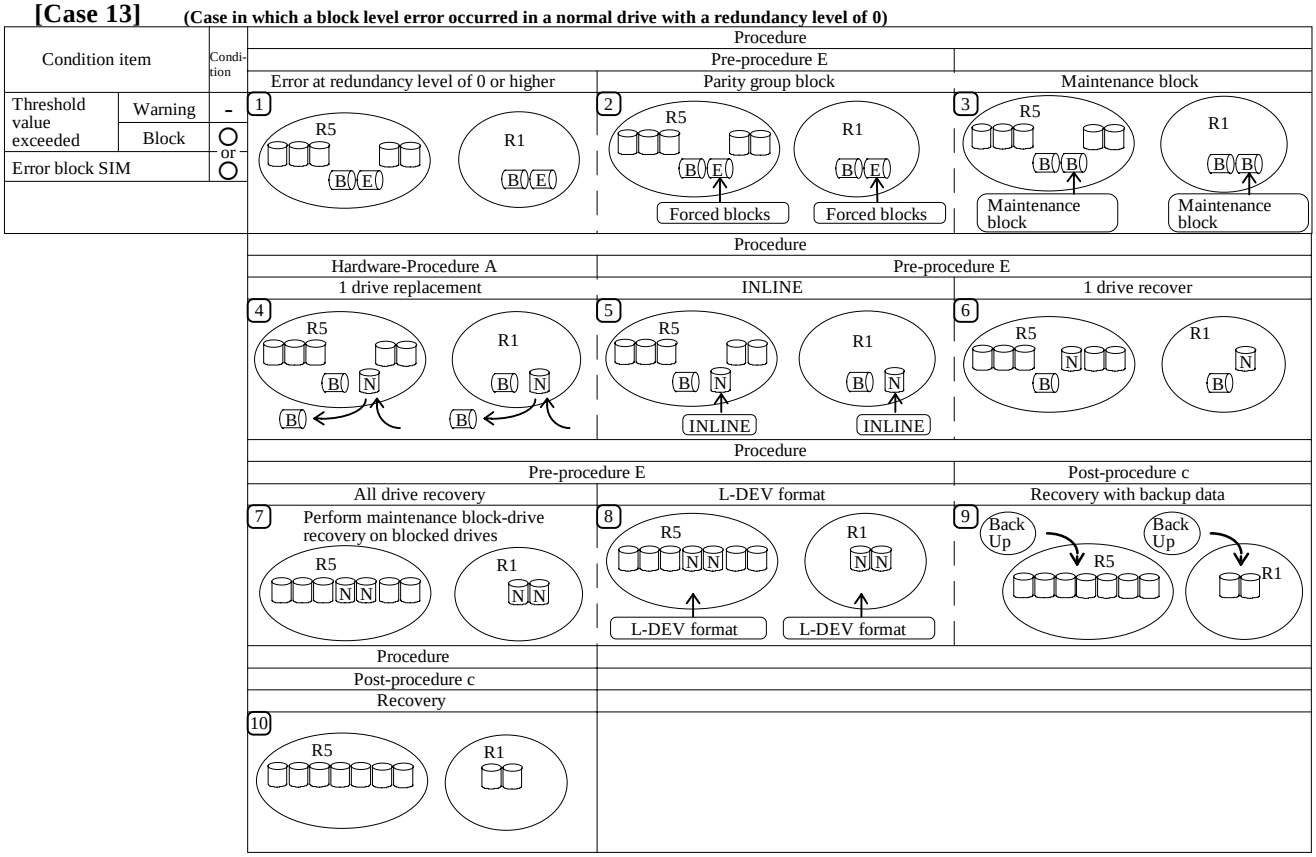
[Other Cases]

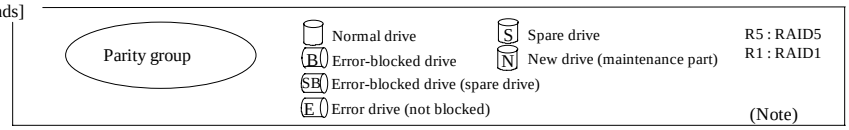
[Case 12] (Spare drive blocked)



[Case 13] (Case in which a block level error occurred in a normal drive with a redundancy level of 0)



[Legends]



(Note) In RAID 1 method, Parity group consists of two drives.

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[Other cases]

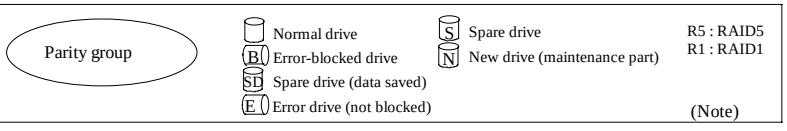
[Case 14] (Preventive drive replacement 1)

Condition item		Condition	Procedure		
			Pre-procedure C		
			Replacement	Spare save	Maintenance block
Threshold value exceeded	Warning	-	1 Unusual noise, etc. (R5) Unusual noise, etc. (R1)	2 R5 → S, R1 → S	3 R5 (SD, B) Maintenance block; R1 (SD, B) Maintenance block
	Block	-			
Others (unusual noise, etc.)		○			
Spare drive		○			
Other case (secondary measure)				① Block source drive (case 2) ② Block destination drive a) Unused spare present (case 6) b) Unused spare absent (case 7)	
			Procedure		
			Hardware-Procedure A	Post-procedure a	
			Drive replacement	INLINE	Copy back
			4 R5 (SD, N, B) R1 (SD, N, B)	5 R5 (SD, N) INLINE; R1 (SD, N) INLINE	6 R5 (SD, N) R1 (SD, N)
Other case (secondary measure)				① Block new drive (case 8)	① Block source drive (case 9) ② Block destination drive (case 8)
			Procedure		
			Post-procedure a		
			Recovery		
			7 R5 (S) R1 (S)		

[Case 15] (Preventive drive replacement 2)

Condition item		Condition	Procedure		
			Pre-procedure D		Hardware Procedure A
			Replacement	Maintenance block	Drive replacement
Threshold value exceeded	Warning	-	1 Unusual noise, etc. (R5) Unusual noise, etc. (R1)	2 R5 Maintenance block; R1 Maintenance block	3 R5 (N, B) R1 (N, B)
	Block	-			
Others (unusual noise, etc)		○			
Spare drive		-			
Other case (secondary measure)					
			Procedure		
			Post-procedure b		
			INLINE	Correction copy	Recovery
			4 R5 (N) INLINE; R1 (N) INLINE	5 R5 (N) R1 (N)	6 R5 R1
Other case (secondary measure)			① Block new drive (case 5)	① Block destination drive (case 5)	

[Legends]



(Note) In RAID 1 method, Parity group consists of two drives.

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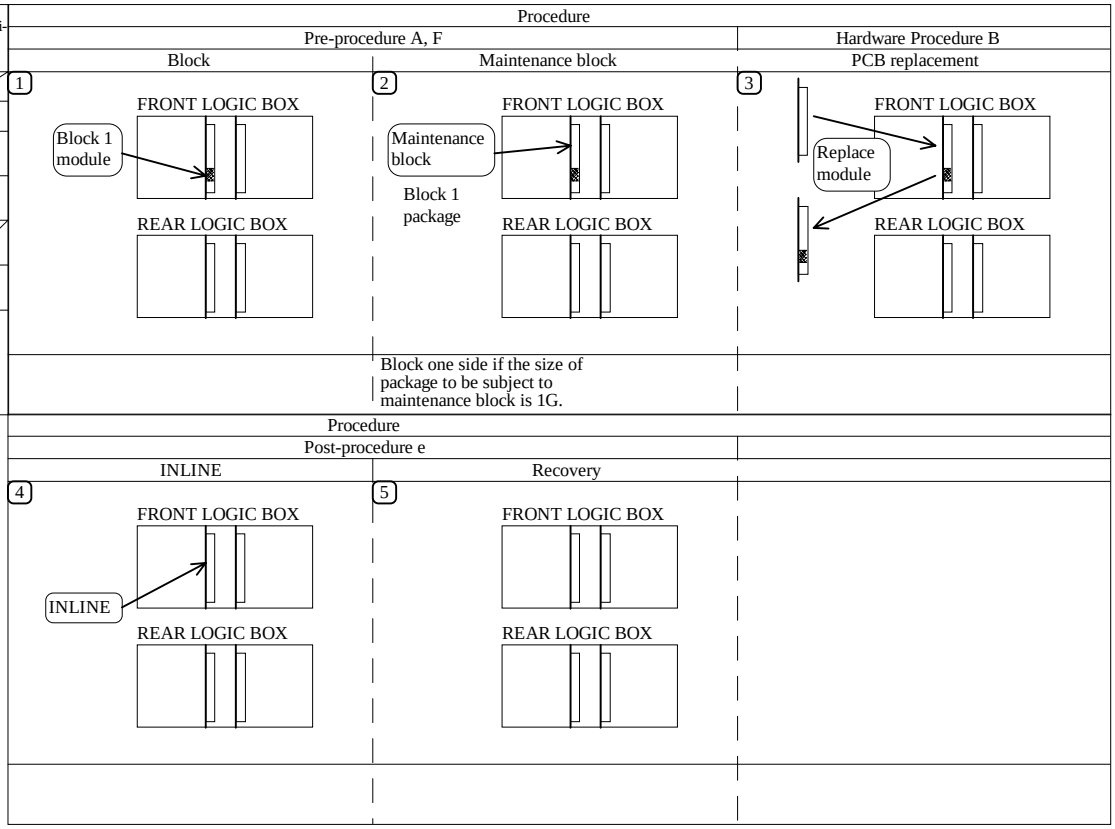
1.3 Concept of Cache Maintenance

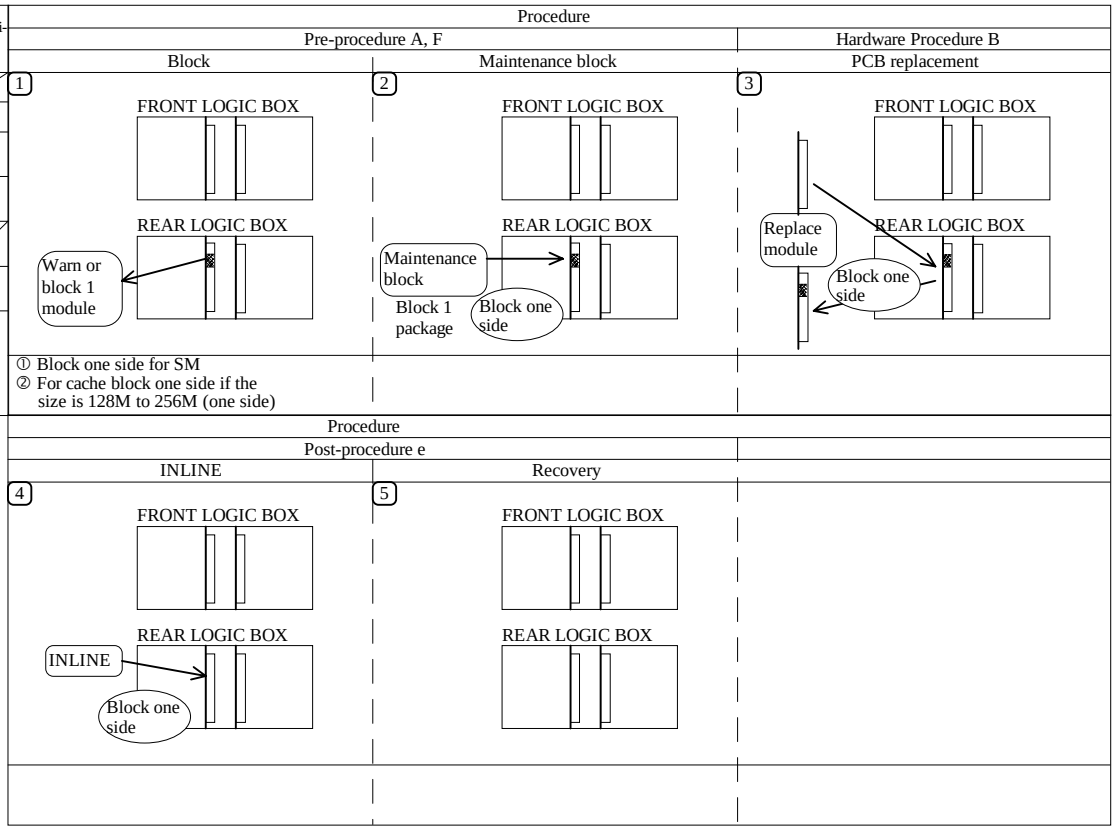
[Case 1]

Condition item		Condition
Threshold value exceeded	Warning	
	Block	○
CACHE (WP108-B)		○
CACHE with SM (WP108-A)		-
CACHE space:256M ~ 16G		



[Case 2]

Condition item		Condition
Threshold value exceeded	Warning	
	Block	○
CACHE (WP008-B/WP018-B)		-
CACHE with SM (WP008-A/WP018-A)		○
CACHE space:256M ~ 16G		



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1.4 How to Interpret the Hot Replace Procedure

[In case of replacement when SIM was reported]

① Search a work ID which coincides with the work ID corresponding to SIM ACC(FPC) (refer to FPC list on page ACC04-10) from Parts Replacement Process Table on page REP01-120. Search a work ID corresponding to the pertinent condition if "Condition Item" is described in Parts Replacement Process Table.

② If the work ID is found,

- Take actions according to the SVP pre-procedure, hardware procedure, SVP post-procedure number that match the work ID.

If no work ID is found,

- Search a work ID corresponding to SIM ACC(FPC, and error details) from Parts Replacement Process Table on page REP01-120.
- Take actions according to the SVP pre-procedure, hardware procedure, SVP post-procedure number that match the work ID.

Note : See page REP01-113 for the procedure for searching a work ID to replace a drive. When replacing a drive, be sure to see page REP01-111 and REP01-112.

[In case of replacement when SIM was not reported]

① Search a work ID corresponding to the part to be replaced from Parts Replacement Process Table on page REP01-120.

② Take actions according to the SVP pre-procedure, hardware procedure, SVP post-procedure number that match the work ID.

Note : See page REP01-113 for the procedure for searching the work ID to replace a drive. When replacing a drive, be sure to see page REP01-111 and REP01-112.

---------- ----------<Example>----------

Condition to replace

SIM was reported

Work ID corresponding to SIM ACC FPC is RCA1

* Search an applicable Work ID identified by shaded area in the following sample of Parts Replacement Process Table under the above conditions.

<CACHE>

Work ID	Part name	Procedure			Replacing time
		SVP re-procedure	Hardware procedure	SVP post-procedure	
RCA1	CACHE with SM (WP108-A)	Pre A, pre F	Hardware B	Post e	15 minutes
RCA2					

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PROCEDURE BEFORE PDEV EXCHANGE AND CORRECTION COPY

Instructions before blocking and exchanging PDEV with a drive failure error is listed below.

When exchanging unblocked PDEV, redundancy in the ECC group is lost. Therefor, during PDEV exchange, the other PDEV in the same ECC group is fenced by a drive failure error, all the LDEV in the ECC group is fenced. Accordingly, to prevent the above problem from occurring, the status of PDEV. When there is a PDEV in the same ECC group having more drive failure errors than the exchanging PDEV exists, replace the PDEV with highest drive failure errors.

Before PDEV exchange, following items are checked.

#	Items checked	Procedure
1	Error Count	“Threshold Counter Display” (See SVP02-390)
2	ORM Over Rate	“ORM Over Rate HDD# Display” (See SVP02-270)
3	Write Error	“Pinned Track Display” (See SVP02-710)

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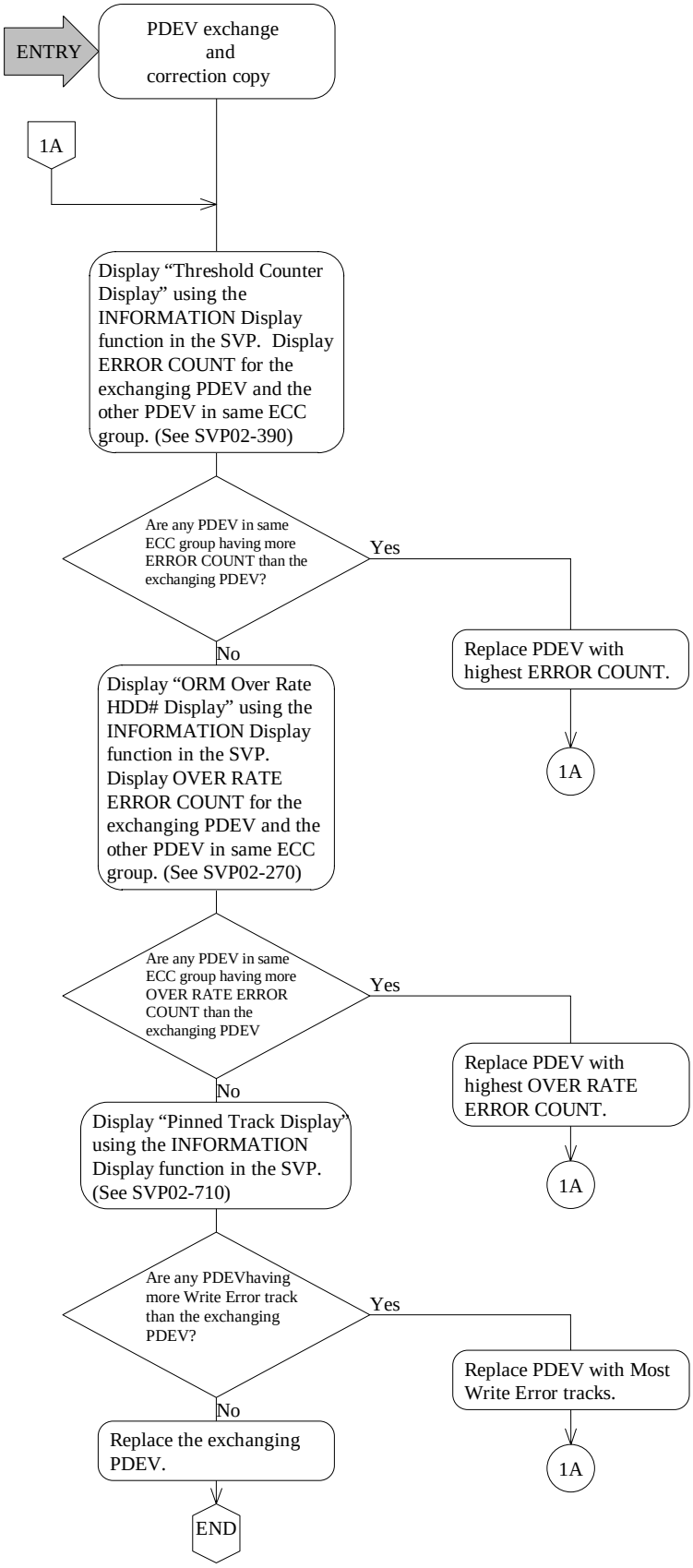
PROCEDURE BEFORE PDEV EXCHANGE and CORRECTION COPY.



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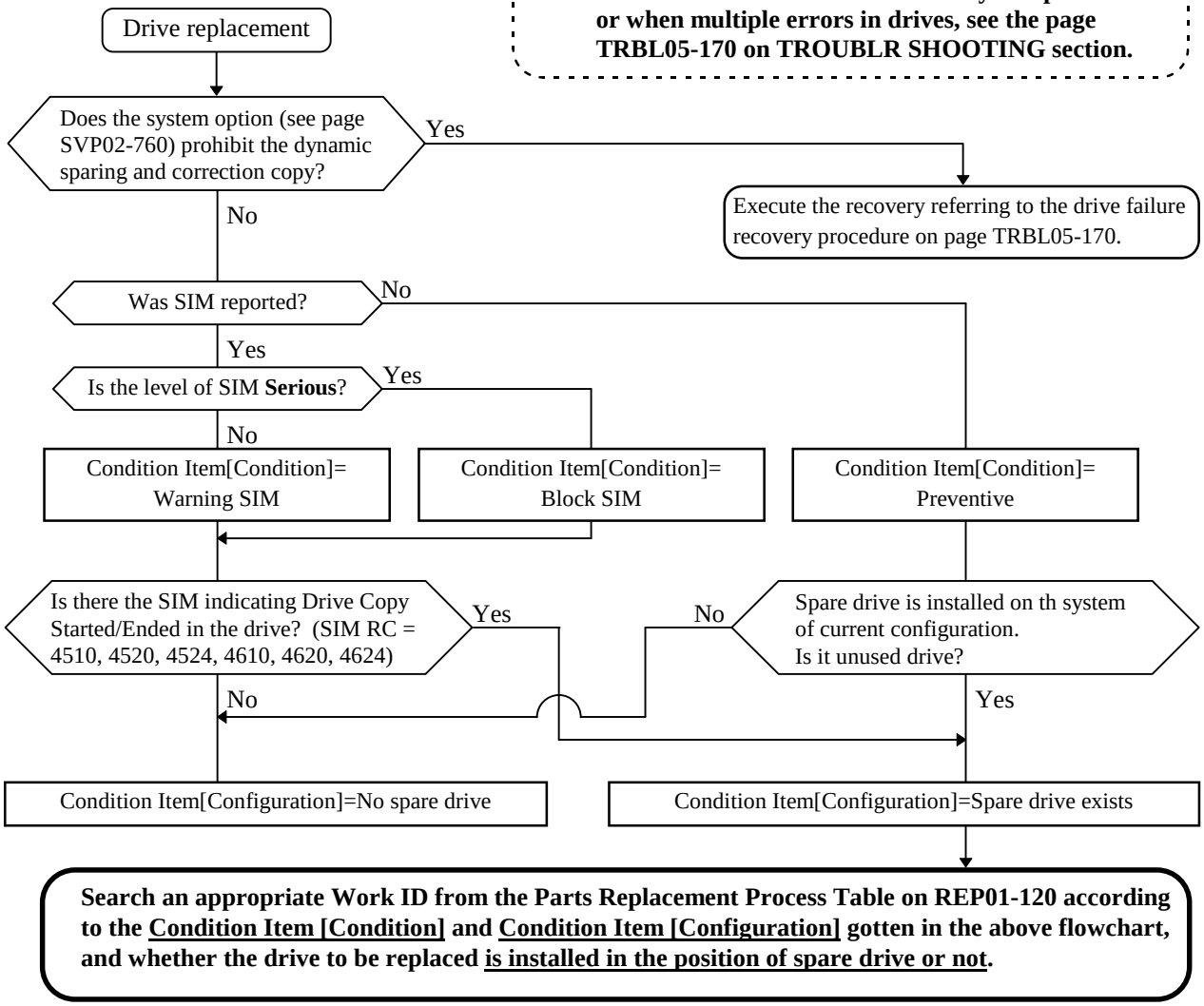
How to search a work ID to replace a drive

Note: When a work ID cannot be found by this procedure or when multiple errors in drives, see the page TRBL05-170 on TROUBLR SHOOTING section.



Search an appropriate Work ID from the Parts Replacement Process Table on REP01-120 according to the Condition Item [Condition] and Condition Item [Configuration] gotten in the above flowchart, and whether the drive to be replaced is installed in the position of spare drive or not.

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——————————————————<<Example>>——————————————————

- SIM was reported.
- Level of the SIM is not "Serious". = Condition Item[Condition] is "Warning SIM".
- There is the SIM that RC is 4510 in the drive. = Condition Item[Configuration] is "Unused spare drive exists".
- The drive to be replaced is not a spare drive. = “Data Drive”

* Under the above conditions, the shaded area is searched from Parts Replacement Process Table. Therefore, in this example Work ID should be RDK1.

<Data Drive, Spare Drive>

Work ID	Parts Name	Condition Item				Procedure			Reference information Image of replacement	
		Condition			Configu-ration	SVP pre-procedure	Hardware procedure	SVP post-procedure	Outline	Case
		Failure		Preven-tive	Unused spare drive					Refer to "1.2 Concept of Drive Maintenance" on REP01-20.
		Warning SIM	Block SIM							
RDK1	Data Drive	×	-	-	Yes	Pre A, Pre B *1	Hard A *1	Post a *1	Drive replacement ~ Copy back	Case 1
RDK2	Data Drive	-	×	-	Yes					

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1.5 Parts Replacement Process Table

<Data Drive, Spare Drive>

Work ID	Parts Name	Condition Item				Procedure *1			Reference information		
		Condition			Configu-ration	SVP pre-procedure	Hardware procedure	SVP post-procedure	Replacing time *3	Outline	Case *2
		Failure									
		Warning SIM	Block SIM	Preven-tive	Unused Spare drive						
RDK1	Data Drive Note 1	×	-	-	Yes	Pre A, pre B *1	Hardware A *1	Post a *1	20 min	Drive replace ~ Copy back	Case1
RDK2	Data Drive Note 1	-	×	-	Yes	Pre A, pre B *1	Hardware A *1	Post a *1	20 min	Drive replace ~ Copy back	Case 2
RDK3	Data Drive Note 1	-	-	×	Yes	Pre A, pre C, pre B *1	Hardware A *1	Post a *1	—	Copy to Spare drive ~ Drive replace ~ Copy back	Case 14
RDK4	Data Drive Note 1	×	-	-	No	Pre A, pre D *1	Hardware A *1	Post b *1	20 min	Drive replace ~ Correction copy	Case 3
RDK5	Data Drive Note 1	-	×	-	No	Pre A, pre D *1	Hardware A *1	Post b *1	20 min	Drive replace ~ Correction copy	Case 4
RDK6	Data Drive Note 1	-	-	×	No	Pre A, pre D *1	Hardware A *1	Post b *1	20 min	Drive replace ~ Correction copy	Case 15
RDK7 Note 2 Note 3	Data Drive Note 1	Note 2				Pre A, pre E *1	Hardware A *1	Post c *1	—	LDEV formrtting after replacing all the HDDs blocked in a parity group Note 3	Case 13
RDK8	Spare Drive Note 1	-				Pre A, pre D *1	Hardware A *1	Post d *1	20 min	Spare drive replace	Case 12

*1: Refer to REP01-170

*2: Refer to REP01-20

*3: This time does not include copy back time of data in HDD.

Note 1) Parts Name is indicates attribute of a drive.
Data Drive : The drive is installed in the position for a drive except spare drive (Data Drive).
Spare Drive : The drive is installed in the position for a spare drive.

Note 2) RDK7 is a Work ID for a work which is applicable to a case that two or more drives in a same parity group are blocked.
When the procedures instructed by RDK7 are executed,data will be lost. Ask the technical support center about the appropriateness of the operation.

Note 3) Confirm the parity group and the LDEV No. corresponding to the HDD through the SVP STATUS. See page SVP03-100 for the procedure for referring to SVP STATUS

Note : If a Work ID cannot be found or if multiple drive error is occurring, see page TRBL05-170 on TROUBLE SHOOTING section.

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<Cache>

Work ID	Part Name	Procedure *1			Replacing Time
		SVP Pre-procedure	Hardware procedure	SVP post-procedure	
RCA1	CACHE (with SM) (WP108-A)	Pre A, Pre F	Hard B	Post e	15 min
RCA2	CACHE (WP108-B)	Pre A, Pre F	Hard B	Post e	15 min

*1 Refer to REP01-170

<Channel Adapter, Disk Adapter, SCSI Buffer, and Terminator>

Work ID	Parts Name	Procedure *1			Replacing Time
		SVP Pre-procedure	Hardware procedure	SVP Post-procedure	
RCH1	Serial CHA	Pre A, Pre H	Hardware C	Post f	20 min
RCH2	Parallel CHA	Pre A, Pre H	Hardware D	Post f	20 min
RCH3	SCSI CHA	Pre A, Pre H	Hardware E	Post f	20 min
RCH4	Fibre CHA	Pre A, Pre H	Hardware F	Post f	20 min
RDA1	DKA	Pre A, Pre H	Hardware G	Post f	20 min
RSC1	SCSI BFR & SCSI Cable	Pre A, Pre I	Hardware H	Post h	10 min
RTM1	Terminator 1 (TM1)	Pre A, Pre T1	Hardware J	Post t1	13 min
RTM2	Terminator 2 (TM2)	Pre A, Pre T1	Hardware K	Post t1	13 min

*1 Refer to REP01-170

If a failure occurs in replacing a channel adaptor or a disk adaptor, see “Error Recovery Procedure for the Replacement of CHA/DKA” (TRBL05-110).

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<DKC, special P/K, Fan, Others>

Work ID	Parts Name	Procedure Note 1)			Replacing Time
		SVP pre-procedure	Hardware procedure	SVP post-procedure	
RT1	System Panel	Pre A, Pre T1	Hardware T1	Post t1	16 min
RT2	OP Panel	Pre A, Pre T1	Hardware T2	Post t1	23 min
RT3	CE Panel	Pre A, Pre T1	Hardware T3	Post t1	23 min
RT4	EPO SW	Pre A, Pre T1	Hardware T4	Post t1	12 min
RT5	PWRCTL	Pre A, Pre T1	Hardware T5	Post t1	22 min
RT6	PCI CONN Note 2)	Pre A, Pre T1	Hardware T6	Post t1	16 min
RT7	RCU CONN	Pre A, Pre T1	Hardware T7	Post t1	13 min
RT8	FAN(LOGIC)	Pre A, Pre T3	Hardware T8	Post t3	8 min
RT9	THERMOSTAT	Pre A, Pre T3	Hardware T9	Post t3	8 min
RT10	SVP, LAN Card	Pre A, Pre T1 Note 3)	Hardware T10	Post t1	40 min
RT11	SSVP	Pre A, Pre T1	Hardware T11	Post t1	29 min
RT12	Breaker box 1	Pre A, Pre T3	Hardware T12	Post t3	28 min
RT13	Breaker box 2	Pre A, Pre T3	Hardware T13	Post t3	18 min
RT14	Battery Box	Pre A, Pre T3	Hardware T14	Post t3	11 min
RT15	Battery Controller PCB	Pre A, Pre T3	Hardware T15	Post t3	8 min
RT17	RS CONN	Pre A, Pre T1	Hardware T23	Post t1	8 min
RT18	SVP PS	Pre A, Pre T3 Note 3)	Hardware T25	Post t3	10 min
RT19	HUB	Pre A, Pre T1	Hardware T26	Post t1	15 min

Note 1) Refer to REP01-170

Note 2) All connected devices to DKC310I are powered off by EPO signal of PCI when the PCI CONN PCB is removed.
Prevent the trouble for connected devices from EPO signal.

Note 3) When SVP is not able to operate, start from Hardware procedure.

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<DKC Power Supply>

Work ID	Parts Name	Procedure Note 1) SVP pre-procedure	Hardware procedure	SVP post-procedure	Replacing Time
RT20	SW PS(LOGIC,5V)	Pre A, pre T3	Hardware T17	Post t3	
RT21	SW PS(LOGIC,5V)	Pre A, pre T3	Hardware T17	Post t3	
RT22	SW PS(LOGIC,5V)	Pre A, pre T3	Hardware T17	Post t3	
RT23	SW PS(LOGIC,Multi)	Pre A, pre T3	Hardware T17	Post t3	
RT24	SW PS(LOGIC,Multi)	Pre A, pre T3	Hardware T17	Post t3	8 min
RT25	SW PS(LOGIC,Multi)	Pre A, pre T3	Hardware T17	Post t3	
RT26	SW PS(LOGIC,3V)	Pre A, pre T3	Hardware T17	Post t3	
RT27	SW PS(LOGIC,3V)	Pre A, pre T3	Hardware T17	Post t3	
RT28	SW PS(LOGIC,3V)	Pre A, pre T3	Hardware T17	Post t3	

Note 1) Refer to REP01-170.

<DKU, Special P/K, Power Supply, Fan>

Work ID	Parts Name	Procedure Note 1) SVP pre-procedure	Hardware procedure	SVP post-procedure	Replacing Time
RT29	DKUMN	Pre A, pre T4 Note 2)	Hardware T18	Post t4	12 min
RT30	SW PS(DKU Multi)	Pre A, pre T4 Note 2)	Hardware T19	Post t4	10 min
RT31	FAN(DKU)	Pre A, pre T4 Note 2)	Hardware T20	Post t4	5 min
RT32	AC Box-R10	Pre A, pre T4 Note 2)	Hardware T21	Post t4	30 min
RT33	AC Box (except R10)	Pre A, pre T4 Note 2)	Hardware T22	Post t4	30 min

Note 1) Refer to REP01-170.

Note 2) When SVP is not able to operate, start from Hardware procedure.

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1.6 Procedure contents table

SVP Pre	GO TO
Pre A	REP02-10
Pre B	REP02-30
Pre C	REP02-90
Pre D	REP02-130
Pre E	REP02-170
Pre F	REP02-220
Pre H	REP02-270
Pre I	REP02-340
Pre J	REP02-390
Pre K	REP02-450
Pre T1	REP02-490
Pre T3	REP02-680
Pre T4	REP02-830
Pre V	REP02-950

Hardware		GO TO
Procedure	Parts Name	
Hardware A	HDD Canister	REP03-10
Hardware B	Cache Memory PCB	REP03-50
Hardware C	Serial CHA	REP03-80
Hardware D	Parallel CHA	REP03-110
Hardware E	SCSI CHA	REP03-140
Hardware F	Fibre CHA	REP03-170
Hardware G	DKA	REP03-200
Hardware H	SCSI BFR,SCSI Cable	REP03-221
Hardware J	Terminator 1(TM1)	REP03-230
Hardware K	Terminator 2(TM2)	REP03-260
Hardware T1	System PNL	REP03-1000
Hardware T2	OP PNL	REP03-1030
Hardware T3	CE PNL	REP03-1100
Hardware T4	EPO SW	REP03-1150
Hardware T5	PWRCTL	REP03-1180
Hardware T6	PCI CONN	REP03-1220
Hardware T7	RCU CONN	REP03-1270
Hardware T8	FAN(DKC)	REP03-1290
Hardware T9	Thermostat	REP03-1310
Hardware T10	SVP, LAN Card	REP03-1330
Hardware T11	SSVP	REP03-1380
Hardware T12	Breaker Box-1	REP03-1400
Hardware T13	Breaker Box-2	REP03-1490
Hardware T14	Battery Box	REP03-1580
Hardware T15	Battery Controller PCB	REP03-1600
Hardware T16	Outlet Box	REP03-1620
Hardware T17	PS(DKC)	REP03-1730
Hardware T18	DKUMN	REP03-1750
Hardware T19	PS(DKU)	REP03-1790
Hardware T20	FAN(DKU)	REP03-1810
Hardware T21	AC BOX-R10	REP03-1830
Hardware T22	AC BOX (except R10)	REP03-1960
Hardware T23	RS CONN	REP03-2140
Hardware T25	SVP PS	REP03-2210
Hardware T26	HUB	REP03-2230

SVP Post	GO TO
Post a	REP04-10
Post b	REP04-80
Post c	REP04-150
Post d	REP04-250
Post e	REP04-330
Post f	REP04-360
Post h	REP04-420
Post i	REP04-450
Post t1	REP04-490
Post t3	REP04-820
Post t4	REP04-880
Post u	REP04-950

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1.7 MAINTENANCE outline

(1) How to interpret the status display

① The status information is displayed on the SVP screen is not on a realtime basis. It reflects the state that was established.

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1.8 Availability of the online maintenance when HRC/HORC is used

Component	Maintenance Type	Condition	HRC path established		During initial copy		After finished copy		Suspend	
			MCU	RCU	MCU	RCU	MCU	RCU	MCU	RCU
Logical Device	Blockade	—	×	×	SVP2031W	SVP2034W	SVP2031W	SVP2034W	SVP2031W	SVP2034W
	Recovery	—	×	×	SVP2031W	SVP2034W	SVP2031W	SVP2034W	SVP2031W	SVP2034W
	Format	—	×	×	SVP2031W	SVP2034W	SVP2031W	SVP2034W	SVP2031W	SVP2034W
	Verify	—	×	×	×	×	×	×	×	×
HDD canister	Replace	—	×	×	×	×	×	×	×	×
Cache PCB	Replace	—	×	×	SVP2059W	SVP2079W	× (*)	×	×	×
CHA	Replace	Alternate path exist.	×	×	×	SVP2038W	×	SVP2038W	×	SVP2038W
		Alternate path not exist.	×	×	SVP2073W	SVP2038W	SVP2074W	SVP2038W	SVP2075W	SVP2038W
CHS	Replace	—	×	×	×	×	×	×	×	×
CHF	Replace	—	×	×	×	×	×	×	×	×
DKA	Replace	—	×	×	×	×	×	×	×	×
LTM PCB	Replace	—	×	×	×	×	×	×	×	×
DKC	Replace	Alternate path exist.	×	×	×	SVP2038W	×	SVP2038W	×	SVP2038W
		Alternate path not exist.	×	×	SVP2073W	SVP2038W	SVP2074W	SVP2038W	SVP2075W	SVP2038W

Component	Maintenance Type	Condition	Suspending		Deleting	
			MCU	RCU	MCU	RCU
Logical Device	Blockade	—	SVP2031W	SVP2034W	SVP2031W	SVP2034W
	Recovery	—	SVP2031W	SVP2034W	SVP2031W	SVP2034W
	Format	—	SVP2031W	SVP2034W	SVP2031W	SVP2034W
	Verify	—	×	×	×	×
HDD canister	Replace	—	×	×	×	×
CACHE	Replace	—	× (*)	×	× (*)	×
CHA	Replace	Alternate path exist.	×	SVP2038W	×	SVP2038W
		Alternate path not exist.	SVP2075W	SVP2038W	SVP2075W	SVP2038W
CHS	Replace	—	×	×	×	×
CHF	Replace	—	×	×	×	×
DKA	Replace	—	×	×	×	×
LTM PCB	Replace	—	×	×	×	×
DKC	Replace	Alternate path exist.	×	SVP2038W	×	SVP2038W
		Alternate path not exist.	SVP2075W	SVP2038W	SVP2075W	SVP2038W

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× : Maintenance is available
SVPXXXXW : Maintenance is not available based on the specification. Refer to SVP-MSG SECTION.

Note.1 About replacement of CHA in the RCU side
If the CHA that will be replaced is connected to a path, from MCU please confirm that the Path is deleted from MCU.
After replacement, please add the Path.

The pair will be suspended if the ESTPAIR or paircreate(pairresync) command issues during the HDD Canister or the Cache PCB replacement. Please ask for the consent of a customer before the online maintenance operation.
Refer to “8.4 Procedures for online microprogram exchange and CHS/CHF replacement using alternate path” (MULTI08-50).

* : If the maintenance operation must be done while HRC asynchronous is using, you must confirm that the usage of Sidefile monitor less than 20% of total Cache capacity before you start the maintenance operation. Only when the usage of Sidefile monitor is less than 20% of total Cache capacity, you can proceed the maintenance operation.
Refer to “Monitoring” in the SVP SECTION about sidefile monitor.

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1.9 Availability of the online maintenance when HODM is used

Component	Maintenance Type	Condition	HODM path established		During initial copy		Waiting for erase		Suspend	
			MCU	RCU	MCU	RCU	MCU	RCU	MCU	RCU
Logical Device	Blocade	—	×		SVP2031W		SVP2031W		SVP2031W	
	Recovery	—	×		SVP2031W		SVP2031W		SVP2031W	
	Format	—	×		SVP2031W		SVP2031W		SVP2031W	
	Verify	—	×		×		×		×	
HDD canister	Replace	—	×		SVP2059W		×		×	
Cache PCB	Replace	—	×		SVP0259W		×		×	
CHA	Replace	Alternate path exist.	×		×		×		×	
		Alternate path not exist.	×		SVP2076W		SVP2078W		SVP2077W	
CHS	Replace	—	×		×		×		×	
CHF	Replace	—	×		×		×		×	
DKA	Replace	—	×		×		×		×	
LTM PCB	Replace	—	×		×		×		×	

Component	Maintenance Type	Condition	During for R-Vol Erasing		Erasing Error	
			MCU	RCU	MCU	RCU
Logical Device	Blocade	—	SVP2031W		SVP2031W	
	Recovery	—	SVP2031W		SVP2031W	
	Format	—	SVP2031W		SVP2031W	
	Verify	—	×		×	
HDD canister	Replace	—	×		×	
Cache PCB	Replace	—	×		×	
CHA	Replace	Alternate path exist.	×		×	
		Alternate path not exist.	SVP2078W		SVP2078W	
CHS	Replace	—	×		×	
CHF	Replace	—	×		×	
DKA	Replace	—	×		×	
LTM PCB	Replace	—	×		×	

× : Maintenance is available

SVPXXXXW : Maintenance is not available based on the specification. Refer to SVP-MSG SECTION.

Note.1 About replacement of CHA in the RCU side

If the CHA that will be replaced is connected to a path, from MCU please confirm that the Path is deleted from MCU.

After replacement, please add the Path.

Refer to “8.4 Procedures for online microprogram exchange and CHS/CHF replacement using alternate path” (MULTI08-50).

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1.10 Availability of the online maintenance when HMRCF is used

Component	Maintenance Type	Condition	Reserve-Volume	Pending/Resync/ SP-PEND		Duplex		Split		Suspend	
				S-VOL	T-VOL	S-VOL	T-VOL	S-VOL	T-VOL	S-VOL	T-VOL
Logical Device	Blocade	—	SVP2484W	SVP2483W	SVP2485W	SVP2483W	SVP2485W	SVP2483W	SVP2485W	SVP2483W	SVP2485W
	Recovery	—	×	×		×		×		×	
	Format	—	×	SVP2483W		SVP2483W		SVP2483W		SVP2483W	
	Verify	—	×	×		×		×		×	
HDD canister	Replace	—	×	×		×		×		×	
	Dynamic Sparing	—	×	SVP2486W		×		×		×	
	Correction Copy	—	×	SVP2486W		×		×		×	
Cache PCB	Replace	—	×	×		×		×		×	
CHA	Replace	—	×	×		×		×		×	
DKA	Replace	—	×	×		×		×		×	
LTM PCB	Replace	—	×	×		×		×		×	

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1.11 Availability of the online maintenance when Concurrent Copy(CC)/HXRC is used

Component	Maintenance Type	During initial copy		Established		Suspend	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
Logical Device	Blockade	**	**	**	**	**	**
	Recovery	**	**	**	**	**	**
	Format	**	**	**	**	**	**
	Verify	x	x	x	x	x	x
HDD canister	Replace	x	x	x	x	x	x
Cache PCB	Replace	*	x	*	x	*	x
CHA	Replace	x	x	x	x	x	x
DKA	Replace	x	x	x	x	x	x
LTM PCB	Replace	x	x	x	x	x	x

x: Maintenance is available

*: When a maintenance operation is needed while CC/HXRC is using, I/O's for CC/HXRC pair volumes or CC/HXRC itself should be stopped before the maintenance operation.
If the maintenance operation must be done while CC/HXRC is using, you must confirm that the usage of Sidefile monitor less than 20% of total Cache capacity before you start the maintenance operation. Only when the usage of Sidefile monitor is less than 20% of total Cache capacity, you can proceed the maintenance operation.
Refer to "Monitoring" in the SVP SECTION about Sidefile monitor.
Select the [Information] icon in the 'SVP' window.
Next select the [Monitor] menu in the 'Information' window and select [start....].
Next select the 'Sideflie' box in the 'Item' menu in the 'Monitoring' window and select [OK].

**: When a maintenance operation is needed while CC/HXRC is using, CC/HXRC should be stopped before the maintenance operation.

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[PRE-PROCEDURE A]

— OUTLINE —

① Initial Screen.
② Change SVP operation mode.
③ Open Maintenance window.

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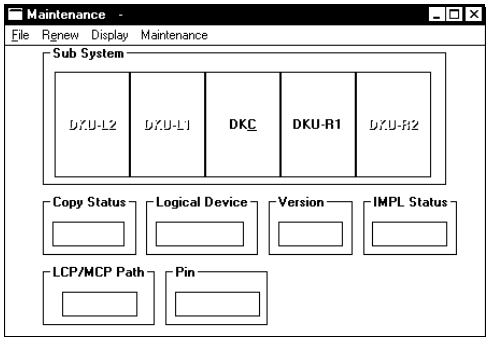
1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Modify Mode].
   Select [Maintenance] (CL).

3. <Maintenance window>
   'Maintenance' window is displayed.



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[PRE-PROCEDURE B]

— OUTLINE —

① Select drive (status check).
② Check progress of copy processing
③ Specify Replacement.
④ Place HDD into unpluggable state.

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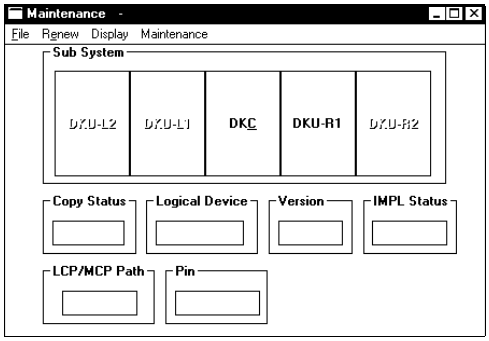
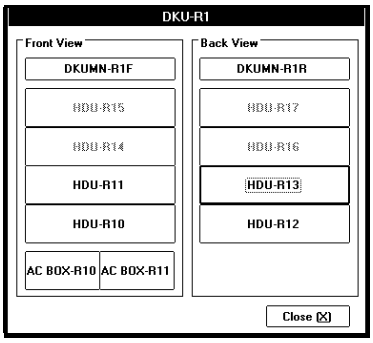
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting [Close] (CL) returns you to step 1.



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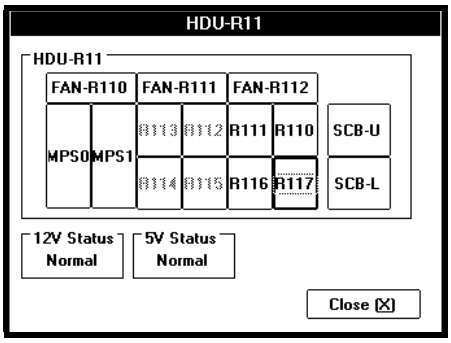
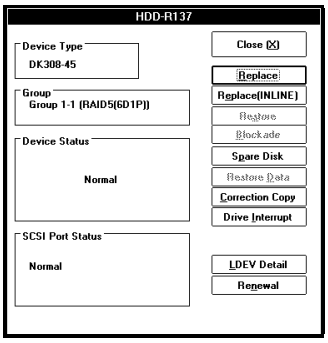
3. <Select HDD>
Check and select [Rnnn] or [Lnnn] to be replaced.
Selecting [Close] (CL) returns you to step 2.



4. <Specify replacement on HDD>
Check status display.
◆ In the case of a warning SIM, “NORMAL” is displayed.
◆ In the case of a blocking SIM, “FAILED” is displayed.

Select (CL) [Replace].



5. <Check progress of copy processing>
Check the status (other than preventive) of [HDD-Rnnn] or [HDD-Lnnn] to be replaced from [HDU-Rnn] or [HDU-Lnn].
[Warning threshold value]
* [RECOVERING] : Copy processing is in progress.
  [FAILED] (S/D set to S) : End of copy processing.

[Block threshold value]
* [FAILED] (S/D set to D) : Copy processing is in progress.
  [FAILED] (S/D set to S) : End of copy processing.

6. <Check progress of copy processing>
See SVP section. (SVP03-120)
After copy processing is complete, perform replacement procedure.

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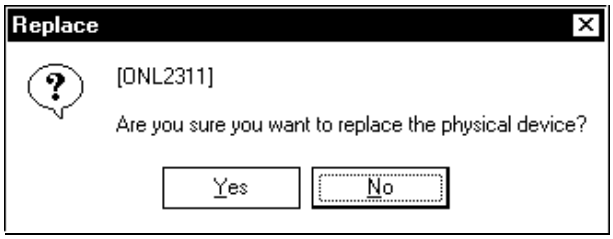
7. <Checking the P-DEV status>
   "Checking..." is displayed.

8. <P-DEV blocking>
   Select (CL) [Yes] in response to "Are you sure you want to replace the physical device?".



NOTICE
When the screen appears prompting the operator to input a password to prevent a multiple maintenance or for executing a pin check, contact the technical support center to ask for an instructions.

9. <Blocking the Physical device>
   "Blocking..." is displayed.

10. <Spin down the Physical device>
    "Spinning down..." is displayed.

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11.

BLANK

12. <Check shut down LED>

Check the shut down LED on the HDD to be replaced.
If LED is off, reconfirm the location of the HDD to be replaced with LOCATION SECTION before replacing hardware.

NOTICE
If a wrong HDD is removed, a data loss or a system down may be caused.

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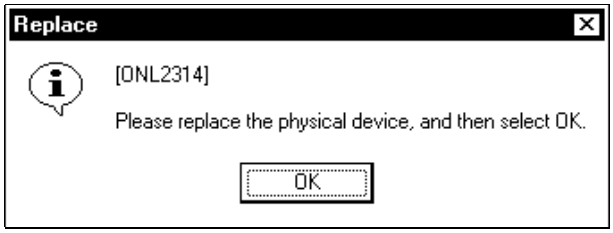
13. <Confirm Replacement.>
Select (CL) [OK] in response to “Please replace the physical device, and then select OK.” after replace the unit.



14. <Replace HDU>
Replace HDU .
See HARDWARE A (REP03-10).

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[PRE-PROCEDURE C]

— OUTLINE —

① Select drive (status check).
② Specify Replacement.
③ Save Spare.

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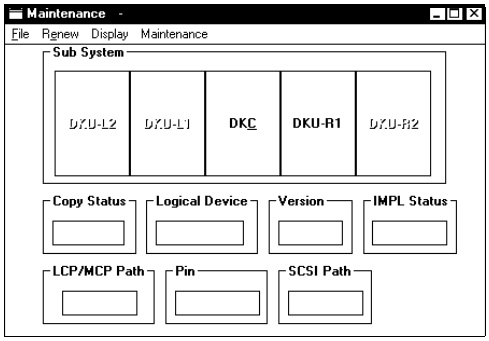
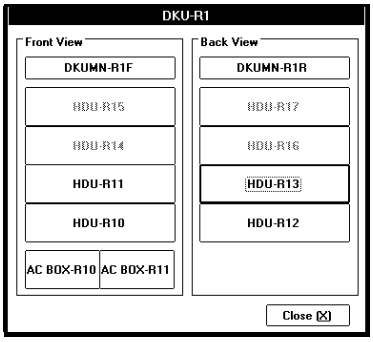
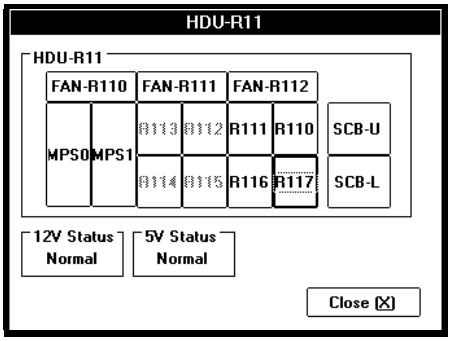
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting (CL) [Close] returns you to step 1.

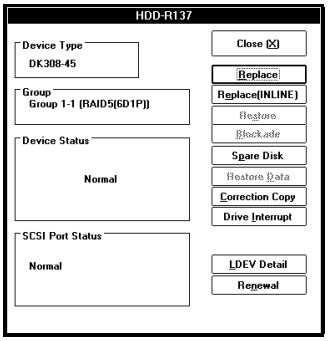


3. <Select HDD>
   Check and select [Rnnn] or [Lnnn] to be replaced.
   Selecting (CL) [Close] returns you to step 2.



4. <Specify replacement on HDD>
   Check status display.
   - ◆ In the case of a warning SIM, "NORMAL" is displayed.
   - ◆ In the case of a blocking SIM, "FAILED" is displayed.

   Select (CL) [Spare Disk].



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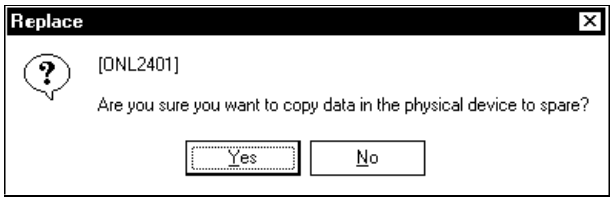
5. <Checking the P-DEV status>
   "Checking..." is displayed.

NOTICE
When the screen appears prompting the operator to input a password to prevent a multiple maintenance or for executing a pin check, contact the technical support center to ask for an instructions.

6. <Saving the spare>
   Select (CL) [Yes] in response to "Are you sure you want to copy data in the physical device to spare?".



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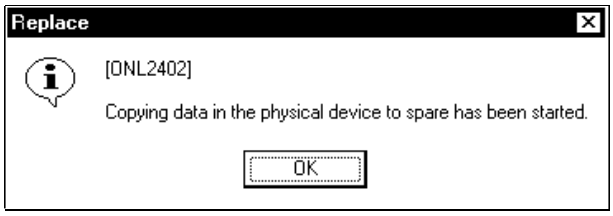
7. <Saving in process>
   "Copying..." is displayed.

8. <End of spare saving>
   Select (CL) [OK] in response to "Copying data in the physical device to spare has been started.".



9.
   Please do Pre B after finishing copy.

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[PRE-PROCEDURE D]

— OUTLINE —

① Select P-DEV (status check).
② Specify Replacement.
③ Place HDD into unpluggable state.

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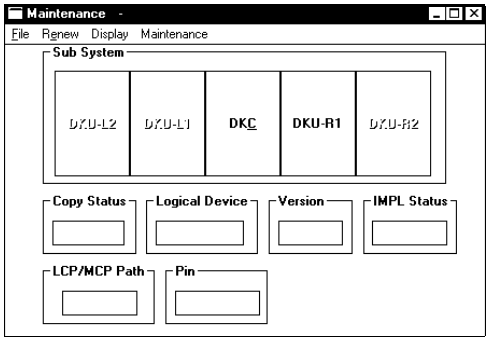
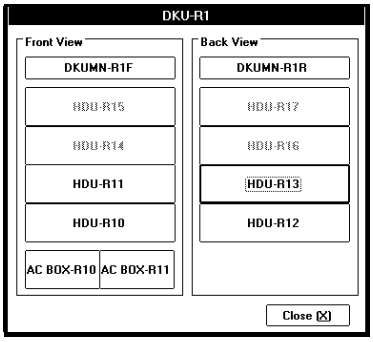
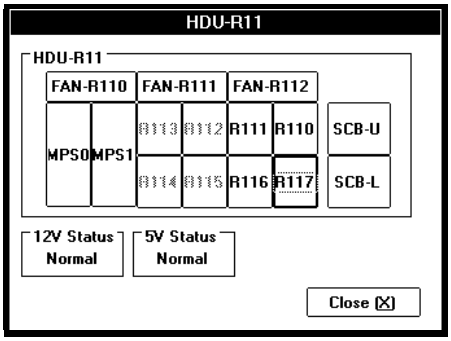
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting [Close] (CL) returns you to step 1.

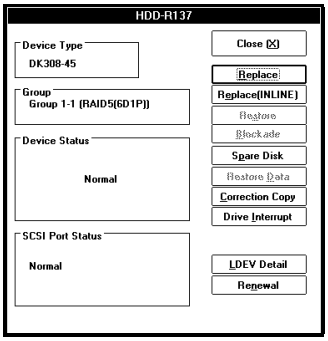


3. <Select HDD>
   Check and select [Rnnn] or [Lnnn] to be replaced.
   Selecting [Close] (CL) returns you to step 2.



4. <Specify replacement on HDD>
   Check status display.
   - ◆ In the case of a warning SIM, "NORMAL" is displayed.
   - ◆ In the case of a blocking SIM, "FAILED" is displayed.

   Select (CL) [Replace].



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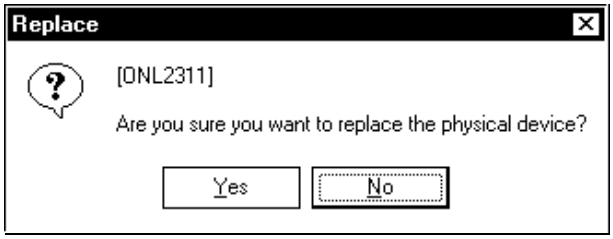
5. <Checking the P-DEV status & saving the spare>
   "Checking..." is displayed.

NOTICE
When the screen appears prompting the operator to input a password to prevent a multiple maintenance or for executing a pin check, contact the technical support center to ask for an instructions.

6. <P-DEV blocking>
   Select (CL) [Yes] in response to "Are you sure you want to replace the physical device?".



7. <Blocking the Physical device>
   "Blocking..." is displayed.

8. <Spin down the Physical device>
   "Spinning down..." is displayed

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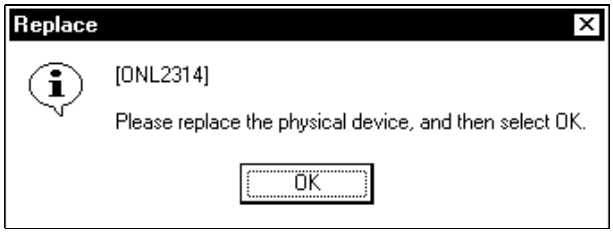
9.

BLANK

10. <Check shut down LED>
Check the shut down LED on the HDD to be replaced.
If LED is off, reconfirm the location of the HDD to be replaced with LOCATION SECTION before hardware work.

NOTICE
If a wrong HDD is removed, a data loss or a system down may be caused.

11. <Confirmation of replace>
Select (CL) [OK] in response to “Please replace the physical device, and then select OK.” after replace the unit (Step 12).



12. <Replace HDD>
Replace HDD.
See HARDWARE A (REP03-10).

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[PRE-PROCEDURE E]

— OUTLINE —

① Select HDD (status check).
② Specify Replacement.
③ Block parity group (enter password).
④ Place HDD into unpluggable state.
⑤ Replace HDD.
⑥ Perform steps ② to ⑤ on blocked drives in parity group.

NOTICE

This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

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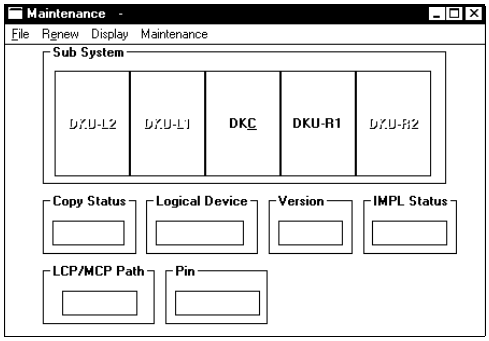
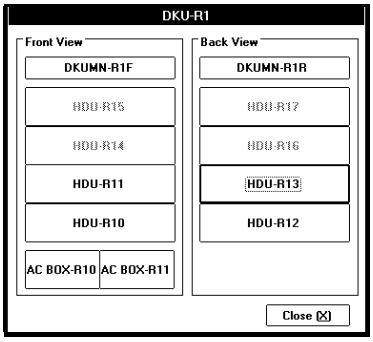
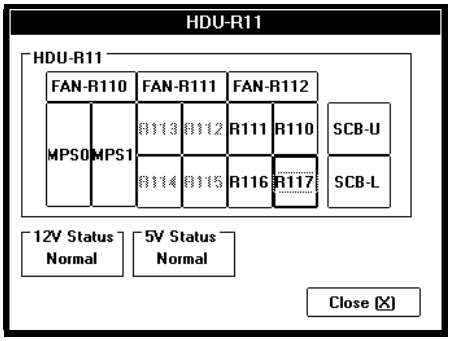
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting [Close] (CL) returns you to step 1.

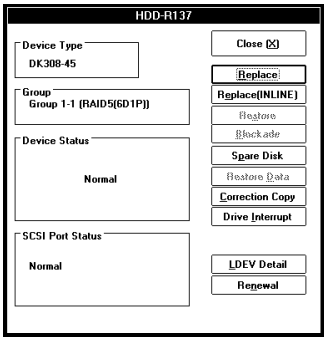


3. <Select HDD>
   Check and select [Rnnn] or [Lnnn] to be replaced.
   Selecting [Close] (CL) returns you to step 2.



4. <Specify replacement on HDD>
   Make sure that the status is FAILED.

   Select (CL) [Replace].



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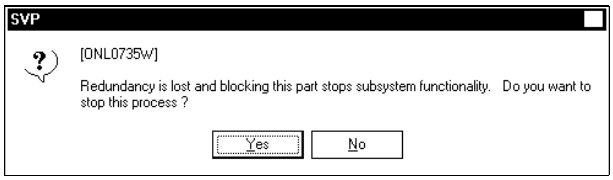
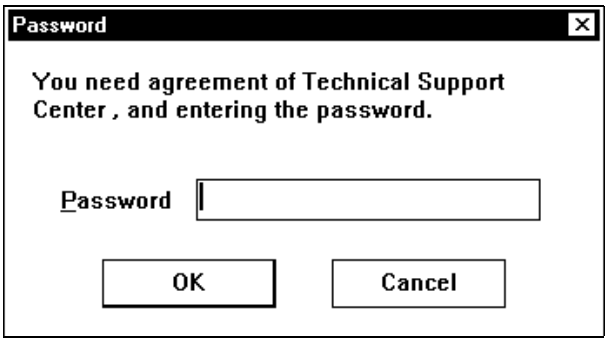
5. <Confirm lost data>
Select (CL) [No] in response to "Redundancy is lost and blocking this part stops subsystem functionality. Do you want to stop this process?"



NOTICE
Executing this operation may cause a serious error such as a system down or a data loss. Accordingly, confirmation of the appropriateness of the operation and input of a password on the succeeding password input screen is required.

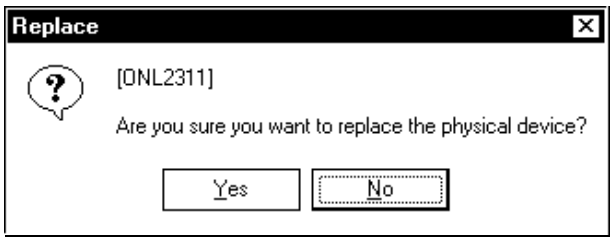
6. <Enter password>
Enter the password in response to "You need agreement of Technical Support Center, and entering the password." and select (CL) [OK]. Password is needed for this operation.



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

7. <Checking the P-DEV status>
"Checking..." is displayed.

8. <P-DEV blocking>
Select (CL) [Yes] in response to "Are you sure you want to replace the physical device?".



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9. <Blocking the Physical device>
“Blocking...” is displayed.

10. <Spin down the Physical device>
“Spinning down...” is displayed.
Shut down LED lit.

11.

BLANK

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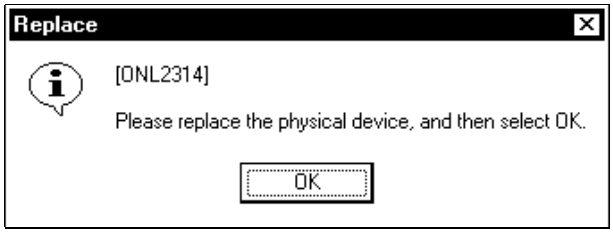
12. <Replace HDU>
Select (CL) [OK] in response to “Please replace the physical device, and then select OK.” after replace the unit.
(See HARDWARE A (REP03-10))



13. <Replace HDD>
Replace HDD.
See HARDWARE A (REP03-10).

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[PRE-PROCEDURE F]

— OUTLINE —

① Select (main platter) cache (status check).
② Specify Replacement.
③ Place PCB into unpluggable state.

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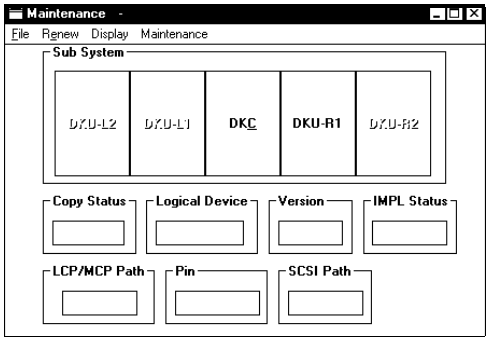
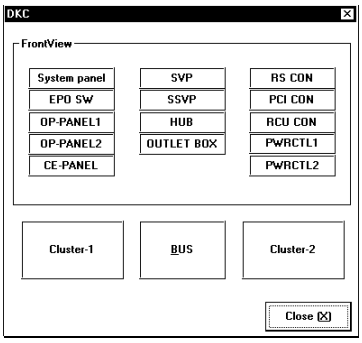
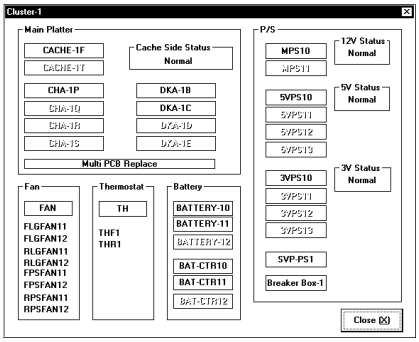
1. <Maintenance window>
   'Maintenance' window is displayed.
   In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



2. <DKC screen>
   Select (CL) [Cluster] in the 'DKC'.



3. <Select Part>
   Select (CL) part.



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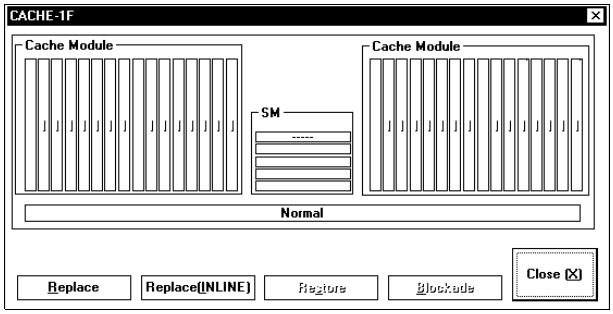
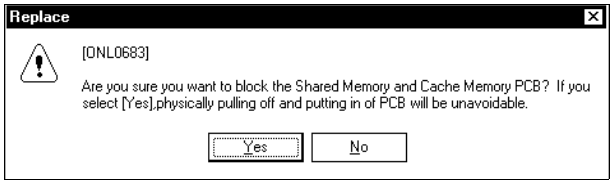
4. <Select Cache>
Check status display.
Select (CL) cache and select (CL) [Replace].

If INLINE CUDG in the Install or replace operation is failed, select (CL) [Replace (INLINE)] to recover target PCB.



NOTICE
When the screen appears prompting the operator to input a password to prevent a multiple maintenance or for executing a pin check, contact the technical support center to ask for an instructions.

5. <Check beginning of cache blocking>
Select (CL) [Yes] after making sure that the package to be blocked is correct in response to:



* For CACHE (with SM) -- [Go to step 6]
"Are you sure you want to block the Shared Memory and Cache Memory PCB? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable."
* For CACHE ---------- [Go to step 6]
"Are you sure you want to block the Cache Memory PCB? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable."

6. <Cache blocking>
"The Cache Memory PCB is being blocked." is displayed.
"The Shared Memory PCB is being blocked…" is displayed.

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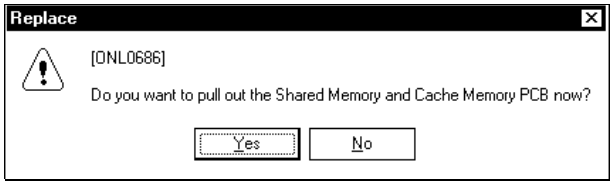
7. <Check removal of cache>
   Select (CL) [Yes] in response to:
   * For CACHE (with SM)
   "Do you want to pull out the Shared Memory and Cache Memory PCB now?"
   * For CACHE
   "Do you want to pull out the Cache Memory PCB now?"



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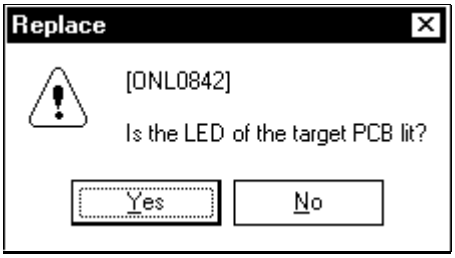
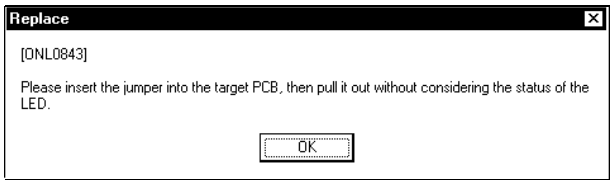
8. <Check shut down LED>
Select (CL)
* [Yes] if LED is on
* [No] if LED is off
in response to “Is the LED of the target PCB lit?”.



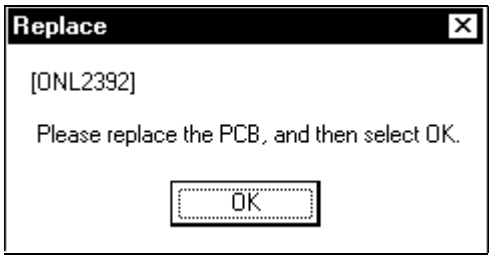
<Forcing shut down LED on>

NOTICE
If the jumper is inserted in the wrong PCB, a system down may be caused.



If [No] is selected:
Insert a jumper in response to “Please insert jumper into the target PCB, then pull it out without considering the status of the LED”.
(Refer REP03-60)
Go to step 9.

9. <Cache Replacement>
“Please replace the PCB, and then select OK.” is displayed.
(Select (CL) [OK] after replacing the PCB.)



10. <Replace cache PCB>
Replace cache.

For CACHE (with SM) See HARDWARE B (REP03-50)

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[PRE-PROCEDURE H]

— OUTLINE —

① Select CHA/DKA (status check).
② Specify Replacement.
③ Place PCB into blocked state.

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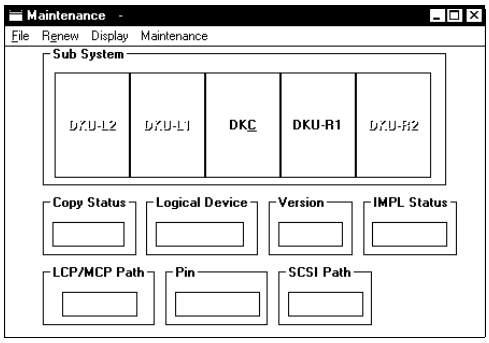
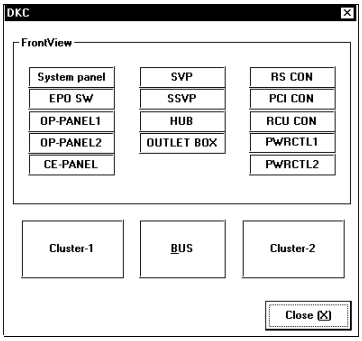
1. <Set path offline>
   Set the path offline from HOST when replacing CHA by your customer.

NOTICE
The path to be placed offline is that connected with the CHA concerned.

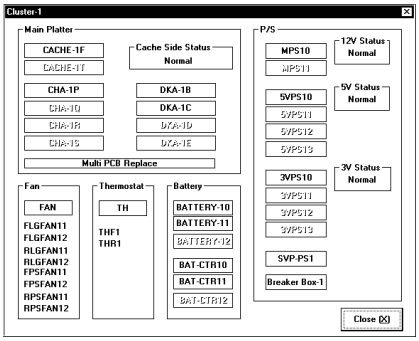
2. <Maintenance window>
   'Maintenance' window is displayed.
   In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



3. <DKC screen>
   Select (CL) [Cluster] in the 'DKC'.



4. <Select CHA/DKA>
   Select (CL) CHA/DKA.
   Selecting (CL) [Close] returns you to step 3.



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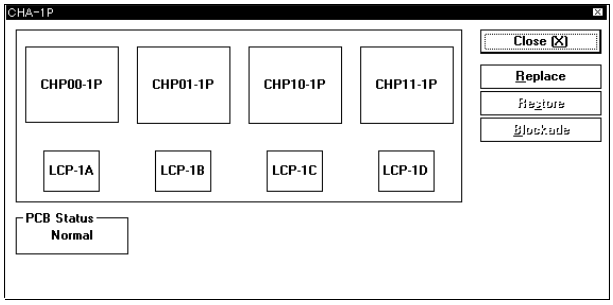
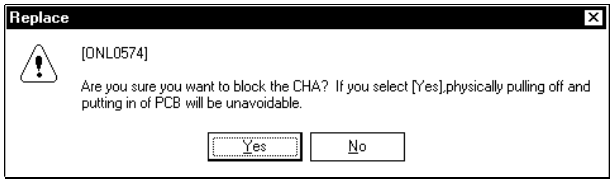
5. <Specify Replacement of CHA/DKA>
Make sure that the status is WARNING.
Select (CL) CHA/DKA PCB. The screen as shown on the right is displayed.
Select (CL) [Replace].



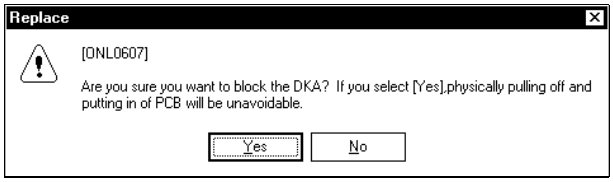
NOTICE
When the subsystem is placed online, ask the customer to place it offline.

NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

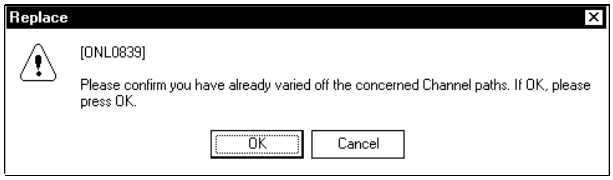
6. <CHA/DKA blocking>
Select (CL) [Yes] in response to:
* For CHA
"Are you sure you want to block the CHA? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable."
Go to step 7.



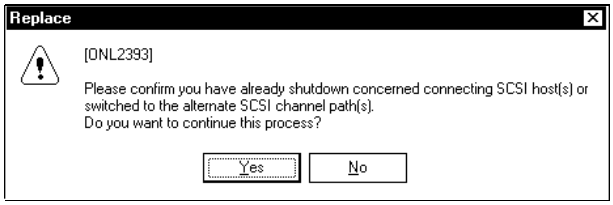
* For DKA
"Are you sure you want to block the DKA? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable."
Go to step 8.



7. <Confirm Channel Path offline>
Select (CL) [OK] in response to:
"Please confirm you have already varied off the concerned Channel paths. If OK, please press OK."



If SCSI channel adapter is installed:
After you confirm that you have stopped concerned SCSI channel paths, select (CL) [Yes].



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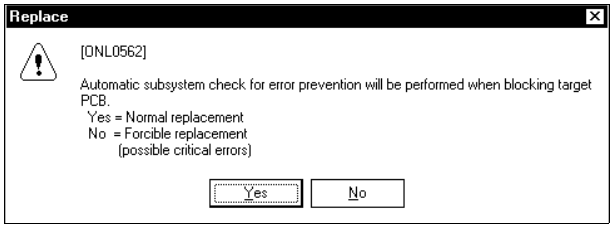
8. <Caution message for system down>

NOTICE
Select (CL) [Yes] in response to the message below.



"Automatic subsystem check for error prevention will be performed when blocking target PCB.
Yes = Normal replacement
No = Forcible replacement
(Possible critical errors)"

9. <CHA/DKA blocking>
* For CHA
"The CHA is being blocked..."
* For DKA
"The DKA is being blocked..."

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10. <Removal of CHA/DKA>

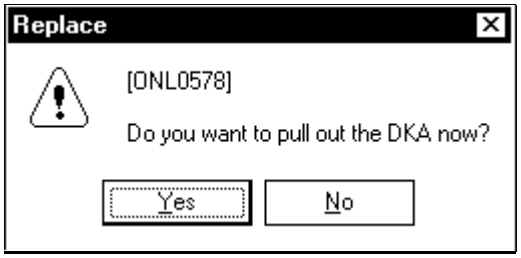
Select (CL) [Yes] in response to:

* For CHA

“Do you want to pull out the CHA now?”

* For DKA

“Do you want to pull out the DKA now?”



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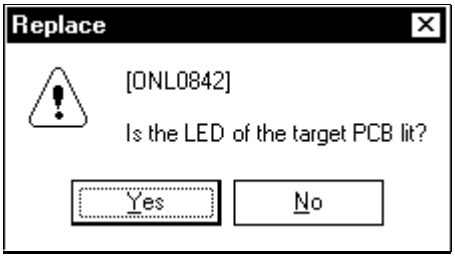
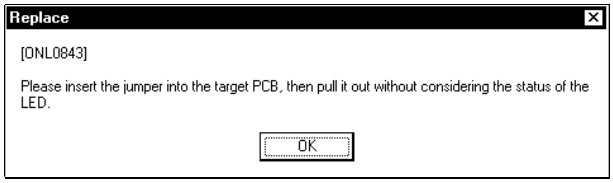
11. <Check to see if shut down LED is lit>



Select (CL)
* [Yes] if LED is on
* [No] if LED is off
in response to “Is the LED of the target PCB lit?”.
If [No] is selected:
Select in response to “Is the LED of the target PCB lit?” again.

<Forcing shut down LED on>

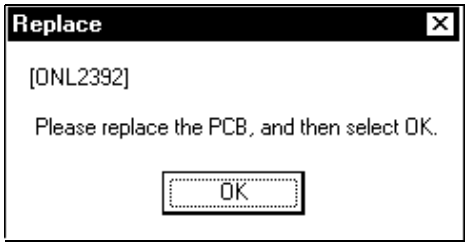
NOTICE
If the jumper is inserted in the wrong PCB, a system down may be caused.



If [No] is selected twice:
Insert a jumper in response to “Please insert the jumper into the target PCB, then pull it out without considering the status of the LED”. (Refer REP03-90)

For CHA (SERIAL)	HARDWARE C (REP03-80)
CHA (PARALLEL)	HARDWARE D (REP03-110)
DKA	HARDWARE G (REP03-200)

12. <Beginning of CHA/DKA Replacement>



“Please replace the PCB, and then select OK.” is displayed. Select (CL) [OK] after replacing the PCBs

For CHA (Serial)	Go to HARDWARE C (REP03-80)
For CHA (Parallel)	Go to HARDWARE D (REP03-110)
For SCSI	Go to HARDWARE E (REP03-140)
For FIBRE	Go to HARDWARE F (REP03-170)
For DKA	Go to HARDWARE G (REP03-200)

13. <Waiting for Power Event>
“Waiting for Power Event...
Usually several minutes (maximum 10 minutes).” is displayed.

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Blank Sheet

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[PRE-PROCEDURE I]

— OUTLINE —

① Select SCSI (status check).
② Specify replacement of SCSI buffer.
③ Select SCSI buffer.

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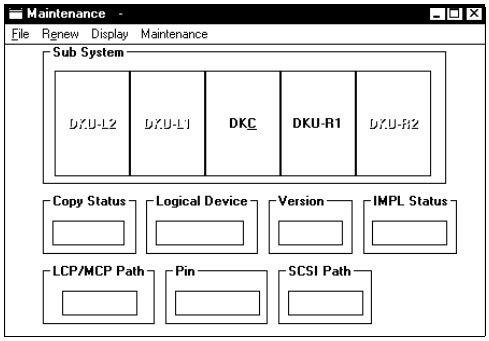
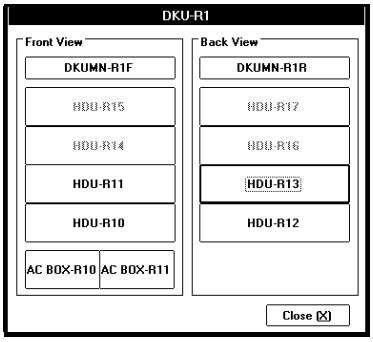
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting (CL) [Close] returns you to step 1.



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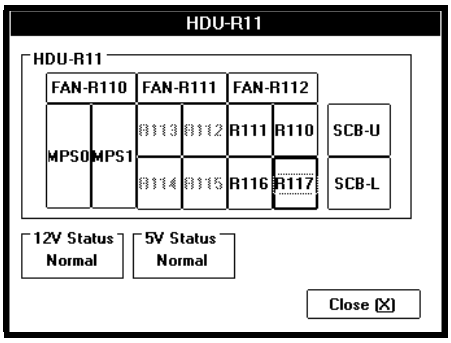
3. <Select SCSI Buffer>
Select (CL) [SCB-U] or [SCB-L] to be replaced.
Selecting (CL) [Close] returns you to step 2.



The correspondence of [SCSI n] in dialog box with location of the SCSI Buffer is shown as follows.
For the location of the SCSI Buffer, refer to LOCATION02-80.

DKA ID	SCSI ID			
	SCSI 0	SCSI 1	SCSI 2	SCSI 3
DKA-1B	SCBFR-R10U	SCBFR-R11U	SCBFR-R12U	SCBFR-R13U
	SCBFR-R20U	SCBFR-R21U	SCBFR-R22U	SCBFR-R23U
DKA-1C	SCBFR-R14U	SCBFR-R15U	SCBFR-R16U	SCBFR-R17U
	SCBFR-R24U	SCBFR-R25U	SCBFR-R26U	SCBFR-R27U
DKA-1D	SCBFR-L10U	SCBFR-L11U	SCBFR-L12U	SCBFR-L13U
	SCBFR-L20U	SCBFR-L21U	SCBFR-L22U	SCBFR-L23U
DKA-1E	SCBFR-L14U	SCBFR-L15U	SCBFR-L16U	SCBFR-L17U
	SCBFR-L24U	SCBFR-L25U	SCBFR-L26U	SCBFR-L27U
DKA-2H	SCBFR-R10L	SCBFR-R11L	SCBFR-R12L	SCBFR-R13L
	SCBFR-R20L	SCBFR-R21L	SCBFR-R22L	SCBFR-R23L
DKA-2J	SCBFR-R14L	SCBFR-R15L	SCBFR-R16L	SCBFR-R17L
	SCBFR-R24L	SCBFR-R25L	SCBFR-R26L	SCBFR-R27L
DKA-2K	SCBFR-L10L	SCBFR-L11L	SCBFR-L12L	SCBFR-L13L
	SCBFR-L20L	SCBFR-L21L	SCBFR-L22L	SCBFR-L23L
DKA-2L	SCBFR-L14L	SCBFR-L15L	SCBFR-L16L	SCBFR-L17L
	SCBFR-L24L	SCBFR-L25L	SCBFR-L26L	SCBFR-L27L

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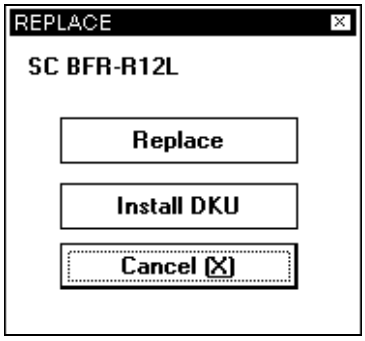
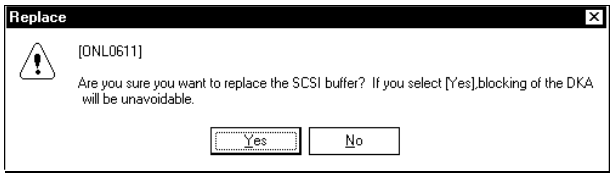
4. <Specify Replacement>
   Select (CL) [Replace].
   Selecting (CL) [Cancel] returns you to step 3.



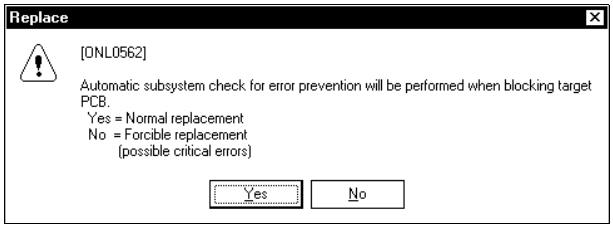
NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

5. <Check beginning of DKA blocking>
   Select (CL) [Yes] in response to "Are you sure you want to replace the SCSI buffer? If you select [Yes], blocking of the DKA will be unavoidable.".



6. <Check system down>

NOTICE
Select (CL) [Yes] in response to the message below.



"Automatic subsystem check for error prevention will be performed when blocking target PCB.
Yes = Normal replacement
No = Forcible replacement
(Possible critical errors)"

7. <Check DKA blocking>
   "The DKA is being blocked..." is displayed.

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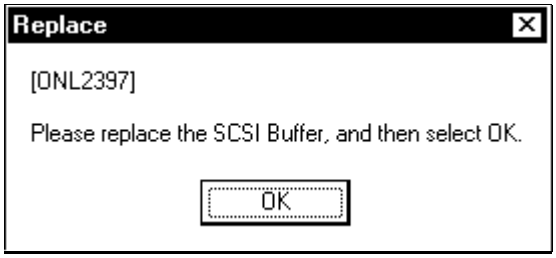
8. <Replace SCSI Buf>
Remove SCSI BUF PCB, and insert it to turn off shut down LED.
Refer HARDWARE H (REP03-221)



Select (CL) [OK] in response to “Please replace the SCSI Buffer. If OK, press return.” after replace the PCB.

If the SCSI Buffer LED is not turn on, please remove SCSI BUF PCB, and insert it.

Perform SCSI Buf PCB Replacement procedure.
A pair of SCSI Buf PCBs which connected by same SCSI Interface cable should be replaced at the same time.

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[PRE-PROCEDURE J]

— OUTLINE —

① Select DKA (status check).
② Specify Replacement.
③ Place PCB into unpluggable state.

NOTICE

This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

NOTICE

This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

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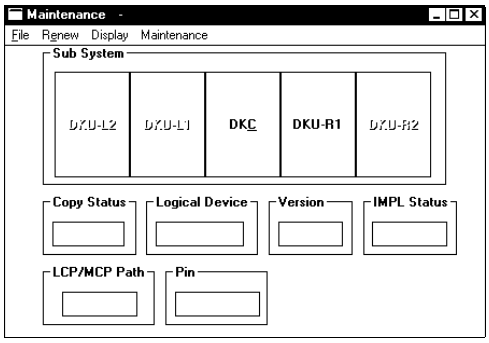
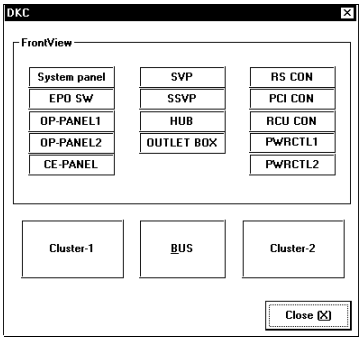
NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

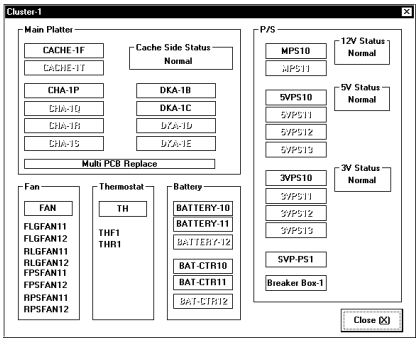
1. <Maintenance window>
   'Maintenance' window is displayed.
   In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



2. <DKC screen>
   Select (CL) [Cluster] in the 'DKC'.



3. <Select DKA>
   Select (CL) DKA.



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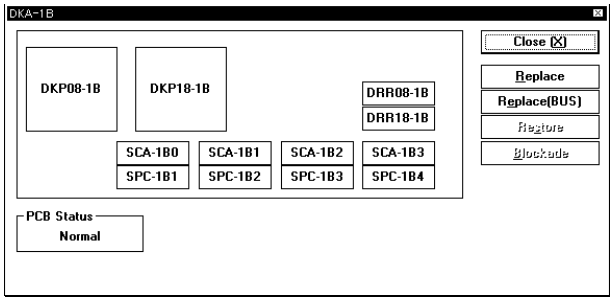
NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

4. <Select DKA>
Select (CL) DKA PCB. The screen as shown on the right is displayed.
Make sure that the status is WARNING.
Select (CL) [Replace(BUS)].



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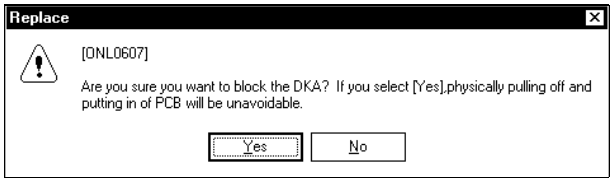
NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

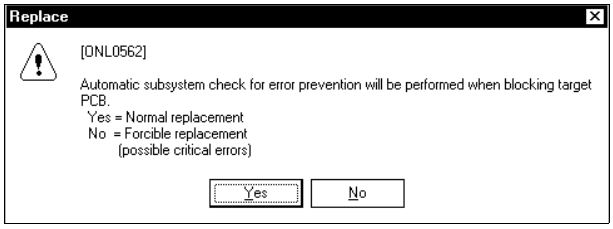
5. <DKA blocking>
Select (CL) [Yes] in response to "Are you sure you want to block the DKA? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable.".



6. <Caution message for system down>

NOTICE
Select (CL) [Yes] in response to the message below.

"Automatic subsystem check for error prevention will be performed when blocking target PCB.
Yes = Normal replacement
No = Forcible replacement
(Possible critical errors)"



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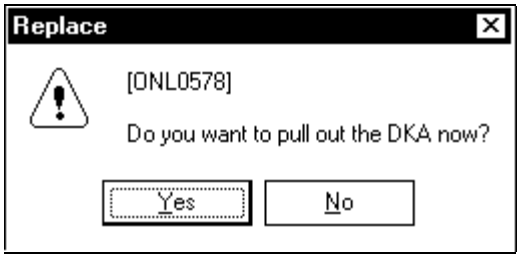
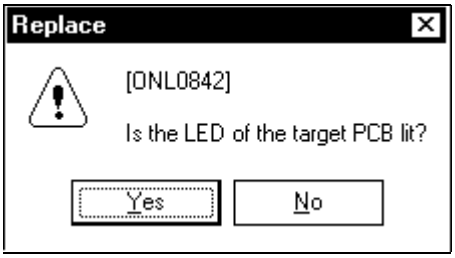
NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

7. <DKA blocking>
"The DKA is being blocked..."

8. <Removal of DKA>
Select (CL) [Yes] in response to "Do you want to pull out the DKA now?".

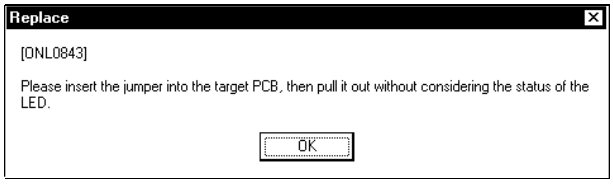


9. <Check to see if shut down LED is lit>
Select (CL)
* [Yes] if LED is on
* [No] if LED is off
in response to "Is the LED of the target PCB lit?".
If [No] is selected:
Select in response to "Is the LED of the target PCB lit?" again.



<Forcing shut down LED on>

NOTICE
If the jumper is inserted in the wrong PCB, a system down may be caused.



If [No] is selected twice:
Insert a jumper in response to "Please insert the jumper into the target PCB, then pull it out without considering the status of the LED". (Refer REP03-210)

For SCSI HARDWARE E (REP03-140)
For FIBRE HARDWARE F (REP03-170)
For DKA HARDWARE G (REP03-200)

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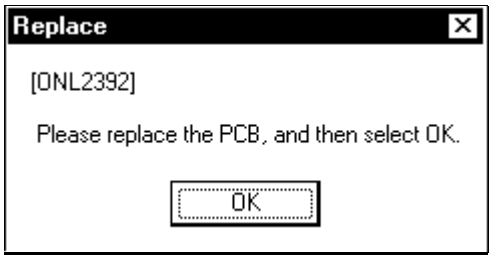
NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

10. <Beginning of CHA/DKA Replacement>
"Please replace the PCB, and then select OK." is displayed. Select (CL) [OK] after replacing the PCBs



For SCSI	Go to HARDWARE E (REP03-140)
For FIBRE	Go to HARDWARE F (REP03-170)
For DKA	Go to HARDWARE G (REP03-200)

11. <Waiting for Power Event>
"Waiting for Power Event...
Usually, several minutes (maximum 10 minutes)." is displayed.

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[PRE-PROCEDURE K]

— OUTLINE —

① Select drive (status check).
② Check progress of copy processing
③ Specify Correction Copy
④ Save Spare

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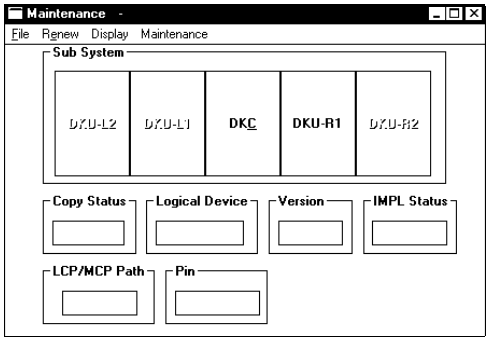
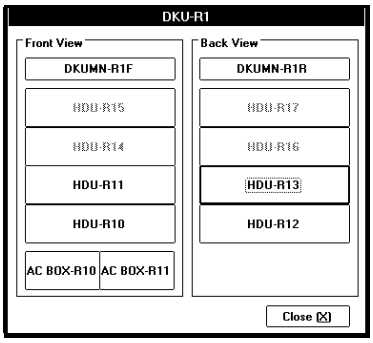
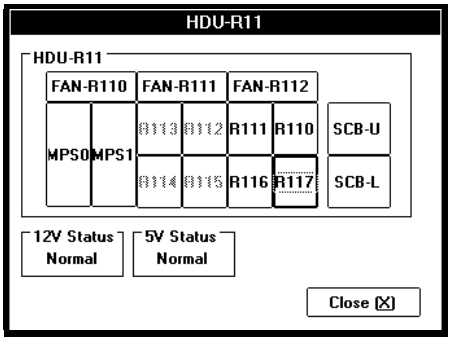
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting (CL) [Close] returns you to step 1.

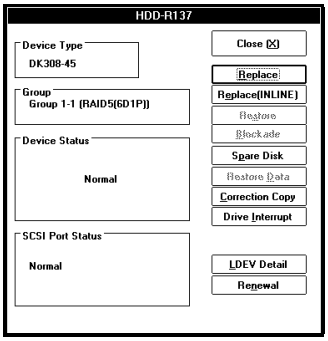


3. <Select HDD>
   Check and select [Rnnn] or [Lnnn] to be replaced.
   Selecting (CL) [Close] returns you to step 2.



4. <Specify replacement on HDD>
   Check status display.
   - ◆ In the case of a warning SIM, "NORMAL" is displayed.
   - ◆ In the case of a blocking SIM, "FAILED" is displayed.

   Select (CL) [Correction Copy].



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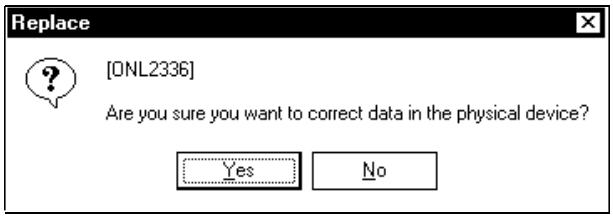
5. <Reading the subsystem configuration data and Checking the P-DEV status>
   "Checking..." is displayed.

6. <Saving the spare>
   Select (CL) [Yes] in response to "Are you sure you want to correct data in the physical device?".



7. <Correction copy in progress>
   "Correcting..." is displayed.

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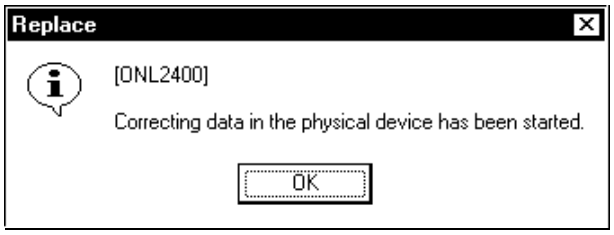
8. <End of starting correction copy>
   Select (CL) [OK] in response to “Correcting data in the physical device has been started.”.



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[PRE-PROCEDURE T1]

— OUTLINE —

① Select special (DKC) part (status check).
② Specify Replacement.
③ Detach parts related to special part.

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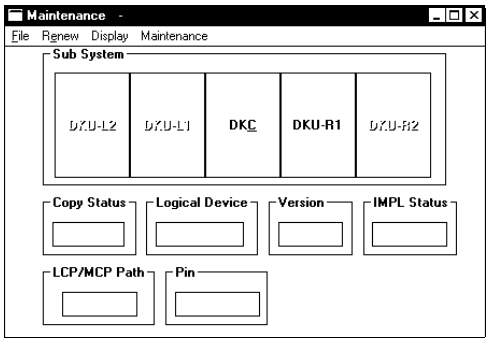
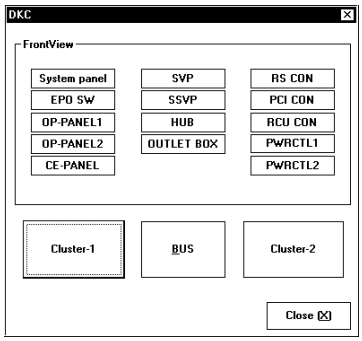
[1] Select special part

1. <Maintenance window>
'Maintenance' window is displayed.
In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



2. <Specify special part>
Select (CL) part [XXXXX] to be replaced from 'DKC'.



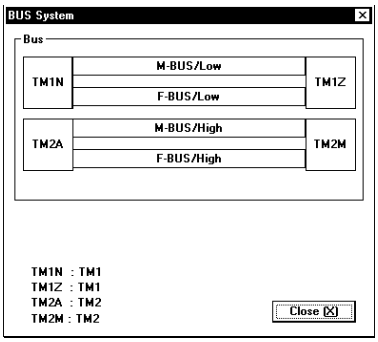
Valid [XXXXX] values are listed below.

- System panel ---------- [System panel]
- OP panel ---------- [OP panel-1/2]
- CE panel ---------- [CE panel]
- PWRCTL ---------- [PWRCTL-1/2]
- PCI CONN ---------- [PCI CONN]
- RCU CONN ---------- [RCU CONN]
- EPO SW ---------- [EPO SW]
- OUTLET BOX -------- [Outlet Box]
- SVP/LAN Card ------- [SVP]
- SSVP ---------- [SSVP]
- HUB ---------- [HUB]
- RS CONN ---------- [RS CONN]

And go to step 4.

- Terminator
  Select (CL) [BUS]. Go to step 3.

3. <Specify special part>
Select (CL) part [XXXXX] to be replaced from 'BUS System'.
- Terminator ---------- [TMnn]



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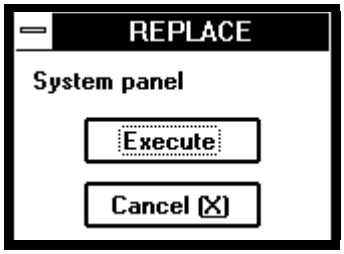
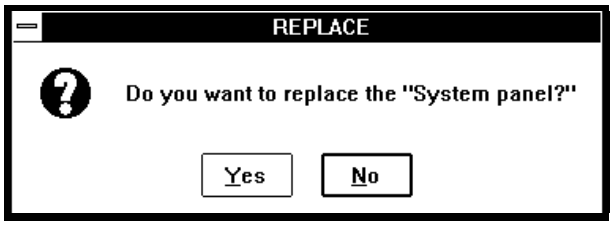
4. <Execute>
Select (CL) [Execute].



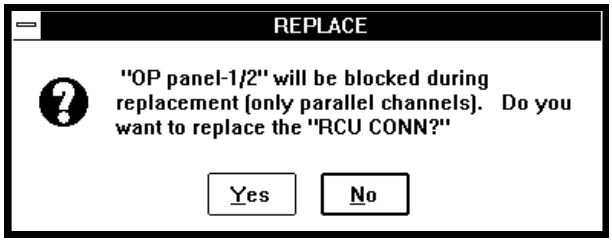
NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

5. <Check beginning of special part Replacement>
Select (CL) [Yes] in response to “Do you want to replace the "XXXXX? "”.



XXXXX represents one of the part names listed in step 2.
- “System panel” ---------Go to [10] (REP02-630)
- “OP panel-1/2” ---------Go to [2] (REP02-520)
- “CE panel” ----------Go to [3] (REP02-530)
- “EPO SW” ----------Go to [4] (REP02-550)
- “PCI CONN” ----------Go to [5] (REP02-560)
- “PWRCTL 1/2” --------Go to [7] (REP02-590)
- “Outlet Box”----------Go to [8] (REP02-600)
- “RS CONN” ----------Go to [10] (REP02-630)
- “SVP” ----------Go to [11] (REP02-640)
- “SSVP”----------Go to [12] (REP02-660)
- “HUB”----------Go to [13] (REP02-670)

Select (CL) [Yes] in response to “"OP panel-m" will be blocked during replacement [only parallel channels]. Do you want to replace the "XXXXX ?"”.



OP panel-m:
- For “RCU CONN” :m = 1/2 (“OP panel-1/2”), OP panel-1 and 2 will be blocked.
- For “TM1” :m = 1 (“OP panel-1”), OP panel-1 will be blocked.
- For “TM2” :m = 2 (“OP panel-2”),OP panel-2 will be blocked.

XXXXX represents one of the part names listed in step 2 or 3.
- “RCU CONN” ---------Go to [6] (REP02-580)
- “TMn” ----------Go to step 6

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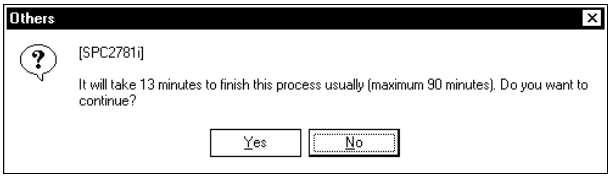
6. <Display time to finish>
Select (CL) [Yes] in response to “It will take xx minutes to finish this process usually (maximum yy minutes). Do you want to continue?”



Parts name:
• “TMn” ----------Go to [9] (REP02-610)

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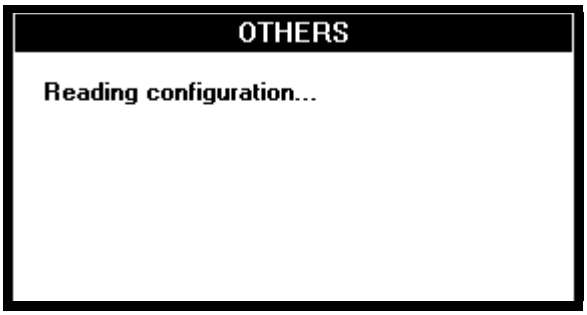
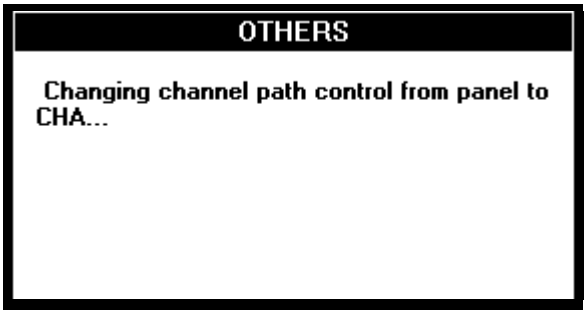
[2] OP PANEL

1. <Check type of CHA>
   "Reading configuration..." is displayed.
   If there are no parallel channels, Go to [10] (REP02-630).



2. <Memorize REMOTE channel name>
   Memorize channel name that switch is REMOTE position, and select (CL) [OK].

3. <Change CHP mode>
   "Changing channel path control from panel to CHA..." is displayed.
   Go to [10] (REP02-630).



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[3] CE PANEL

1. <Read environment monitor>
   The SVP automatically read REMOTE/LOCAL position of the CE panel.

2. <Check jumper installation>
   Attach jumper on HUB in response to “Please attach "CE PANEL INH" jumper plug. Then press OK.”. (see HARDWARE T3 (REP03-1110 step 1)).
   Select (CL) [OK] after confirming that jumper is attached.
   Go to step 4.
   If jumper plug is not attached, go to step 3.

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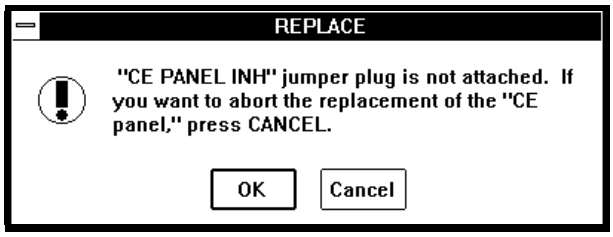
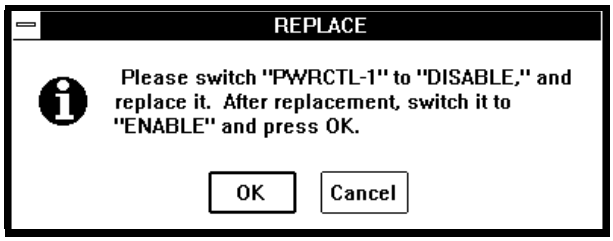
3. <Check jumper reinstallation>
"CE PANEL INH" jumper plug is not attached. If you want to abort the replacement of the "CE panel," press CANCEL." is displayed if no jumper is attached. Attach jumper and select (CL) [OK].
If jumper plug is not attached, step 3 again.



4. <Check beginning of special part replacement>
"Please switch "XXXXX" to "DISABLE," and replace it. After replacement, switch it to "ENABLE" and press OK." is displayed.
(Reply with [OK] after replacing the special part)



5. <Replace special part>
Replace the special part.
(See HARDWARE T3 step 2 (REP03-1120).)

[End of PRE-PROCEDURE]

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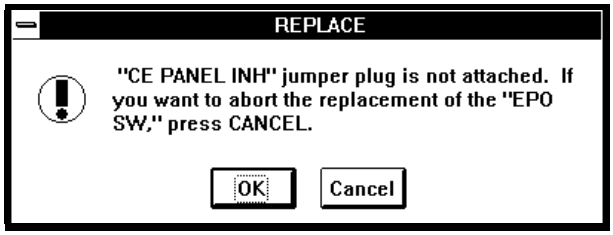
[4] EPO SW

1. <Check jumper installation>
   Attach jumper on HUB in response to “Please attach "CE PANEL INH" jumper plug. Then press OK.”. (see HARDWARE T4 (REP03-1160 step 1)).
   Select (CL) [OK] after confirming that jumper is attached.
   Go to [10] (REP02-630).
   If jumper plug is not attached, go to 2.

2. <Check jumper reinstallation>
   “"CE PANEL INH" jumper plug is not attached. If you want to abort the replacement of the "EPO SW," press CANCEL.” is displayed if no jumper is attached. Attach jumper and select (CL) [OK].
   Go to [10] (REP02-630).
   If jumper plug is not attached, step 2 again.



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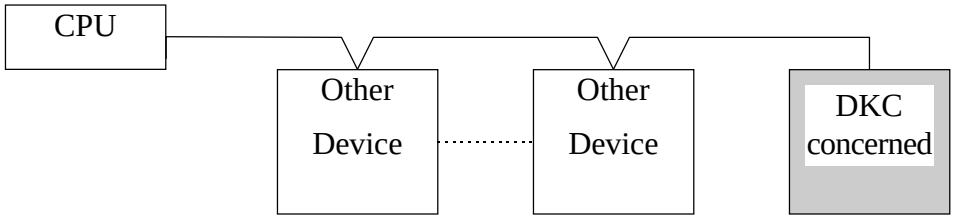
[5] PCI CONN

Note: Replacement of PCI CONN Panel causes other devices running on the same PCI connection line to be powered off except a) and b) shown below (because giving the EPO instruction is assumed). Therefore, stop the other device before performing replacement.

a) If PCI cable is not connected to the replacing DKC.
b) If the replacing DKC (DKC concerned) is connected to the end of the PCI cable as shown below.



1. <Check CE panel switches>
Set REMOTE/LOCAL SW to LOCAL and select (CL) [OK] in response to “Please switch REMOTE/LOCAL Sw, on "CE panel," to the LOCAL position. Then press OK.”. (see HARDWARE T6 (REP03-1230 step 1))
Select (CL) [OK] after confirming that REMOTE/LOCAL SW is LOCAL.
Go to [10] (REP02-630).
If REMOTE/LOCAL SW is not LOCAL, go to 2.

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2. <Check that the REMOTE/LOCAL switch of CE panel is LOCAL>
"REMOTE/LOCAL Sw is not "LOCAL." Please check it. If you want to abort the replacement of the "PCI CONN," press CANCEL." is displayed if REMOTE/LOCAL SW is not LOCAL. Turn to LOCAL and select (CL) [OK], or [Cancel] to terminate replacing.

Go to [10] (REP02-630).
If REMOTE/LOCAL SW is not LOCAL, step 2 again.

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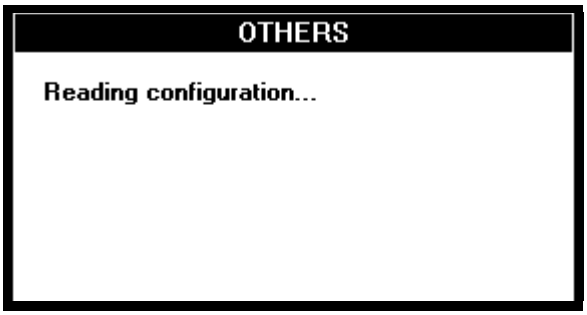
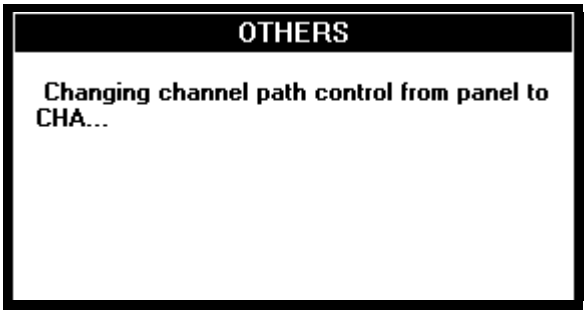
[6] RCU CONN

1. <Read configuration>
   "Reading configuration..." is displayed.



2. <Change CHP mode>
   "Changing channel path control from panel to CHA..." is displayed.
   Go to [10] (REP02-630).



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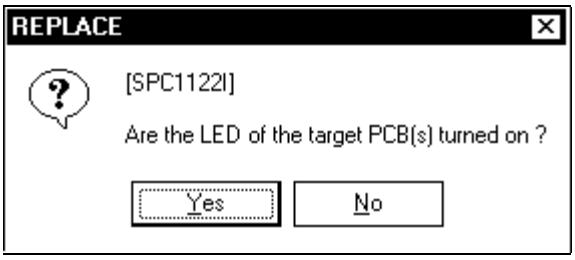
[7] PWRCTL

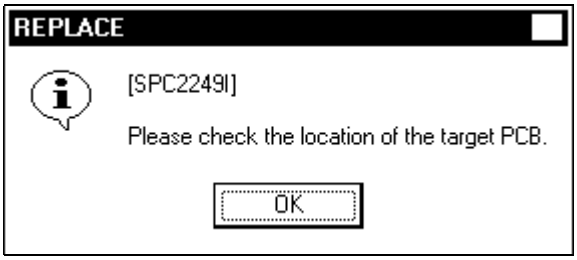
1. <Check DKUMN switch>
Select (CL) [OK] after disabling DKUMN in response to:
“Please switch "DKUMN-n" of all DKU to "DISABLE." Then press OK.”
(About DKUMN position, see LOCATION SECTION (LOCATION02-80), and about connection, see LOCATION SECTION (LOCATION05-40))

DKUMN-n:
① For PWRCTL-1
n = F (“DKUMN-F”), Switch DKUMN on front side of DKU to DISABLE.
② For PWRCTL-2
n = R (“DKUMN-R”),Switch DKUMN on rear side of DKU to DISABLE.

2.
The message “Are the LED of the target PCB(s) turned on?” is displayed.
If you select (CL) [Yes], go to [10] (REP02-630).
If you select (CL) [No], go to step 3.



3.
The message shown on the right is displayed.
Check the location of the PWRCTL.
(see HARDWARE T5 (REP03-1190 step 1))
Select (CL) [OK].
Go to [10] (REP02-630).



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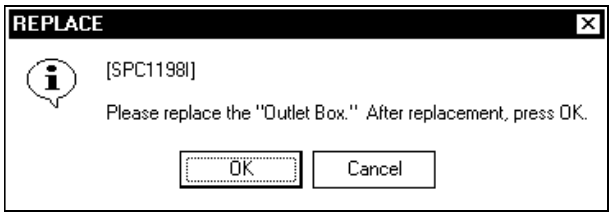
[8] OUTLET BOX

1. <Checking special part Replacement>
   “Please replace the "Outlet Box." After replacement, press OK.” is displayed.
   (Reply with [OK] after replacing the special part.)



2. <Replace special part>
   Replace the special part.

   (See HARDWARE T16 (REP03-1620))

   [End of PRE-PROCEDURE]

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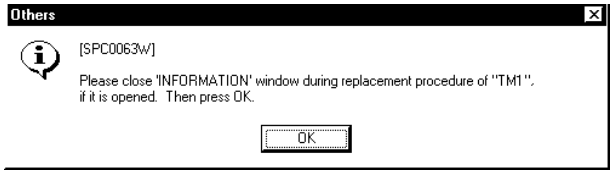
[9] TM PCB (Terminator PCB)

1.

Please confirm that “INFORMATION” program is not executed.
Select (CL) [OK].



2.

When the internal process is completed normally, the message shown on the right is not displayed. Go to 3.
If blocking OP panel is failed, “Please confirm you have already varied off the concerned channel path(s).” is displayed.

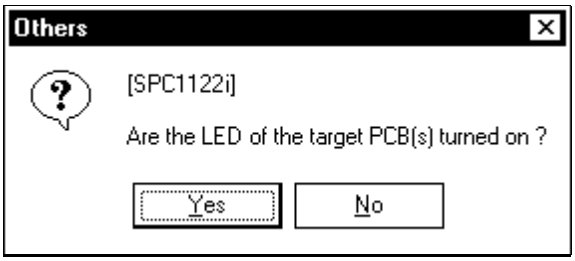
If you replace “TM1”, vary off the channel of Cluster-1.
If you replace “TM2”, vary off the channel of Cluster-2.
If you select (CL) [OK], go to step 3.
If you select (CL) [Cancel], go to step 6.

NOTICE
When failing to block the OP panel, channel must be placed offline. If the channel is not allowed to be placed offline, select [Cancel] to cancel the replacement.

3.

The message “Are the LED of the target PCB(s) turned on?” is displayed.

Note: Because two TM PCBs must be replaced at one time, the LEDs on these PCBs are turned on.



If you select (CL) [Yes], go to step 5.
If you select (CL) [No], go to step 4.

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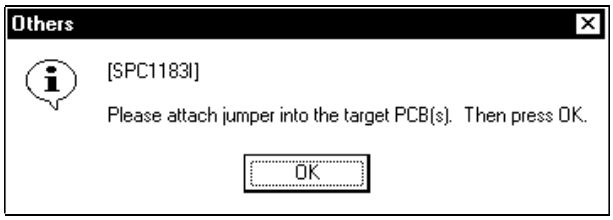
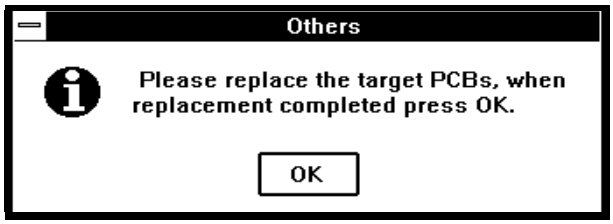
4.

Please attach the jumper in response to the displayed message. And select (CL) [OK].



5.

The message “Please replace the target PCBs, when replacement completed press OK.”is displayed.
(Reply with [OK] after replacing the special part.)
(TM1 : see HARDWARE J (REP03-230))
(TM2 : see HARDWARE K (REP03-260))



Note : When you plug in new PCBs, the LEDs are lit on again.
But you select (CL) [OK], then the LEDs are lit off.

[End of PRE-PROCEDURE]

6. Replacement error
Select (CL) [OK] in response to “The replacement has failed.”.

[End of Replacement]

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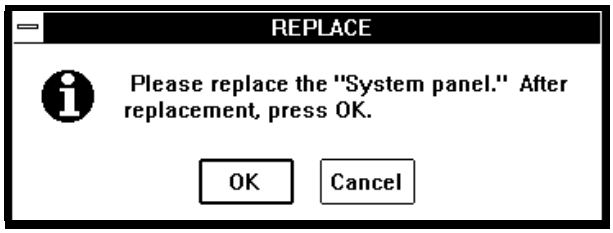
[10] Check beginning of replacement 1

1. <Check beginning of special part Replacement>
   “Please replace the "XXXXXX." After replacement, press OK.” is displayed.
   (Reply with [OK] after replacing the special part.)



2. <Replace special part>
   Replace the special part.

   System panel ----------see HARDWARE T1 (REP03-1000)
   OP panel-1/2 ----------see HARDWARE T2 (REP03-1030)
   EPO SW ----------see HARDWARE T4 (REP03-1150)
   PCI CONN----------see HARDWARE T6 (REP03-1220)
   RCU CONN ----------see HARDWARE T7 (REP03-1270)
   RS CONN ----------see HARDWARE T23 (REP03-2140)
   PWRCTL-1/2 ----------see HARDWARE T5 (REP03-1180)

   [End of PRE-PROCEDURE]

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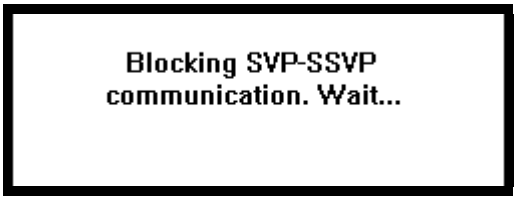
[11] SVP/LAN Card

1.

Select (CL) [OK] in response to the message shown on the right.

2.

The message “Blocking SVP-SSVP communication. Wait...” is displayed.



The message “Blocking DKC-SVP communication. Wait...” is displayed.

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3.

The message “This will end SVP operation. Replace SVP after turning off.” is displayed. Select (CL) [OK], so SVP is turned off automatically.
(See HARDWARE T10 (REP03-1330))

[End of PRE-PROCEDURE]

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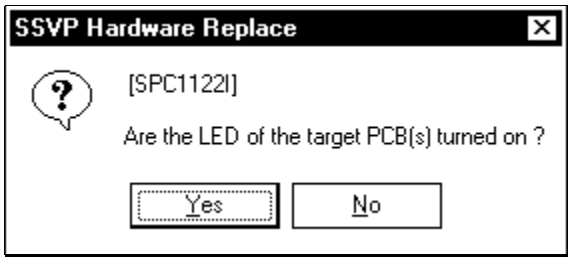
[12] SSVP

1.

Select (CL) [OK] in response to the message shown on the right.

2.

The message “Are the LED of the target PCB(s) turned on?” is displayed.
If you select (CL) [Yes], go to step 4.
If you select (CL) [No], go to step 3.



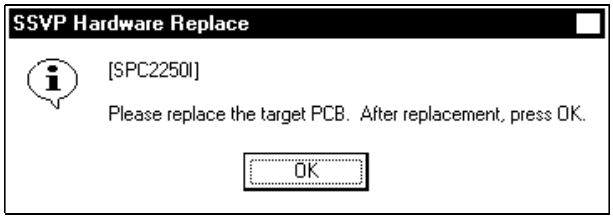
3.

The message shown on the right is displayed.
Check the location of the SSVP.
(see HARDWARE T11 (REP03-1390 step 1))
Select (CL) [OK].

4.

The message “Please replace the target PCB. After replacement, press OK.” is displayed.
(Reply with [OK] after replacing the special part.)
(see HARDWARE T11 (REP03-1380))

[End of PRE-PROCEDURE]



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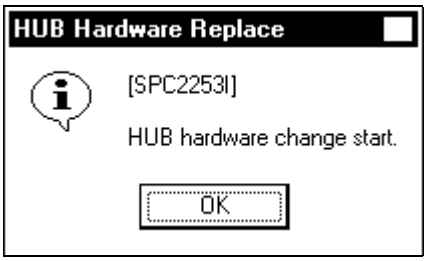
[13] HUB

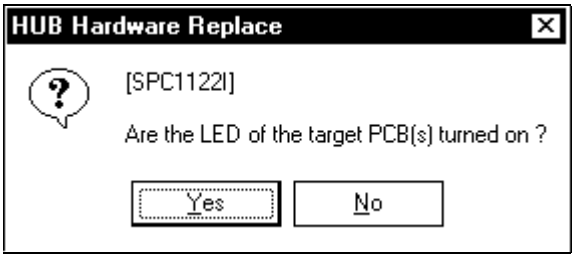
1.

Select [OK] (CL) in response to the message shown on the right.



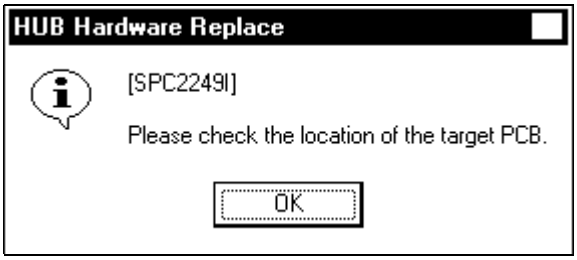
2.

The message “Are the LED of the target PCB(s) turned on?” is displayed.
If you select (CL) [Yes], go to step 4.
If you select (CL) [No], go to step 3.



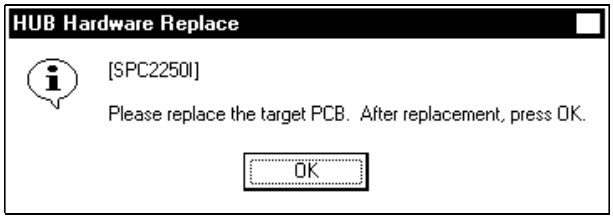
3.

The message shown on the right is displayed.
Check the location of the HUB.
(see HARDWARE T26 (REP03-2240 step 1))
Select (CL) [OK].



4.

The message “Please replace the target PCB. After replacement, press OK.” is displayed.
(Reply with [OK] after replacing the special part.)
(see HARDWARE T26 (REP03-2230))



[End of PRE-PROCEDURE]

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[PRE-PROCEDURE T3]

— OUTLINE —

① Select special (DKC) part (status check).
② Specify Replacement.
③ Detach parts related to special part.
④ Place parts related to special part into unpluggable state.

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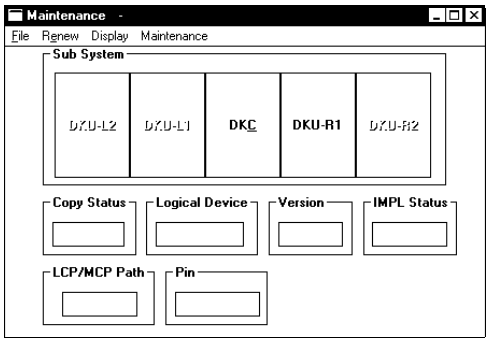
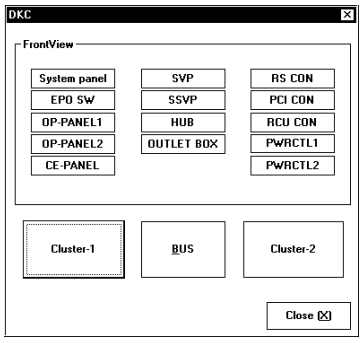
[1] Select special part

1. <Maintenance window>
In the 'Maintenance' window, check and select (CL) DKC to be replaced.

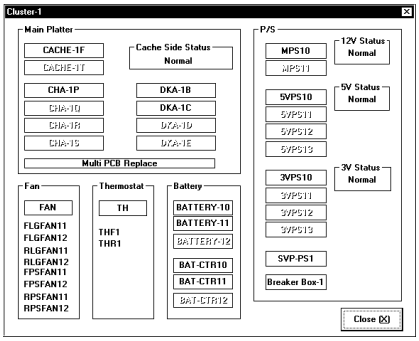


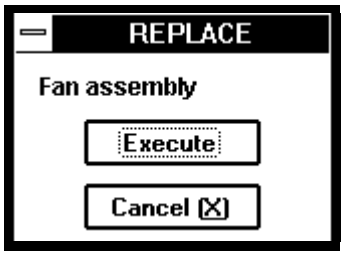
2. <DKC window>
Select (CL) [Cluster-n] in the 'DKC'.



3. <Select special part>
Select (CL) part [XXXX] to be replaced from [Cluster-n] window and select (CL) [Execute].
Valid [XXXX] values are listed below.

- FAN..... [FAN]
- PS ..... [MPSn], [5VPSn], [3VPSn]
- SVPPS..... [SVPPSn]
- Battery..... [Battery, BAT CTR]
- Breaker Box ..... [Breaker Box-n] Go to [6] (REP02-760)
- Thermostat [TH]





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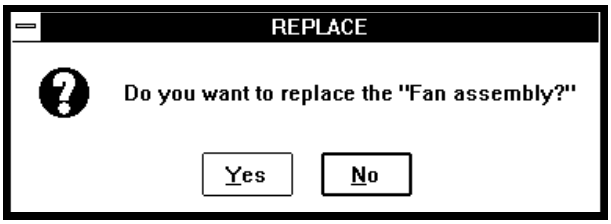
4. <Check beginning of special part Replacement>
Select (CL) [Yes] in response to “Do you want to replace the "XXXXX?."”.

XXXXX represents one of the part names listed in step 3.



- “FAN” ----------Go to [2] (REP02-710)
- “MPSn” ----------Go to [3] (REP02-720)
- “5V PSn”----------Go to [3] (REP02-720)
- “3V PSn”----------Go to [3] (REP02-720)
- “Battery-n”----------Go to [4] (REP02-740)
- “BAT CTR-n”----------Go to [4] (REP02-740)
- “Thermostat” ----------Go to [5] (REP02-750)
- “SVPPSn”----------Go to [7] (REP02-810)

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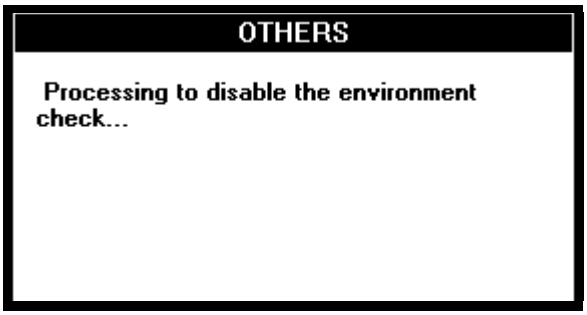
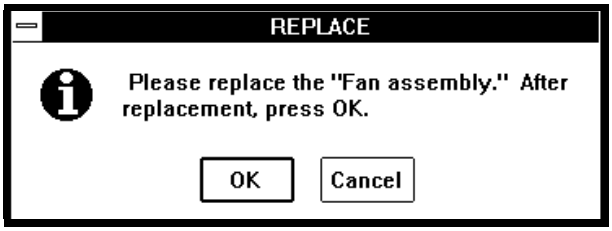
[2] FAN

1. <Check environment monitor stopped state>
   “Processing to disable the environment check...” is displayed.



2. <Special part Replacement>
   “Please replace the "XXXXX." After replacement, press OK.” is displayed.
   (Reply with [OK] after replacing the special part.)
   Go to [8] (REP02-820).



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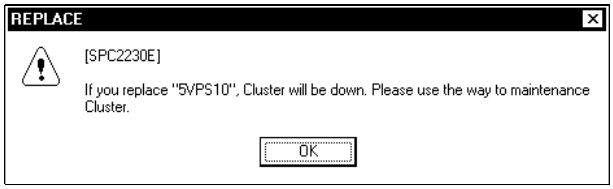
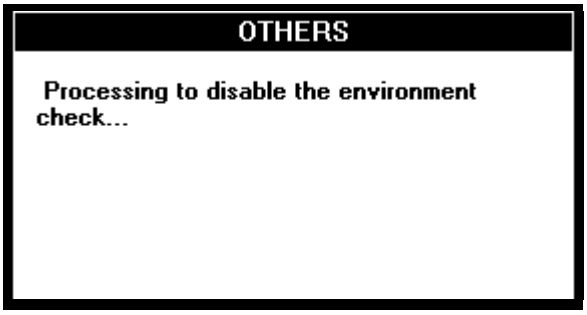
[3] 5V PS, 3V PS, MPS

1. <Check matching power supply>
   The SVP automatically checks the power supply to see if it is replaceable.

2.
   When a cluster needs to be blocked, the message shown on the right is displayed.
   Select (CL) [OK].
   Go to 5.



3. <Environment monitor state>
   "Processing to disable the environment check..." is displayed.



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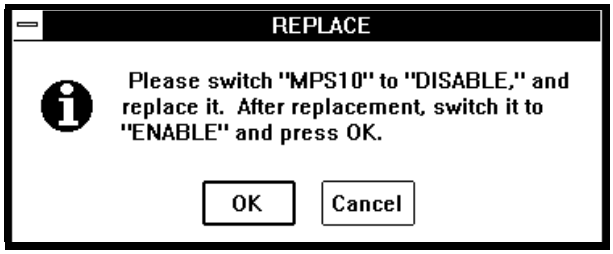
4. <Special part replacement>
The message shown on the right is displayed. (Reply with [OK] after replacing the special part.)
Go to [8] (REP02-820).



5. <Block Cluster>
• 5VPS, 3VPS, MPS
Block cluster that include target PS.
see SVP02-860.

6. <Special part replacement>
Go to [8] (REP02-820).

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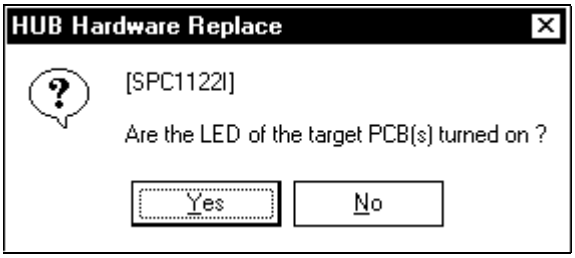
[4] Battery/BATCTR

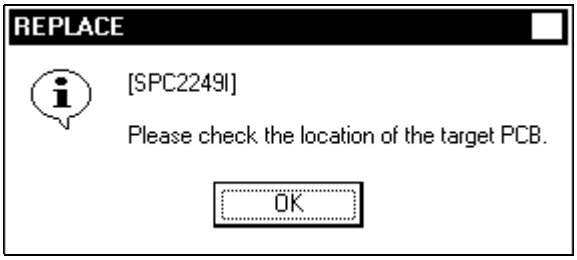
1. <Check source power>
   The SVP automatically checks the 3V power supply to determine whether it is not shut down.

   Battery-xx : Go to 4

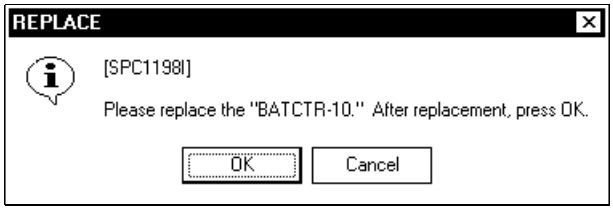
2.
   The message “Are the LED of the target PCB(s) turned on?” is displayed.
   If you select (CL) [Yes], go to step 4.
   If you select (CL) [No], go to step 3.



3.
   The message shown on the right is displayed.
   Check the location of the BATCTR.
   (see HARDWARE T15 (REP03-1610 step 1))
   Select (CL) [OK].



4. <Check beginning of special part Replacement>
   “Please replace the "XXXXX." After replacement, press OK.” is displayed.
   (Reply with [OK] after replacing the special part.)
   Go to [8] (REP02-820).



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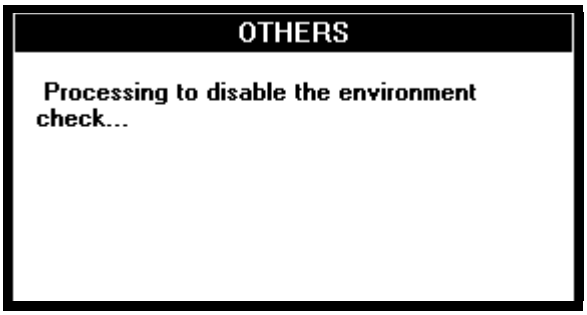
[5] Thermostat

1. <Environment monitor state>
   "Processing to disable the environment check..." is displayed.



2. <Special part Replacement>
   "Please replace the "Thermostat assembly." After replacement, press OK." is displayed. (Reply with [OK] after replacing the special part.)
   Go to [8] (REP02-820).

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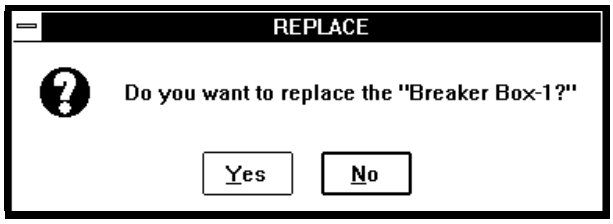
[6] Breaker Box

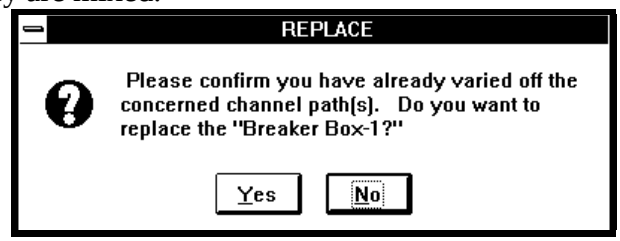
1.

① When redundant power supply is installed, then go to 5.

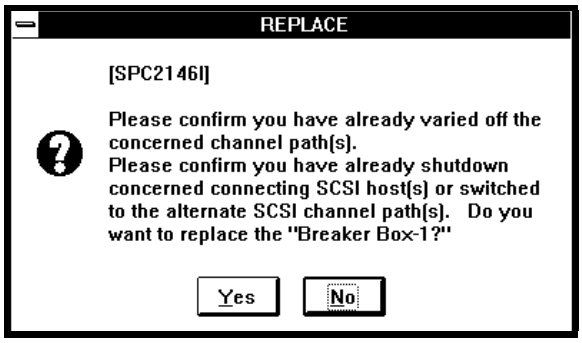


② Otherwise

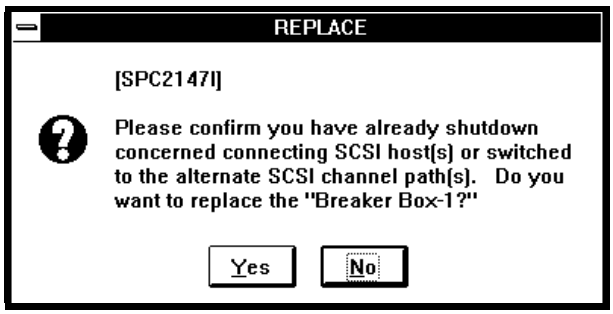
- When only serial or parallel channels, or they are mixed.
  "Please confirm you have already varied off the concerned channel path(s). Do you want to replace the "Breaker Box-n?" " is displayed. Select (CL) [Yes].



- When SCSI channels and other kinds are mixed.
  "Please confirm you have already varied off the concerned channel path(s). Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to replace the "Breaker Box-n?" " is displayed. Select (CL) [Yes].



- When only SCSI channels are installed.
  "Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to replace the "Breaker Box-n?" " is displayed. Select (CL) [Yes].



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2.

The SVP automatically checks the power supplies to see if Breaker Box is replaceable.

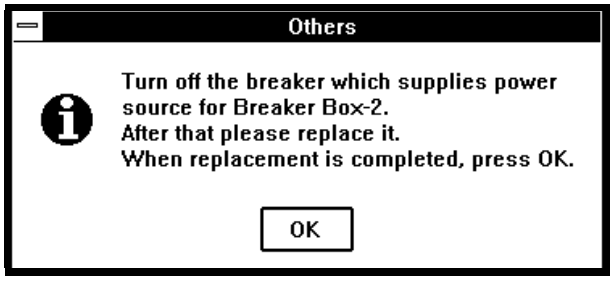
3. <Block cluster>

NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

Blocking cluster has finished normally, go to next step.

4.

The message shown on the right is displayed. (Reply with [OK] after replacing the special part.)
Go to [8] (REP02-820).



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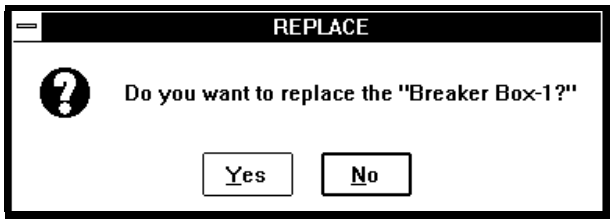
5.

When redundant power supply is installed.
“Do you want to replace the "Breaker Box-n?"” is displayed.
Select (CL) [Yes].



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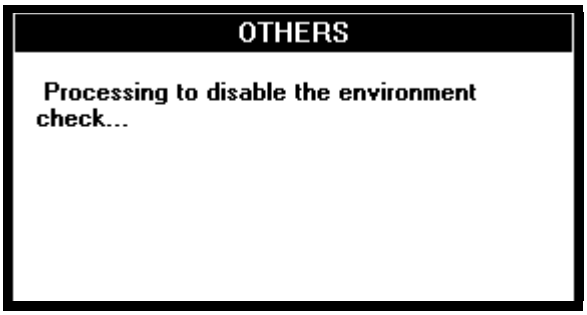
6.

The SVP automatically checks the power supplies to see if Breaker Box is replaceable.

7. <Check environment monitor stopped state>
"Processing to disable the environment check..." is displayed.



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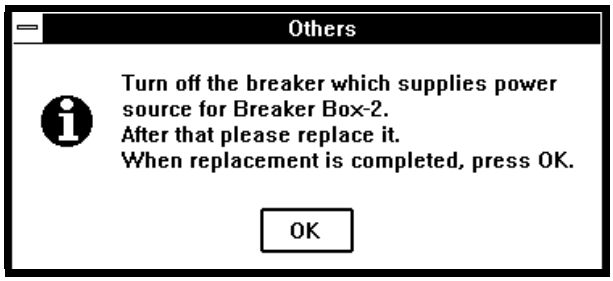
8.

The message shown on the right is displayed. (Reply with [OK] after replacing the special part.)
Go to [8] (REP02-820).



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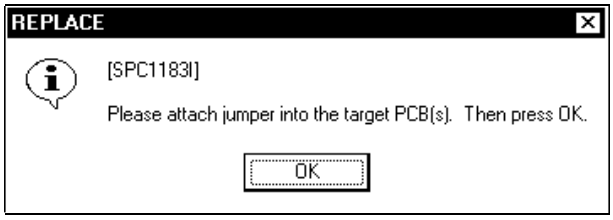
[7] SVPPS

1. <Check matching power supply>
   The SVP automatically checks the power supply if it is replaceable.

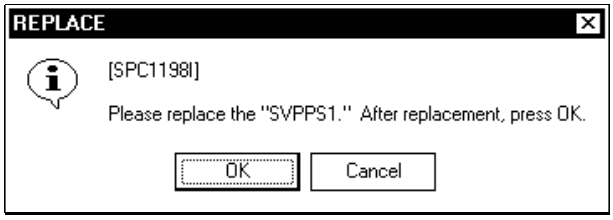
2.

Please attach the jumper in response to the displayed message.
(see HARDWARE T25 (REP03-2220 step 1))
Select (CL) [OK].



3.

The message “Please replace the "SVPPS1." After replacement, press OK.”is displayed.
(Reply with [OK] after replacing the special part.)
Go to [8] (REP02-820)



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[8] Replacement

1. <Replace special part>
   Replace the special part.

FAN----------see HARDWARE T8 (REP03-1290)
Thermostat----------see HARDWARE T9 (REP03-1310)
Breaker Box-1----------see HARDWARE T12 (REP03-1400)
Breaker Box-2----------see HARDWARE T13 (REP03-1490)
Battery----------see HARDWARE T14 (REP03-1580)
BAT CTR----------see HARDWARE T15 (REP03-1600)
PS(DKC)----------see HARDWARE T17 (REP03-1730)
SVPPS----------see HARDWARE T25 (REP03-2210)

[End of PRE-PROCEDURE]

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[PRE-PROCEDURE T4]

— OUTLINE —

① Select special (DKU) part (status check).
② Specify Replacement.
③ Detach parts related to special part.
④ Place part into unpluggable state.

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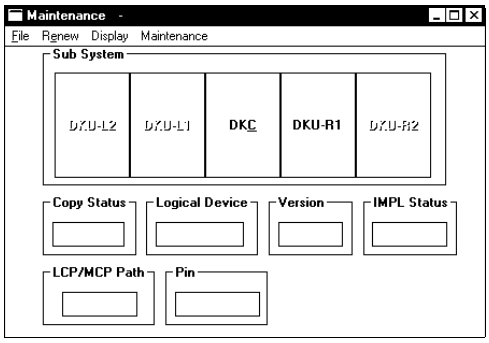
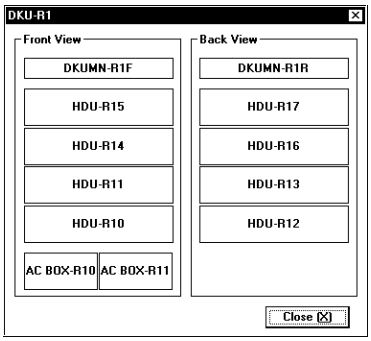
[1] Select special part

1. <Select DKU-nn>
   Select (CL) [DKU-nn] from 'Maintenance'.

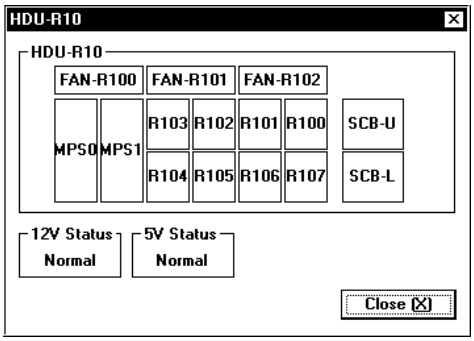


2. <Specify special part>
   Select part [XXXXX] to be Replaced.
   • DKUMN -------- [DKUMN-nnn]
   • AC BOX -------- [AC BOX-nn]
   Go to step 4.

   • FAN
   • PS (DKU 5/12V)
   Select (CL) [HDU-nnn]. Go to step 3.



3. <Specify special part>
   Select (CL) [HDU-nnn] containing part to be replaced.
   • FAN----------[FAN-nnnn]
   • PS (DKU 5/12V)-------[MPS-n]



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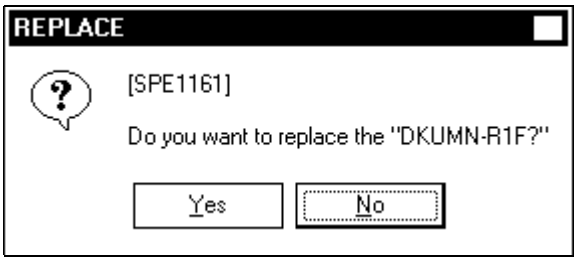
4. <Specify special part Replacement>
Select (CL) [Execute].
• 'AC BOX-nnn'---------Go to [5] (REP02-890)

5. <Special part Replacement>
Select (CL) [Yes] in response to "Do you want to replace the "XXXXXX?"".
XXXXX represents one of the part names listed in step 2 or 3.
Valid [XXXXX] values are listed below.



• 'DKUMN-nnn'---------Go to [2] (REP02-860)
• 'MPS-n' ----------Go to [3] (REP02-870)
• 'FAN'----------Go to [4] (REP02-880)

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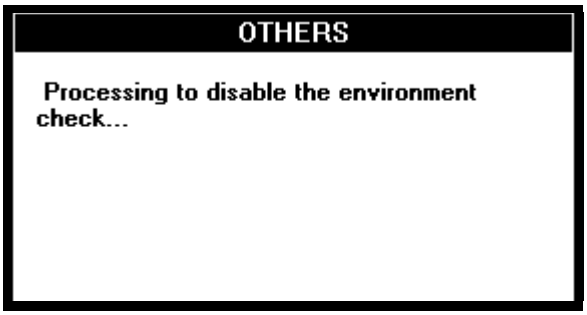
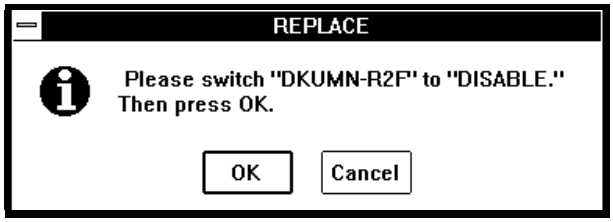
[2] DKUMN PCB

1. <Environment monitor state>
   "Processing to disable the environment check..." is displayed.
   • DKUMN-R2n, DKUMN-L2n -----Go to 3



2. <Disable DKUMN>
   When DKUMN-XXX (listed below) is installed, this message is displayed.
   Disable the DKUMN in response to "Please switch "DKUMN-XXX" to "DISABLE". Then press OK." (see HARDWARE T18 (REP03-1750)).
   After confirming that the DKUMN-XXX has been disabled, select (CL) [OK].



   DKUMN-XXX:
   • For DKUMN-R1F: XXX=R2F ("DKUMN-R2F"), Switch DKUMN-R2F to DISABLE.
   • For DKUMN-R1R: XXX=R2R ("DKUMN-R2R"), Switch DKUMN-R2R to DISABLE.
   • For DKUMN-L1F: XXX=L2F ("DKUMN-L2F"), Switch DKUMN-L2F to DISABLE.
   • For DKUMN-L1R: XXX=L2R ("DKUMN-L2R"), Switch DKUMN-L2R to DISABLE.

3. <Special part Replacement>
   "Please switch "DKUMN-xxx" to "DISABLE," and replace it. After replacement, switch it to "ENABLE" and press OK." is displayed.
   (Reply with [OK] after replacing the special part.)
   Go to [6] (REP02-940).

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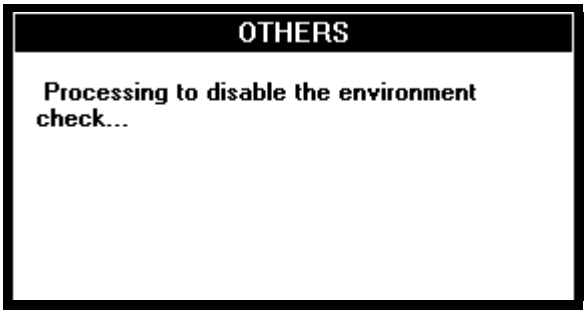
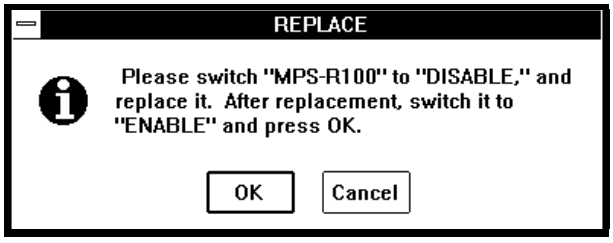
[3] MPS (DKU 5/12V)

1. <Check matching power supply>
   The SVP automatically checks that the mate power supply is normal.

2. <Environment monitor state>
   "Processing to disable the environment check..." is displayed.



3. <Special part replacement>
   The message shown on the right is displayed. (Reply with [OK] after replacing the special part.)
   Go to [6] (REP02-940).



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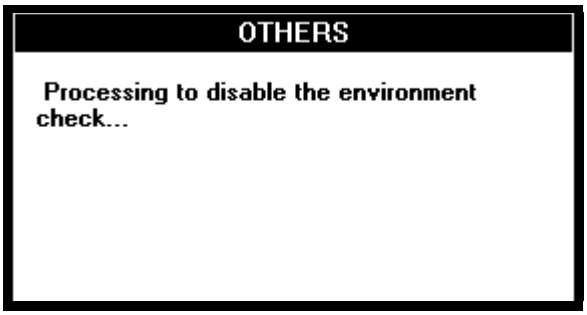
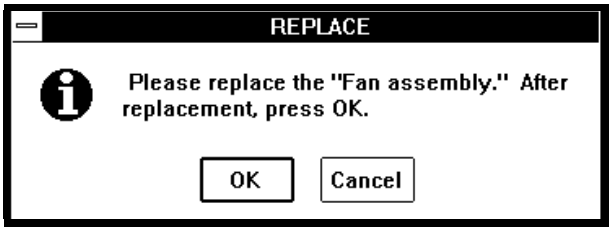
[4] FAN

1. <Environment monitor state>
   “Processing to disable the environment check...” is displayed.



2. <Special part Replacement>
   “Please replace the "Fan assembly." After replacement, press OK.” is displayed.
   (Reply with [OK] after replacing the special part.)
   Go to [6] (REP02-940).



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[5] AC BOX

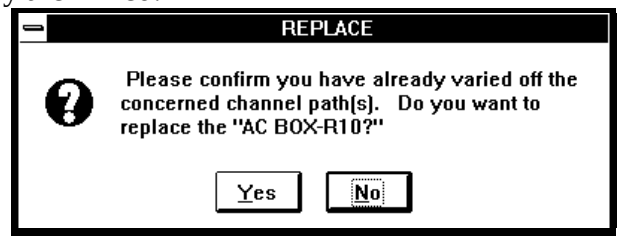
When part to be replaced is neither “AC-BOX-R10” nor “AC-BOX-R11”, Go to 6.

1.

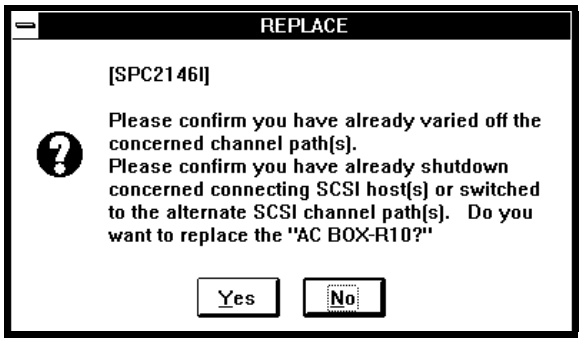
① When redundant power supply is installed, then go to 6.

② Otherwise

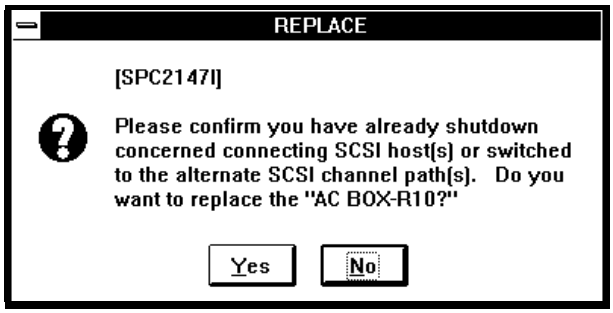
- When only serial or parallel channels, or they are mixed.
  “Please confirm you have already varied off the concerned channel path(s). Do you want to replace the “AC BOX-XXX?” ” is displayed. Select (CL) [Yes].



- When SCSI channels and other kinds are mixed.
  “Please confirm you have already varied off the concerned channel path(s). Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to replace the “AC BOX-XXX?” ” is displayed. Select (CL) [Yes].



- When only SCSI channels are installed.
  “Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to replace the “AC BOX-XXX?” ” is displayed. Select (CL) [Yes].



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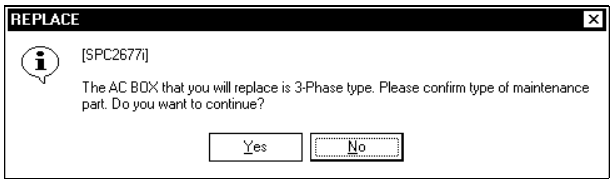
2.

"The AC BOX that you will replace is 3-Phase type. Please confirm type of maintenance part. Do you want to continue?" is displayed. Confirm that maintenance part is 3-Phase type, and select (CL) [Yes].



3. <Check power supply>

The SVP automatically checks that the power supplies to see if AC BOX is replaceable.

4. <Block cluster>

NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

Blocking cluster has finished normally, go to next step.

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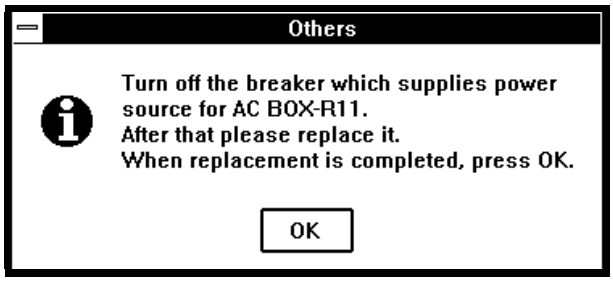
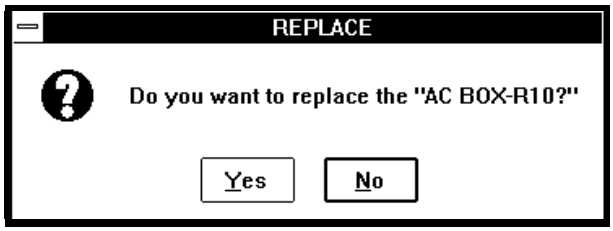
5.

Turn off the AC BOX-R1n, and replace the AC BOX-R1n.
(Reply with [OK] after replacing the special part.)
Go to [6] (REP02-940).



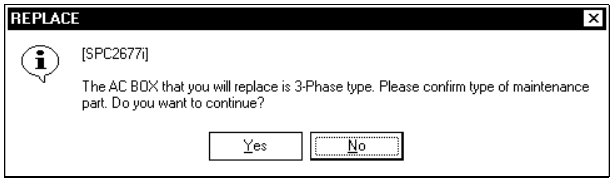
6.

"Do you want to replace the "AC BOX-xxx?"" is displayed.
Select (CL) [Yes].



7.

"The AC BOX that you will replace is 3-Phase type. Please confirm type of maintenance part. Do you want to continue?" is displayed.
Confirm that maintenance part is 3-Phase type, and select (CL) [Yes].



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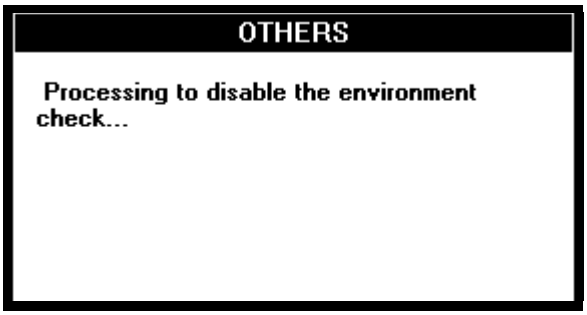
8.

The SVP automatically checks the power supplies to see if AC BOX is replaceable.

9. <Check environment monitor stopped state>
"Processing to disable the environment check..." is displayed.



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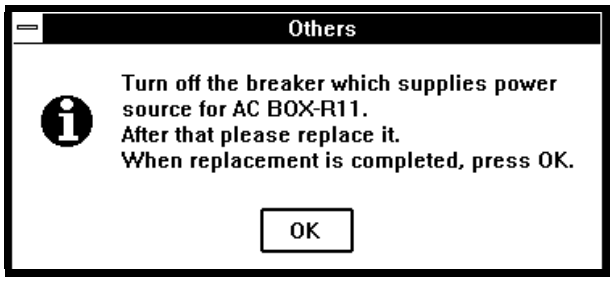
10.

"Turn off the breaker which supplies power source for AC-BOX-xxx. After that please replace it. When replacement is completed, press OK." is displayed.
(Reply with [OK] after replacing the special part.)
Go to [6] (REP02-940).



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[6] Replacement

1. <Replace special part>
   Replace the special part .

DKUMN ---------- see HARDWARE T18 (REP03-1750)
PS(DKU)---------- see HARDWARE T19 (REP03-1790)
FAN(DKU) ---------- see HARDWARE T20 (REP03-1810)
AC BOX-R10 ---------- see HARDWARE T21 (REP03-1830)
AC BOX(except AC BOX-R10) ---------- see HARDWARE T22 (REP03-1960)

[End of PRE-PROCEDURE]

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[PRE-PROCEDURE V]

— OUTLINE —

① Select P-DEV (status check).
② Specify Replacement.
③ Place HDD into unpluggable state.

NOTICE

This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

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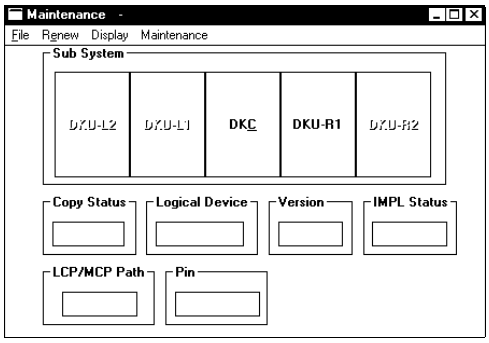
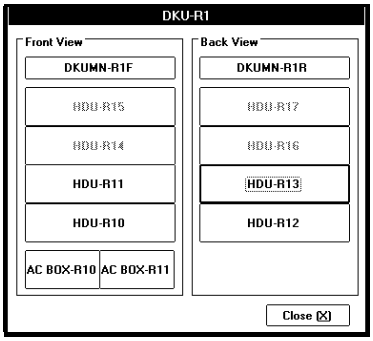
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

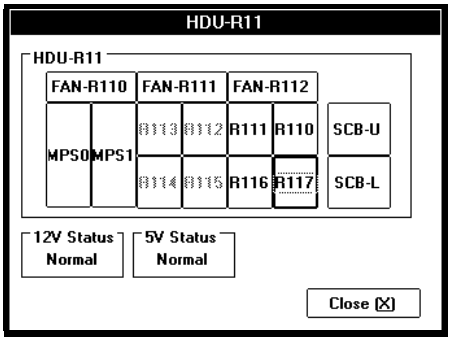
1. <Maintenance window>
   In the 'Maintenance' window, check and select (CL) [DKU-Rn] or [DKU-Ln] to be replaced.



2. <Select HDU-BOX>
   Check and select (CL) [HDU-Rnn] or [HDU-Lnn] to be replaced.
   Selecting [Close] (CL) returns you to step 1.



3. <Select HDD>
   Check and select [Rnnn] or [Lnnn] to be replaced.
   Selecting [Close] (CL) returns you to step 2.



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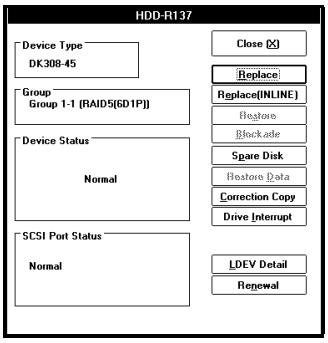
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

4. <Specify replacement on HDD>
Check status display.
◆ In the case of a warning SIM, “NORMAL” is displayed.
◆ In the case of a blocking SIM, “FAILED” is displayed.

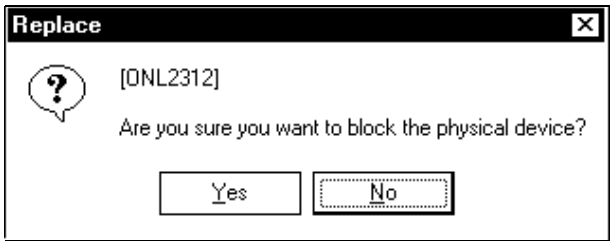
Select (CL) [Replace (INLINE)].



5. <Checking the P-DEV status & saving the spare>
“Checking...” is displayed.

NOTICE
When the screen appears prompting the operator to input a password to prevent a multiple maintenance or for executing a pin check, contact the technical support center to ask for an instructions.

6. <P-DEV blocking>
Select (CL) [Yes] in response to “Are you sure you want to block the physical device?”.



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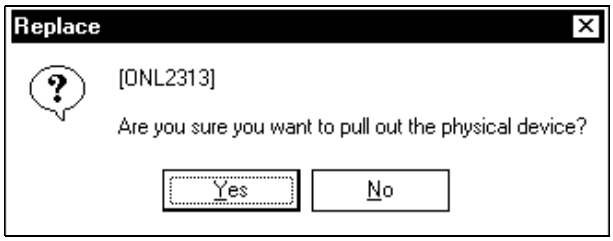
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

7. <Blocking the Physical device>
"Blocking..." is displayed.

8. <Spin down the Physical device>
"Spinning down..." is displayed

9. <P-DEV pull out>
Select (CL) [Yes] in response to "Are you sure you want to pull out the physical device?".



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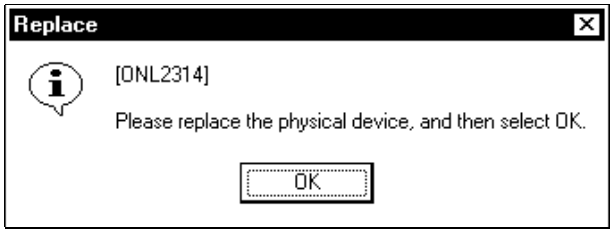
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

10. <Check shut down LED>
    Check the shut down LED on the HDD to be replaced.
    If LED is off, reconfirm the location of the HDD to be replaced with LOCATION SECTION before hardware work.

NOTICE
If a wrong HDD is removed, a data loss or a system down may be caused.

11. <Confirmation of replace>
    Select (CL) [OK] in response to "Please replace the physical device, and then select OK." after replace the unit (Step 12).



12. <Replace HDD>
    Replace HDD.
    See HARDWARE A (REP03-10).

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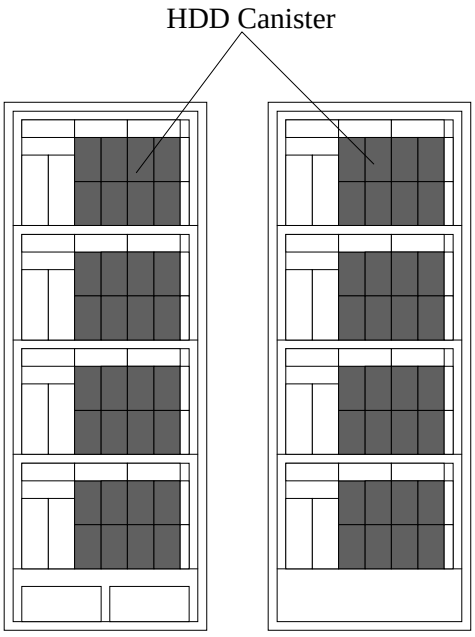
[HARDWARE A]

Location	Function Name of Component		Part Name	HDA Label
HDU Box in DKU	1	HDD Canister	HDU-6F1(60)	DK3F1-60
			HDU-901(90)	DK308/309-90
			HDU-1801(180)	DK309/30A-180
			HDU-9F1(90)	DK3F2-90
			HDU-15F1(150)	DK3F2-150
			HDU-3601(360)	DK30A-360
			HDU-18J1SC(180)	DKR2B-J18SC
			HDU-47J1SC(470)	DKR1B-J47SC

NOTICE:
Replace the HDD canister in the subsystem power on status only.
Do not replace with the subsystem power off status.



Front View of DKU

Rear View of DKU

NOTICE:
(1) Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.
(2) HDD is a precise component. Be careful in handling HDD to avoid vibration and impact.

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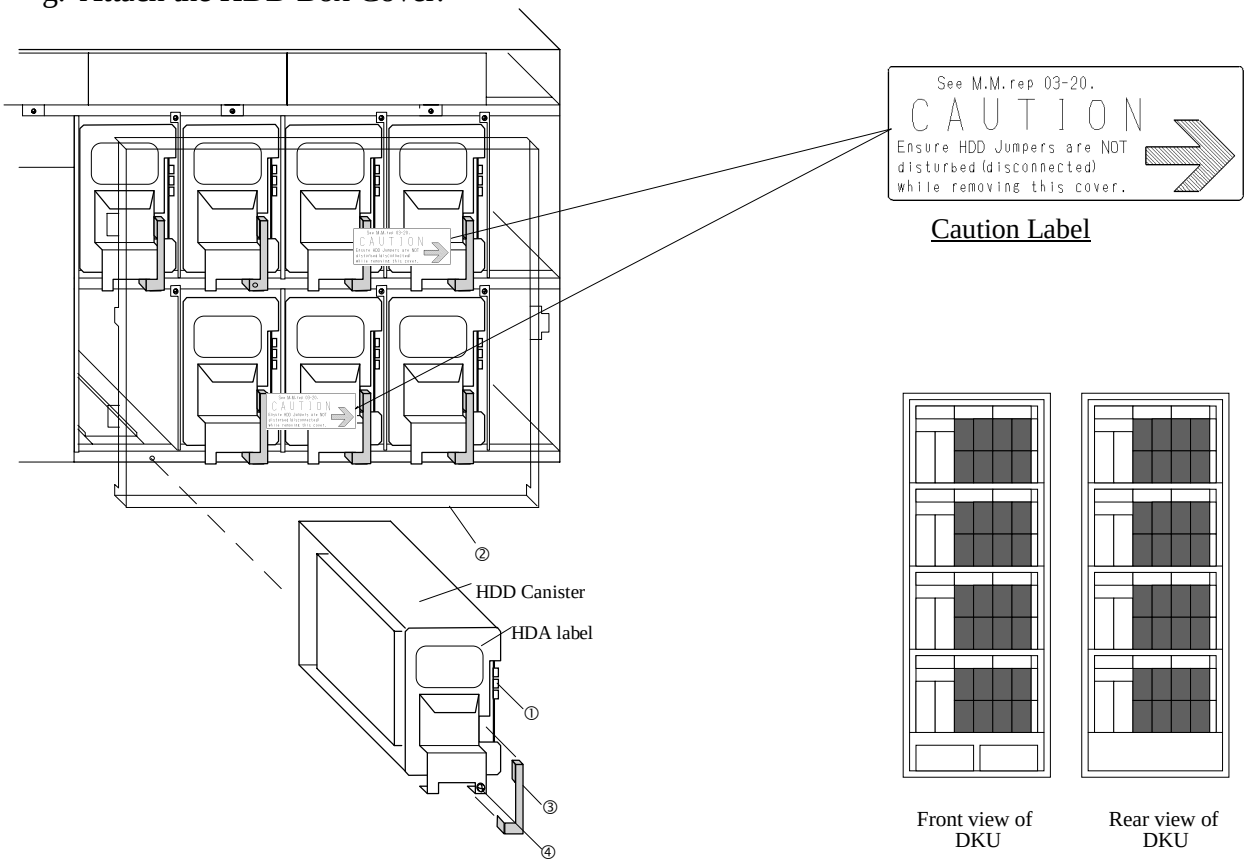
1. The following figure shows the correct way to replace the HDD canister.

a. Check Shut Down LED ① on the HDD canister.

> **⚠ CAUTION**
>
> A system down may be caused by a replacement of an HDD canister other than that to be replaced. Make sure that it is the HDD canister to be replaced.

b. Remove the HDD Box Cover (acrylic cover ②).
Process 1: Move HDD Box Cover toward the right edge, and take fastener parts(two parts on the left side of HDD Box Cover) off from HDD Box.
Process 2: Push the HDD Box Cover toward lower edge then pull it out from HDD Box (HDD Box Cover should NOT touch Jumper Cover(connector ③)). Please refer to Caution Label.
*Please handle Jumper Cover with care, especially the right side and lower side of the Jumper Cover.
*Caution Label says: Ensure HDD Jumpers are NOT disturbed(disconnected) while removing this cover.
c. Remove Jumper Cover from the replacement HDD canister.
d. Loosen screw ④ and remove the HDD canister.
e. Insert the spare HDD canister into the HDU Box. Fix screw ④.
f. Insert Jumper Cover into the spare HDD canister.
g. Attach the HDD Box Cover.



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2. See SVP post-procedure as follows.

<Data drive, spare drive>

Work ID	Part name	Condition Item				Procedure *1
		Condition			Configuration	SVP post-procedure
		Failure		Preventive	Unused Spare drive	
		Warning SIM	Block SIM			
RDK1	Data Drive Note 1	×	-	-	Yes	Post a *1
RDK2	Data Drive Note 1	-	×	-	Yes	Post a *1
RDK3	Data Drive Note 1	-	-	×	Yes	Post a *1
RDK4	Data Drive Note 1	×	-	-	No	Post b *1
RDK5	Data Drive Note 1	-	×	-	No	Post b *1
RDK6	Data Drive Note 1	-	-	×	No	Post b *1
RDK7 Note 2 Note 3	Data Drive Note 1	Note 2				Post c *1
RDK8	Spare Drive Note 1	-				Post d *1

*1: Refer to REP01-170

Note 1) Parts Name is indicates attribute of a drive.
Data Drive : The drive is installed in the position for a drive except spare drive (Data Drive).
Spare Drive : The drive is installed in the position for a spare drive.

Note 2) RDK7 is a Work ID for a work which is applicable to a case that two or more drives in a same parity group are blocked.
When the procedures instructed by RDK7 are executed, data will be lost. Ask the technical support center about the appropriateness of the operation.

Note 3) Confirm the parity group and the LDEV No. corresponding to the HDD through the SVP STATUS. See page SVP03-100 for the procedure for referring to SVP STATUS.

Note : If a Work ID cannot be found or if multiple drive error is occurring, see page TRBL05-170 on TROUBLE SHOOTING section.

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Blank Sheet

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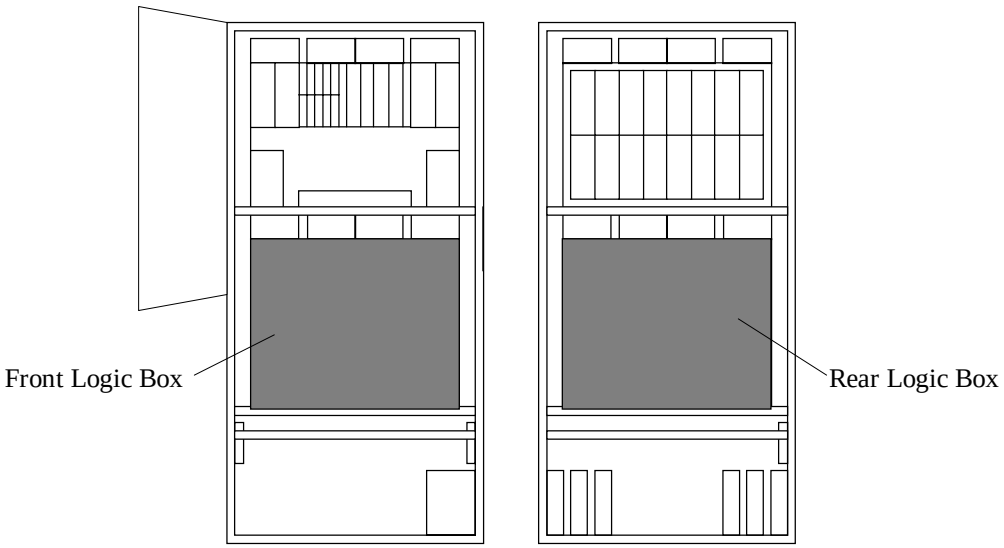
[HARDWARE B]

Location		Function Name of Component	Part Name
Rear Logic Box in DKC	1	Cache Memory PCB	• WP108-A/WP118-A
	2	Cache Memory Module on Cache Memory PCB	• SH024-A • SH100-A
	3	Shared Memory Module on Cache Memory PCB	• SH024-B • SH100-B
Front Logic Box in DKC	4	Cache Memory PCB	• WP108-B/WP118-B
	5	Cache Memory Module on Cache Memory PCB	• SH024-A • SH100-A



Front View of DKC

Rear View of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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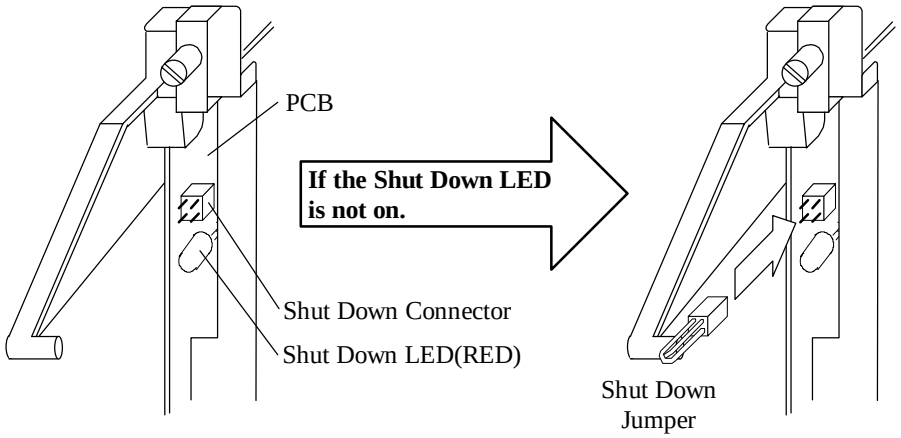
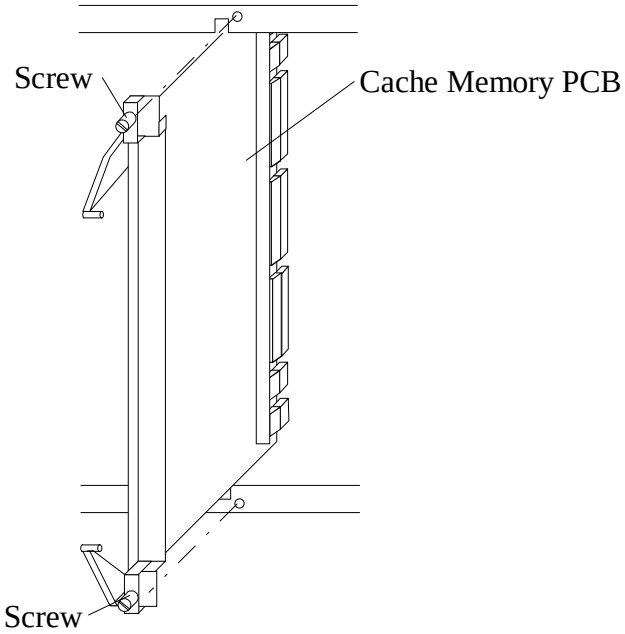
1. Remove the Cache Memory PCB

   a. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



   b. Remove the two screws and remove the Cache Memory PCB.



   c. Remove the Shut Down Jumper if it is mounted.

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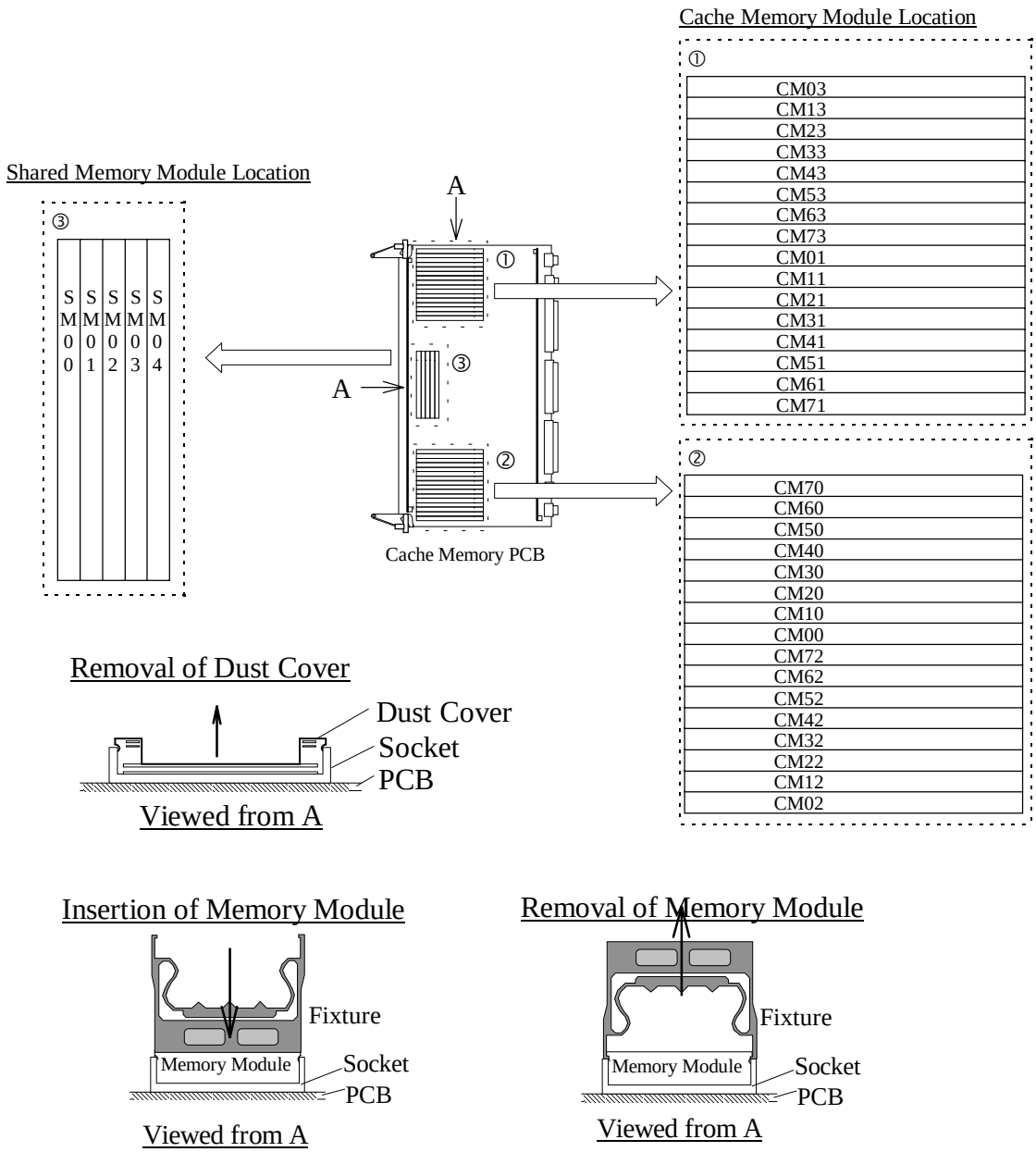
2. Replace the failed part to spare part.
   a. When replacing the CM package, move all the shared memory modules and cache memory modules (including dust covers if any) mounted on an extracted PCB to the same mounting positions on the spare PCB.
   b. When the failed part is Cache Memory Module, replace the Cache Memory Module.
   c. When the failed part is Shared Memory Module, replace the Shared Memory Module.



3. Insert the Cache Memory PCB.
   a. Insert the Cache Memory PCB and fasten the two screws.

4. Go to SVP post-procedure e [REP04-330].

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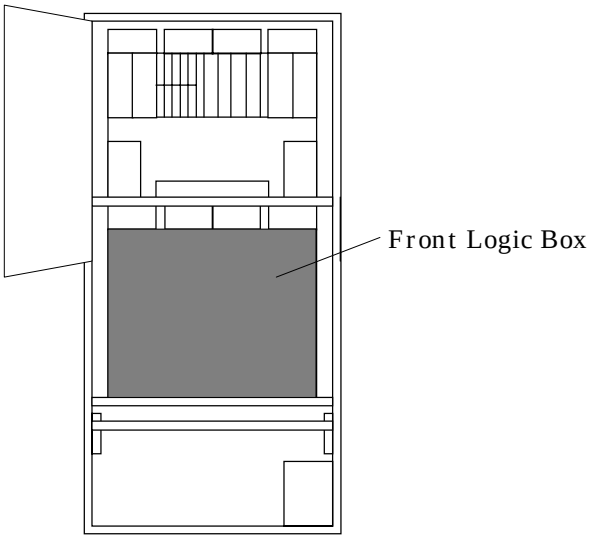
[HARDWARE C]

Location	Function Name of Component		Part Name
Front Logic Box in DKC	1	CHA (Channel Adapter) PCB for serial channel	• WP207-B/WP217-B & SH086-A/SH149-A×2 • WP207-A/WP217-A & SH086-A/SH149-A×4



Front View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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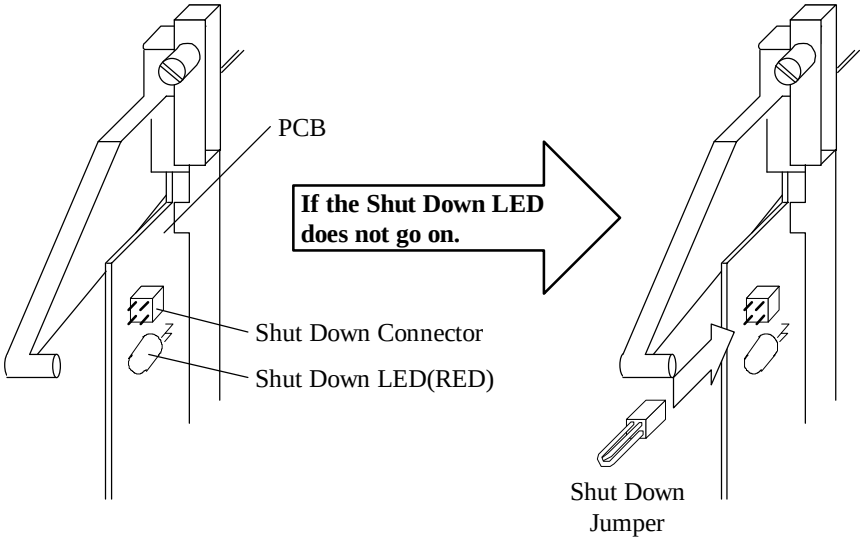
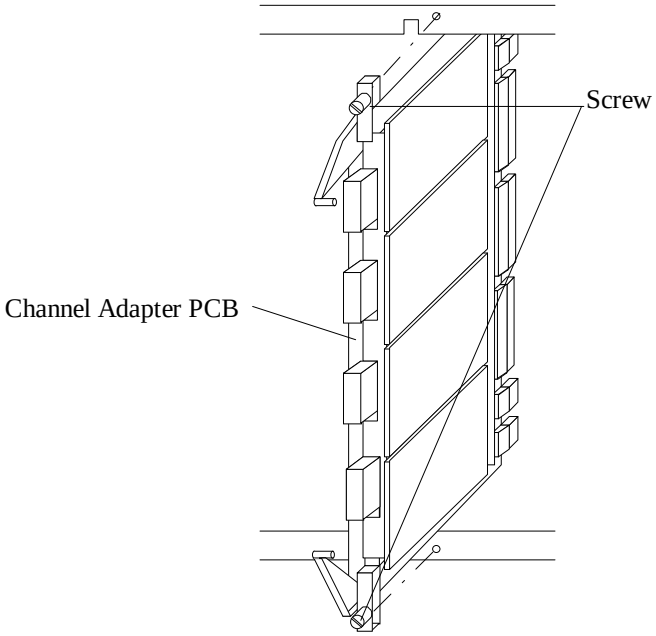
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Disconnect the optical fiber cables from the failed Channel Adapter PCB.

3. Remove the two screws and remove the failed PCB.
   Note: If the Shut Down Jumper is used, remove it.



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4. Insert the spare PCB to the correct location and fasten the two screws.

5. Connect the optical fiber cables to the spare PCB.

6. Go to SVP post procedure.
   BUS blocking: Go to post i [REP04-450].
   Others: Go to post f [REP04-360].

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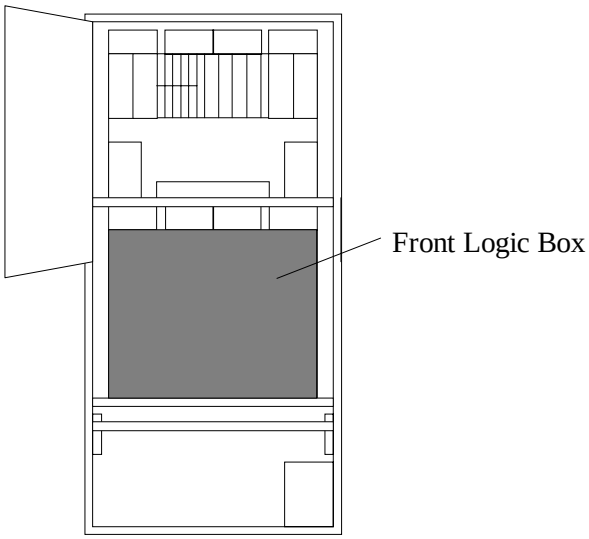
[HARDWARE D]

Location	Function Name of Component		Part Name
Front Logic Box in DKC	1	CHA (Channel Adapter) PCB for parallel channel	• WP209-A & SH086-B/SH149-B×2



Front View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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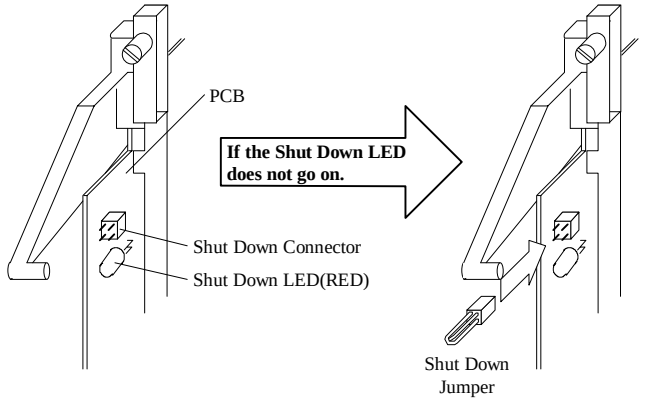
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector.(only hot replace)

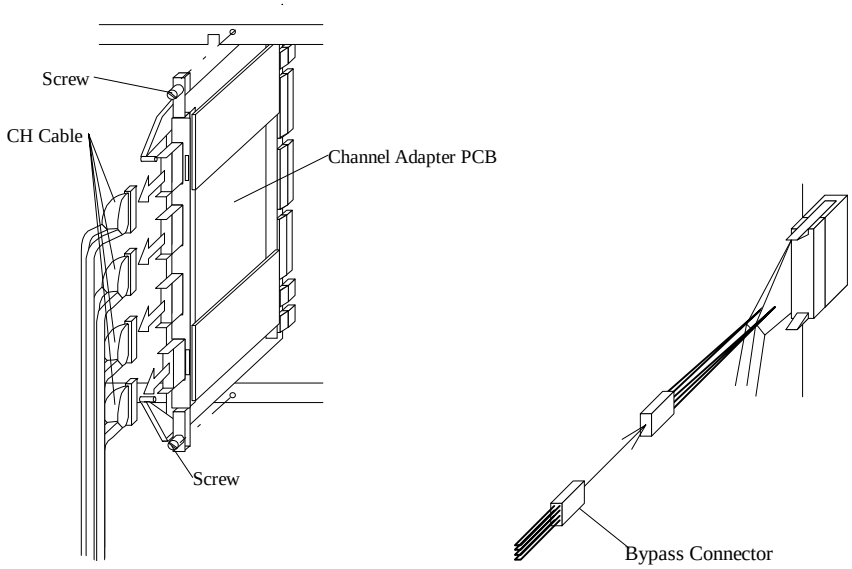
> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Remove the PCB.
   Note: If the DKC is connecting with the other DKC, the bypass connectors must be inserted to all CH cables that connect to the PCB to be removed.

> **⚠ CAUTION**
>
> A system down may be caused if the Sel Out bypass connector is inserted in a PCB other than that to be replaced. Make sure that it is a PCB to be replaced.

   a. Disconnect the CH cables from the failed Channel Adapter PCB.
   b. Remove the two screws and remove the failed Channel Adapter PCB.
   c. If the Shut Down Jumper is used, remove it.



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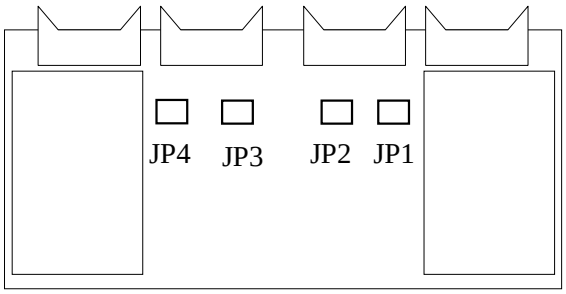
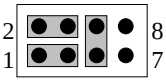
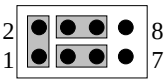
3. Set the jumper plugs(JP1-JP4).

⚠ CAUTION

If you do not make settings of jumpers (JP1 to JP4) of the replacement PCB, the relevant channel path is not placed online. Be sure to make the same settings as that of the removed PCB.



Description	Setting (JP1-JP4)
Selected by SELECT OUT	
Selected by SELECT IN	

4. Insert the spare PCB to the correct location and fasten the two screws.

5. Connect the CH cables to the spare PCB.
   Note: If the bypass connectors are used , remove them.

6. Go to SVP post procedure.
   BUS blocking: Go to post i [REP04-450].
   Others: Go to post f [REP04-360].

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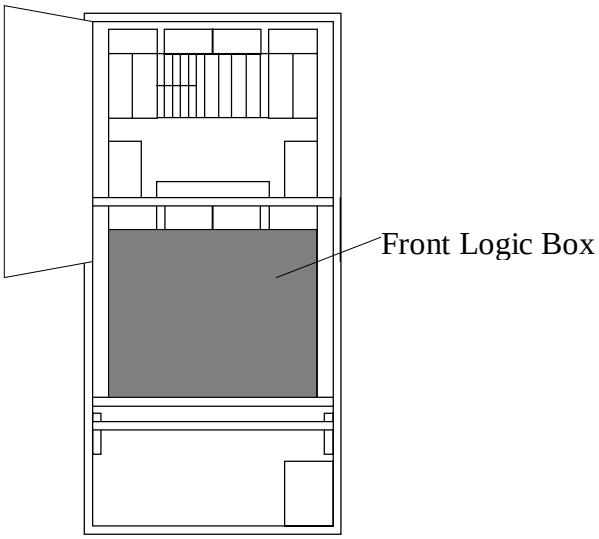
[HARDWARE E]

Location	Function Name of Component		Part Name
Front Logic Box in DKC	1	CHA (Channel Adapter) PCB for SCSI channel	• WP204-AWP214-A & SH086-C/SH149-C × 4



Front View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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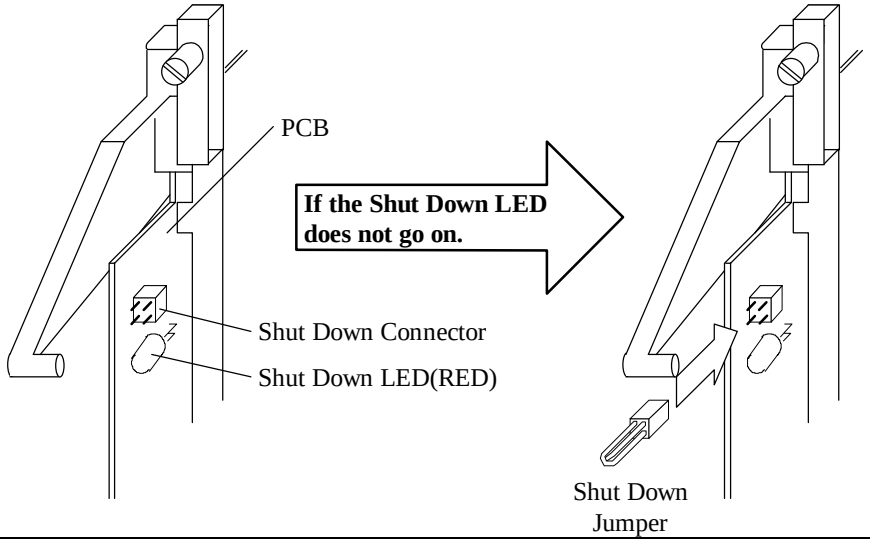
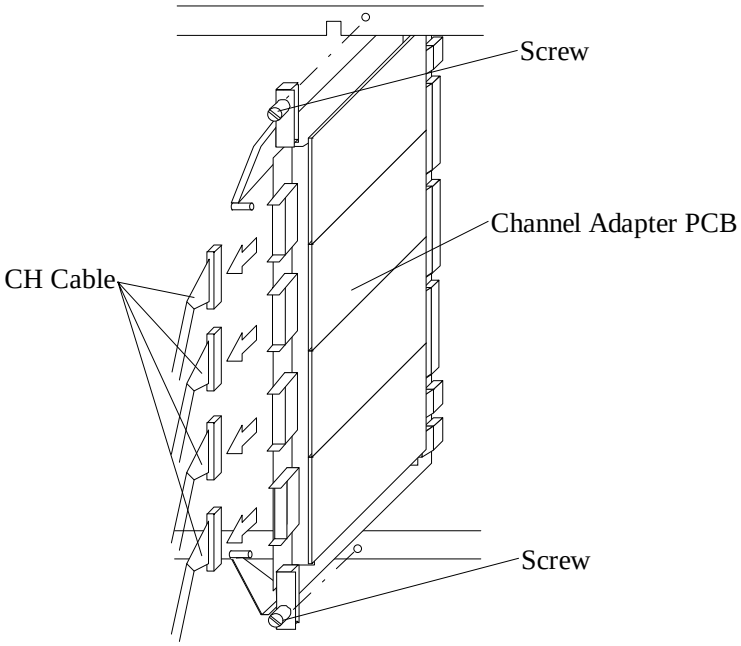
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector.(only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Remove the PCB.
   a. Disconnect the CH cables from the failed Channel Adapter PCB.
   b. Remove the two screws and remove the failed Channel Adapter PCB.
   c. If the Shut Down Jumper is used, remove it.



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3. Insert the spare PCB to the correct location and fasten the two screws.

4. Connect the CH cables to the spare PCB

5. Go to SVP post procedure.
   BUS blocking: Go to post i [REP04-450].
   Others: Go to post f [REP04-360].

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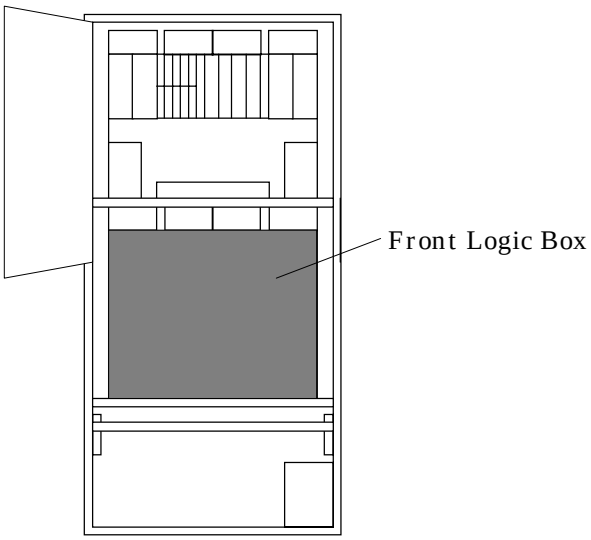
[HARDWARE F]

Location	Function Name of Component		Part Name
Rear Logic Box in DKC	1	Fibre 4-port Adapter PCB for optical cable	• WP206-A & SH113-A×2 & SH086-D/SH149-D×2
			• WP206-B & SH160-A×2 & SH086-D/SH149-D×2
	2	Fibre 4-port Adapter PCB for Short Wavelength	• WP256-A & SH164-A
	3	Fibre 4-port Adapter PCB for Long Wavelength	• WP256-B & SH164-A



Front View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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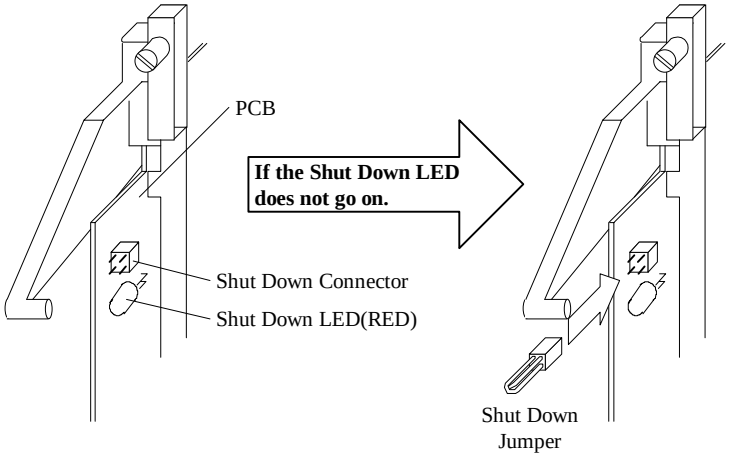
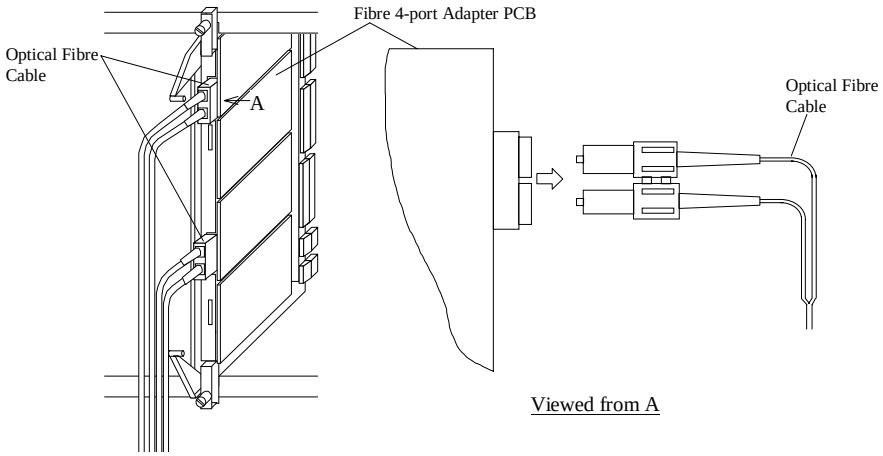
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Disconnect the fibre cables from the failed PCB.



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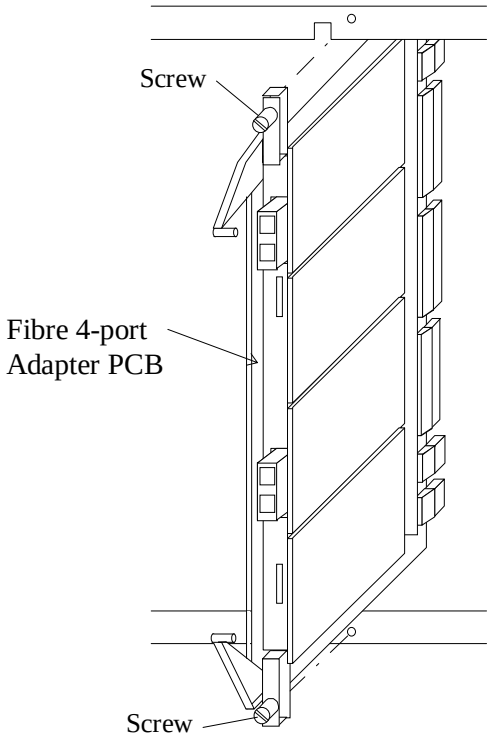
3. Remove the two screws and remove the failed PCB.
   Note: If the Shut Down Jumper is used, remove it.



4. Insert the spare PCB to the correct location and fasten the two screws.

5. Connect the fibre cables to the spare PCB.

6. Go to SVP post procedure.
   BUS blocking: Go to post i [REP04-450].
   Others: Go to post f [REP04-360].

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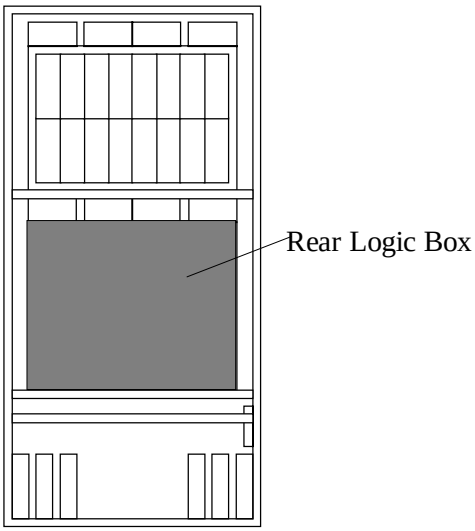
[HARDWARE G]

Location	Function Name of Component		Part Name
Front Logic Box in DKC	1	DKA (Disk Adapter) PCB	• WP102-A • WP102-B/WP132-B



Rear View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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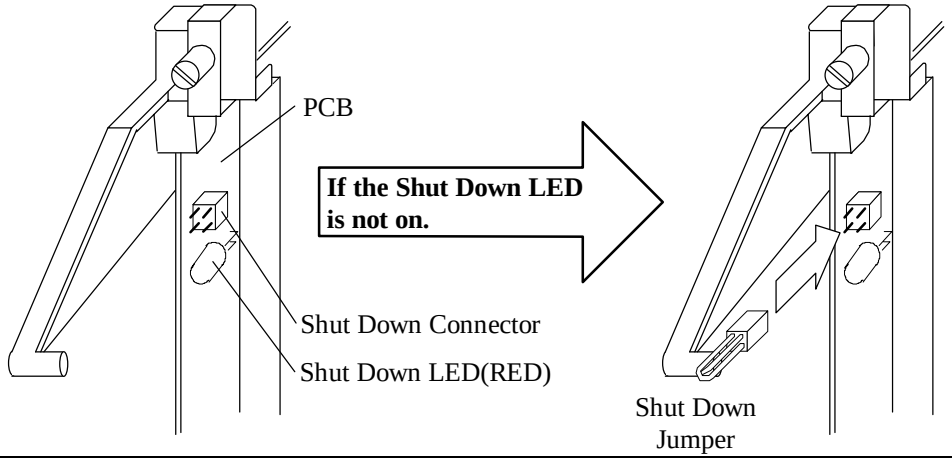
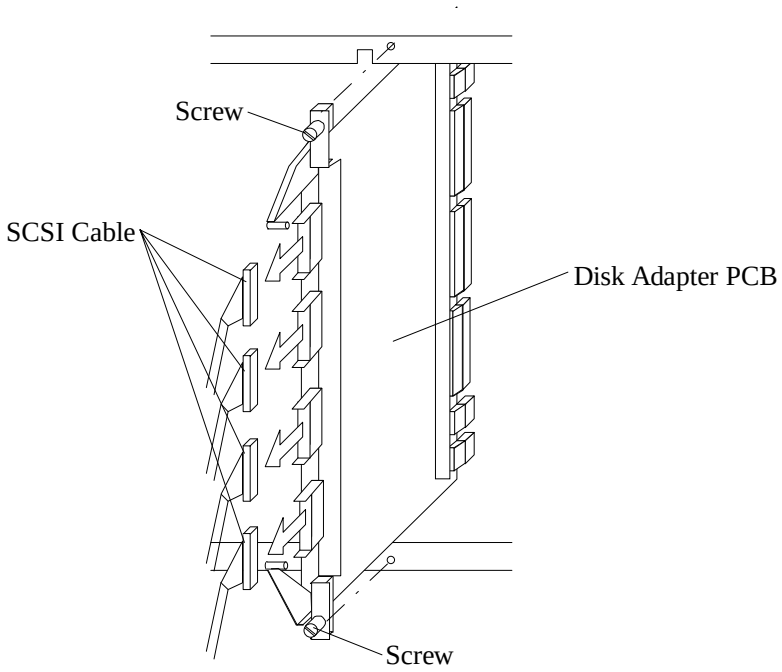
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Remove the PCB.
   a. Disconnect the SCSI cables.
   b. Remove two screws and remove the failed Disk Adapter PCB.
   c. If the Shut Down Jumper is used, remove it.



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3. Insert the spare PCB to the correct location and fasten the screws.

4. Connect the SCSI cables to the spare PCB.

5. Go to SVP post procedure.
   BUS blocking: Go to post i [REP04-450].
   Others: Go to post f [REP04-360].

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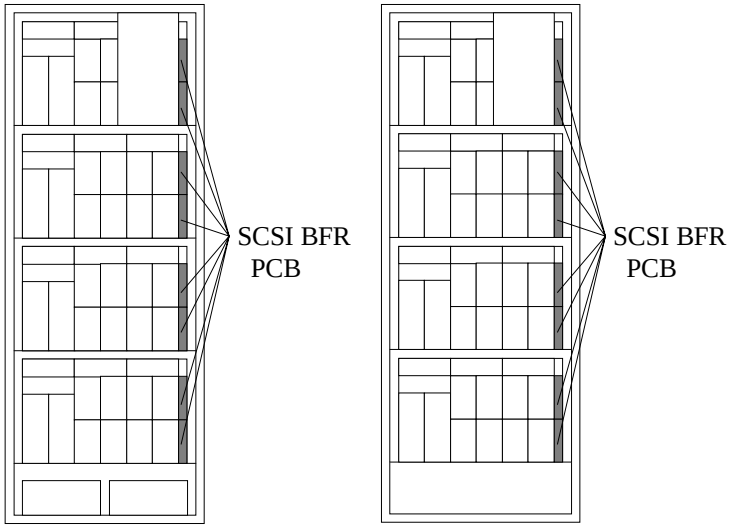
[HARDWARE H]

Location		Function Name of Component	Part Name
Front or Rear of DKU	1	SCSI BFR PCB	• SH087-A
		SCSI Interface Cable	• DEV I/F Cable



Front View of DKU

Rear View of DKU

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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Caution

Whenever you have to replace a SCSI BFR PCB, you have to replace also, all the concerned SCSI cables and SCSI BFR PCB (In case DKU-R2 and/or DKU-L2 are installed). This consists of all parts connected to the same SCSI path, i.e., (1) SCSI cable connecting the DKA and SCSI BFR, (2) SCSI cable connecting the two SCSI BFRs and (3) the other SCSI BFR in the same path. If the SCSI cable and/or the other SCSI BFR are/is not available, proceed by replacing the SCSI BFR specified in FPC first.

1. Check Shut Down LED on the SCSI BFR PCB.

⚠ CAUTION

A system down is caused by a replacement of the SCSI BFR PCB other than that to be replaced. Make sure that it is the SCSI BFR PCB to be replaced.

2. Disconnect the SCSI interface cables.
3. Loosen screw and slide stopper.
4. Replace the SCSI BFR PCB.
5. Slide stopper and fasten screw.

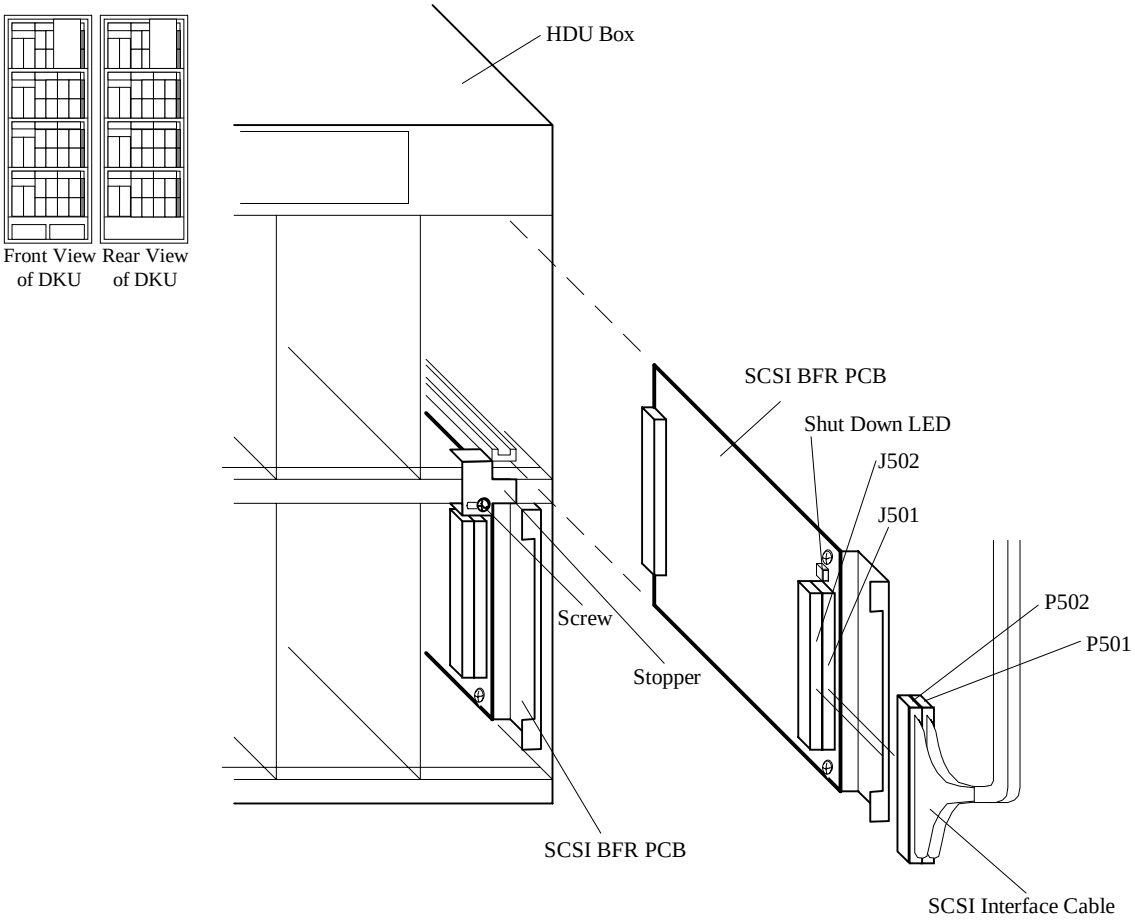

Fig. H-1 Replacement of SCSI BFR PCB

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6 Refer to Table H-1 and H-2, connect the SCSI interface cables.

Table H-1 SCSI Interface Cable Connections (DKA through SCSI BFR PCB of 1st /3rd DKU)

Cable No.	DKA PCB			SCSI BFR PCB (1st/3rd DKU)			Refer Page
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.	
1	DKA-1B	1R·B1	1R·B1	SCBFR-R10U	0U·J501	0U·P501	REP03-222
2		1R·B2	1R·B2	SCBFR-R11U	1U·J501	1U·P501	REP03-222
3		1R·B3	1R·B3	SCBFR-R12U	2U·J501	2U·P501	REP03-222
4		1R·B4	1R·B4	SCBFR-R13U	3U·J501	3U·P501	REP03-222
5	DKA-2H	2R·H1	2R·H1	SCBFR-R10L	0L·J501	0L·P501	REP03-222
6		2R·H2	2R·H2	SCBFR-R11L	1L·J501	1L·P501	REP03-222
7		2R·H3	2R·H3	SCBFR-R12L	2L·J501	2L·P501	REP03-222
8		2R·H4	2R·H4	SCBFR-R13L	3L·J501	3L·P501	REP03-222
9	DKA-1C	1R·C1	1R·C1	SCBFR-R14U	4U·J501	4U·P501	REP03-223
10		1R·C2	1R·C2	SCBFR-R15U	5U·J501	5U·P501	REP03-223
11		1R·C3	1R·C3	SCBFR-R16U	6U·J501	6U·P501	REP03-223
12		1R·C4	1R·C4	SCBFR-R17U	7U·J501	7U·P501	REP03-223
13	DKA-2J	2R·J1	2R·J1	SCBFR-R14L	4L·J501	4L·P501	REP03-223
14		2R·J2	2R·J2	SCBFR-R15L	5L·J501	5L·P501	REP03-223
15		2R·J3	2R·J3	SCBFR-R16L	6L·J501	6L·P501	REP03-223
16		2R·J4	2R·J4	SCBFR-R17L	7L·J501	7L·P501	REP03-223
17	DKA-1D	1R·D1	1R·D1	SCBFR-L10U	0U·J501	0U·P501	REP03-224
18		1R·D2	1R·D2	SCBFR-L11U	1U·J501	1U·P501	REP03-224
19		1R·D3	1R·D3	SCBFR-L12U	2U·J501	2U·P501	REP03-224
20		1R·D4	1R·D4	SCBFR-L13U	3U·J501	3U·P501	REP03-224
21	DKA-2K	2R·K1	2R·K1	SCBFR-L10L	0L·J501	0L·P501	REP03-224
22		2R·K2	2R·K2	SCBFR-L11L	1L·J501	1L·P501	REP03-224
23		2R·K3	2R·K3	SCBFR-L12L	2L·J501	2L·P501	REP03-224
24		2R·K4	2R·K4	SCBFR-L13L	3L·J501	3L·P501	REP03-224
25	DKA-1E	1R·E1	1R·E1	SCBFR-L14U	4U·J501	4U·P501	REP03-225
26		1R·E2	1R·E2	SCBFR-L15U	5U·J501	5U·P501	REP03-225
27		1R·E3	1R·E3	SCBFR-L16U	6U·J501	6U·P501	REP03-225
28		1R·E4	1R·E4	SCBFR-L17U	7U·J501	7U·P501	REP03-225
29	DKA-2L	2R·L1	2R·L1	SCBFR-L14L	4L·J501	4L·P501	REP03-225
30		2R·L2	2R·L2	SCBFR-L15L	5L·J501	5L·P501	REP03-225
31		2R·L3	2R·L3	SCBFR-L16L	6L·J501	6L·P501	REP03-225
32		2R·L4	2R·L4	SCBFR-L17L	7L·J501	7L·P501	REP03-225

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Table H-2 SCSI Interface Cable Connections
(SCSI BFR PCB of 1st/3rd DKU through SCSI BFR PCB of 2nd/4th DKU)

Cable No.	SCSI BFR PCB (1st/3rd DKU)			SCSI BFR PCB (2nd/4th DKU)		
	Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.
33	SCBFR-R10U	0U·J502	0U·P502	SCBFR-R20U	0U·J501	0U·P501
34	SCBFR-R11U	1U·J502	1U·P502	SCBFR-R21U	1U·J501	1U·P501
35	SCBFR-R12U	2U·J502	2U·P502	SCBFR-R22U	2U·J501	2U·P501
36	SCBFR-R13U	3U·J502	3U·P502	SCBFR-R23U	3U·J501	3U·P501
37	SCBFR-R10L	0L·J502	0L·P502	SCBFR-R20L	0L·J501	0L·P501
38	SCBFR-R11L	1L·J502	1L·P502	SCBFR-R21L	1L·J501	1L·P501
39	SCBFR-R12L	2L·J502	2L·P502	SCBFR-R22L	2L·J501	2L·P501
40	SCBFR-R13L	3L·J502	3L·P502	SCBFR-R23L	3L·J501	3L·P501
41	SCBFR-R14U	4U·J502	4U·P502	SCBFR-R24U	4U·J501	4U·P501
42	SCBFR-R15U	5U·J502	5U·P502	SCBFR-R25U	5U·J501	5U·P501
43	SCBFR-R16U	6U·J502	6U·P502	SCBFR-R26U	6U·J501	6U·P501
44	SCBFR-R17U	7U·J502	7U·P502	SCBFR-R27U	7U·J501	7U·P501
45	SCBFR-R14L	4L·J502	4L·P502	SCBFR-R24L	4L·J501	4L·P501
46	SCBFR-R15L	5L·J502	5L·P502	SCBFR-R25L	5L·J501	5L·P501
47	SCBFR-R16L	6L·J502	6L·P502	SCBFR-R26L	6L·J501	6L·P501
48	SCBFR-R17L	7L·J502	7L·P502	SCBFR-R27L	7L·J501	7L·P501
49	SCBFR-L10U	0U·J502	0U·P502	SCBFR-L20U	0U·J501	0U·P501
50	SCBFR-L11U	1U·J502	1U·P502	SCBFR-L21U	1U·J501	1U·P501
51	SCBFR-L12U	2U·J502	2U·P502	SCBFR-L22U	2U·J501	2U·P501
52	SCBFR-L13U	3U·J502	3U·P502	SCBFR-L23U	3U·J501	3U·P501
53	SCBFR-L10L	0L·J502	0L·P502	SCBFR-L20L	0L·J501	0L·P501
54	SCBFR-L11L	1L·J502	1L·P502	SCBFR-L21L	1L·J501	1L·P501
55	SCBFR-L12L	2L·J502	2L·P502	SCBFR-L22L	2L·J501	2L·P501
56	SCBFR-L13L	3L·J502	3L·P502	SCBFR-L23L	3L·J501	3L·P501
57	SCBFR-L14U	4U·J502	4U·P502	SCBFR-L24U	4U·J501	4U·P501
58	SCBFR-L15U	5U·J502	5U·P502	SCBFR-L25U	5U·J501	5U·P501
59	SCBFR-L16U	6U·J502	6U·P502	SCBFR-L26U	6U·J501	6U·P501
60	SCBFR-L17U	7U·J502	7U·P502	SCBFR-L27U	7U·J501	7U·P501
61	SCBFR-L14L	4L·J502	4L·P502	SCBFR-L24L	4L·J501	4L·P501
62	SCBFR-L15L	5L·J502	5L·P502	SCBFR-L25L	5L·J501	5L·P501
63	SCBFR-L16L	6L·J502	6L·P502	SCBFR-L26L	6L·J501	6L·P501
64	SCBFR-L17L	7L·J502	7L·P502	SCBFR-L27L	7L·J501	7L·P501

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Cable No. 1-8 DKA-1B/2H through SC BFR-R10-R13U/L

(1) Remove the cable fixing wires and repeat binders.

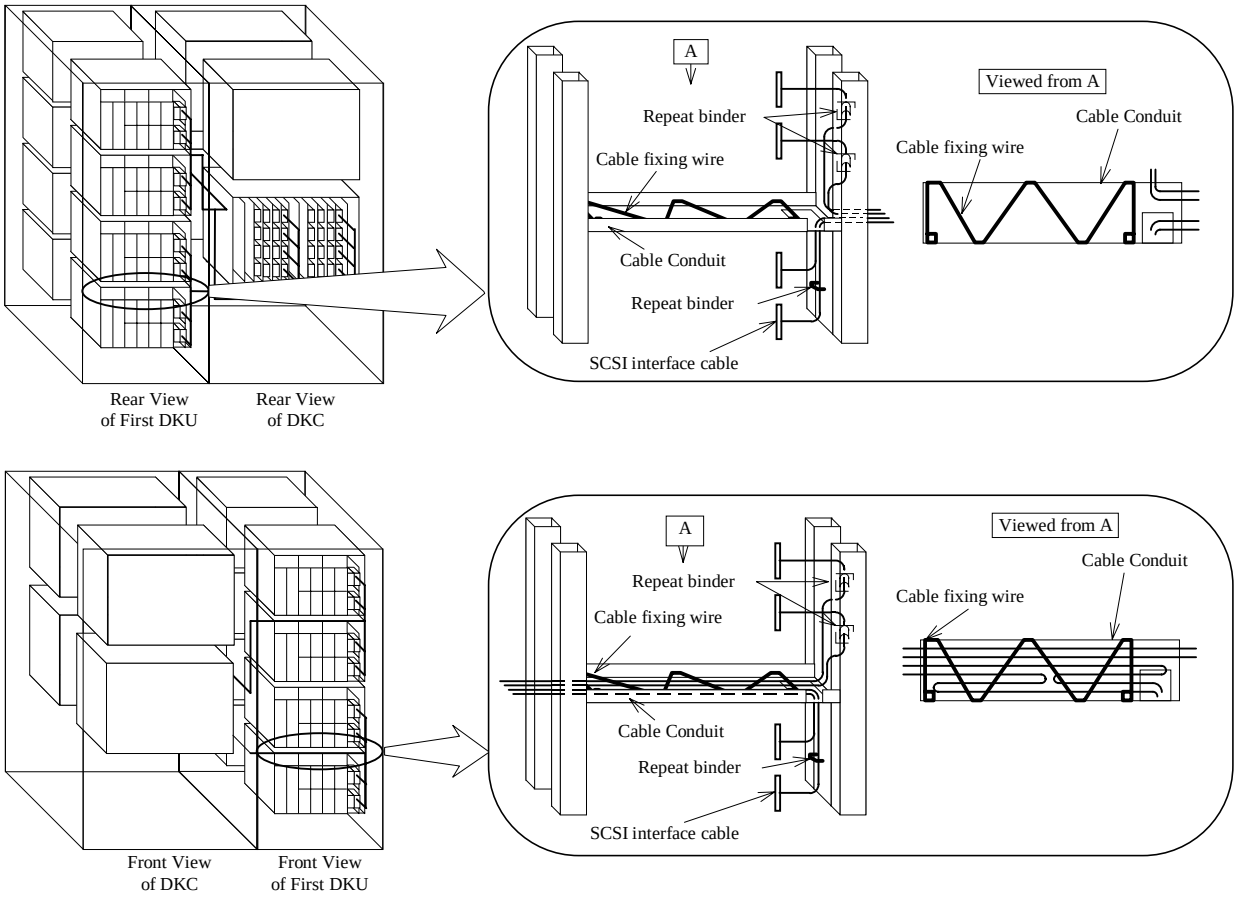

Fig. H-2 Removal of the cable fixing wires and repeat binders

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(2) Remove the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(3) Loosen the screws and remove the cable duct covers.

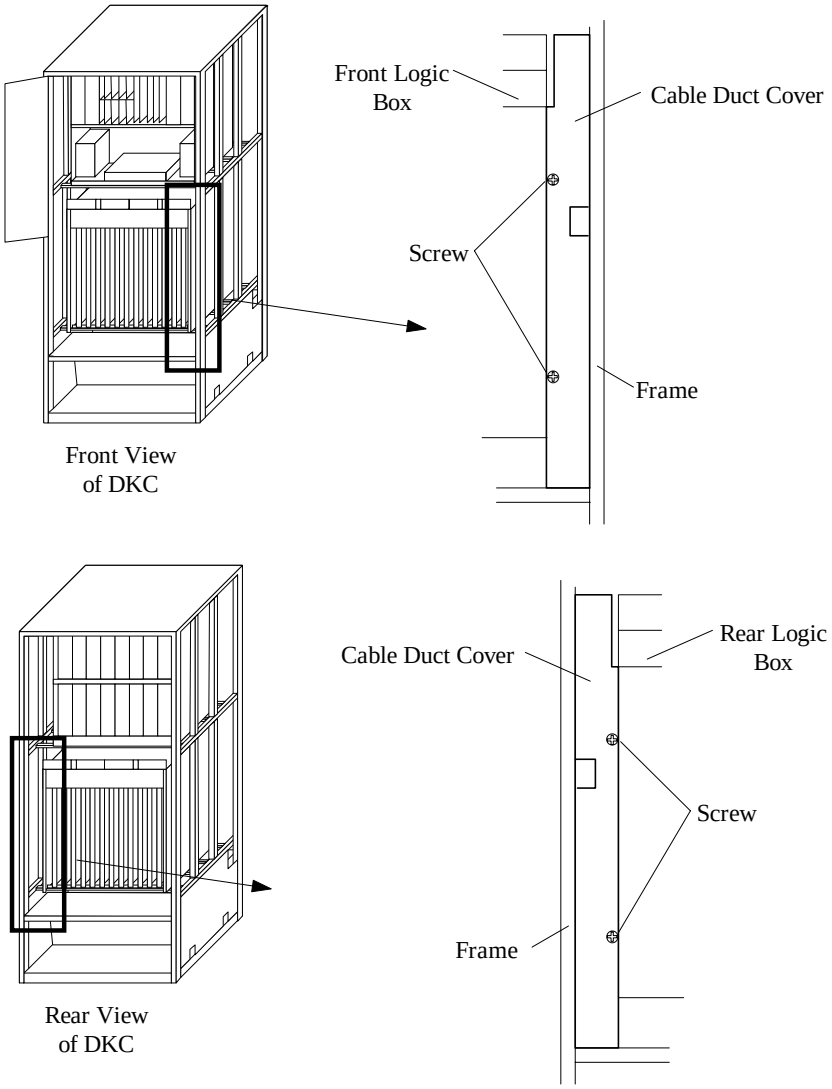

Fig. H-3 Removal of Cable Duct Covers

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(4) Since the SCSI interface cable shown in the table below is not detachable, it should be replaced after wiring a cable for maintenance parts in a different route. Other cables should be wired in the same way as the previous route.

Table H-3 SCSI Interface Cable Connections

DKA PCB			SCSI BFR PCB (1st/3rd DKU)		
Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.
DKA-1B	1R·B1	1R·B1	SCBFR-R10U	0U·J501	0U·P501
	1R·B2	1R·B2	SCBFR-R11U	1U·J501	1U·P501
DKA-2H	2R·H1	2R·H1	SCBFR-R10L	0L·J501	0L·P501
	2R·H2	2R·H2	SCBFR-R11L	1L·J501	1L·P501

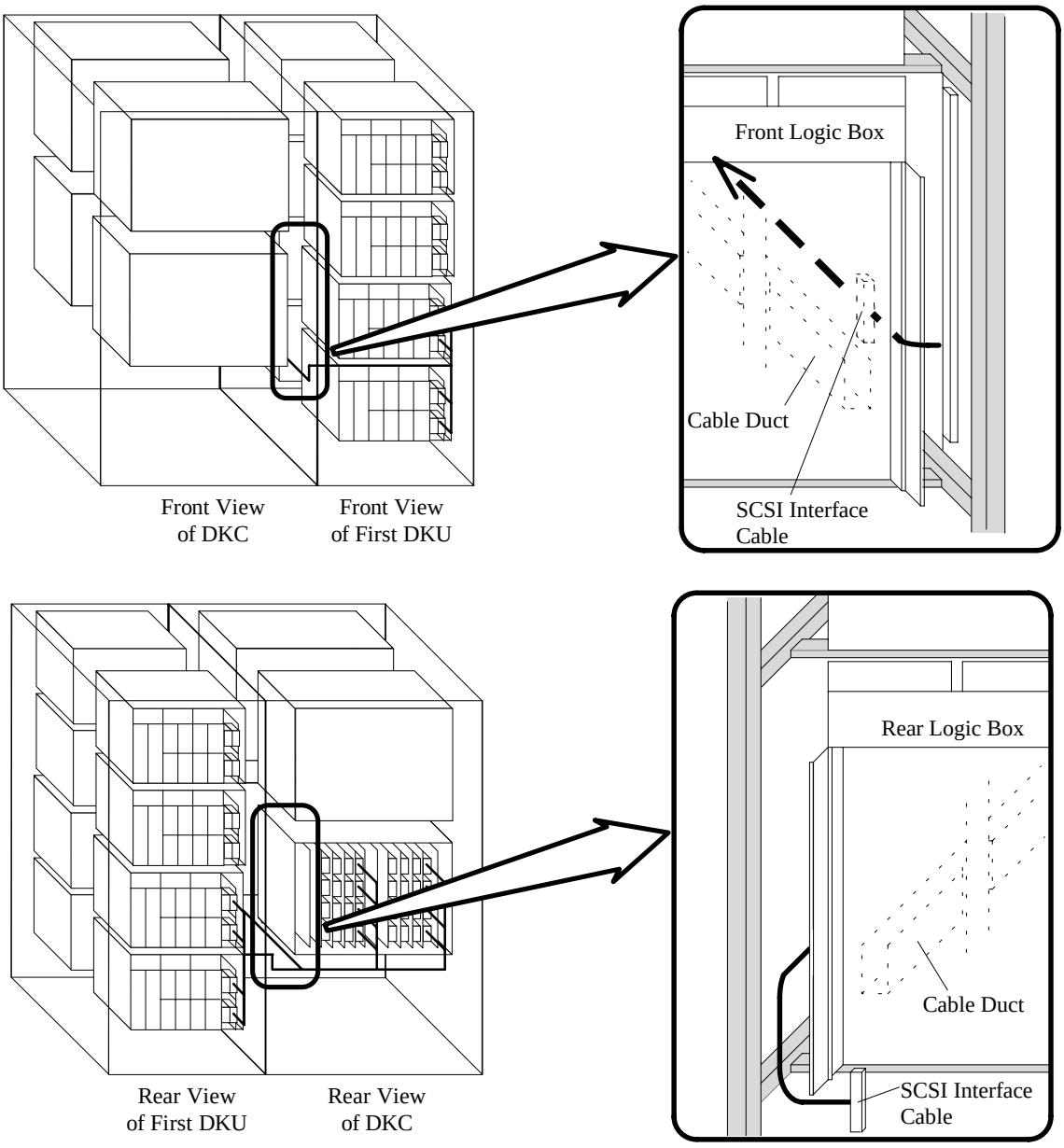

Fig. H-4 Routing of SCSI Interface Cable

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(5) Replace the SCSI interface cable.

Cable No. 1 DKA-1B (1R･B1) through SC BFR-R10U (0U･J501)

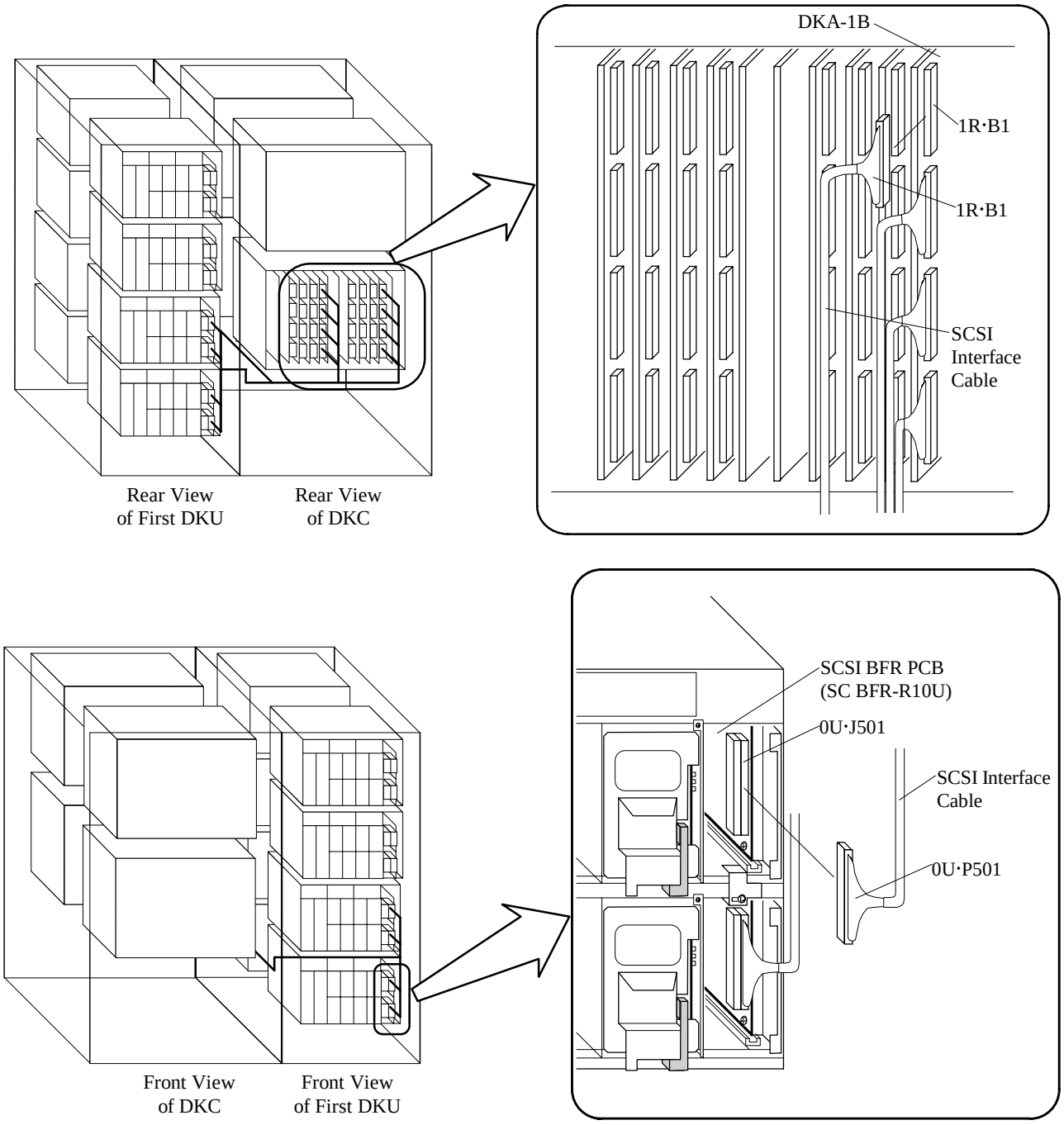

Fig. H-5 Replacement of SCSI Interface Cable

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Cable No. 2 DKA-1B (1R･B2) through SC BFR-R11U (1U･J501)

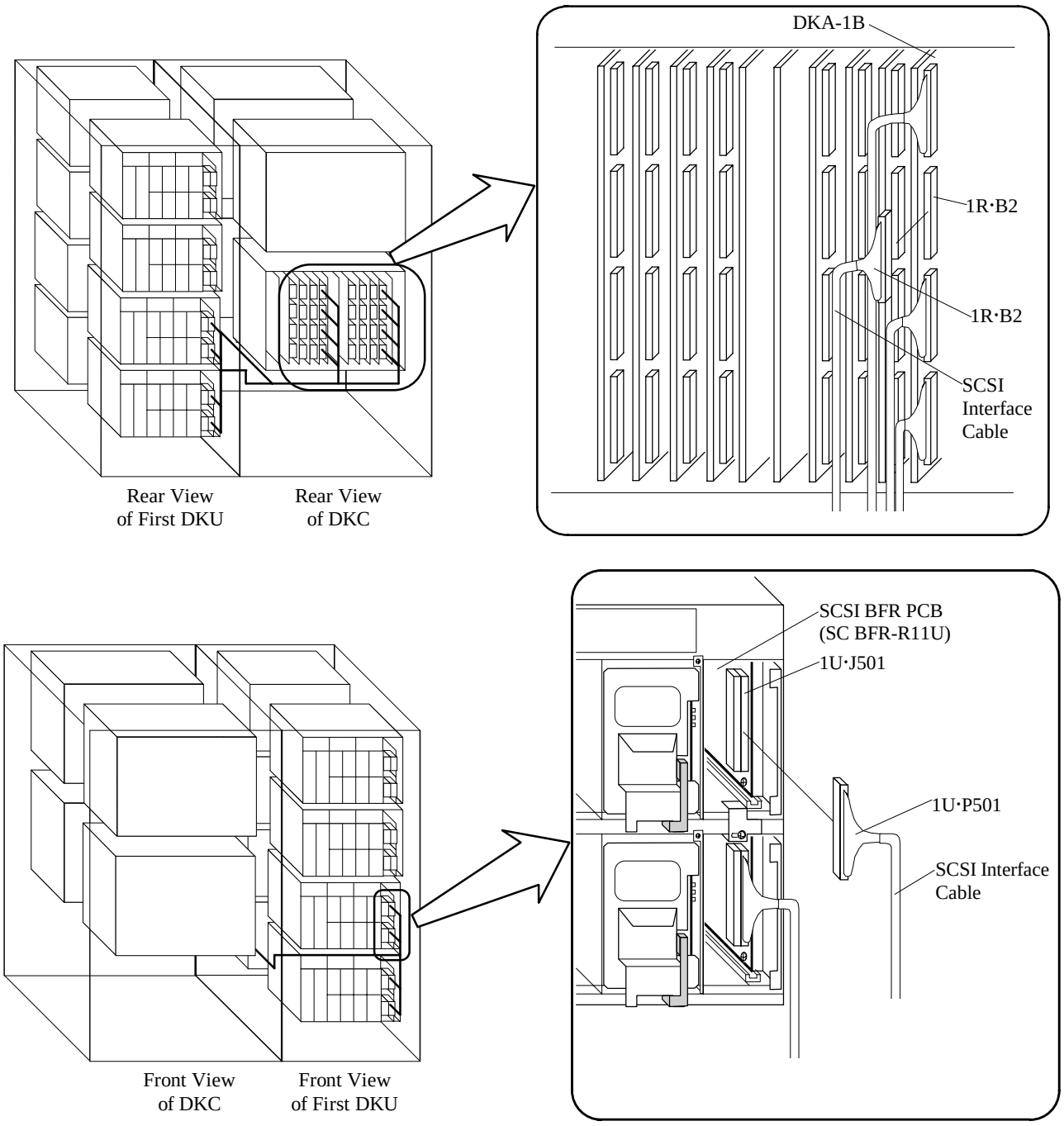

Fig. H-6 Replacement of SCSI Interface Cable

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Cable No. 3 DKA-1B (1R･B3) through SC BFR-R12U (2U･J501)

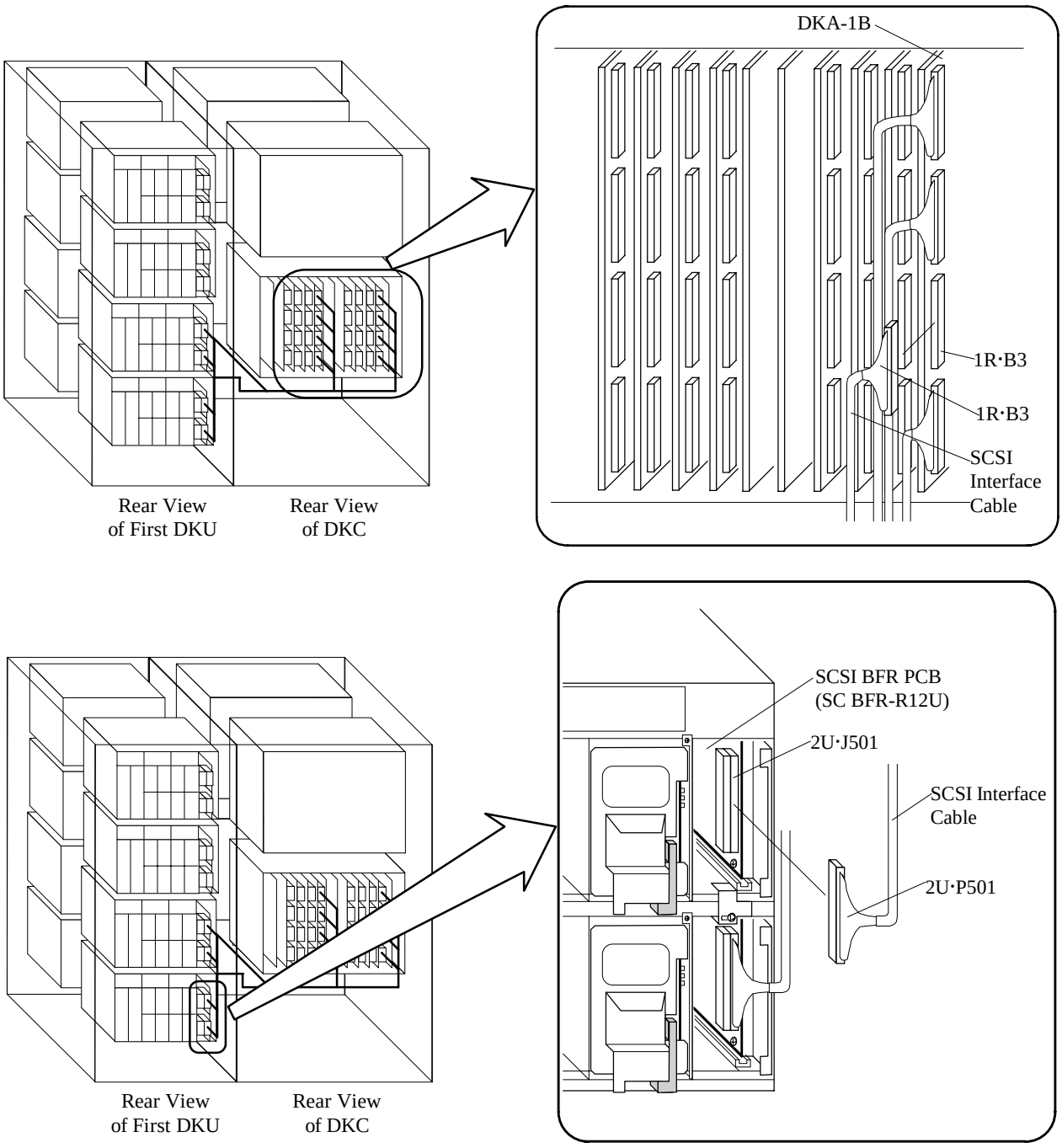

Fig. H-7 Replacement of SCSI Interface Cable

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Cable No. 4 DKA-1B (1R･B4) through SC BFR-R13U (3U･J501)

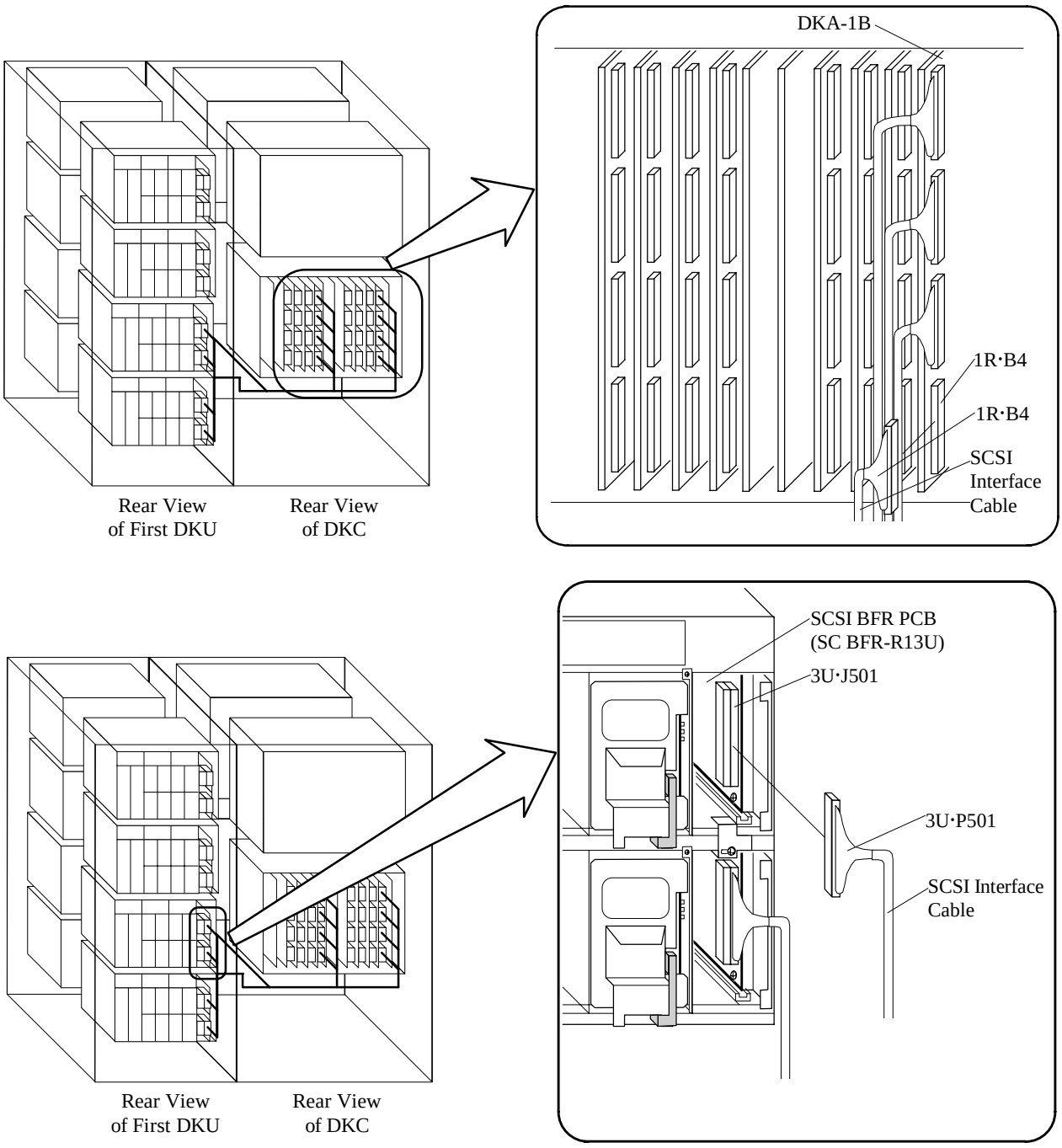

Fig. H-8 Replacement of SCSI Interface Cable

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Cable No. 5 DKA-2H (2R･H1) through SC BFR-R10L (0L･J501)

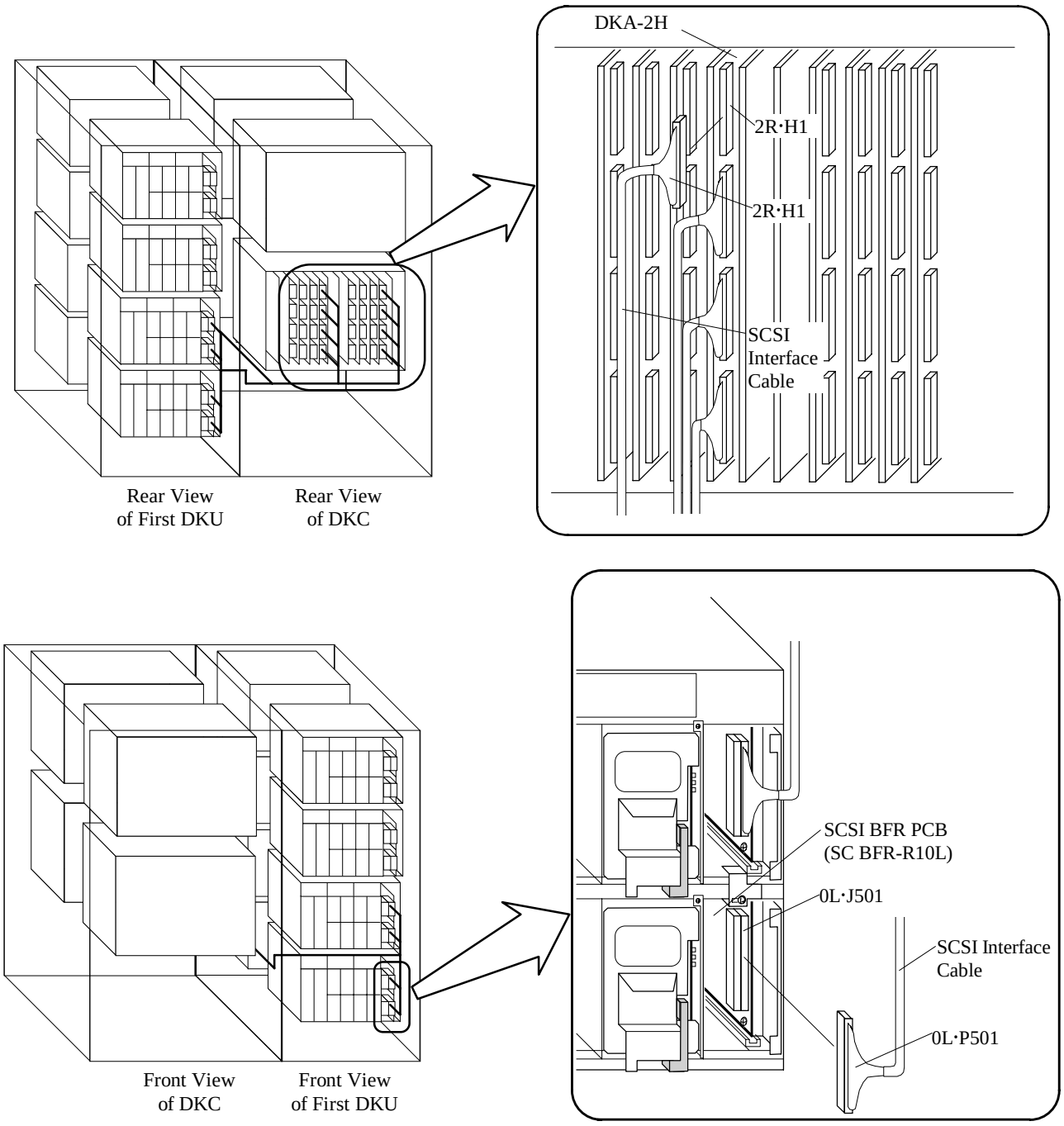

Fig. H-9 Replacement of SCSI Interface Cable

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Cable No. 6 DKA-2H (2R･H2) through SC BFR-R11L (1L･J501)

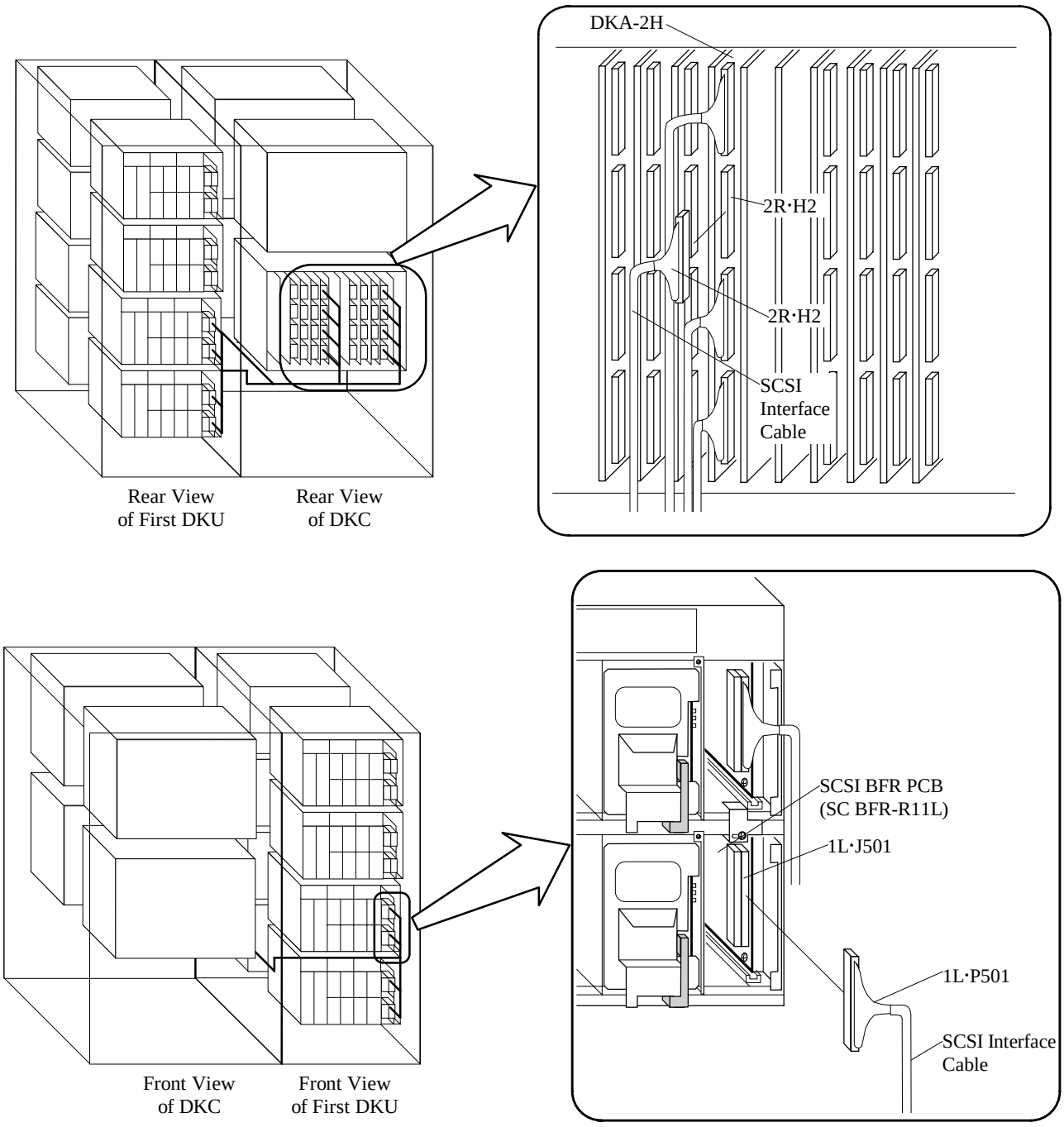

Fig. H-10 Replacement of SCSI Interface Cable

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Cable No. 7 DKA-2H (2R·H3) through SC BFR-R12L (2L·J501)

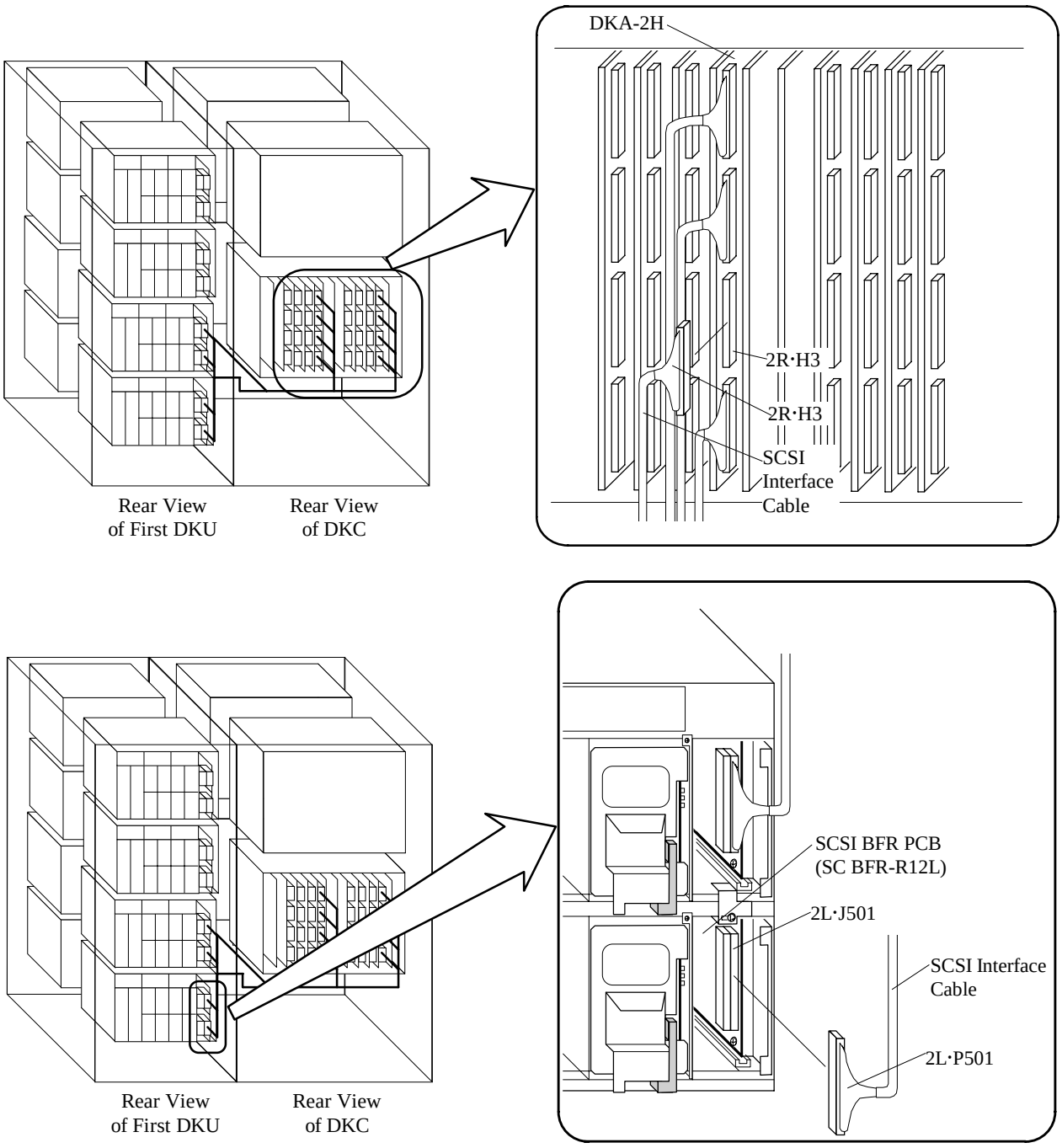

Fig. H-11 Replacement of SCSI Interface Cable

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Cable No. 8 DKA-2H (2R･H4) through SC BFR-R13L (3L･J501)

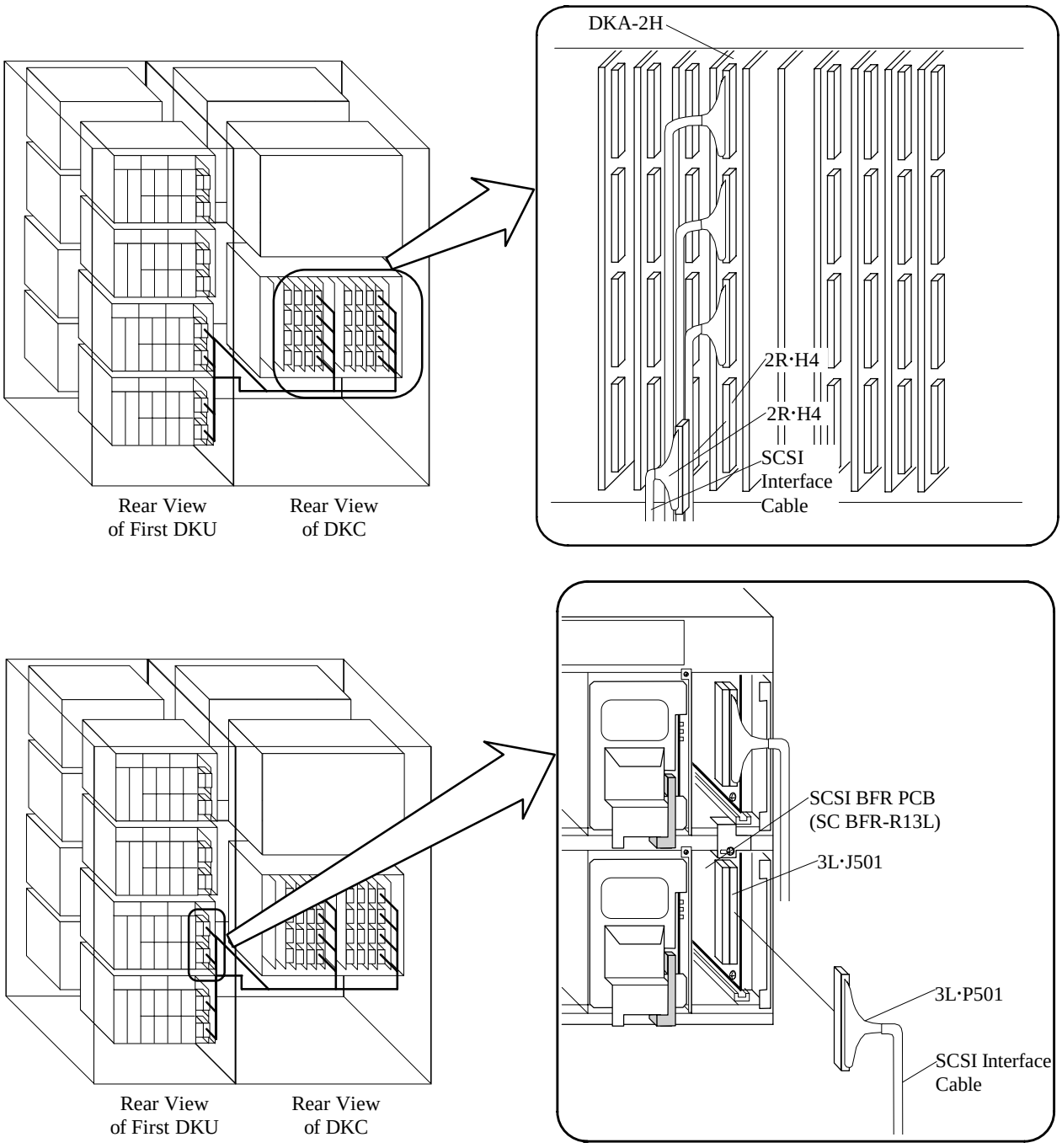

Fig. H-12 Replacement of SCSI Interface Cable

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(6) Attach the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(7) Attach the cable duct covers and fasten the screws. Refer to Fig. H-3.

(8) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

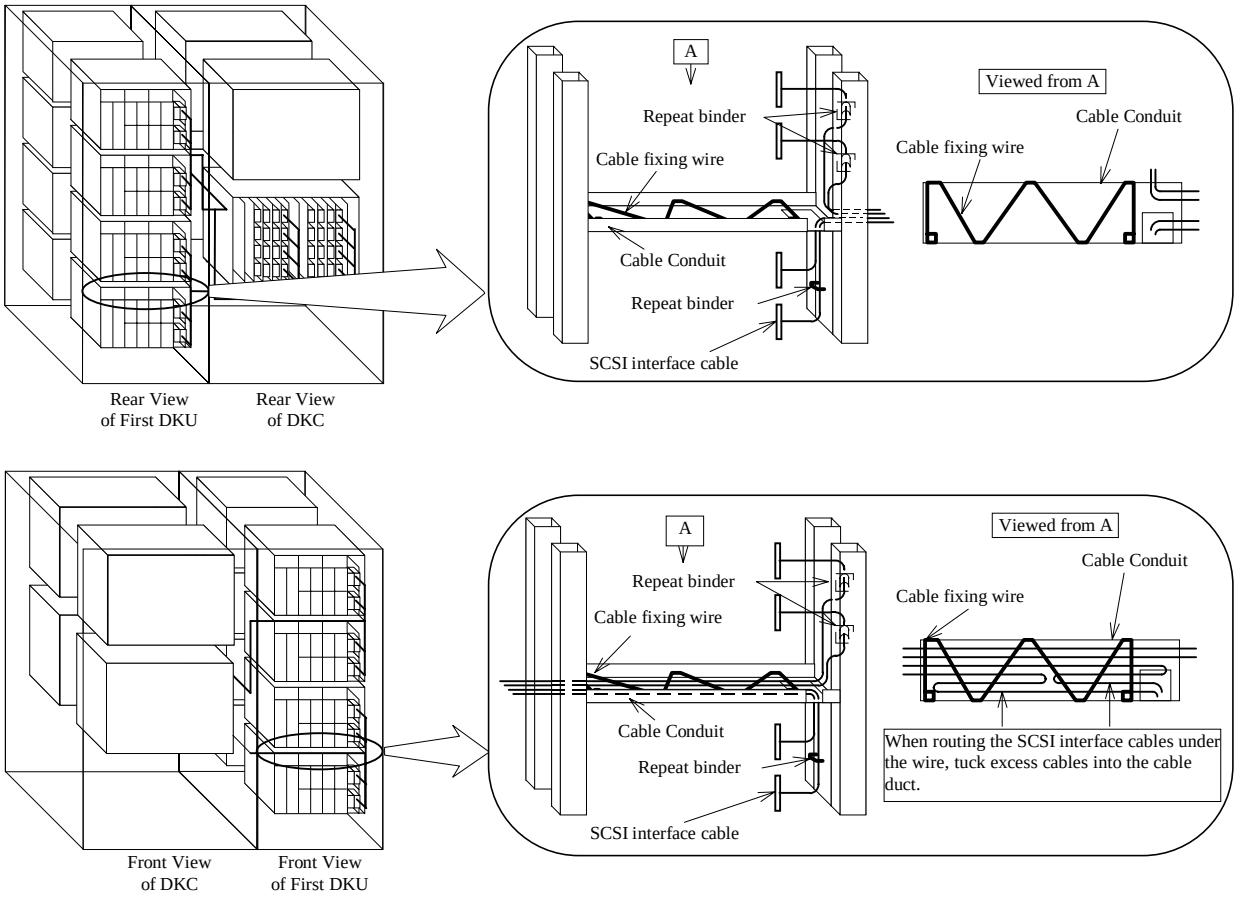

Fig. H-13 Fixation of the SCSI Interface Cables

(9) In case that there is 2nd/4th DKU, go to REP03-226.
In case that there isn't 2nd/4th DKU, go to post-PROCEDURE h (REP04-420).

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Cable No. 9-16 DKA-1C/2J through SC BFR-R14-R17U/L

(1) Remove the cable fixing wires and repeat binders.

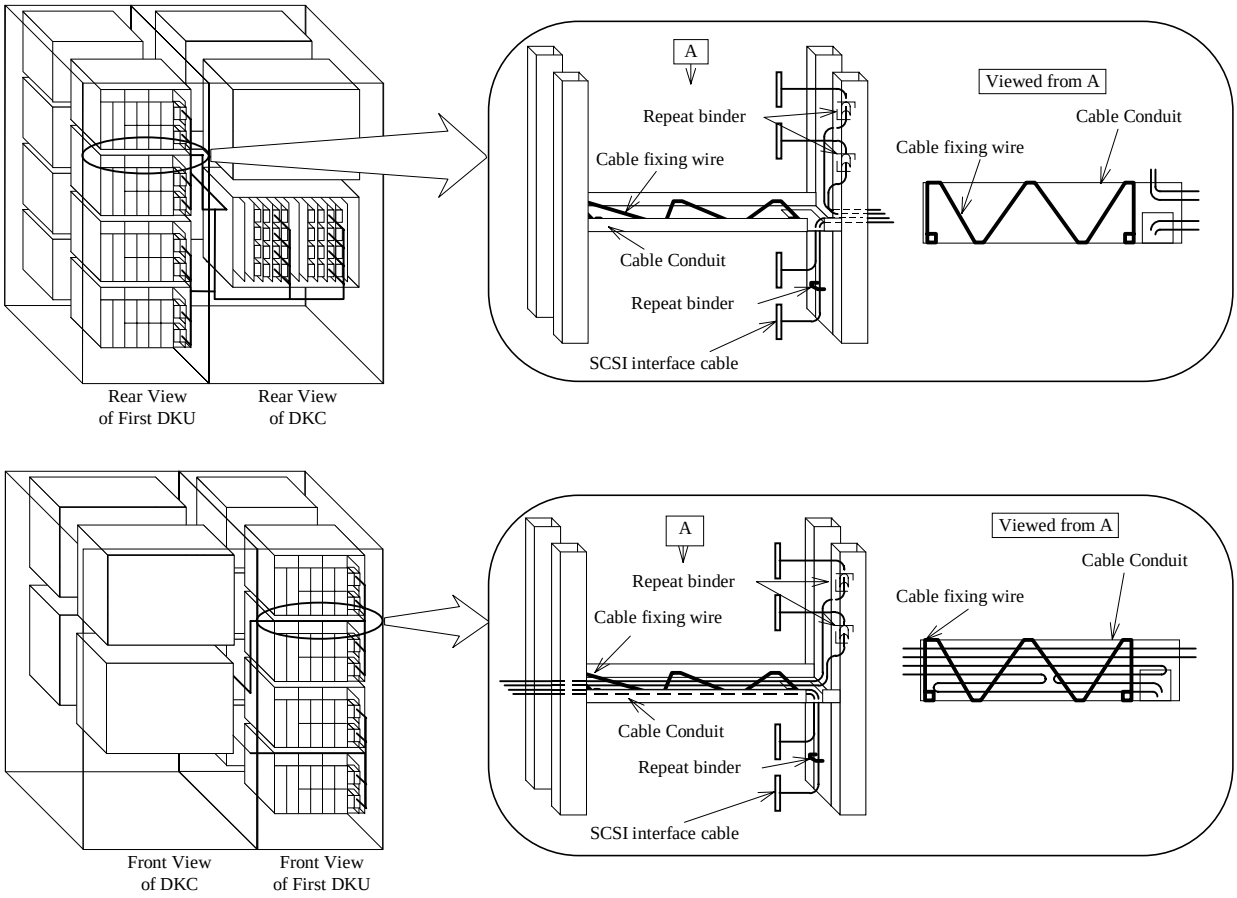

Fig. H-14 Removal of the cable fixing wires and repeat binders

Copyright ©1998, Hitachi, Ltd.

(2) Remove the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(3) Loosen the screws and remove the cable duct covers.

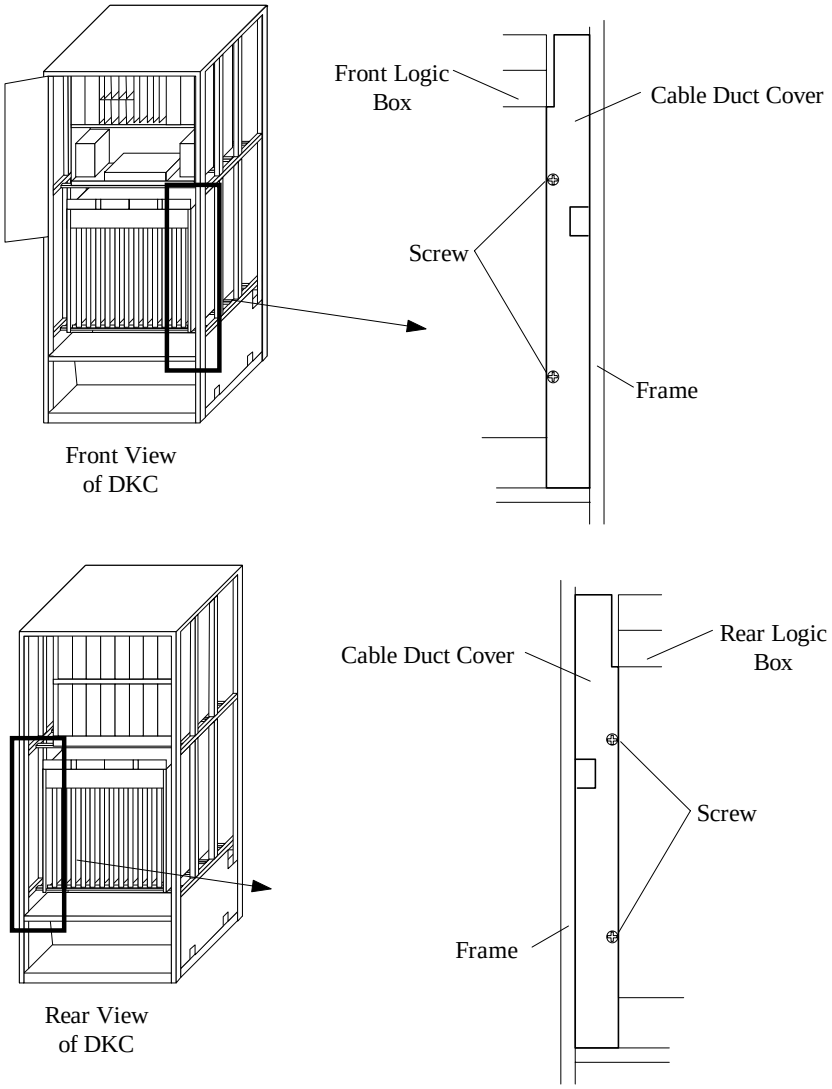

Fig. H-15 Removal of Cable Duct Covers

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(4) Since the SCSI interface cable shown in the table below is not detachable, it should be replaced after wiring a cable for maintenance parts in a different route. Other cables should be wired in the same way as the previous route.

Table H-4 SCSI Interface Cable Connections

DKA PCB			SCSI BFR PCB (1st/3rd DKU)		
Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.
DKA-1C	1R·C1	1R·C1	SCBFR-R14U	4U·J501	4U·P501
	1R·C2	1R·C2	SCBFR-R15U	5U·J501	5U·P501
DKA-2J	2R·J1	2R·J1	SCBFR-R14L	4L·J501	4L·P501
	2R·J2	2R·J2	SCBFR-R15L	5L·J501	5L·P501

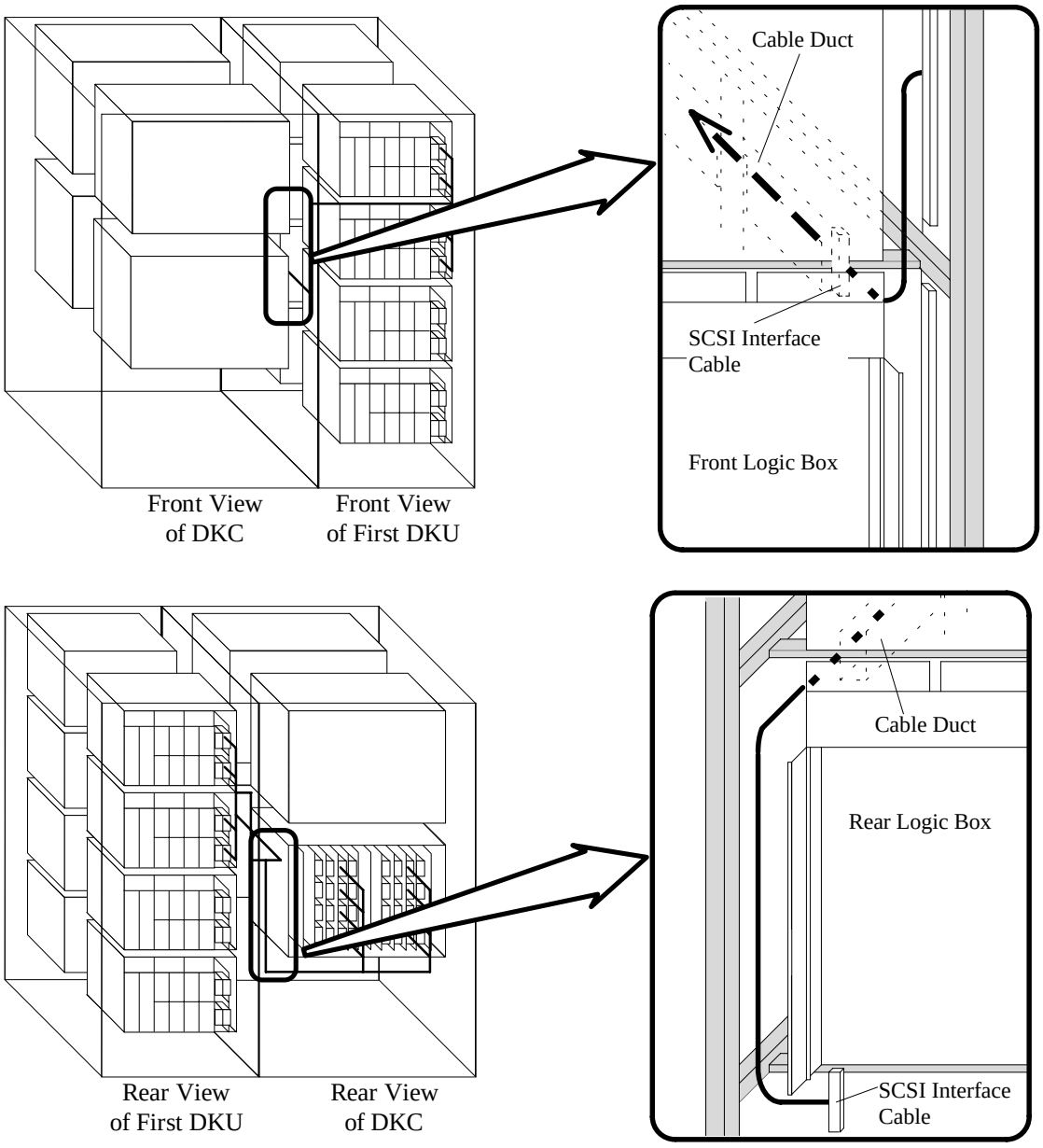

Fig. H-16 Routing of SCSI Interface Cable

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(5) Replace the SCSI interface cable.

Cable No. 9 DKA-1C (1R·C1) through SC BFR-R14U (4U·J501)

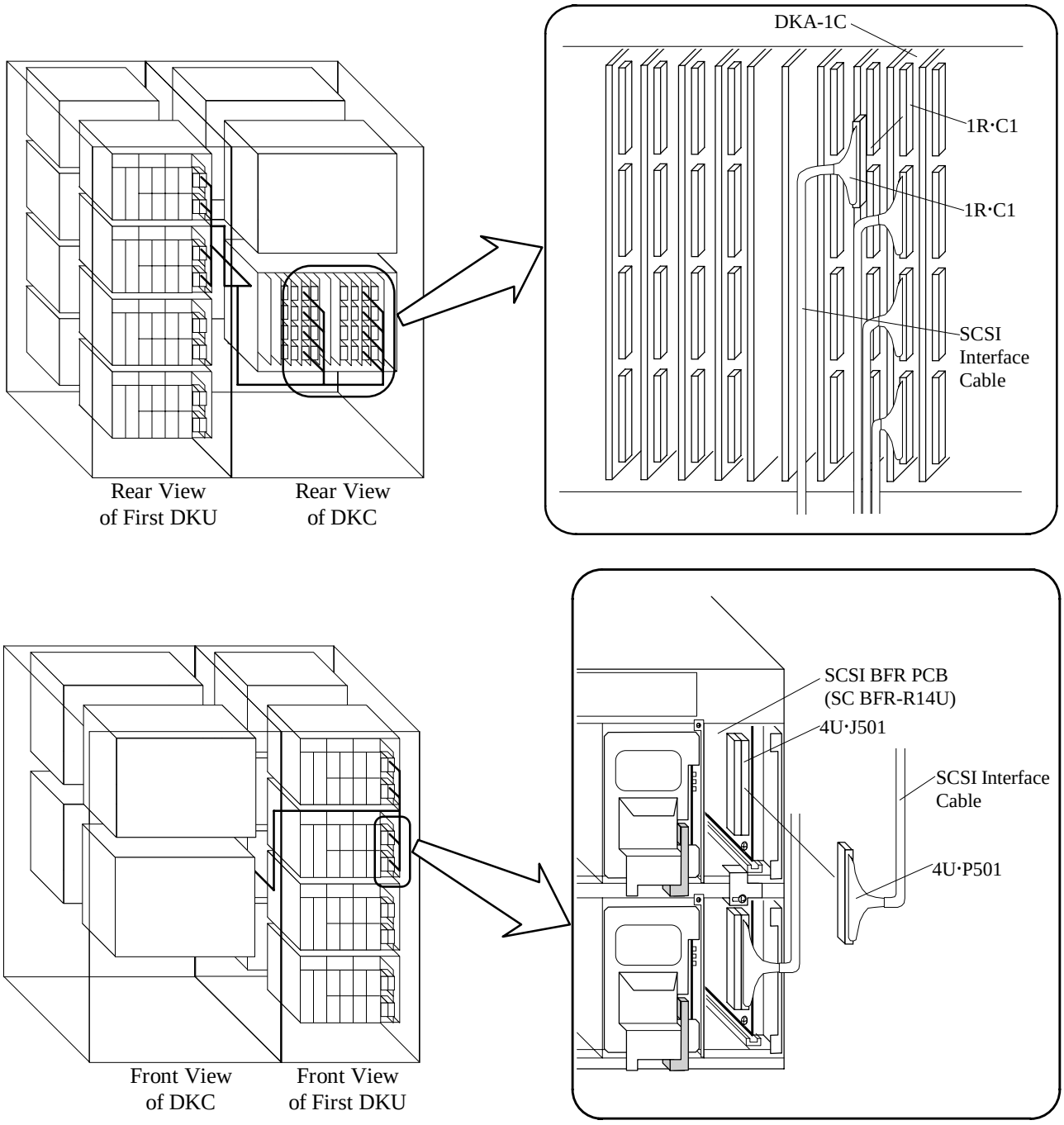

Fig. H-17 Replacement of SCSI Interface Cable

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Cable No. 10 DKA-1C (1R･C2) through SC BFR-R15U (5U･J501)

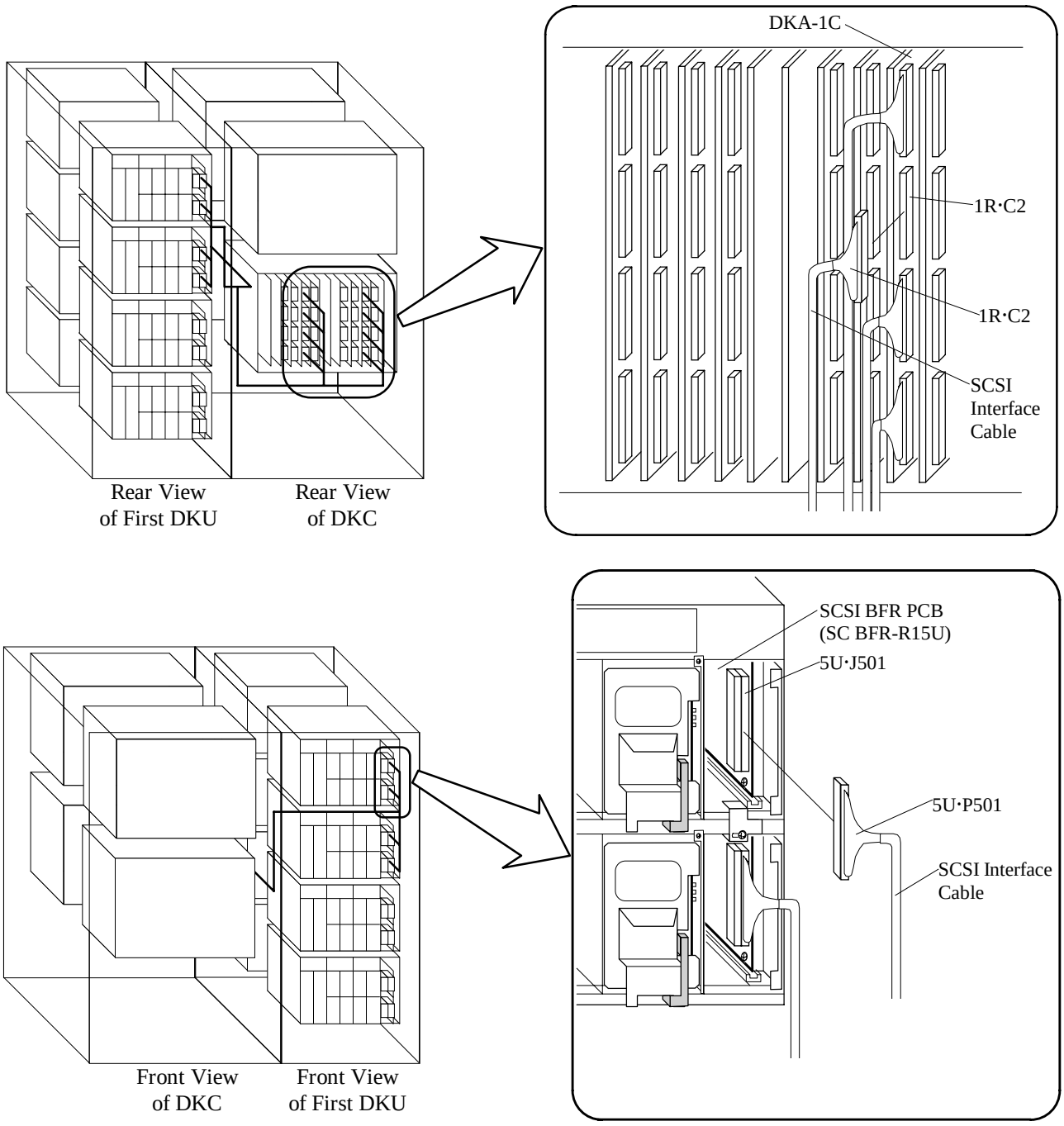

Fig. H-18 Replacement of SCSI Interface Cable

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Cable No. 11 DKA-1C (1R･C3) through SC BFR-R16U (6U･J501)

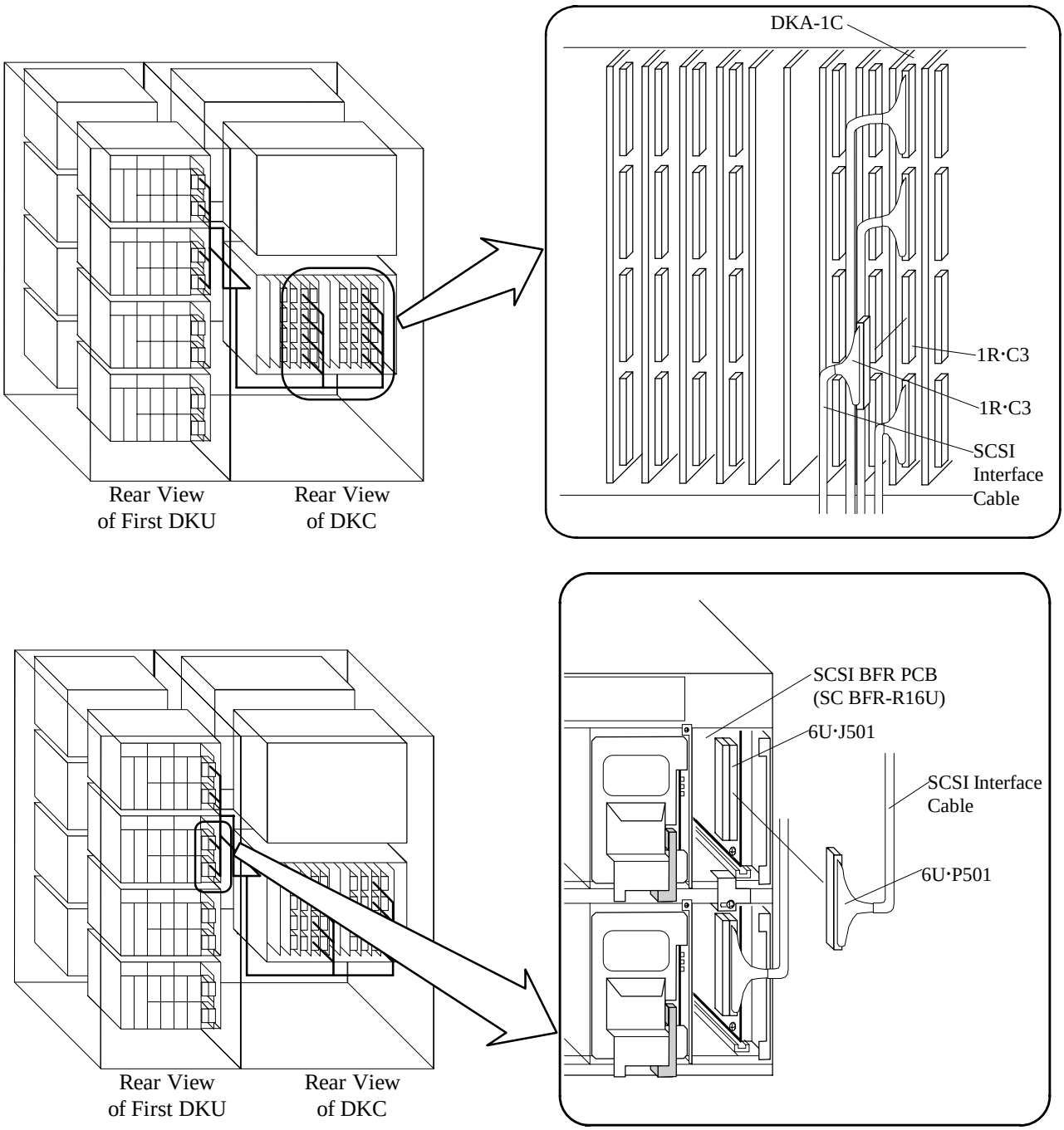

Fig. H-19 Replacement of SCSI Interface Cable

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Cable No. 12 DKA-1C (1R･C4) through SC BFR-R17U (7U･J501)

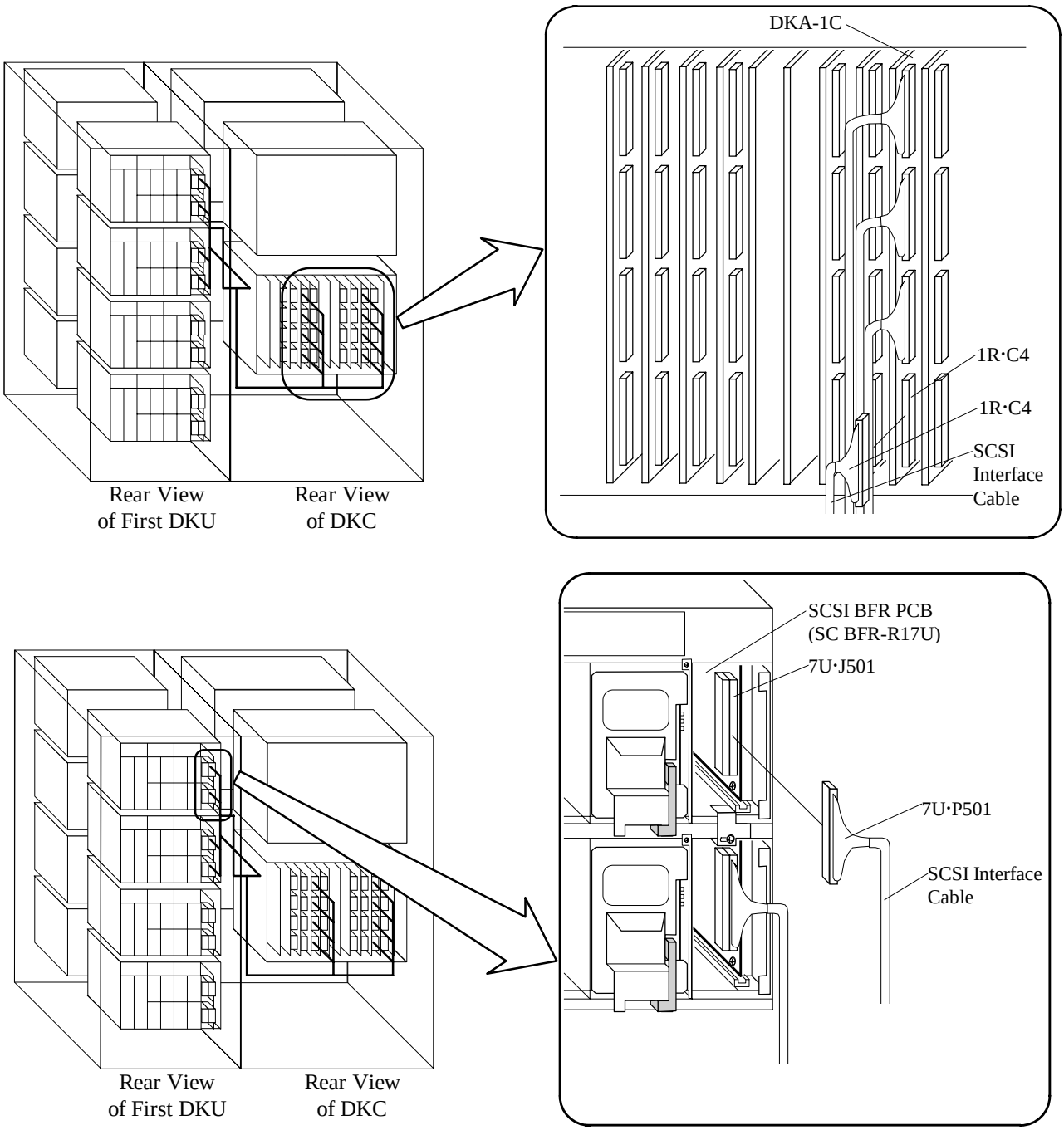

Fig. H-20 Replacement of SCSI Interface Cable

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Cable No. 13 DKA-2J (2R･J1) through SC BFR-R14L (4L･J501)

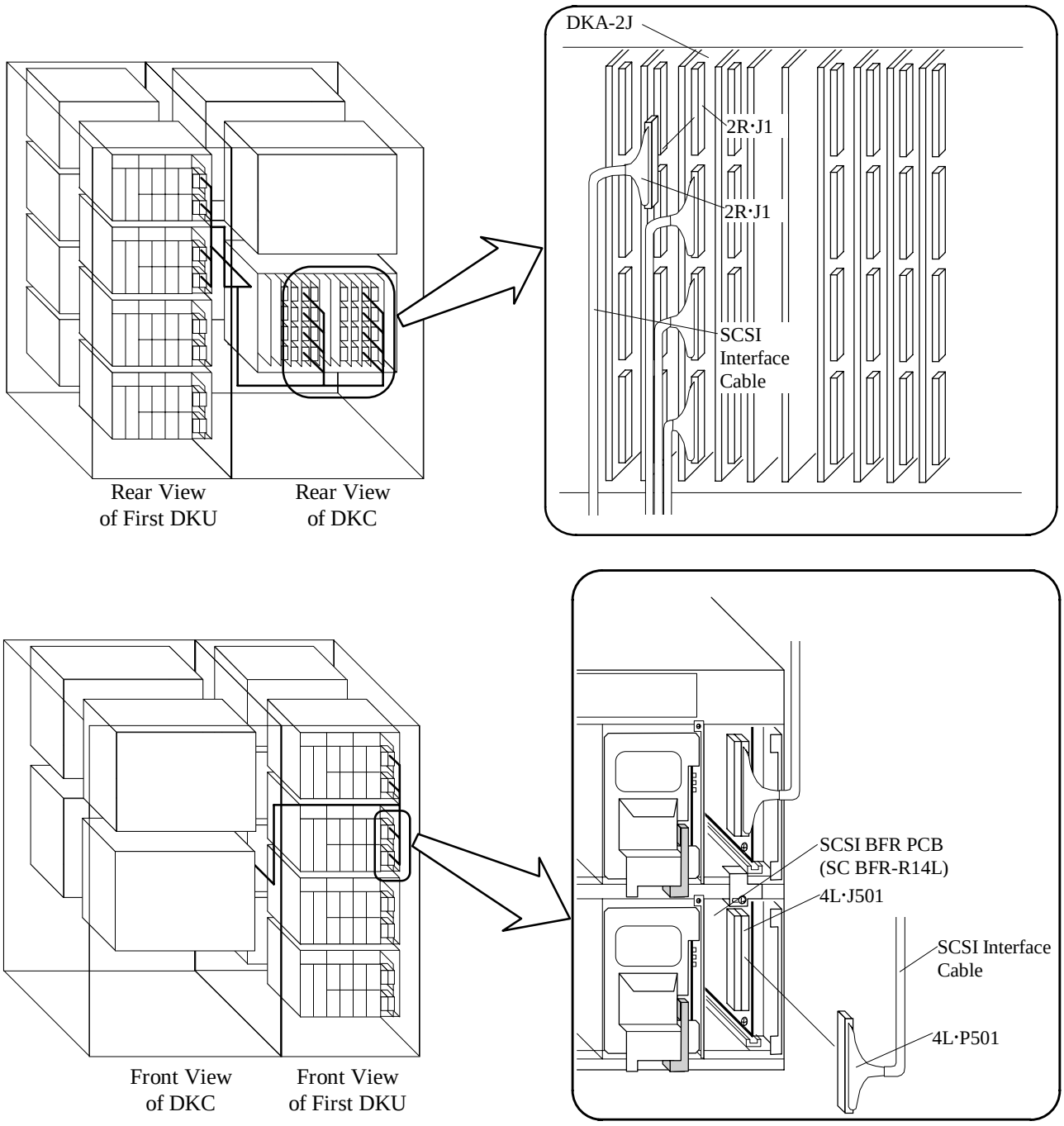

Fig. H-21 Replacement of SCSI Interface Cable

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Cable No. 14 DKA-2J (2R･J2) through SC BFR-R15L (5L･J501)

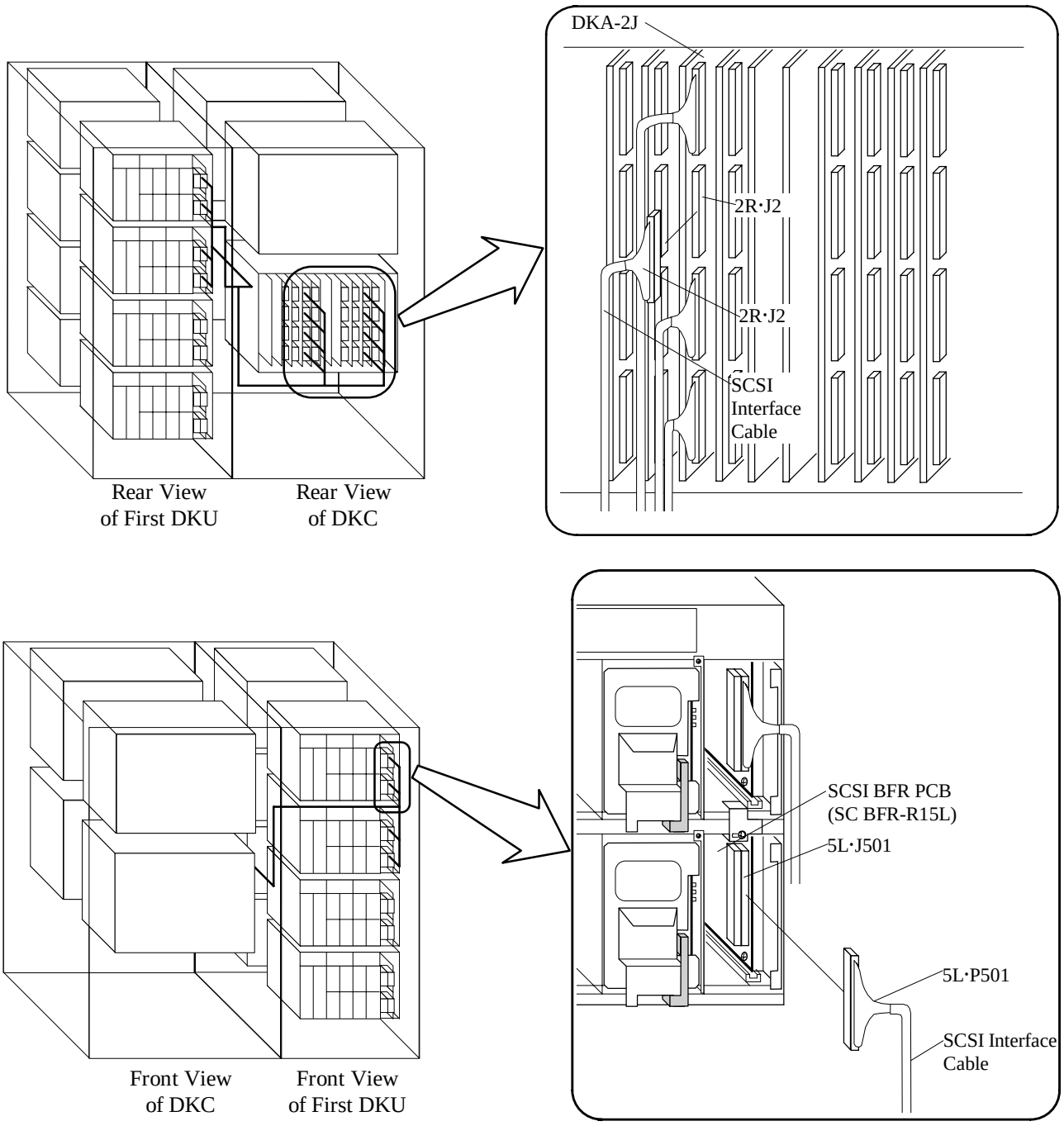

Fig. H-22 Replacement of SCSI Interface Cable

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Cable No. 15 DKA-2J (2R･J3) through SC BFR-R16L (6L･J501)

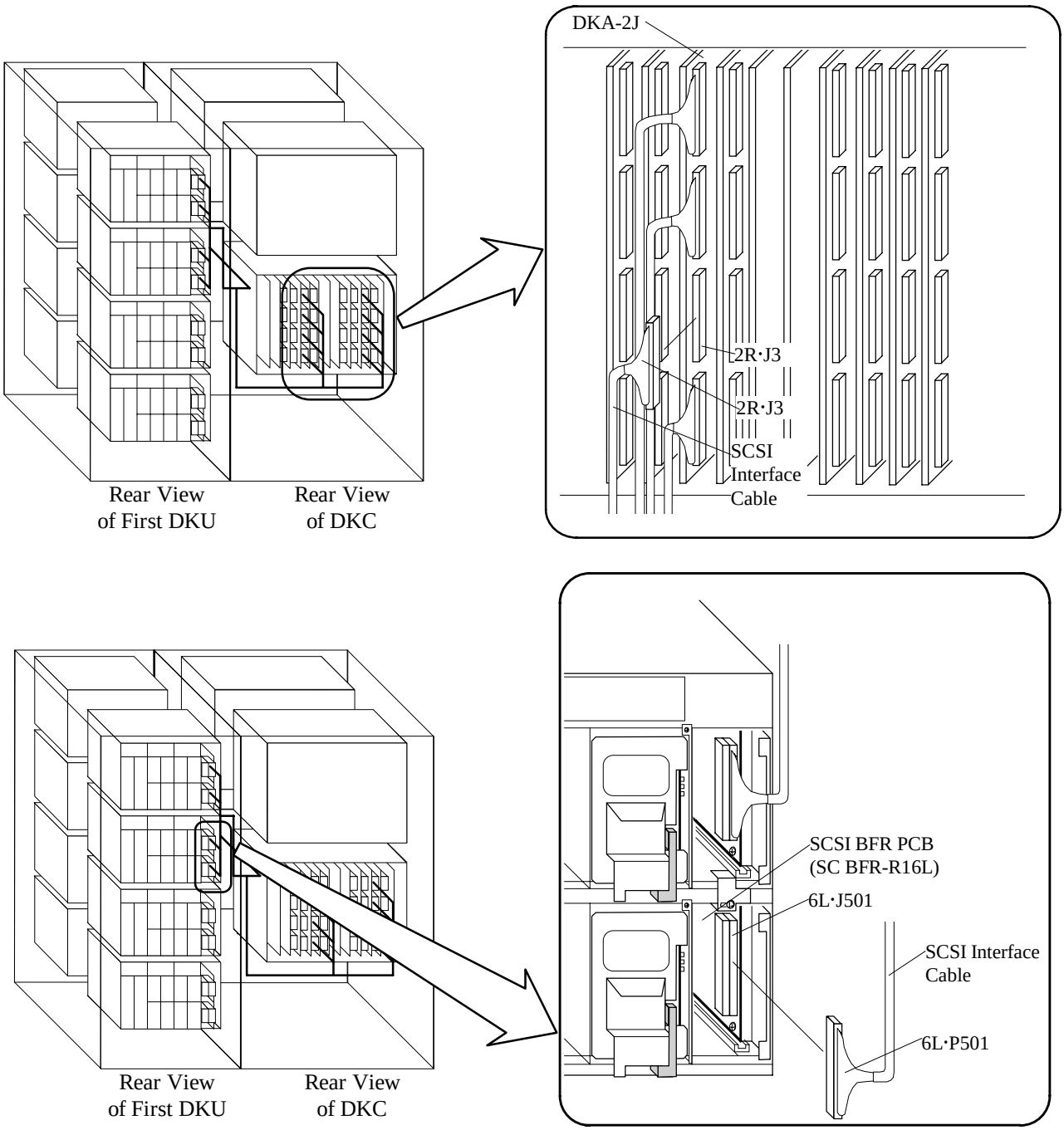

Fig. H-23 Replacement of SCSI Interface Cable

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Cable No. 16 DKA-2J (2R･J4) through SC BFR-R17L (7L･J501)

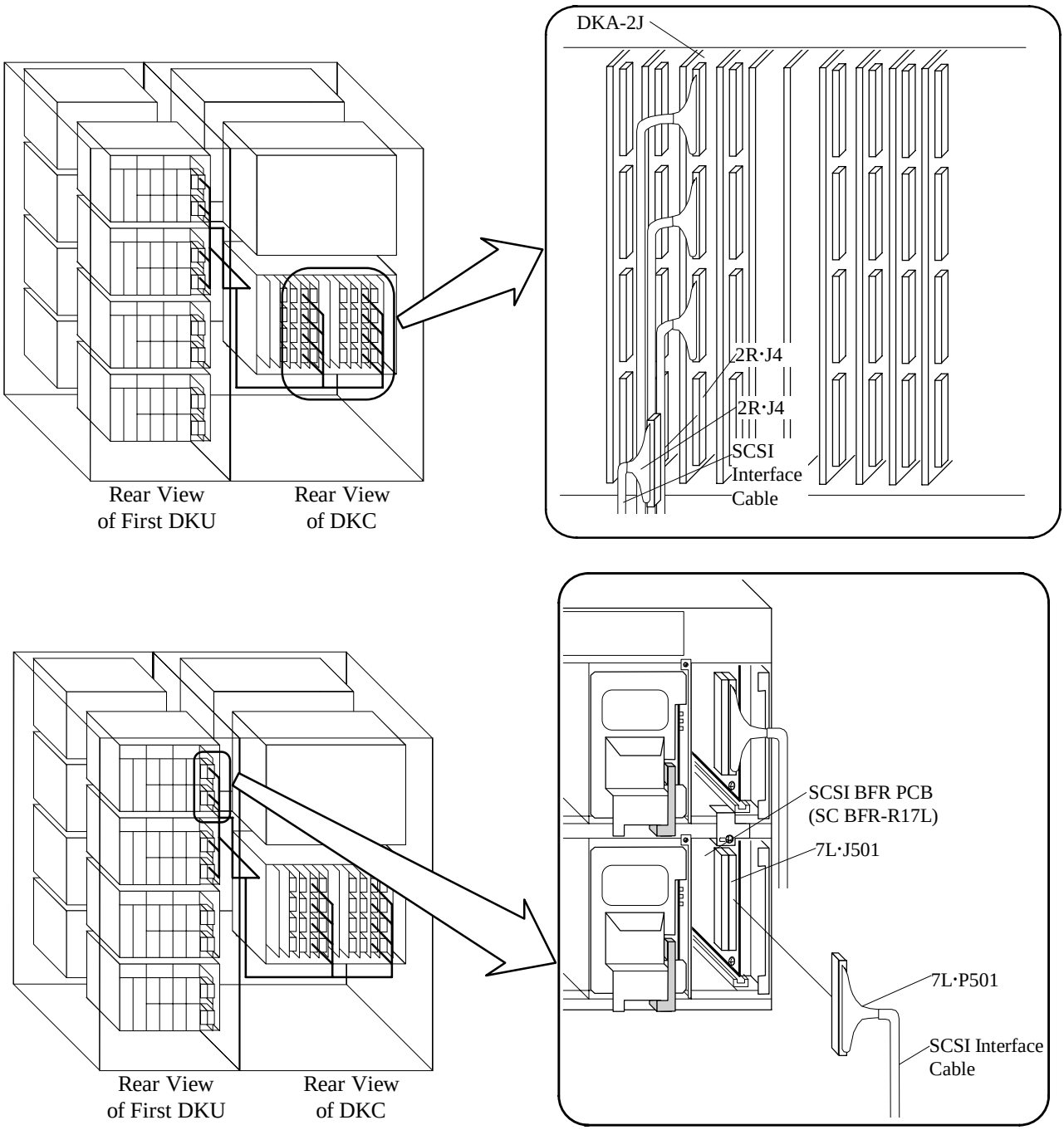

Fig. H-24 Replacement of SCSI Interface Cable

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(6) Attach the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(7) Attach the cable duct covers and fasten the screws. Refer to Fig. H-15.

(8) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

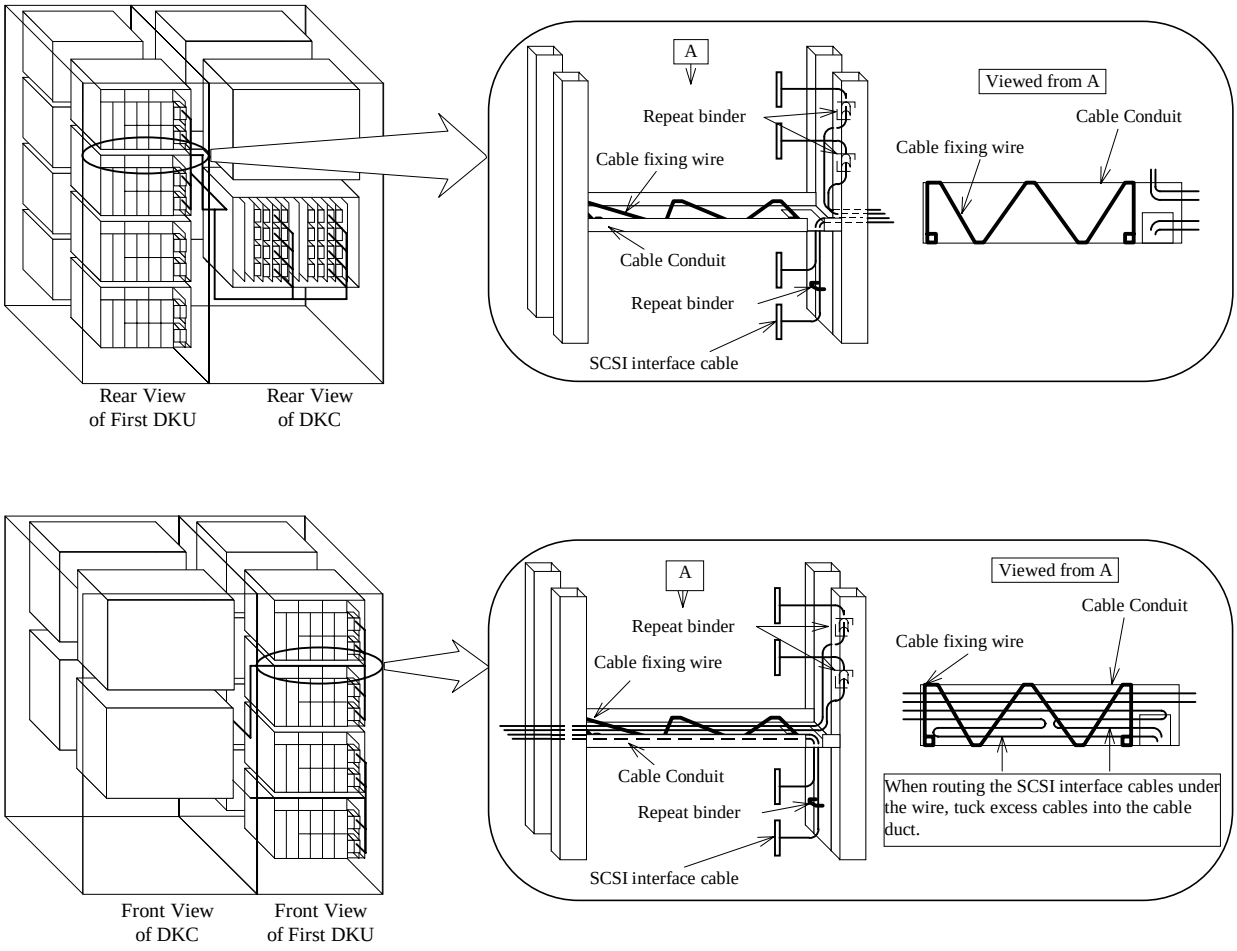

Fig. H-25 Fixation of the SCSI Interface Cables

(9) In case that there is 2nd/4th DKU, go to REP03-227.
In case that there isn't 2nd/4th DKU, go to post-PROCEDURE h (REP04-420).

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Cable No. 17-24 DKA-1D/2K through SC BFR-L10-L13U/L

(1) Remove the cable fixing wires and repeat binders.

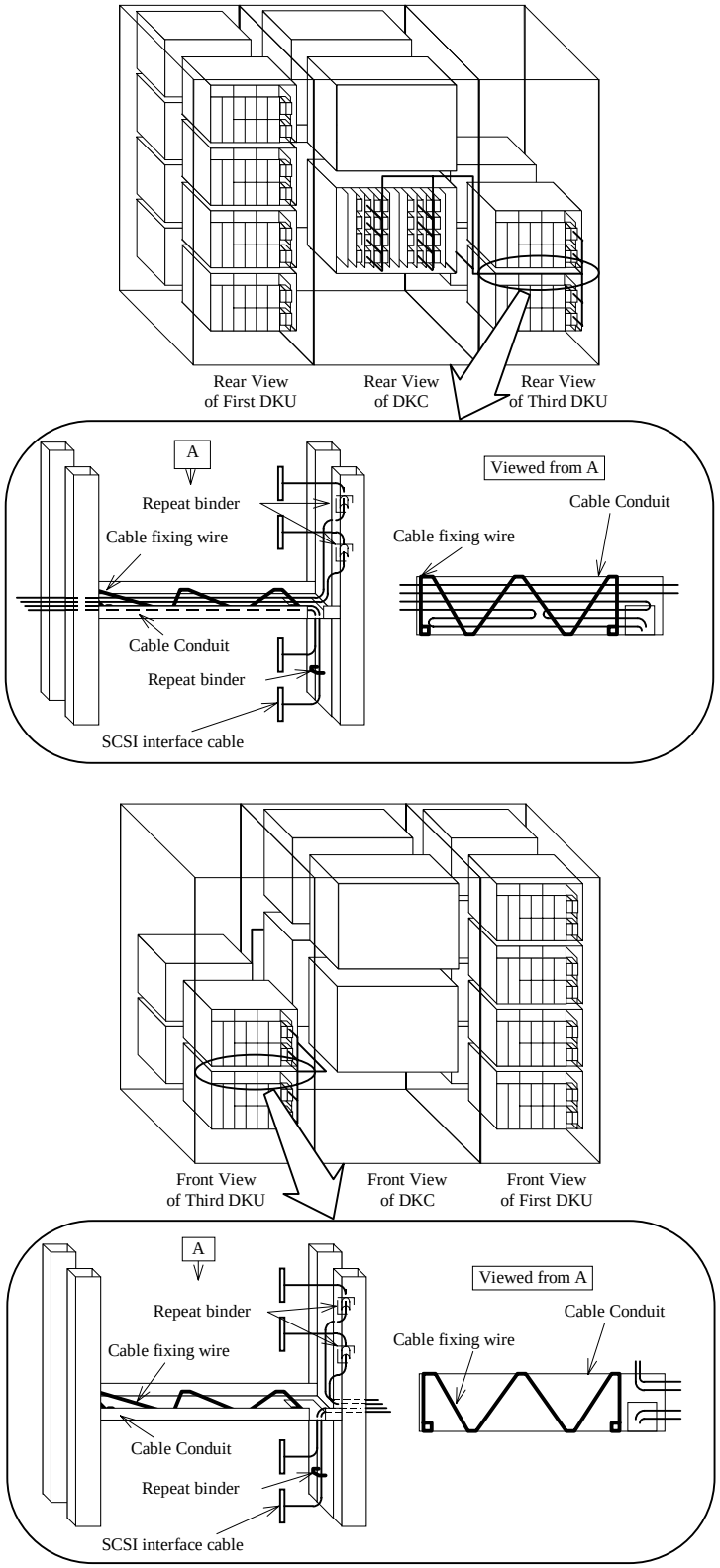

Fig. H-26 Removal of the cable fixing wires and repeat binders

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(2) Remove the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(3) Loosen the screws and remove the cable duct covers.

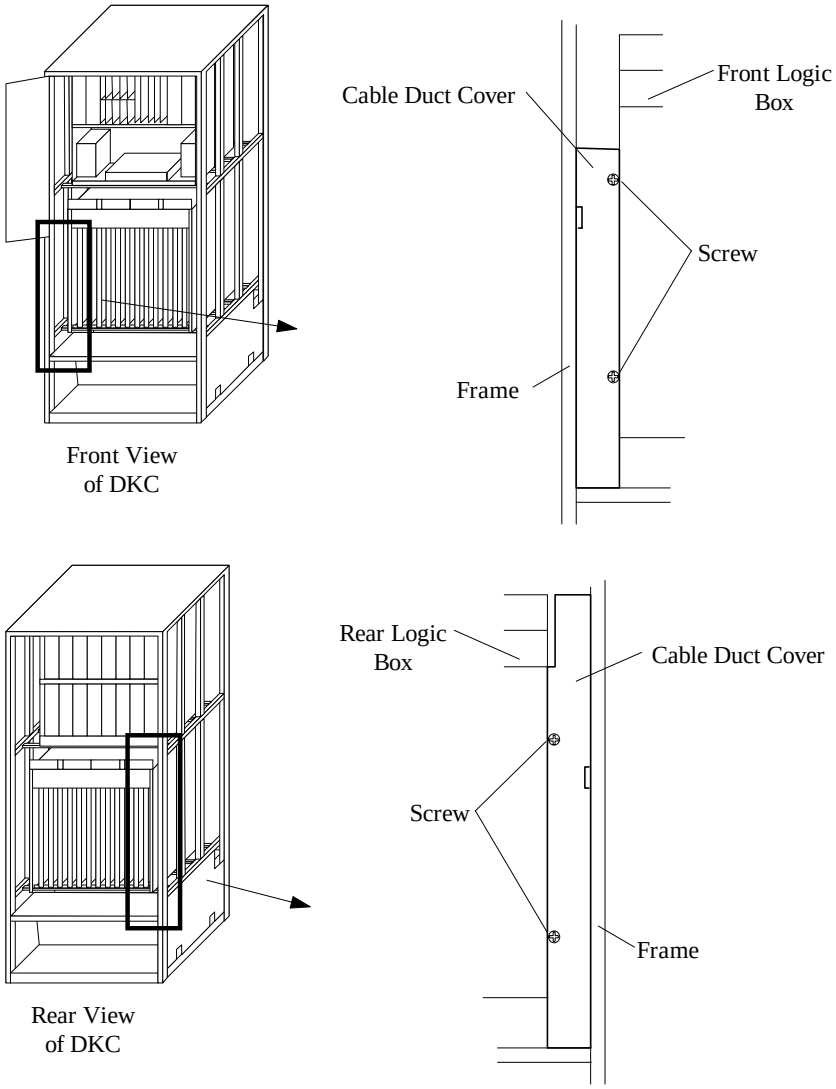

Fig. H-27 Removal of Cable Duct Covers

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(4) Since the SCSI interface cable shown in the table below is not detachable, it should be replaced after wiring a cable for maintenance parts in a different route. Other cables should be wired in the same way as the previous route.

Table H-5 SCSI Interface Cable Connections

DKA PCB			SCSI BFR PCB (1st/3rd DKU)		
Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.
DKA-1D	1R·D1	1R·D1	SCBFR-L10U	0U·J501	0U·P501
	1R·D2	1R·D2	SCBFR-L11U	1U·J501	1U·P501
DKA-2K	2R·K1	2R·K1	SCBFR-L10L	0L·J501	0L·P501
	2R·K2	2R·K2	SCBFR-L11L	1L·J501	1L·P501

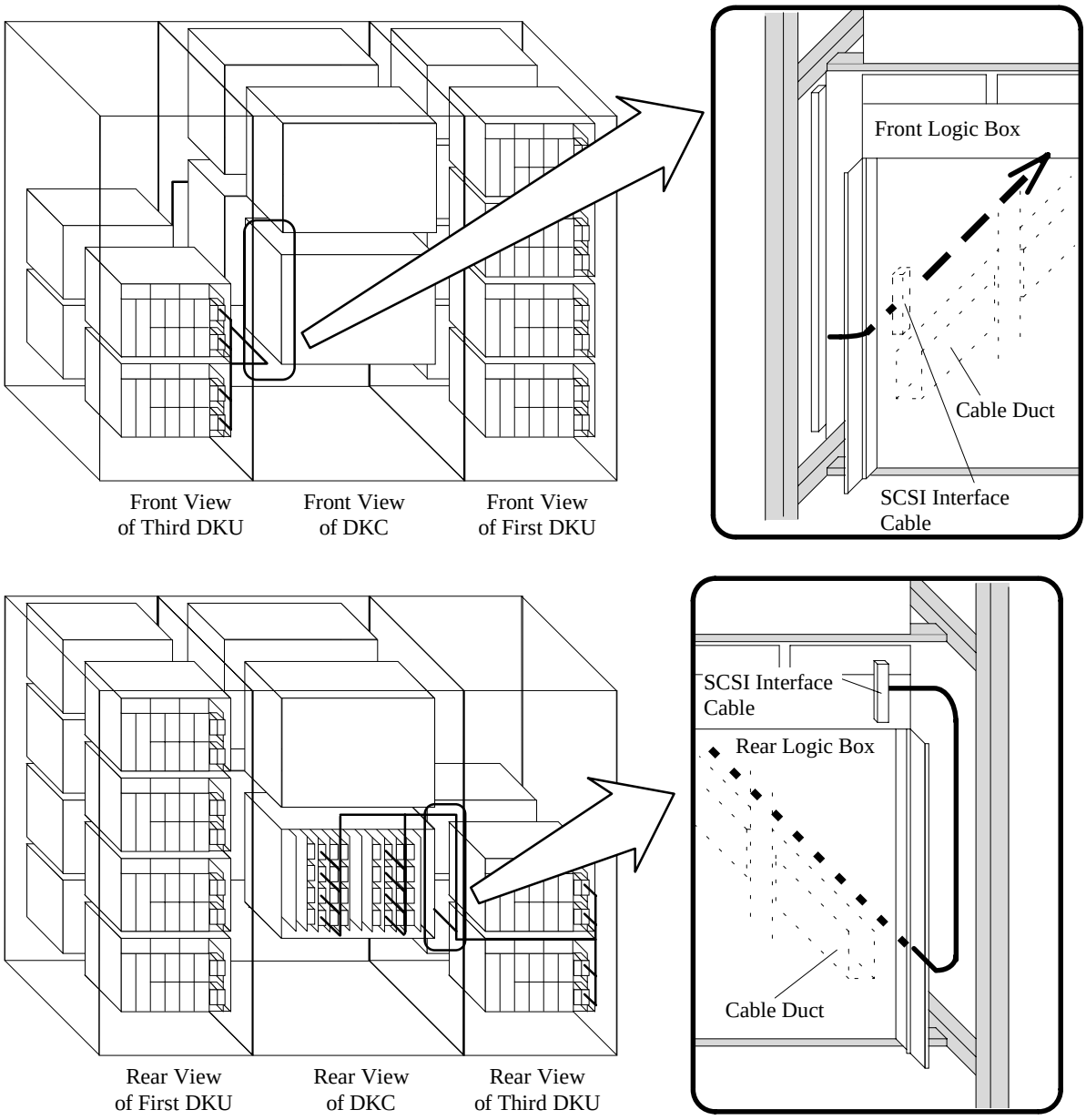

Fig. H-28 Routing of SCSI Inteface Cable

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(5) Replace the SCSI interface cable.

Cable No. 17 DKA-1D (1R·D1) through SC BFR-L10U (0U·J501)

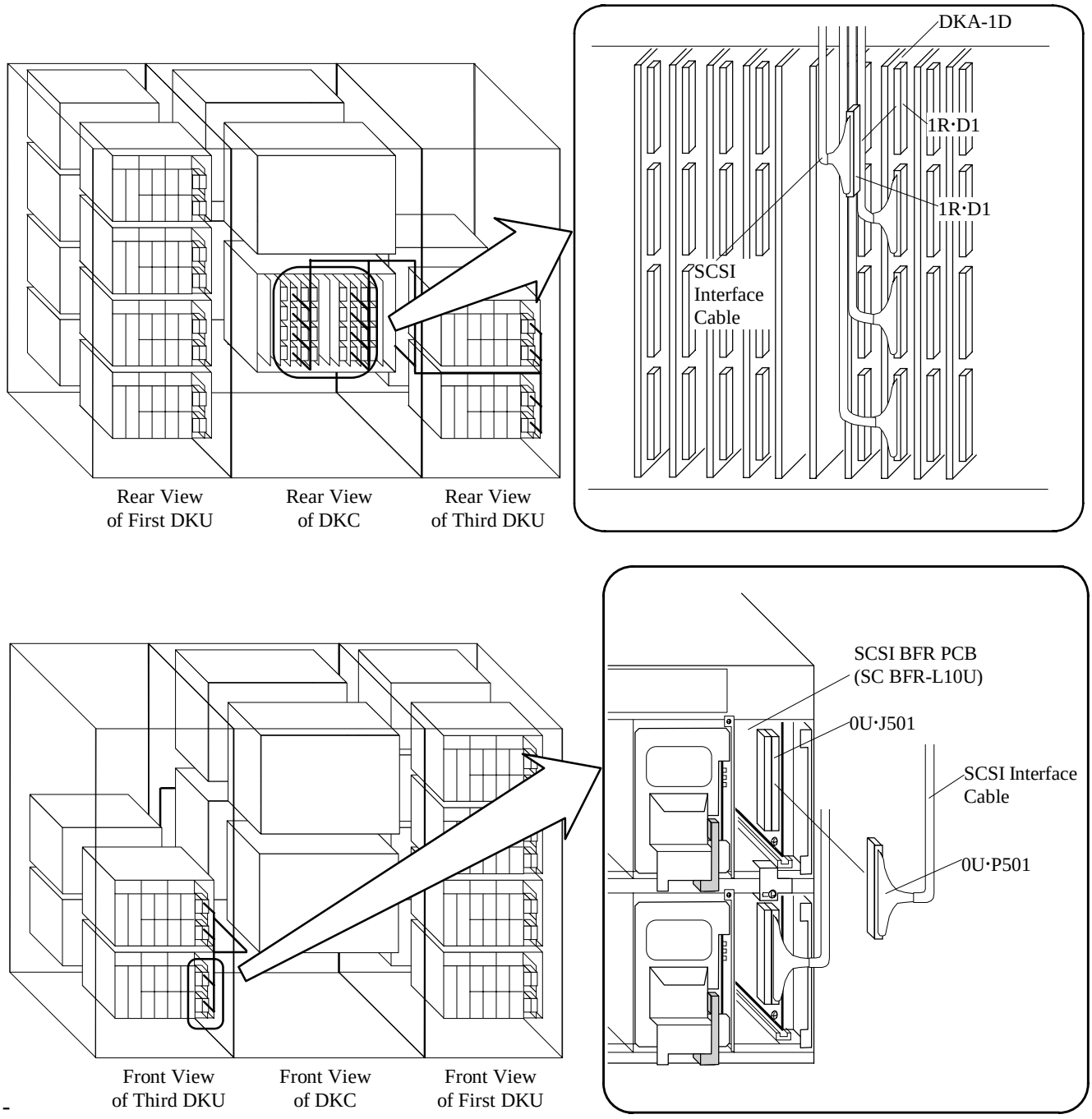

Fig. H-29 Replacement of SCSI Interface Cable

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Cable No. 18 DKA-1D (1R･D2) through SC BFR-L11U (1U･J501)

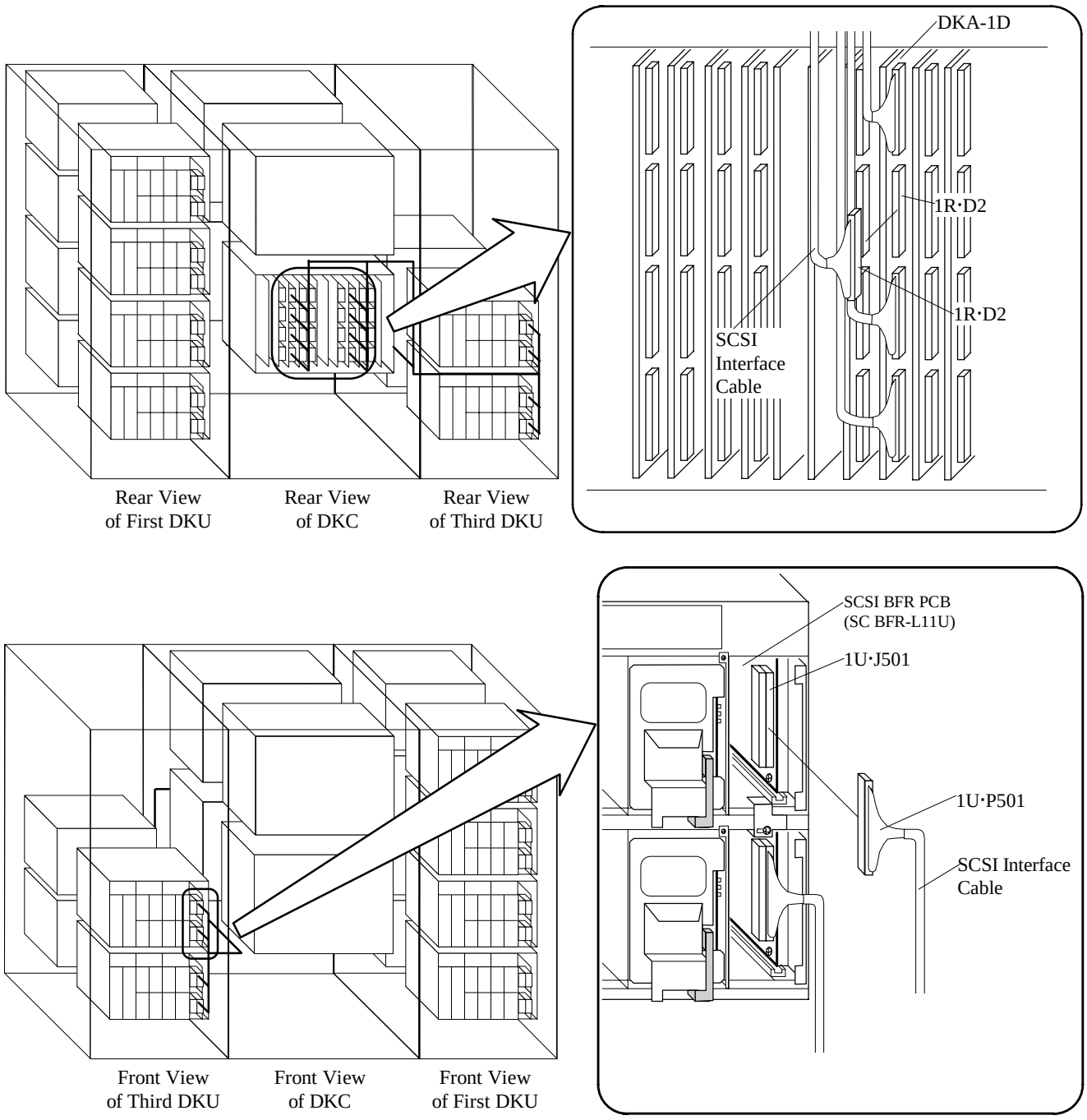

Fig. H-30 Replacement of SCSI Interface Cable

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Cable No. 19 DKA-1D (1R･D3) through SC BFR-L12U (2U･J501)

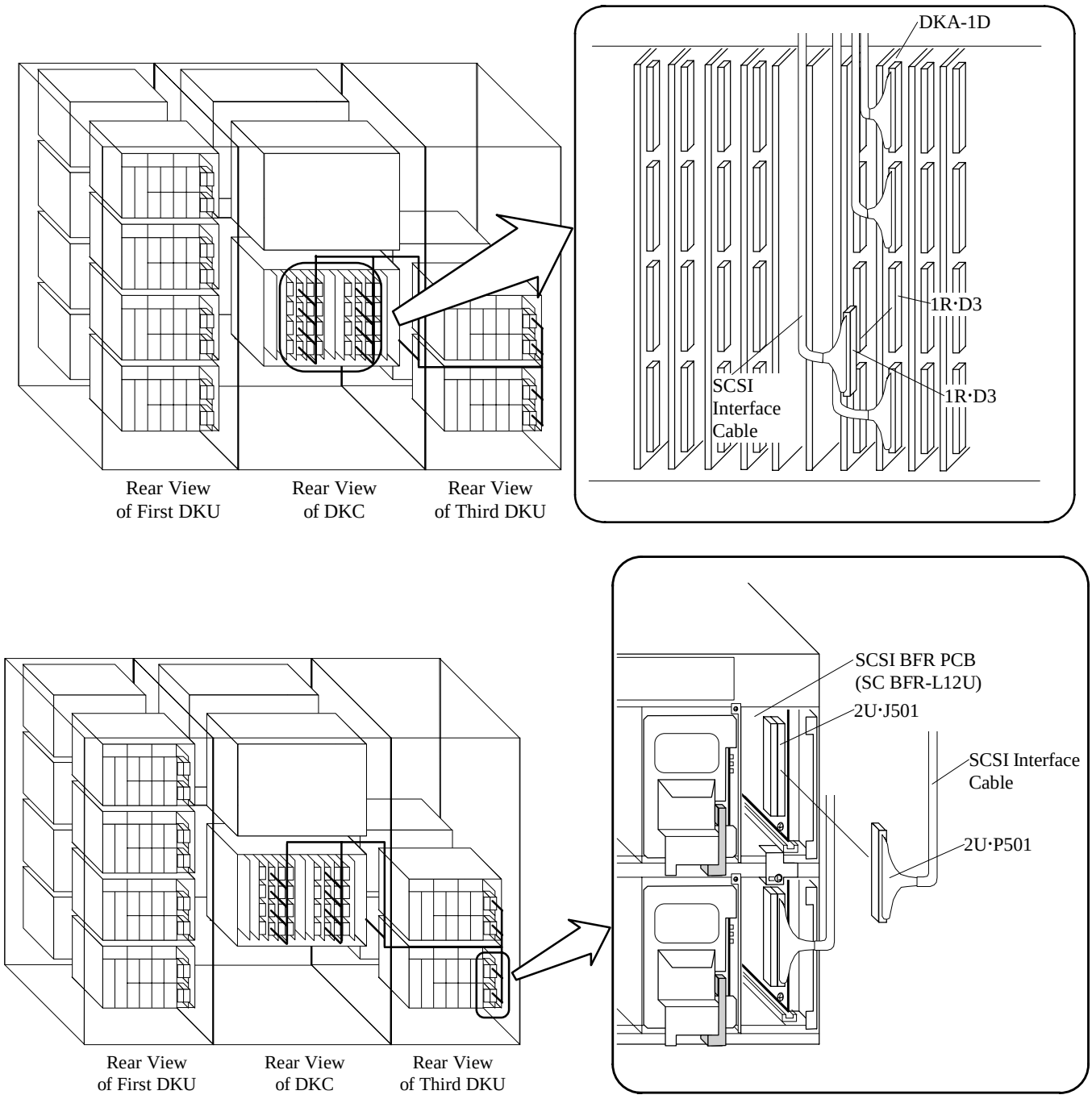

Fig. H-31 Replacement of SCSI Interface Cable

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Cable No. 20 DKA-1D (1R･D4) through SC BFR-L13U (3U･J501)

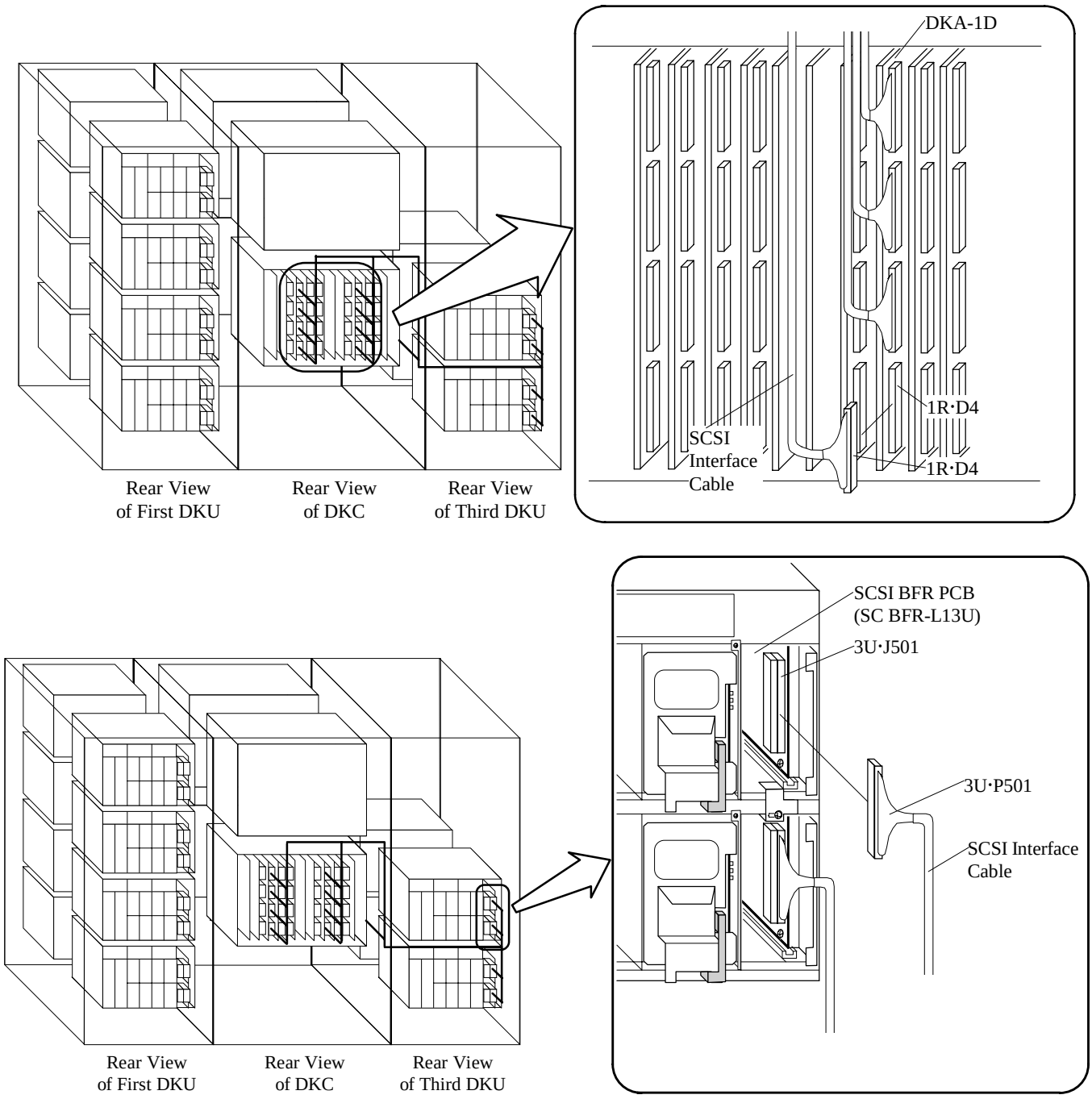

Fig. H-32 Replacement of SCSI Interface Cable

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Cable No. 21 DKA-2K (2R･K1) through SC BFR-L10L (0L･J501)

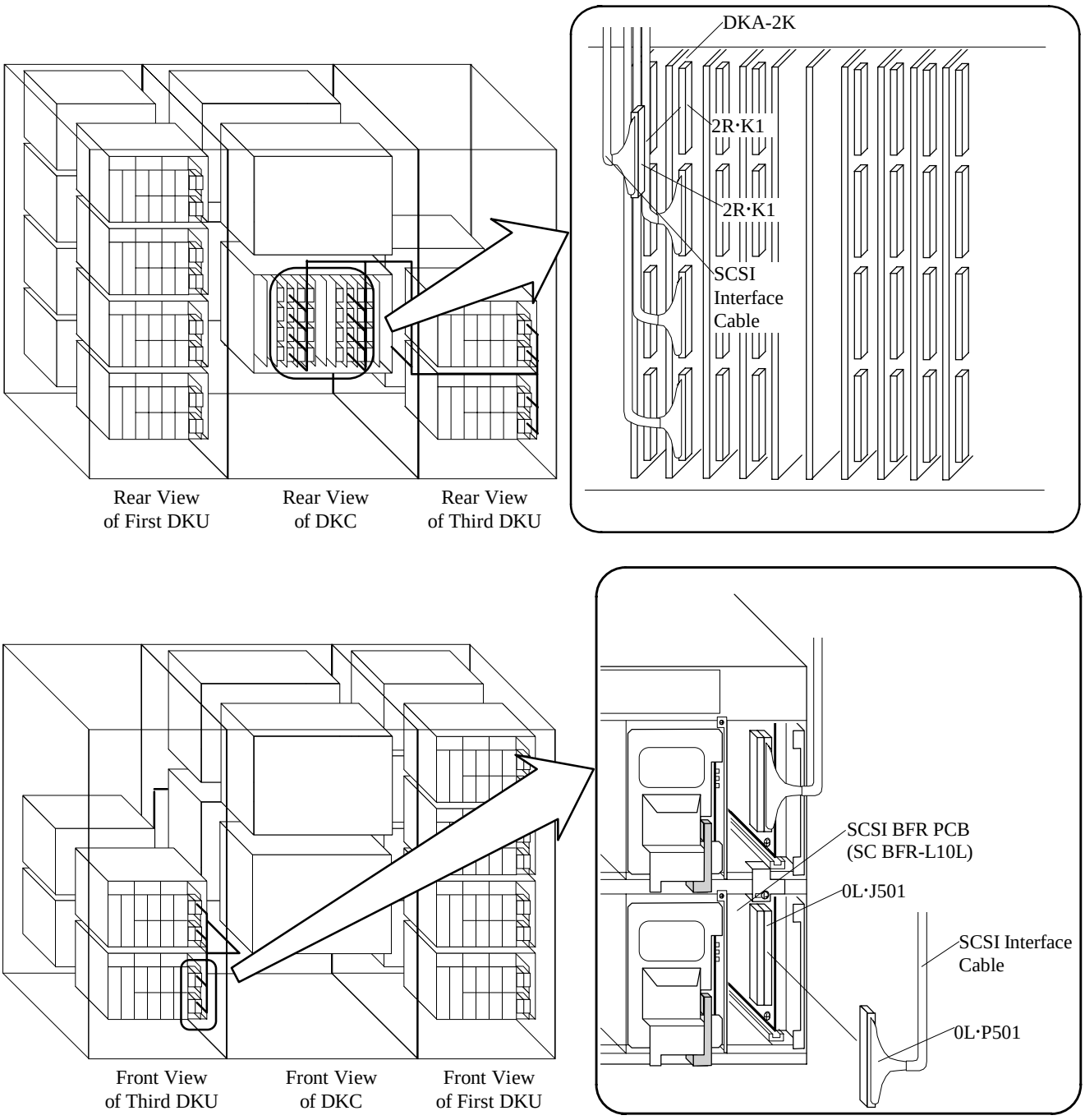

Fig. H-33 Replacement of SCSI Interface Cable

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Cable No. 22 DKA-2K (2R･K2) through SC BFR-L11L (1L･J501)

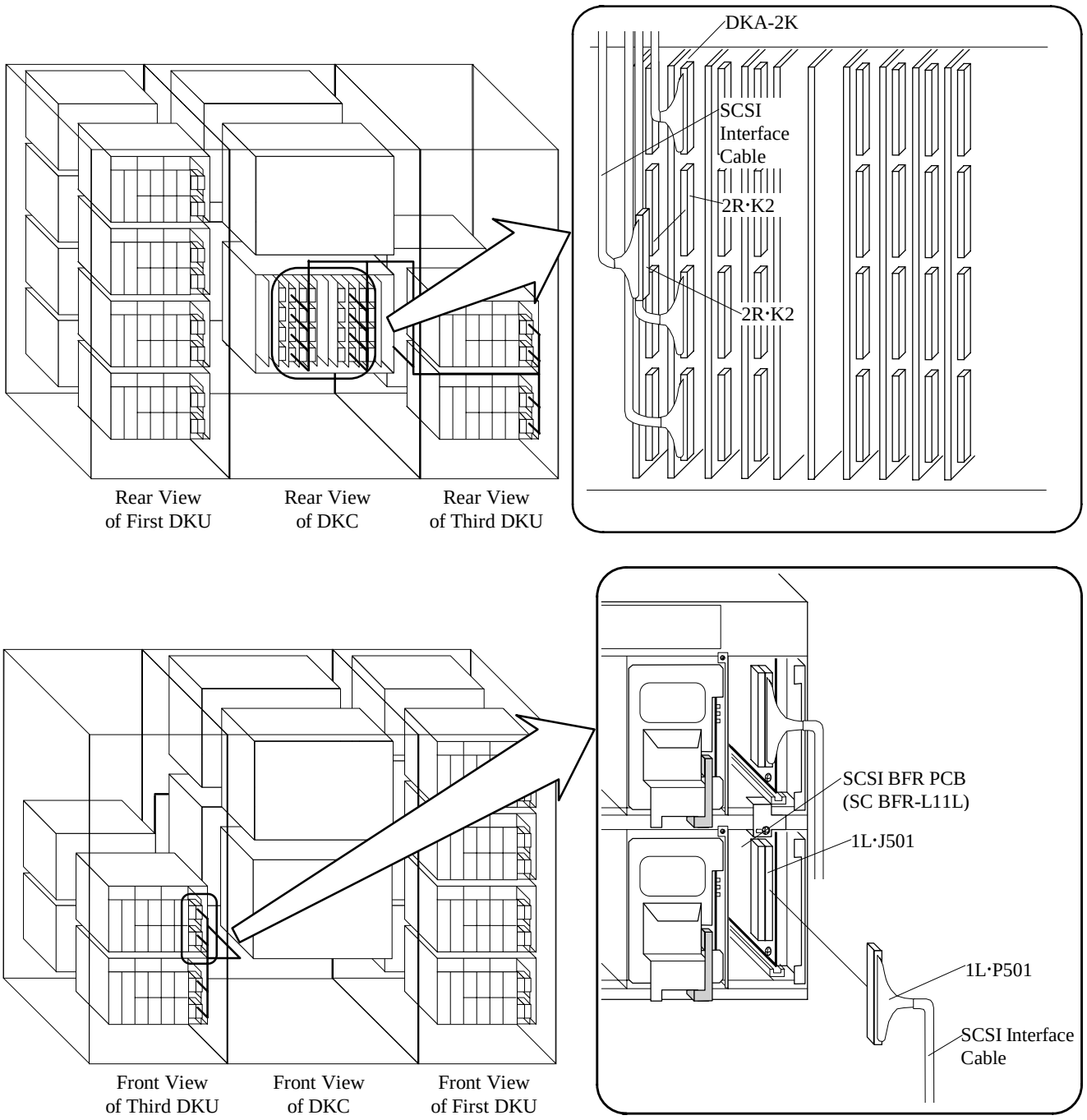

Fig. H-34 Replacement of SCSI Interface Cable

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Cable No. 23 DKA-2K (2R･K3) through SC BFR-L12L (2L･J501)

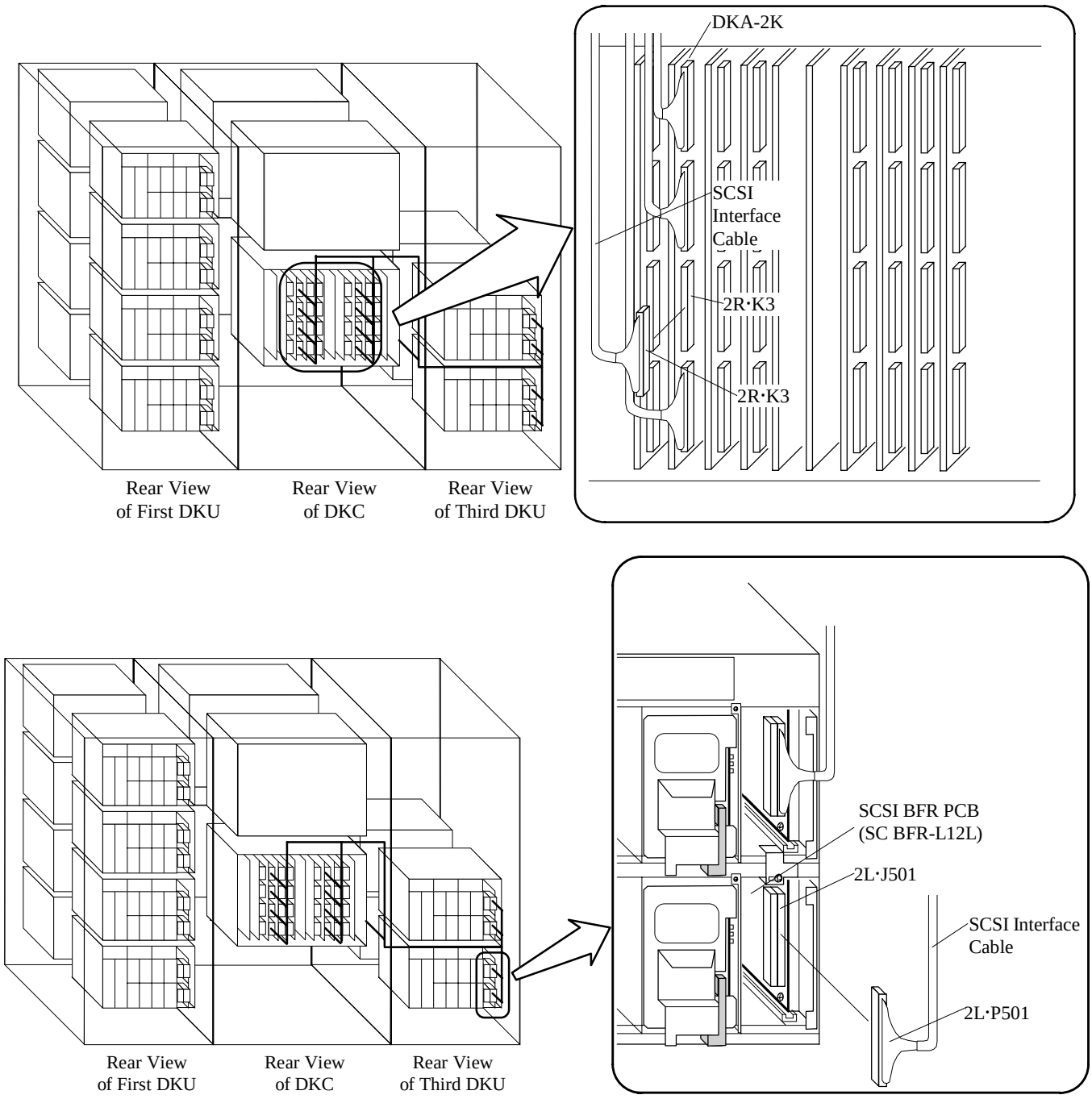

Fig. H-35 Replacement of SCSI Interface Cable

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Cable No. 24 DKA-2K (2R･K4) through SC BFR-L13L (3L･J501)

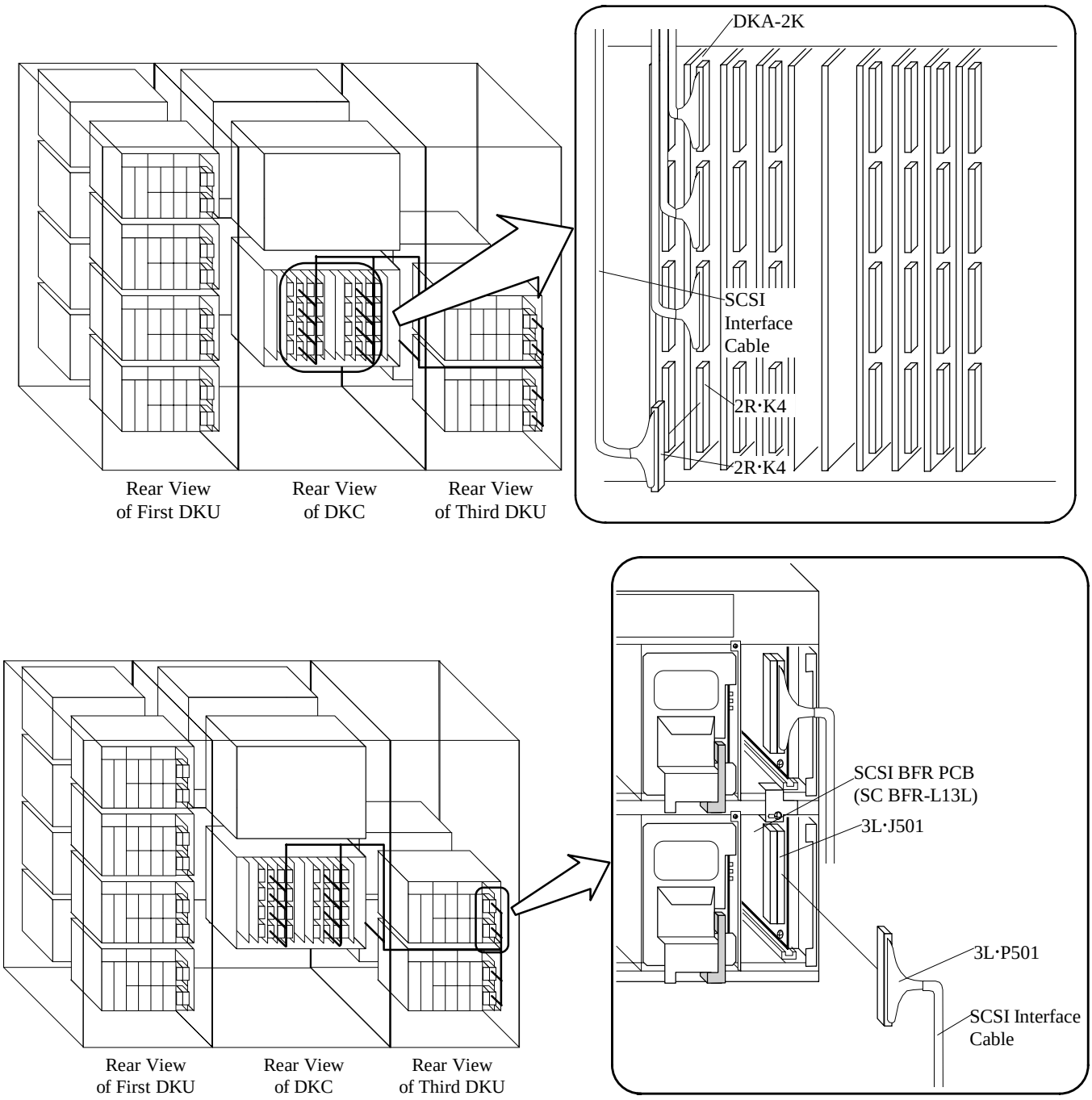

Fig. H-36 Replacement of SCSI Interface Cable

(6) Attach the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(7) Attach the cable duct covers and fasten the screws. Refer to Fig. H-27.

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(8) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

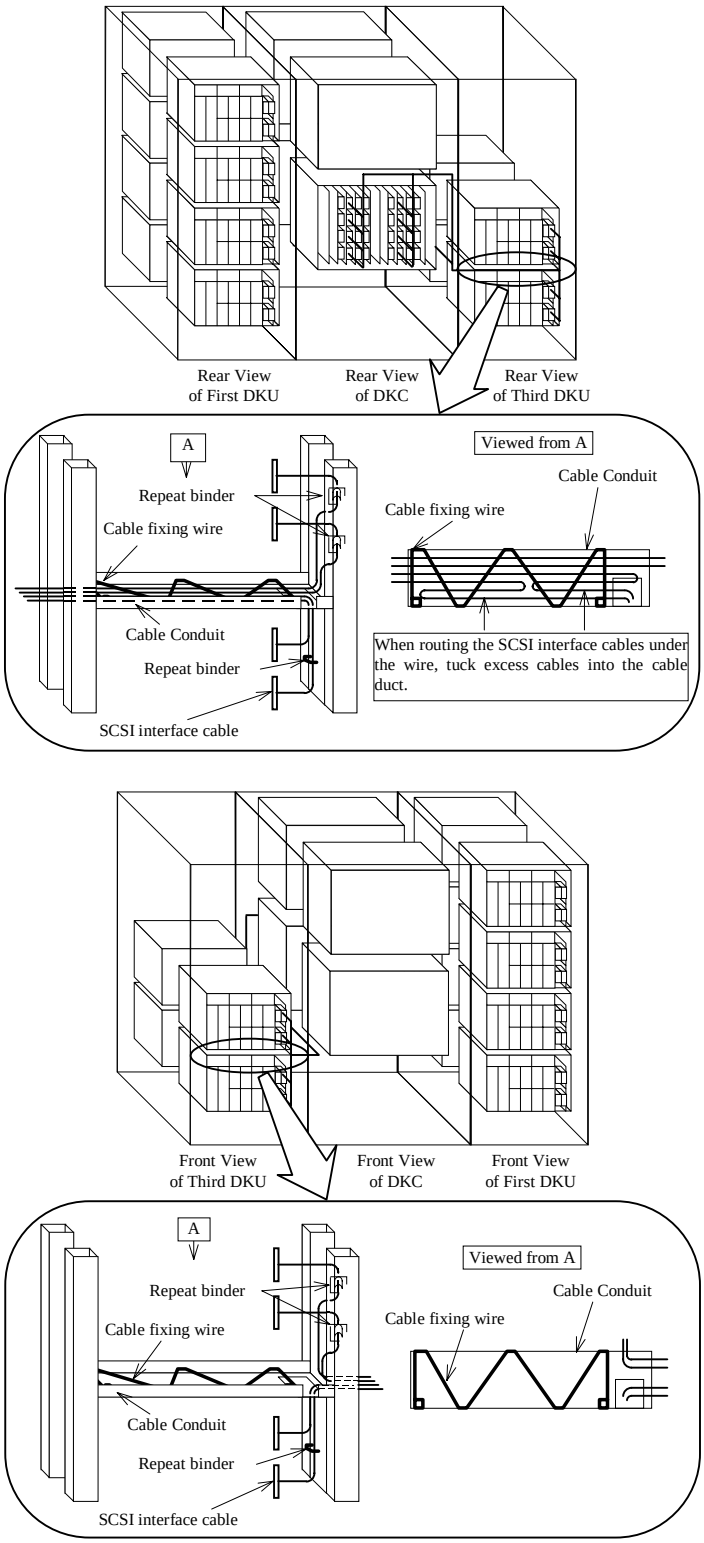

Fig. H-37 Fixation of the SCSI Interface Cables

(9) In case that there is 2nd/4th DKU, go to REP03-228.
In case that there isn't 2nd/4th DKU, go to post-PROCEDURE h (REP04-420).

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Cable No. 25-32 DKA-1E/2L through SC BFR-L14-L17U/L

(1) Remove the cable fixing wires and repeat binders.

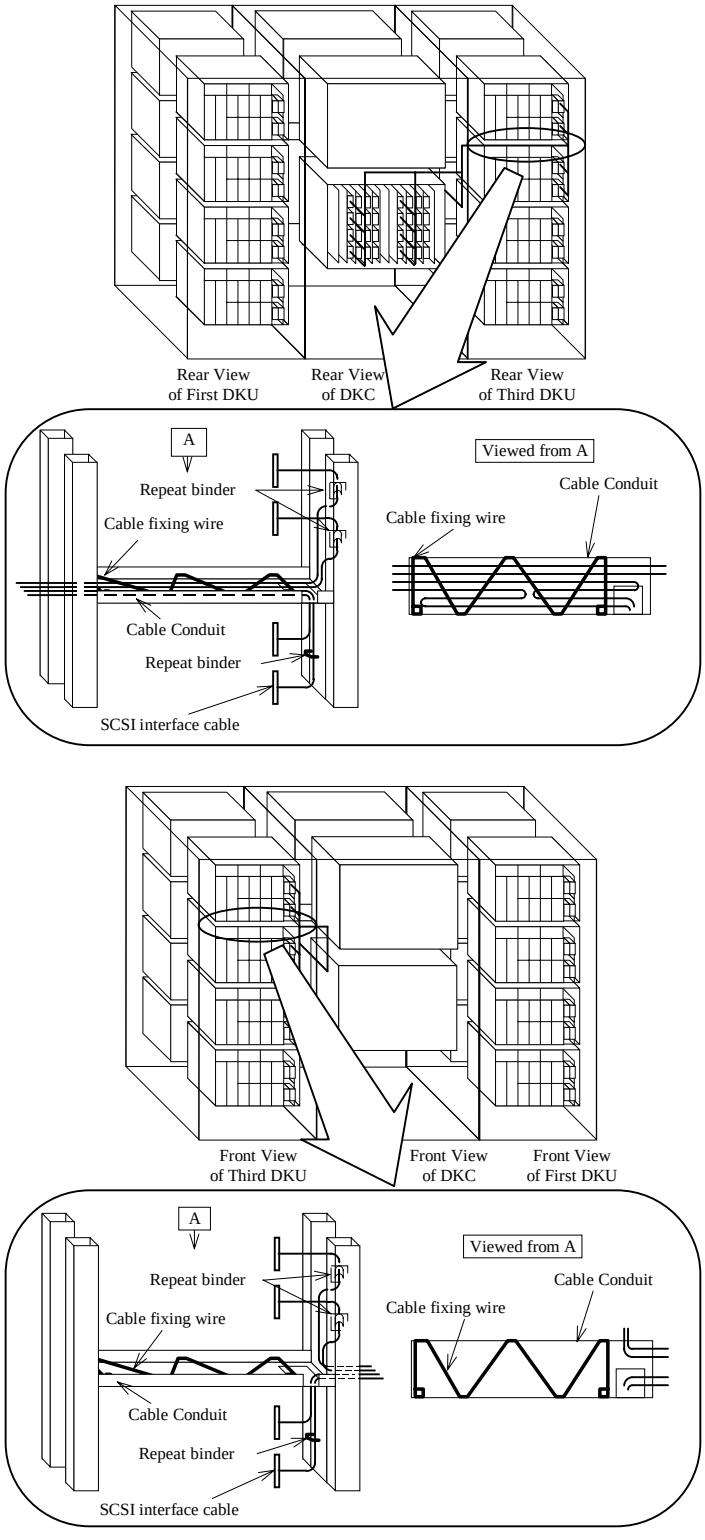

Fig. H-38 Removal of the cable fixing wires and repeat binders

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(2) Remove the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(3) Loosen the screws and remove the cable duct covers.

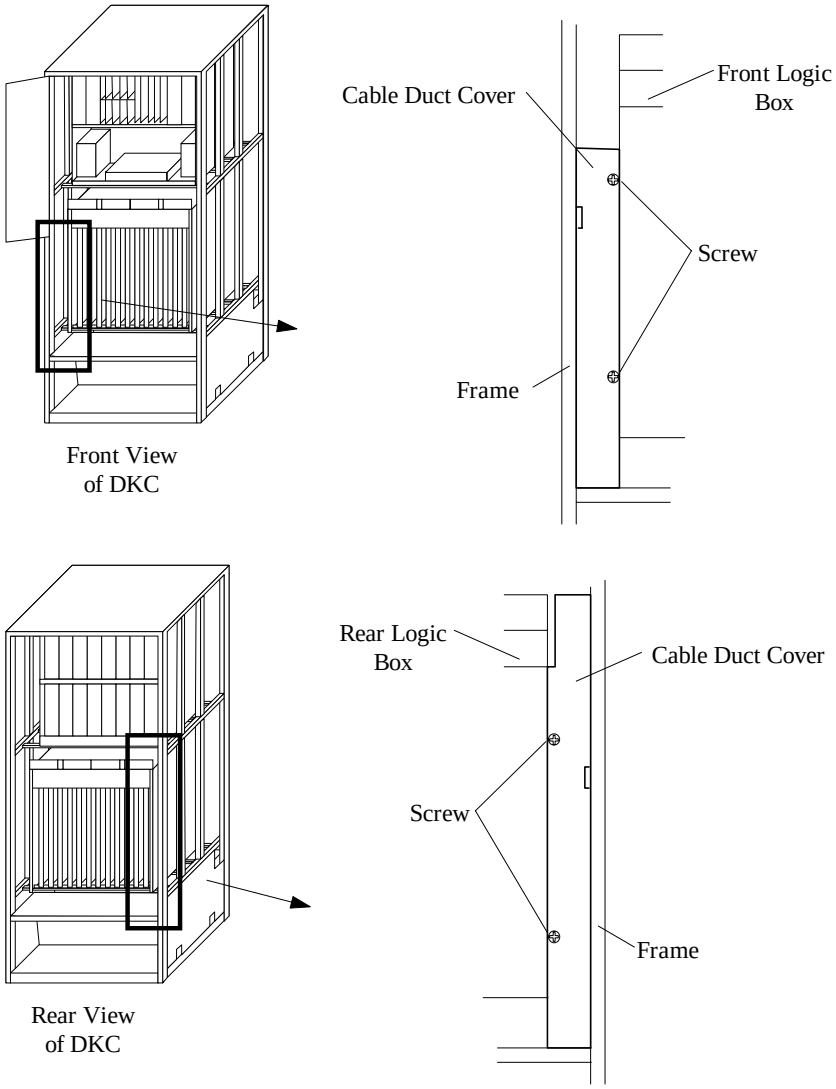

Fig. H-39 Removal of Cable Duct Covers

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(4) Since the SCSI interface cable shown in the table below is not detachable, it should be replaced after wiring a cable for maintenance parts in a different route. Other cables should be wired in the same way as the previous route.

Table H-6 SCSI Interface Cable Connections

Location No.	Connector No.	Cable No.	Location No.	Connector No.	Cable No.
DKA-1E	1R·E1	1R·E1	SCBFR-L14U	4U·J501	4U·P501
	1R·E2	1R·E2	SCBFR-L15U	5U·J501	5U·P501
DKA-2L	2R·L1	2R·L1	SCBFR-L14L	4L·J501	4L·P501
	2R·L2	2R·L2	SCBFR-L15L	5L·J501	5L·P501

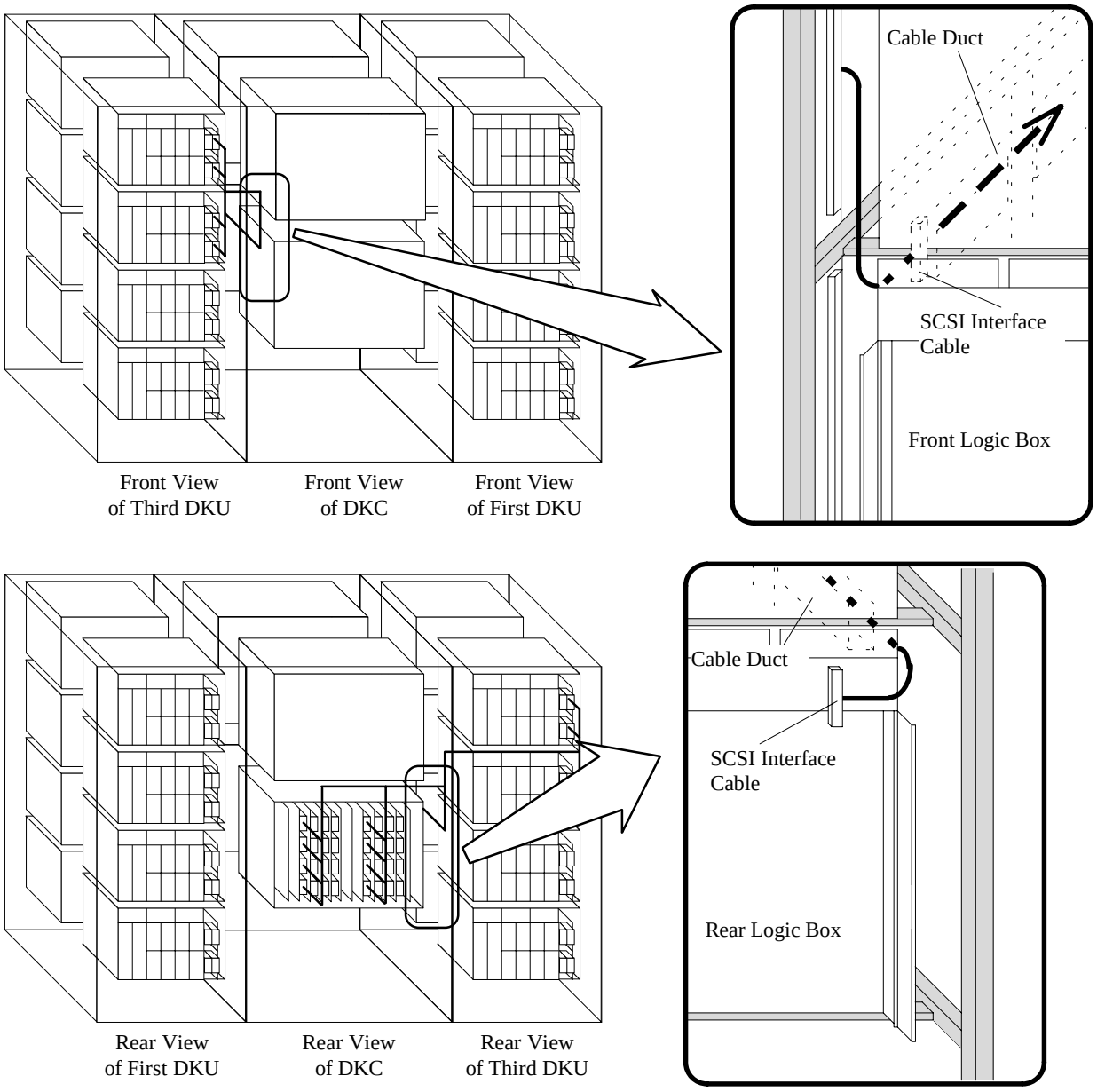

Fig. H-40 Routing of SCSI Inteface Cable

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(5) Replace the SCSI interface cable. The SCSI interface cable should be wired in the same way as the previous route.

Cable No. 25 DKA-1E (1R･E1) through SC BFR-L14U (4U･J501)

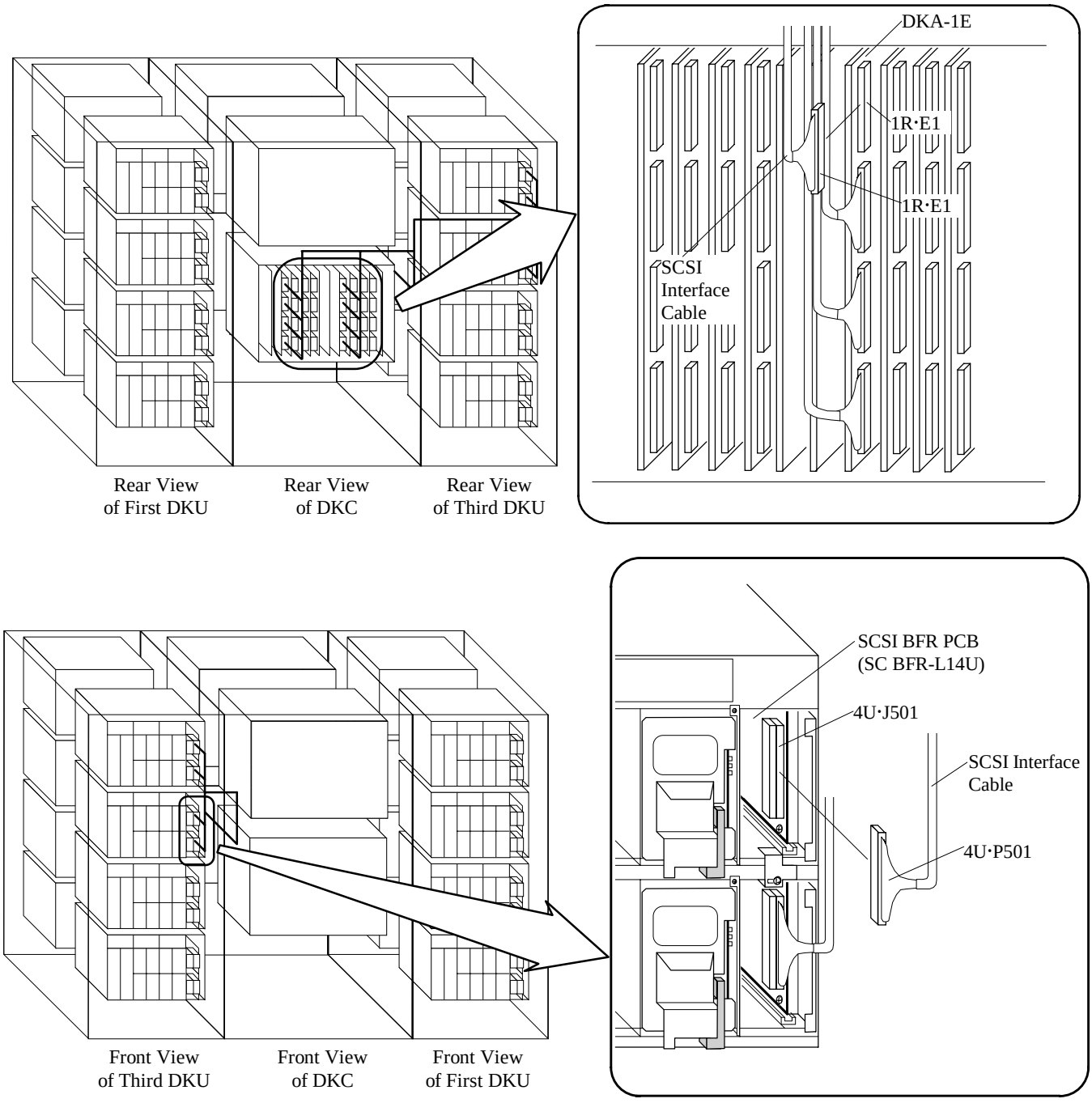

Fig. H-41 Replacement of SCSI Interface Cable

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Cable No. 26 DKA-1E (1R･E2) through SC BFR-L15U (5U･J501)

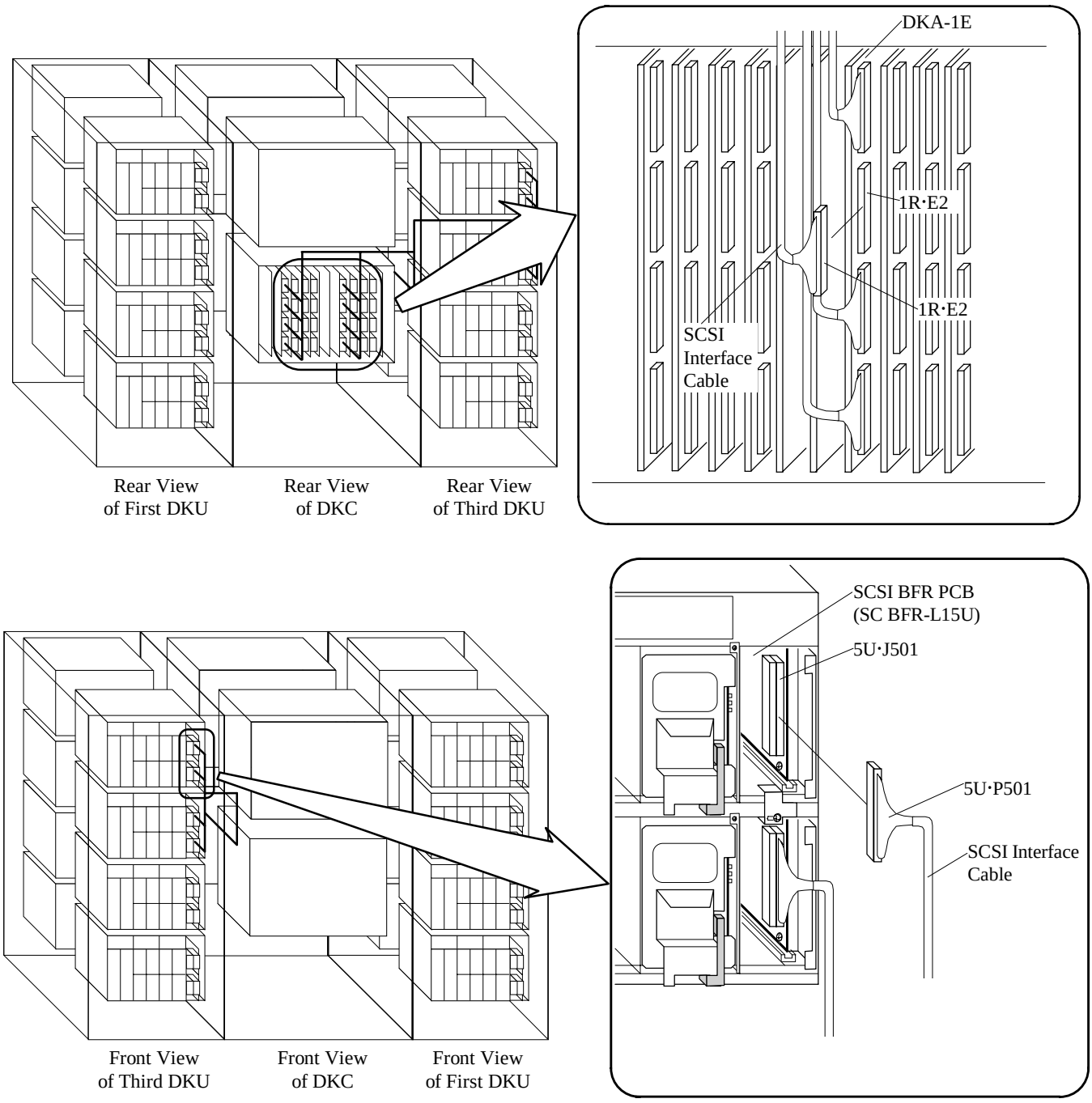

Fig. H-42 Replacement of SCSI Interface Cable

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Cable No. 27 DKA-1E (1R･E3) through SC BFR-L16U (6U･J501)

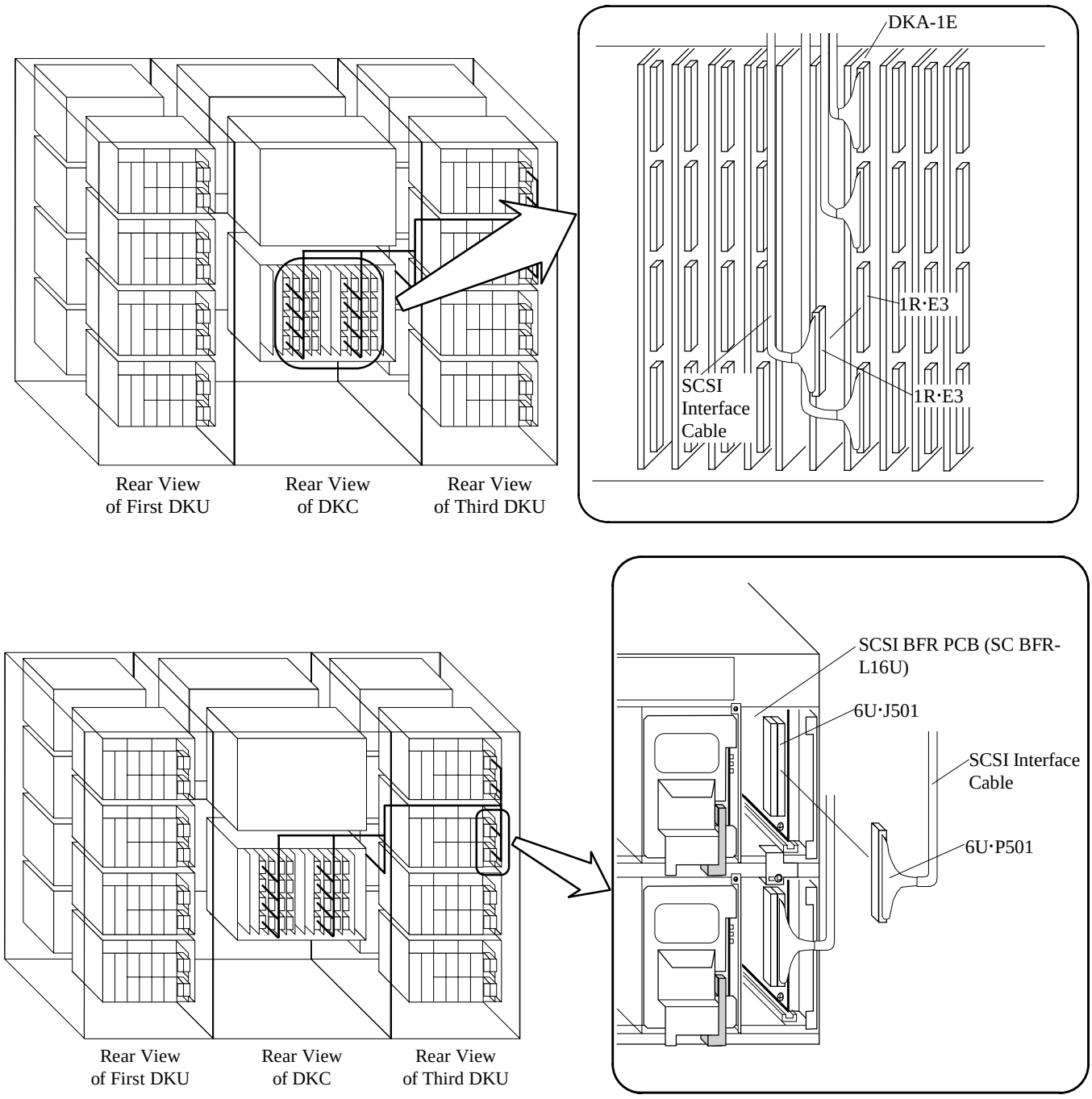

Fig. H-43 Replacement of SCSI Interface Cable

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Cable No. 28 DKA-1E (1R･E4) through SC BFR-L17U (7U･J501)

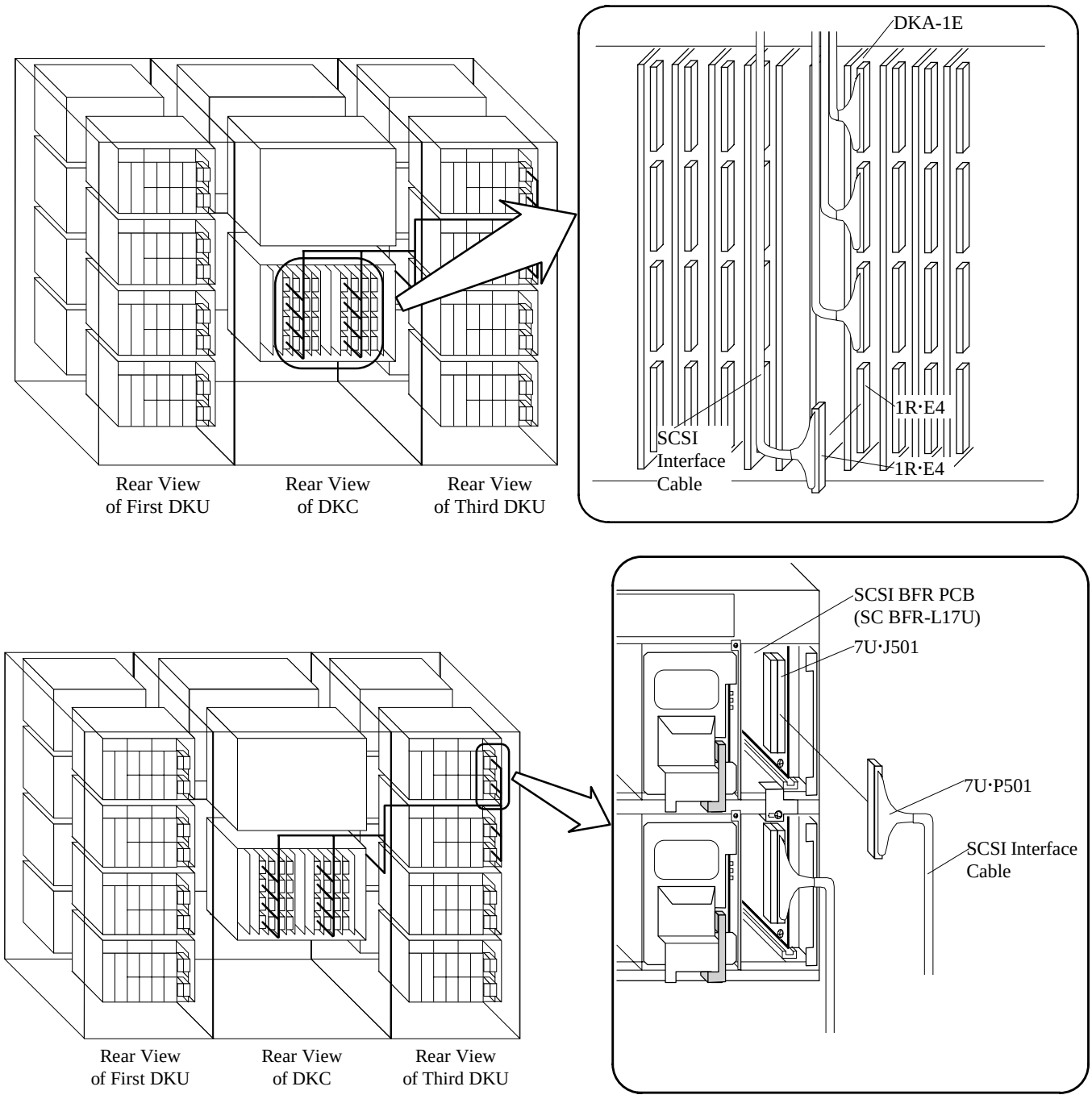

Fig. H-44 Replacement of SCSI Interface Cable

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Cable No. 29 DKA-2L (2R･L1) through SC BFR-L14L (4L･J501)

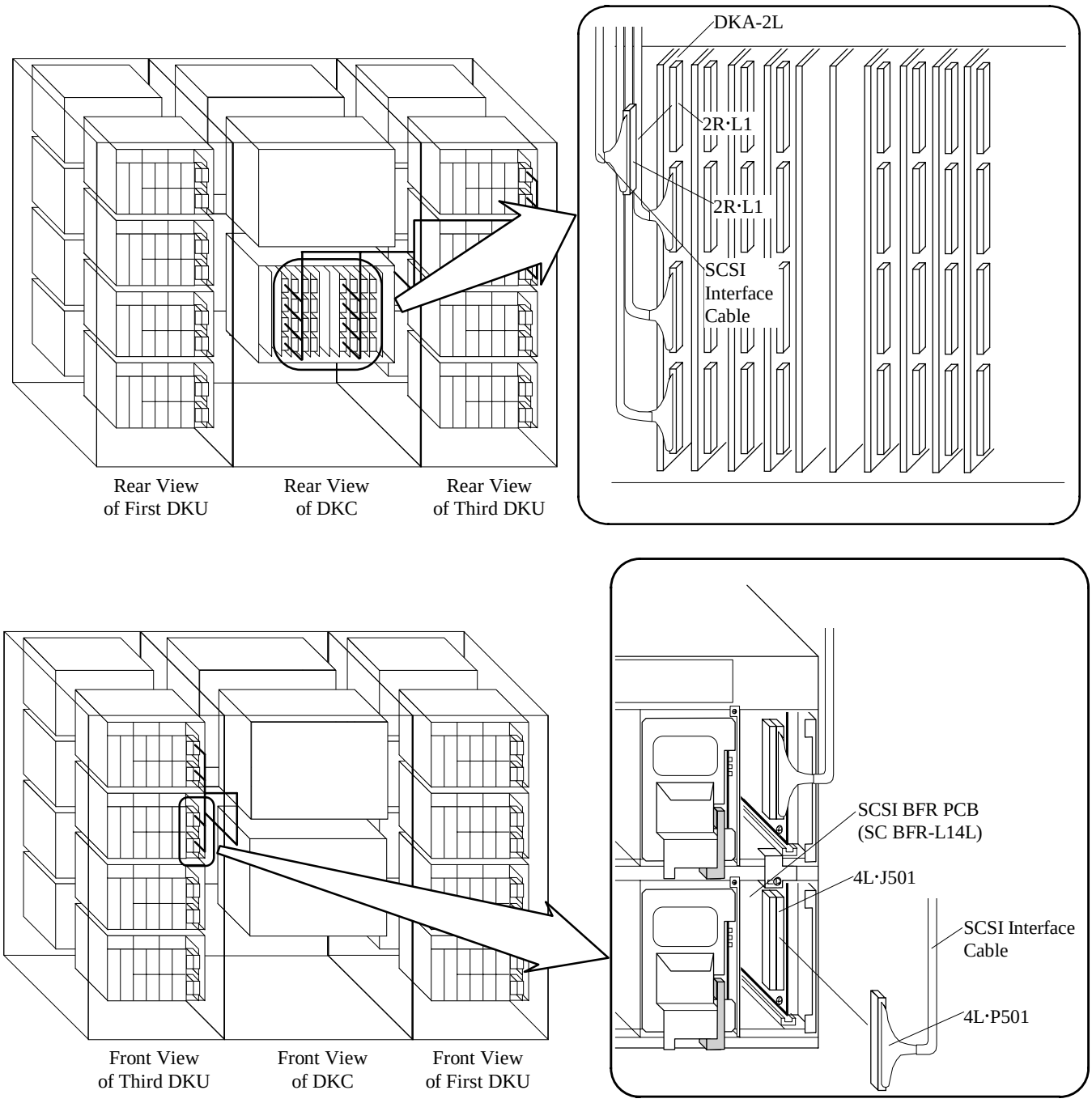

Fig. H-45 Replacement of SCSI Interface Cable

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Cable No. 30 DKA-2L (2R･L2) through SC BFR-L15L (5L･J501)

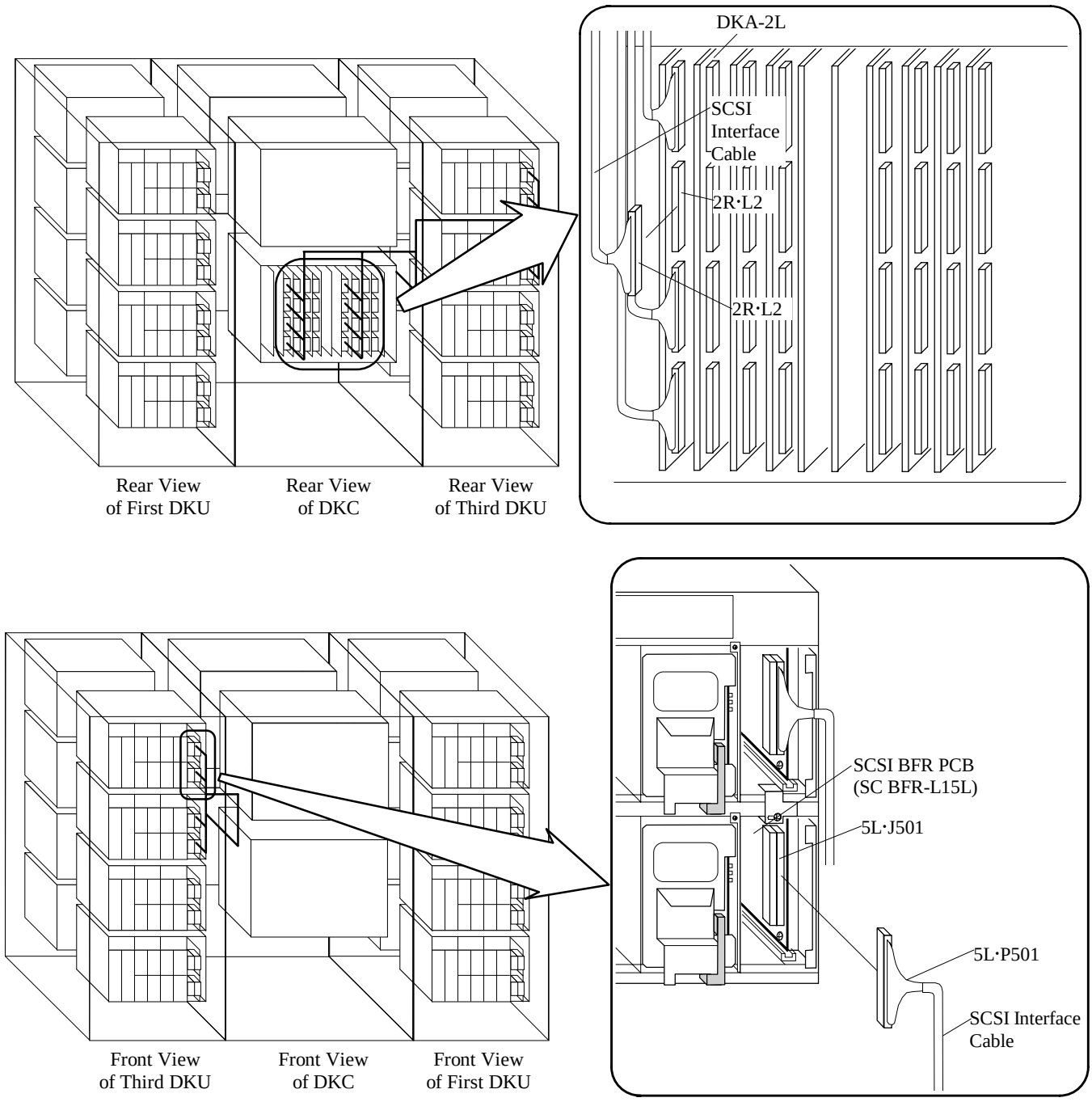

Fig. H-46 Replacement of SCSI Interface Cable

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Cable No. 31 DKA-2L (2R･L3) through SC BFR-L16L (6L･J501)

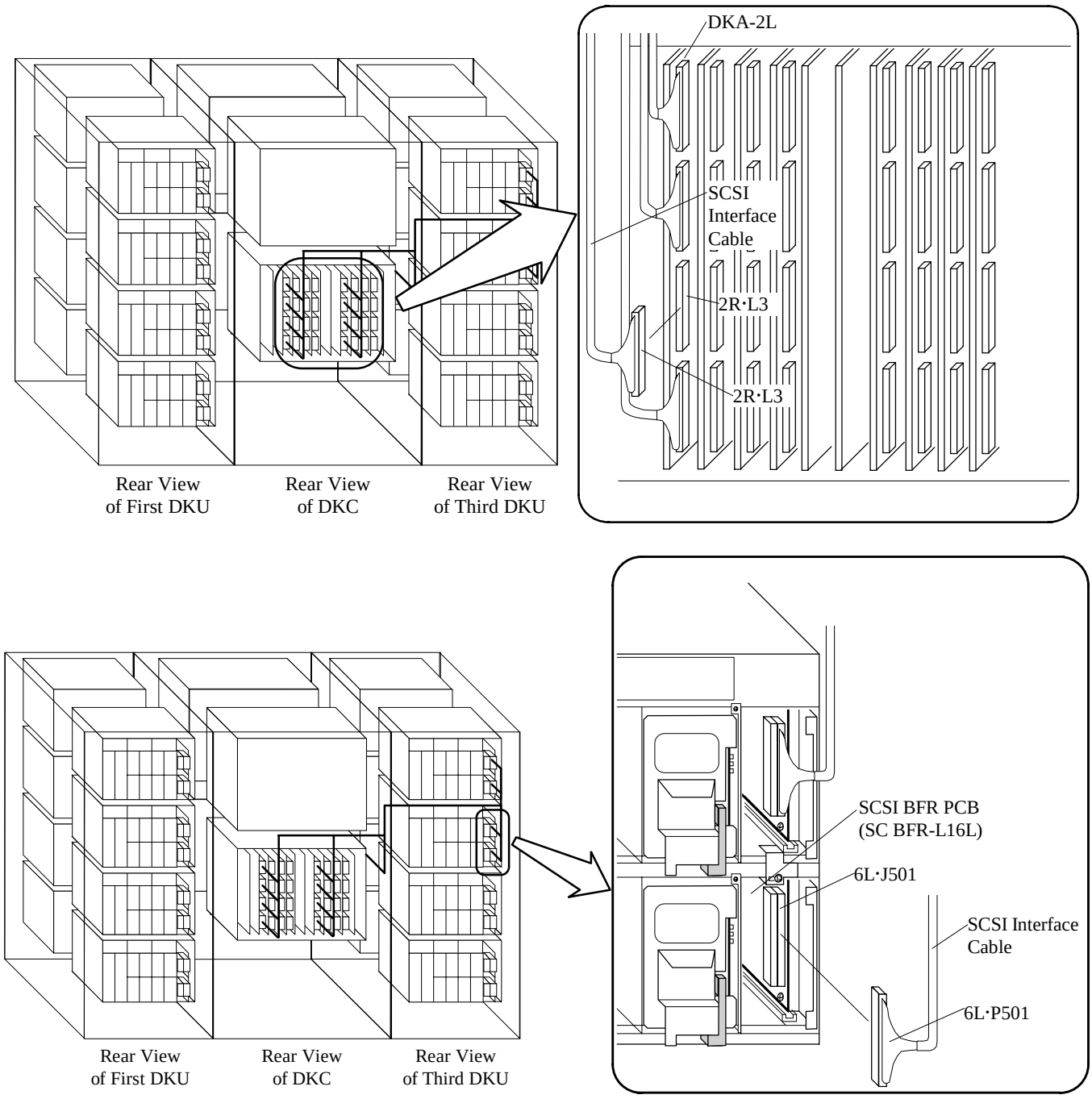

Fig. H-47 Replacement of SCSI Interface Cable

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Cable No. 32 DKA-2L (2R･L4) through SC BFR-L17L (7L･J501)

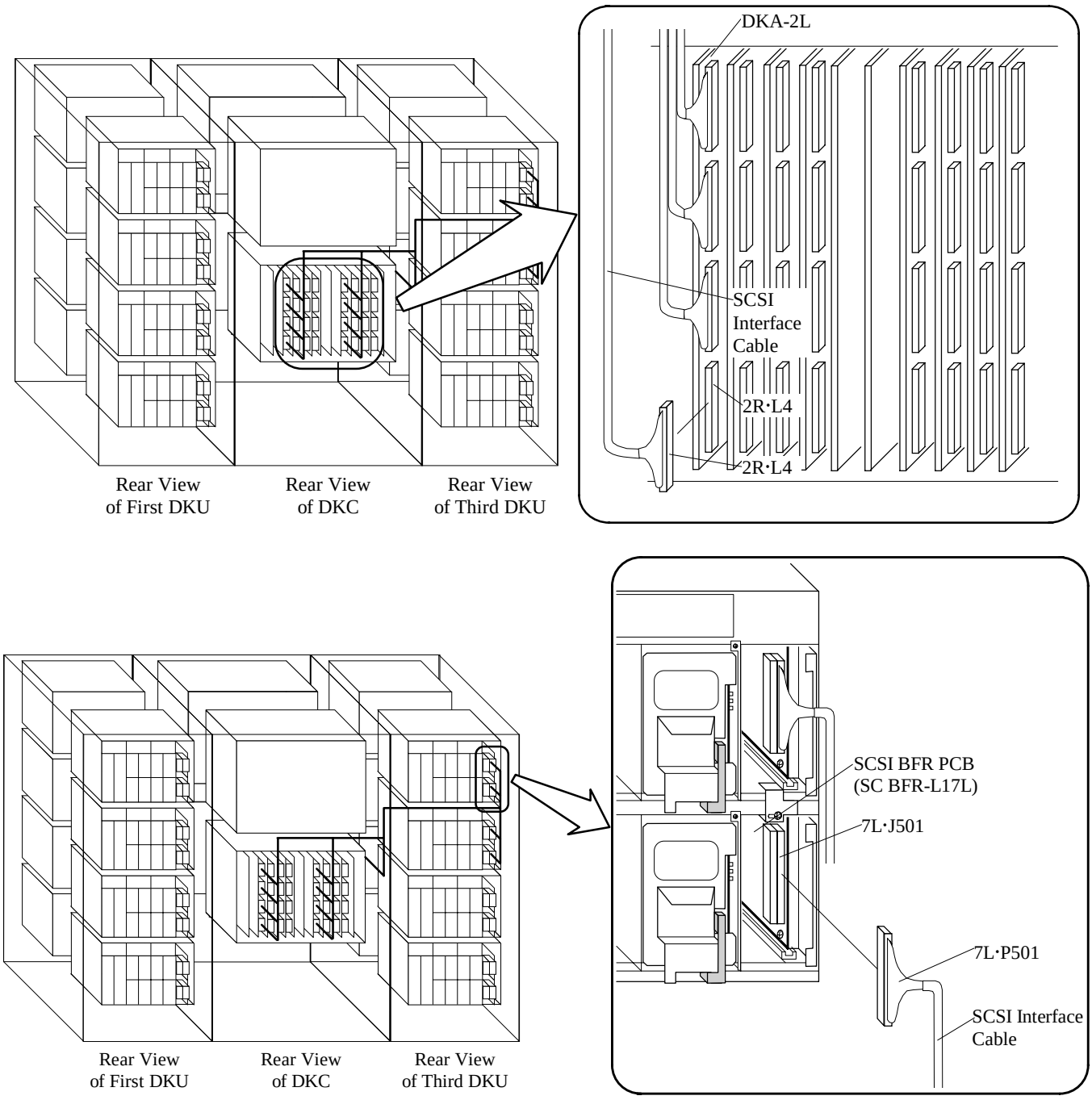

Fig. H-48 Replacement of SCSI Interface Cable

(6) Attach the Front and Rear Logic Box covers. Refer to Installation Section 3.1.1 How to open / close the cover [INST03-20 and 40].

(7) Attach the cable duct covers and fasten the screws. Refer to Fig. H-39.

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(8) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

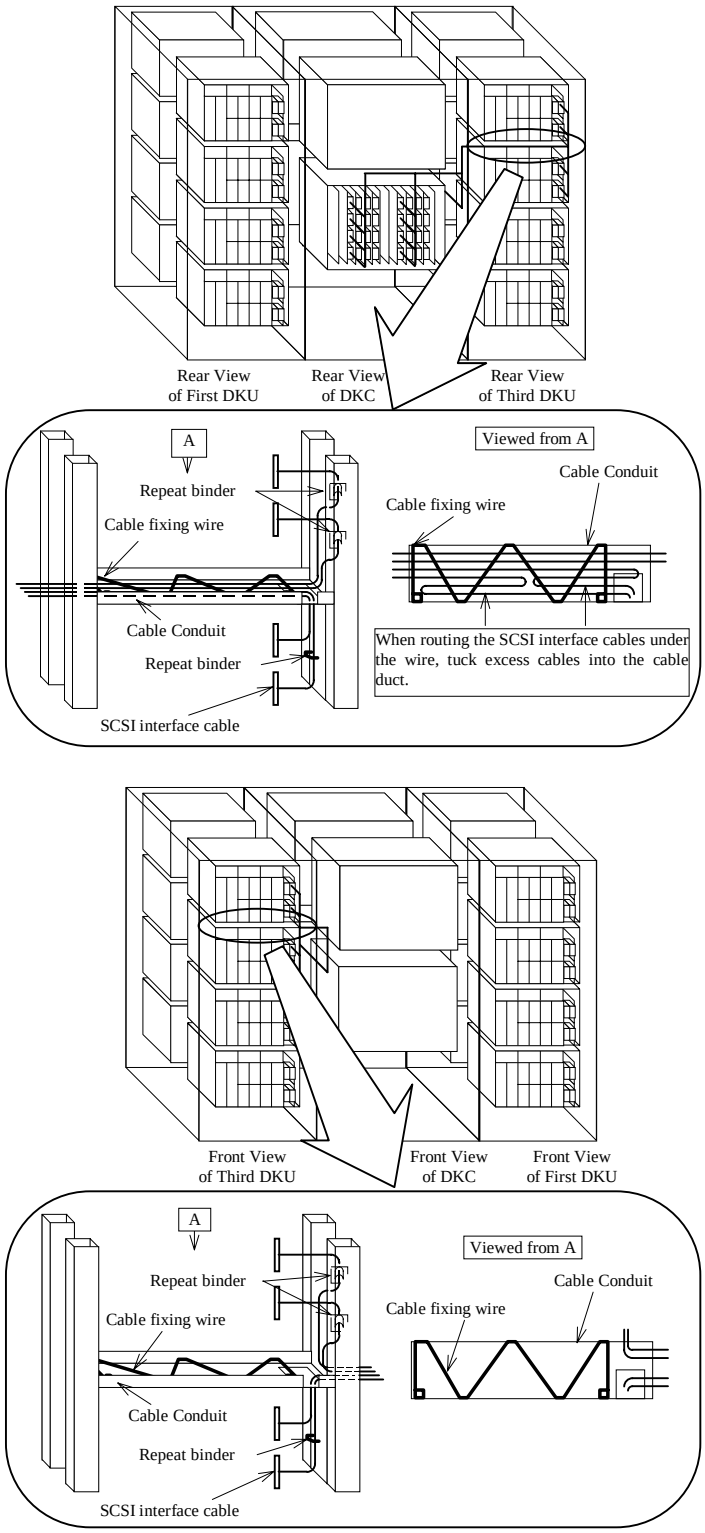

Fig. H-49 Fixation of the SCSI Interface Cables

(9) In case that there is 2nd/4th DKU, go to REP03-229.
In case that there isn't 2nd/4th DKU, go to post-PROCEDURE h (REP04-420).

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Cable No. 33-40 SC BFR-R10-R13U/L through SC BFR-R20-R23U/L

(1) Remove the cable fixing wires and repeat binders.

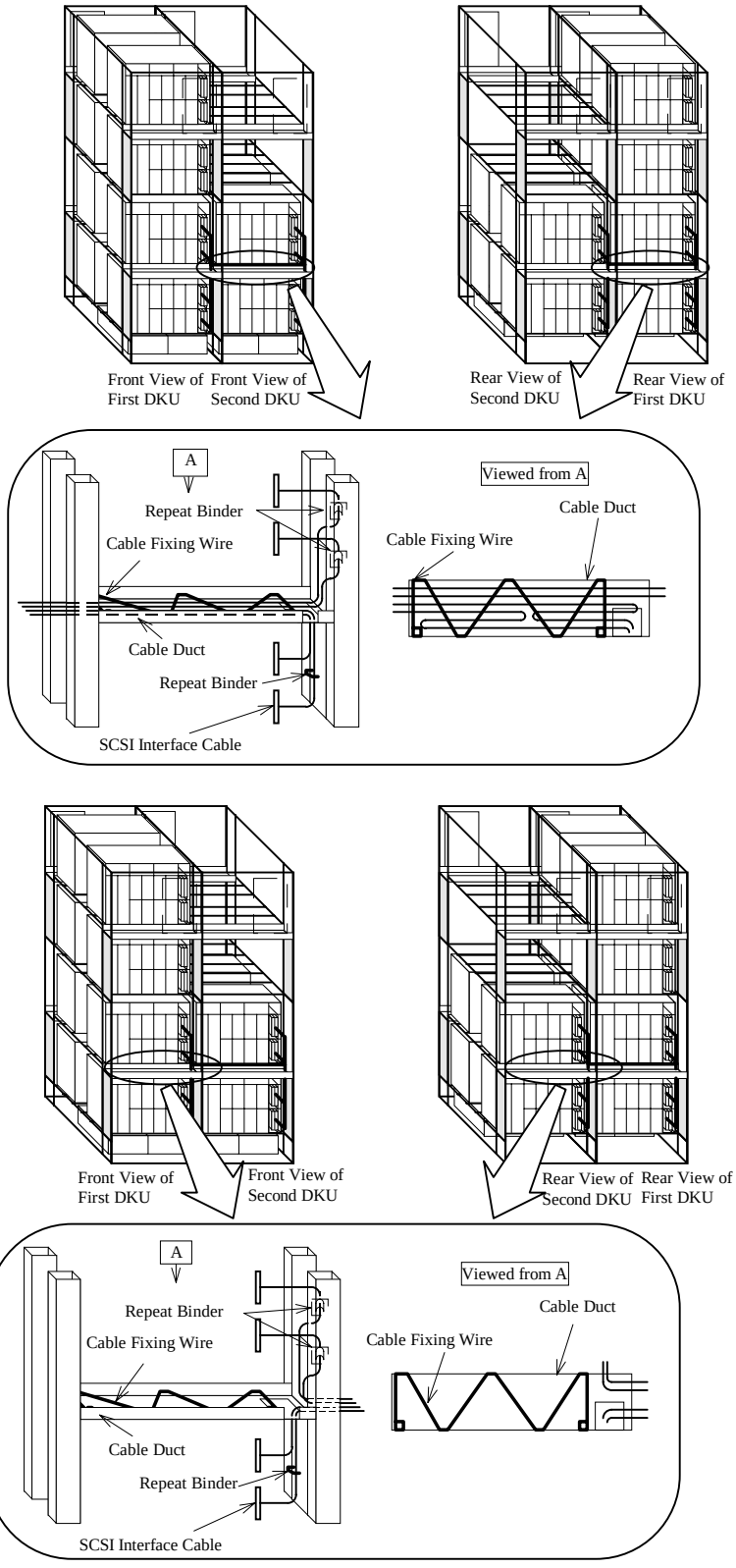

Fig. H-50 Removal of the cable fixing wires and repeat binders

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(2) Replace the SCSI interface cable. The SCSI interface cable should be wired in the same way as the previous route.

Cable No. 33 SC BFR-R10U (0U·J502) through SC BFR-R20U (0U·J501)

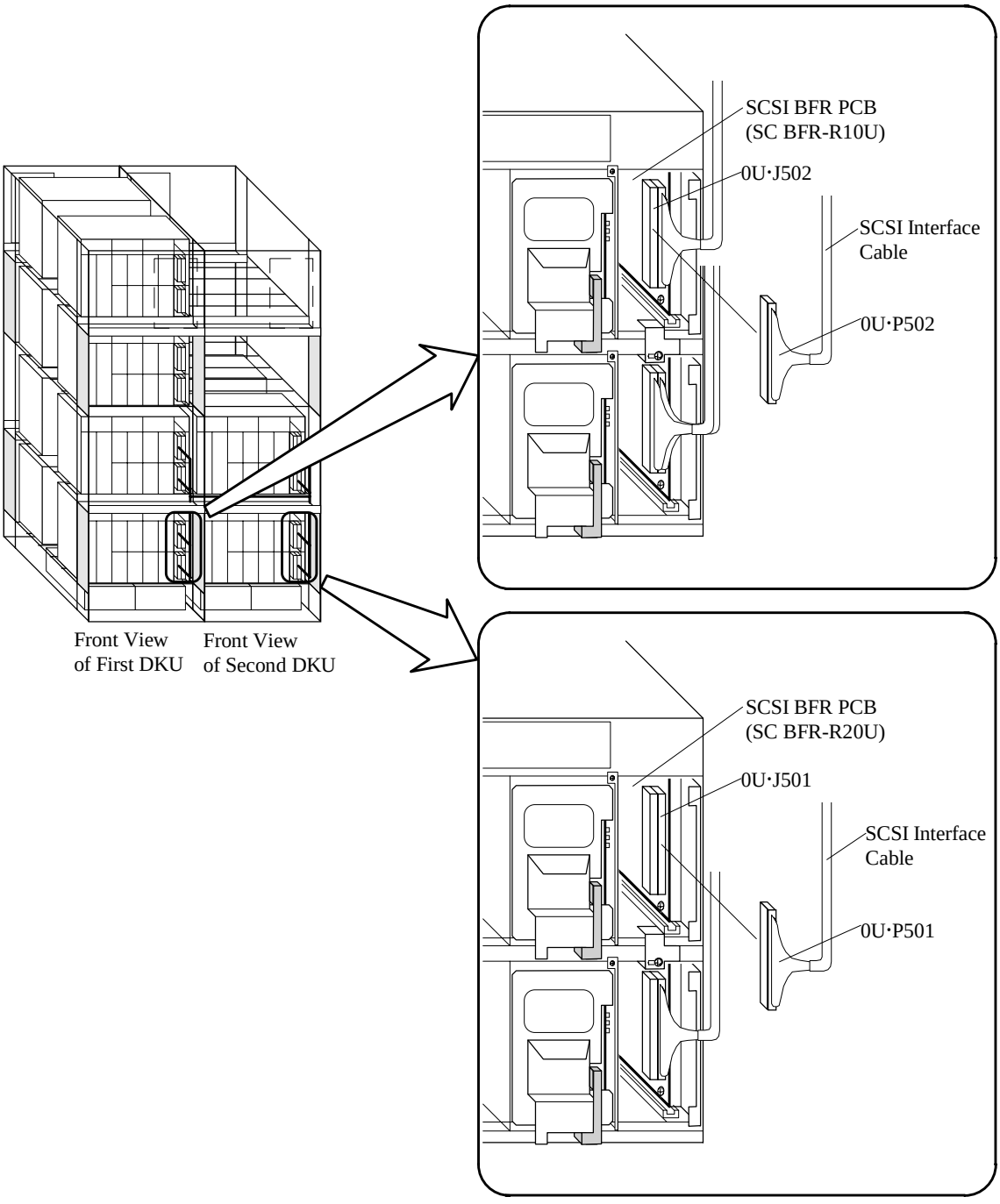

Fig. H-51 Replacement of SCSI Interface Cable

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Cable No. 34 SC BFR-R11U (1U･J502) through SC BFR-R21U (1U･J501)

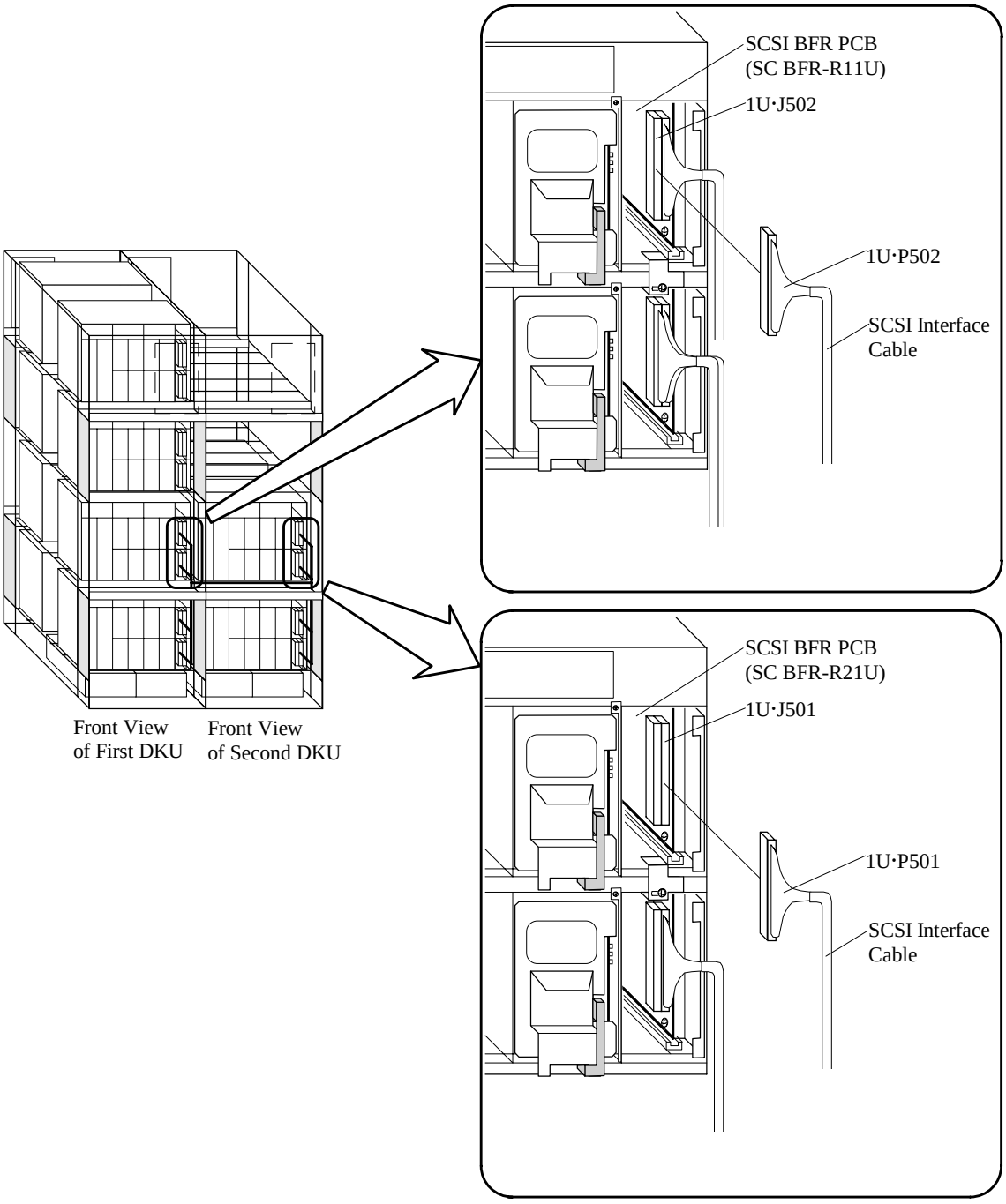

Fig. H-52 Replacement of SCSI Interface Cable

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Cable No. 35 SC BFR-R12U (2U·J502) through SC BFR-R22U (2U·J501)

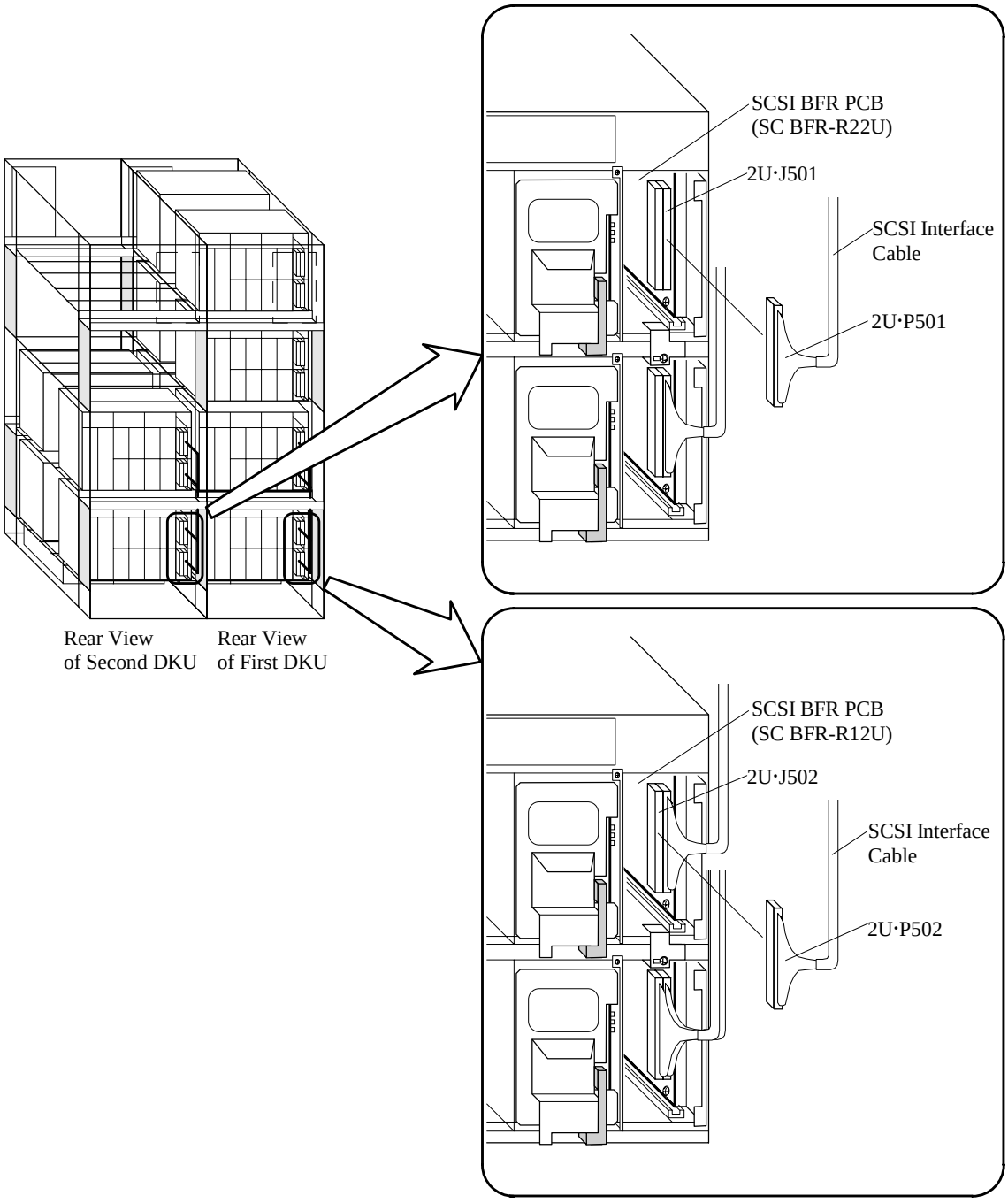

Fig. H-53 Replacement of SCSI Interface Cable

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Cable No. 36 SC BFR-R13U (3U･J502) through SC BFR-R23U (3U･J501)

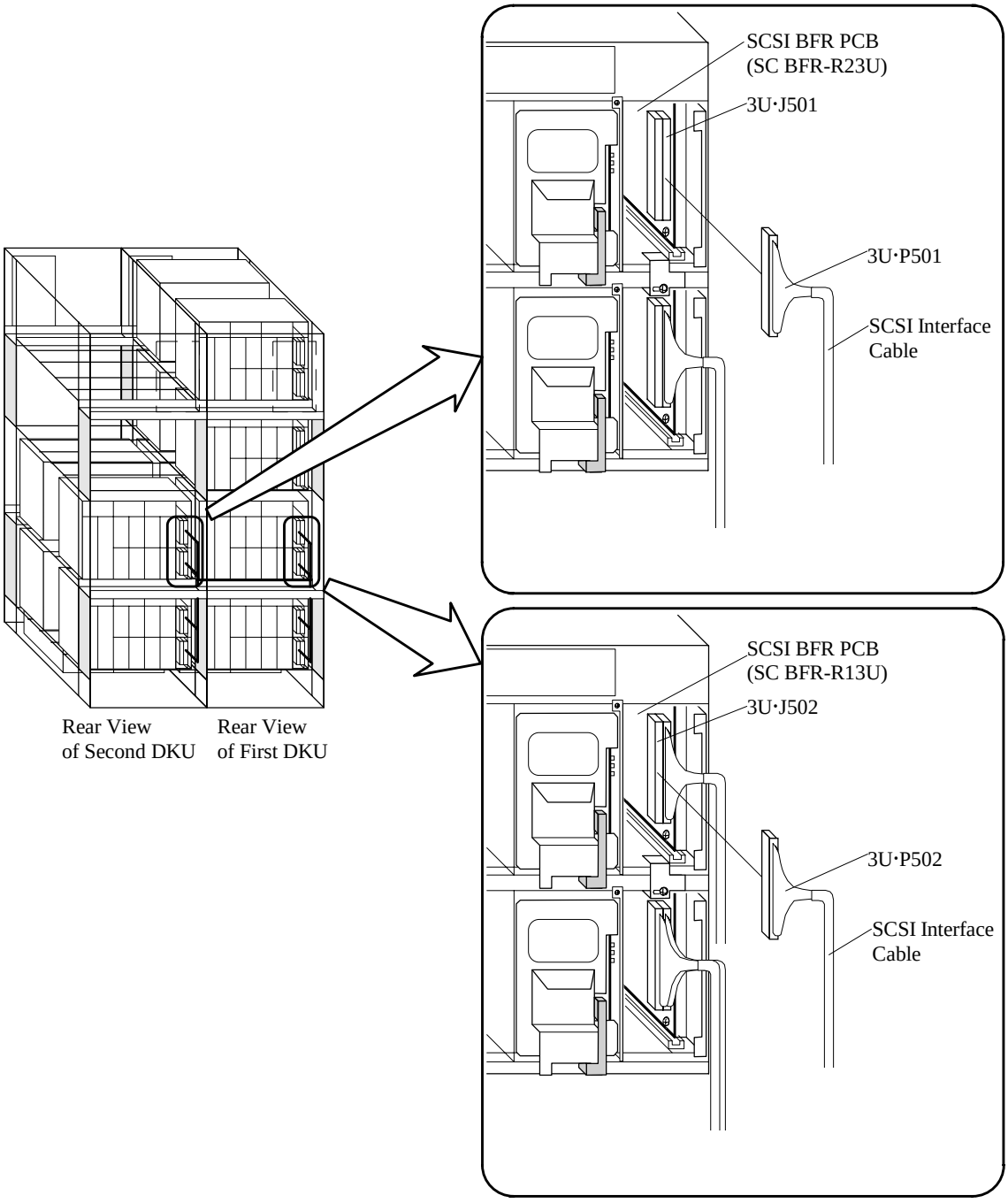

Fig. H-54 Replacement of SCSI Interface Cable

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Cable No. 37 SC BFR-R10L (0L･J502) through SC BFR-R20L (0L･J501)

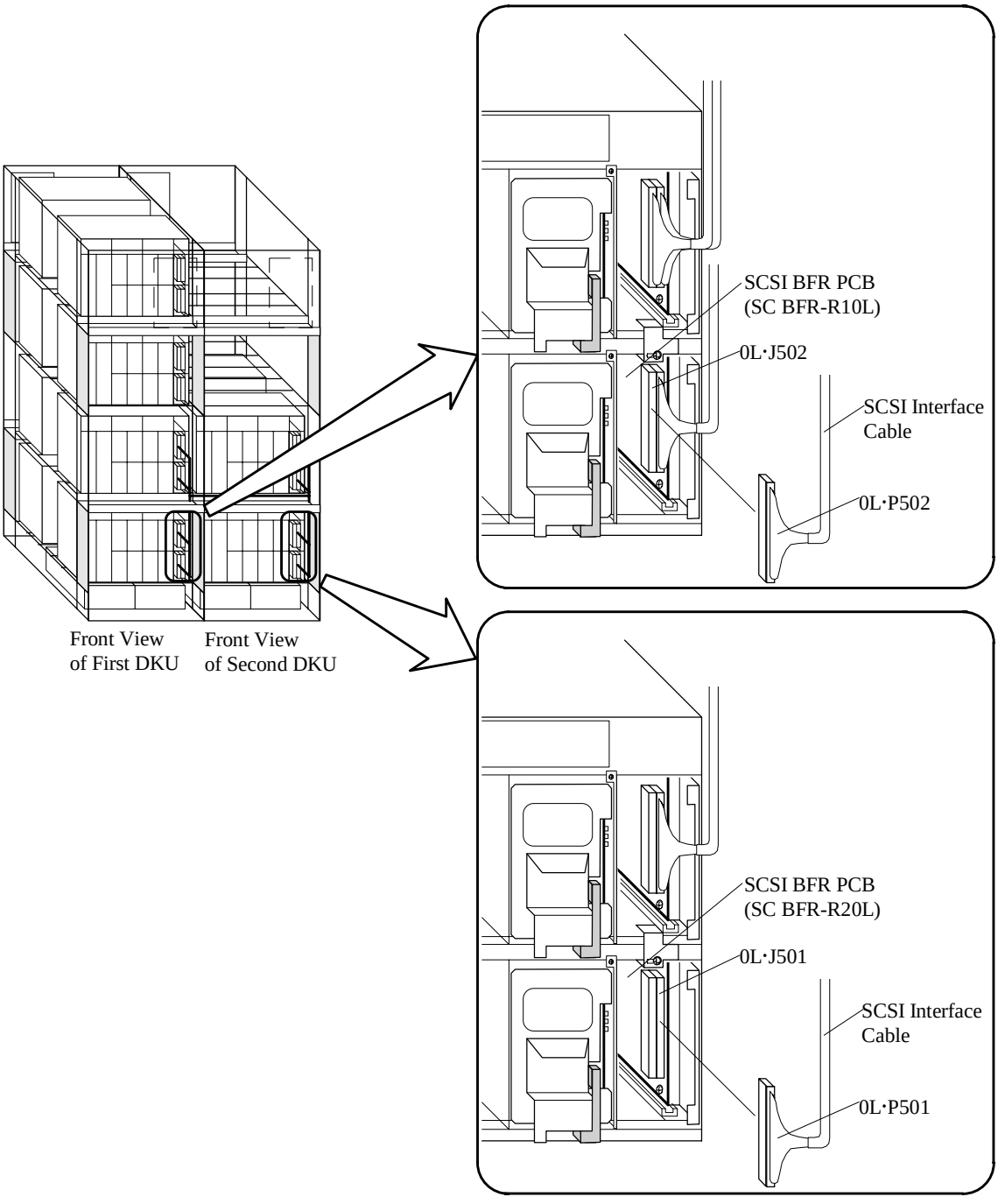

Fig. H-55 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

Cable No. 38 SC BFR-R11L (1L･J502) through SC BFR-R21L (1L･J501)

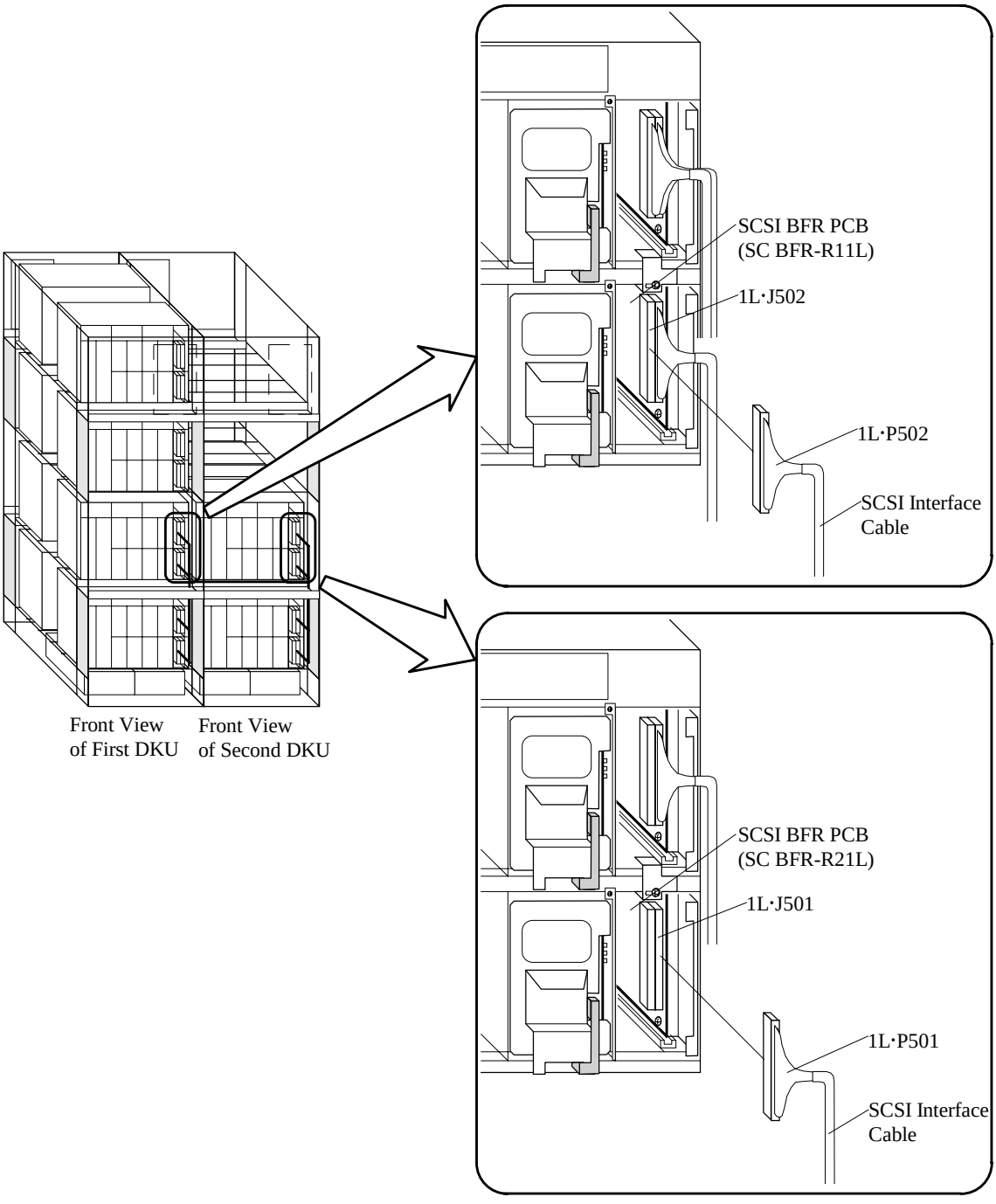

Fig. H-56 Replacement of SCSI Interface Cable

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Cable No. 39 SC BFR-R12L (2L･J502) through SC BFR-R22L (2L･J501)

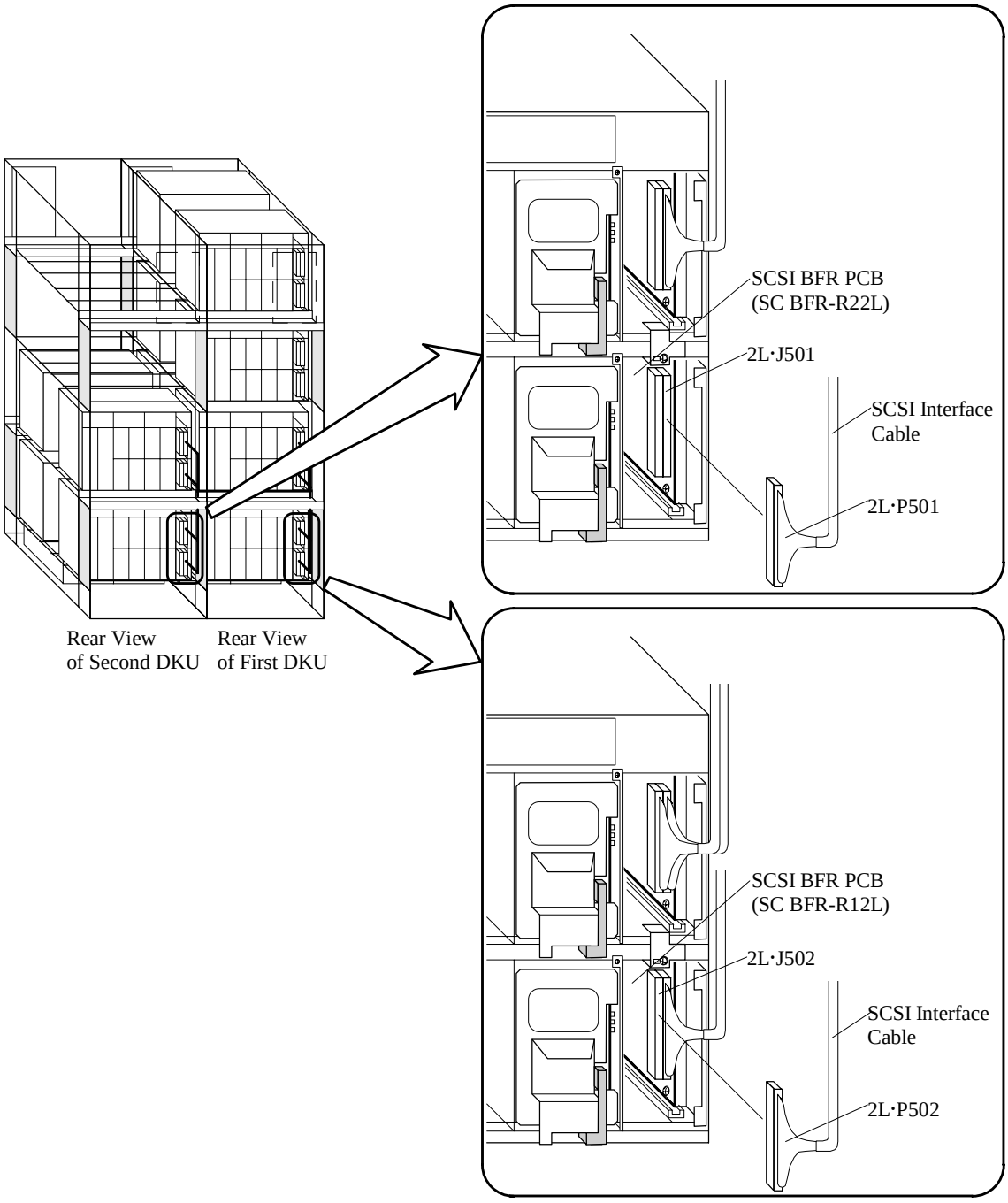

Fig. H-57 Replacement of SCSI Interface Cable

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Cable No. 40 SC BFR-R13L (3L･J502) through SC BFR-R23L (3L･J501)

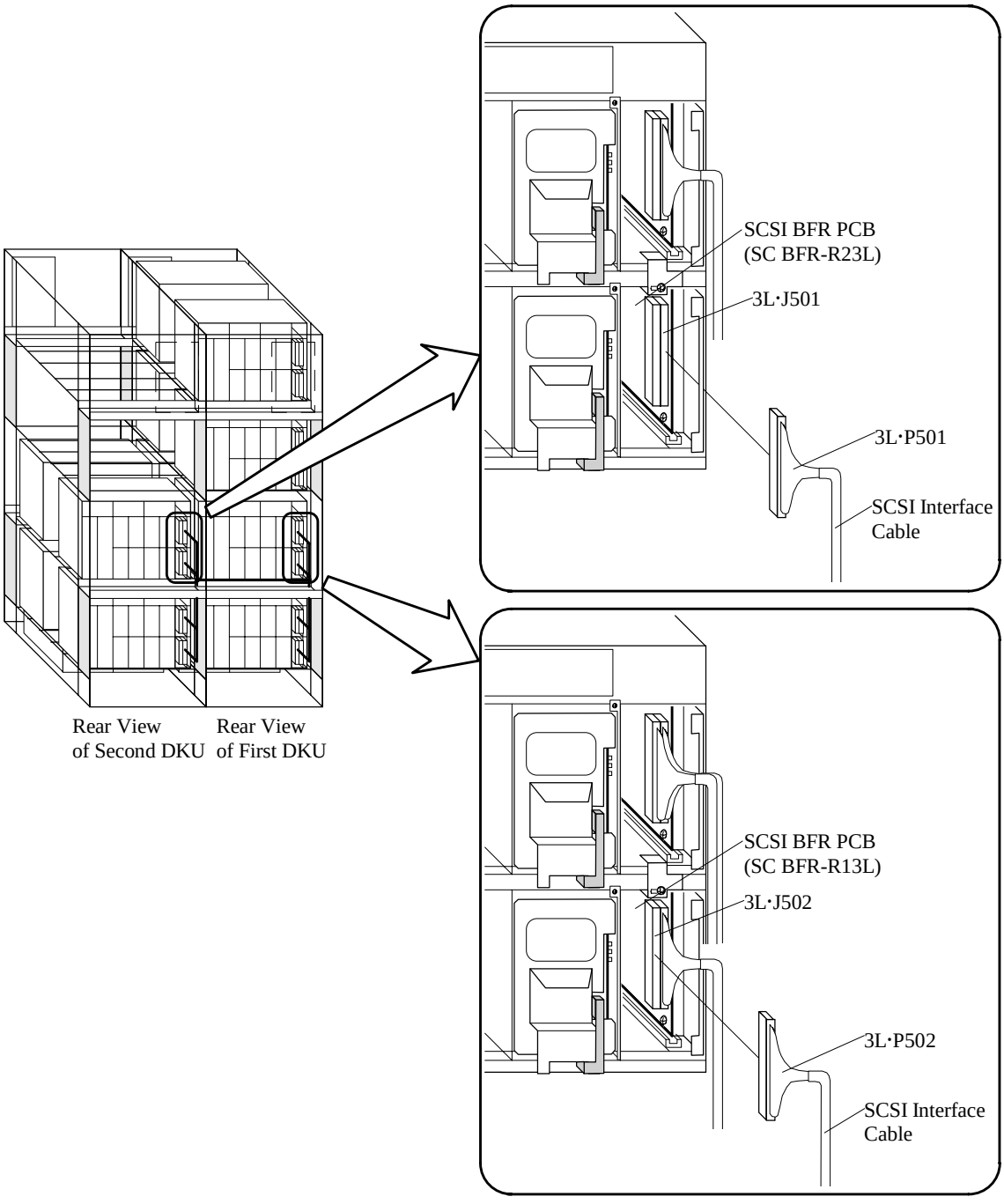

Fig. H-58 Replacement of SCSI Interface Cable

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(3) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

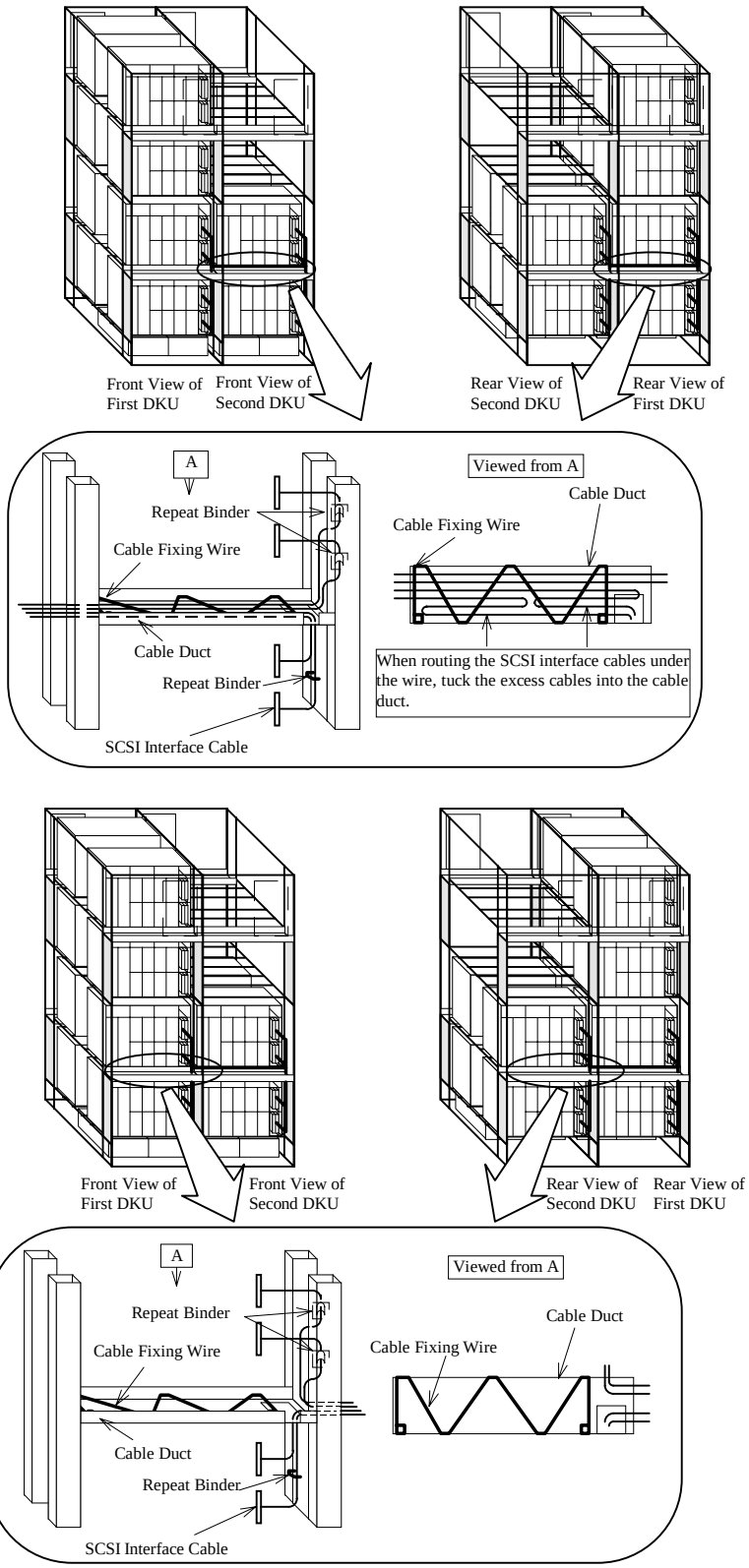

Fig. H-59 Fixation of the SCSI Interface Cables

(4) Go to post-PROCEDURE h (REP04-420).

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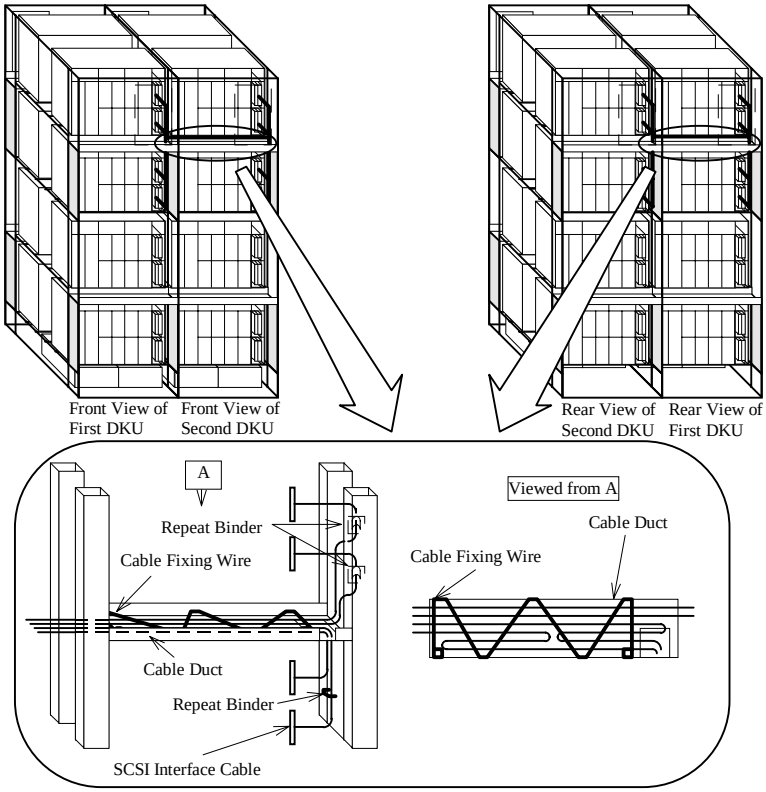
Cable No. 41-48 SC BFR-R14-R17U/L through SC BFR-R24-R27U/L

(1) Remove the cable fixing wires and repeat binders.



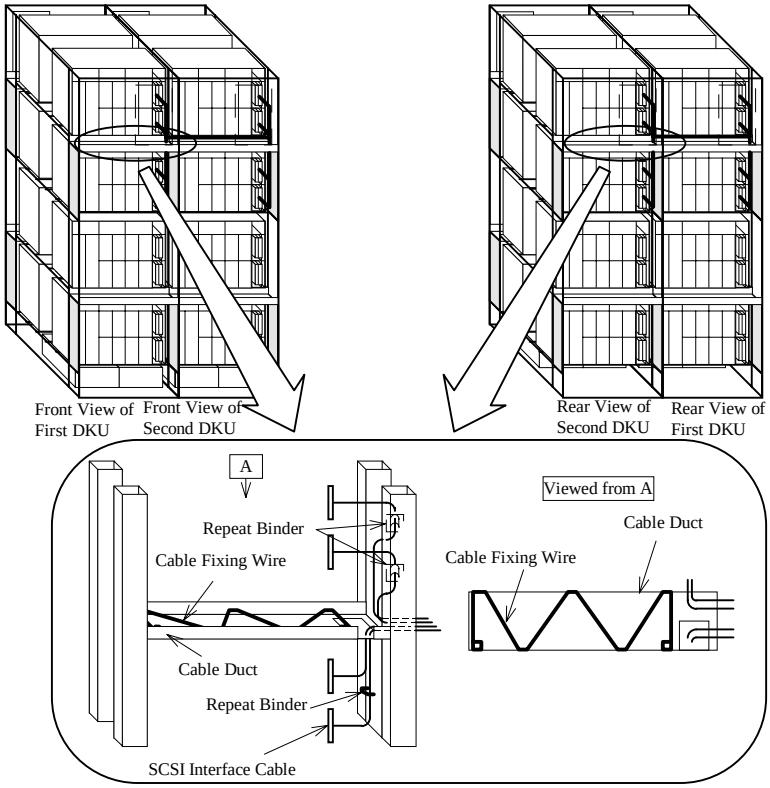


Fig. H-60 Removal of the cable fixing wires and repeat binders

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(2) Replace the SCSI interface cable. The SCSI interface cable should be wired in the same way as the previous route.

Cable No. 41 SC BFR-R14U (4U·J502) through SC BFR-R24U (4U·J501)

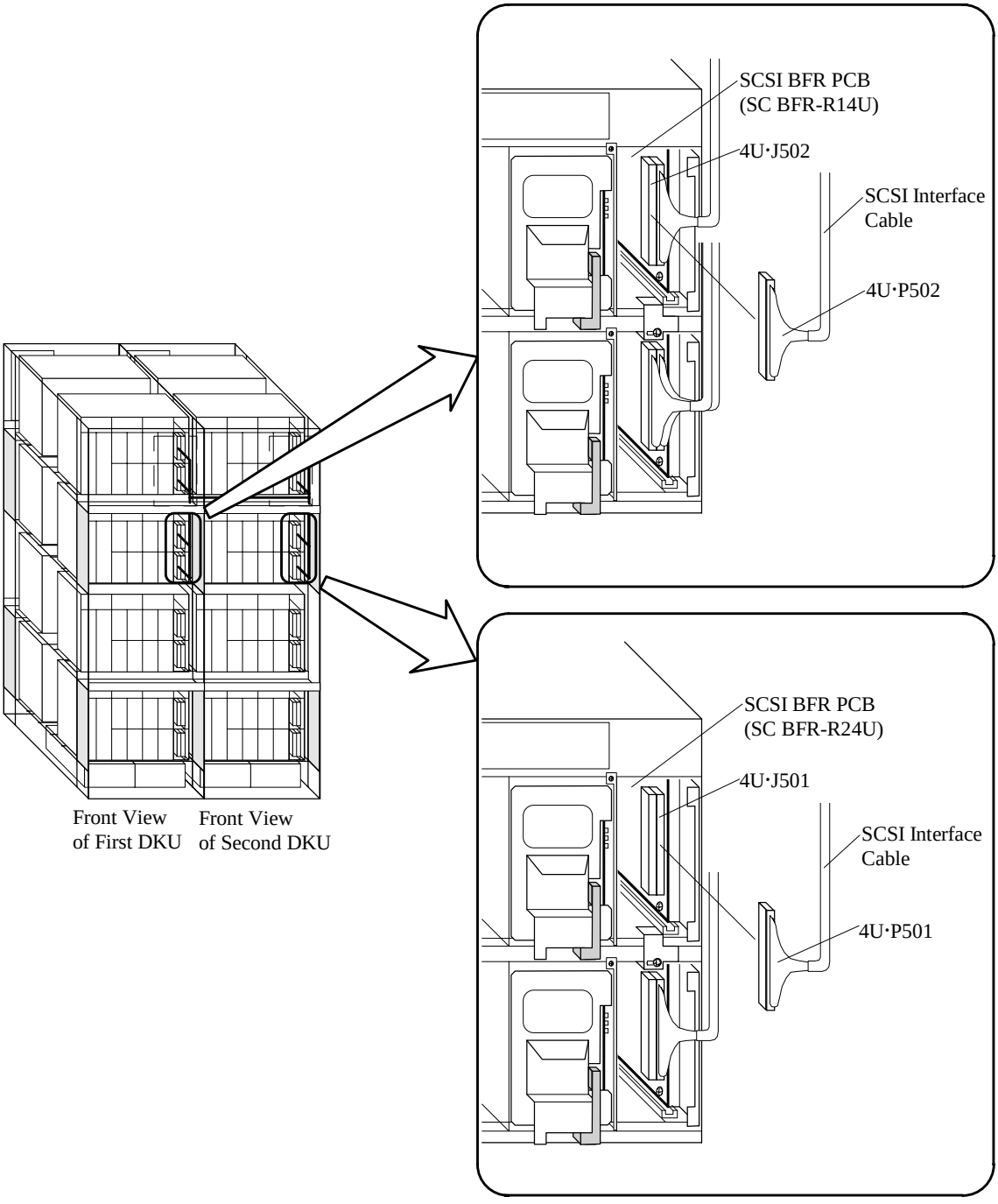

Fig. H-61 Replacement of SCSI Interface Cable

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Cable No. 42 SC BFR-R15U (5U･J502) through SC BFR-R25U (5U･J501)

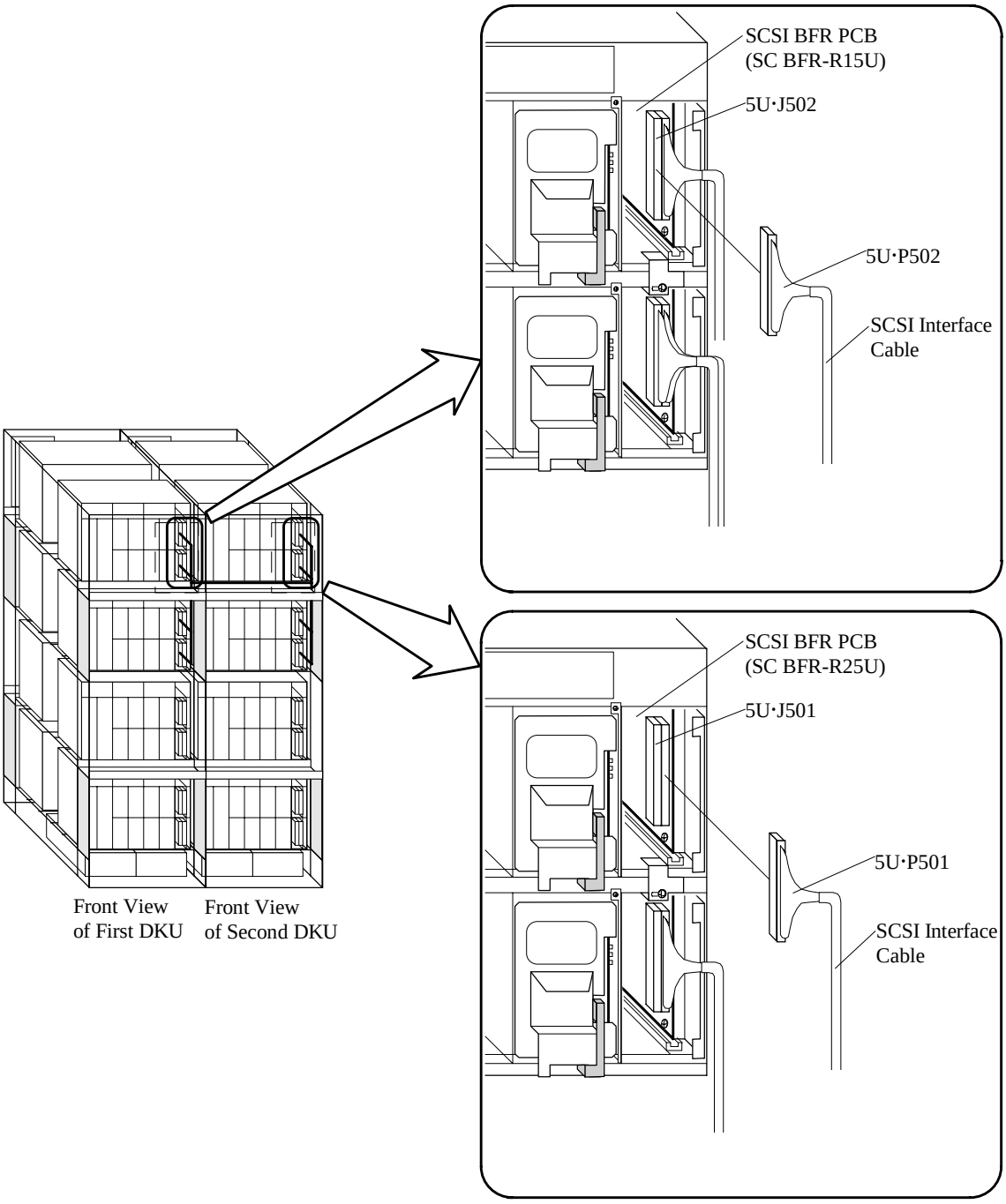

Fig. H-62 Replacement of SCSI Interface Cable

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Cable No. 43 SC BFR-R16U (6U･J502) through SC BFR-R26U (6U･J501)

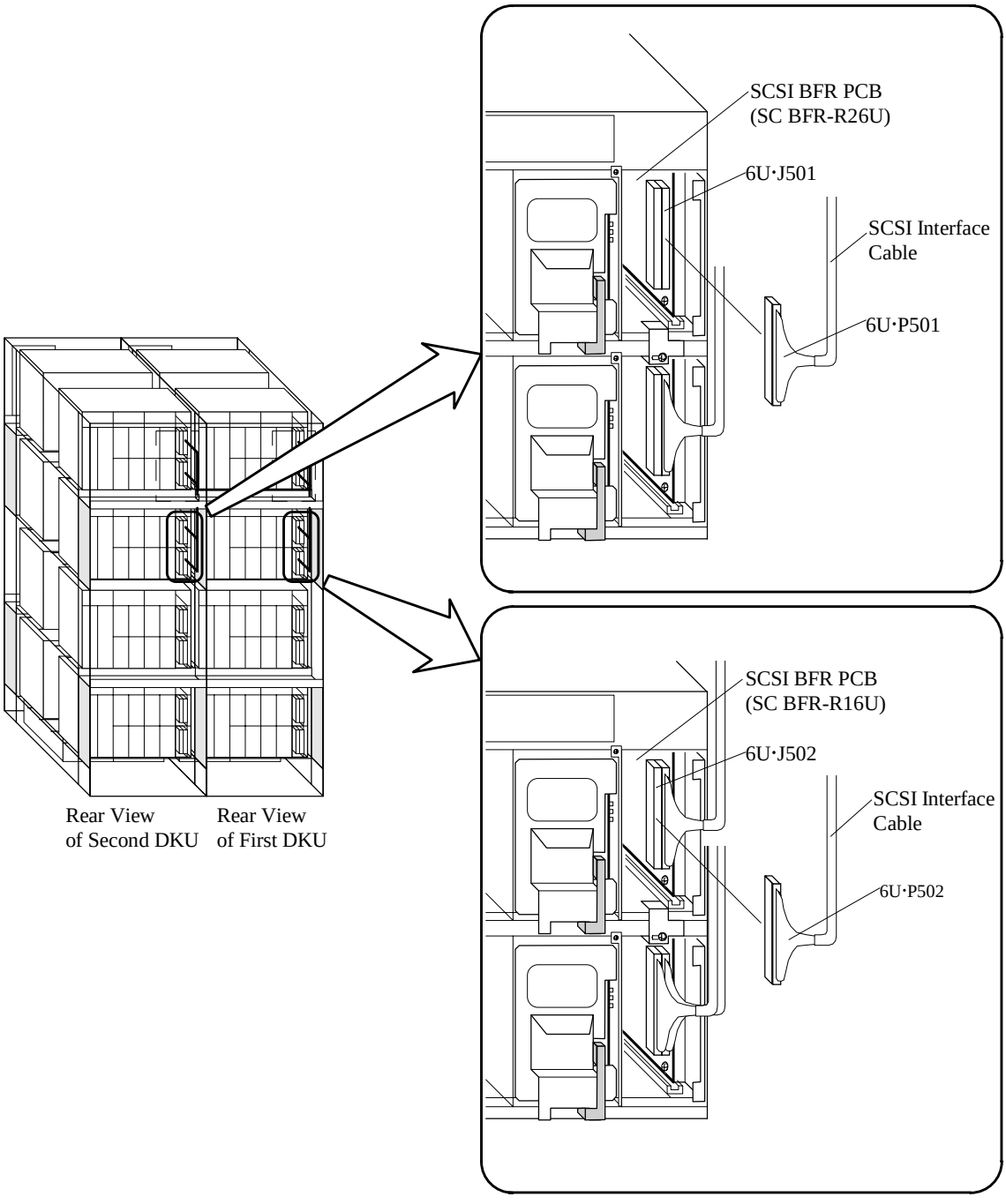

Fig. H-63 Replacement of SCSI Interface Cable

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Cable No. 44 SC BFR-R17U (7U･J502) through SC BFR-R27U (7U･J501)

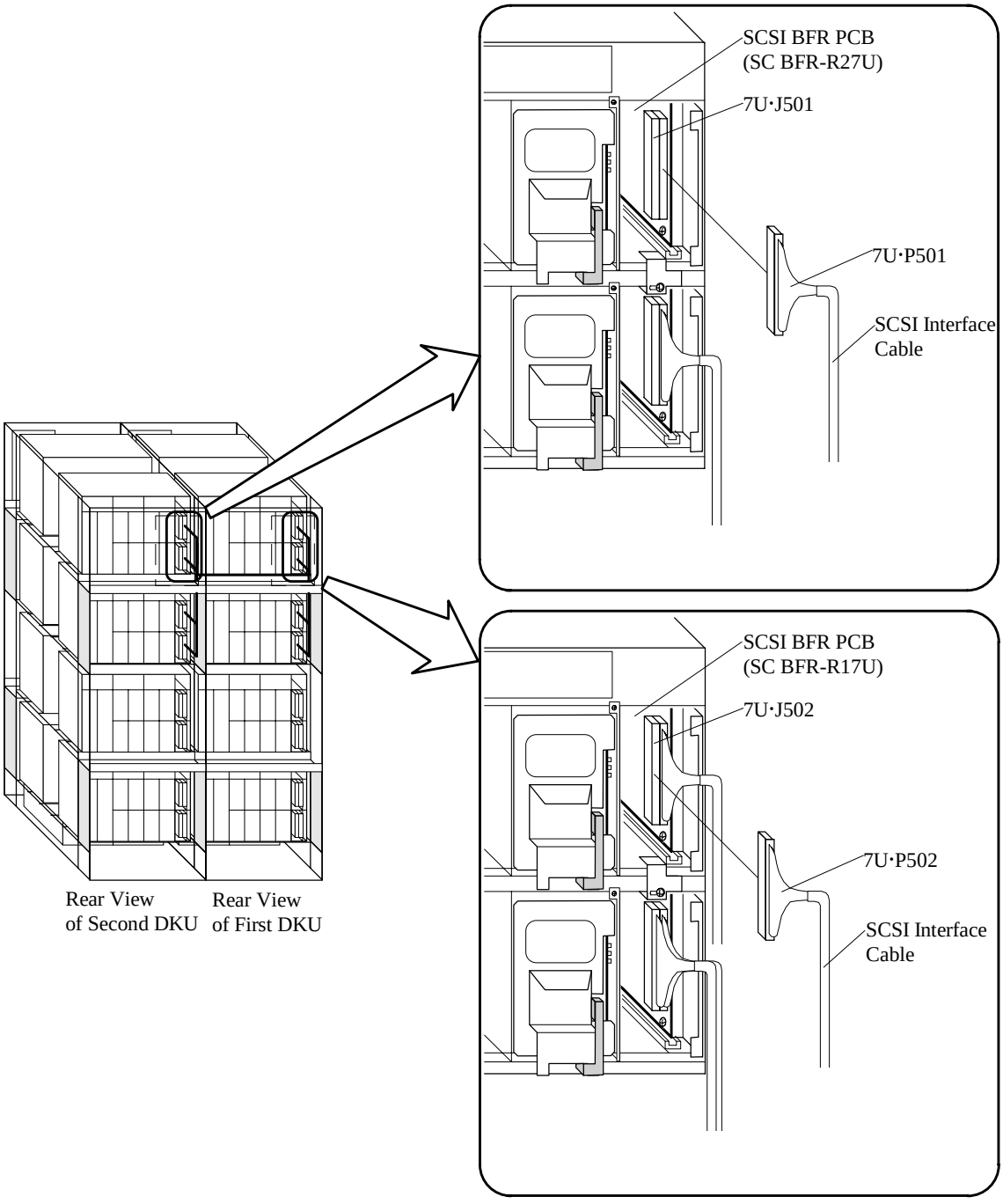

Fig. H-64 Replacement of SCSI Interface Cable

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Cable No. 45 SC BFR-R14L (4L･J502) through SC BFR-R24L (4L･J501)

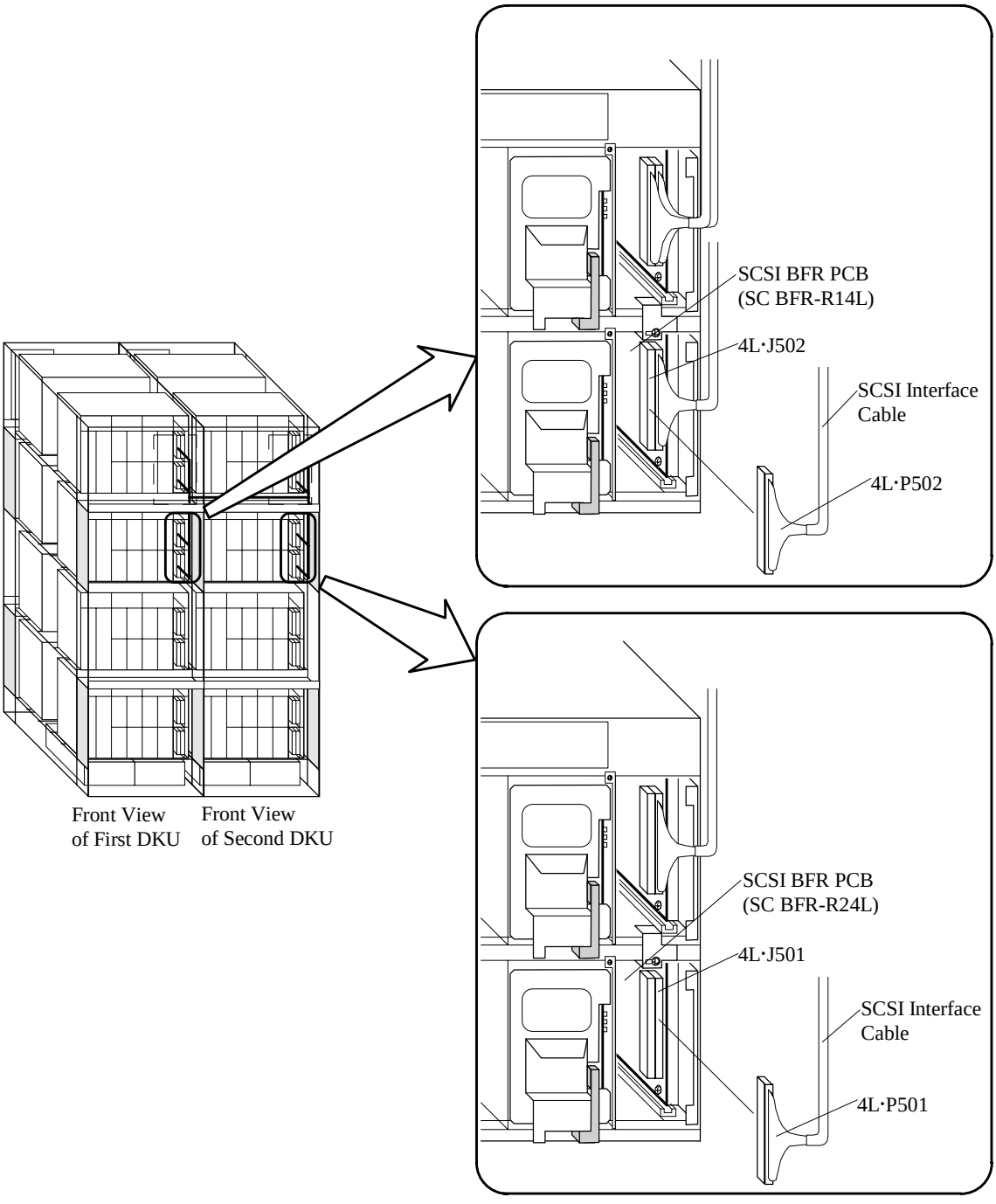

Fig. H-65 Replacement of SCSI Interface Cable

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Cable No. 46 SC BFR-R15L (5L･J502) through SC BFR-R25L (5L･J501)

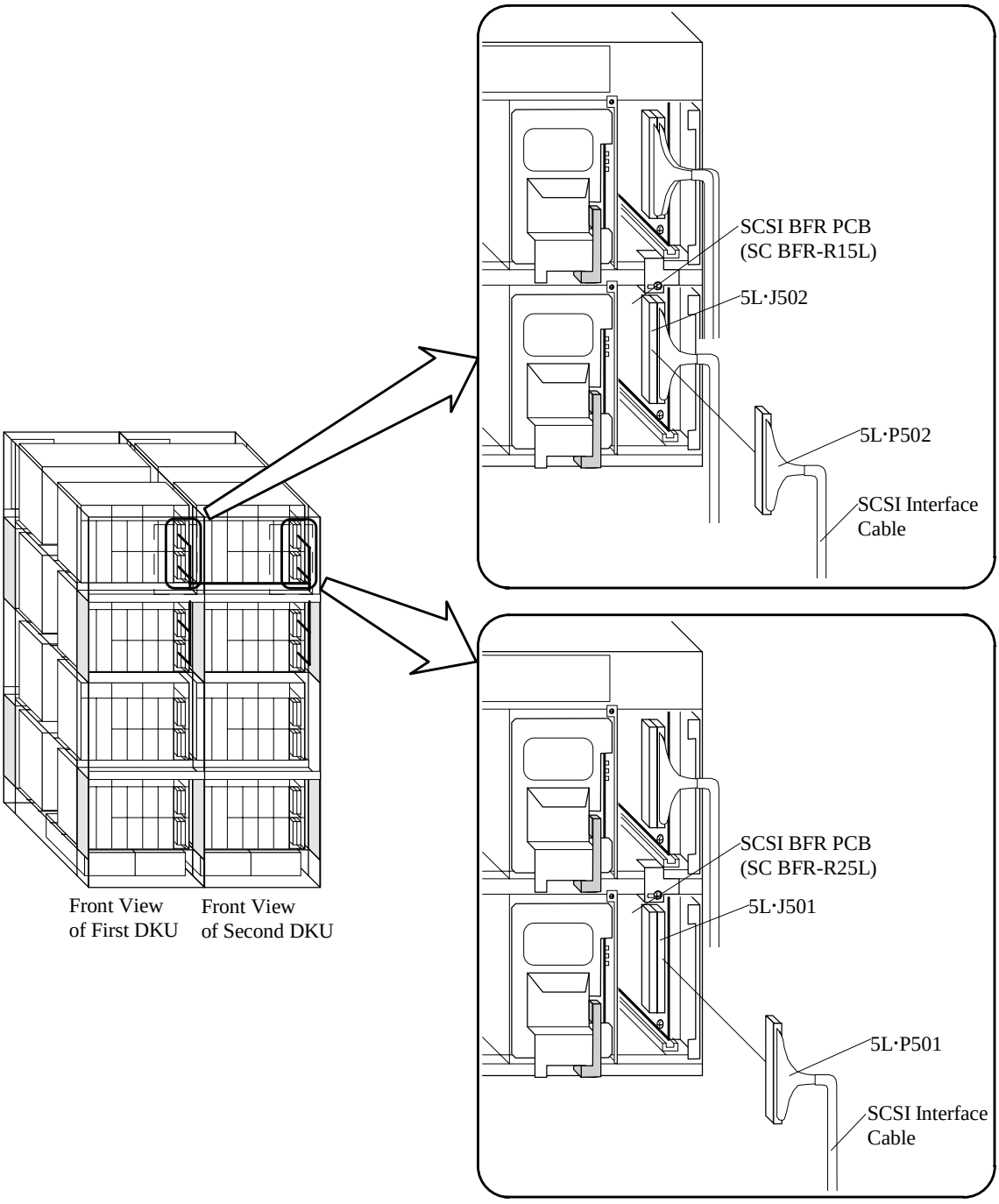

Fig. H-66 Replacement of SCSI Interface Cable

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Cable No. 47 SC BFR-R16L (6L･J502) through SC BFR-R26L (6L･J501)

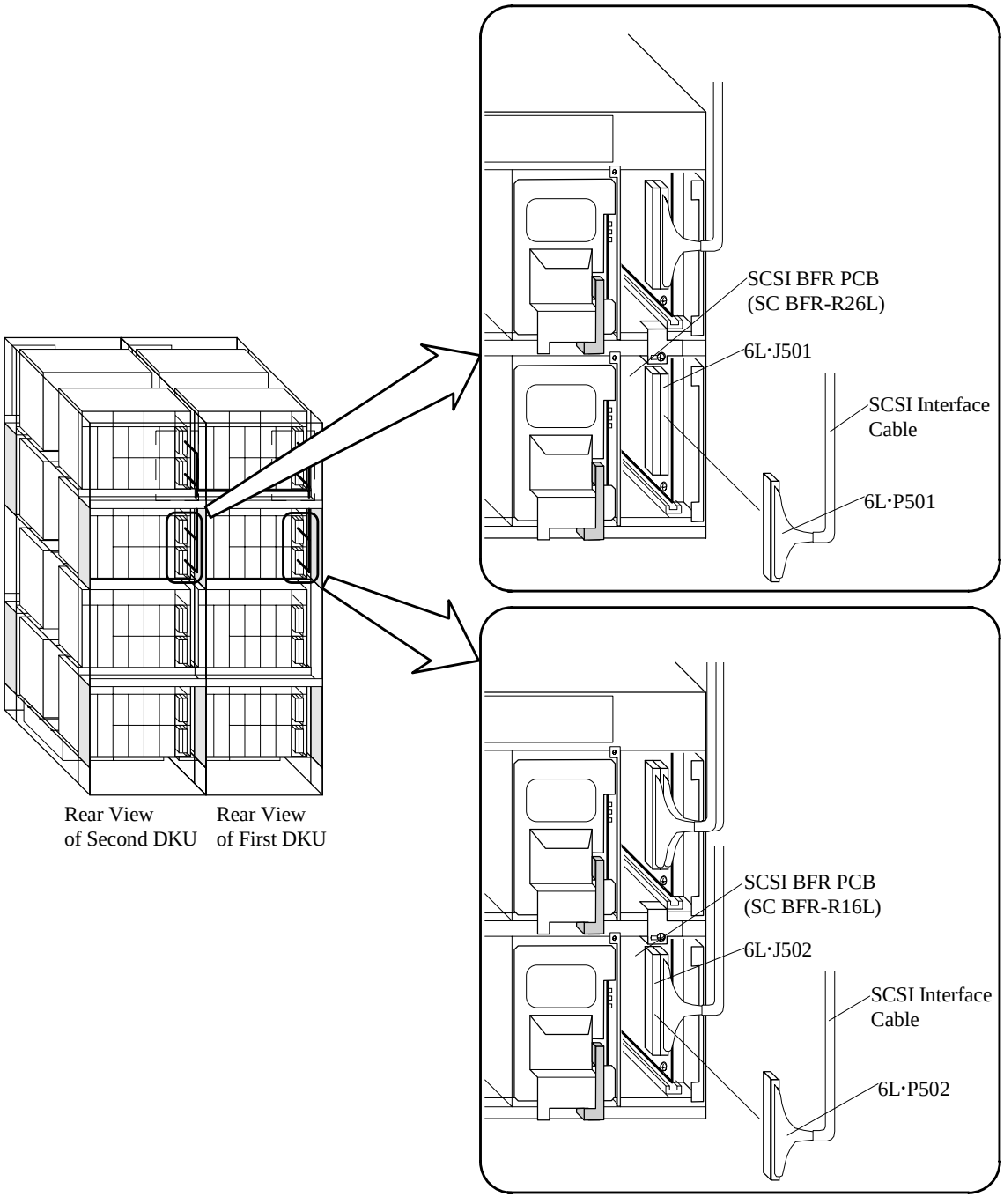

Fig. H-67 Replacement of SCSI Interface Cable

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Cable No. 48 SC BFR-R17L (7L･J502) through SC BFR-R27L (7L･J501)

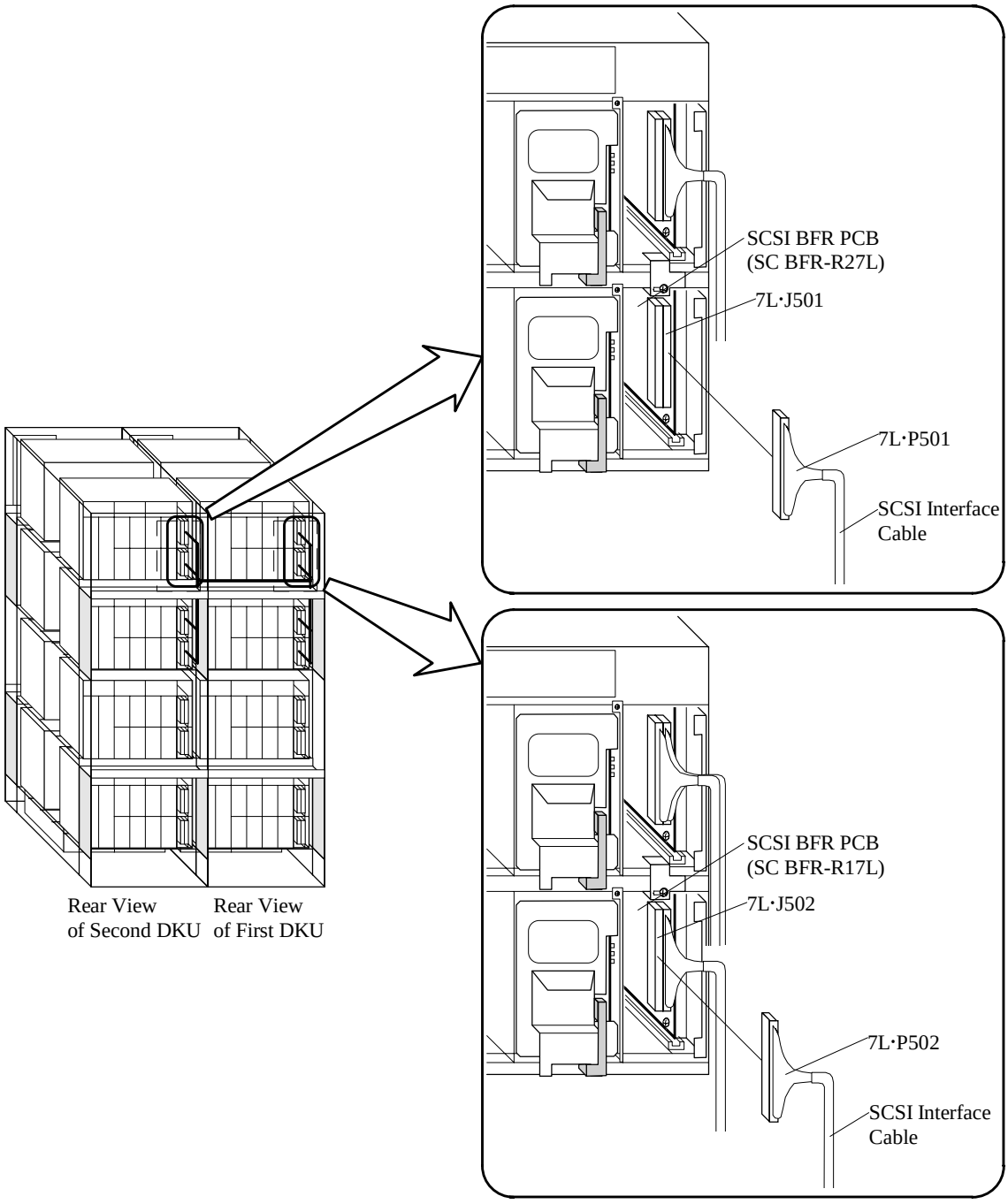

Fig. H-68 Replacement of SCSI Interface Cable

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(3) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

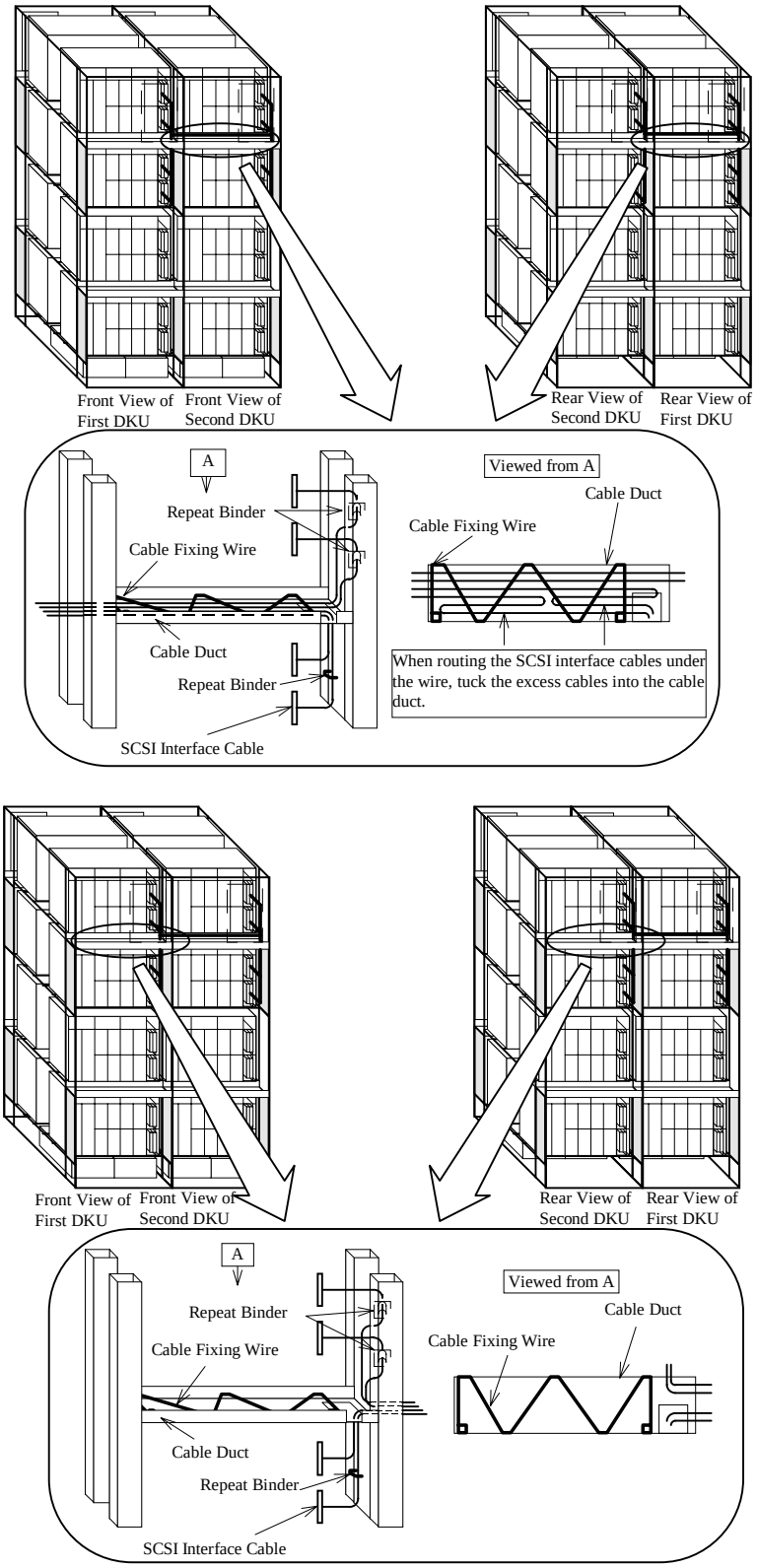

Fig. H-69 Fixation of the SCSI Interface Cables

(4) Go to post-PROCEDURE h (REP04-420).

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Cable No. 49-56 SC BFR-L10-L13U/L through SC BFR-L20-L23U/L

(1) Remove the cable fixing wires and repeat binders.

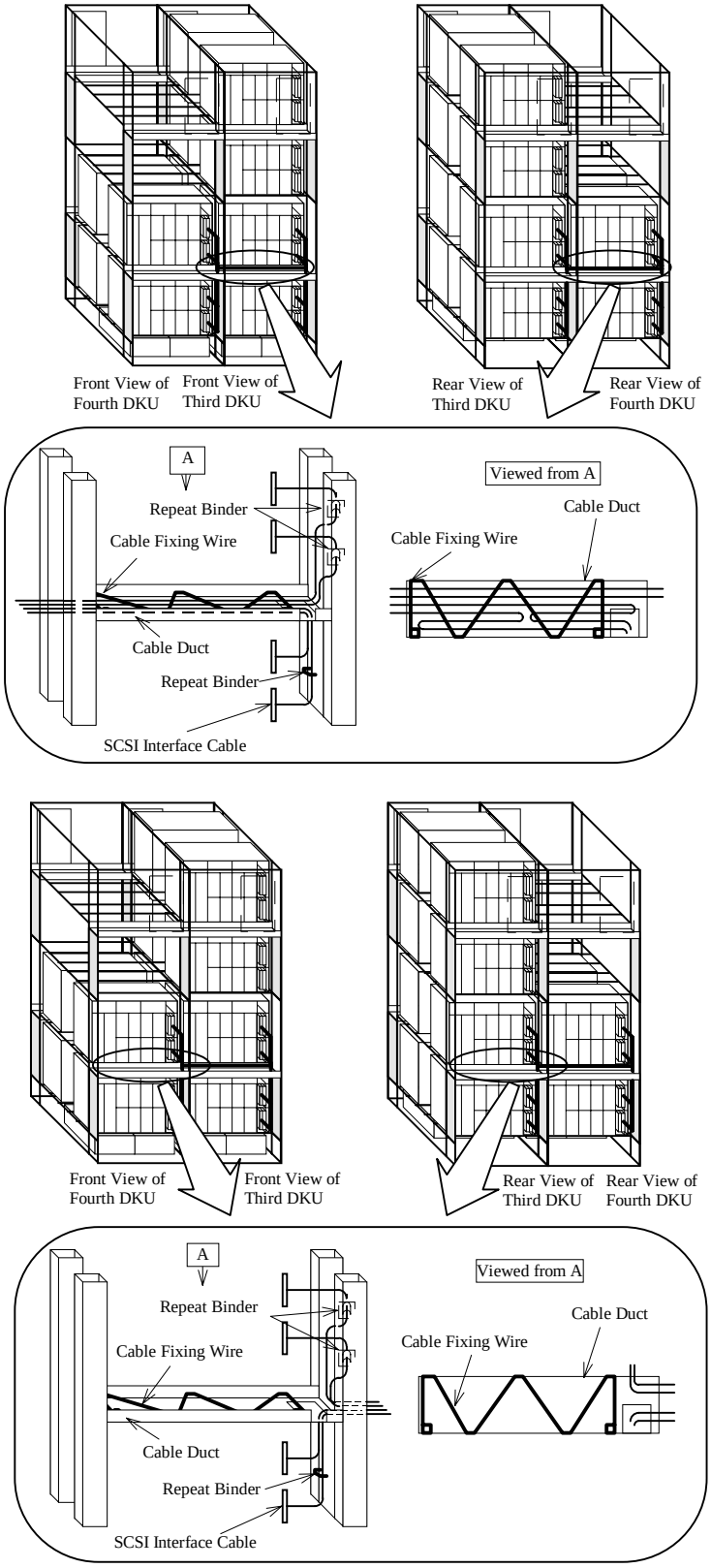

Fig. H-70 Removal of the cable fixing wires and repeat binders

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(2) Replace the SCSI interface cable. The SCSI interface cable should be wired in the same way as the previous route.

Cable No. 49 SC BFR-L10U (0U･J502) through SC BFR-L20U (0U･J501)

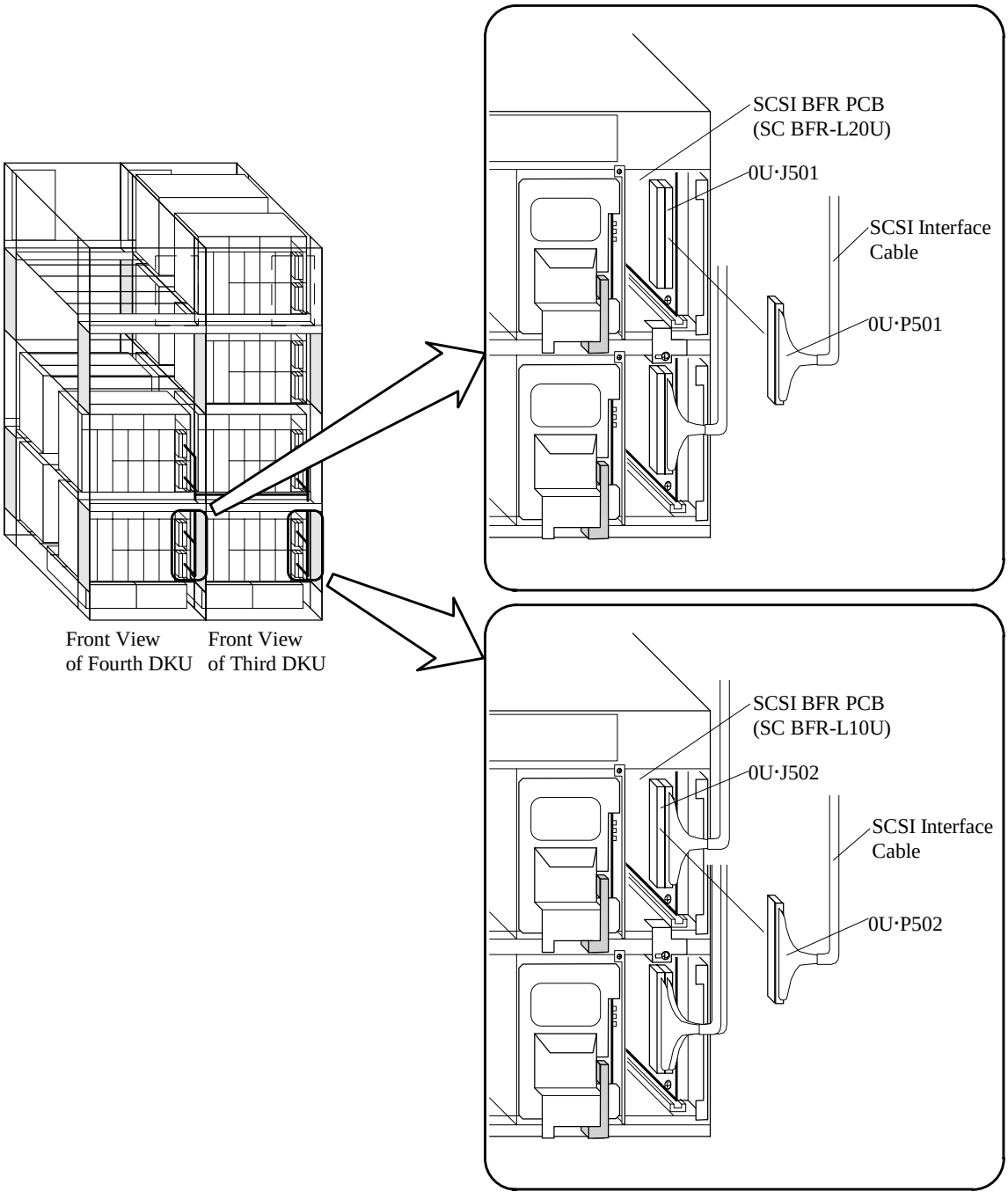

Fig. H-71 Replacement of SCSI Interface Cable

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Cable No. 50 SC BFR-L11U (1U･J502) through SC BFR-L21U (1U･J501)

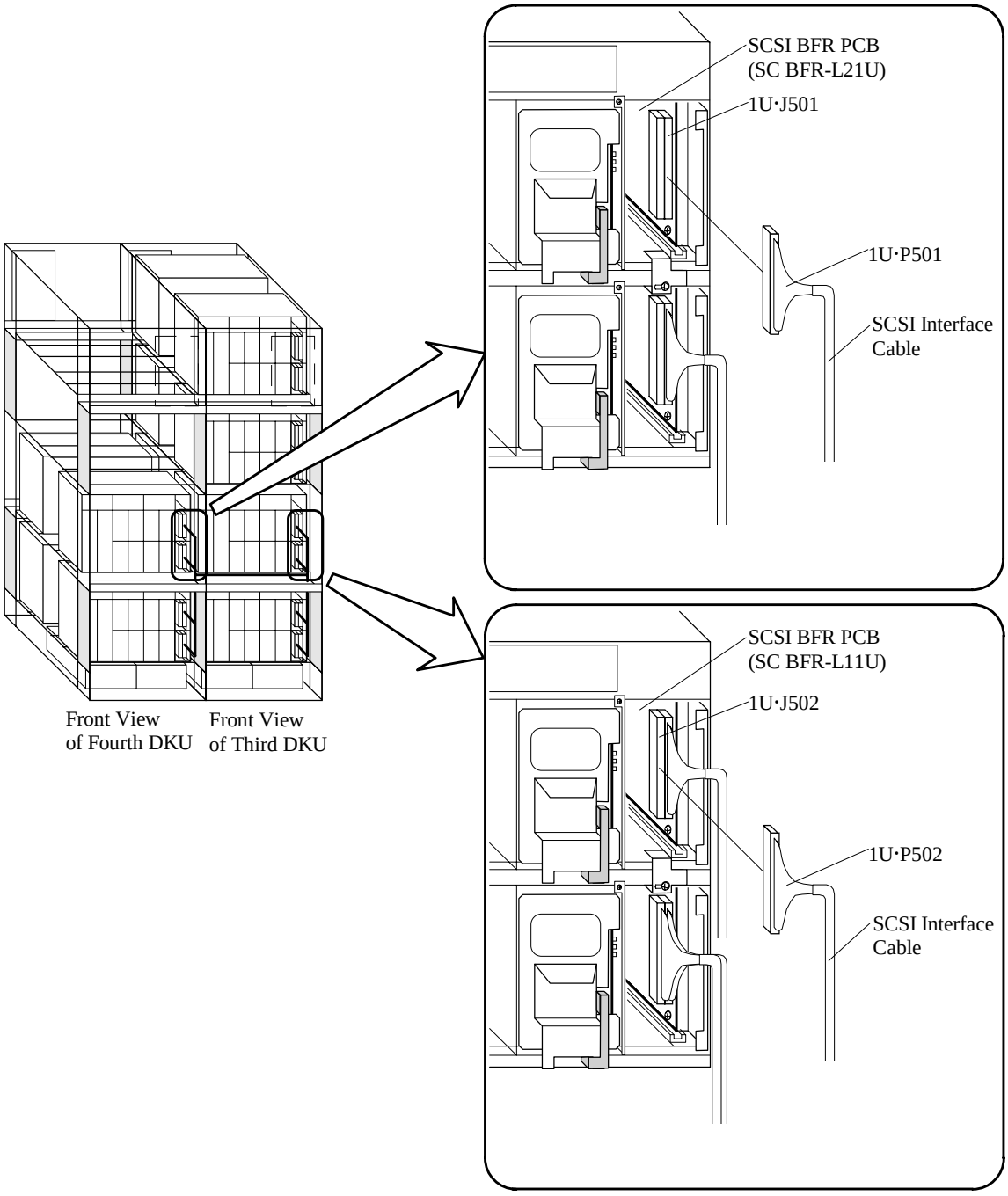

Fig. H-72 Replacement of SCSI Interface Cable

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Cable No. 51 SC BFR-L12U (2U･J502) through SC BFR-L22U (2U･J501)

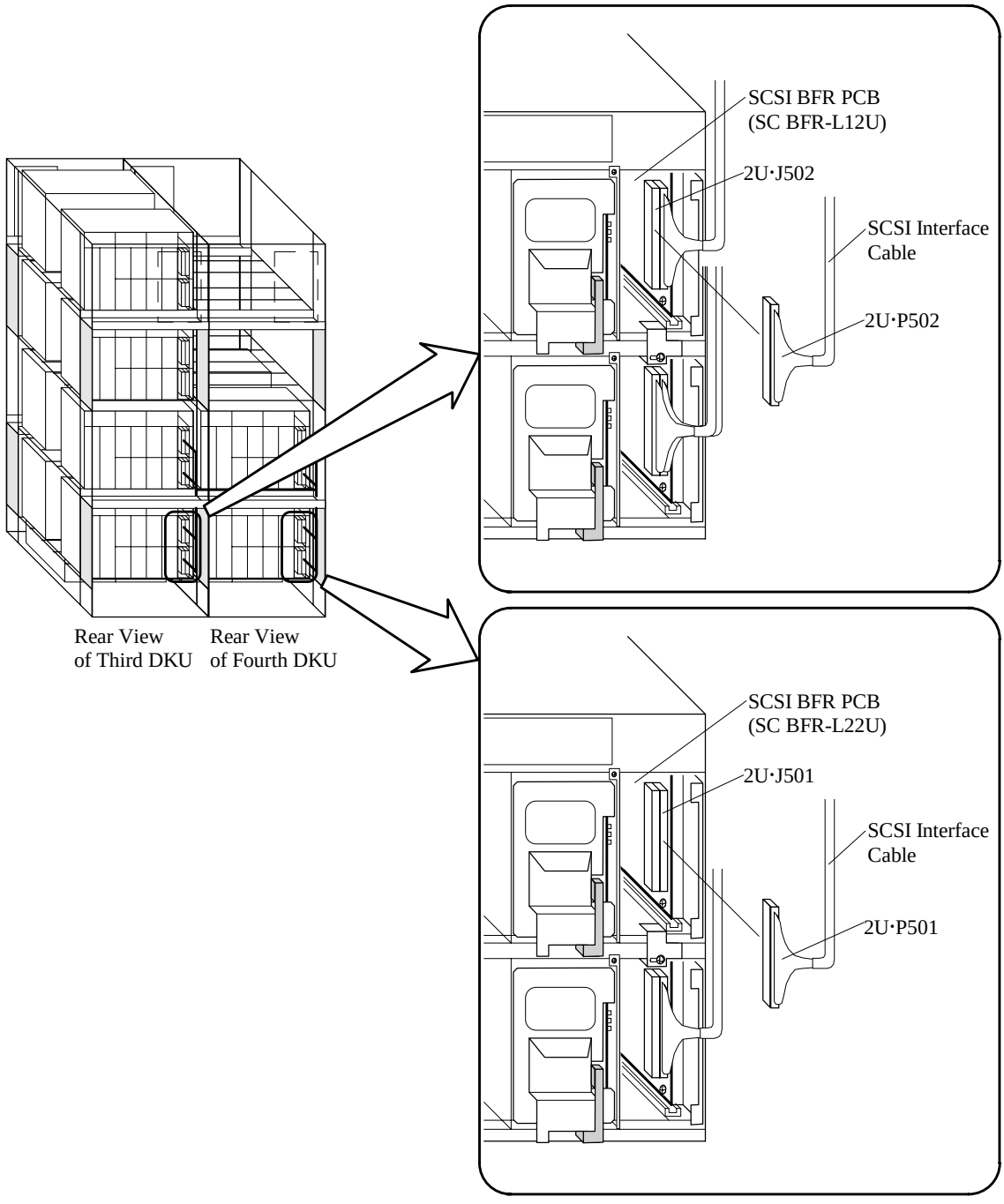

Fig. H-73 Replacement of SCSI Interface Cable

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Cable No. 52 SC BFR-L13U (3U･J502) through SC BFR-L23U (3U･J501)

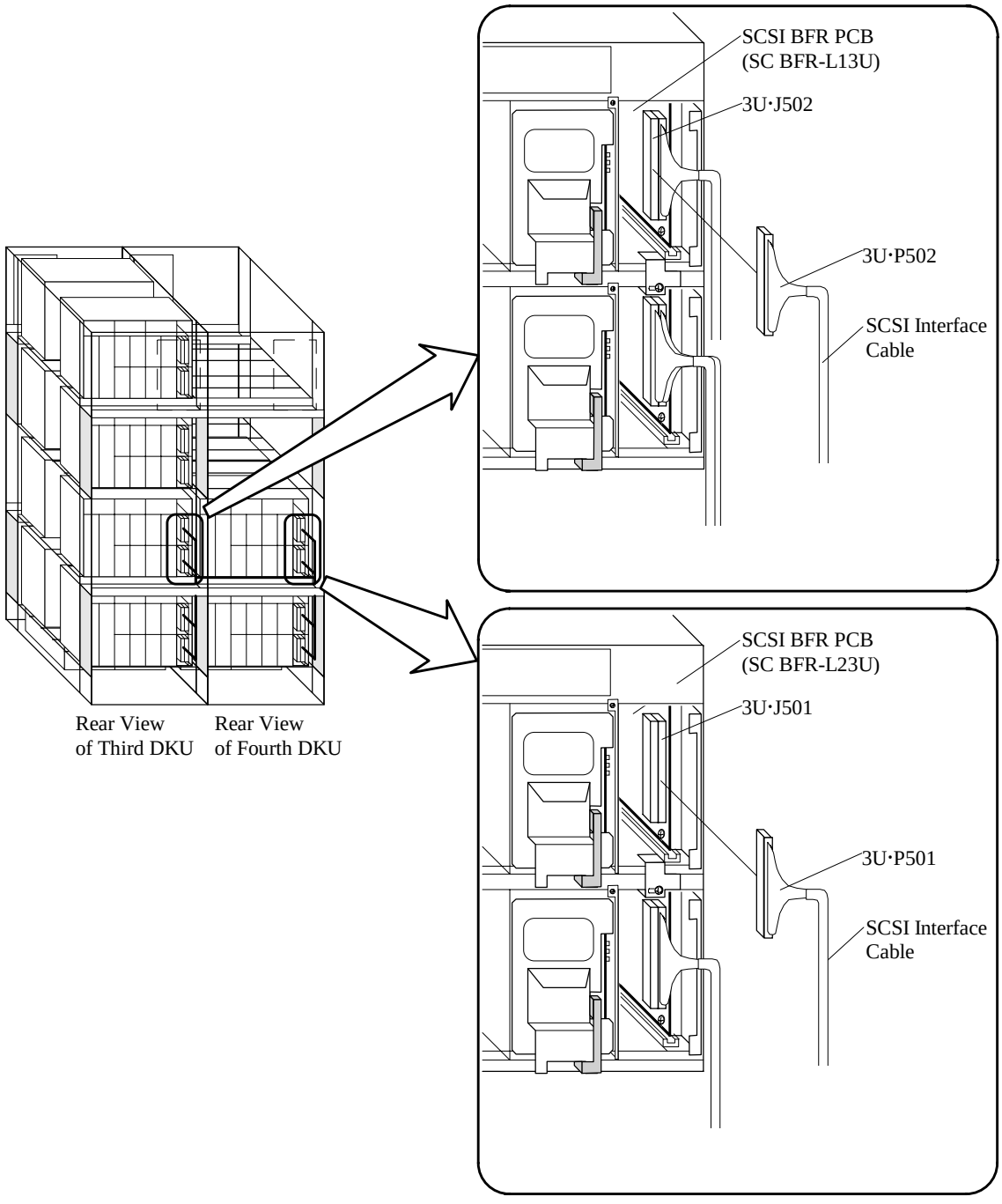

Fig. H-74 Replacement of SCSI Interface Cable

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Cable No. 53 SC BFR-L10L (0L·J502) through SC BFR-L20L (0L·J501)

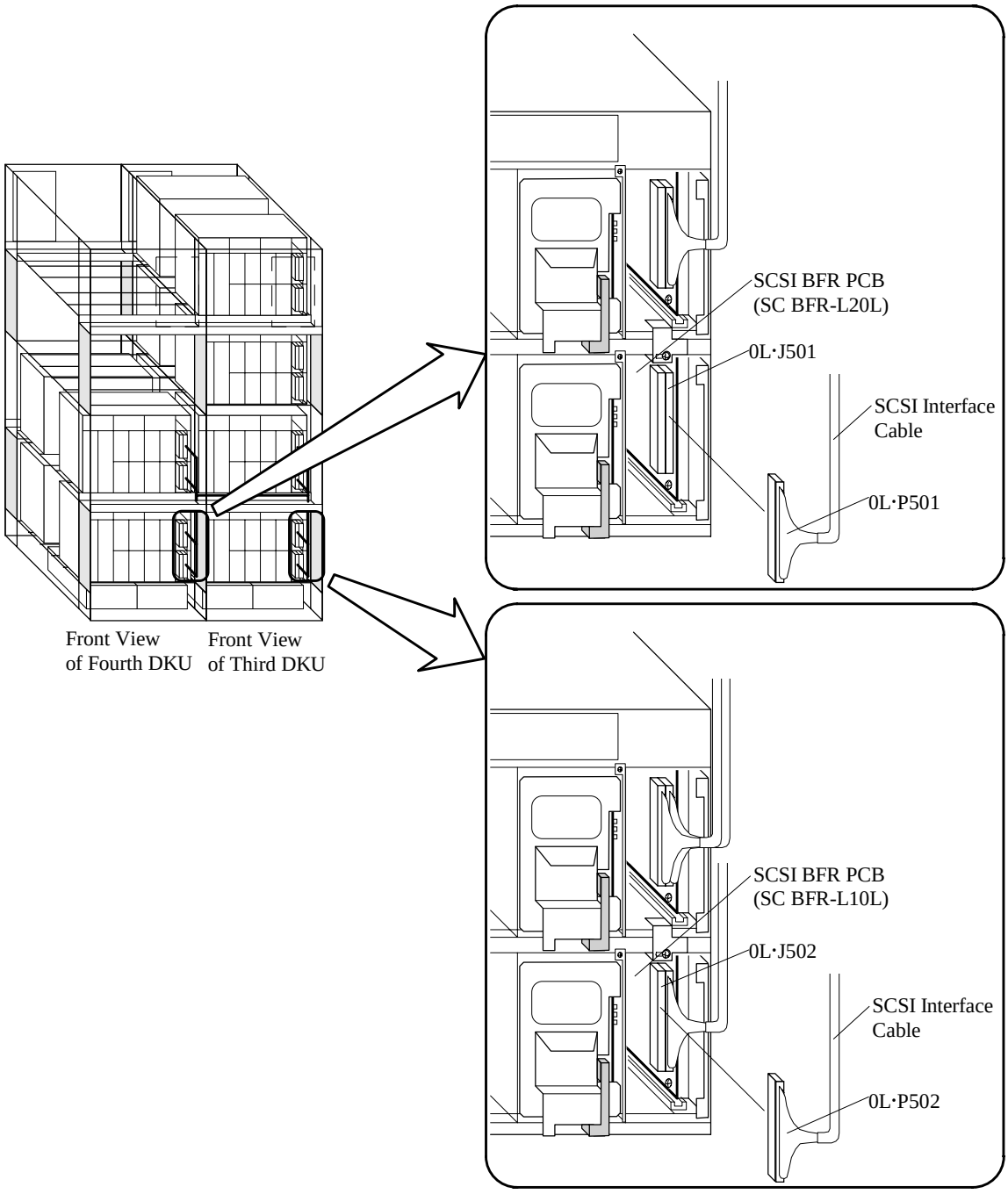

Fig. H-75 Replacement of SCSI Interface Cable

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Cable No. 54 SC BFR-L11L (1L·J502) through SC BFR-L21L (1L·J501)

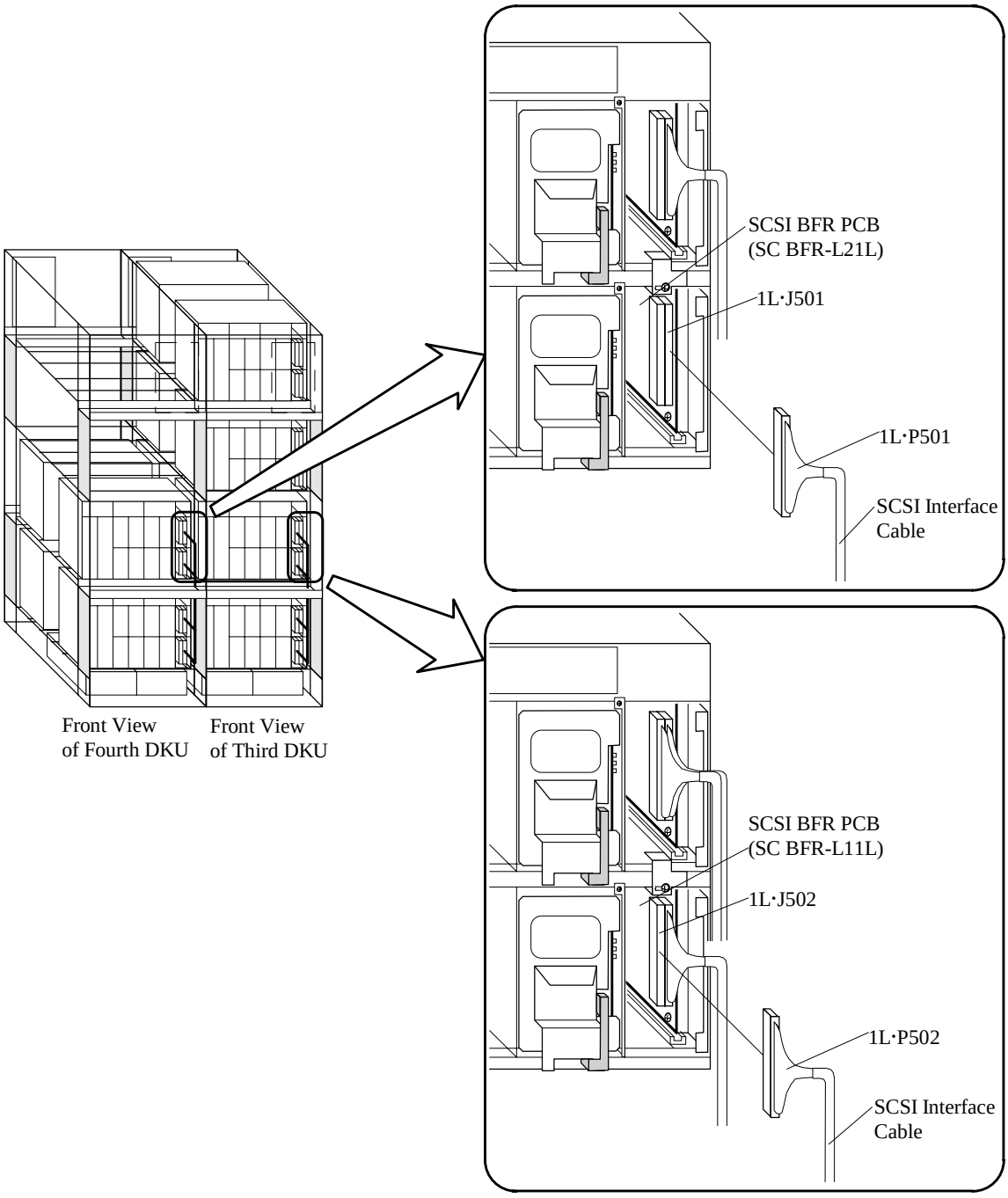

Fig. H-76 Replacement of SCSI Interface Cable

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Cable No. 55 SC BFR-L12L (2L·J502) through SC BFR-L22L (2L·J501)

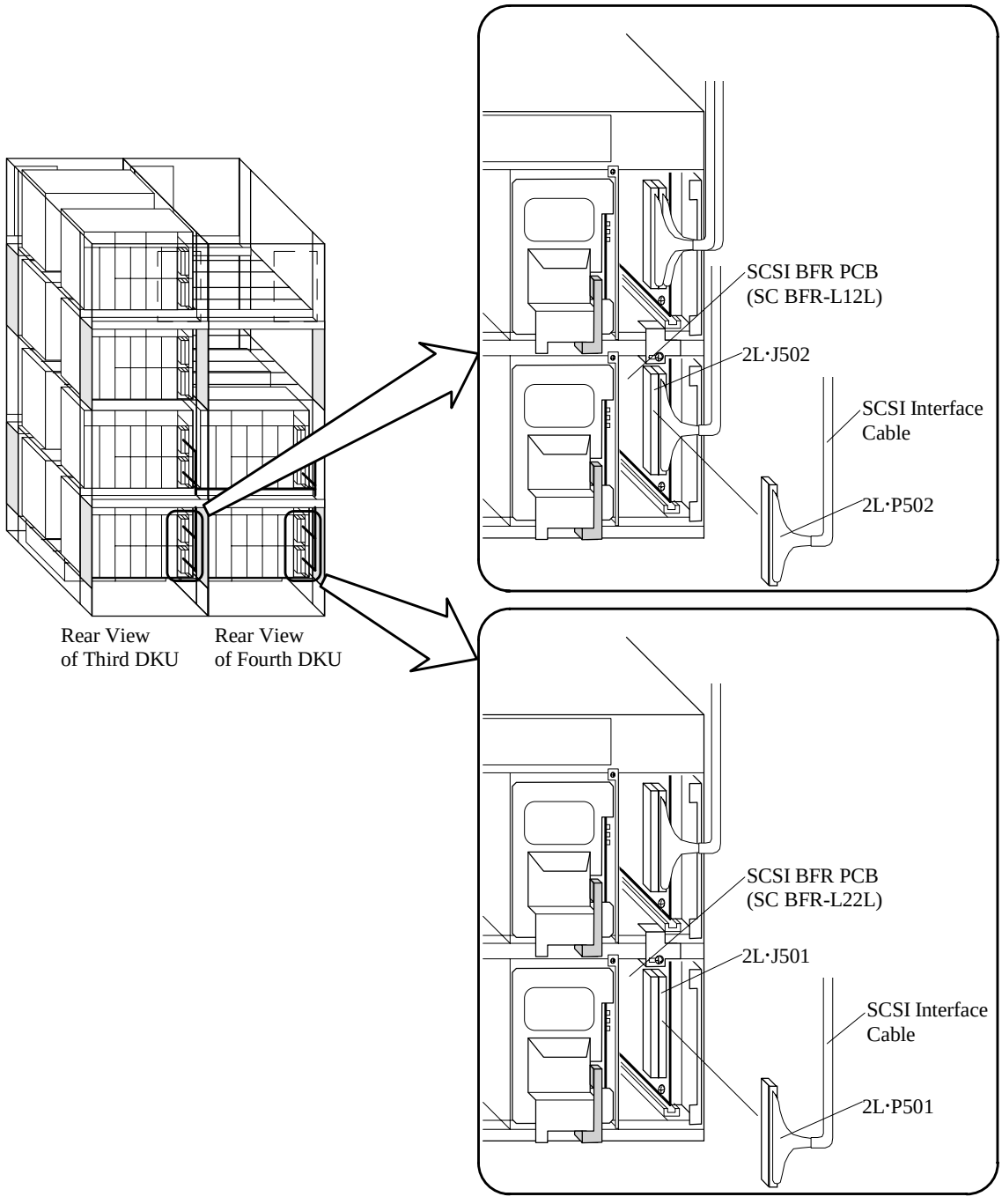

Fig. H-77 Replacement of SCSI Interface Cable

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Cable No. 56 SC BFR-L13L (3L·J502) through SC BFR-L23L (3L·J501)

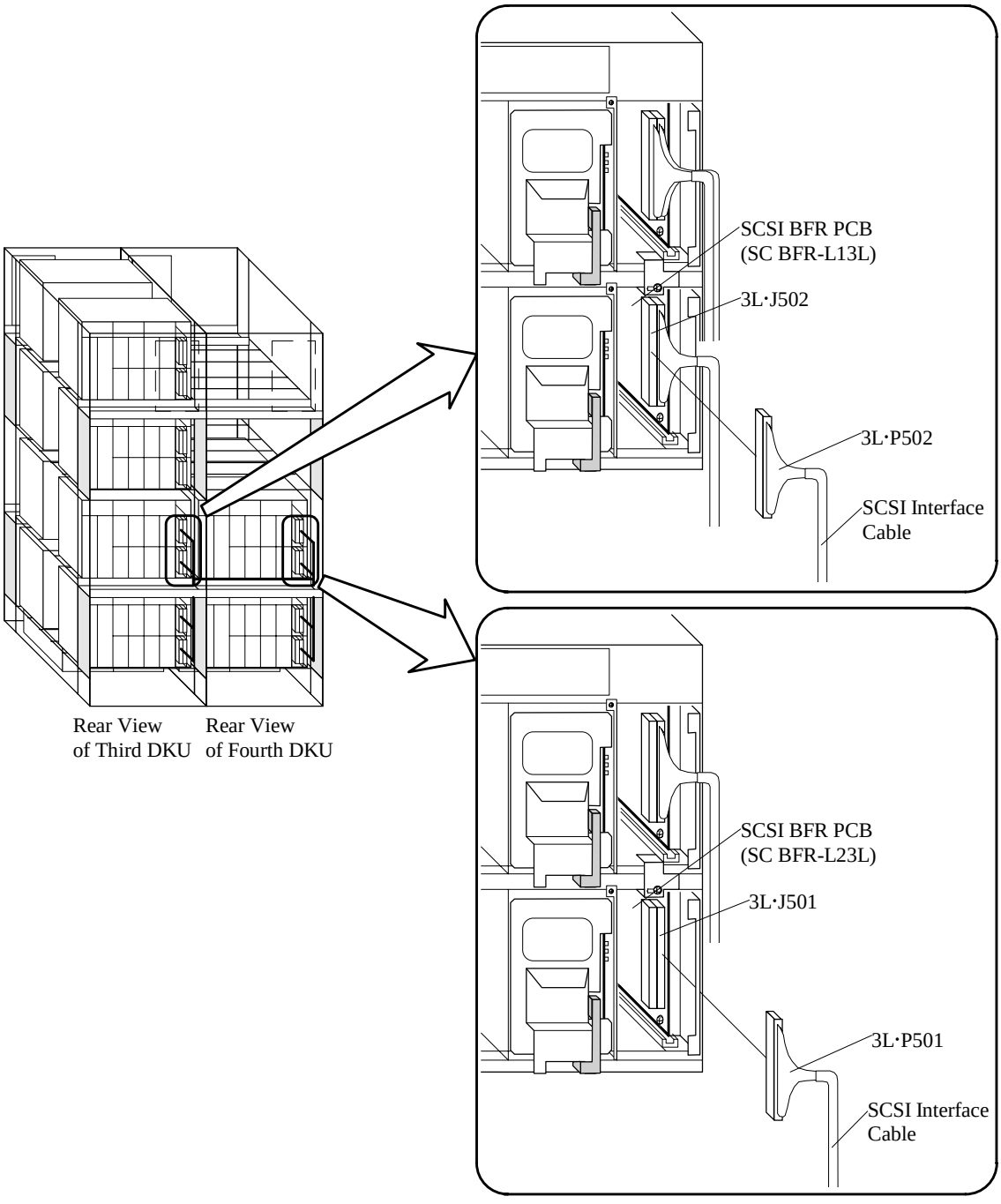

Fig. H-78 Replacement of SCSI Interface Cable

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(3) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

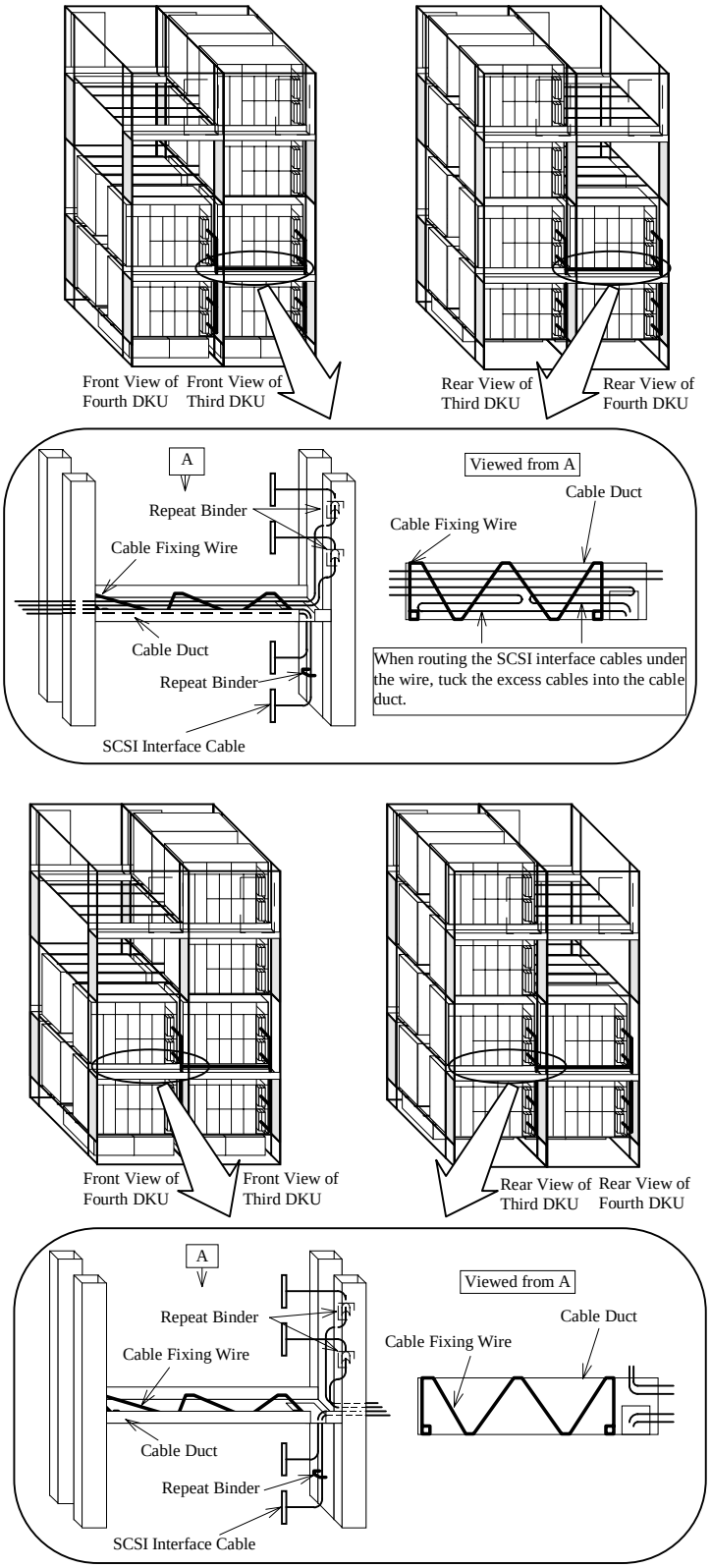

Fig. H-79 Fixation of the SCSI Interface Cables

(4) Go to post-PROCEDURE h (REP04-420).

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Cable No. 57-64 SC BFR-L14-L17U/L through SC BFR-L24-L27U/L

(1) Remove the cable fixing wires and repeat binders.

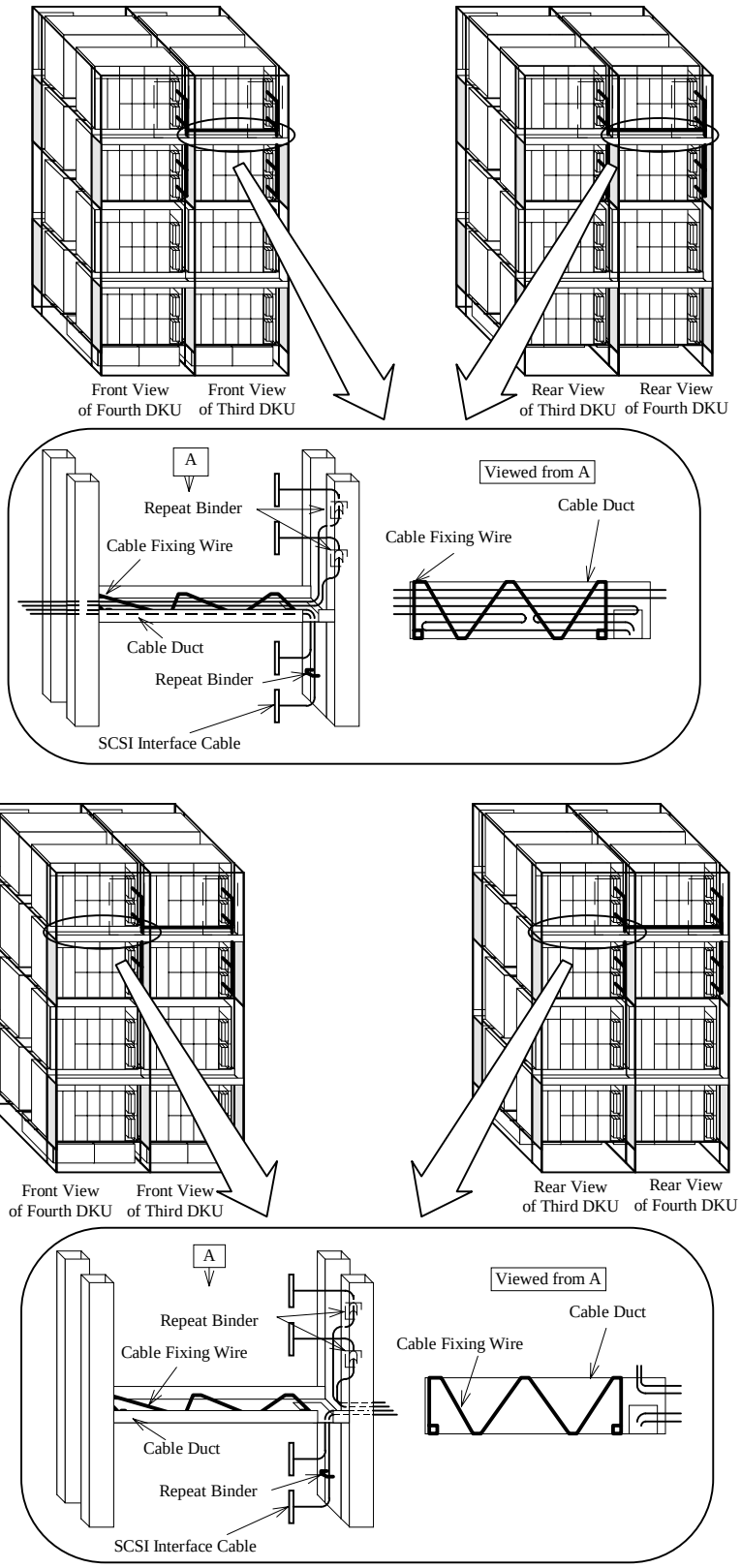

Fig. H-80 Removal of the cable fixing wires and repeat binders

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(2) Replace the SCSI interface cable. The SCSI interface cable should be wired in the same way as the previous route.

Cable No. 57 SC BFR-L14U (4U･J502) through SC BFR-L24U (4U･J501)

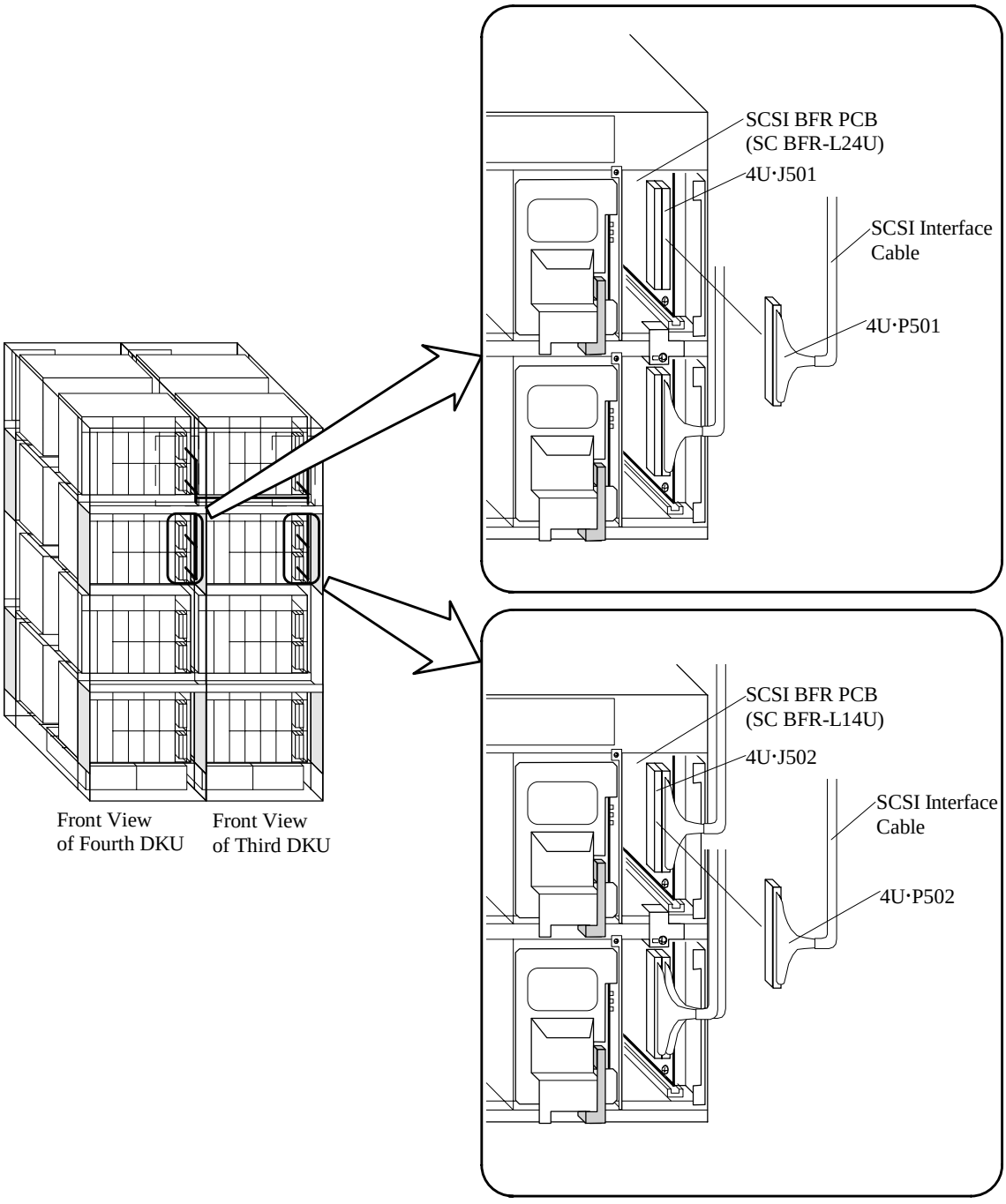

Fig. H-81 Replacement of SCSI Interface Cable

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Cable No. 58 SC BFR-L15U (5U･J502) through SC BFR-L25U (5U･J501)

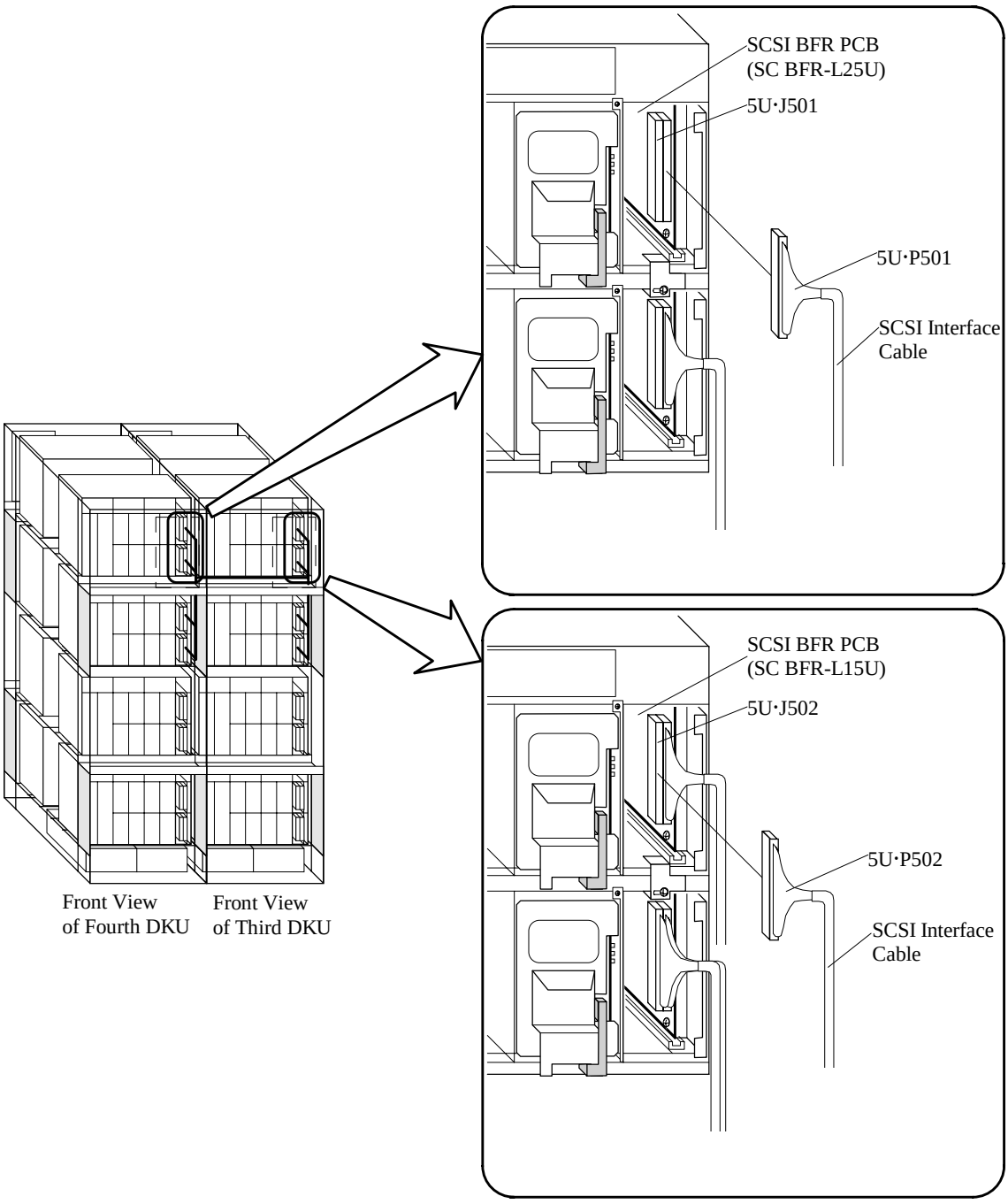

Fig. H-82 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

Cable No. 59 SC BFR-L16U (6U･J502) through SC BFR-L26U (6U･J501)

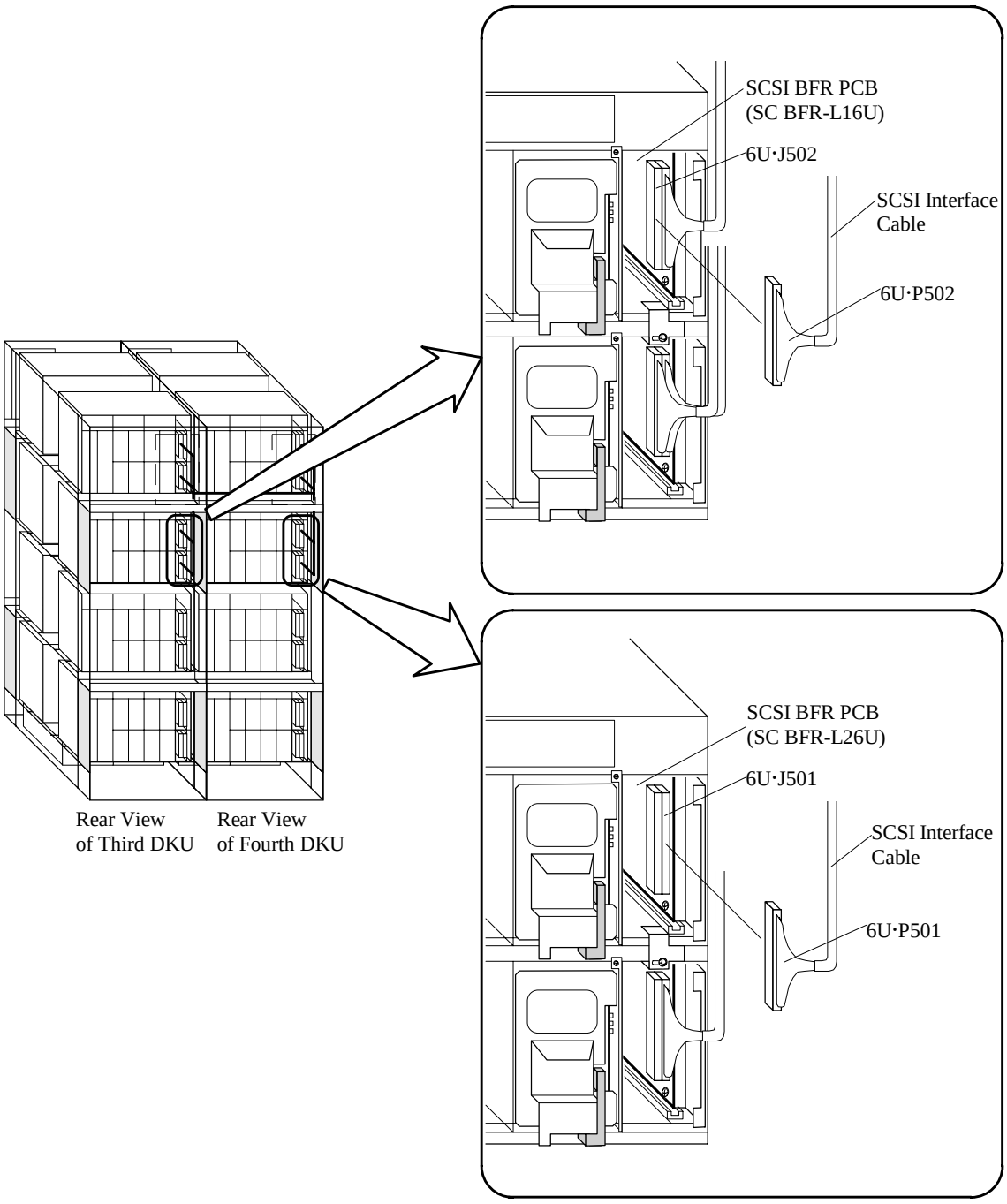

Fig. H-83 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

Cable No. 60 SC BFR-L17U (7U･J502) through SC BFR-L27U (7U･J501)

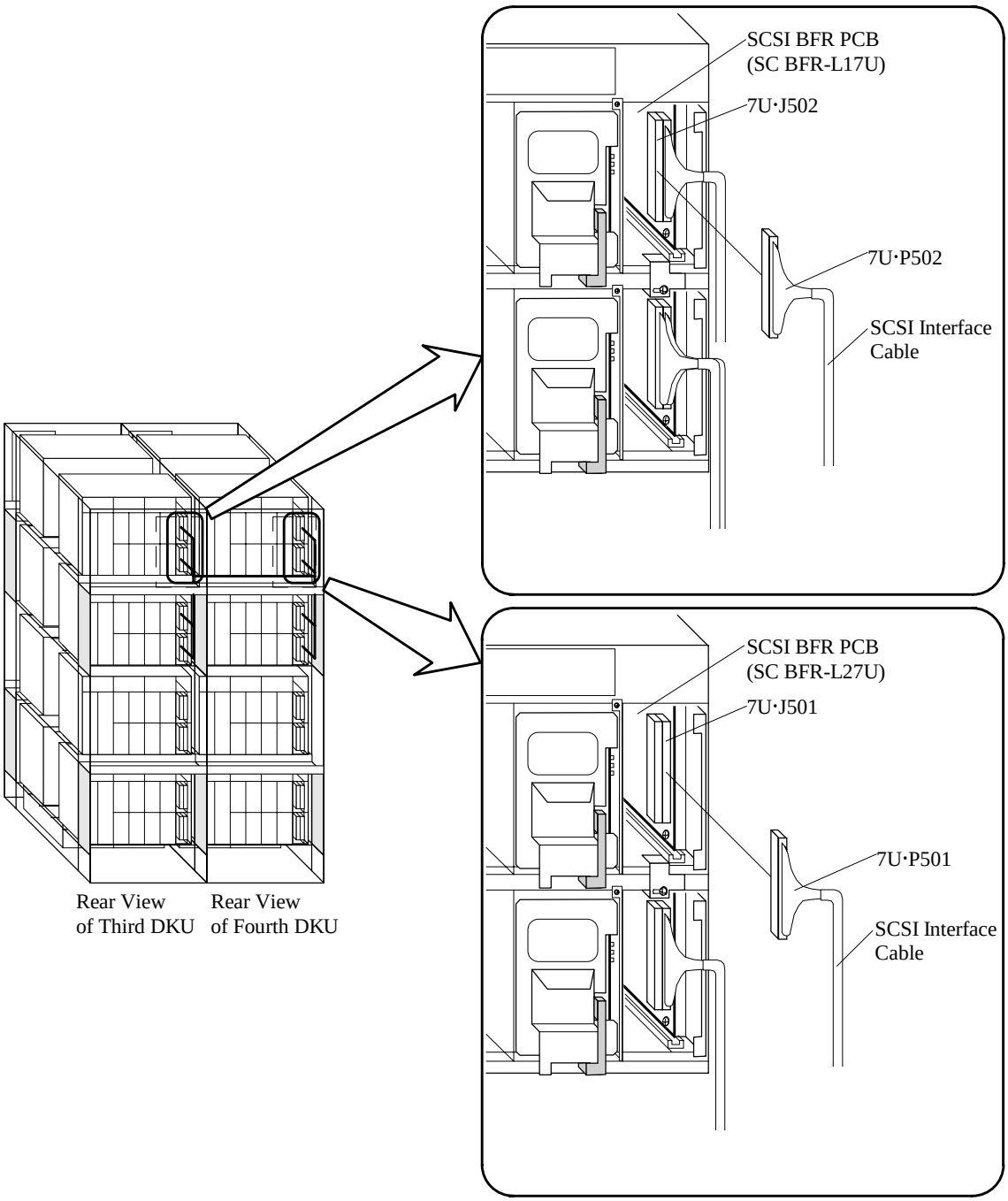

Fig. H-84 Replacement of SCSI Interface Cable

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Cable No. 61 SC BFR-L14L (4L･J502) through SC BFR-L24L (4L･J501)

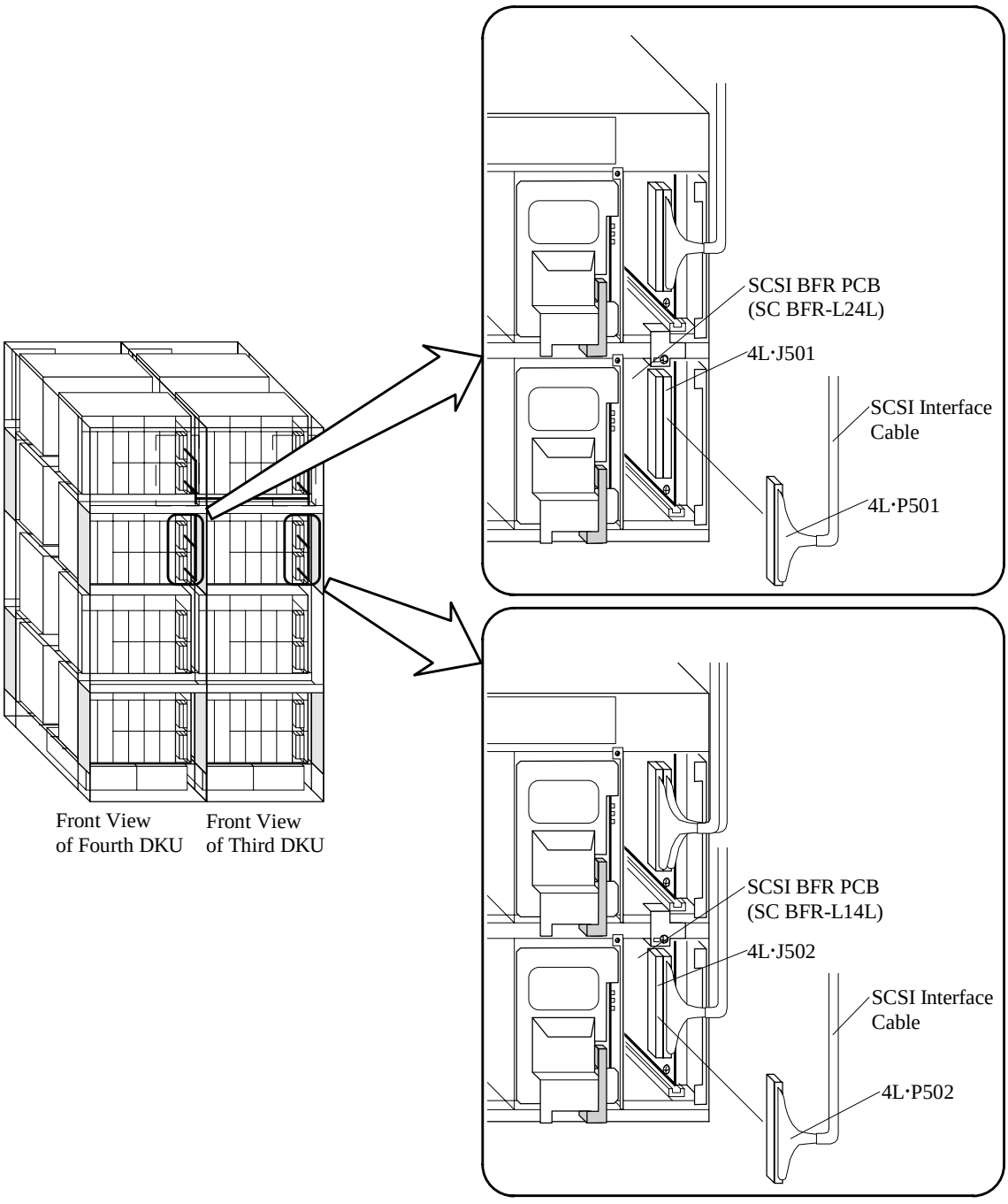

Fig. H-85 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

Cable No. 62 SC BFR-L15L (5L･J502) through SC BFR-L25L (5L･J501)

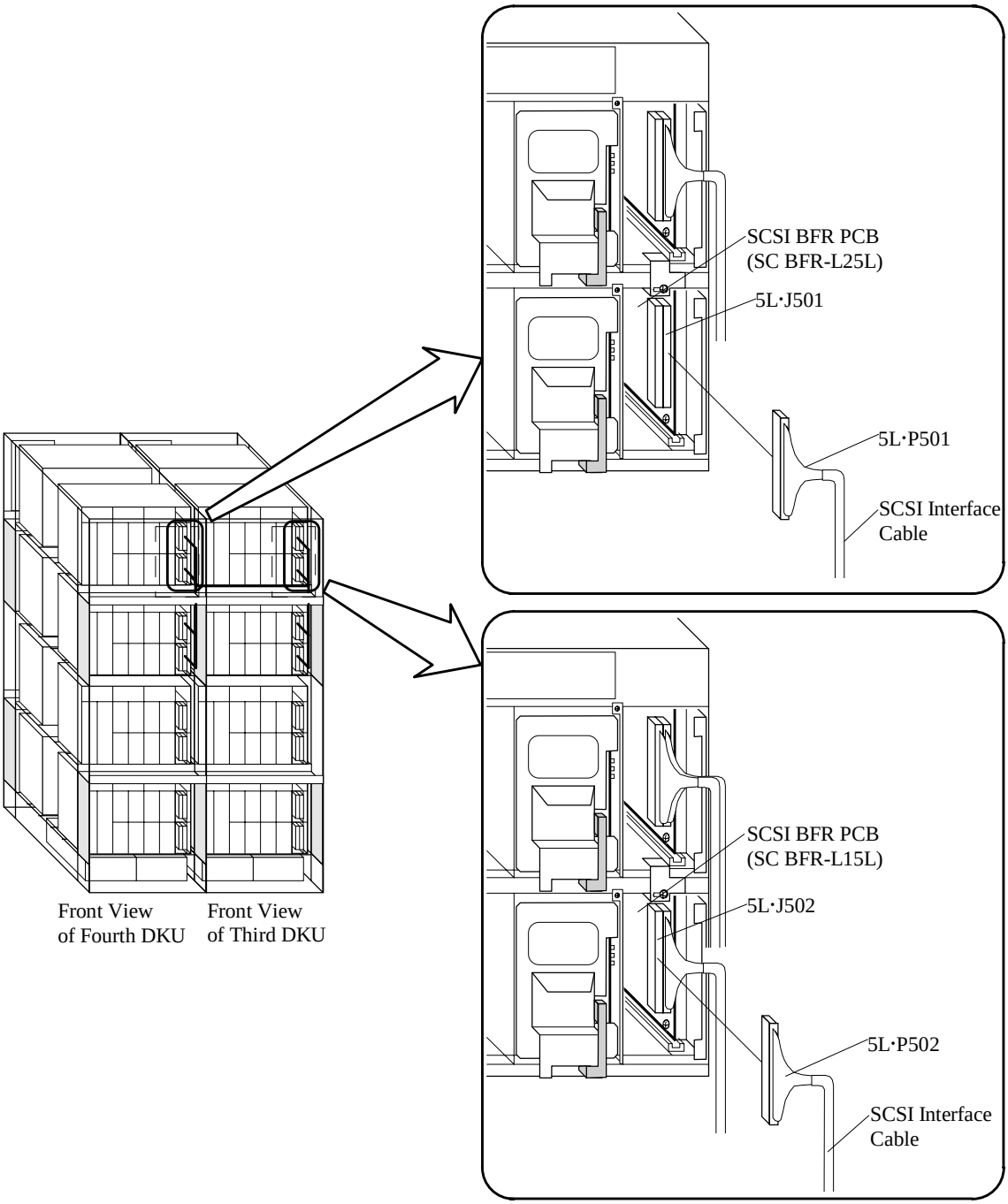

Fig. H-86 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

Cable No. 63 SC BFR-L16L (6L･J502) through SC BFR-L26L (6L･J501)

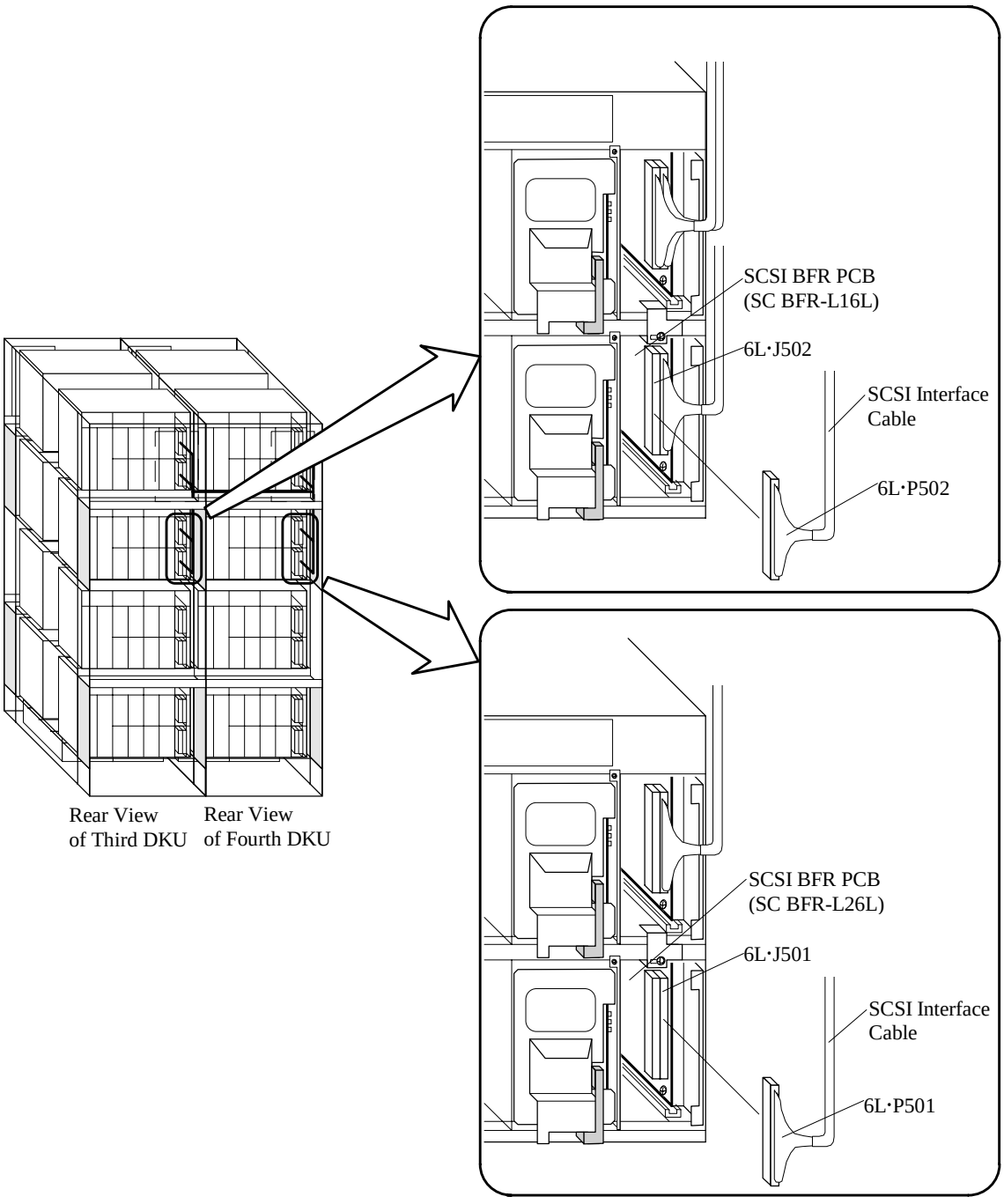

Fig. H-87 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

Cable No. 64 SC BFR-L17L (7L･J502) through SC BFR-L27L (7L･J501)

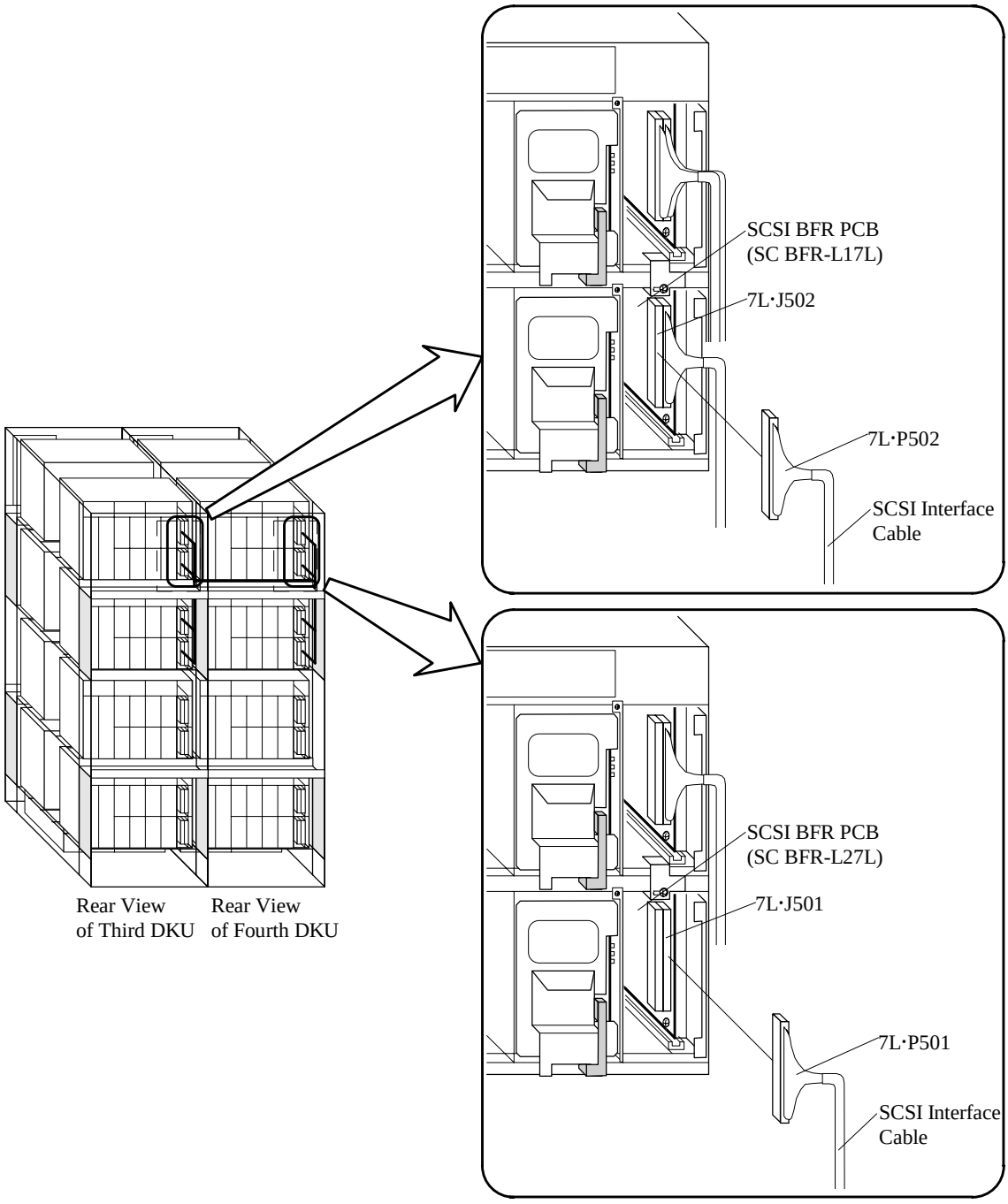

Fig. H-88 Replacement of SCSI Interface Cable

Copyright ©1998, Hitachi, Ltd.

(3) Fix the SCSI interface cables in the DKU chassises with the cable fixing wires and repeat binders.

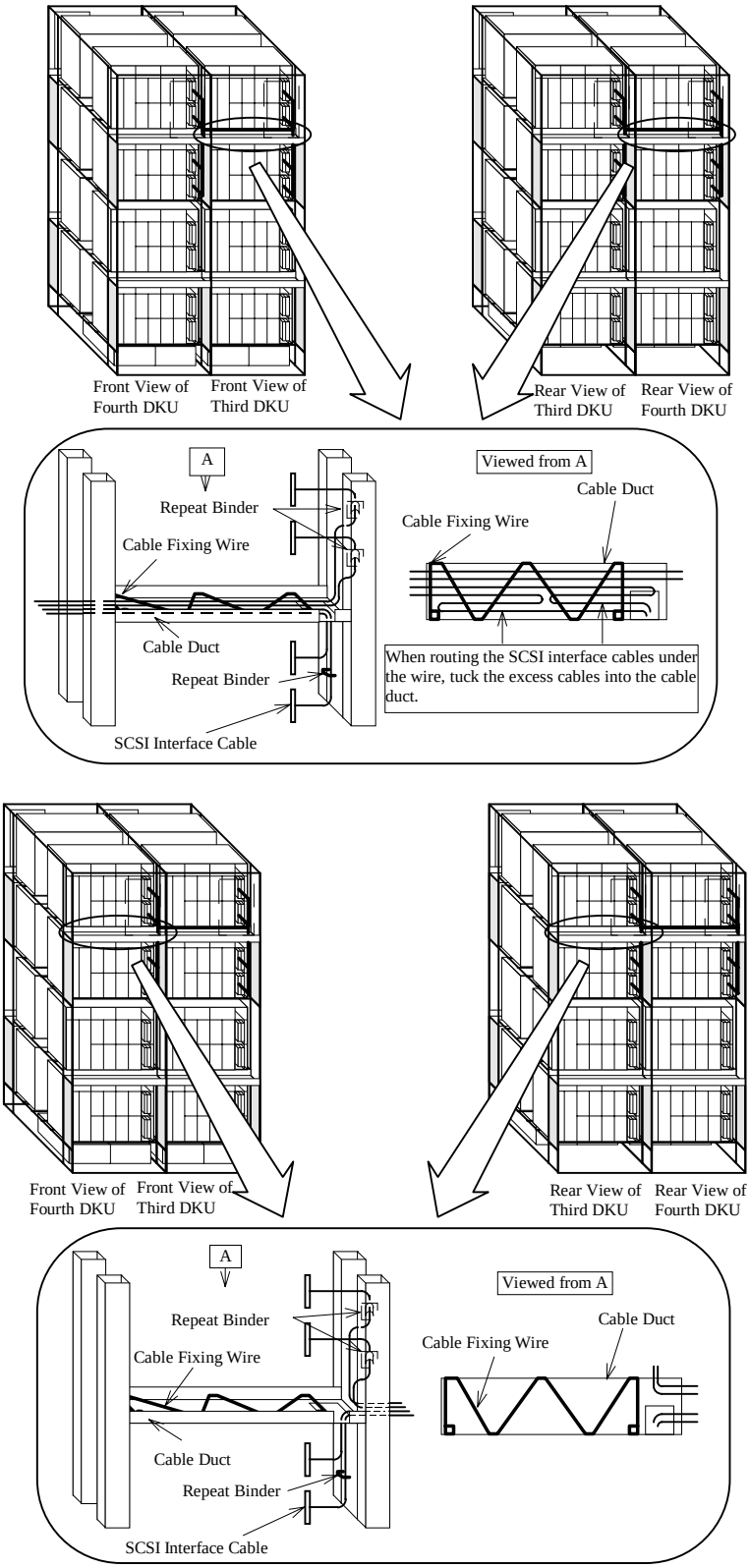

Fig. H-89 Fixation of the SCSI Interface Cables

(4) Go to post-PROCEDURE h (REP04-420).

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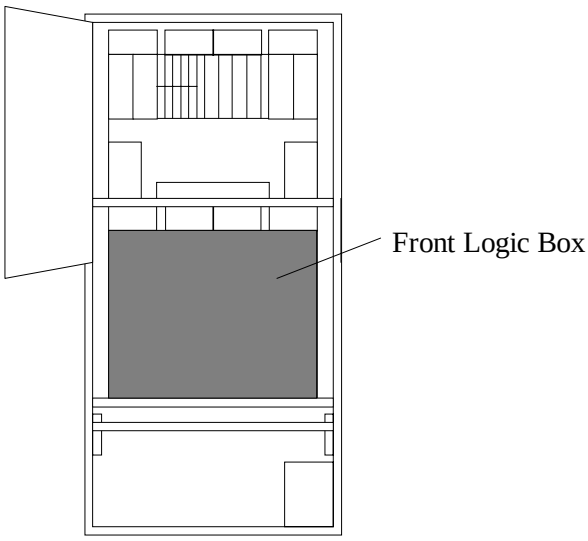
[HARDWARE J]

Location	Function Name of Component		Part Name
Front Logic Box in DKC	1	TM1 PCB	• WP105-A • WP105-B



Front View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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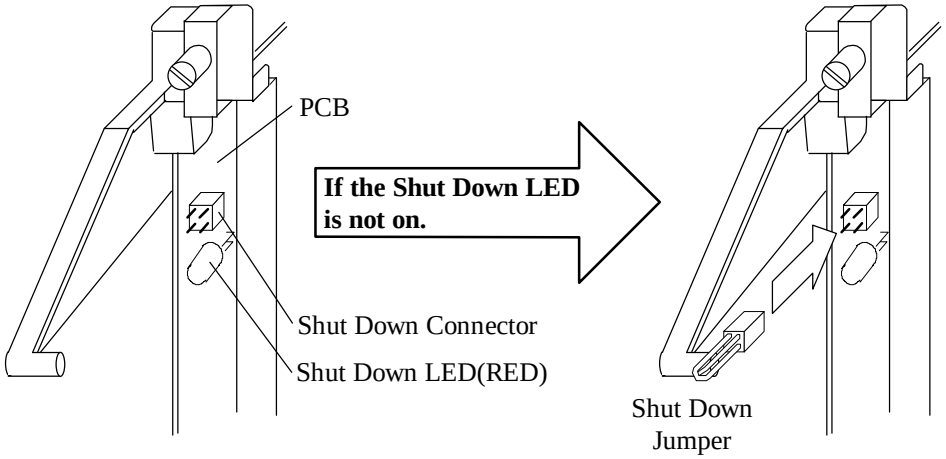
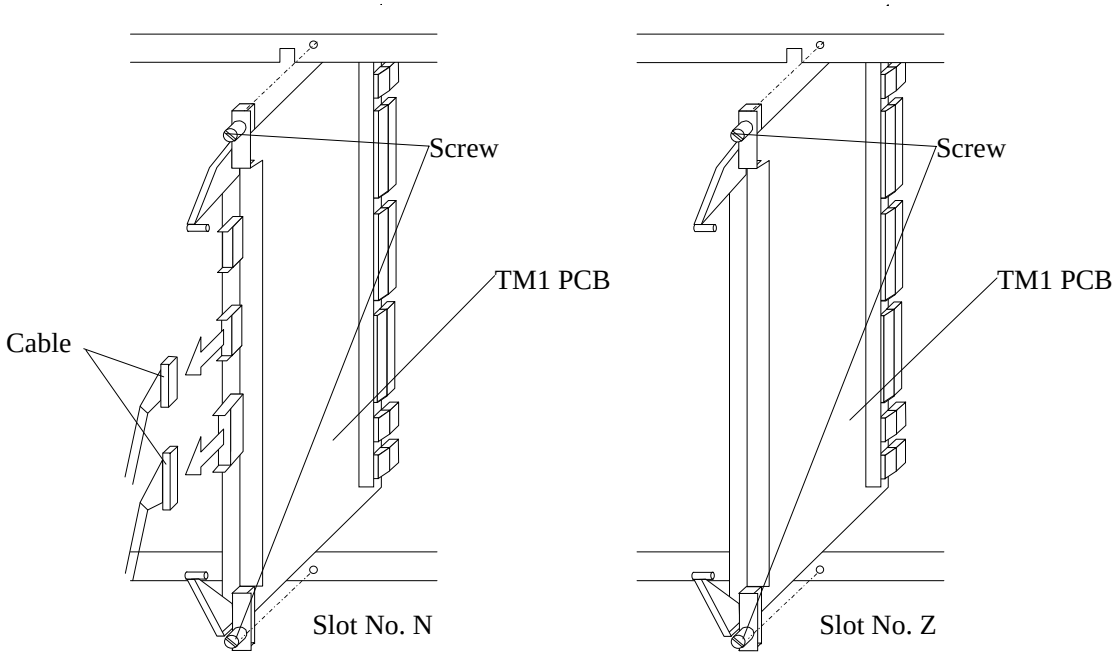
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Remove the TM1 PCB.
   a. If the "Slot No." of the failed TM1 PCB is N, disconnect the two cables from the sub-edge of the failed PCB.
   b. Remove the two screws and remove the failed TM1 PCB.
   c. If the Shut Down Jumper is used, remove it.



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3. Insert the spare PCB to the correct location and fasten the screws.
   (When you plug in new PCB, the Shut Down LED is lit on again.)

4. Connect the cables to the sub-edge of the spare PCB.

5. Go to SVP post procedure t1 [REP04-490].

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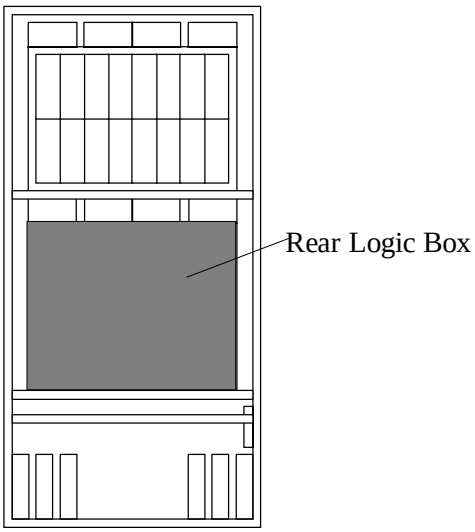
[HARDWARE K]

Location	Function Name of Component		Part Name
Rear Logic Box in DKC	1	TM2 PCB	• WP100-A • WP100-B



Rear View
of DKC

NOTICE:
Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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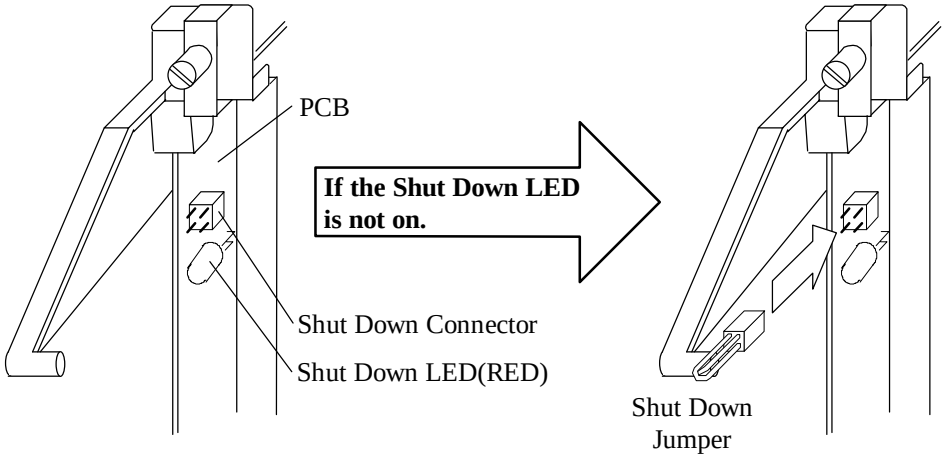
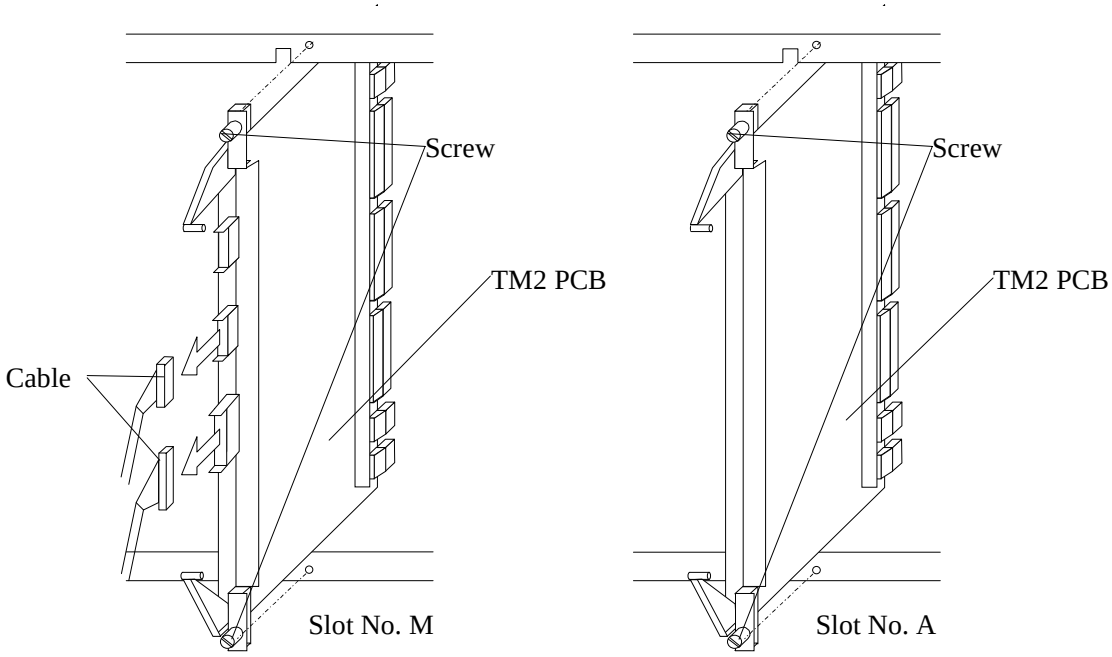
1. Check that the Shut Down LED is on. If not, connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
>
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.



2. Remove the TM2 PCB.
   a. If the "Slot No." of the failed TM2 PCB is M, disconnect the two cables from the sub-edge of the failed PCB.
   b. Remove the two screws and remove the failed TM2 PCB.
   c. If the Shut Down Jumper is used, remove it.



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3. Insert the spare PCB to the correct location and fasten the screws.
   (When you plug in new PCB, the Shut Down LED is lit on again.)

4. Connect the cables to the sub-edge of the spare PCB.

5. Go to SVP post procedure t1 [REP04-490].

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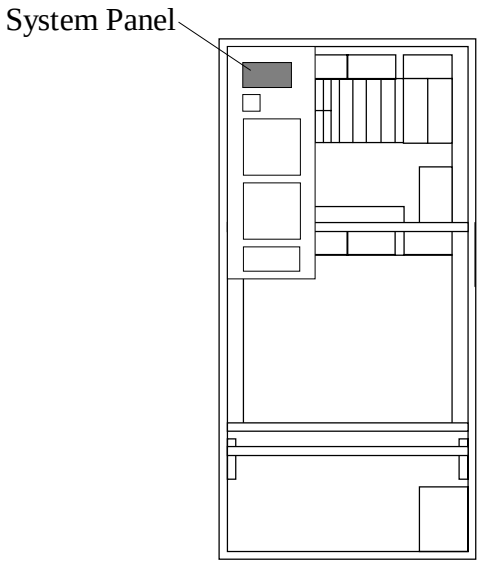
[HARDWARE T1]

Location	Function Name of Component		Part Name
Front upside of DKC	1	System Panel PCB	• SZ569-A



Front View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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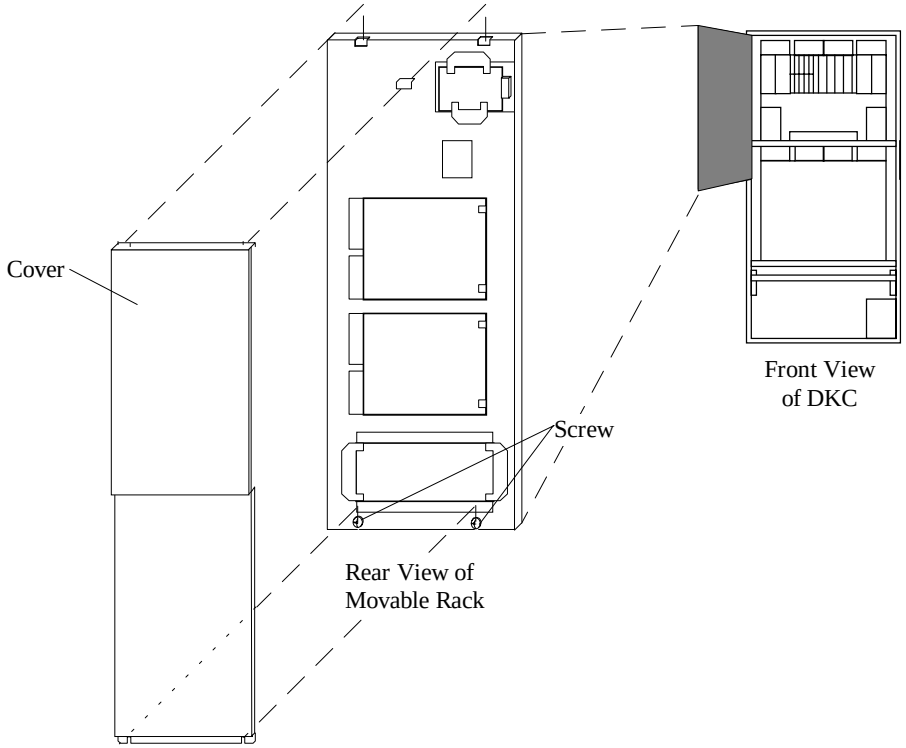
1. Set the switches of the spare PCB to the same positions as those of the failed PCB.

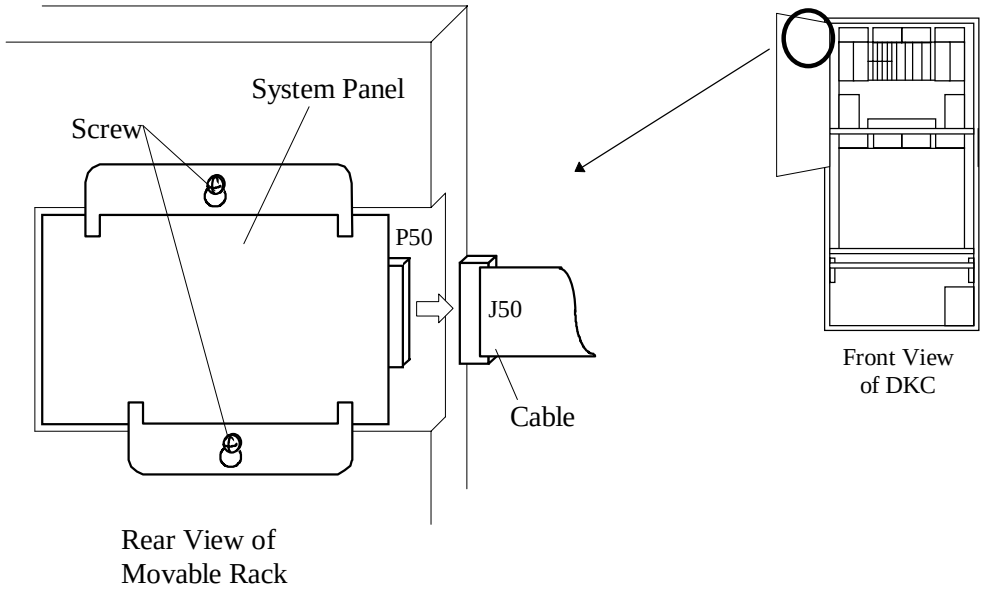
2. Remove the cover from the Movable rack.

a. Loosen the two screws and remove the cover from the Movable Rack.



3. Remove the PCB.

a. Disconnect the cable.
b. Loosen the two screws and remove the System Panel.



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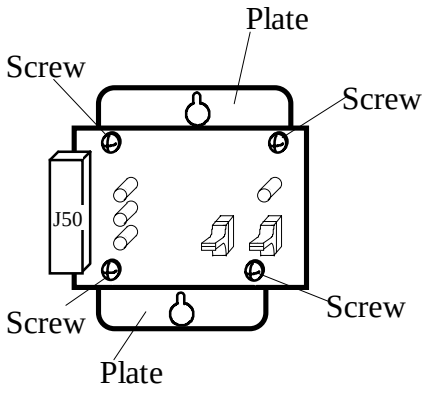
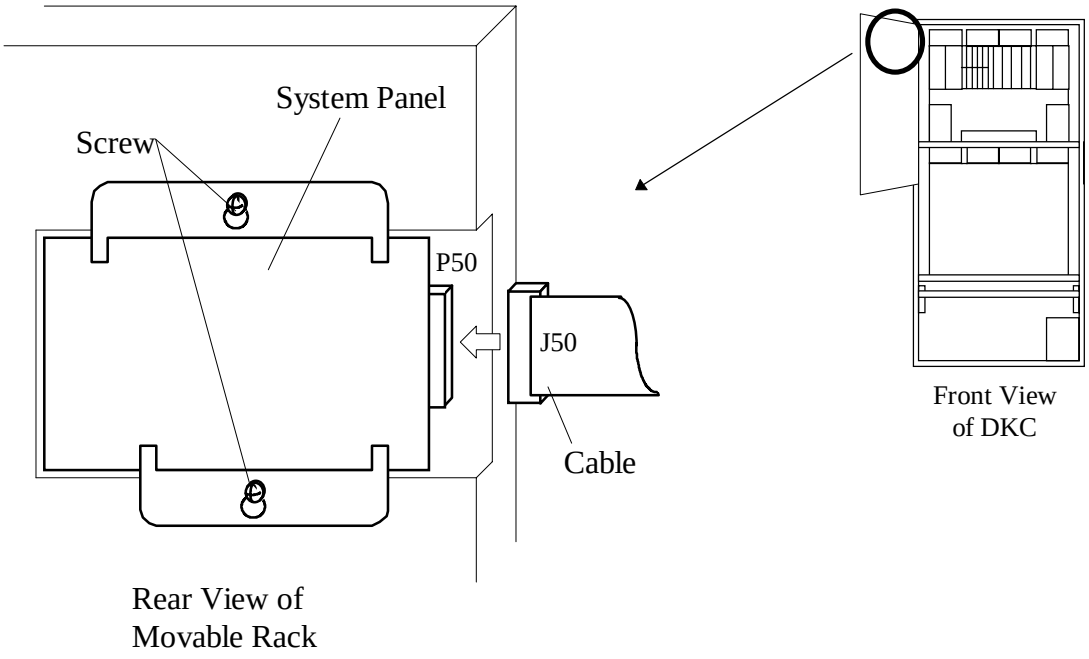
4. Remove the plates from the failed PCB, and then attach them to the spare PCB.
   a. Remove the four screws and the two plates from the failed PCB.
   b. Attach the two plates to the spare PCB and fasten the four screws.



5. Attach the PCB.
   a. Attach the spare PCB.
   b. Fasten the two screws and connect the cable.



6. Go to SVP post procedure t1 [REP04-490].

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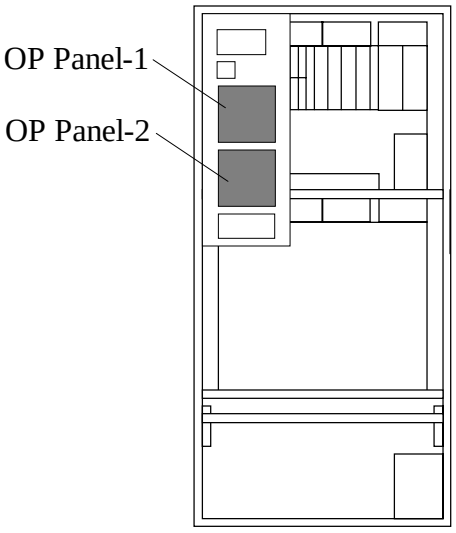
[HARDWARE T2]

Location	Function Name of Component		Part Name
Front upside of DKC	1	OP Panel-1	• SH089-A
	2	OP Panel-2	• SH089-A



Front View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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OP Panel-1

1. Memorize the current setting of Enable/Remote/Disable Switches on the OP Panel-1.

2. Set the switches of the spare PCB to the proper position.
   a. If Enable/Disable LED is on, set the Enable/Remote/Disable Switch to Enable position.
   b. If Enable/Disable LED is off, set the Enable/Remote/Disable Switch to Disable position.

3. Remove the PCB.
   a. Loosen the two screws and remove the plate.
   b. Set the jumper socket(JP1) of the failed PCB referring to following figure.
   c. Disconnect the cables.

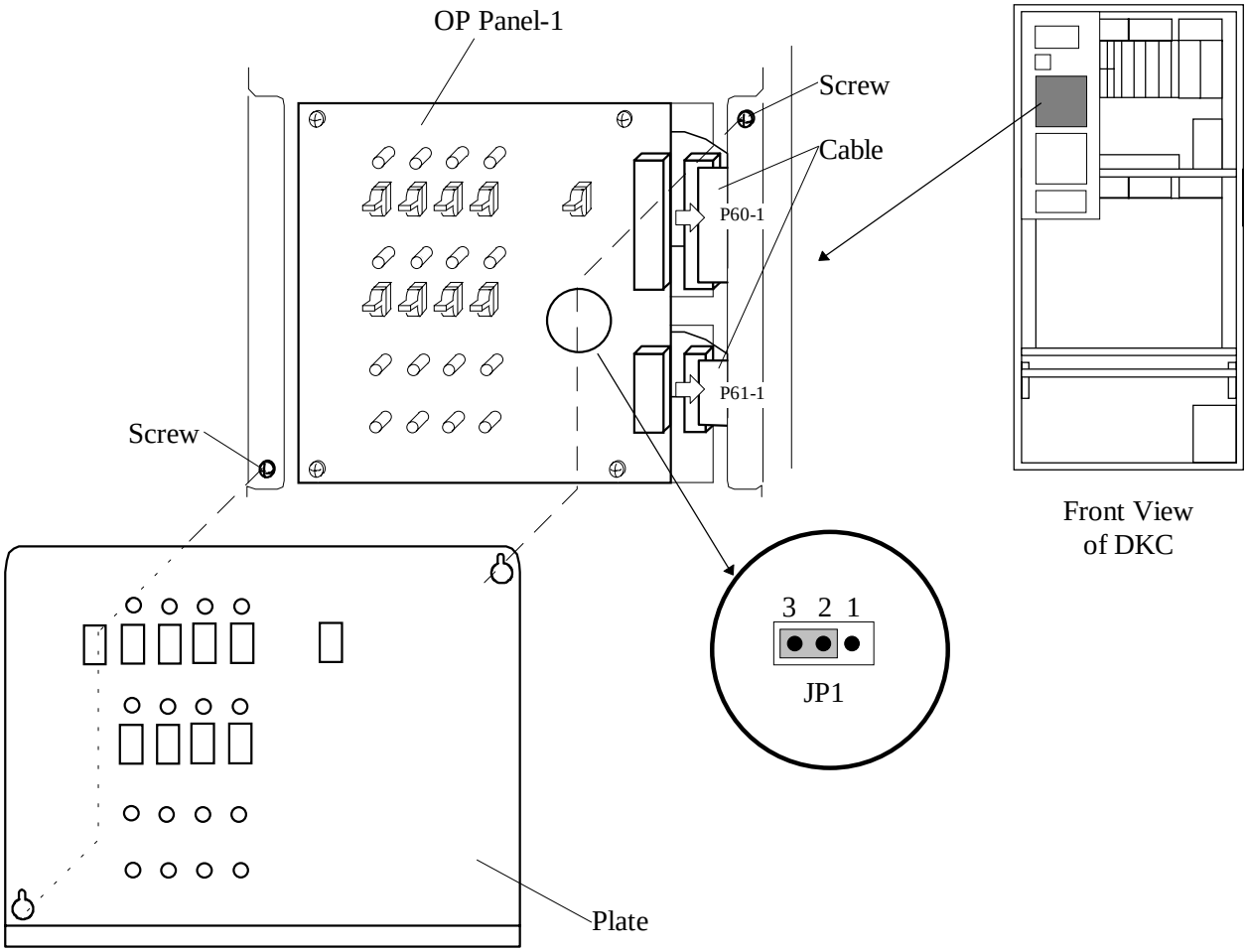

Fig. T2-1 Removal of Plate

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d. Loosen the two screws and remove the cover from the Movable Rack.

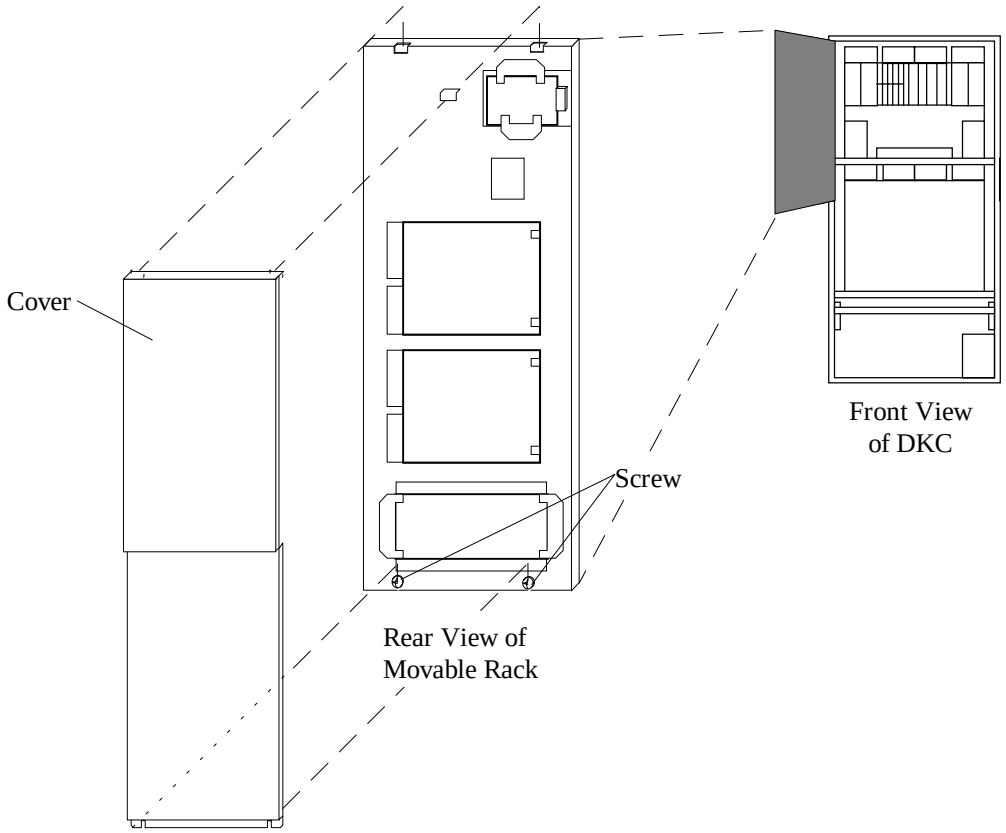

Fig. T2-2 Removal of Cover

e. Loosen the two screws and remove the OP Panel-1.

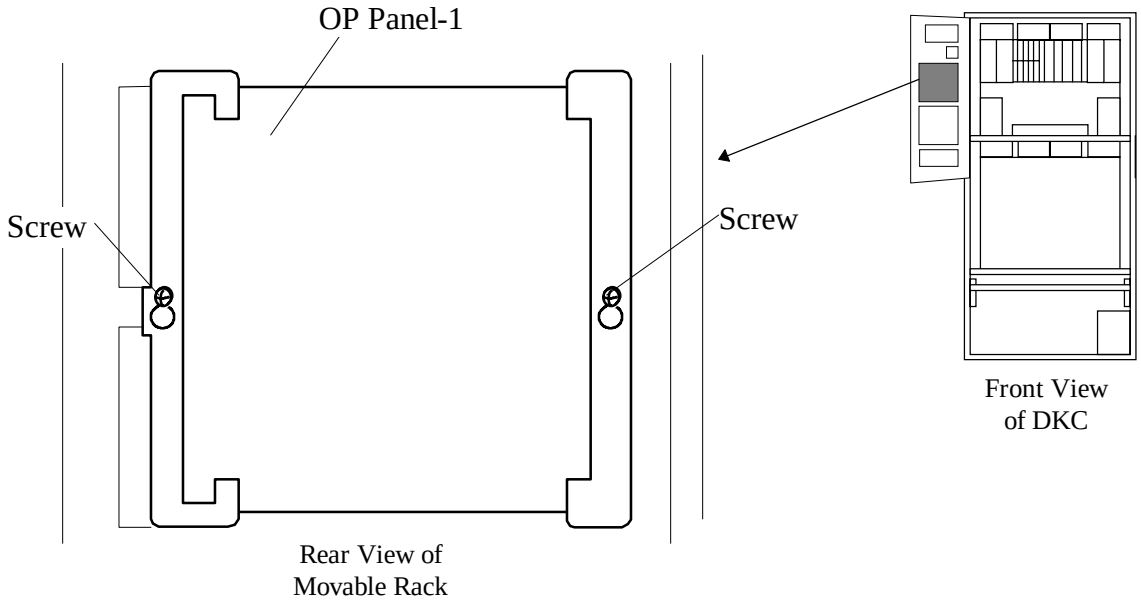

Fig. T2-3 Removal of OP Panel-1

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4. Remove the plates from the failed PCB, and then attach them to the spare PCB.

   a. Remove the four screws and the plates from the failed PCB.
   b. Attach the plates to the spare PCB and fasten the four screws.

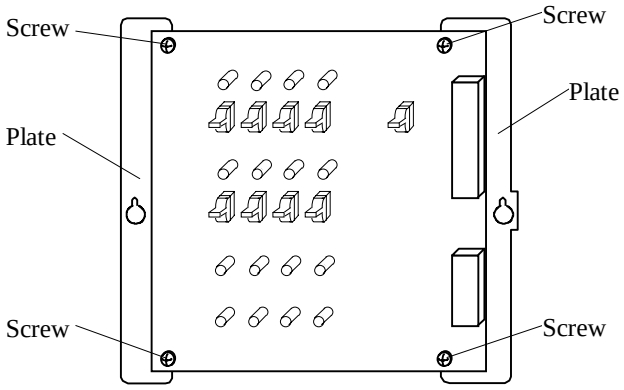

Fig. T2-4 Replacement of PCB

5. Attach the PCB.

   a. Attach the spare PCB and fasten the two screws. Refer to Fig.T2-3.
   b. Attach the cover to the Movable Rack and fasten the two screws. Refer to Fig.T2-2.
   c. Set the jumper socket(JP1) referring to Fig. a.
   d. Connect the cables.
   e. Set the jumper socket(JP1) referring to Fig. b.
   f. Attach the plate and fasten the two screws.

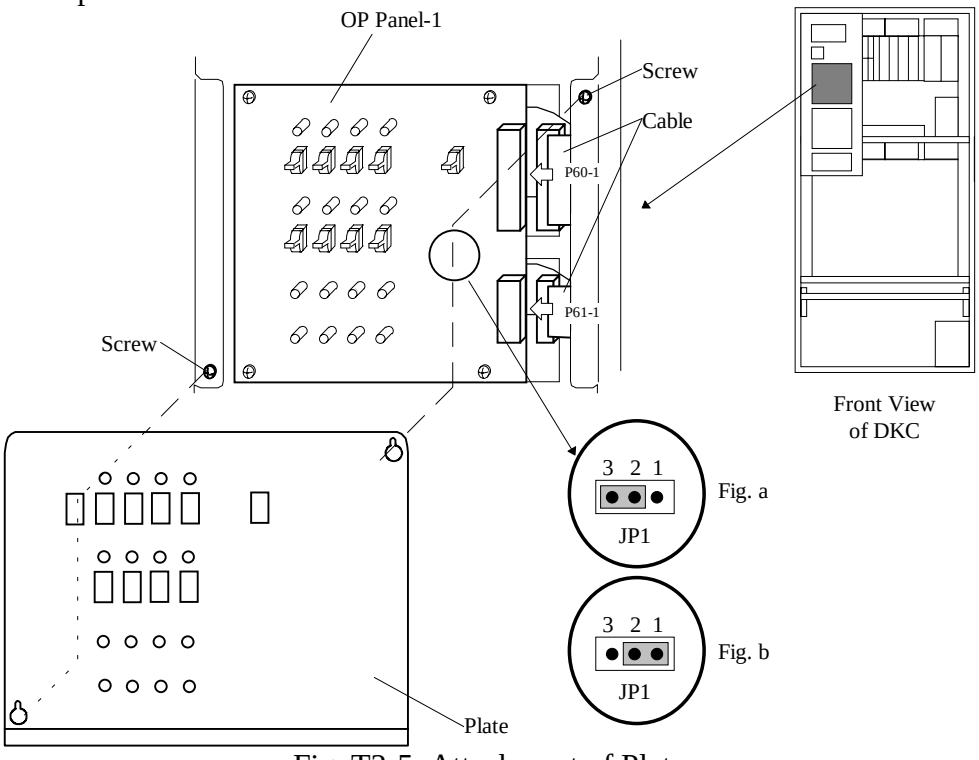

Fig. T2-5 Attachment of Plate

6. Go to SVP post procedure t1 [REP04-490].

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OP Panel-2

1. Memorize the current setting of Enable/Remote/Disable Switches on the OP Panel-2.

2. Set the switches of the spare PCB to the proper position.
   a. If Enable/Disable LED is on, set the Enable/Remote/Disable Switch to Enable position.
   b. If Enable/Disable LED is off, set the Enable/Remote/Disable Switch to Disable position.

3. Remove the PCB.
   a. Loosen the two screws and remove the plate.
   b. Set the jumper socket(JP1) of the failed PCB referring to following figure.
   c. Disconnect the cables.

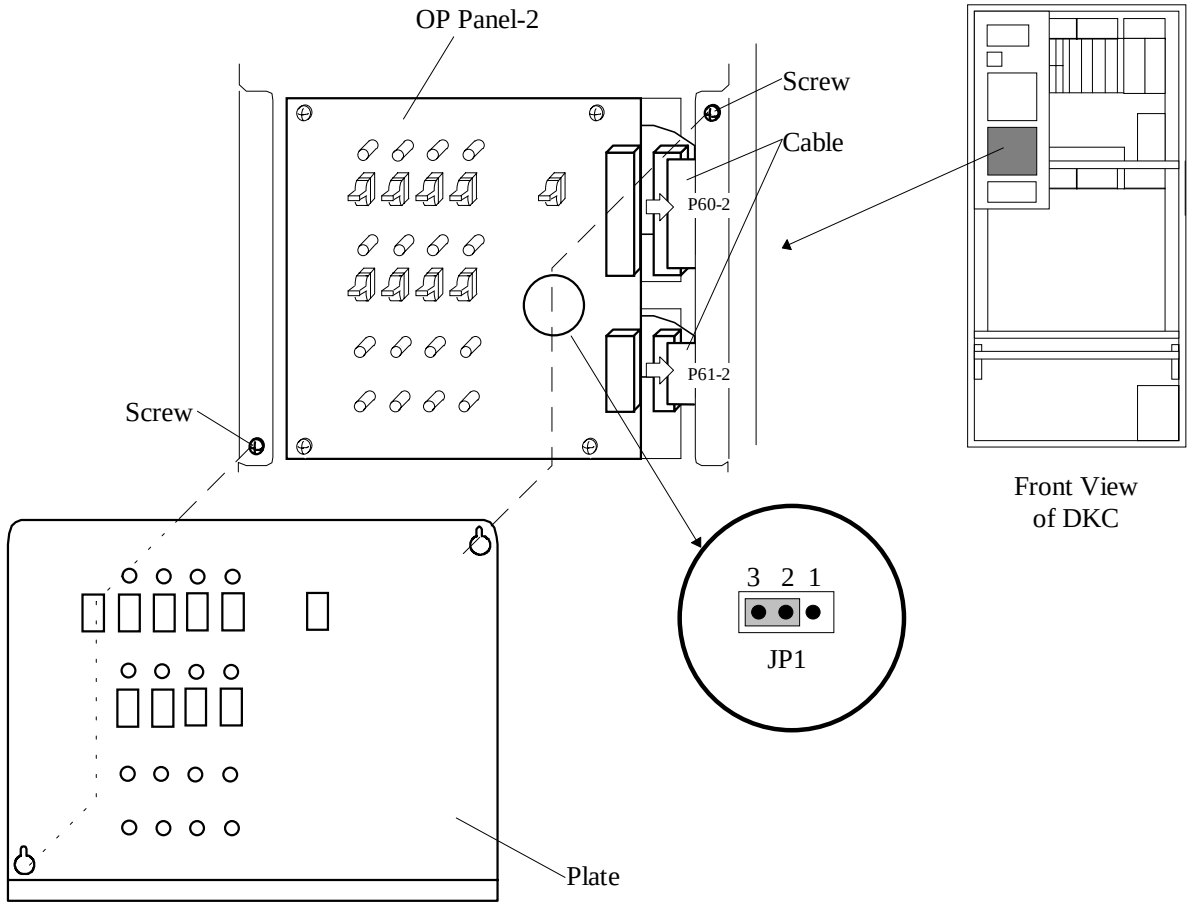

Fig. T2-6 Removal of Plate

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d. Loosen the two screws and remove the cover from the Movable Rack.

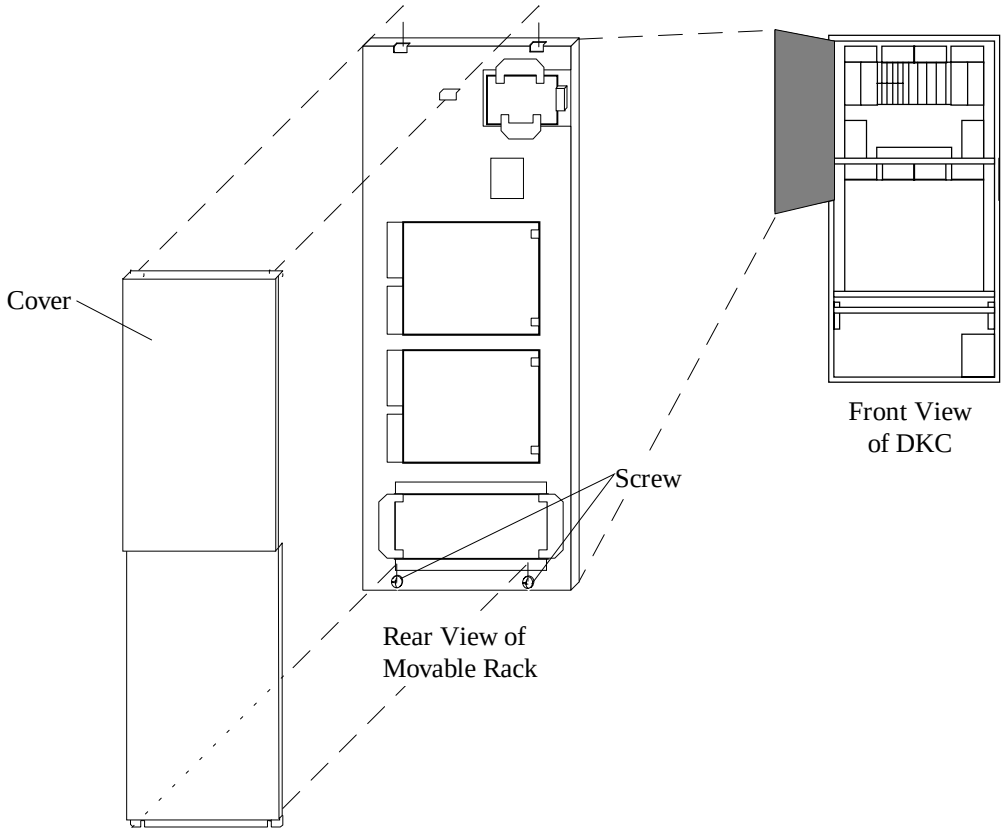

Fig. T2-7 Removal of Cover

e. Loosen the two screws and remove the OP Panel-2.

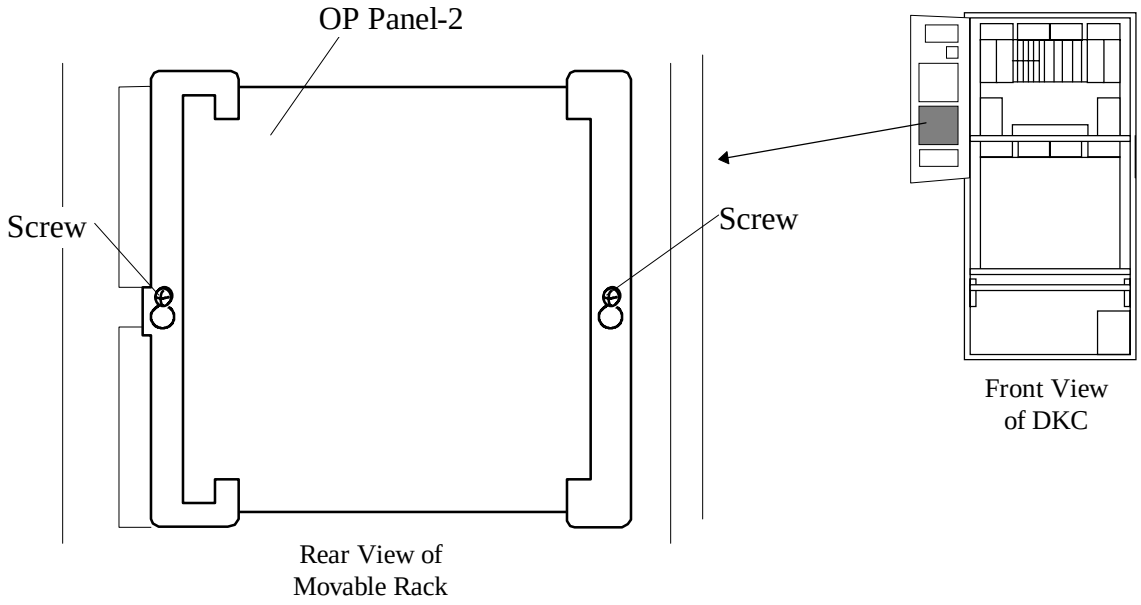

Fig. T2-8 Removal of OP Panel-2

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4. Remove the plates from the failed PCB, and then attach them to the spare PCB.

   a. Remove the four screws and the plates from the failed PCB.
   b. Attach the plates to the spare PCB and fasten the four screws.

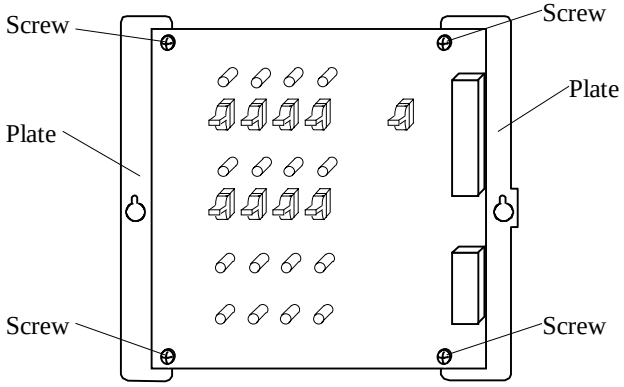

Fig. T2-9 Replacement of PCB

5. Attach the PCB.

   a. Attach the spare PCB and fasten the two screws. Refer to Fig. T2-8.
   b. Attach the cover to the Movable Rack and fasten the two screws. Refer to Fig. T2-7.
   c. Set the jumper socket(JP1) referring to Fig. a.
   d. Connect the cables.
   e. Set the jumper socket(JP1) referring to Fig. b.
   f. Attach the plate and fasten the two screws.

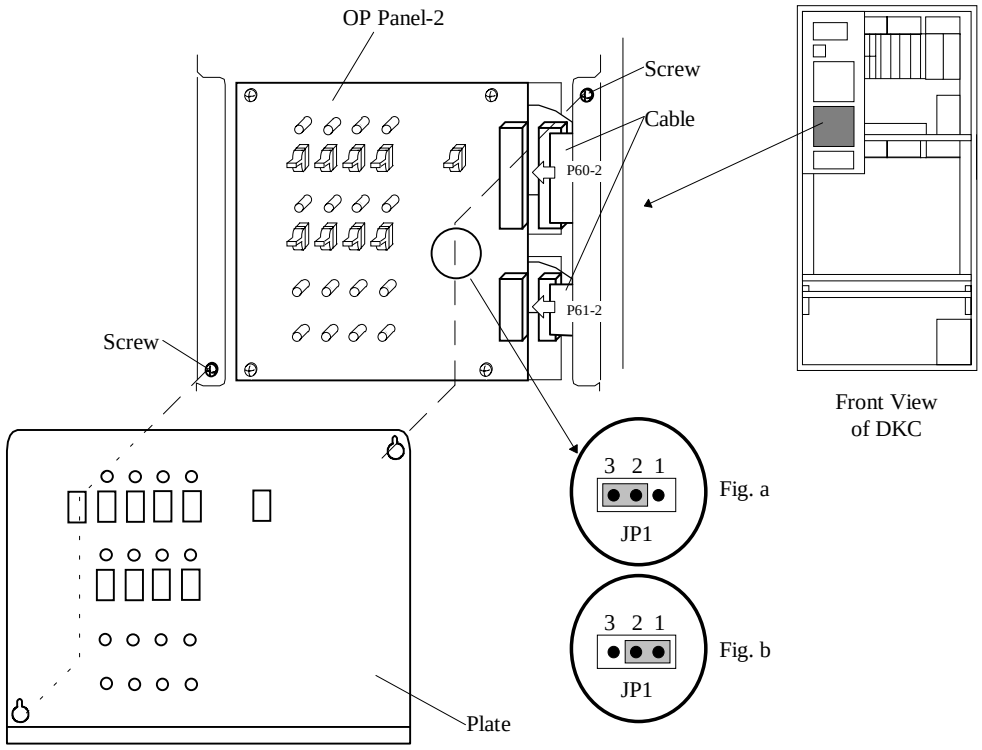

Fig. T2-10 Attachment of Plate

6. Go to SVP post procedure t1 [REP04-490].

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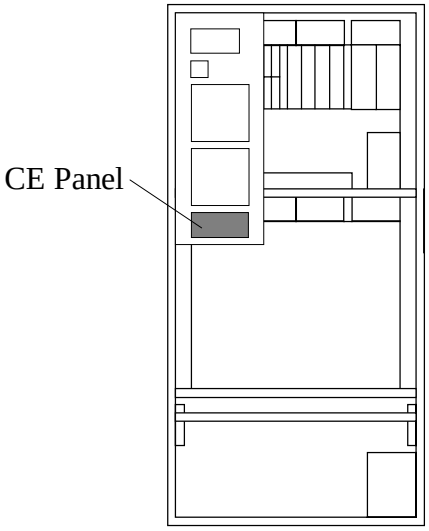
[HARDWARE T3]

Location	Function Name of Component		Part Name
Front of DKC	1	CE Panel	• SZ591-A



Front View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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Note: The COMP signal of PCI is turned off, if the CE Panel is removed.

1. Connect the "CE Panel INH" jumper plug to the socket on the HUB.

> **⚠ CAUTION**
>
> A system down is caused if the CE Panel INH jumper socket is not inserted. Be sure to insert the CE Panel INH jumper socket before starting the work.

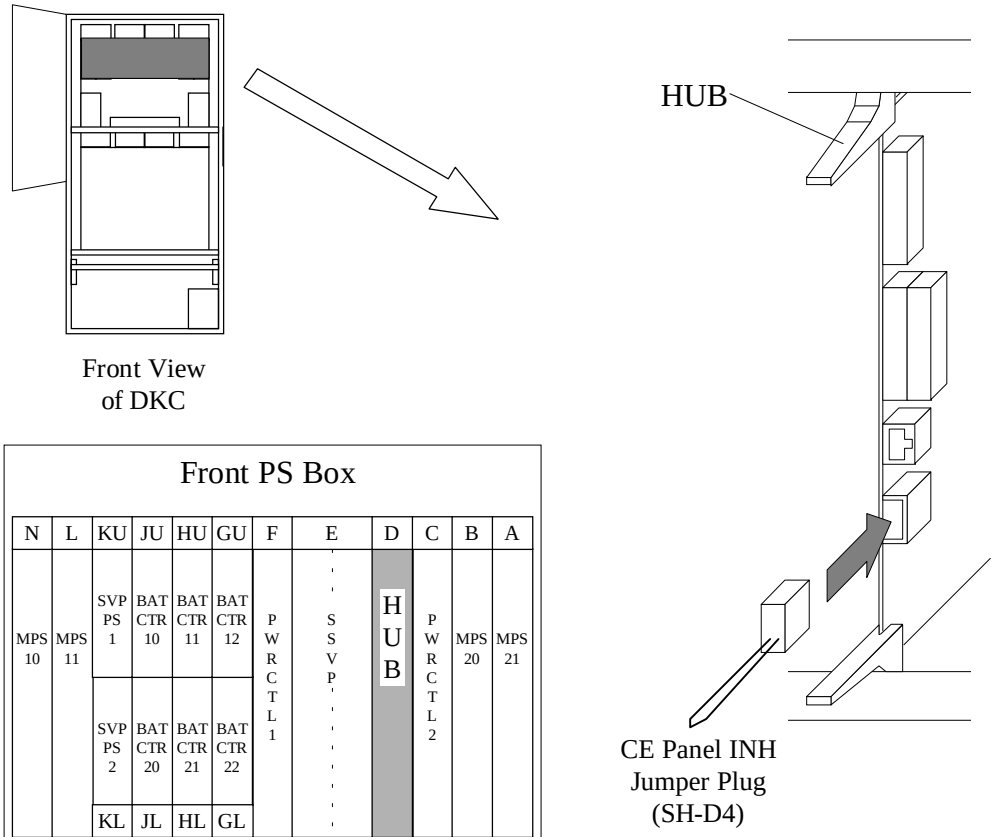

Fig. T3-1 Insertion of Jumper Plug

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2 Remove the PCB.

a. Loosen the two screws and remove the plate and the switch cover.
b. Set the three switches and the two jumper plugs of the spare PCB to the same positions as those of the failed PCB.
c. Set Enable/Disable Switch to Disable on the CE Panel.
d. Disconnect all cables from the CE Panel.

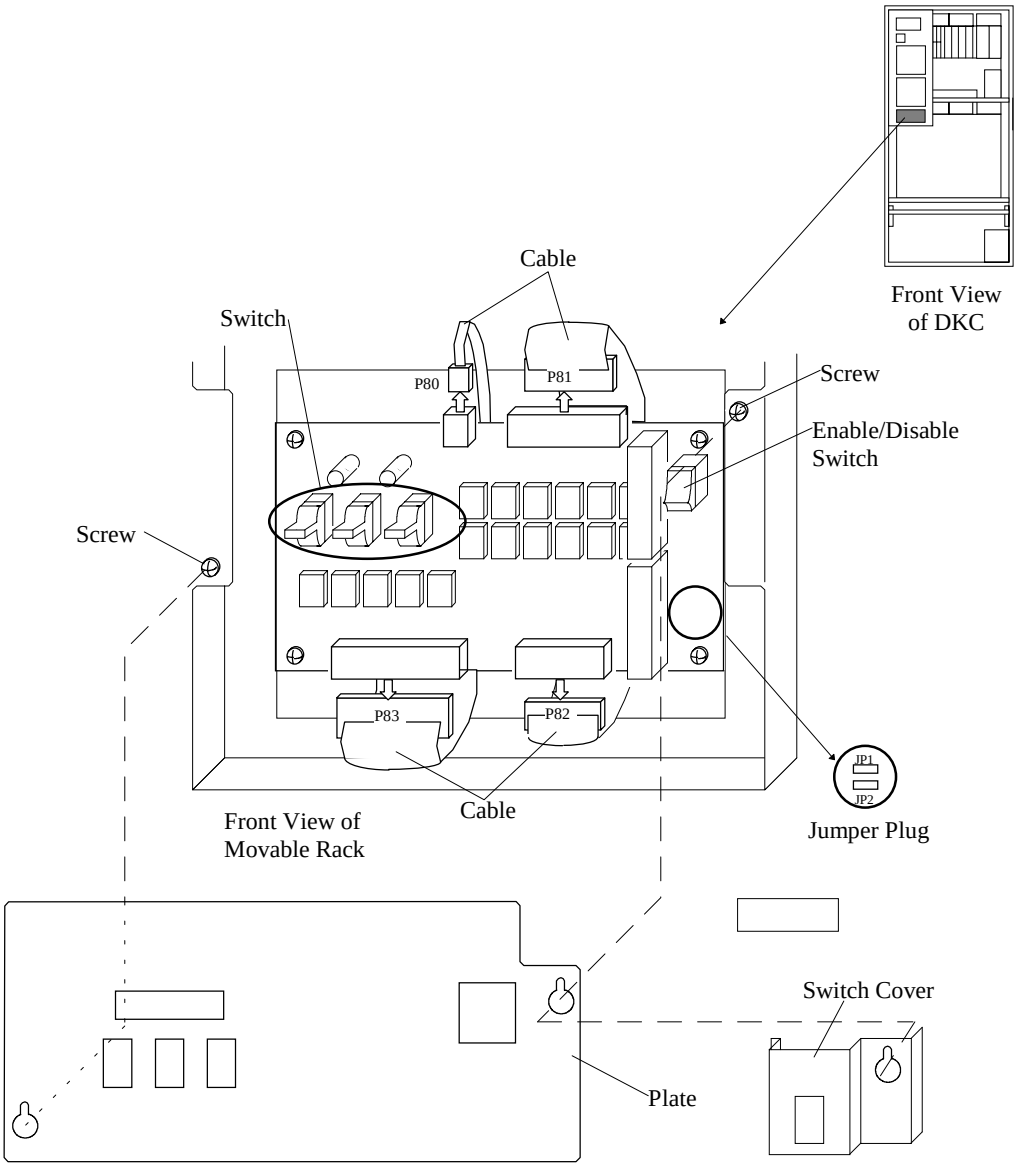

Fig. T3-2 Removal of Plate

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e. Loosen the two screws and remove the cover from the Movable Rack.

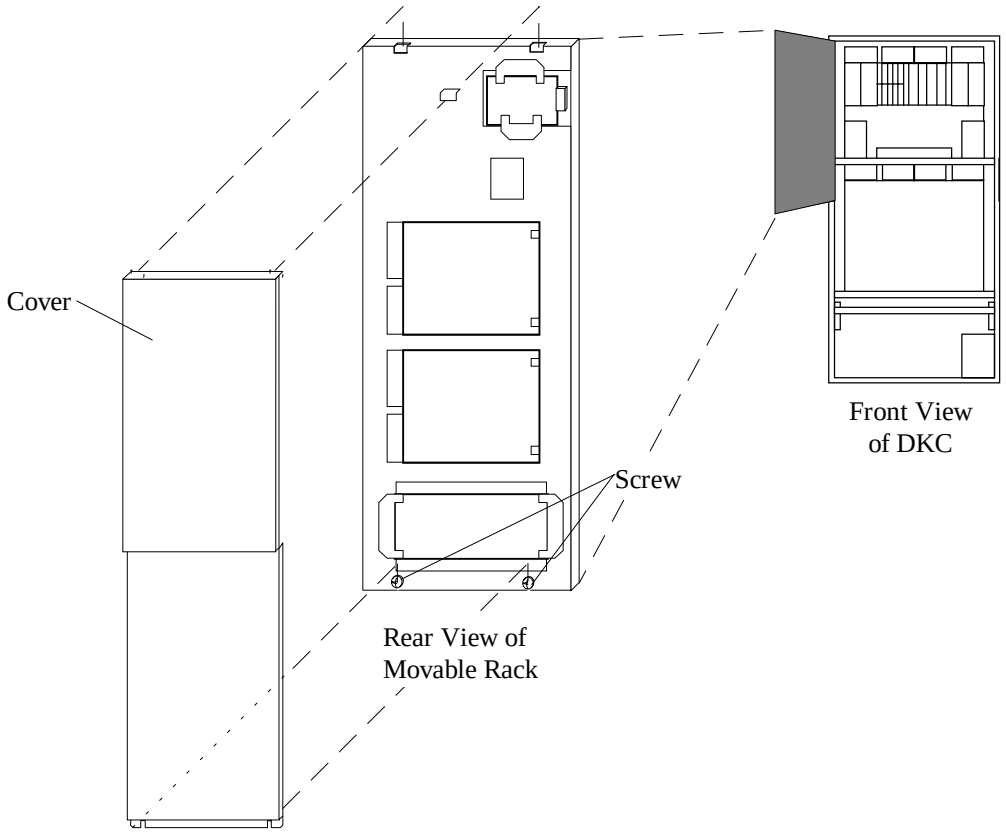

Fig. T3-3 Removal of Cover

f. Loosen the two screws and remove the CE Panel from the Movable Rack.

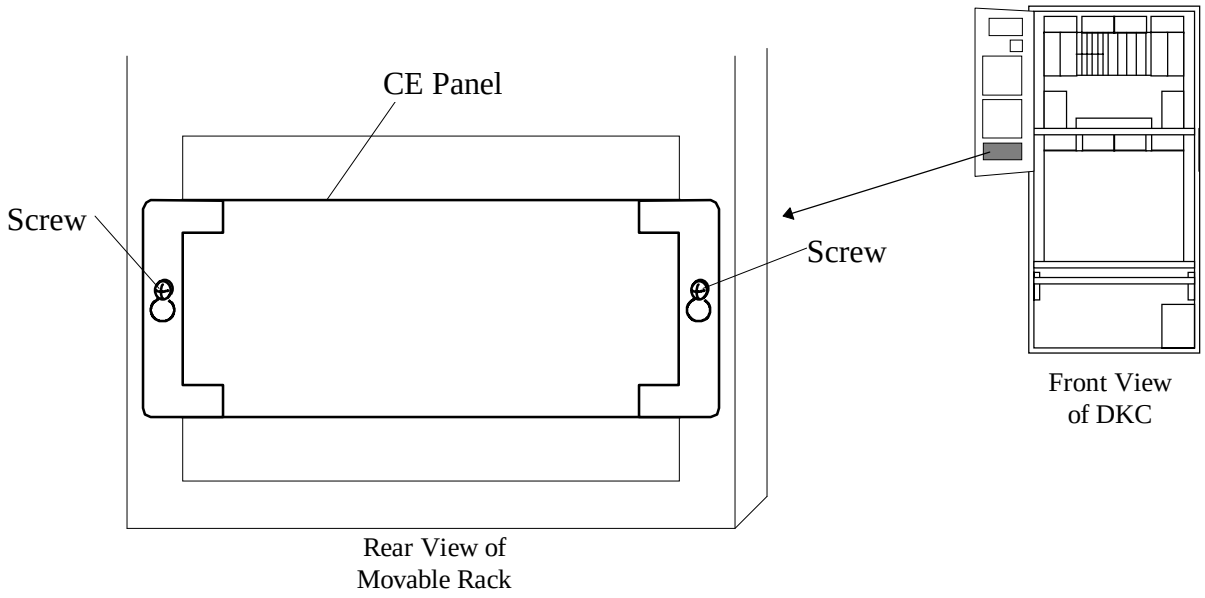

Fig. T3-4 Removal of CE Panel

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3. Remove the plates from the failed PCB, and then attach them to spare PCB.

   a. Remove the four screws and the plates from the failed PCB.
   b. Attach the plates to the spare PCB and fasten the four screws.
   c. Set Enable/Disable Switch to Disable on the spare PCB.

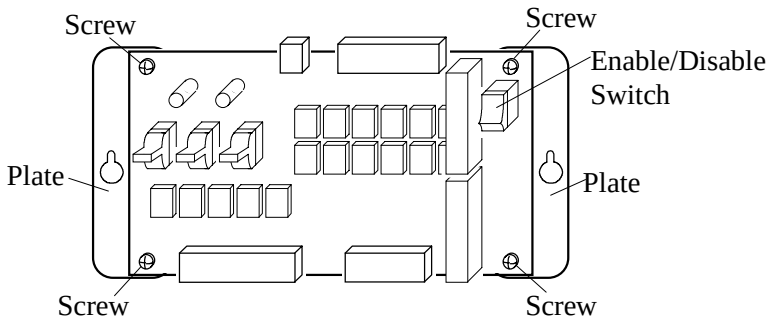

Fig. T3-5 Replacement of PCB

4. Attach the PCB.

   a. Attach the spare PCB and fasten the two screws. Refer to Fig. T3-4.
   b. Attach the cover to the Movable Rack. Refer to Fig. T3-3.
   c. Connect the cables.
   d. Attach the plate and the switch cover and fasten the two screws.
   e. Set Enable/Disable Switch to Enable.

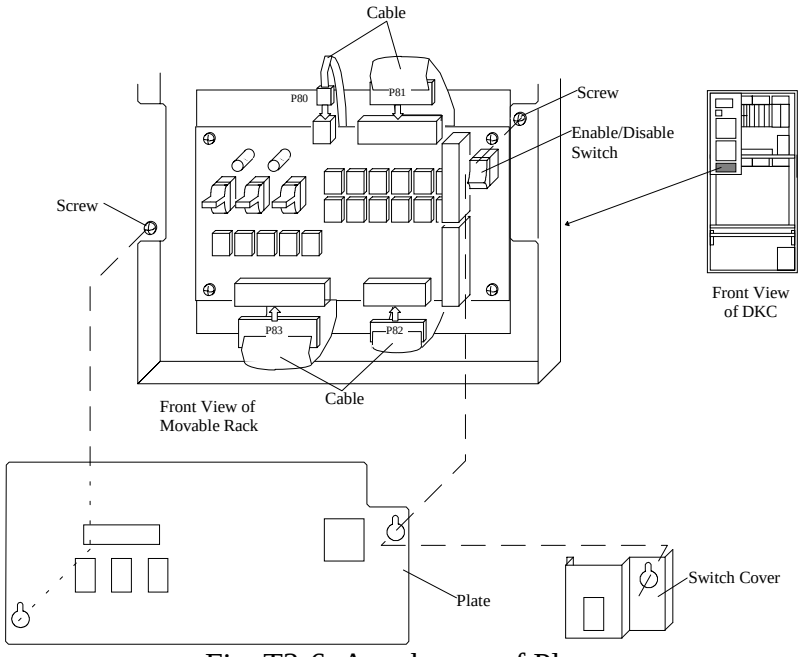

Fig. T3-6 Attachment of Plate

5. Go to SVP post procedure t1 [REP04-490].

Note: Disconnect the "CE Panel INH" jumper plug from the socket on the HUB according to the guidance of SVP.

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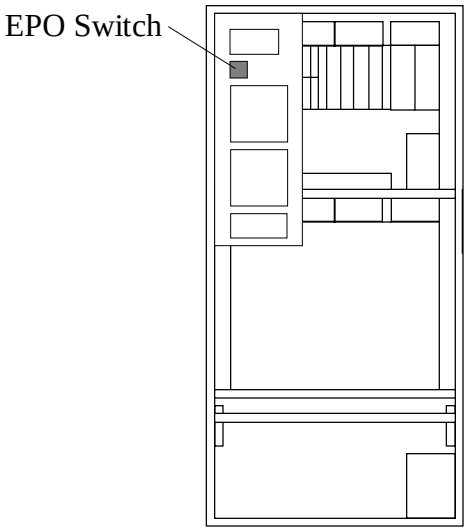
[HARDWARE T4]

Location	Function Name of Component	
Front upside of DKC	1	EPO Switch
(Reference) The related PCB for replacement of EPO Switch 1. HUB PCB (Front PS Box in DKC)		



Front View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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1. Connect the "CE Panel INH" jumper plug to the socket on the HUB.

> **⚠ CAUTION**
>
> A system down is caused if the CE Panel INH jumper socket is not inserted. Be sure to insert the CE Panel INH jumper socket before starting the work.

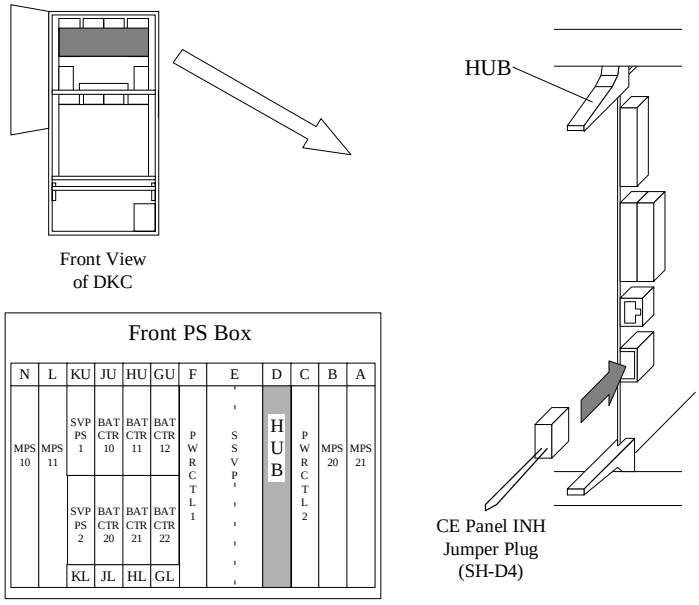

Fig. T4-1 Insertion of Jumper Plug

2. Remove the cover

   a. Open the Movable Rack, loosen the two screws and remove the cover from the Movable Rack.

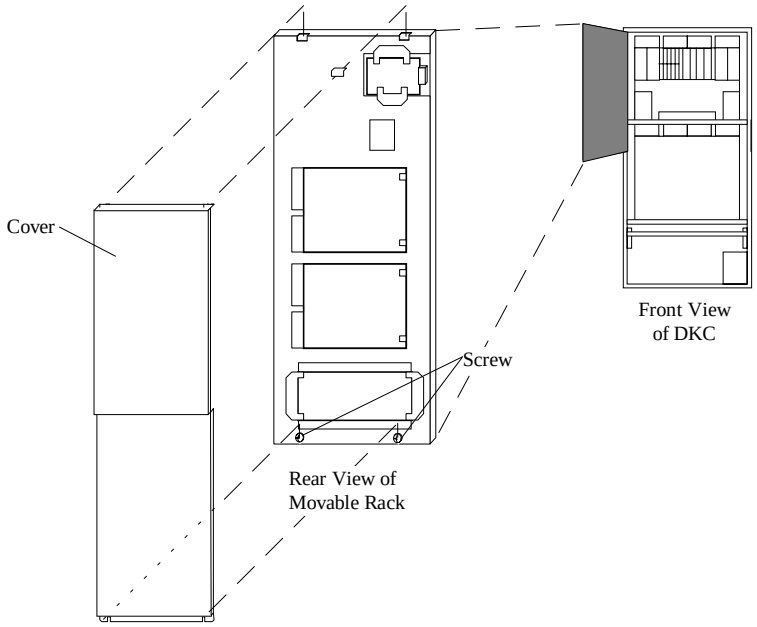

Fig. T4-2 Removal of Cover

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3. The following figures show the correct way to replace the EPO SW.

   a. Remove EPO SW Cover.
   b. Disconnect the connector.
   c. Loosen the two screws and replace the EPO SW.
   d. Fasten the two screws and attach the EPO SW Cover.
   e. Confirm that the EPO SW isn't pulled, and then connect the cables.
   f. Attach the cover to Movable Rack and fasten the two screws. (Refer to Fig, T4-2)

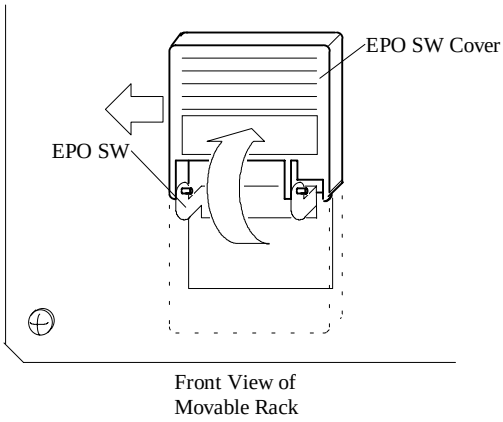

Fig. T4-3 Removal of EPO SW Cover

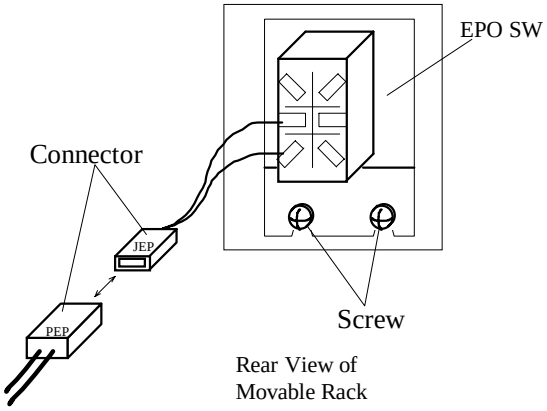

Fig. T4-4 Removal of EPO SW

4. Go to SVP post procedure t1 [REP04-490].

   Note: Disconnect the "CE Panel INH" jumper plug from the socket on the HUB according to the guidance of SVP.

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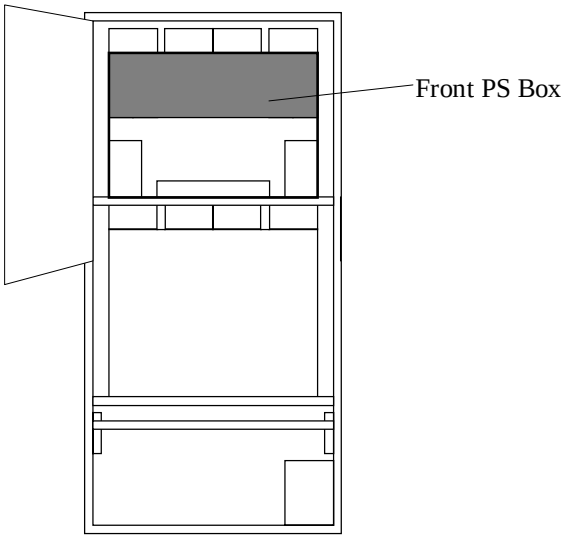
[HARDWARE T5]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	PWRCTL-1 or PWRCTL-2	• SH092-A



Front View
of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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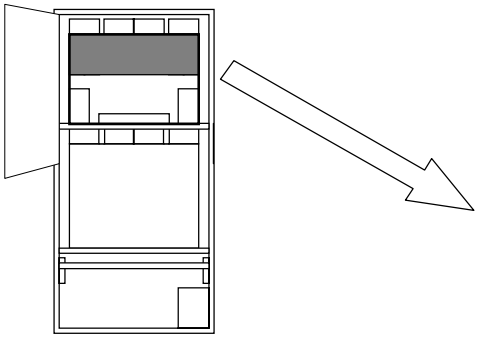
PWRCTL-1 or PWRCTL-2

Note: Do not replace PWRCTL-1 PCB and PWRCTL-2 PCB at the same time.
If you want to replace the both PCB, first complete the replacement of one PCB and then start the replacement of the other.

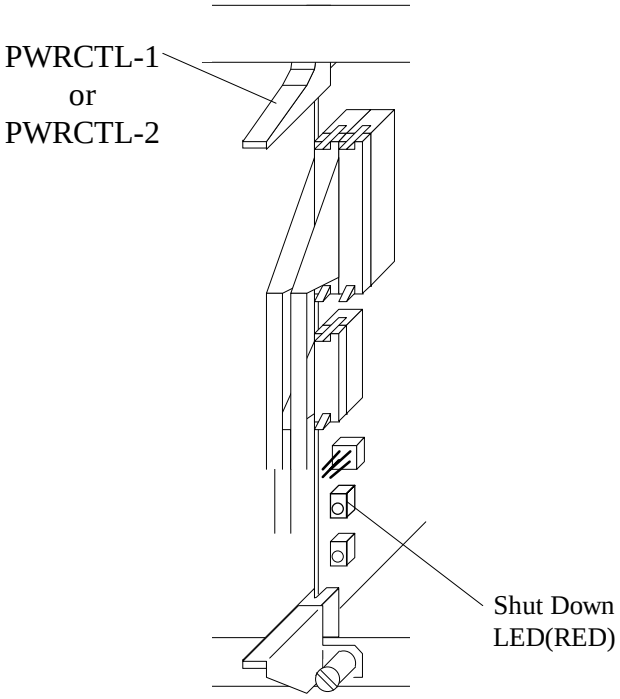
1. Check that the Shut Down LED is on. (only hot replace)

⚠ CAUTION

A system down is caused by a replacement of the PWRCTL PCB other than that to be replaced. Make sure that it is the PWRCTL PCB to be replaced.



Front View of DKC



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWRCTL1	SSVP	HUB	PWRCTL2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

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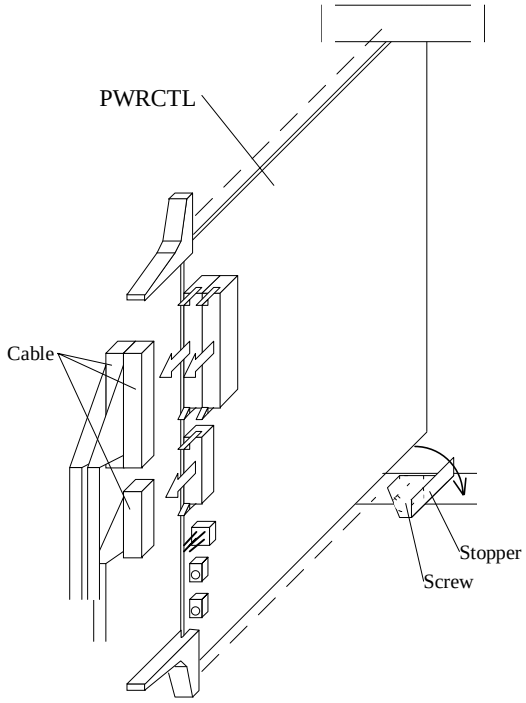
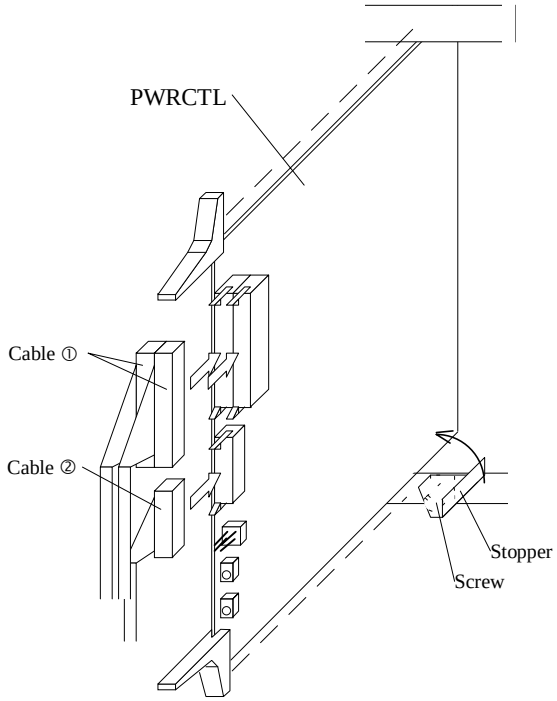
2. Remove the PCB.
   a. Loosen the screw and rotate the stopper.
   b. Remove all cables and remove the PWRCTL.



3. Insert the spare PCB.
   a. Insert the PWRCTL PCB and attach the cables.
   b. Rotate the stopper and fasten the screw.



Cable No.	Cable Location			
	PWRCTL-1		PWRCTL2	
①	SH-F21	SH-F22	SH-C21	SH-C22
②	SH-F3		SH-C3	

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4. Go to SVP post procedure t1 [REP04-490].

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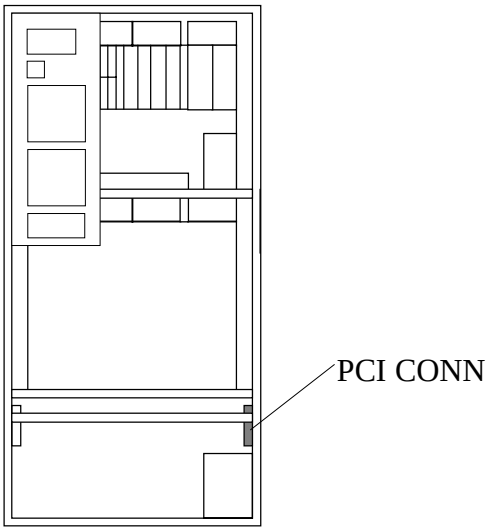
[HARDWARE T6]

Location	Function Name of Component		Part Name
Lower right front of DKC	1	PCI CONN	• SZ624-A
(Reference) The related PCB for replacement of PCI CONN 1. CE Panel PCB (Front of DKC) 2. HUB PCB (Front PS Box in DKC)			



Front View
of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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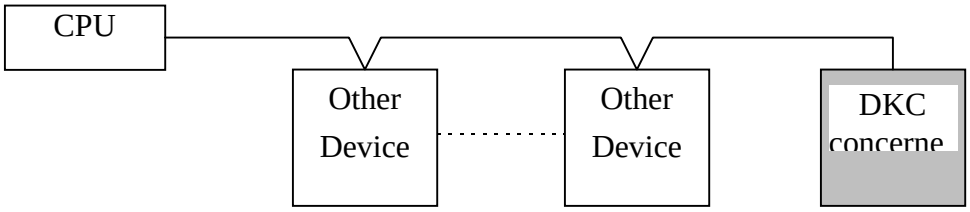
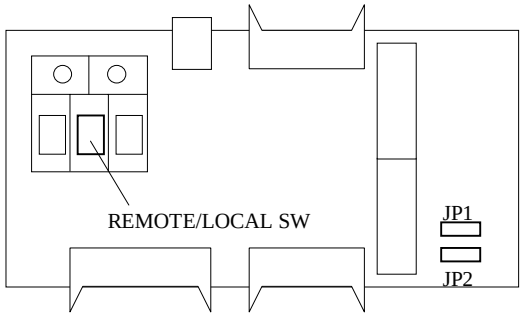
Note 1: Replacement of PCI CONN Panel causes other devices running on the same PCI connection line to be powered off except a) and b) shown below (because giving the EPO instruction is assumed). Therefore, stop the other device before performing replacement.

a) If PCI cable is not connected to the replacing DKC.
b) If the replacing DKC (DKC concerned) is connected to the end of the PCI cable as shown below.

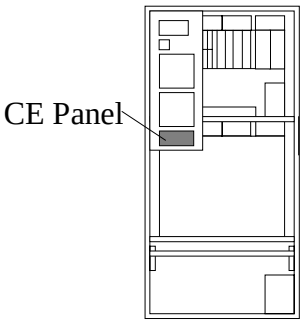


Note 2: The COMP signal of PCI is turned off, if the PCI cable is disconnected.

1. Confirm that the REMOTE/LOCAL Switch of CE Panel is set to LOCAL. If not, set the REMOTE/LOCAL Switch to LOCAL.



CE Panel



Front View of DKC

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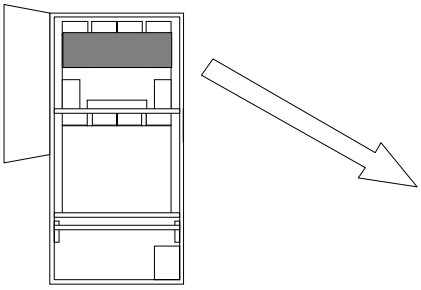
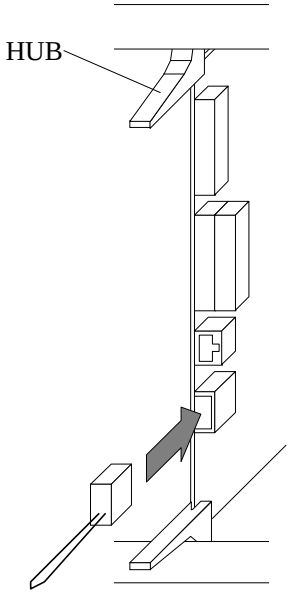
2. Connect the "CE Panel INH" jumper plug to the sockets on the HUB.

> **⚠ CAUTION**
>
> A system down is caused if the CE Panel INH jumper socket is not inserted. Be sure to insert the CE Panel INH jumper socket before starting the work.



Front View of DKC

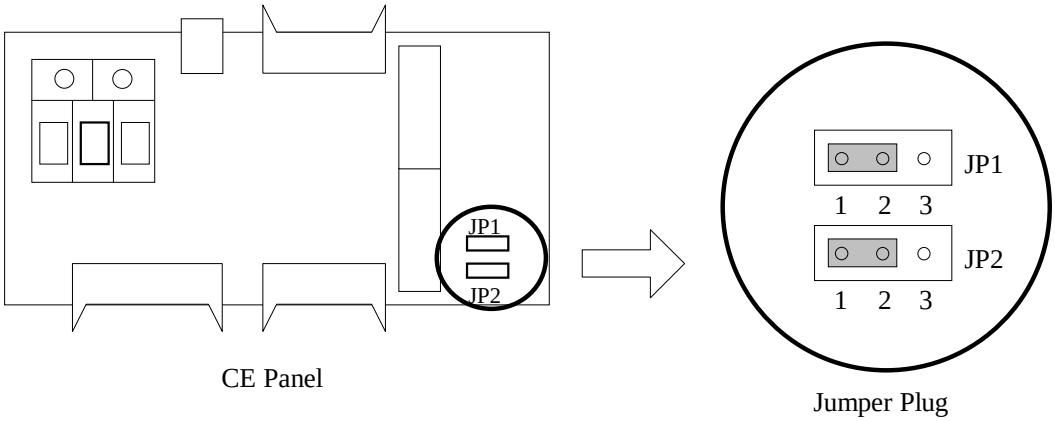


CE Panel INH Jumper Plug (SH-D4)

Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTL 1	SSVP	HUB	PWR CTL 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

2. Set the jumper connectors(JP1 and JP2) of the CE Panel referring to following figure.



CE Panel

Jumper Plug

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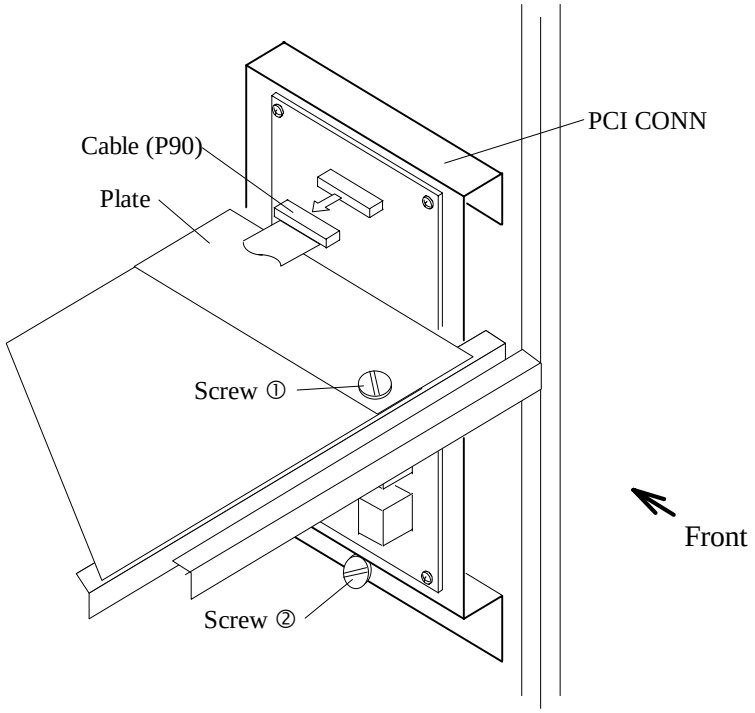
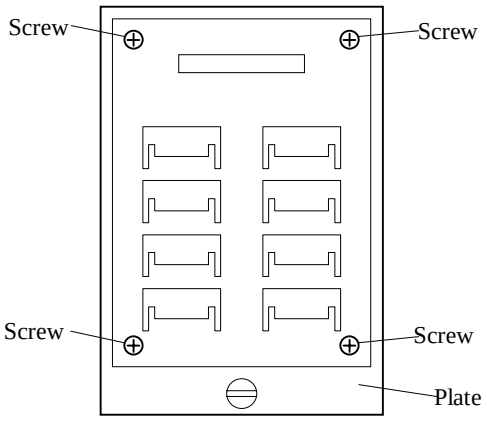
4. Remove the PCI CONN.

a. Disconnect all cables from PCI CONN.
b. Loosen the screw① and remove the plate.
c. Remove the screw③ and remove the PCI CONN.



5. Remove the plate from the failed PCB, and then attach them to the spare PCB.

a. Remove the four screws and the plate from the failed PCB.
b. Attach the plate to the spare PCB and fasten the four screws.



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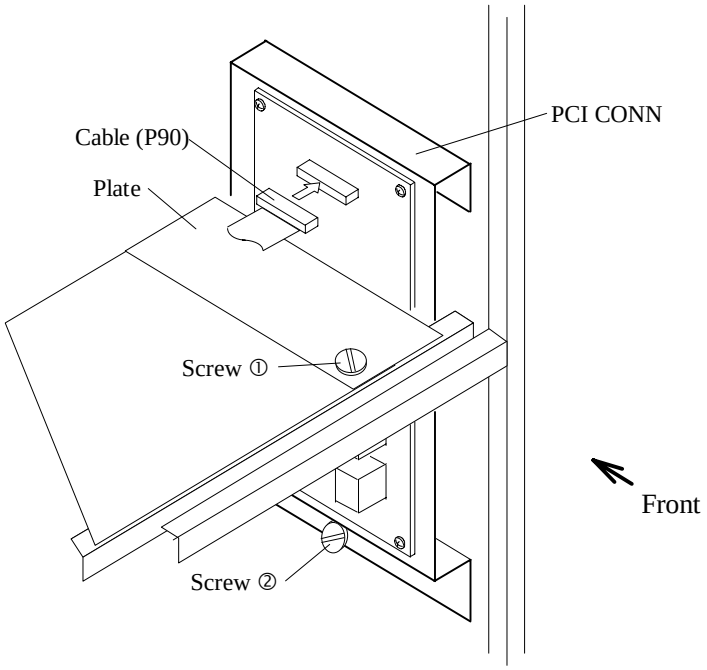
6. Attach the PCI CONN.

a. Attach the PCI CONN and fasten the screw②.
b. Attach the plate and fasten the screw①.
c. Connect the cables.



7. Restore the REMOTE/LOCAL switch and jumpers (JP1 and JP2) on the CE panel.

a. Restore the REMOTE/LOCAL switch and jumpers (JP1 and JP2) on the CE panel set in step 1 and 2 to its previous setting. The relation between the REMOTE/LOCAL switch and the jumper settings is shown below.

No.	Description	JP1 and JP2 Setting
1	When power is controlled from the host (at least one PCI cable attached to JP1-JP8 on PCI CONN PCB), set the jumpers as shown.	○ ○ ○ JP1 1 2 3 ○ ○ ○ JP2 1 2 3
2	When power is not controlled from the host, no PCI Cable attached to JP1-JP8 PCI CONN PCB or to disable the EPO of host, set the jumpers as shown.	○ ○ ○ JP1 1 2 3 ○ ○ ○ JP2 1 2 3

8. Disconnect the "CE Panel INH" jumper plug from the socket on the HUB.

9. Go to SVP post procedure t1 [REP04-490].

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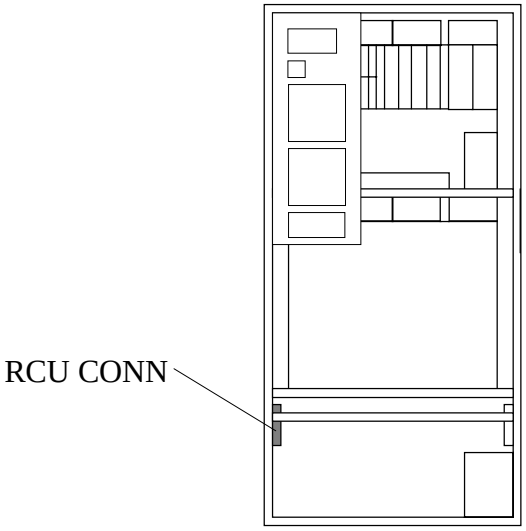
[HARDWARE T7]

Location	Function Name of Component		Part Name
Lower left front of DKC	1	RCU CONN	• SZ625-A



Front View
of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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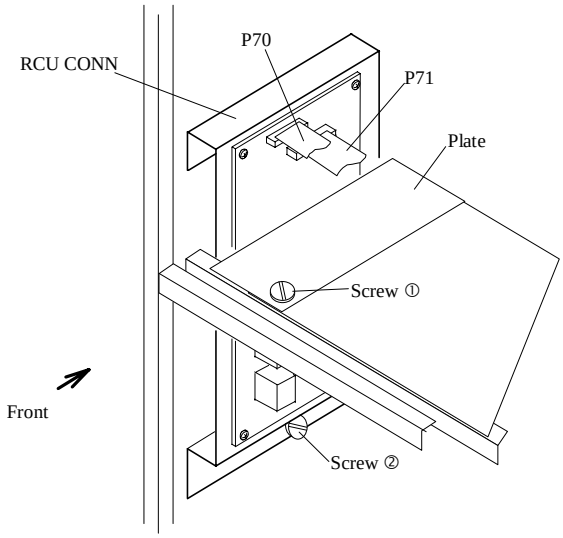
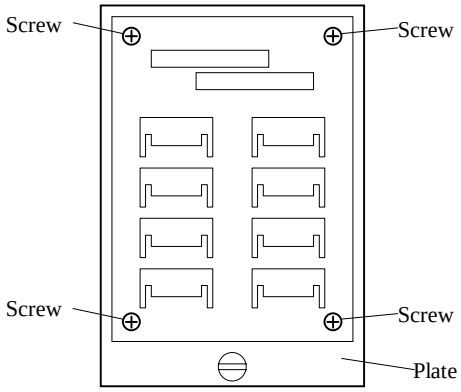
1. Remove the RCU CONN.

a. Disconnect all cables from the RCU CONN.
b. Loosen the screw① and remove the plate.
c. Remove the screw② and remove the RCU CONN.



2. Remove the plate from the failed PCB, and then attach them to spare PCB.

a. Remove the four screws and the plate from the failed PCB.
b. Attach the plate to the spare PCB and fasten the four screws.



3. Attach the PCB.

a. Attach the RCU CONN and fasten the screw②.
b. Attach the plate and fasten the screw①.
c. Connect the cables(P70, 71).

4. Go to SVP post procedure t1 [REP04-490].

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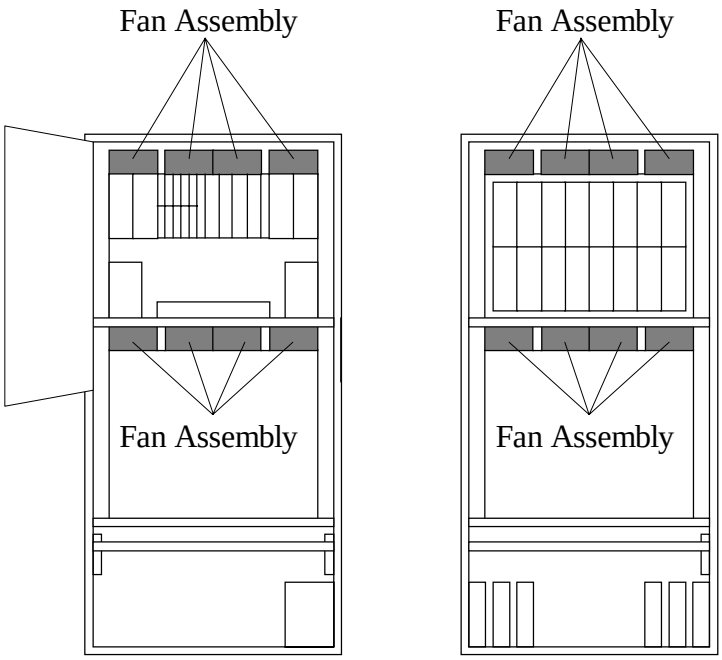
[HARDWARE T8]

Location	Function Name of Component	
Top of Box	1	Fan Assembly



Front View of DKC

Rear View of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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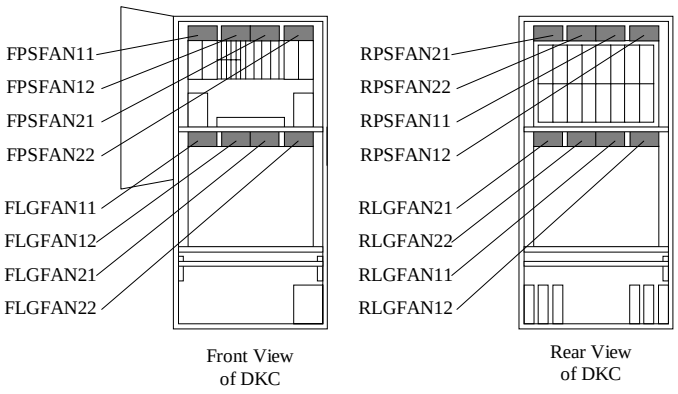
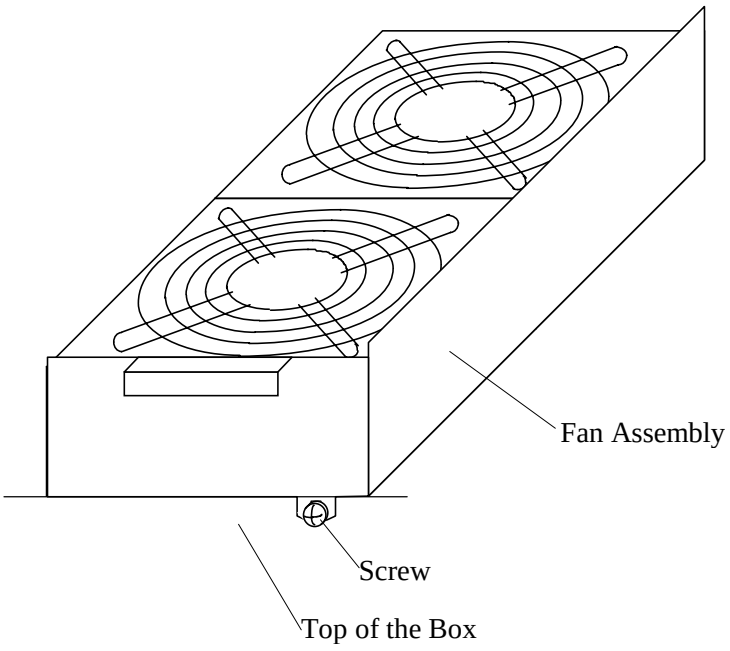
Fan Assembly

Hazardous rotating mechanism: Can cause injury if touched. Stay clear of it when machine is running.

1. The following figure shows the correct way to replace the Fan Assembly.

   a. Loosen the screw.
   b. Replace the Fan Assembly.
   c. Fasten the screw.





2. Go to SVP post procedure t3 [REP04-820].

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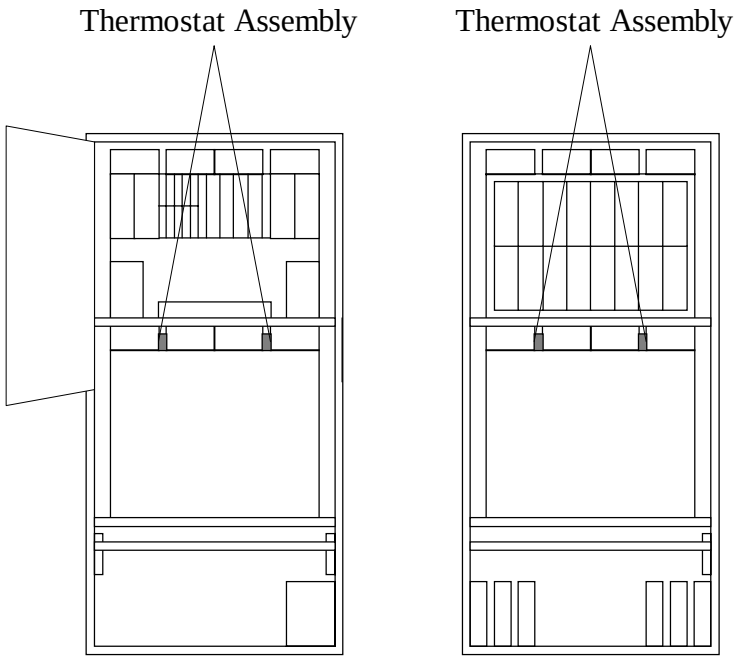
[HARDWARE T9]

Location	Function Name of Component	
Top of Box	1	Thermostat Assembly



Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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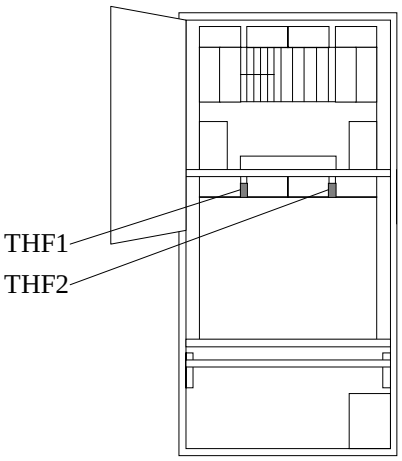
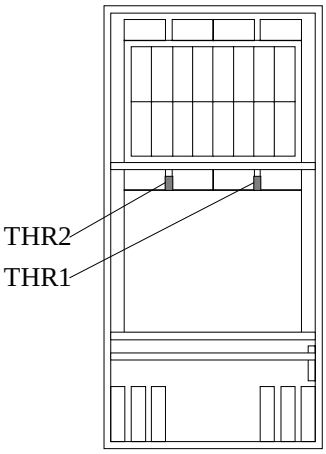
Thermostat Assembly

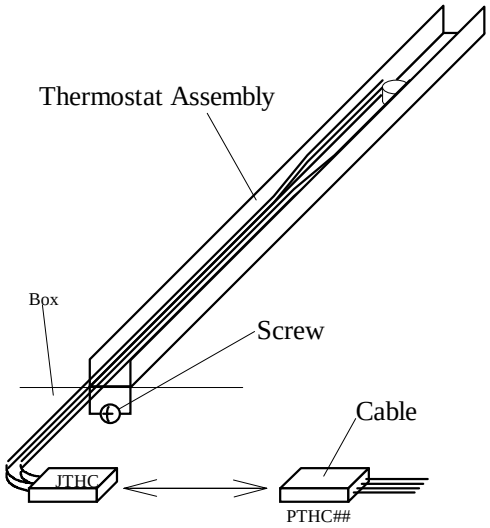
1. The following figure shows the correct way to replace the Thermostat Assembly.
   a. Disconnect the cable and loosen the screw.
   b. Replace the Thermostat Assembly.
   c. Fasten the screw and connect the cable.



Front View
of DKC



Rear View
of DKC



2. Go to SVP post procedure t3 [REP04-820].

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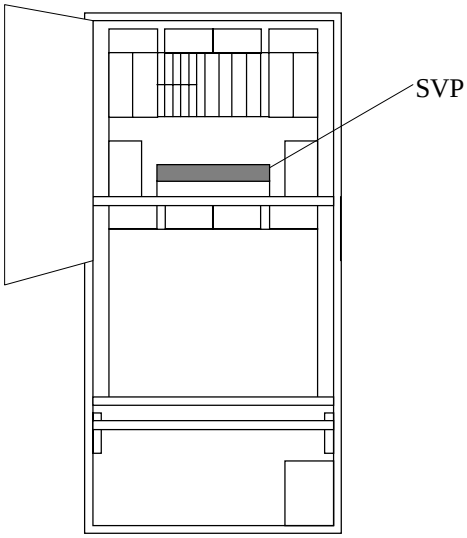
[HARDWARE T10]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	SVP	• ARMADA (COMPAQ) • FLORA230 (HITACHI) • FLORA270V (HITACHI)
		LAN Card	• PS-CE2-10BT • PS-CE3-10BT



Front View
of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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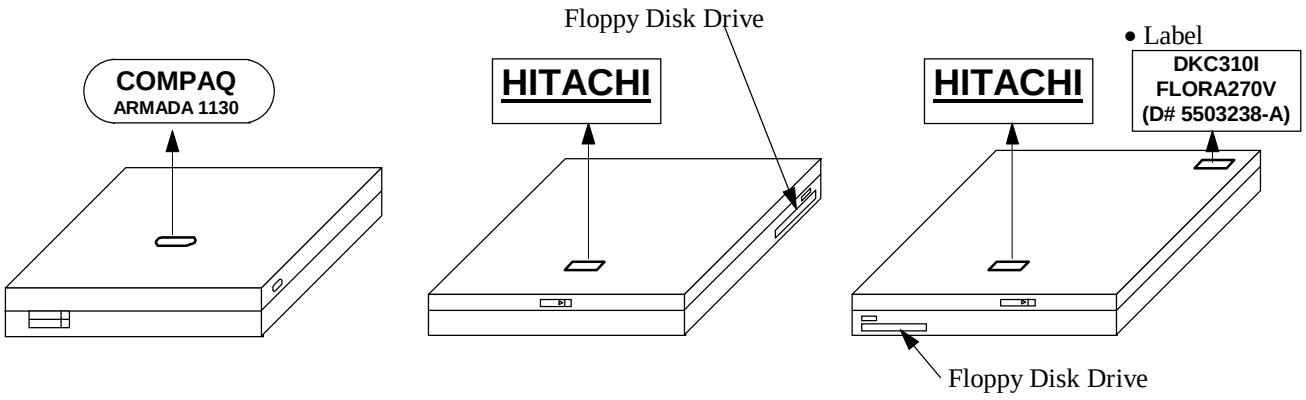
1	Replacement of SVP and LAN Card

[1] Removal of Failed SVP

Refer to Table T10-1 and Fig. T10-1, and go to corresponding step for removing the SVP.

T10-1 Removal of Failed SVP

No.	Failed SVP	Page
1	ARMADA (COMPAQ)	REP03-1340
2	FLORA230 (HITACHI)	REP03-1344
3	FLORA270V (HITACHI)	REP03-1348



ARMADA
(A COMPAQ product)

FLORA230
(A HITACHI product)

FLORA270V
(A HITACHI product)

T10-1 How to distinguish SVP

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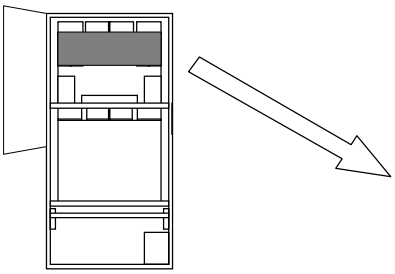
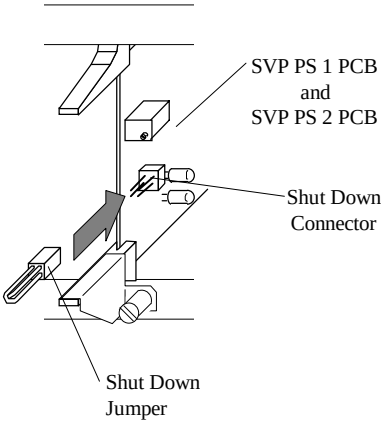
When failed SVP is ARMADA

CAUTION : Do not replace the SVP for 20 minutes after turning AC power on.
The SSVP may power off and then power on the SVP in order to recover.

1. Turn off the SVP.
   a. Loosen the screw and open the Movable Rack.
   b. Remove the Front PS Box Covers 1 and 2 from the Front PS Box.
   c. Connect the Shut Down Jumpers to the SVP PS 1 and 2 PCBs in the Front PS Box.

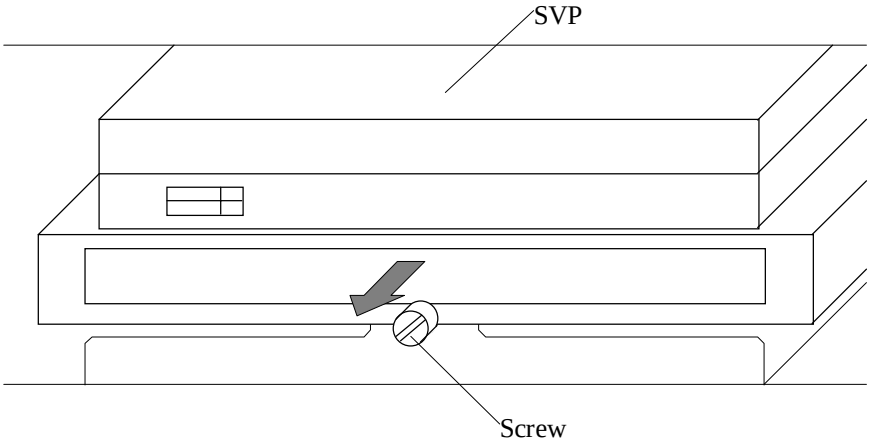




Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BATT CTR 10	BATT CTR 11	BATT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BATT CTR 20	BATT CTR 21	BATT CTR 22						
		KL	JL	HL	GL						

   d. Loosen the screw and pull out the SVP.



   e. Open the SVP.

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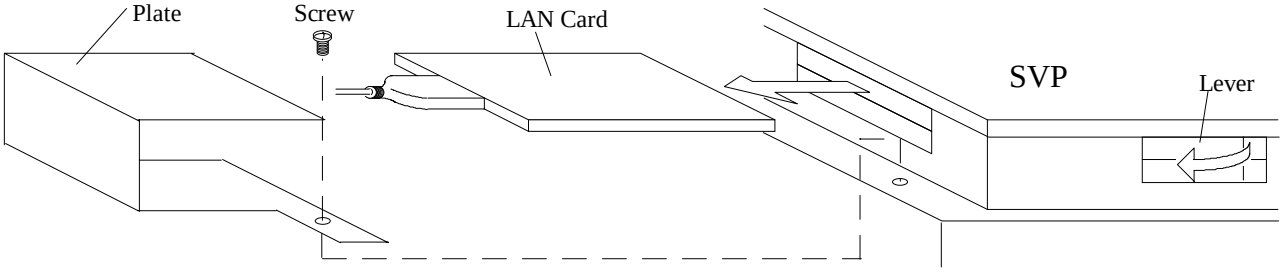
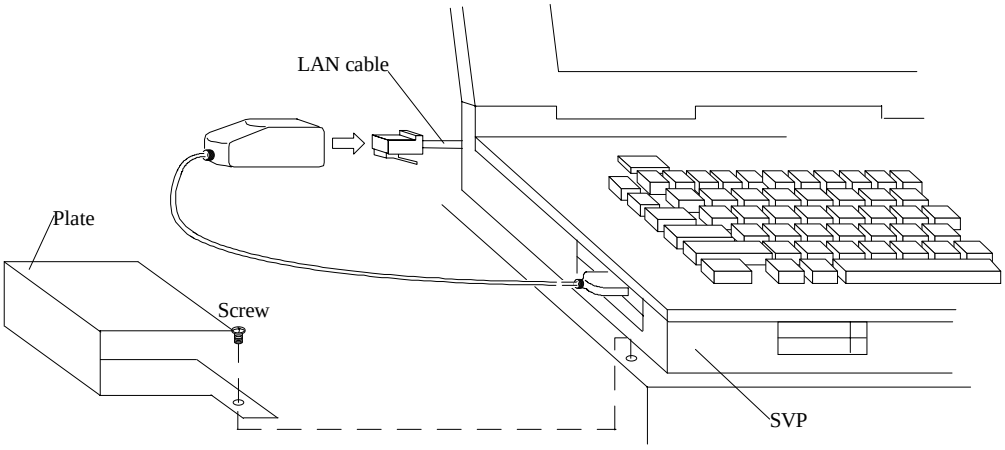
2. When replacing the SVP only, remove the LAN card. (When replacing both the SVP and LAN card at the same time, go to step 3.)

   a. Loosen the screw and remove the plate.
   b. Move the lever located on the front left side of the SVP to left to release the LAN Card.



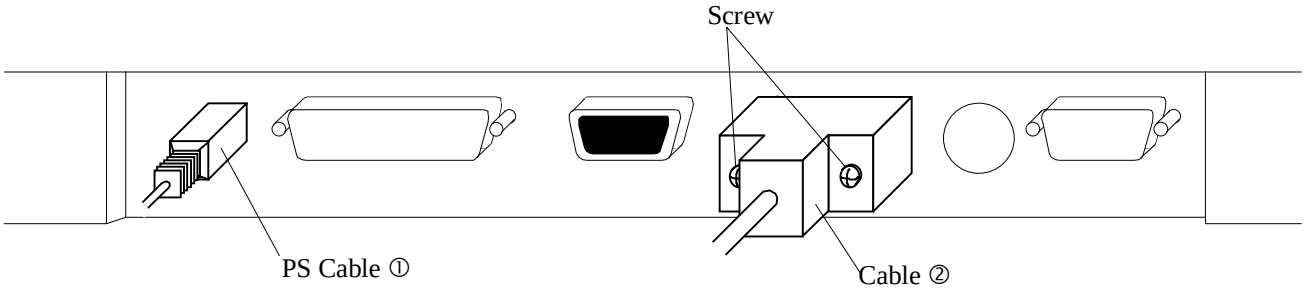
3. When replacing both the SVP and LAN card at the same time, remove the LAN cable. (When replacing the SVP only, go to step 4.)

   a. Loosen the screw and remove the plate.
   b. Remove the LAN cable.



4. Disconnect the cables.

   a. Disconnect the PS cable ① from the SVP.
   b. Loosen the two screws and disconnect the cable ②.



Rear View of SVP

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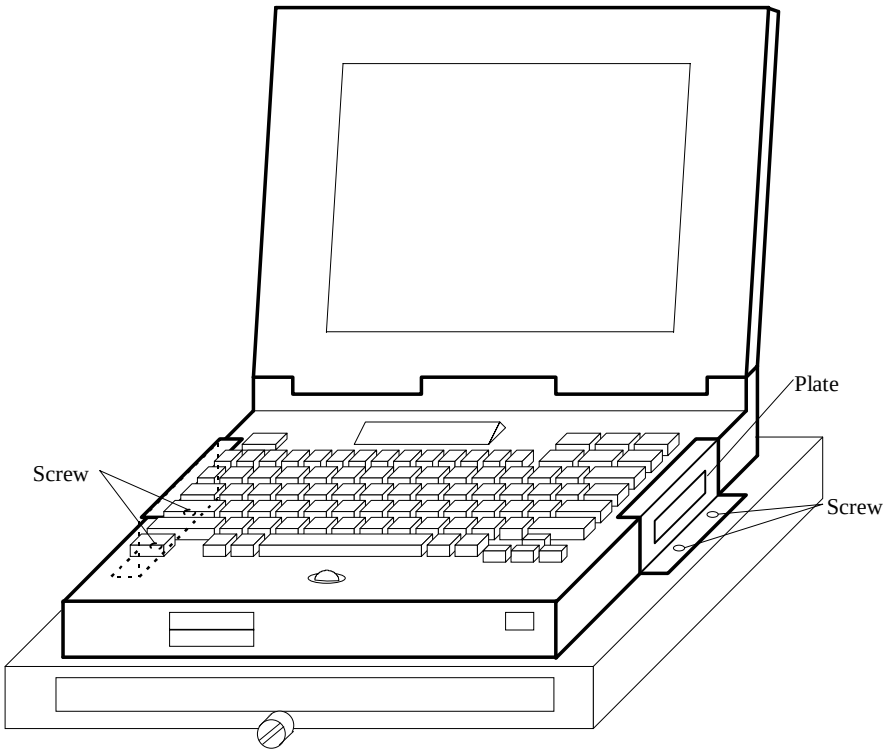
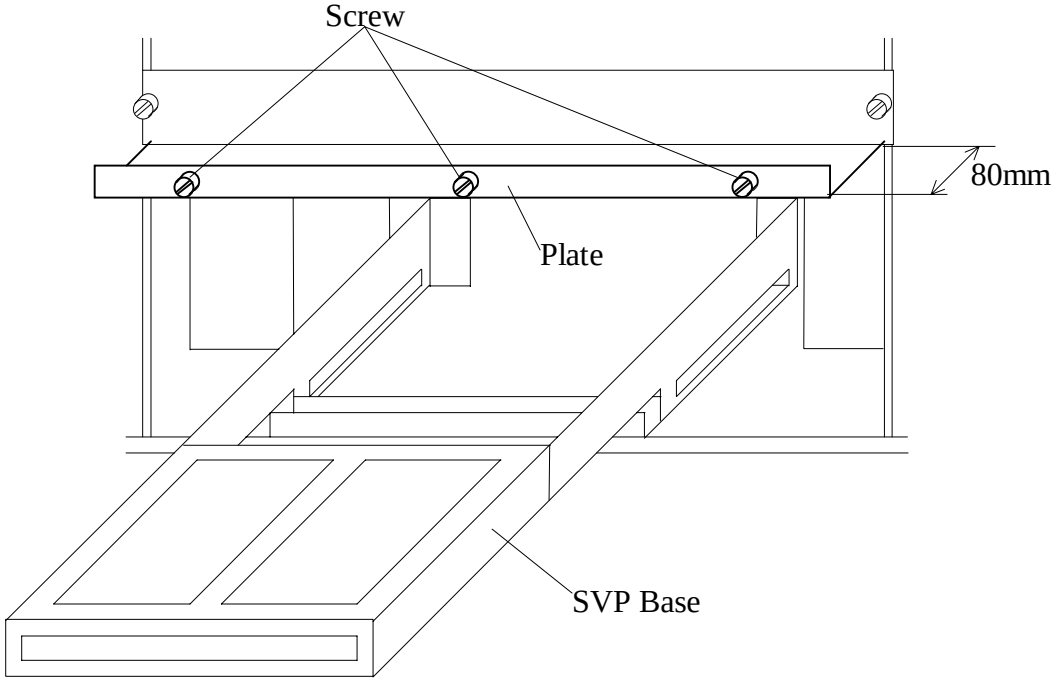
5. Remove the SVP.

   a. Loosen the four screws with a torque driver, and remove the plates which fix the side of SVP.
   b. Remove the SVP.



6. Disconnect the PS cable for the SVP. (When the model of the failed SVP is the same as that of the spare SVP, go to step 7.)

   a. Loosen the three screws and pull out the plate approximately 80mm.



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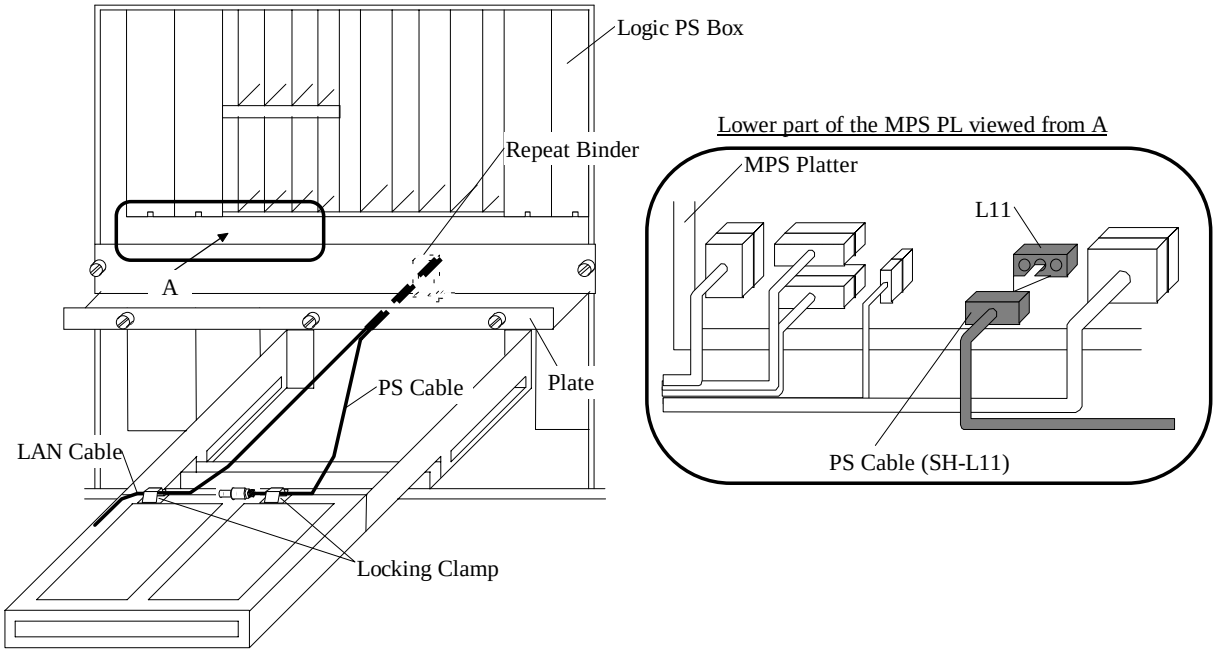
b. Open the Repeat binder and the two locking clamps under the plate, and then remove the PS cable and LAN cable.
c. Put in your hand from the bottom of the plate, and disconnect the PS cable (SH-L11) from the connector (L11) on the MPS platter.



7. Install the spare SVP.

a. Go to REP03-1360.

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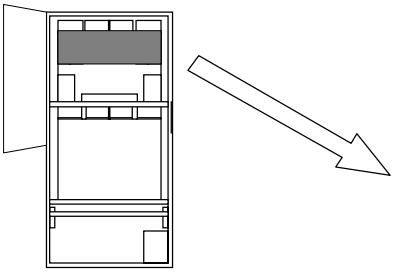
When failed SVP is FLORA230

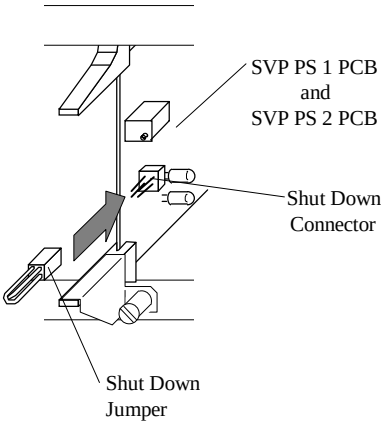
CAUTION : Do not replace the SVP for 20 minutes after turning AC power on.
The SSVP may power off and then power on the SVP in order to recover.

1. Turn off the SVP.

   a. Loosen the screw and open the Movable Rack.
   b. Remove the Front PS Box Covers 1 and 2 from the Front PS Box.
   c. Connect the Shut Down Jumpers to the SVP PS 1 and 2 PCBs in the Front PS Box.



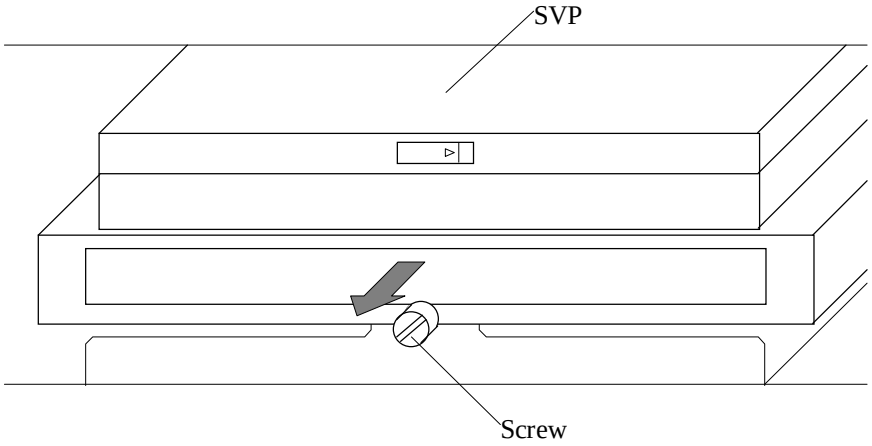
Front View
of DKC



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BATT CTR 10	BATT CTR 11	BATT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BATT CTR 20	BATT CTR 21	BATT CTR 22						
		KL	JL	HL	GL						

   d. Loosen the screw and pull out the SVP.



   e. Open the SVP.

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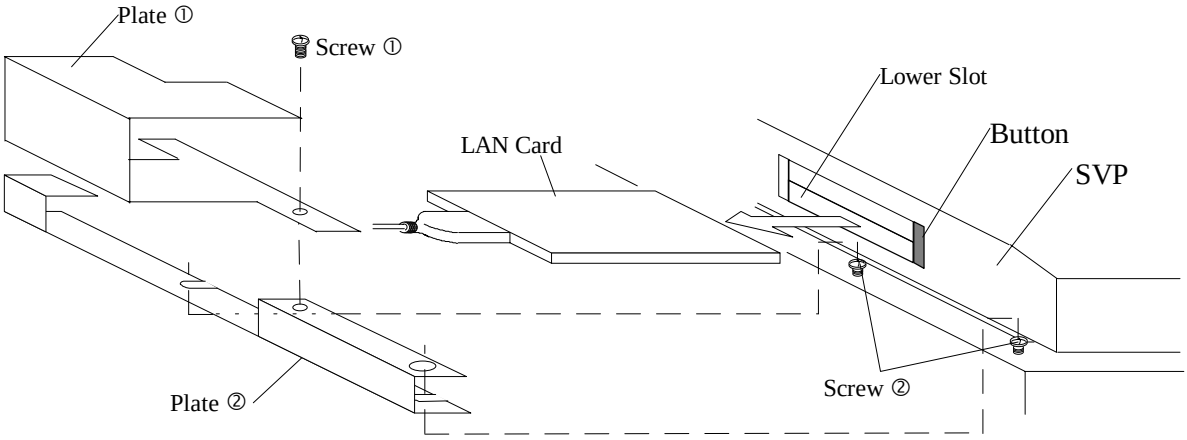
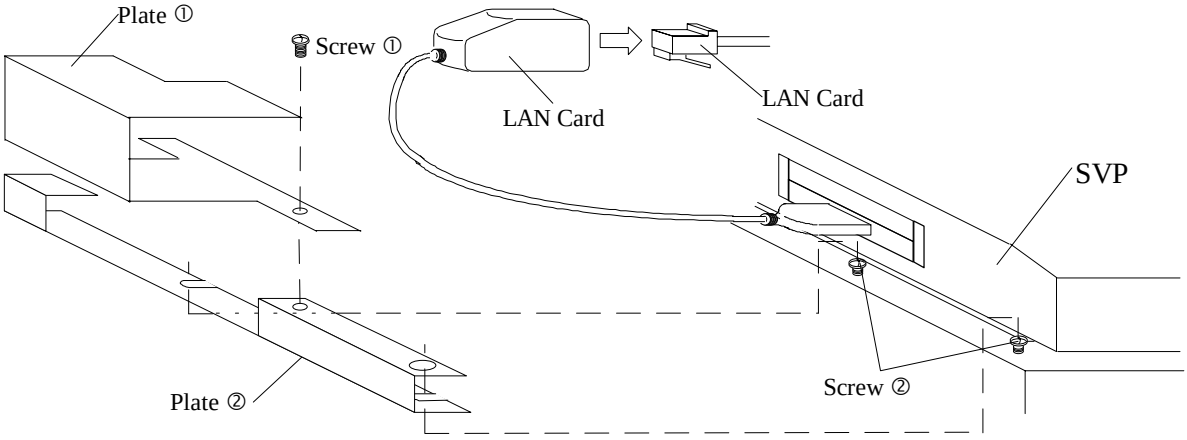
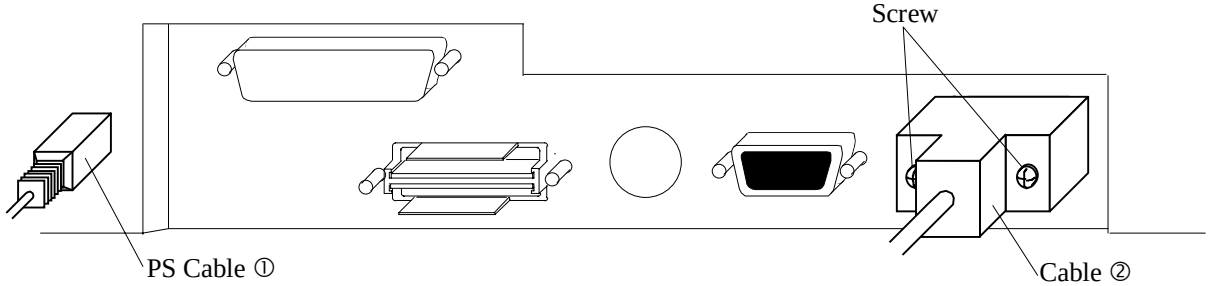
2. When replacing the SVP only, remove the LAN card. (When replacing both the SVP and LAN card at the same time, go to step 3.)
   a. Loosen the screw ① and remove the plate ①.
   b. Press the button on the right of the slot, and remove the LAN card from the lower slot.
   c. Loosen the two screws ② and remove the plate ②.



3. When replacing both the SVP and LAN card at the same time, remove the LAN cable. (When replacing the SVP only, go to step 4.)
   a. Loosen the screw ① and remove the plate ①.
   b. Remove the LAN cable from the LAN card.
   c. Loosen the two screws ② and remove the plate ②.



4. Disconnect the cables.
   a. Disconnect the PS cable ① from the SVP.
   b. Loosen the two screws and disconnect the cable ②.



Rear View of SVP

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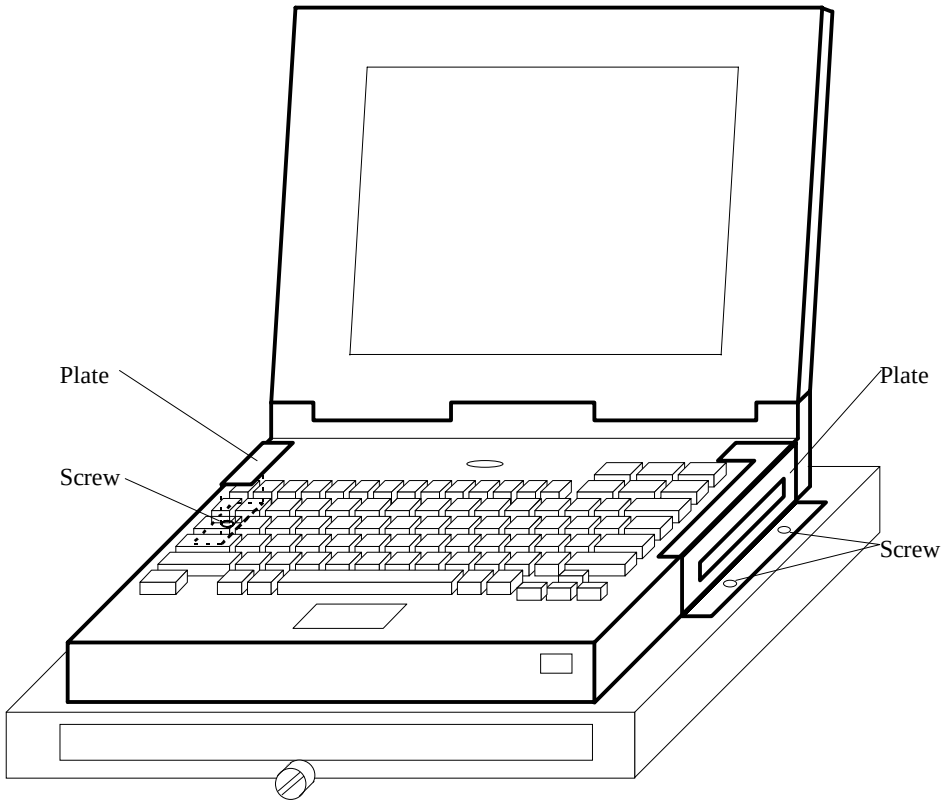
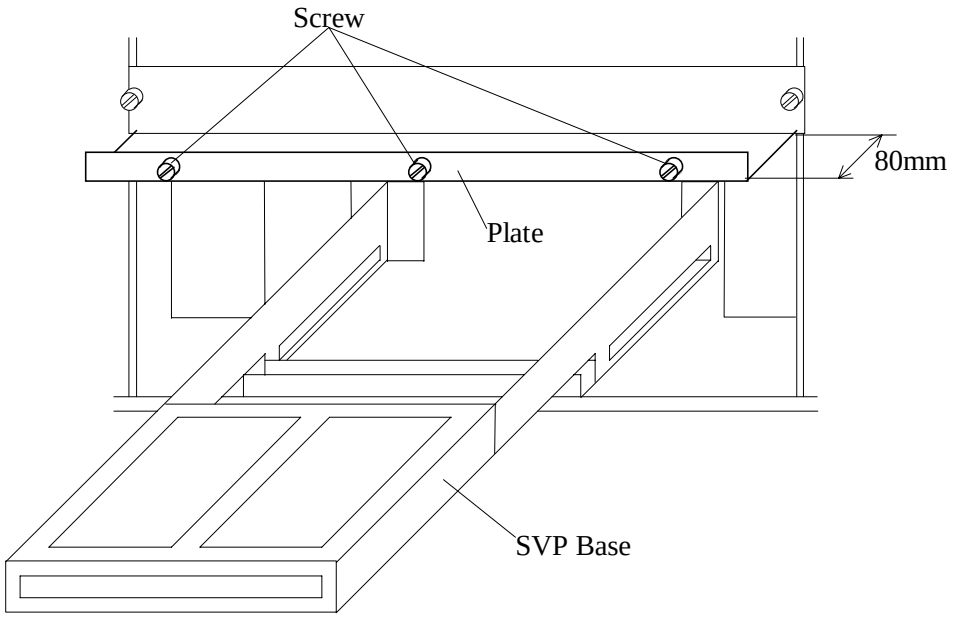
5. Remove the SVP.

   a. Loosen the three screws with a torque driver, and remove the plates which fix the side of SVP.
   b. Remove the SVP.



6. Disconnect the PS cable for the SVP. (When the model of the failed SVP is the same as that of the spare SVP, go to step 7.)

   a. Loosen the three screws and pull out the plate approximately 80mm.



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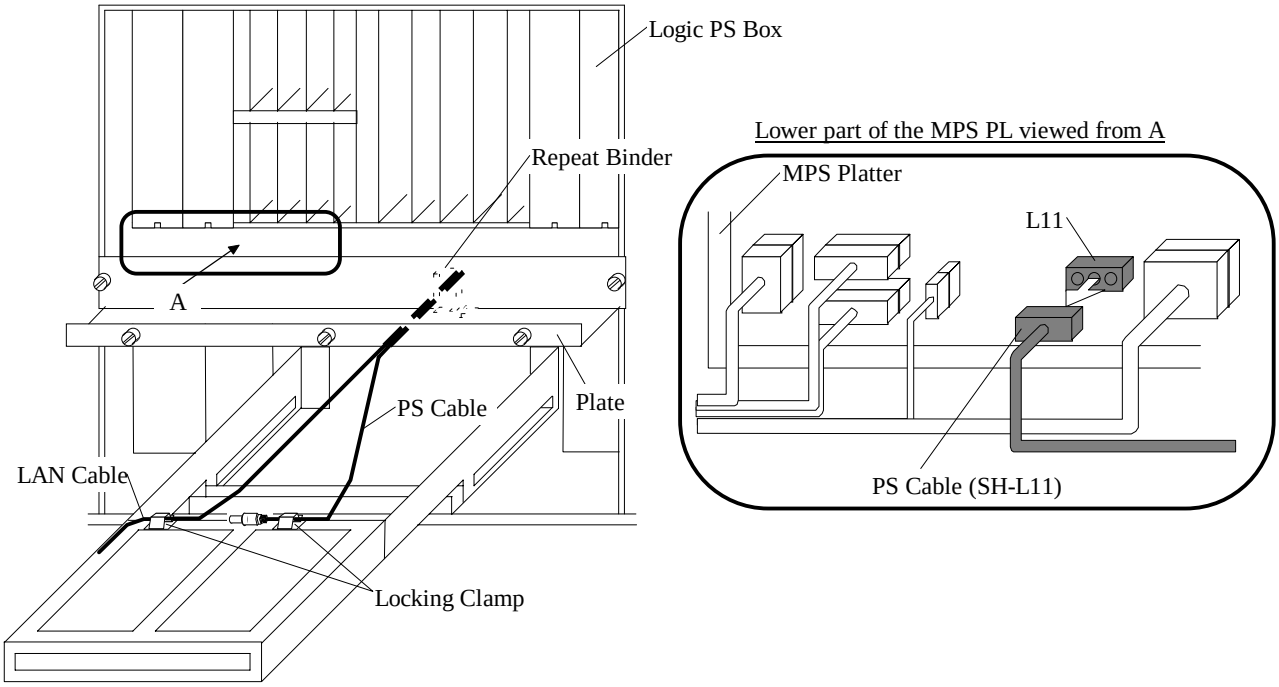
b. Open the Repeat binder and the two locking clamps under the plate, and then remove the PS cable and LAN cable.
c. Put in your hand from the bottom of the plate, and disconnect the PS cable (SH-L11) from the connector (L11) on the MPS platter.



7. Install the spare SVP.
   a. Go to REP03-1360.

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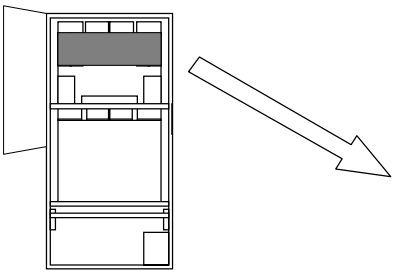
When failed SVP is FLORA270V

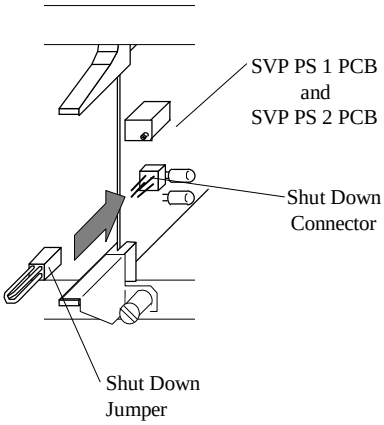
CAUTION : Do not replace the SVP for 20 minutes after turning AC power on.
The SSVP may power off and then power on the SVP in order to recover.

1. Turn off the SVP.

   a. Loosen the screw and open the Movable Rack.
   b. Remove the Front PS Box Covers 1 and 2 from the Front PS Box.
   c. Connect the Shut Down Jumpers to the SVP PS 1 and 2 PCBs in the Front PS Box.



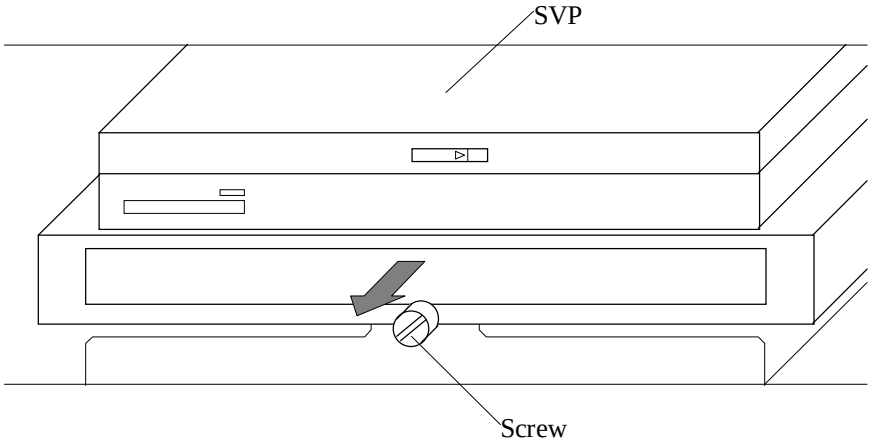
Front View
of DKC



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BATT CTR 10	BATT CTR 11	BATT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BATT CTR 20	BATT CTR 21	BATT CTR 22						
		KL	JL	HL	GL						

   d. Loosen the screw and pull out the SVP.



   e. Open the SVP.

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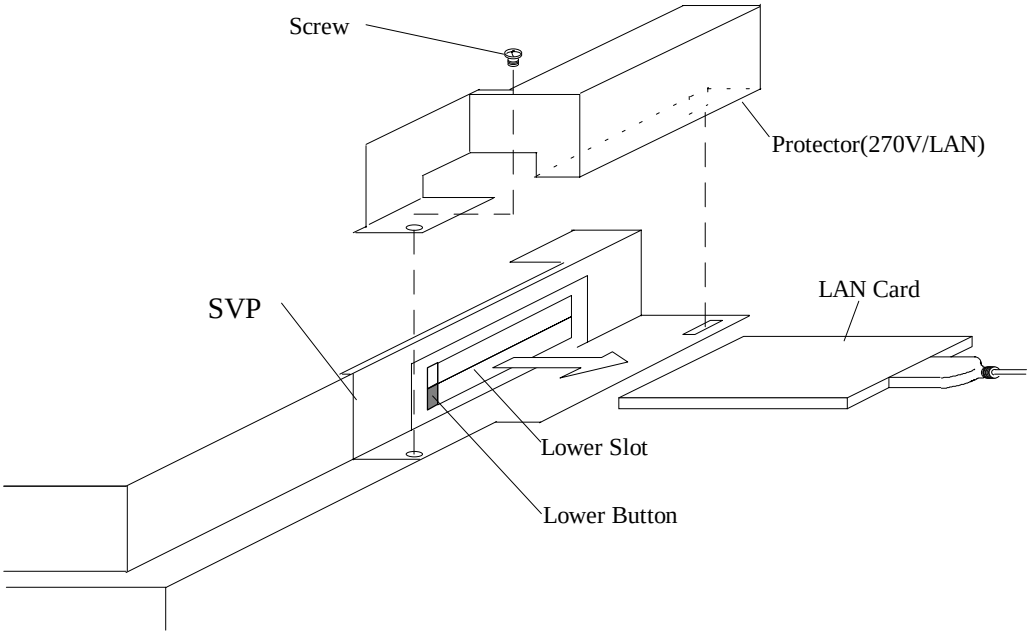
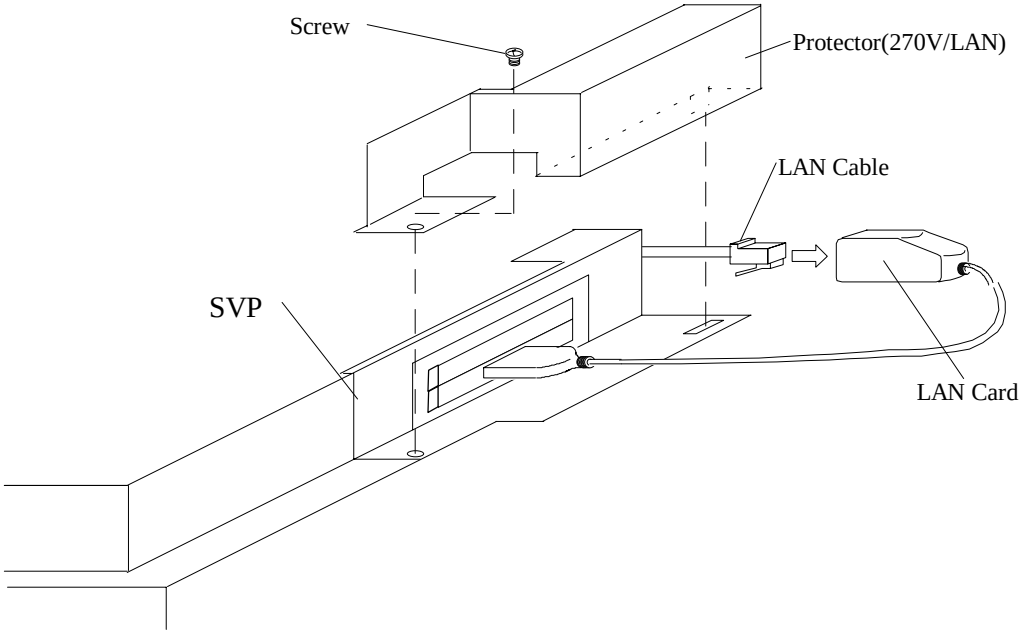
2. When replacing the SVP only, remove the LAN card. (When replacing both the SVP and LAN card at the same time, go to step 3.)

   a. Loosen the screw and remove the protector.
   b. Press the button on the lower left of the slot, and remove the LAN card from the lower slot.



3. When replacing both the SVP and LAN card at the same time, remove the LAN cable. (When replacing the SVP only, go to step 4.)

   a. Loosen the screw and remove the protector.
   b. Remove the LAN cable.



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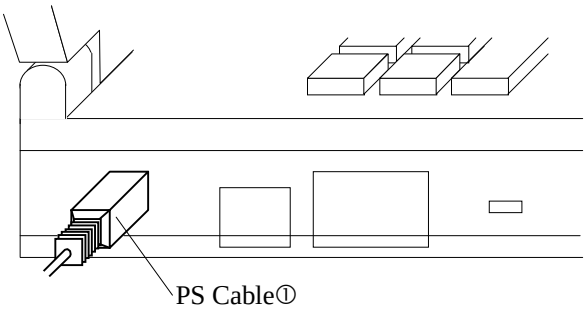
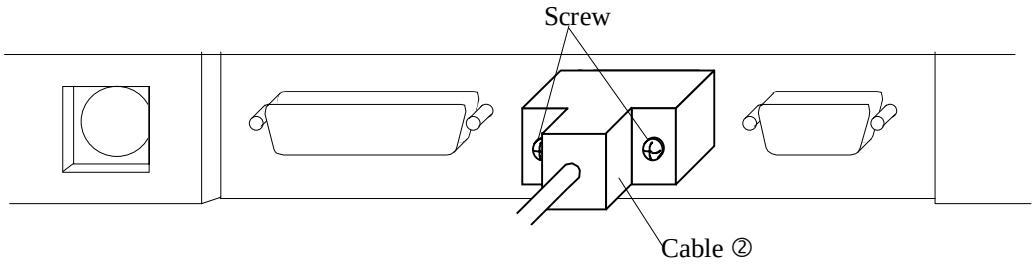
4. Disconnect the cables.

a. Disconnect the PS cable ① from the SVP.



Left -Side View of SVP

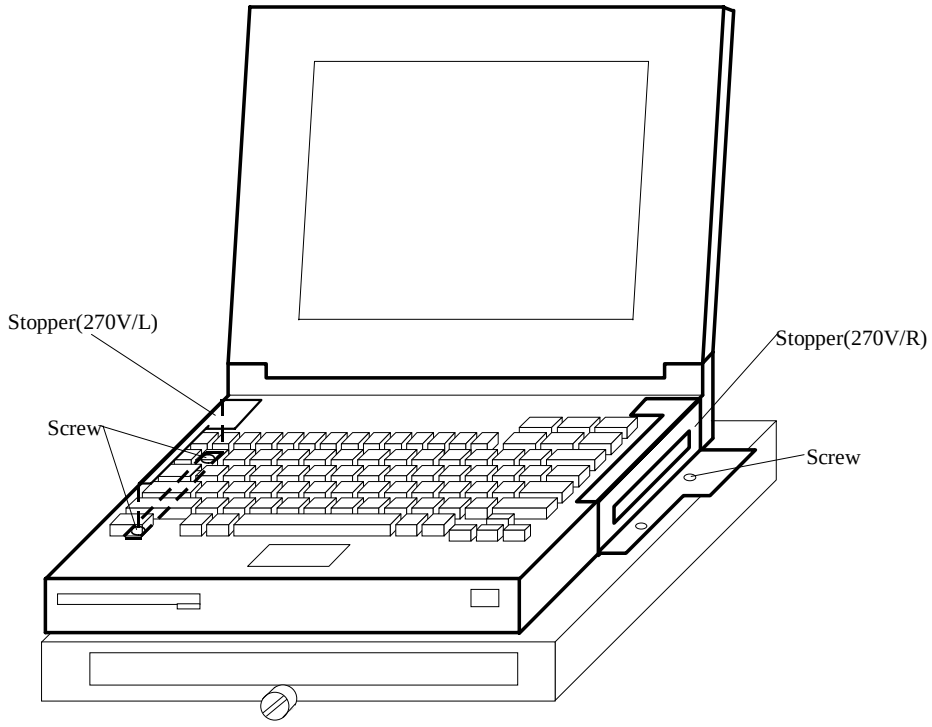
b. Loosen the two screws and disconnect the cable ②.



Rear View of SVP

5. Remove the SVP.

a. Loosen the four screws with a torque driver, and remove the stoppers which fix the side of SVP.
b. Remove the SVP.



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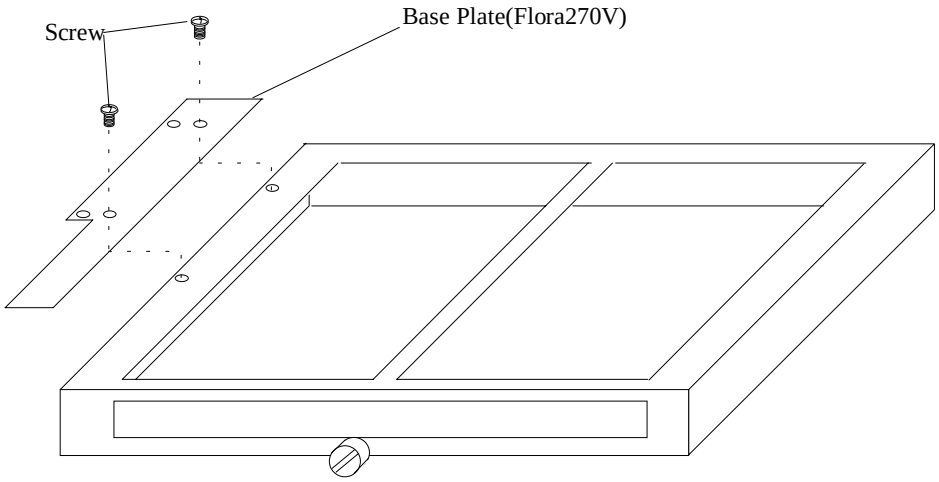
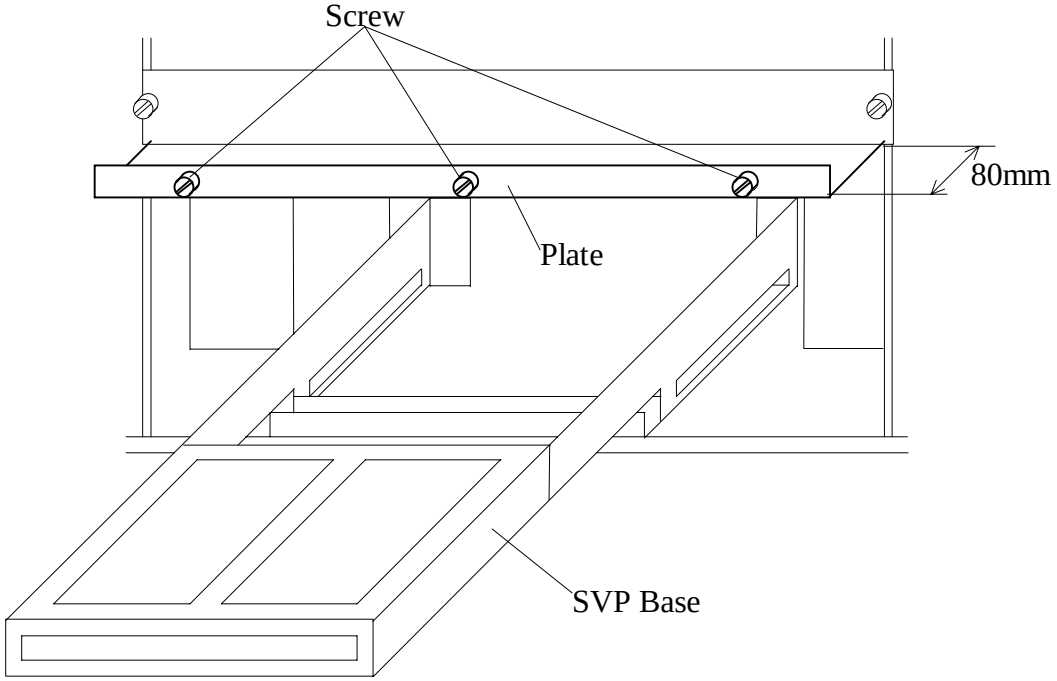
6. Remove the base plate. (When the model of the failed SVP is the same as that of the spare SVP, go to step 8.)

   a. Loosen the two screws and remove the base plate from SVP base.



7. Disconnect the PS cable for the SVP.

   a. Loosen the three screws and pull out the plate approximately 80mm.



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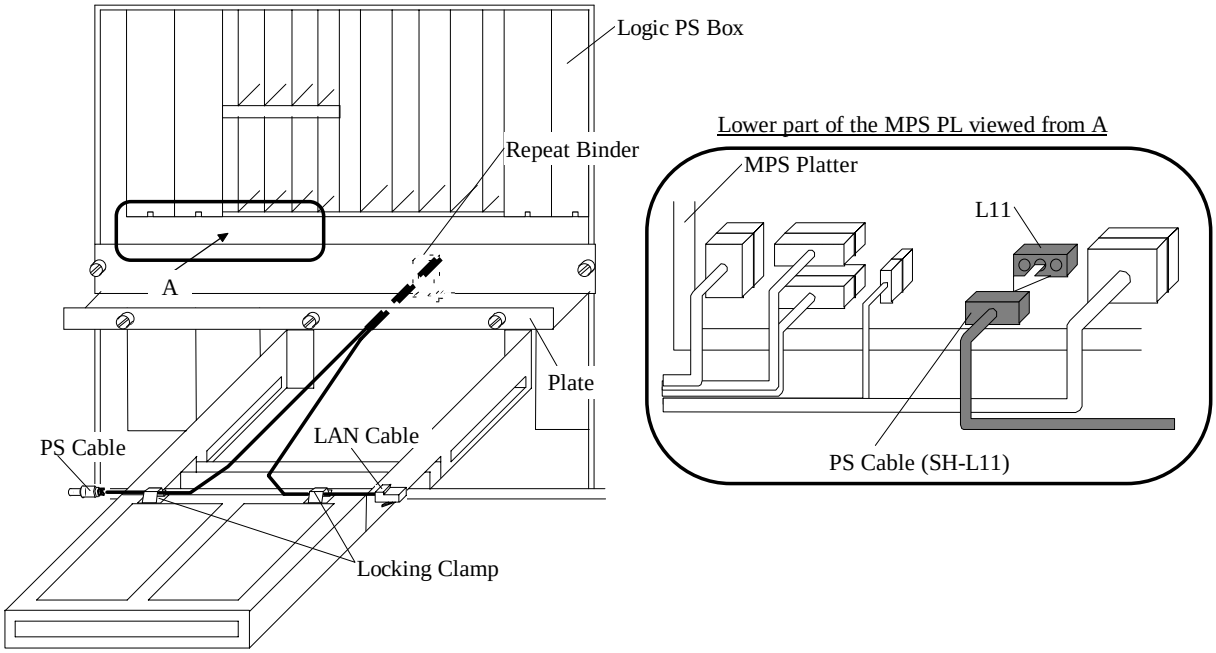
b. Open the Repeat binder and the two locking clamps under the plate, and then remove the PS cable and LAN cable.
c. Put in your hand from the bottom of the plate, and disconnect the PS cable (SH-L11) from the connector (L11) on the MPS platter.



8. Install the spare SVP.
   a. Go to REP03-1360.

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[2] Installation of Spare SVP

(i) When replacing both the SVP and LAN card at the same time, connect the LAN adapter cable to the LAN card referring to Fig. T10-2.
If the LAN adapter cable is connected to the LAN card, go to step (ii).

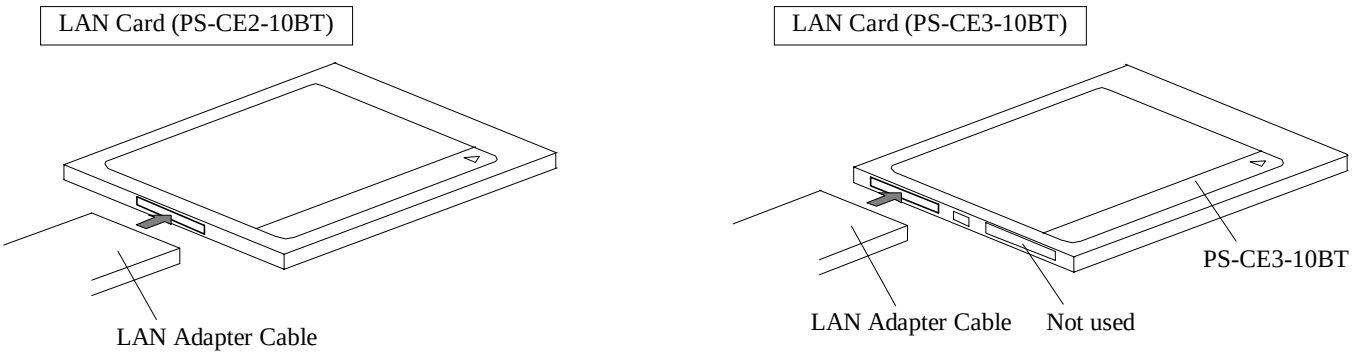

Fig. T10-2 Connection of LAN Adapter Cable

(ii) Refer to Table T10-2 and Fig. T10-3, and go to corresponding step for installing the SVP.

Table T10-2 Installation of Spare SVP

No.	Spare SVP	Page
1	ARMADA (COMPAQ)	REP03-1361
2	FLORA230 (HITACHI)	REP03-1365
3	FLORA270V (HITACHI)	REP03-1369

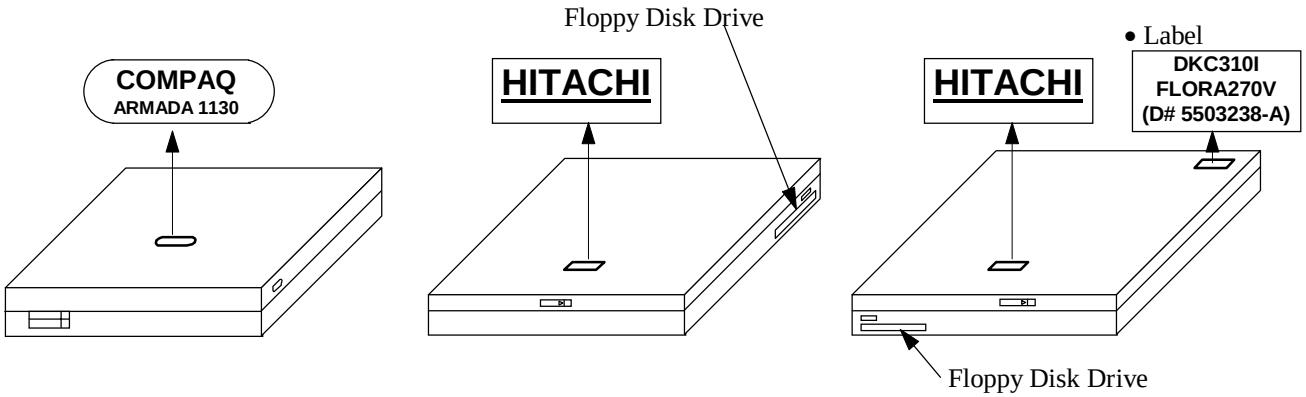

Fig. T10-3 How to distinguish SVP

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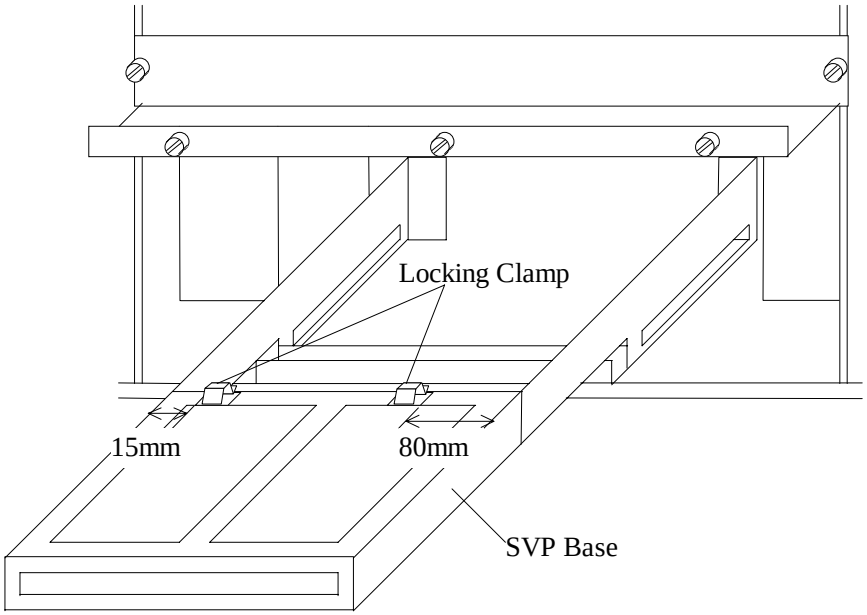
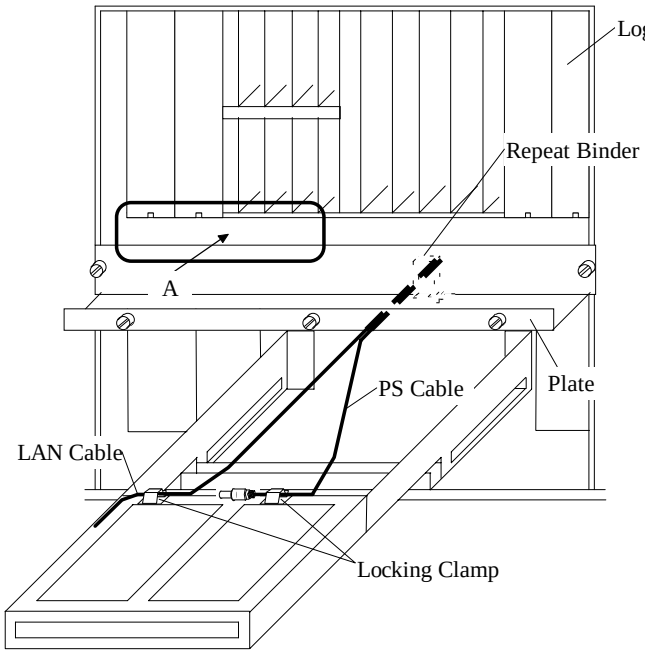
When Spare SVP is ARMADA

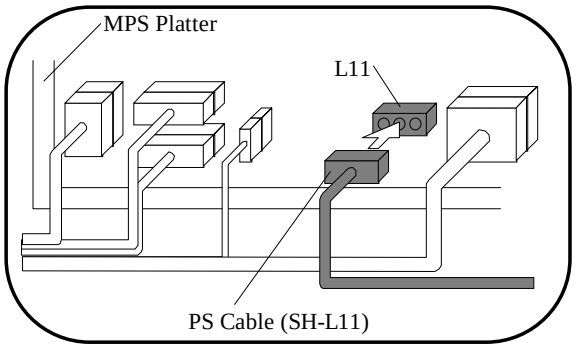
1. Connect the PS cable for the SVP. (When the model of the failed SVP is the same as that of the spare SVP, go to step 2.)
   a. Remove the two locking clamps on the SVP base, and affix the two locking clamps which are spare parts.



   b. Connect the spare PS cable to the connector on the MPS platter.
   c. Fasten the PS cable with the Repeat binder and locking clamp.
   d. Fasten the LAN cable with the locking clamp.



Lower part of the MPS PL viewed from A



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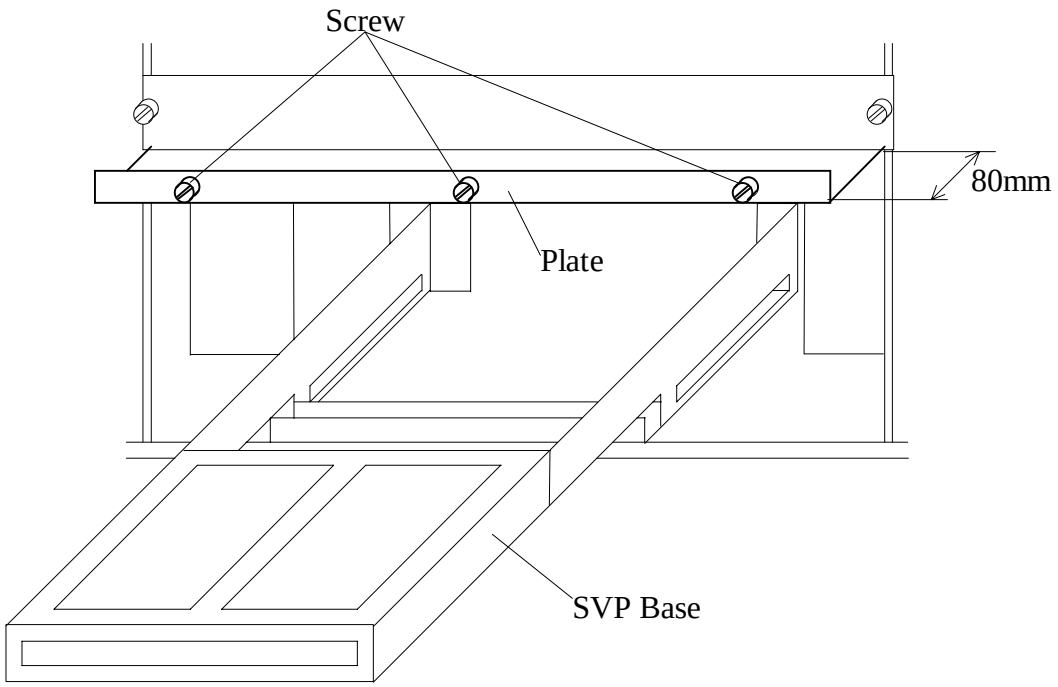
e. Return the plate, and fasten it with the three screws.



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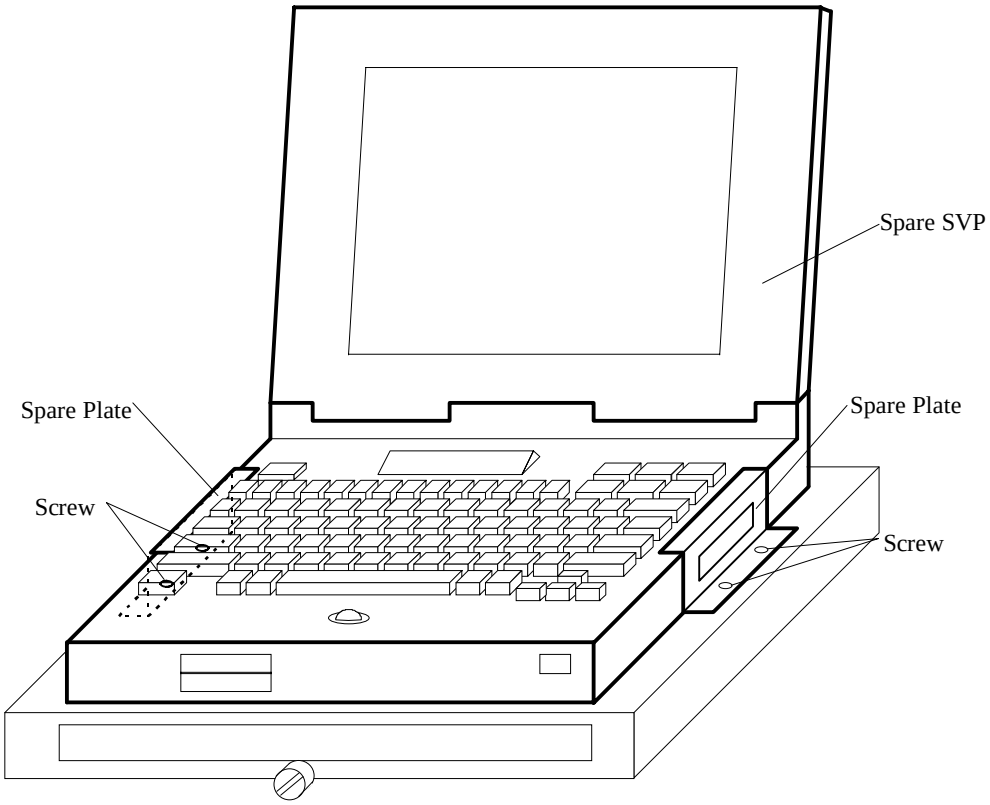
2. Install the spare SVP.

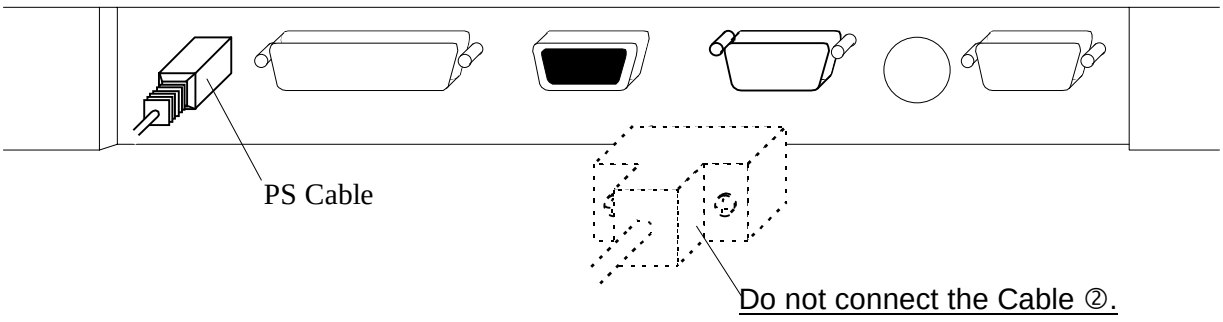
   a. Install the spare SVP.
   b. Attach the spare plates and fasten the four screws.



3. Connect the PS cable.

   a. Connect the spare PS cable to the SVP.

Note : In this step, do not connect the cable ② because it will be connected in Post-Procedure t1.



Rear View of SVP

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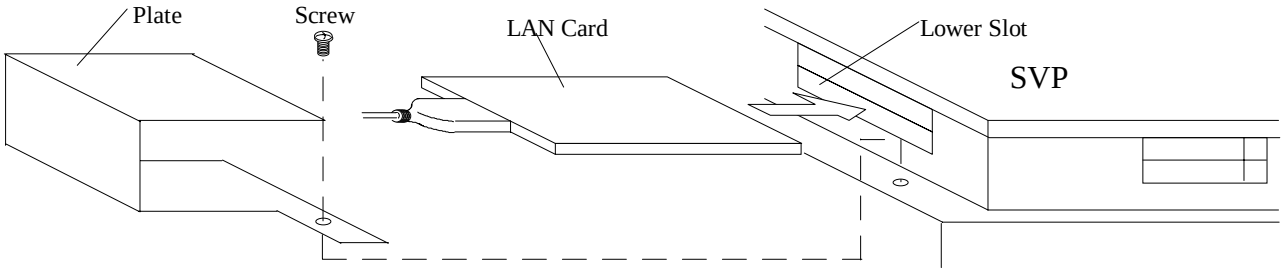
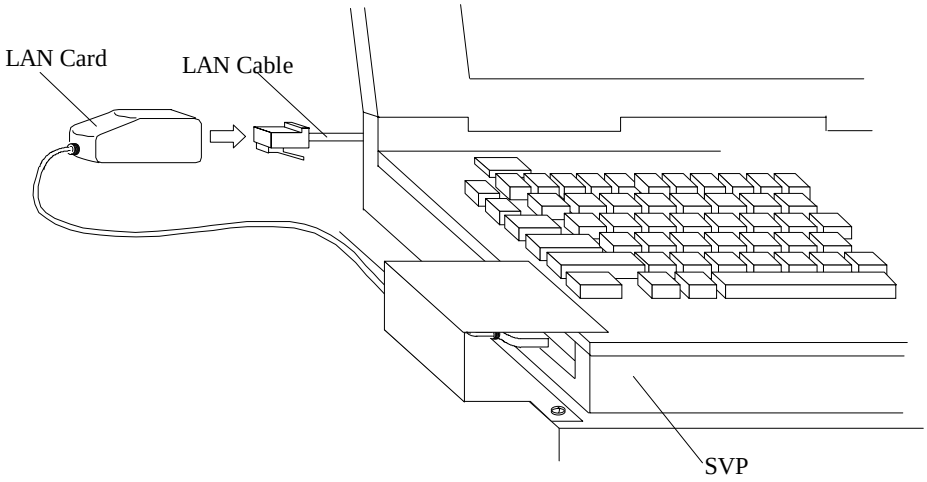
4. Insert the LAN card.
   a. Insert the LAN card into the lower slot.
   b. Attach the plate and fasten the screw.



5. When replacing both the SVP and LAN card at the same time, install the LAN cable. (When replacing the SVP only, go to step 6.)
   a. Attach the LAN cable to the LAN card.



6. Remove the Shut Down Jumpers from the SVP PS PCBs.
   a. Remove the Shut Down Jumpers attached to the SVP PS 1 and 2 PCBs.

7. Go to SVP post procedure t1 [REP04-490].

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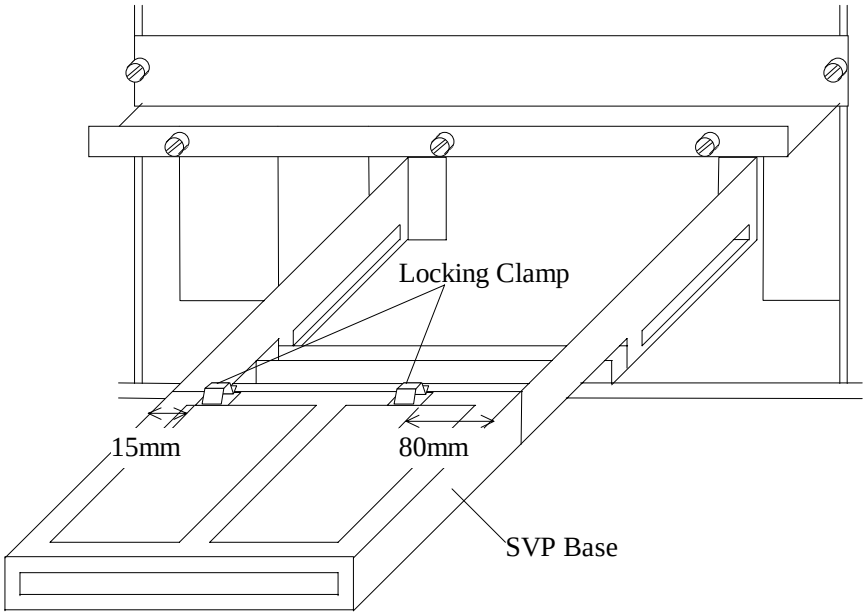
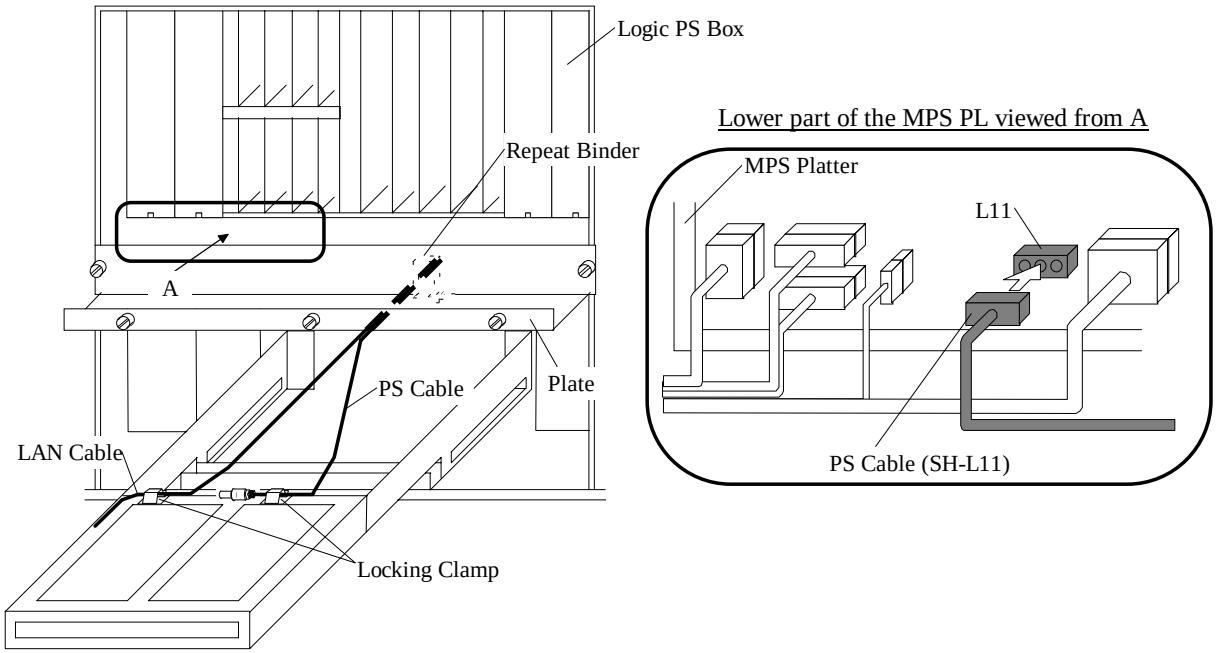
When Spare SVP is FLORA230

1. Connect the PS cable for the SVP. (When the model of the failed SVP is the same as that of the spare SVP, go to step 2.)
   a. Remove the two locking clamps on the SVP base, and affix the two locking clamps which are spare parts.



   b. Connect the spare PS cable to the connector on the MPS platter.
   c. Fasten the PS cable with the Repeat binder and locking clamp.
   d. Fasten the LAN cable with the locking clamp.



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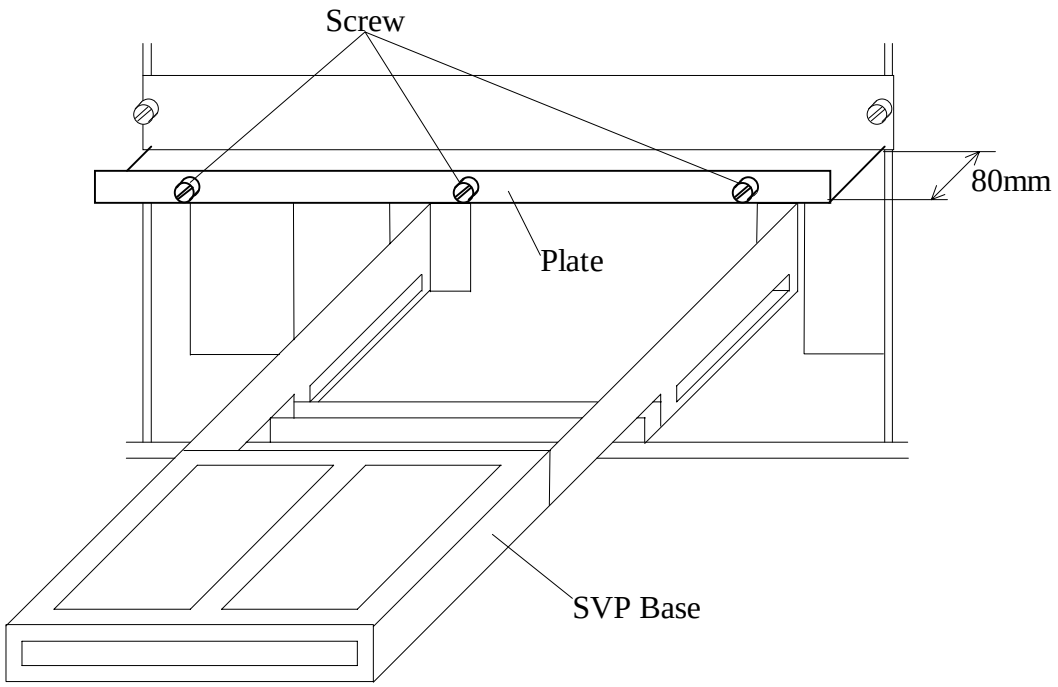
e. Return the plate, and fasten it with the three screws.



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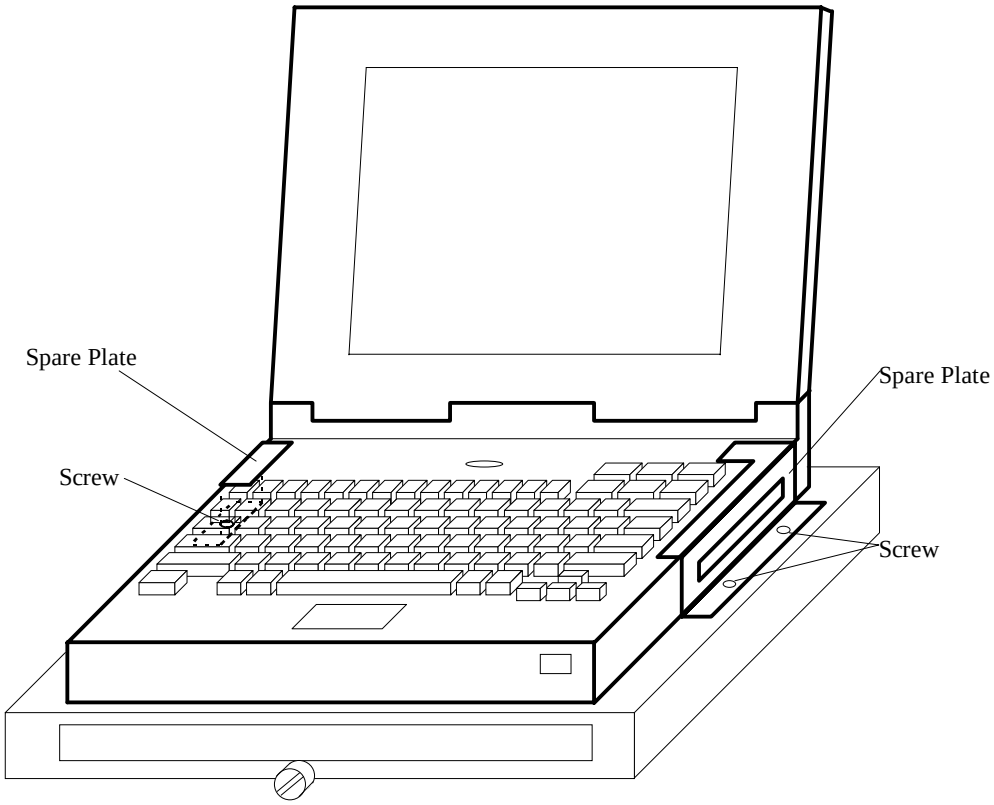
2. Install the spare SVP.

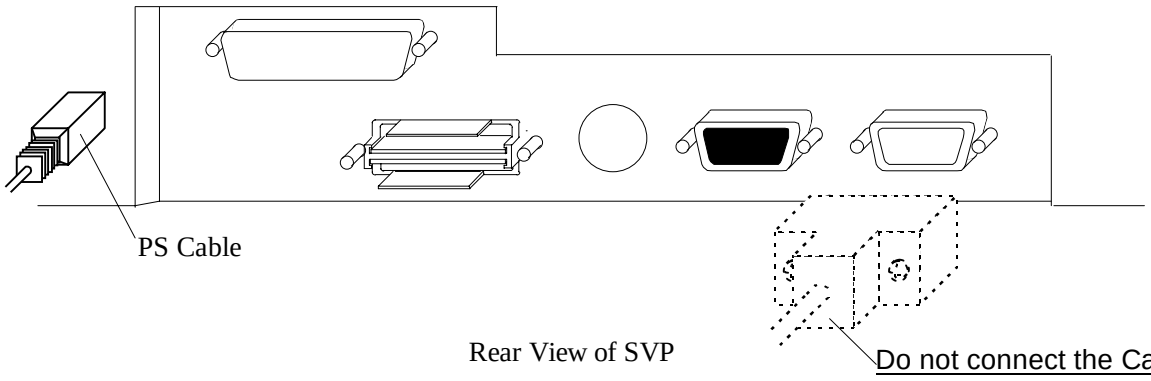
   a. Install the spare SVP.
   b. Attach the spare plates and fasten the three screws.



3. Connect the PS cable.

   a. Connect the spare PS cable to the SVP.

   Note : In this step, do not connect the cable ② because it will be connected in Post-Procedure t1.



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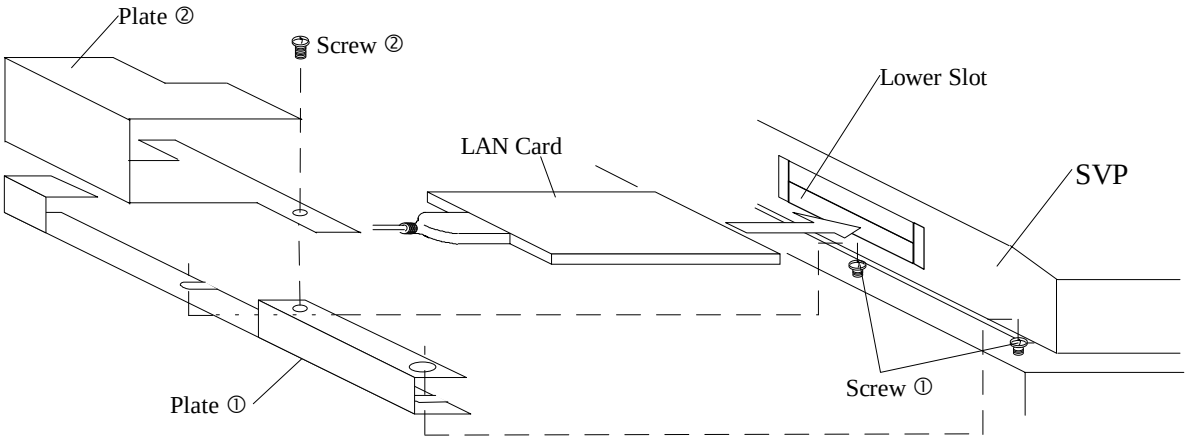
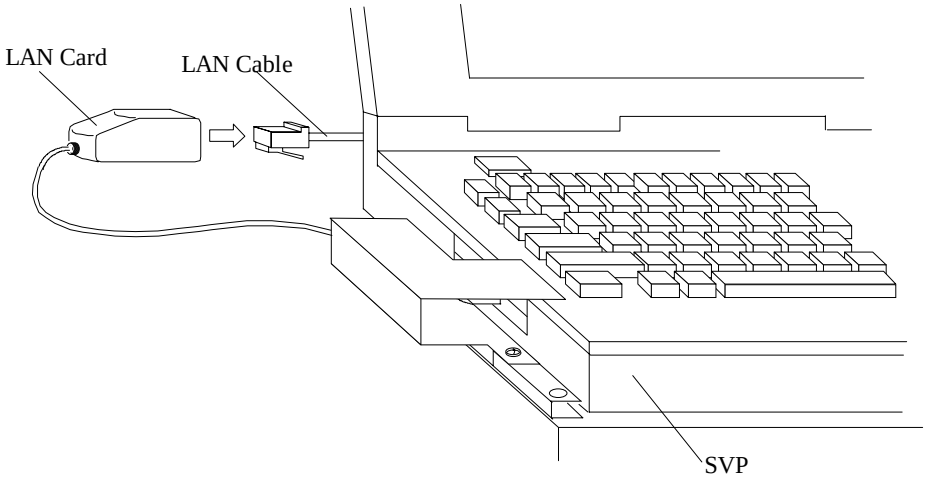
4. Insert the LAN card.

   a. Attach the Plate ① and fasten the two screws ①.
   b. Insert the LAN card into the lower slot.
   c. Attach the Plate ② and fasten the screw ②.



5. When replacing both the SVP and LAN card at the same time, install the LAN cable. (When replacing the SVP only, go to step 6.)

   a. Attach the LAN cable to the LAN card.



6. Remove the Shut Down Jumpers from the SVP PS PCBs.

   a. Remove the Shut Down Jumpers attached to the SVP PS 1 and 2 PCBs.

7. Go to SVP post procedure t1 [REP04-490].

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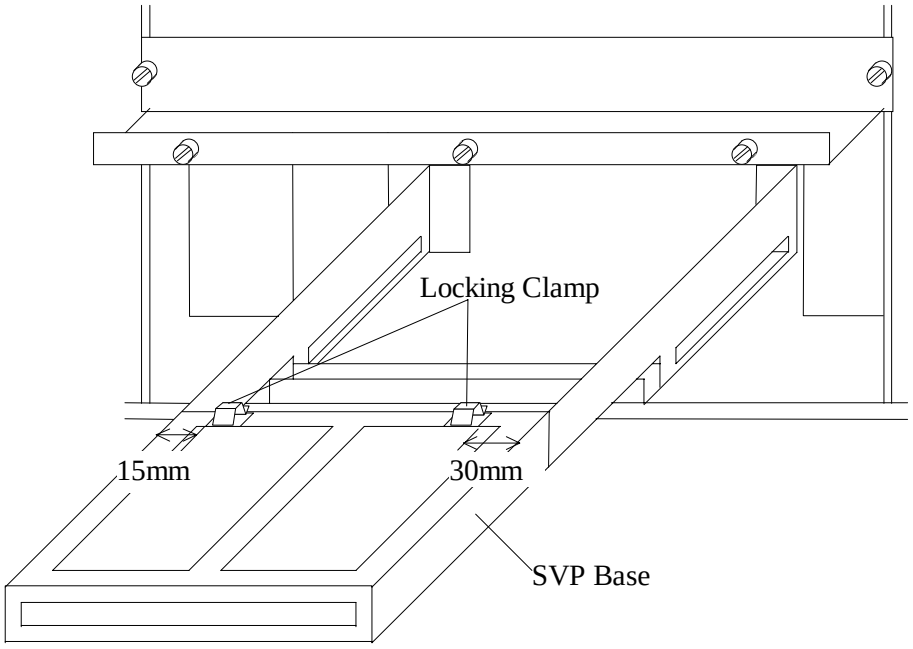
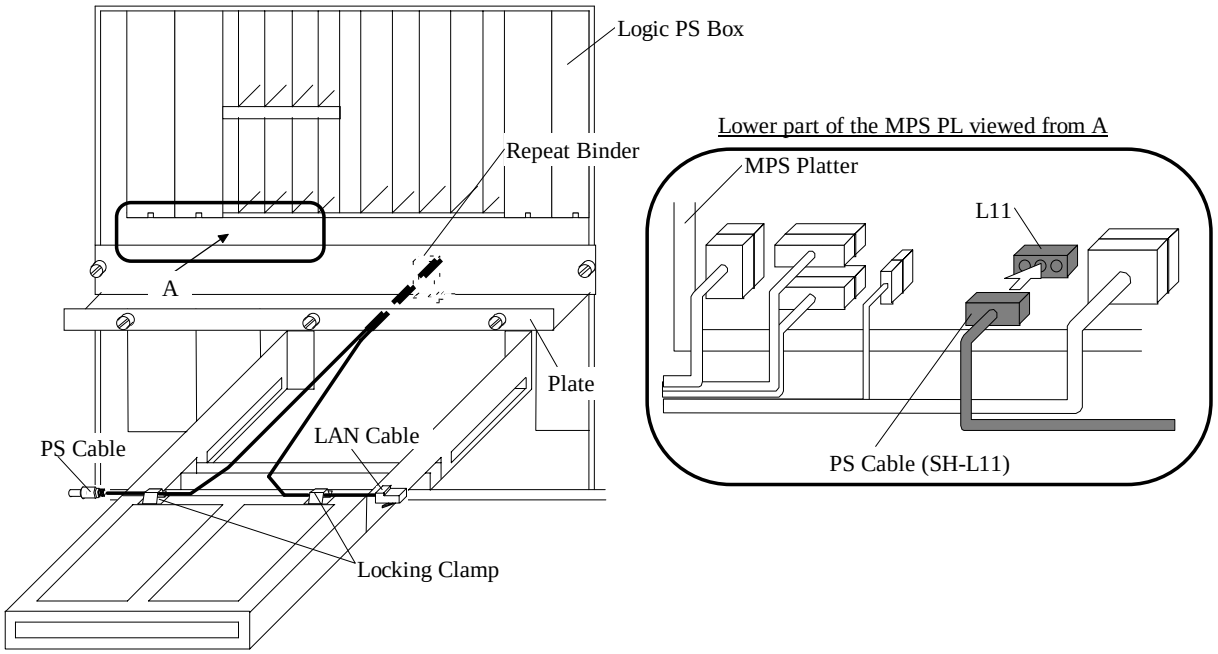
When Spare SVP is FLORA270V

1. Connect the PS cable for the SVP. (When the model of the failed SVP is the same as that of the spare SVP, go to step 2.)
   a. Remove the two locking clamps on the SVP base, and affix the two locking clamps which are spare parts.



   b. Connect the spare PS cable to the connector on the MPS platter.
   c. Fasten the PS cable with the Repeat binder and locking clamp.
   d. Fasten the LAN cable with the locking clamp.



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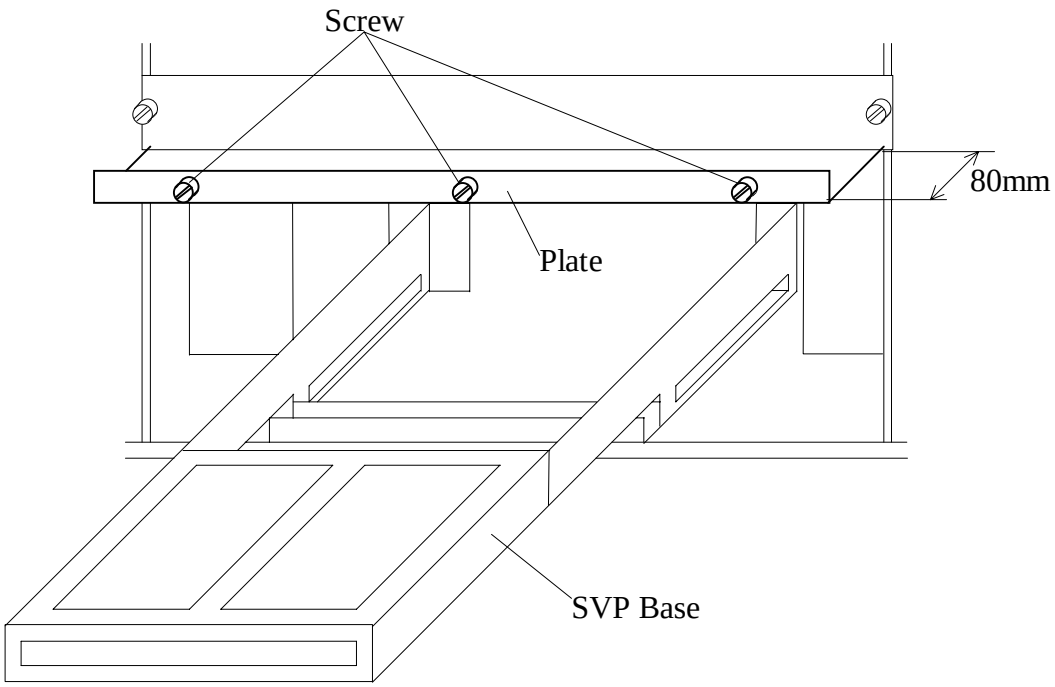
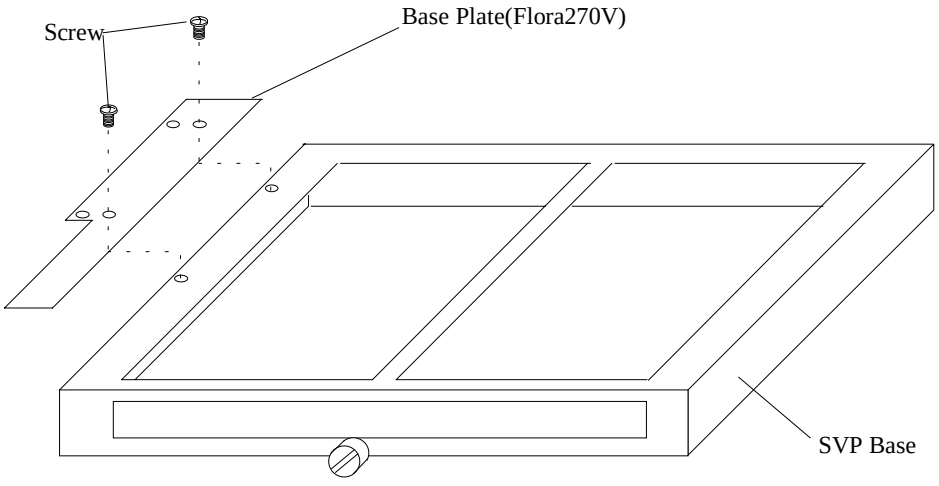
e. Return the plate, and fasten it with the three screws.



f. Attach the base plate to SVP base and fasten the two screws.



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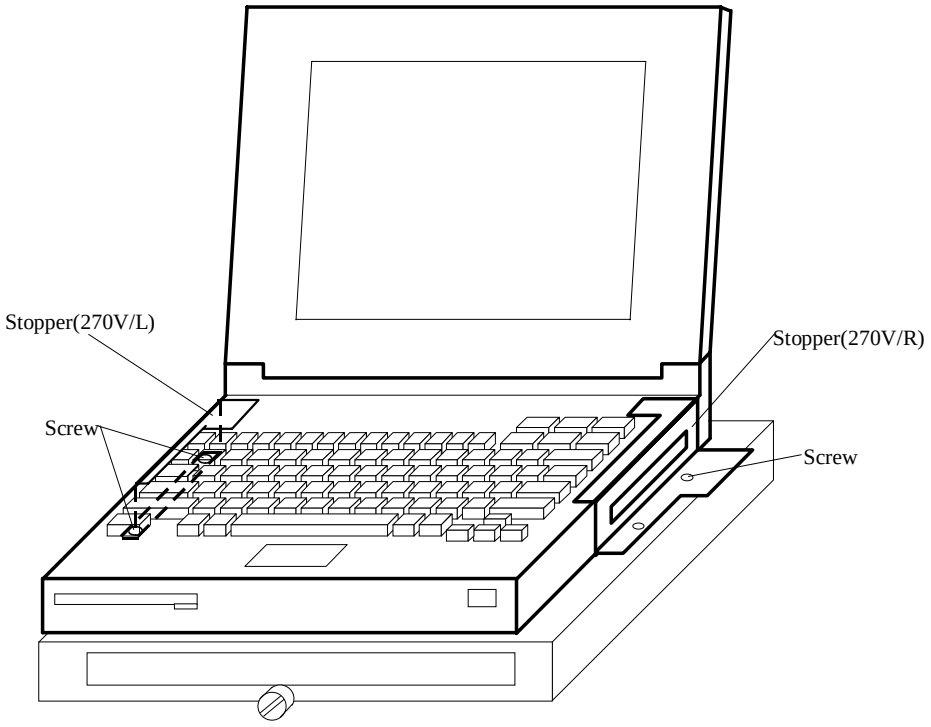
2. Install the spare SVP.

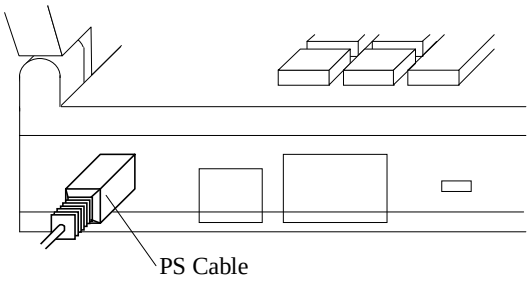
   a. Install the spare SVP.
   b. Attach the stoppers and fasten the three screws.



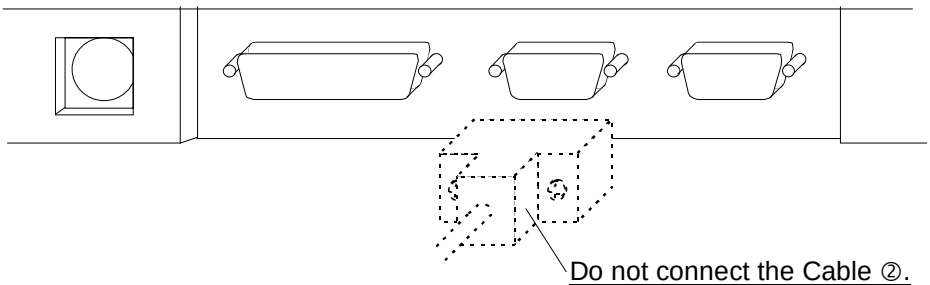
3. Connect the PS cable.

   a. Connect the spare PS cable to the SVP.

Note : In this step, do not connect the cable ② because it will be connected in Post-Procedure t1.



Left -Side View of SVP



Rear View of SVP

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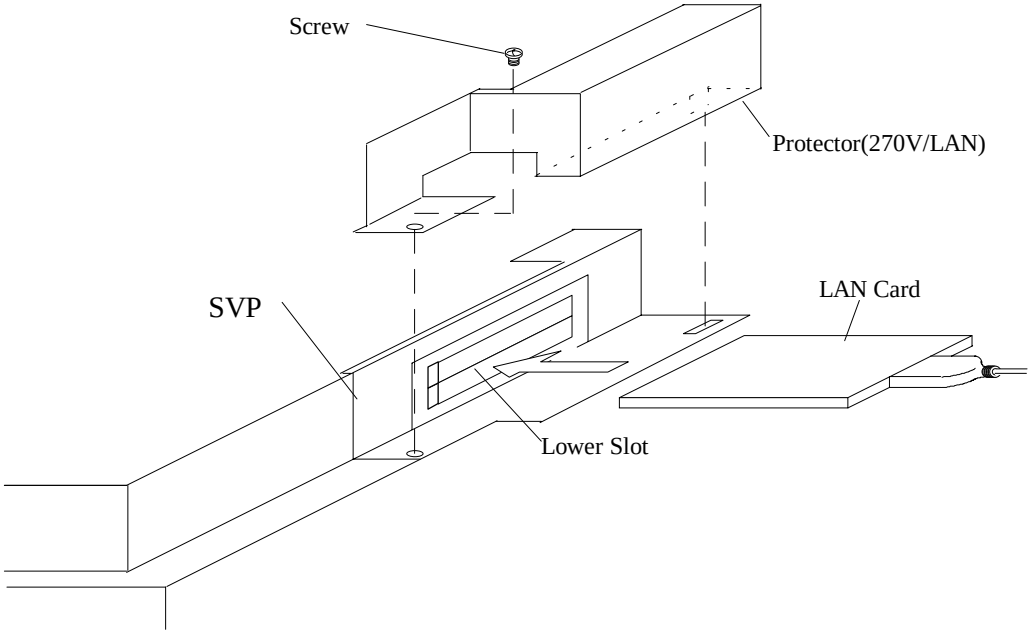
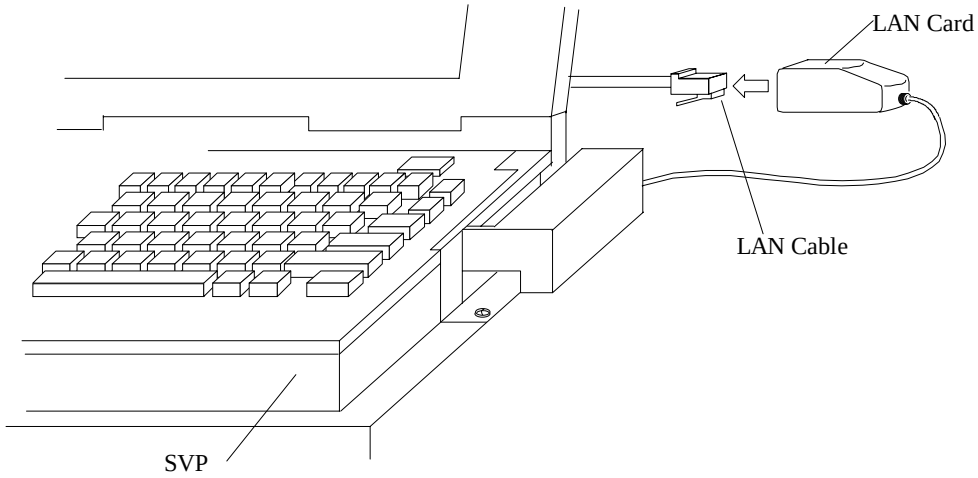
4. Insert the LAN card.

   a. Insert the LAN card into the lower slot.
   b. Attach the protector and fasten the screw.



5. When replacing both the SVP and LAN card at the same time, install the LAN cable. (When replacing the SVP only, go to step 6.)

   a. Attach the LAN cable to the LAN card.



6. Remove the Shut Down Jumpers from the SVP PS PCBs.

   a. Remove the Shut Down Jumpers attached to the SVP PS 1 and 2 PCBs.

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7. Watch messages displayed on the SVP Keyboard.

   a. If following messages are displayed, Go to step b.
   Otherwise, Go to step 8.

```
Phoenix BIOS 4.0 Release 6.0.0
Copyright 1985-1997 Phoenix Technologies LTD., All Rights Reserved.

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CPU = Pentium with MMX  166 MHz
0000640K System RAM Passed
0031744K Extended RAM Passed
Mouse initialized
ERROR
0271: Check date and time settings
ERROR
0251: System CMOS checksum bad - Default configuration used
ERROR
0280: Previous boot incomplete - Default configuration used

Press <F1> to resume, <F2> to Setup
```

   b. Press “F2” key on the SVP keyboard.
   c. Select (use “←”,“→” key) the “Exit” in the menu.

```
   Main    Advances   Security    Power     Boot      Exit
                                                  Item Specific Help
  Save Values & Exit
  Discard Values & Exit
  Get Default Values
  Load Previous Values
  Save Current Values

F1  Help ↑ ↓ Select Item  +/- Change Values        F9  Setup Defaults
ESC Exit ← → Select Menu  Enter Select > Sub-Menu  F10 Save and Exit
```

   d. Select (use “↑”,“↓” key) the “Get Default Values” in the “Exit” menu and press “Enter” key.

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e. Select (use "←","→" key) "Yes" in the "Setup Confirmation" and press "Enter" key.

```
┌──────────────────────────────┐
│      Setup Confirmation      │
├──────────────────────────────┤
│ Load default configuration now?
│
│       [Yes]       [No]
└──────────────────────────────┘
```

f. Select (use "←","→" key) the "Main" in the menu.

```
   Main     Advances    Security     Power      Boot       Exit
┌──────────────────────────────────────────────┬──────────────────┐
│ System Information                           │ Item Specific Help
│ System Time:   [xx:xx:xx]                    │
│ System Date:   [xx/xx/xxxx]                  │
│ Primary Master    [xxxxMB]                   │
│ Secondary Master  [xxxx]                     │
└──────────────────────────────────────────────┴──────────────────┘
F1  Help ↑ ↓ Select Item  +/- Change Values        F9  Setup Defaults
ESC Exit ← → Select Menu  Enter Select > Sub-Menu  F10 Save and Exit
```

g. Specify the time (hour, minute and second) and date (month, day and year) and press "ESC" key on the SVP keyboard.

h. Select (use "←","→" key) "Advanced" in the menu.

```
   Main     Advances    Security     Power      Boot       Exit
┌──────────────────────────────────────────────┬──────────────────┐
│ Enable ACPI:                      [No]       │ Item Specific Help
│ Plug & Play O/S:                  [Yes]      │
│ PS/2 Mouse:                       [Enabled]  │
│ External PS/2 Device Hot-Plug:    [Enabled]  │
│>Peripheral Configuration                     │
│>Audio options Menu                           │
│>PCI Configuration                            │
└──────────────────────────────────────────────┴──────────────────┘
F1  Help ↑ ↓ Select Item  +/- Change Values        F9  Setup Defaults
ESC Exit ← → Select Menu  Enter Select > Sub-Menu  F10 Save and Exit
```

i. Select (use "↑","↓" key) the "Peripheral Configuration" in the "Advanced" menu and press "Enter" key.

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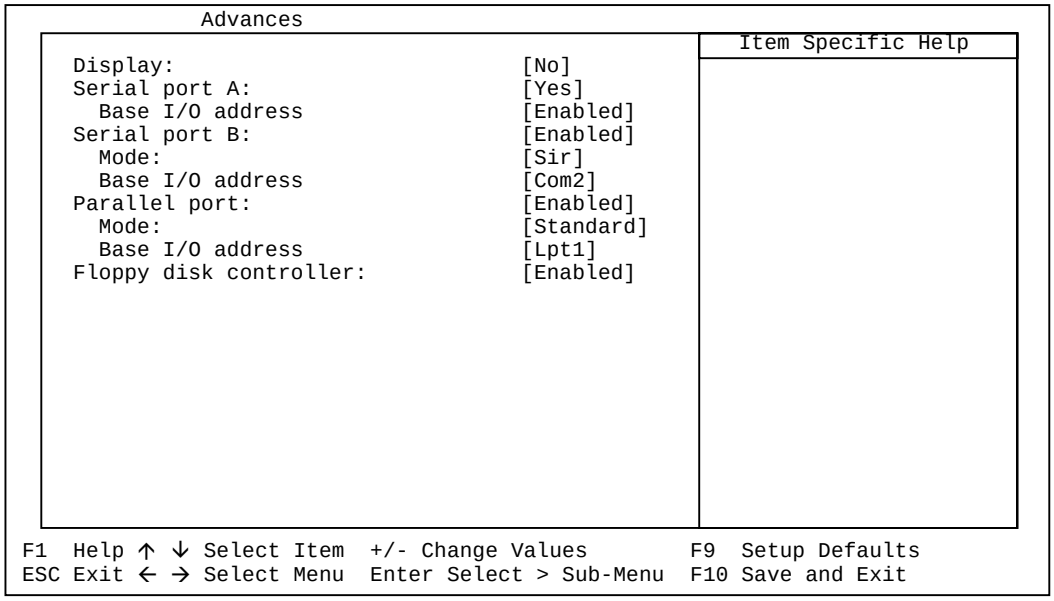
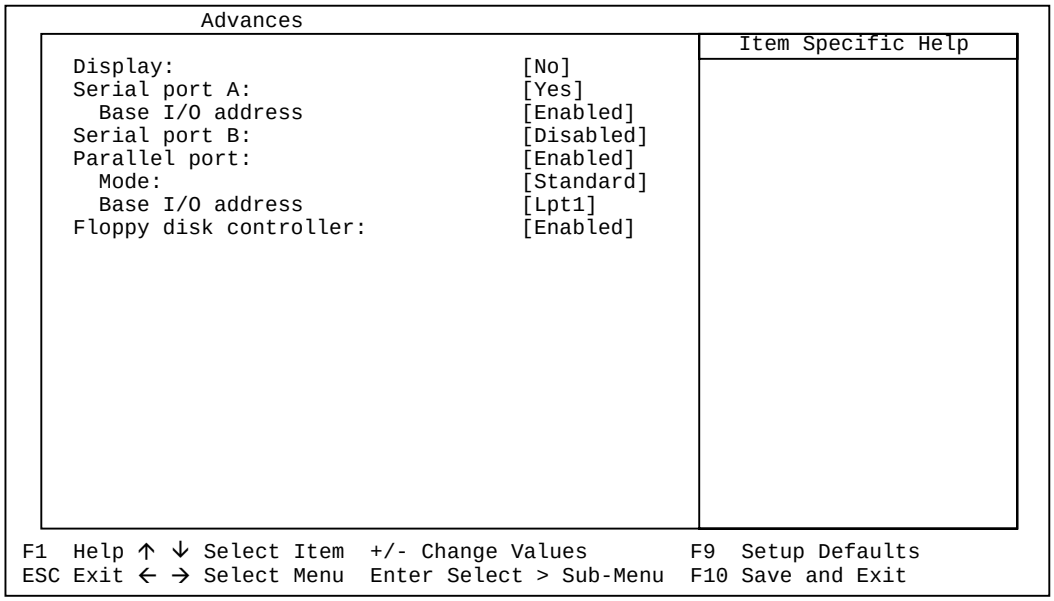
j. Select (use “↑”,“↓” key) “Serial port B:” .



k. Select (press “Space” key) “Disable” in the “Serial port B:” and press “ESC” key.



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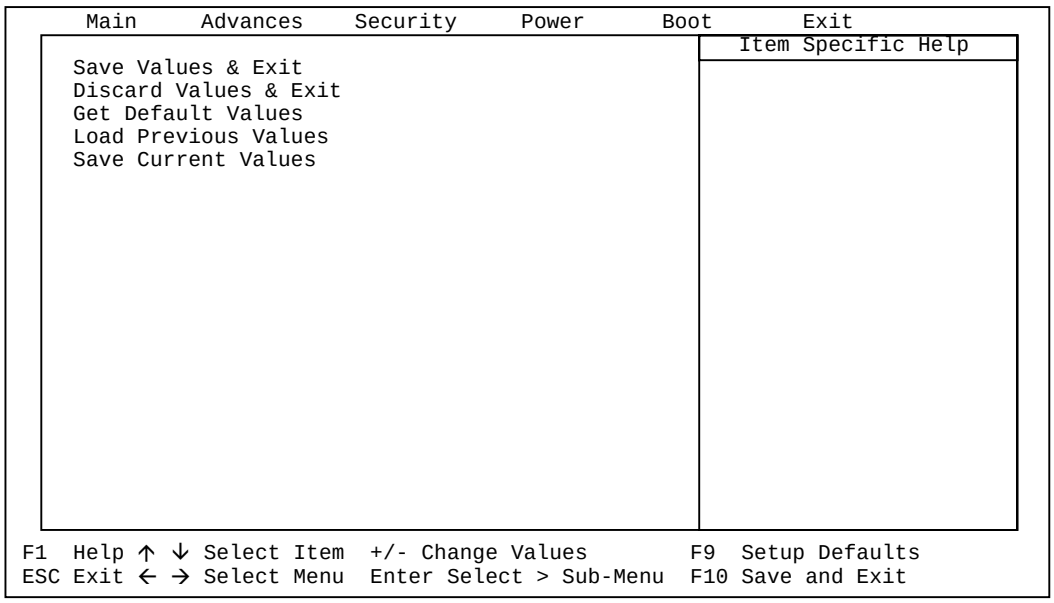
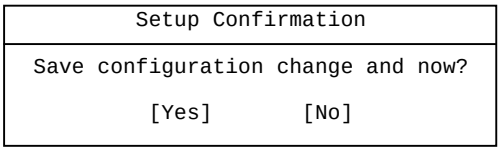
l. Select (use "←","→" key) the "Exit" in the menu.



m. Select (use "↑","↓" key) the "Save Values" in the "Exit" menu and press "Enter" key.
n. Select (use "←","→" key) "Yes" in the "Setup Confirmation" and press "Enter" key.



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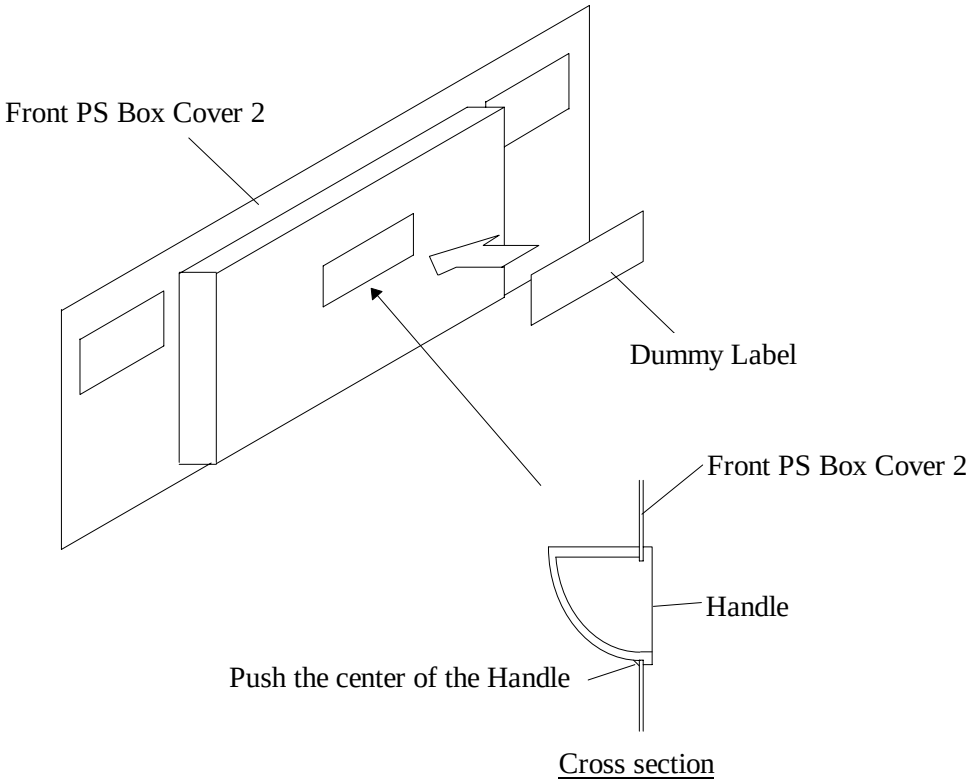
8. Attach the dummy label. (When the dummy label has already been affixed, go to step 9.)

   a. Remove the Handle of Front PS Box Cover 2.
   b. Attach the dummy label.



9. Go to SVP post procedure t1 [REP04-490].

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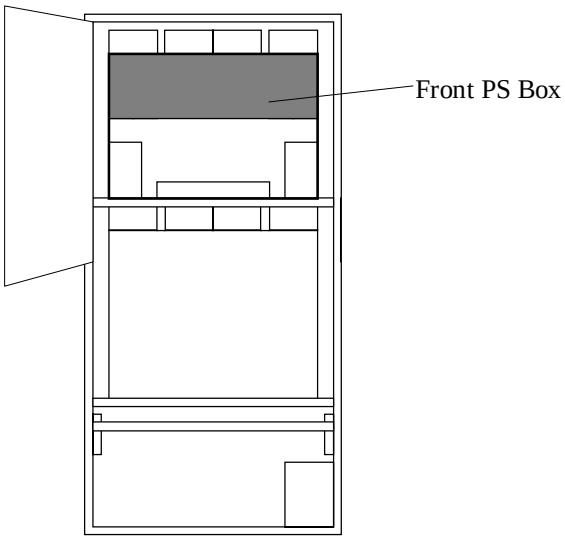
[HARDWARE T11]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	SSVP	• SH090-A + SH091-A



Front View
of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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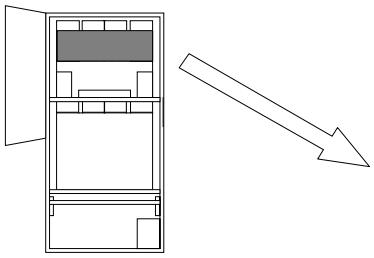
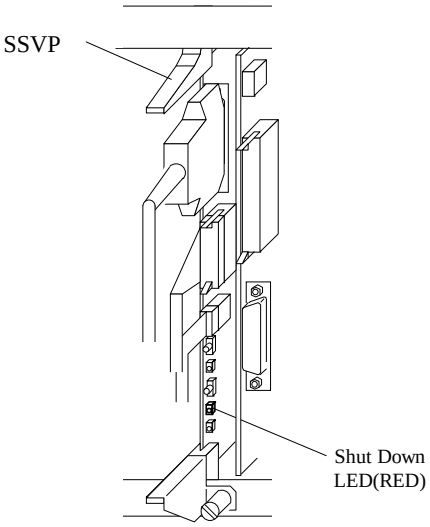
1. The following figure shows the correct way to replace the SSVP PCB.

   a. Check that the Shut Down LED is on. (only hot replace)



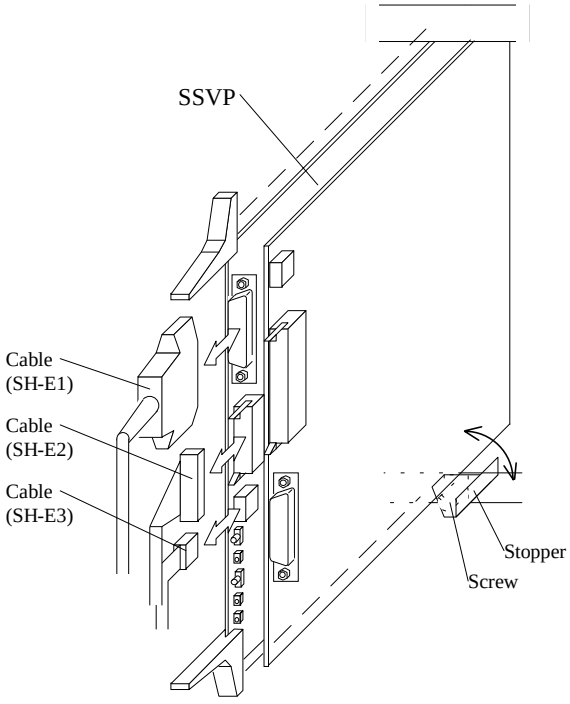
Front View
of DKC



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTL 1	SSVP	HUB	PWR CTL 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

   b. Disconnect all cables from the failed PCB.
   c. Loosen the screw and rotate the stopper.
   d. Replace the SSVP PCB.
   e. Rotate the stopper and fasten the screw.
   f. Connect the cables to spare PCB.



2. Go to SVP post procedure t1 [REP04-490].

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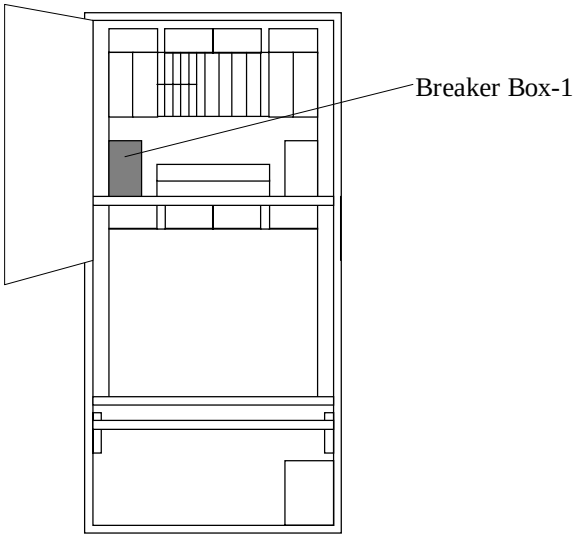
[HARDWARE T12]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	Breaker Box	• Breaker Box-1
(Reference) The related PCB for replacement of Breaker Box-1 1. PWRCTL-1 and PWRCTL-2 (Front PS Box in DKC) 2. AC BOX-R10 (Lower left front of 1st DKU) 3. Outlet Box (Lower front of DKC) 4. CE Panel PCB (Front of DKC)			



Front View
of DKC

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1. Connection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Connect the Alarm INH Jumpers to the connectors on the PWRCTL-1 and PWRCTL-2.

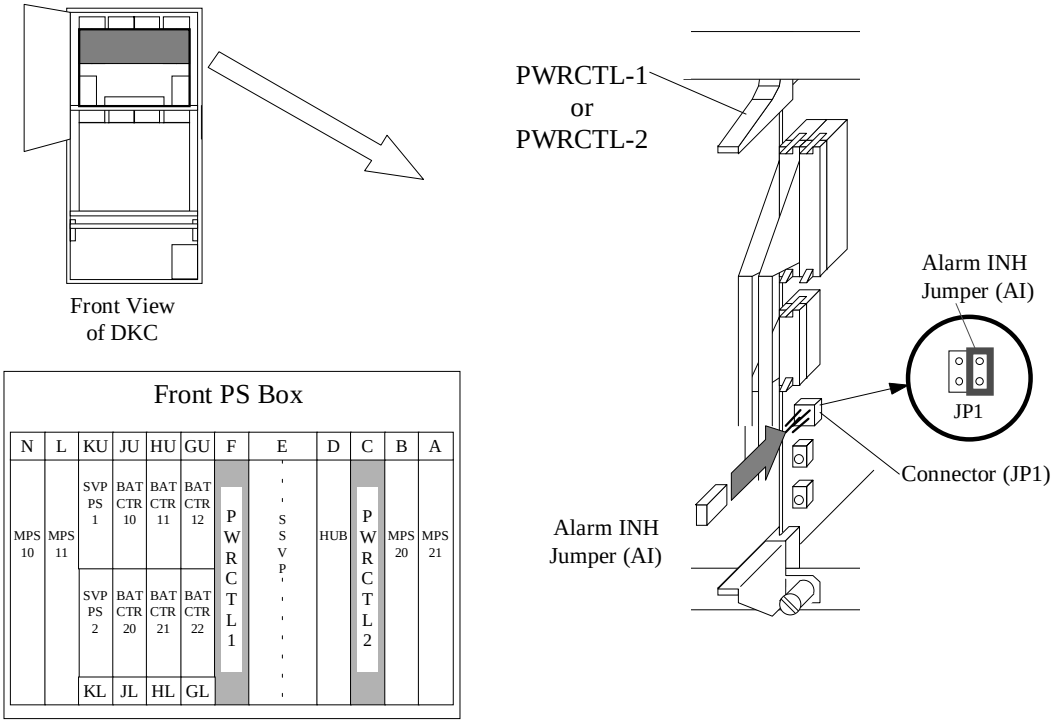

Fig. T12-1 Connection of Jumper

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2. Power Off the Component to be Replaced

⚠ WARNING

Be Careful of Electric Shock

- The power to the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.
- The circuit has residual voltage for one minute after turning off the breakers, so be sure to disconnect all the connectors after this period.

⚠ CAUTION

Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which could cause injury.

Table T12-1 Circuit Breakers to be Turned Off When Replacing Breaker Box-1

No.	Unit	Location No.	Breaker No.	Remarks
1	Disk Controller	Breaker Box-1	CB201	
2	Disk Controller	Outlet Box	CB301	
3	Disk Controller	Outlet Box	CB302	Only IU Type
4	First Disk Unit	AC BOX-R10	CB101	Failure to turn off may result in an electric shock.
5	First Disk Unit	AC BOX-R10	CB102	
6	First Disk Unit	AC BOX-R10	CB103	

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a. Turn off the circuit breaker (CB201) on the Breaker Box in the Disk Controller.

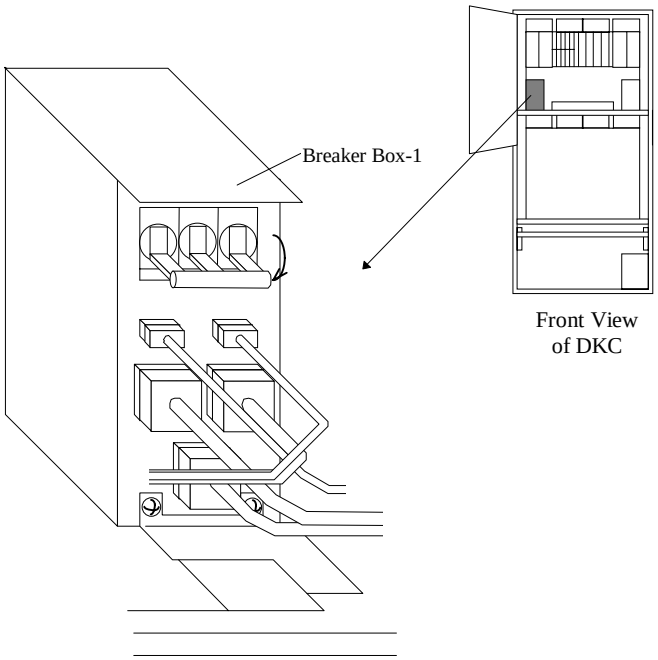

Fig. T12-2 Circuit Breakers to be Turned Off When Replacing Breaker Box-1

b. When the Outlet Box is installed, turn off the circuit breakers (CB301, CB302) on the Outlet Box in the Disk Controller.

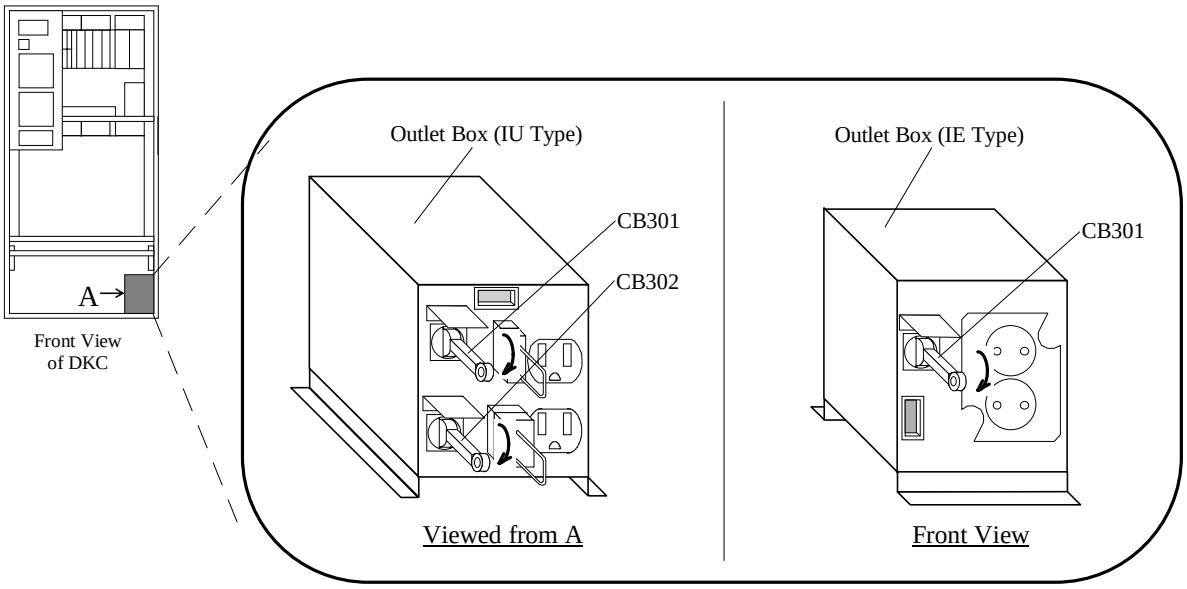

Fig. T12-3 Circuit Breakers to be Turned Off When Replacing Breaker Box-1

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c. Turn off the circuit breakers(CB101, CB102, CB103) on AC BOX-R10 in the First Disk Unit.

⚠ WARNING

Warning: You will get an electric shock if you fail to turn it off.
Start your work after turning off the AC BOX-R10 circuit breaker.

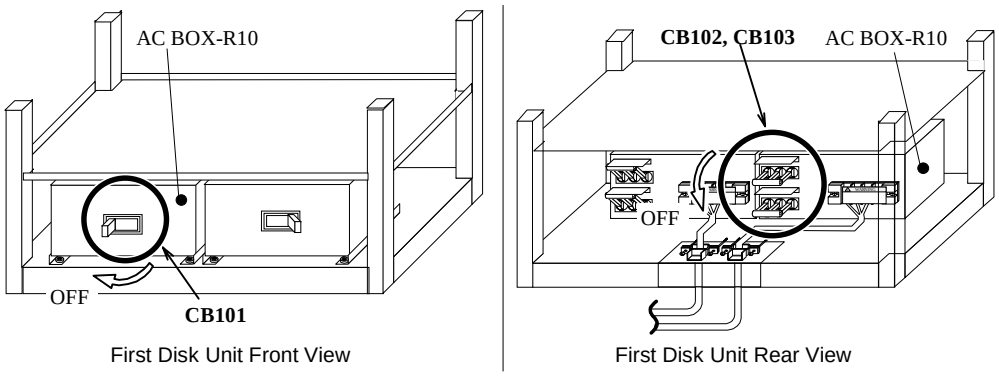

Fig. T12-4 Circuit Breakers to be Turned Off When Replacing Breaker Box-1

3. Breaker Box Removal

a. Remove the Front PS Box Cover 2 from the Front PS Box.

⚠ WARNING

Be Careful of Electric Shock

- Be sure to turn off the circuit breaker of AC BOX-R10 before operation.

b. Disconnect the connectors from Breaker Box-1.

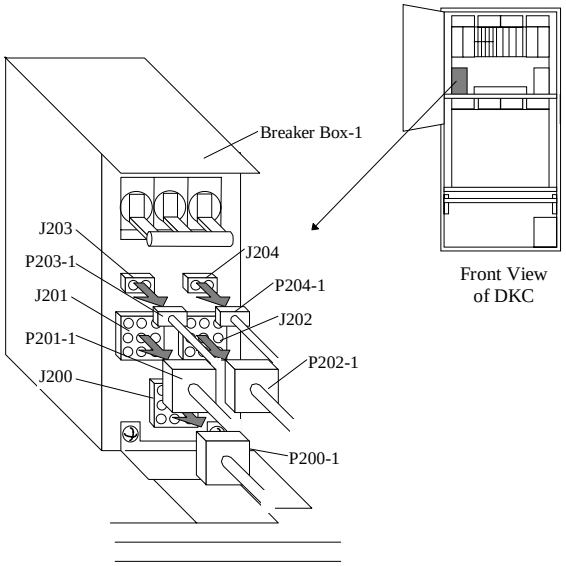

Fig. T12-5 Disconnection of Cable Connectors from Breaker Box-1

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c. Loosen the screw and remove Breaker Box-1.

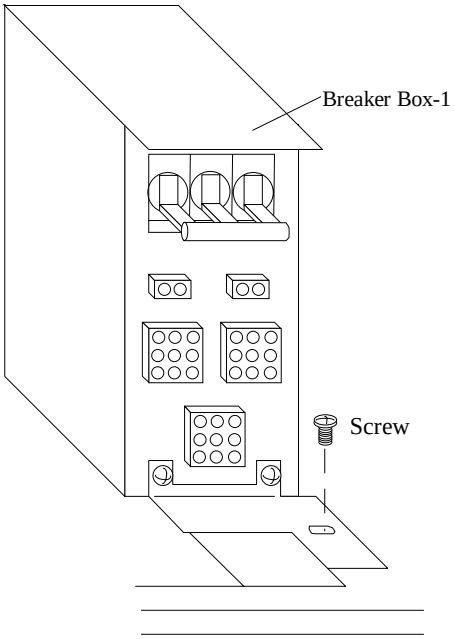

Fig. T12-6 Removal of Breaker Box-1

4. Angle(Breaker) Replacement

a. Loosen the two screws. Remove the Angle(Breaker) from the failed Breaker Box.
b. Secure the Angle(Breaker) to a spare Breaker Box with the two screws

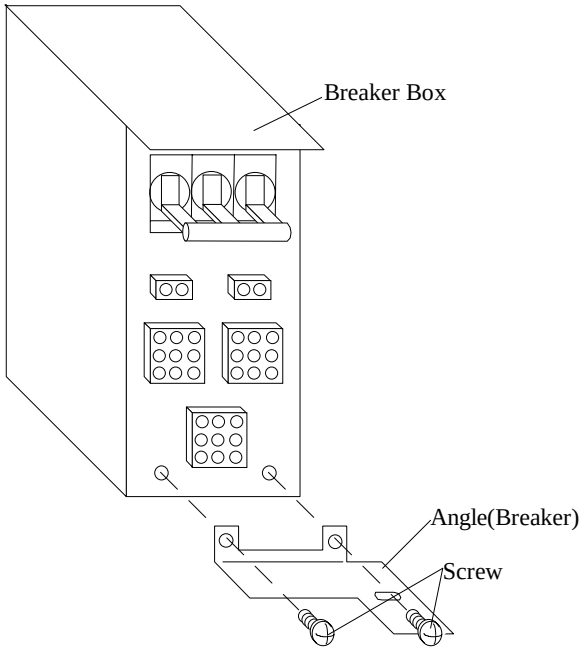

Fig. T12-7 Replacement of Angle(Breaker)

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5. Spare Breaker Box Attachment

a. Turn off the circuit breaker (CB201) on the spare Breaker Box.
b. Attach the spare Breaker Box. Secure the Breaker Box with the screw.

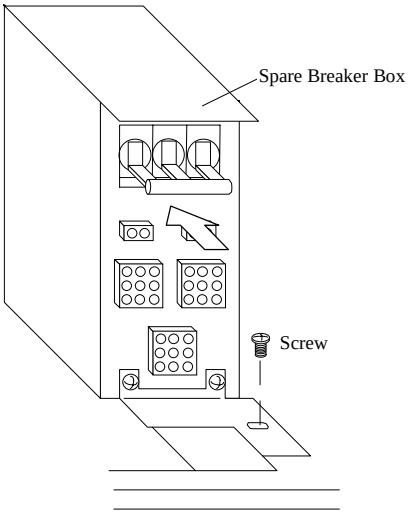

Fig. T12-8 Attachment of Spare Breaker Box

c. Connect the connectors. Refer to Table T12-2 and Fig. T12-9.

Table 12-2 Breaker Box-1 Connectors

No.	Connector No.	Cable No.	Remarks
1	J200	P200-1	
2	J201	P201-1	
3	J202	P202-1	
4	J203	P203-1	
5	J204	P204-1	

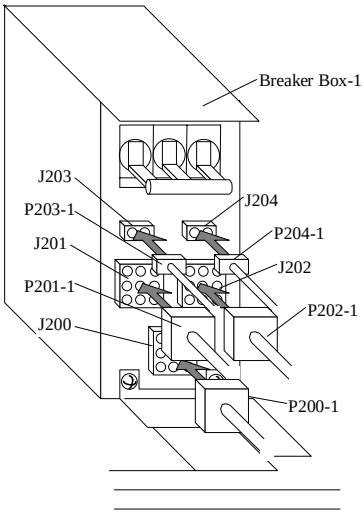

Fig. T12-9 Cable Connection of Breaker Box-1

d. Attach the Front PS Box Cover 2 to the Front PS Box.

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6. Powering On the Replacement Component

a. Turn on all the circuit breakers in the reverse order of powering off. Refer to Table T12-1 [REP03-1420]
b. Turn “IND TEST / CHK RST” switch in CE panel to “CHK RST”.

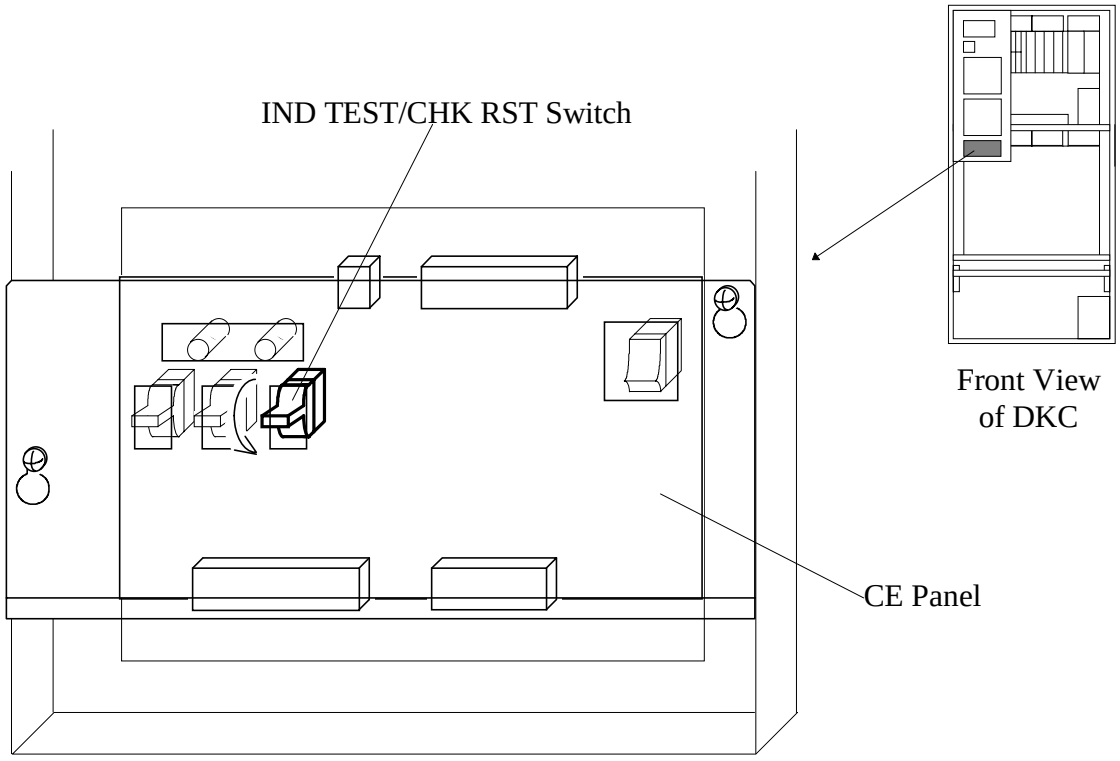

Fig. T12-10 Setting of IND TEST / CHK RST Switch

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7. Disconnection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Disconnect the Alarm INH Jumpers from the connectors on the PWRCTL-1 and PWRCTL-2.

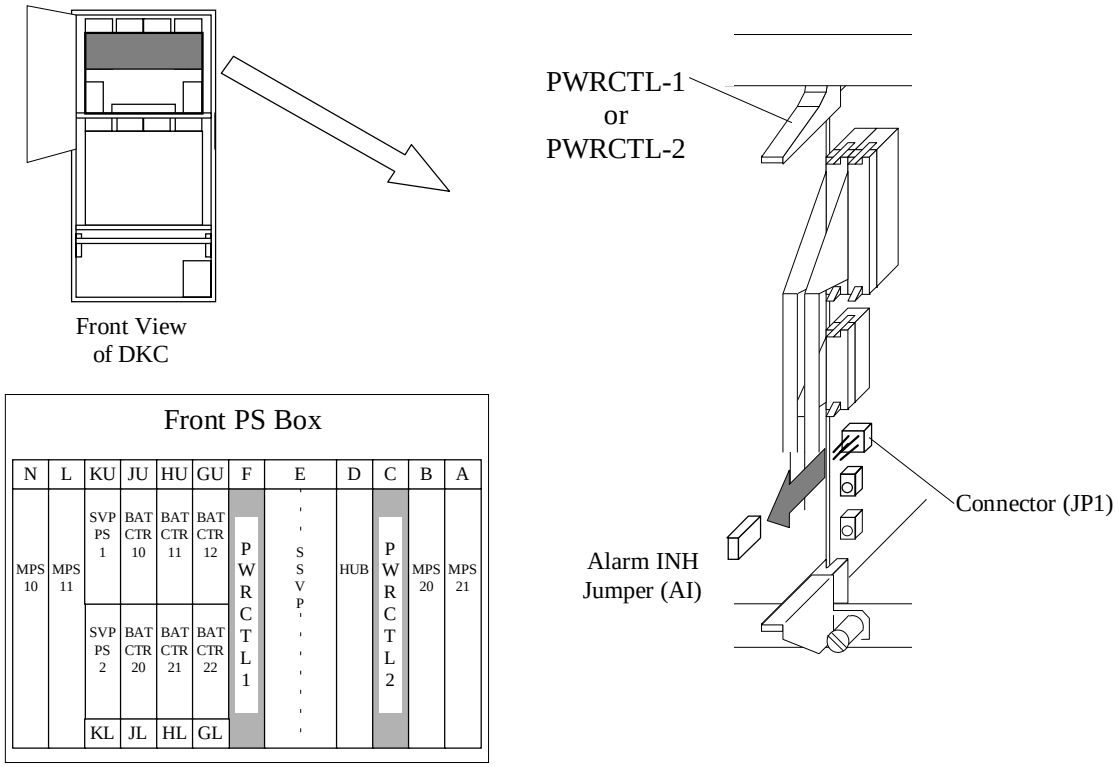

Fig. T12-11 Disconnection of Jumper

8. Go to SVP post-procedure t3 [REP04-860].

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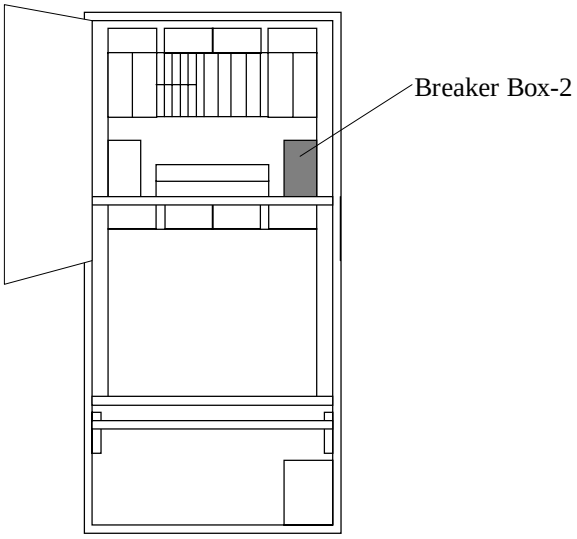
[HARDWARE T13]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	Breaker Box	• Breaker Box-2
(Reference) The related PCB for replacement of Breaker Box-2 1. PWRCTL-1 and PWRCTL-2 (Front PS Box in DKC) 2. AC BOX-R11 (Lower right front of 1st DKU) 3. CE Panel PCB (Front of DKC)			



Front View
of DKC

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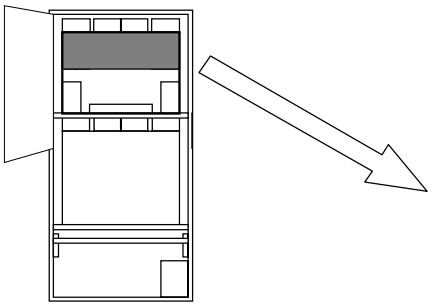
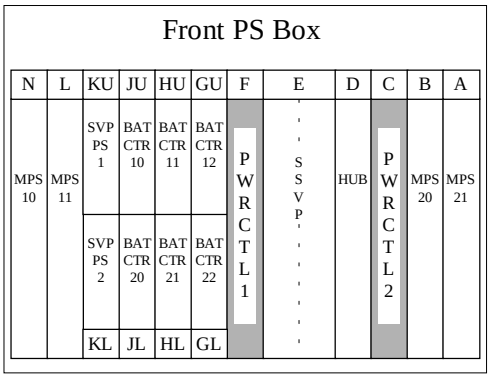
1. Connection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Connect the Alarm INH Jumpers to the connectors on the PWRCTL-1 and PWRCTL-2.



Front View of DKC



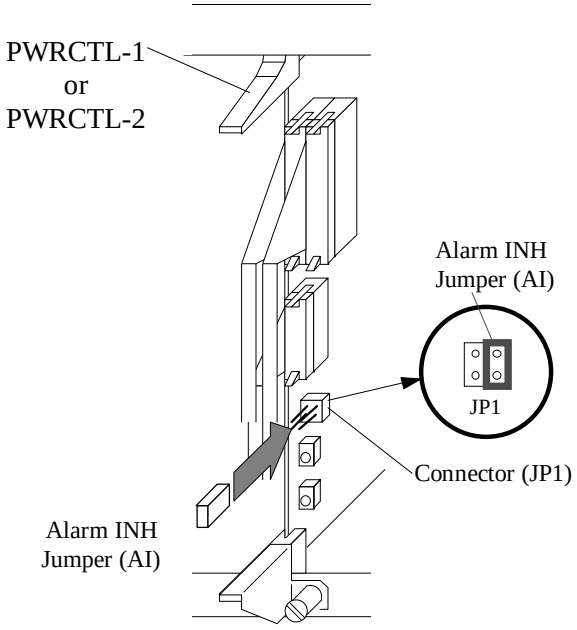


Fig. T13-1 Connection of Jumper

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2. Powering Off the Component to be Replaced

⚠ WARNING

Be Careful of Electric Shock

- The power to the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.
- The circuit has residual voltage for one minute after turning off the breakers, so be sure to disconnect all the connectors after this period.

⚠ CAUTION

Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which could cause injury.

Table T13-1 Circuit Breakers to be Turned Off When Replacing Breaker Box-2

No.	Unit	Location No.	Breaker No.	Remarks
1	Disk Controller	Breaker Box-2	CB201	
2	First Disk Unit	AC BOX-R11	CB101	Failure to turn off may result in an electric shock.
3	First Disk Unit	AC BOX-R11	CB102	
4	First Disk Unit	AC BOX-R11	CB103	

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a. Turn off the circuit breaker (CB201) on Breaker Box-2.

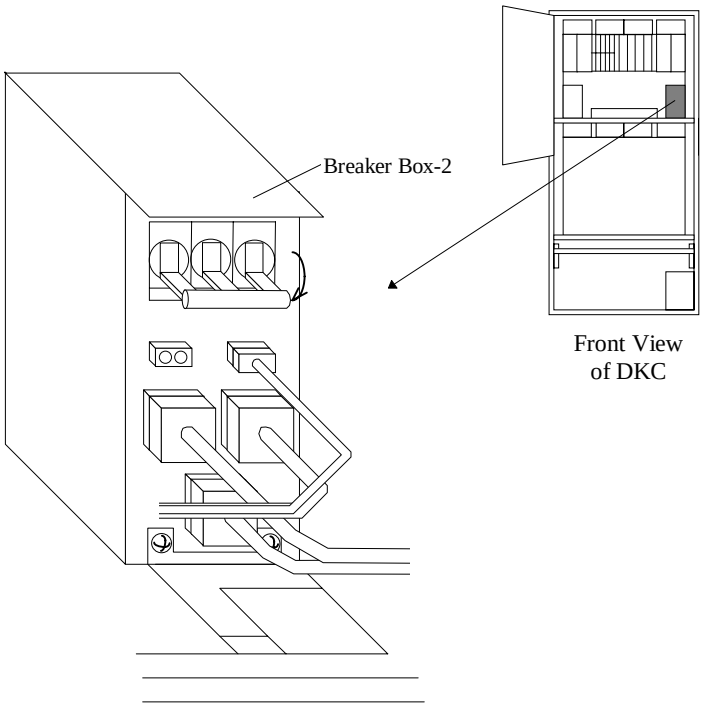

Fig. T13-2 Circuit Breakers to be Turned Off When Replacing AC BOX-R11

b. Turn off the circuit breakers (CB101, CB102, CB103) on AC BOX-R11 in the First Disk Unit.

⚠ WARNING

Warning: You will get an electric shock if you fail to turn it off.
Start your work after turning off the AC BOX-R11 circuit breaker.

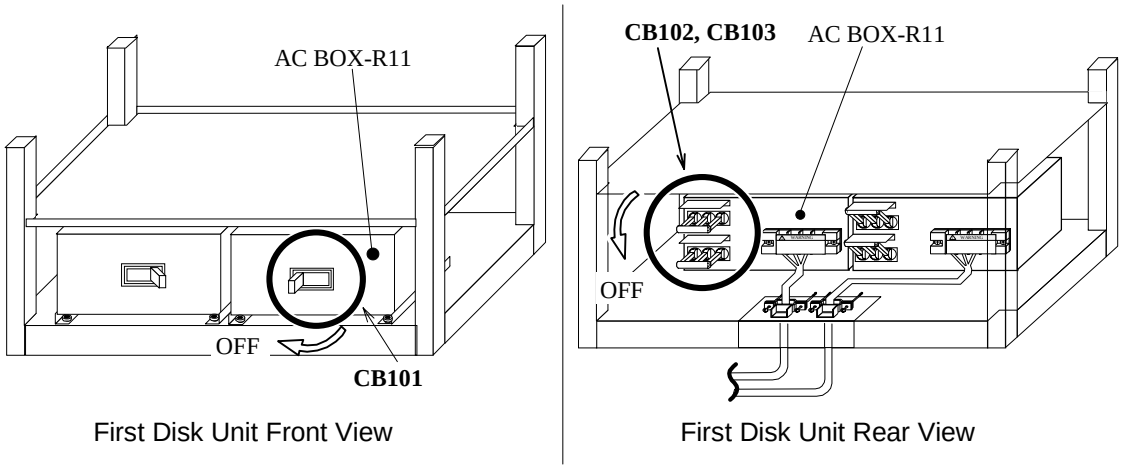

Fig. T13-3 Circuit Breakers to be Turned Off When Replacing Breaker Box-2

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3. Breaker Box Removal

a. Remove the Front PS Box Cover 2 from the Front PS Box.

⚠ WARNING

Be Careful of Electric Shock

- Be sure to turn off the circuit breaker of AC BOX-R10 before operation.

b. Disconnect the connectors from Breaker Box-2.

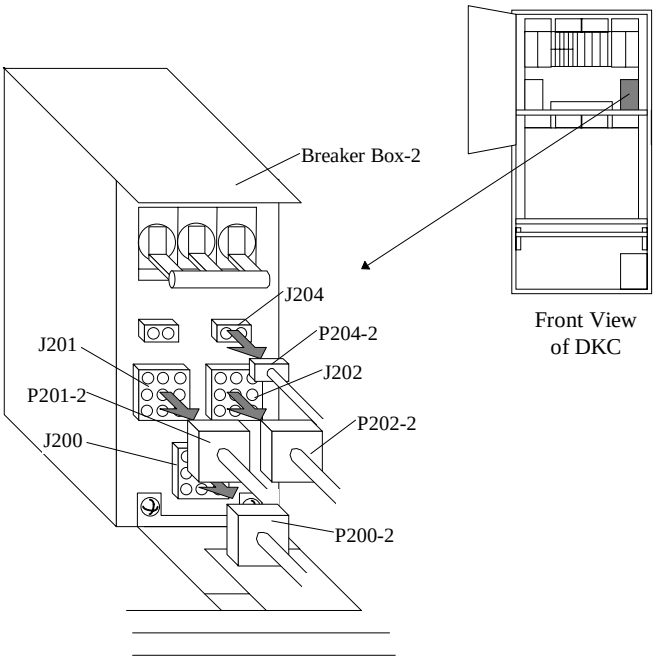

Fig. T13-4 Disconnection of Cable Connectors from Breaker Box-2

c. Loosen the screw and remove Breaker Box-2.

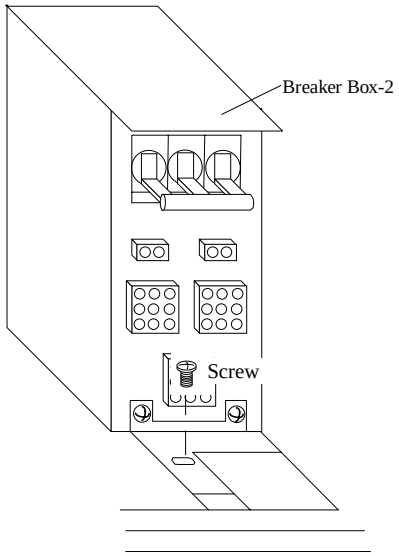

Fig. T13-5 Removal of Breaker Box-2

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4. Angle(Breaker) Replacement

a. Loosen the two screws. Remove the Angle(Breaker) from the failed Breaker Box.
b. Secure the Angle(Breaker) to a spare Breaker Box with the two screws

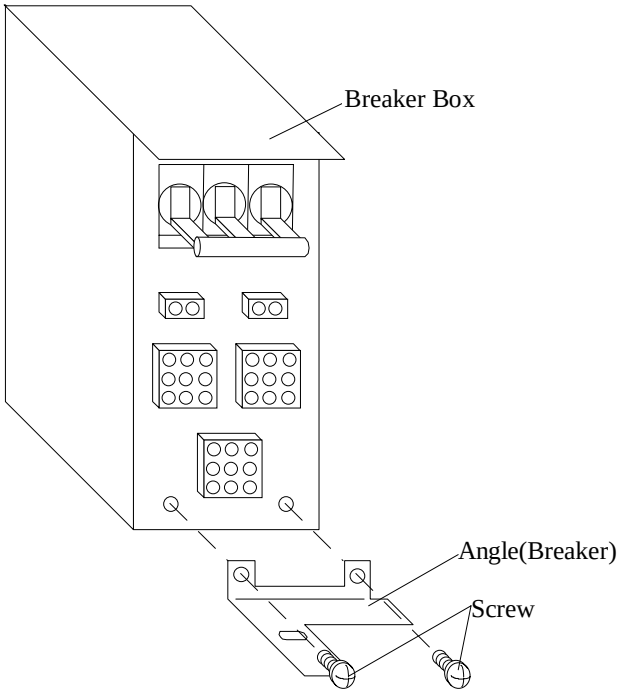

Fig. T13-6 Replacement of Angle(Breaker)

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5. Spare Breaker Box Attachment

a. Turn off the circuit breaker (CB201) on the spare Breaker Box.

b. Attach the spare Breaker Box. Secure the Breaker Box with the screw.

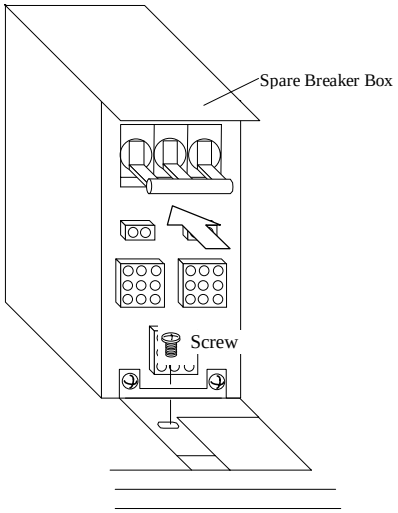

Fig. T13-7 Attachment of Breaker Box-2

c. Connect the connectors. Refer to Table T13-2 and Fig. T13-8.

Table T13-2 Breaker Box-2 Connectors

No.	Connector No.	Cable No.	Remarks
1	J200	P200-2	
2	J201	P201-2	
3	J202	P202-2	
4	J204	P204-2	

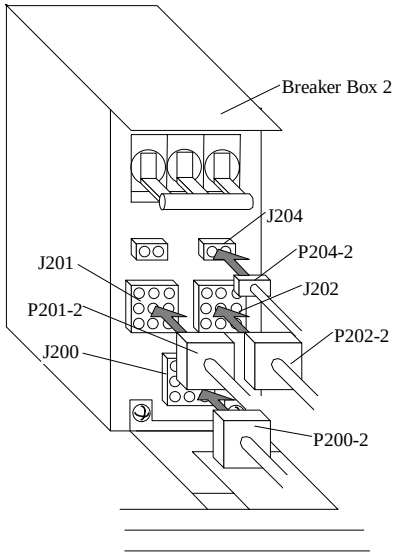

Fig. T13-8 Cable Connection of Breaker Box-2

d. Attach the Front PS Box Cover 2 to the Front PS Box.

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6. Powering On the Replacement Component

a. Turn on all the circuit breakers in the reverse order of powering off. Refer to Table T13-1 [REP03-1510]

b. Turn “IND TEST / CHK RST” switch in CE panel to “CHK RST”.

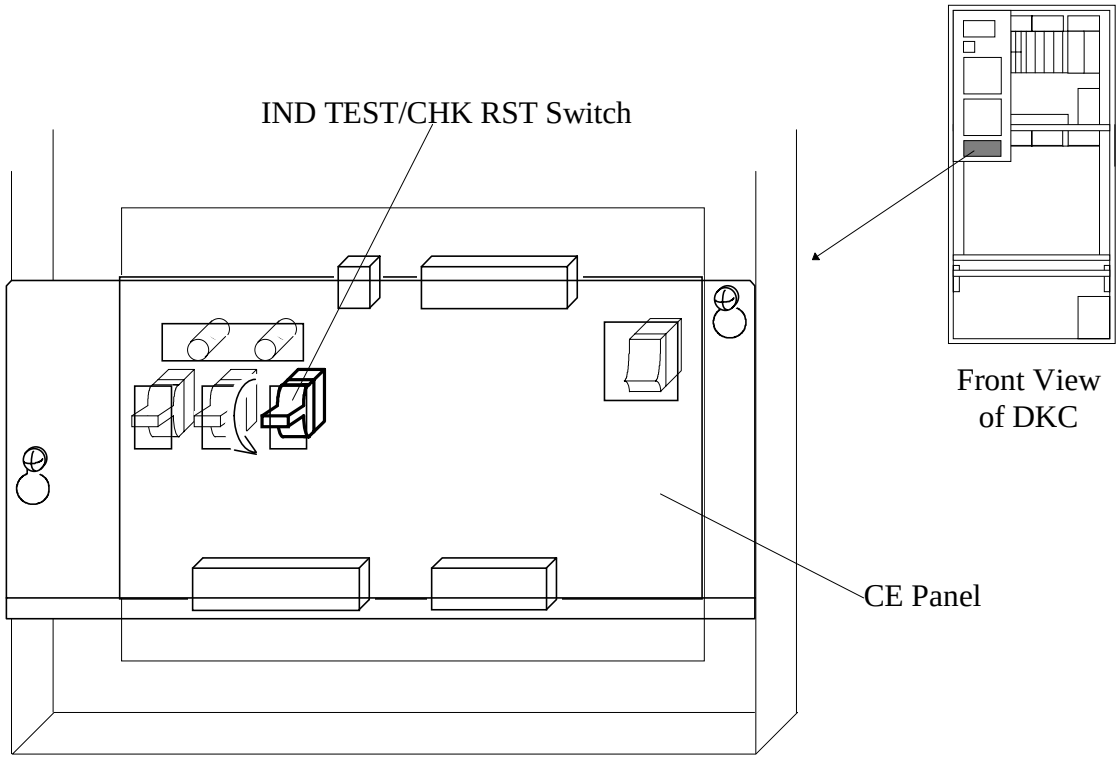

Fig. T13-9 Setting of IND TEST / CHK RST Switch

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7. Disconnection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Disconnect the Alarm INH Jumpers from the connectors on the PWRCTL-1 and PWRCTL-2.

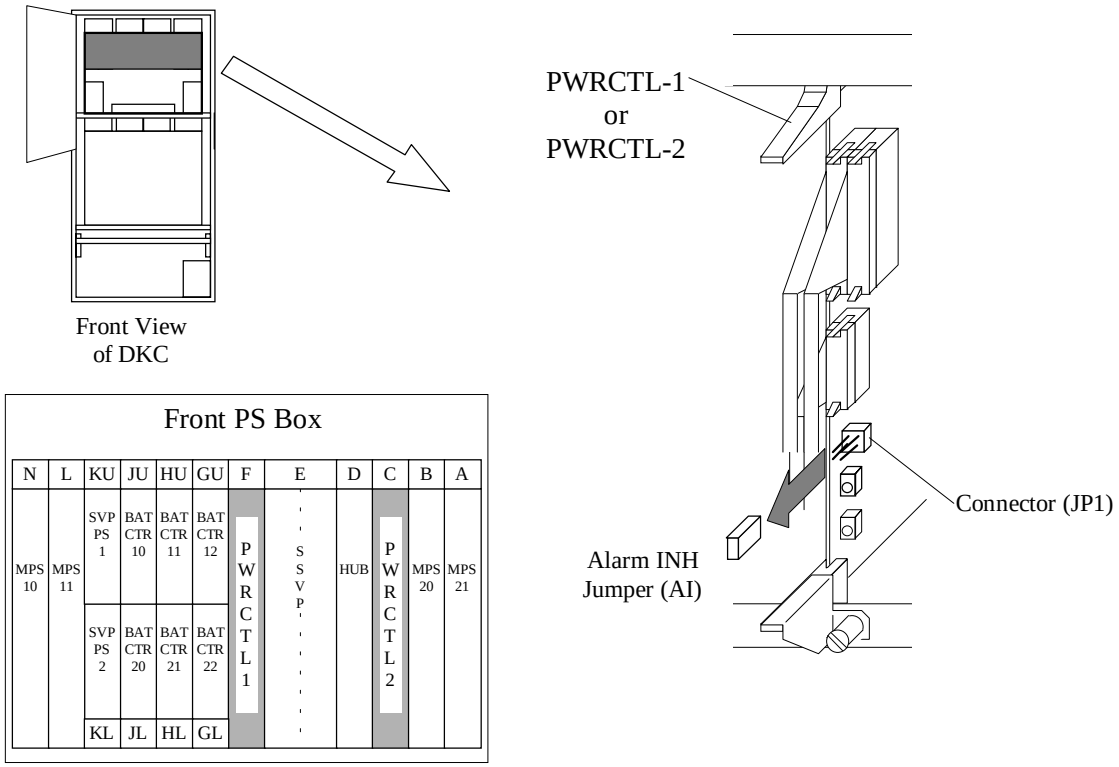

Fig. T13-10 Disconnection of Jumper

8. Go to SVP post-procedure t3 [REP04-860].

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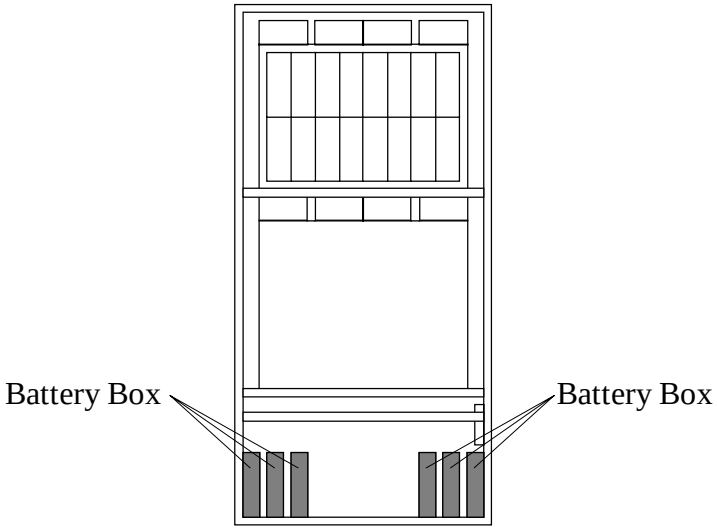
[HARDWARE T14]

Location	Function Name of Component	
Lower front of DKC	1	Battery Box



Rear View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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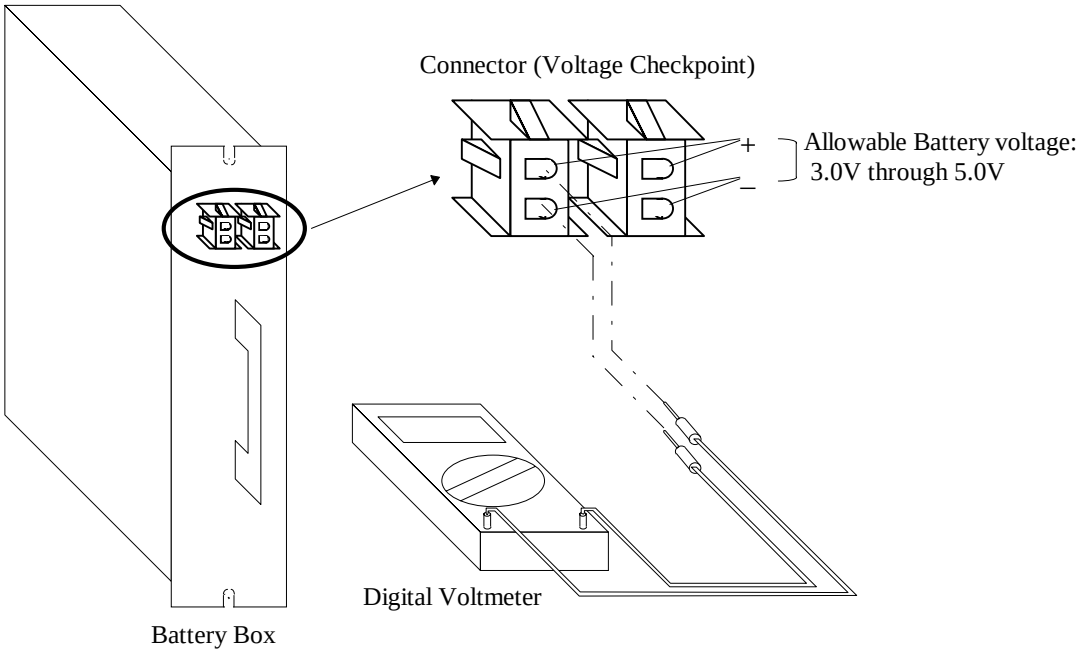
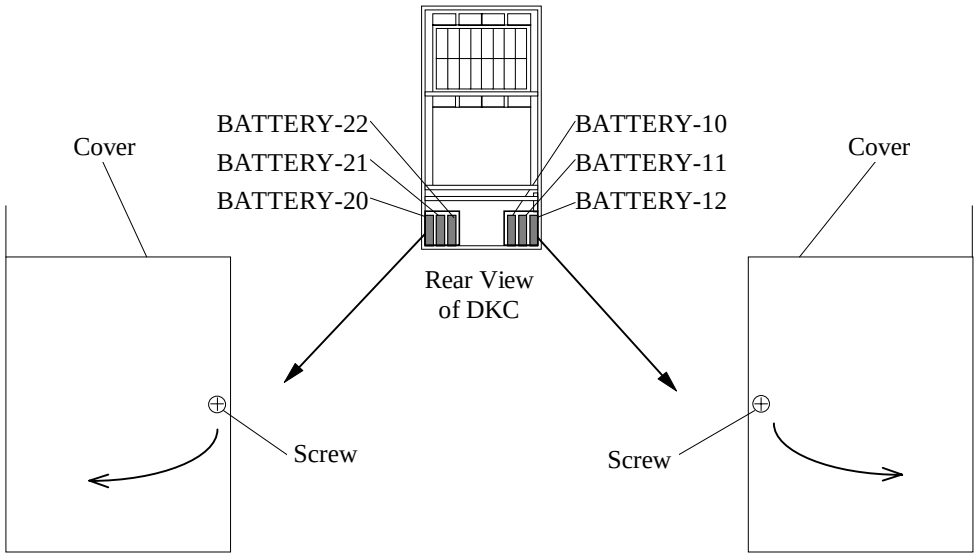
1. Insert the pins of the digital voltmeter into the Connectors on the spare part to make sure that battery voltage is within the allowable voltage.



2. The following figure shows the correct way to replace the battery box.

a. Remove the screw and open the cover.



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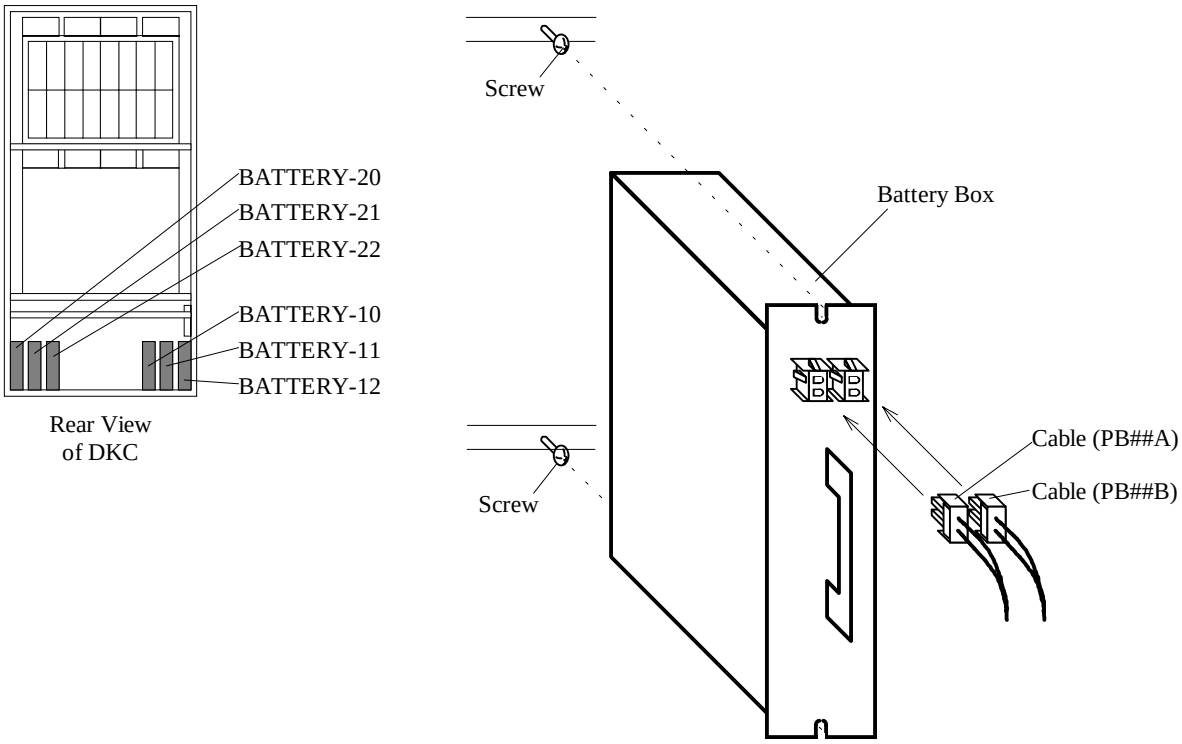
b. Disconnect the two cables.
c. Loosen the two screws.
d. Replace the battery box and fasten the two screws.
e. Connect the cables.
f. Close the cover and fasten the screw.



3. Go to SVP post procedure t3 [REP04-820].

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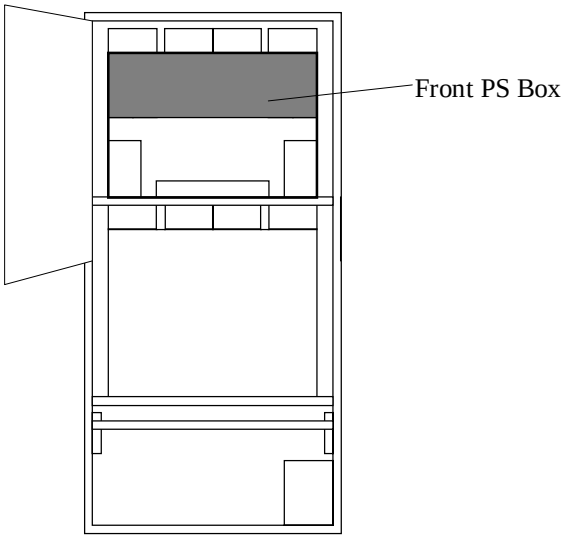
[HARDWARE T15]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	Battery Controller(BAT CTR) PCB	• SH093-A



Front View
of DKC

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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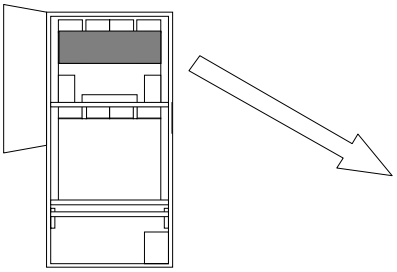
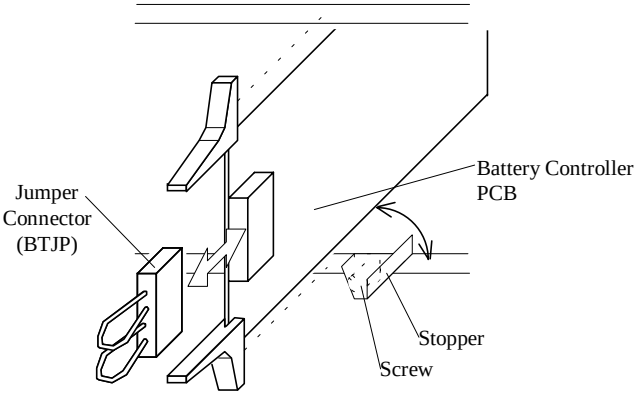
BATT CTR

1. The following figure shows the correct way to replace the battery controller PCB.

   a. Disconnect the jumper connector.
   b. Loosen the screw and rotate the stopper..
   c. Replace the battery controller PCB.
   d. Rotate the stopper and fasten the screw.
   e. Connect the jumper connector.



Front View of DKC



Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

2. Go to SVP post procedure t3 [REP04-820].

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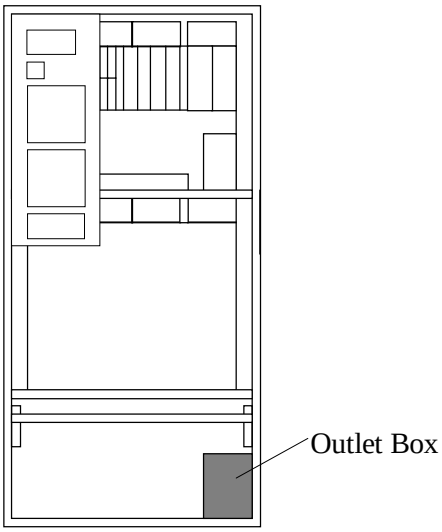
[HARDWARE T16]

Location	Function Name of Component	
Lower front of DKC	1	Outlet Box
(Reference) The related PCB for replacement of Outlet Box 1. Breaker Box-1 (Front PS Box in DKC)		



Front View
of DKC

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1. Circuit Breaker (Off)

⚠ WARNING

Be Careful of Electric Shock

- The power to the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.

⚠ CAUTION

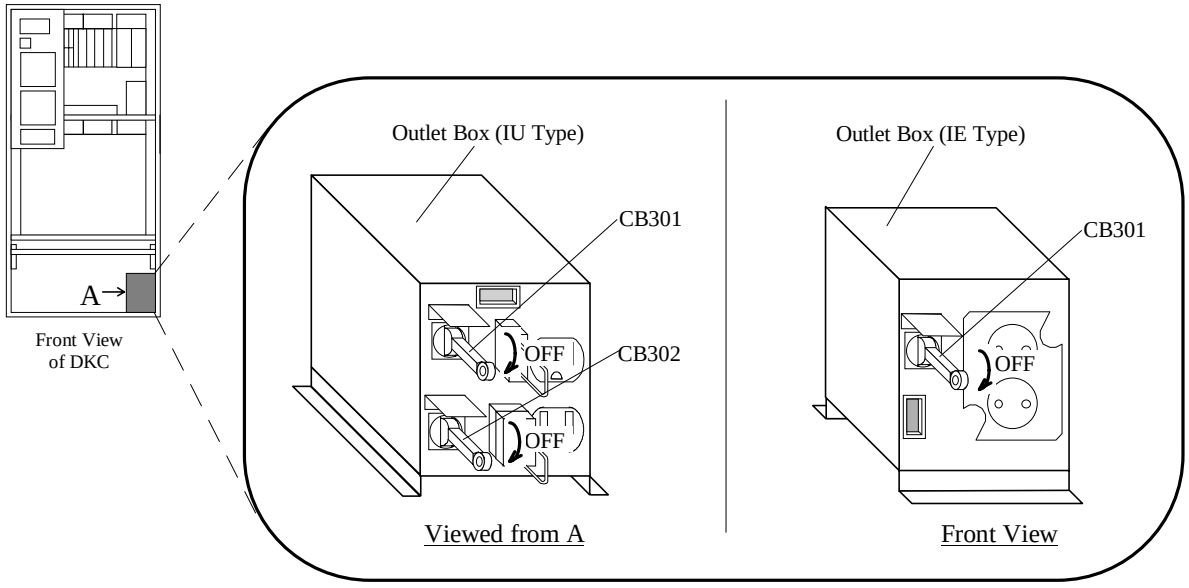
Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which could cause injury.

a. Turn off the circuit breakers in the DKC.

• Circuit Breakers to be Turned Off When Replacing Outlet Box

No.	Unit	Location No.	Breaker No.	Remarks
1	DKC	Outlet Box	CB301	Failure to turn off may result in an electric shock.
2	DKC	Outlet Box	CB302	Failure to turn off may result in an electric shock. Only IU Type



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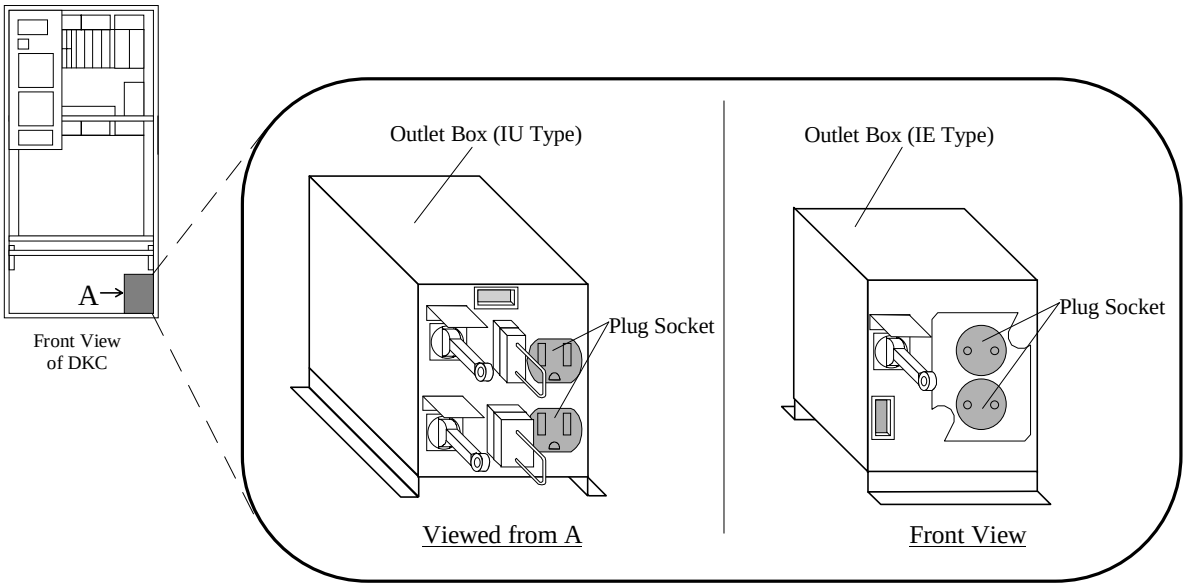
2. Outlet Box Removal

a. Remove the Front PS Box Cover 2 from the Front PS Box.
b. Detach the power cord set(s) from the plug socket(s) on the Outlet Box.



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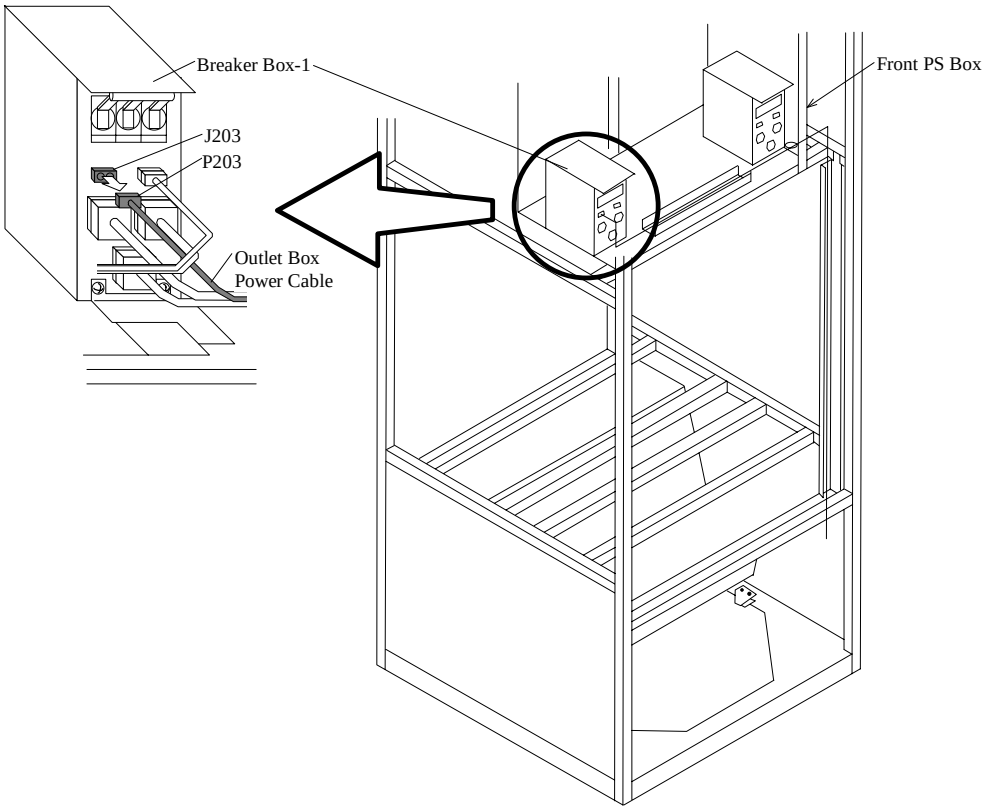
c. Detach the OLB power cable (P203) from Breaker Box-1

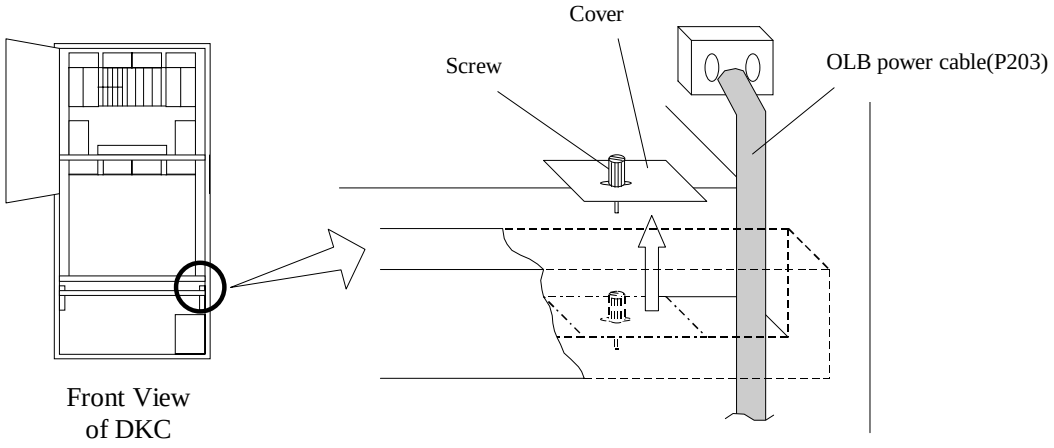
⚠ WARNING

Be Careful of Electric Shock

- Be sure to turn off the circuit breakers (CB301 and CB302) on Outlet Box before operation.
- The connector J203 on Breaker Box-1 is a live part, so be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.
- The connector J203 on Breaker Box-1 is a live part, so be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.



d. Remove the cover and draw the OLB power cable(P203).



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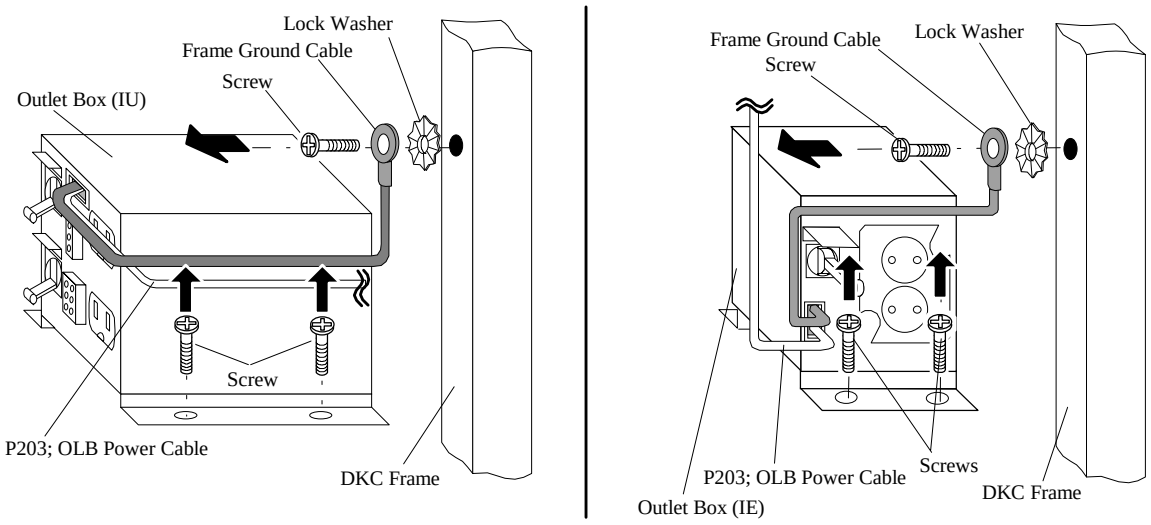
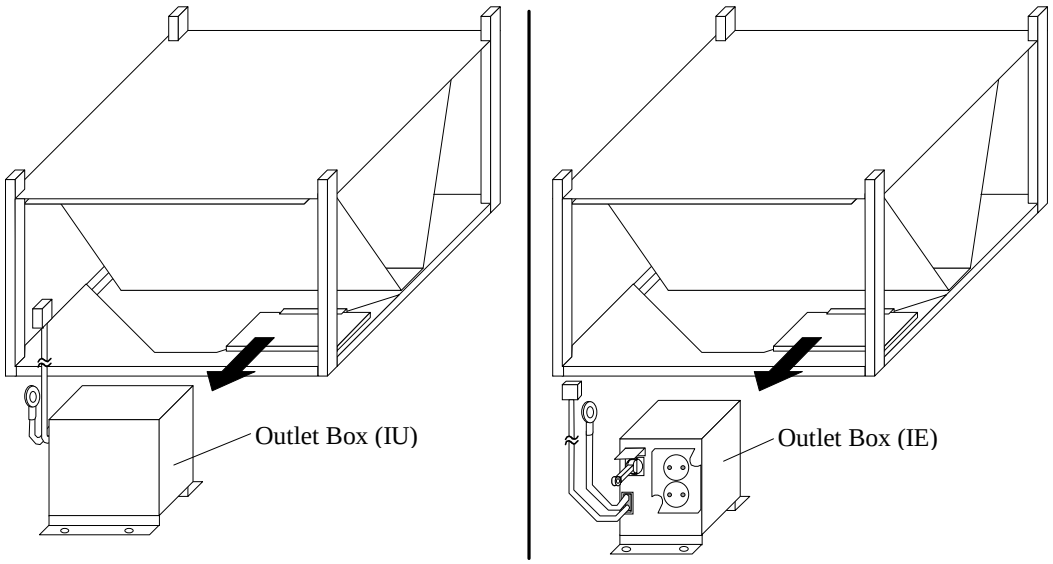
e. Detach the Outlet Box frame ground wire from the DKC frame. Remove the two screws that fasten the Outlet Box.



Front View

f. Remove the Outlet Box.



Front View

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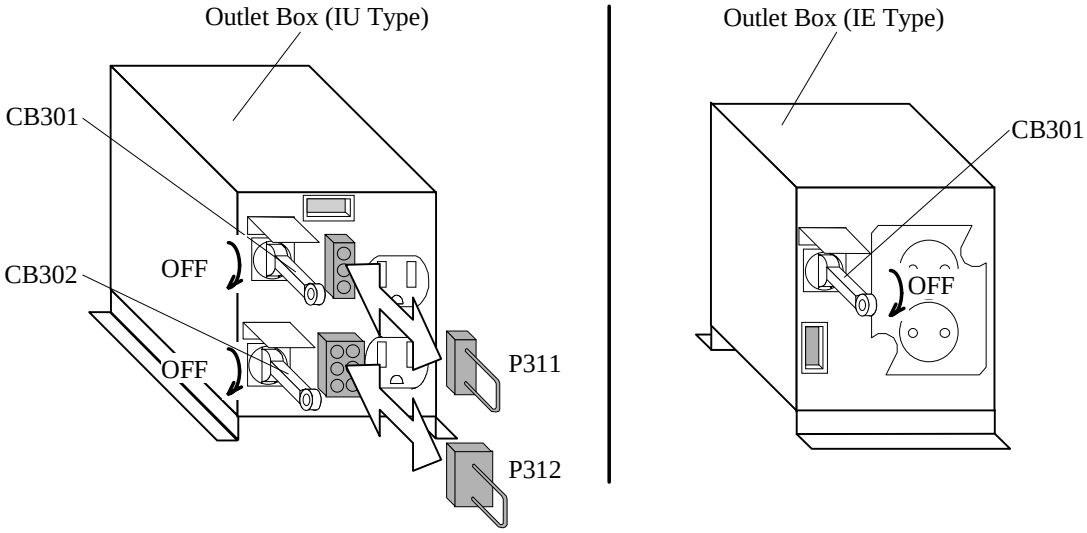
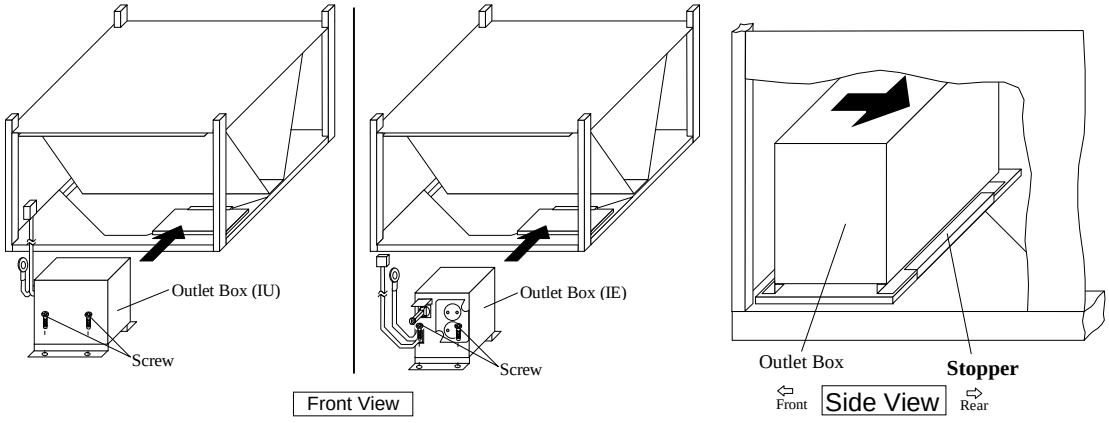
3. Outlet Box Attachment

a. Detach the jumper connectors (P311, P312) from the failed Outlet Box, then attach the jumper connectors (P311, P312) to spare Outlet Box.(Only for IU type)

b. Turn off the circuit breaker(s) (CB301, CB302) on the spare Outlet Box.



c. Insert the Outlet Box to the stopper position located at the bottom of the DKC, then fix the Outlet Box with two screws.



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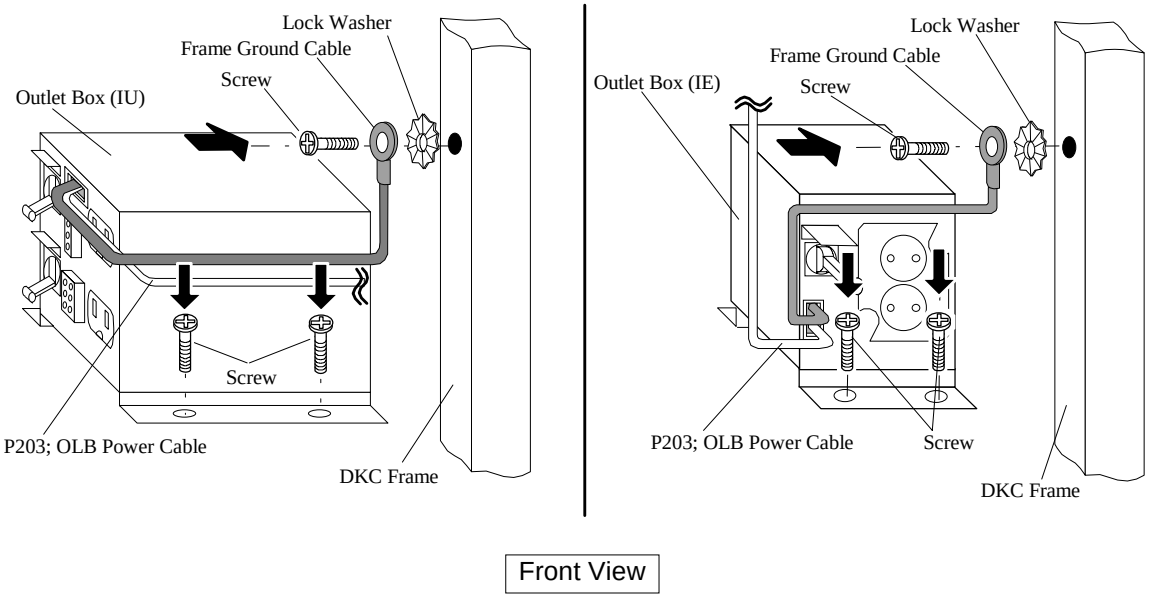
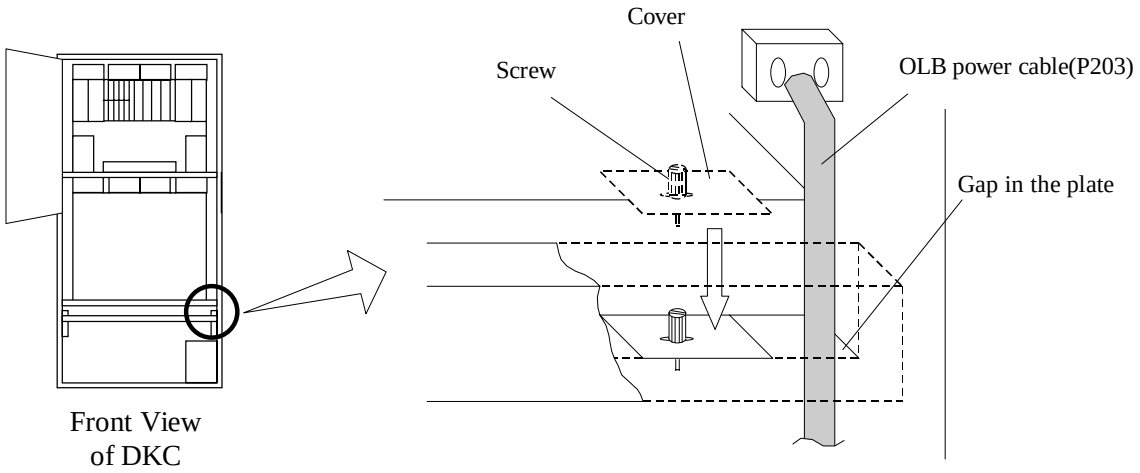
d. Attach the frame ground wire to the DKC frame, using the screw and lock washer.



Front View

e. Pass the OLB power cable(P203) through the gap in the plate and attach the cover.



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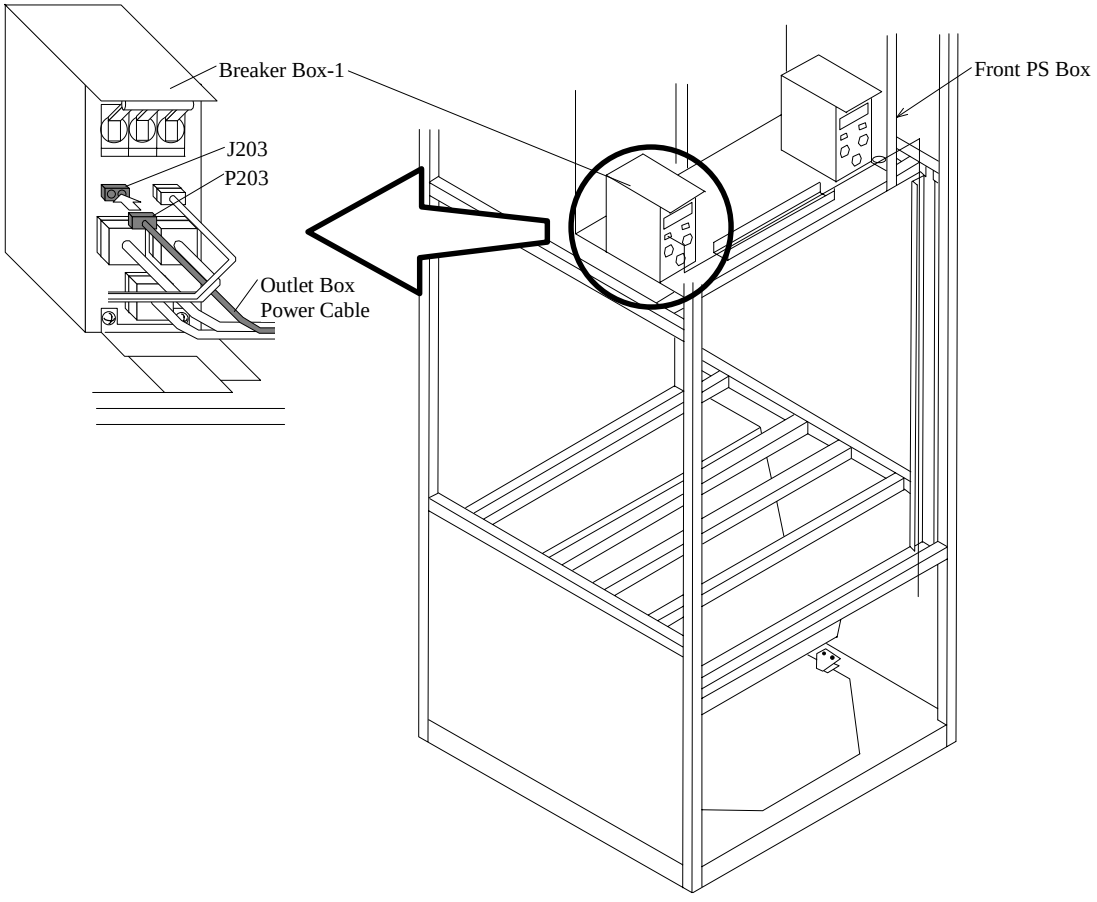
f. Insert the Outlet Box connector as it was.
Attach the OLB power cable (P203) .
Connect the OLB power cable (P203) to Breaker Box-1.

⚠ WARNING

Be Careful of Electric Shock

- Be sure to turn off the circuit breakers (CB301 and CB302) on Outlet Box before operation.
- The connector J203 on Breaker Box-1 is a live part, so be sure to keep tools and parts such as a screwdriver and screw from contact with the connector.
- Be sure to connect or disconnect the power cable P203 for the Outlet Box with one hand. This can prevent an electric current from flowing between your arms if you touch the live part of the J203.

Location No.	Cable No.	Connector No.	Remarks
Breaker Box-1	P203	J203	OLB Power Cable



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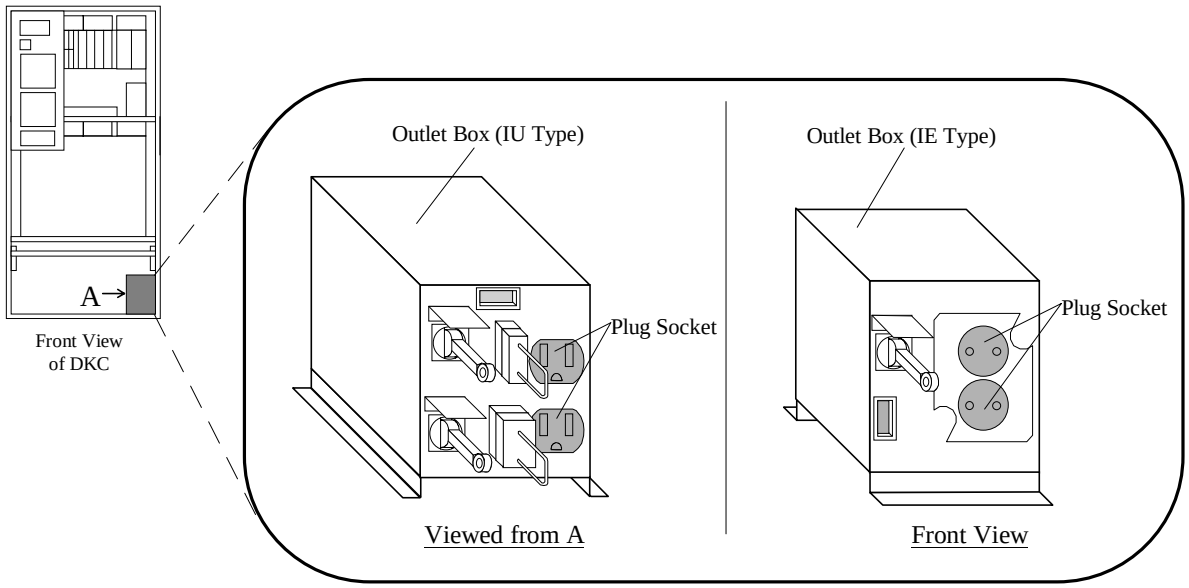
g. Attach the power cord set(s) to the Plug Socket(s) on the Outlet Box.



h. Attach the Front PS Box Cover 2 to Front PS Box.

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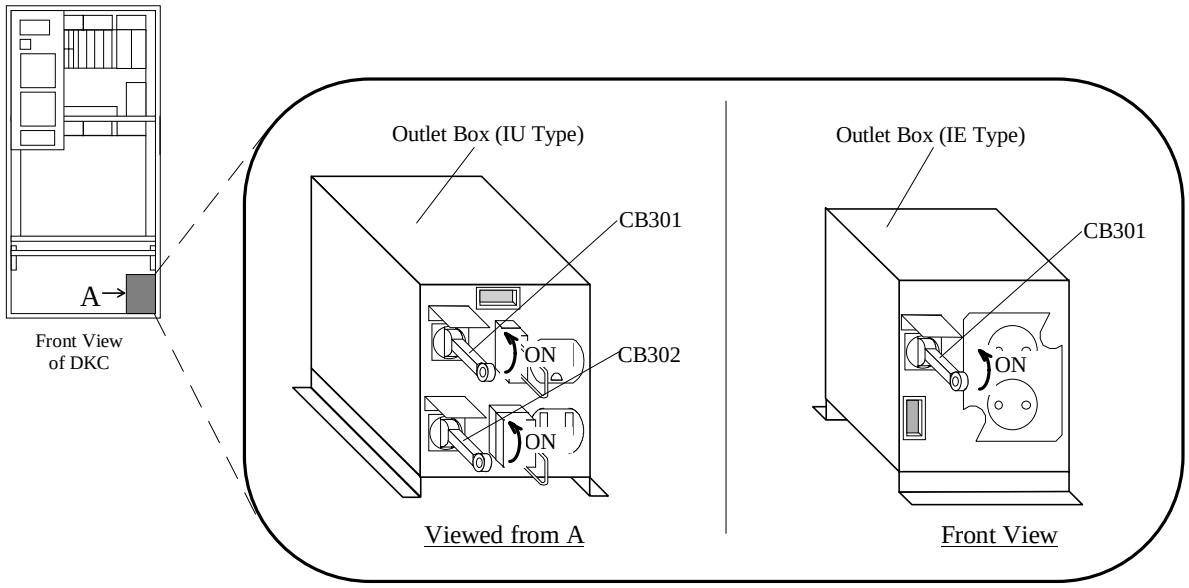
4. Circuit Breaker (On)

a. Turn on the circuit breakers in the DKC.



• Circuit Breakers to be Turned On After Replacing Outlet Box

No.	Unit	Location No.	Breaker No.	Remarks
1	Disk Controller	Outlet Box	CB301	
2	Disk Controller	Outlet Box	CB302	Only IU Type

5. Go to SVP post-procedure t1 [REP04-490].

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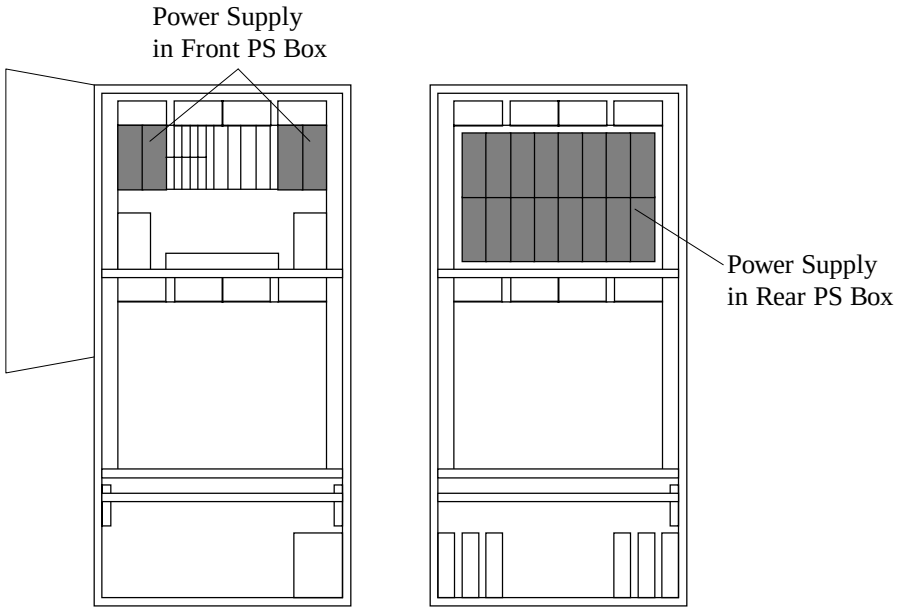
[HARDWARE T17]

Location	Function Name of Component		Part Name
Front or Rear PS Box in DKC	1	5V Power Supply	• HS05065C-S • TAH-325HSA • HS05065C-W
		3V Power Supply	• HS03075C-S • TAH-264HSA • HS03075C-W
		Multi Power Supply	• HS300-04C-V • HS300-04C-R • TSG-370HS-C • HS400-08GR



Front View of DKC

Rear View of DKC

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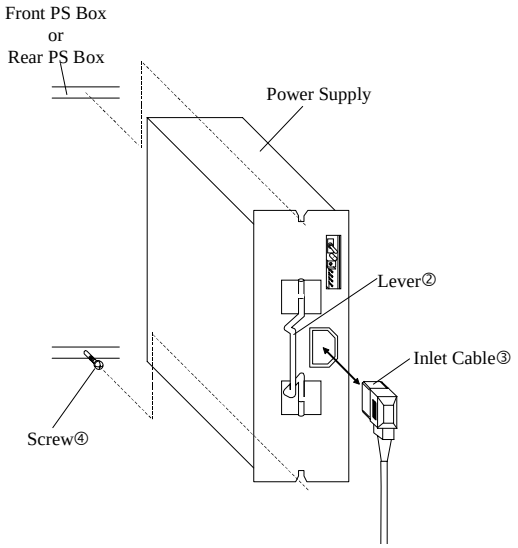
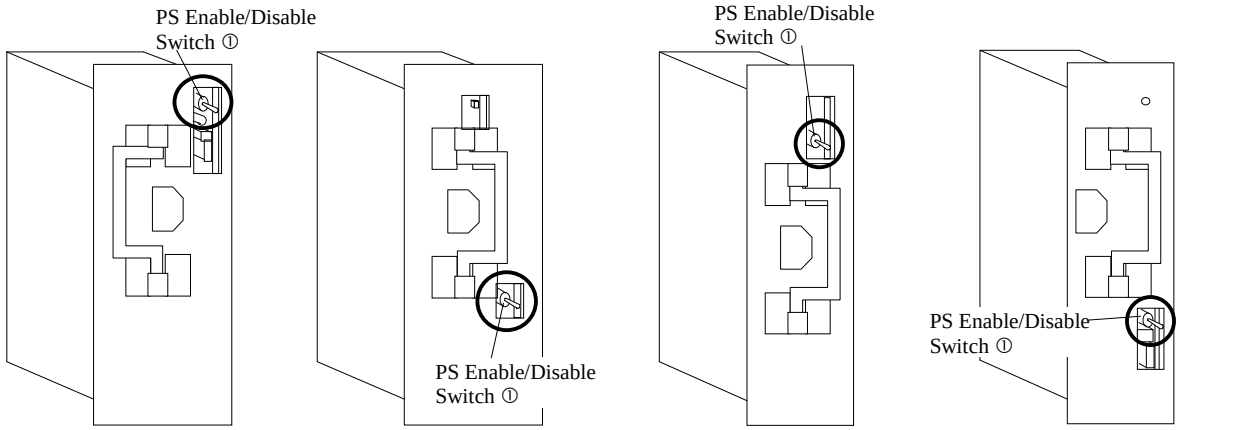
1. The following figure shows the correct way to replace the power supply(PS).

   a. Set PS Enable/Disable Switch① to Disable (DOWN).

> **⚠ CAUTION**
>
> A system down may be caused by setting the PS Enable/Disable switch of the power supply other than that to be replaced to "Disable". Make sure that it is a power supply to be replaced.

   b. Remove the power supply lever②and disconnect the inlet cable③.
   c. Loosen the screw④ and remove the failed PS.
   d. Perform the short circuit check on the spare power supply. (Refer to REP03-1745.)
   e. Confirm that PS Enable/Disable Switch① of spare PS is set to Disable (Down).
   f. Insert the spare PS and fasten the screw④.
   g. Connect the inlet cable③ and secure it with the lever②.
   h. Set PS Enable/Disable Switch① to Enable (UP).





5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')
Multi PS (type 'HS300-04C-R')

Multi PS (type 'HS300-04C-V')
Multi PS (type 'TSG-370HS-C')

Multi PS (type 'HS400-08GR')

5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

2. Go to SVP post procedure t3 [REP04-860].

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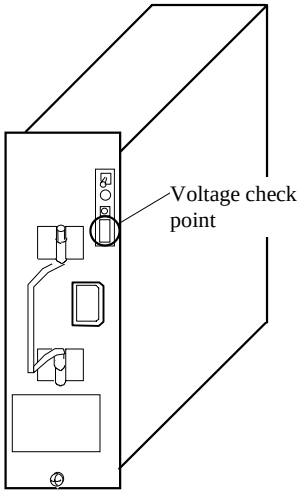
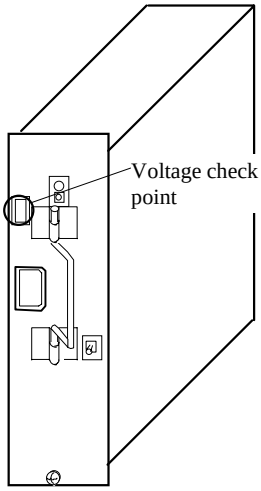
Procedure for short circuit check on the power supply

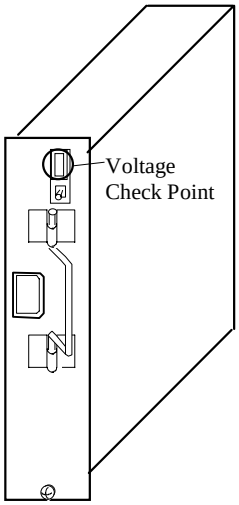
① Check the power supply for short circuit by connecting the voltage checking jig to the short circuit check point of the power supply as shown below.
② Measure the resistance at the check points on the individual power supply before installation shown below. Confirm that the measured resistance values are higher than those shown in the table below.



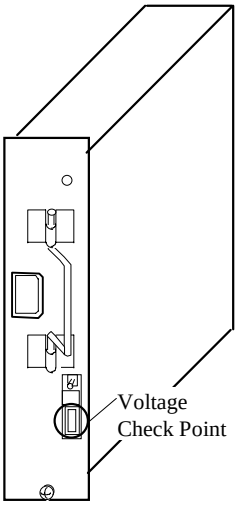
5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')
Multi PS (type 'HS300-04C-R')



Multi PS (type 'HS300-04C-V')
Multi PS (type 'TSG-370HS-C')



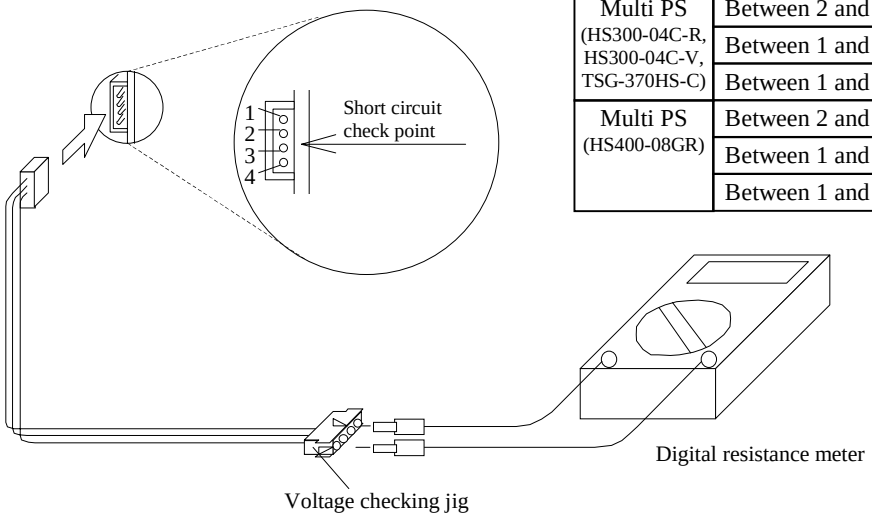
Multi PS (type 'HS400-08GR')



5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')

Short Circuit Check Points

PS	Check pin	Resistance
5V PS	Between 2 and 4	2KΩ + 10%
3V PS	Between 2 and 4	2KΩ + 10%
Multi PS (HS300-04C-R, HS300-04C-V, TSG-370HS-C)	Between 2 and 4	2KΩ + 10%
	Between 1 and 4	2KΩ + 10%
	Between 1 and 2	4KΩ + 10%
Multi PS (HS400-08GR)	Between 2 and 4	2KΩ + 10%
	Between 1 and 4	2KΩ + 10%
	Between 1 and 2	2.2KΩ + 10%



Short circuit check points

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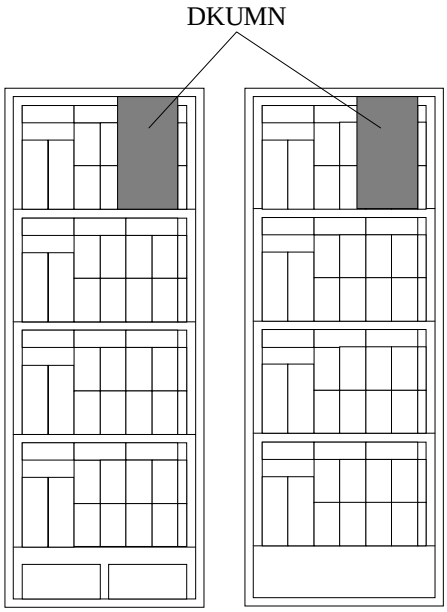
[HARDWARE T18]

Location	Function Name of Component		Part Name
Front or Rear upside of DKU	1	DKUMN	• SZ601-A



Front View of DKU

Rear View of DKU

Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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1. The following figure(Fig. T18-1) and table(Table T18-1) show the correct way to replace the DKUMN PCB.

a. Set Enable/Disable Switch to Disable on the DKUMN PCB.

⚠ CAUTION

A system down may be caused by setting the Enable/Disable switch of the DKUMN PCB other than that to be replaced to "Disable". Be sure that it is the DKUMN PCB to be replaced.

b. Disconnect all cables.
c. Remove the failed DKUMN PCB off the four latches.
d. Attach the spare PCB on the latches.
e. Connect all the cables.

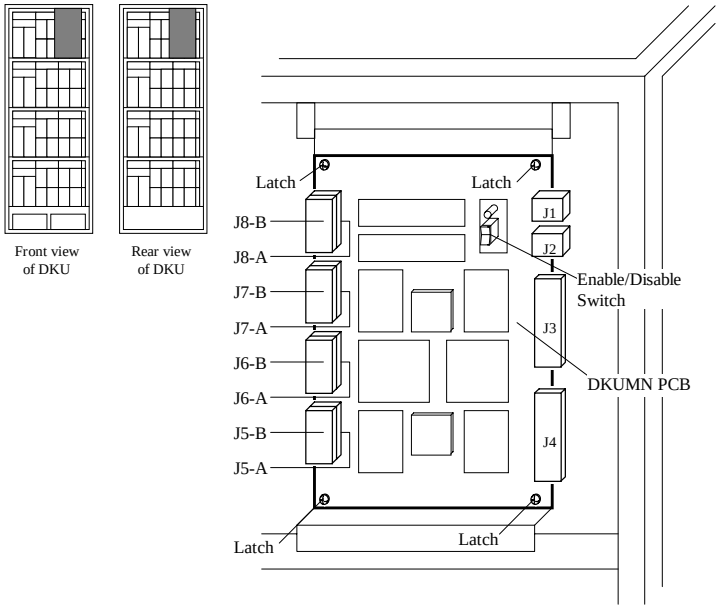

Fig. T18-1 Replacement of DKUMN PCB

Table T18-1 Connection of DKUMN PCB Cables

No.	Connector No.	DKUMN -R1F	DKUMN -R1R	DKUMN -R2F	DKUMN -R2R	DKUMN -L1F	DKUMN -L1R	DKUMN -L2F	DKUMN -L2R
1	J1	P1-1	P1-2	P1-1	P1-2	P1-1	P1-2	P1-1	P1-2
2	J2	P2-1R	P2-2R	-	-	P2-1L	P2-2L	-	-
3	J3	P3-1	P3-2	-	-	P3-1	P3-2	-	-
4	J4	P4-1R	P4-2R	P4-1R	P4-2R	P4-1L	P4-2L	P4-1L	P4-2L
5	J5-A	P5A-1	P5A-2	P5A-1	P5A-2	P5A-1	P5A-2	P5A-1	P5A-2
6	J5-B	P5B-1	P5B-2	P5B-1	P5B-2	P5B-1	P5B-2	P5B-1	P5B-2
7	J6-A	P6A-1	P6A-2	P6A-1	P6A-2	P6A-1	P6A-2	P6A-1	P6A-2
8	J6-B	P6B-1	P6B-2	P6B-1	P6B-2	P6B-1	P6B-2	P6B-1	P6B-2
9	J7-A	P7A-1	P7A-2	P7A-1	P7A-2	P7A-1	P7A-2	P7A-1	P7A-2
10	J7-B	P7B-1	P7B-2	P7B-1	P7B-2	P7B-1	P7B-2	P7B-1	P7B-2
11	J8-A	P8A-1	P8A-2	P8A-1	P8A-2	P8A-1	P8A-2	P8A-1	P8A-2
12	J8-B	P8B-1	P8B-2	P8B-1	P8B-2	P8B-1	P8B-2	P8B-1	P8B-2

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2. Set the switches and jumpers

a. Set the switches and install the jumpers on the DKUMN PCBs as indicated in the table below(tables T18-2 and T18-3).
b. Set Enable/Disable Switch to Enable on the DKUMN PCB.

Table T18-2 DKUMN PCB Jumper Plug Positions

No.	Location No.	S1	JP1(#1,#2,#3)	JP1(#4,#5,#6)	JP1(#7,#8,#9)	JP2	Remarks
1	DKUMN-R1F	DISABLE	#1-#2 SHORT	#4-#5 SHORT	#7-#8 SHORT	Not Used	First Disk Unit
2	DKUMN-R1R	DISABLE	#2-#3 SHORT	#4-#5 SHORT	#7-#8 SHORT	Not Used	
3	DKUMN-R2F	DISABLE	#1-#2 SHORT	#5-#6 SHORT	#7-#8 SHORT	Not Used	Second Disk Unit
4	DKUMN-R2R	DISABLE	#2-#3 SHORT	#5-#6 SHORT	#7-#8 SHORT	Not Used	
5	DKUMN-L1F	DISABLE	#1-#2 SHORT	#4-#5 SHORT	#8-#9 SHORT	Not Used	Third Disk Unit
6	DKUMN-L1R	DISABLE	#2-#3 SHORT	#4-#5 SHORT	#8-#9 SHORT	Not Used	
7	DKUMN-L2F	DISABLE	#1-#2 SHORT	#5-#6 SHORT	#8-#9 SHORT	Not Used	Fourth Disk Unit
8	DKUMN-L2R	DISABLE	#2-#3 SHORT	#5-#6 SHORT	#8-#9 SHORT	Not Used	

No.	Location No.	Additional HDU Box Installed		No Additional HDU Box Installed		Remarks
		JP3(#1,#2,#3)	JP3(#4,#5,#6)	JP3(#1,#2,#3)	JP3(#4,#5,#6)	
1	DKUMN-R1F	#1-#2 SHORT	#4-#5 SHORT	#1-#2 SHORT	#5-#6 SHORT	First Disk Unit
2	DKUMN-R1R	#1-#2 SHORT	#4-#5 SHORT	#2-#3 SHORT	#4-#5 SHORT	
3	DKUMN-R2F	#1-#2 SHORT	#4-#5 SHORT	#1-#2 SHORT	#5-#6 SHORT	Second Disk Unit
4	DKUMN-R2R	#1-#2 SHORT	#4-#5 SHORT	#2-#3 SHORT	#4-#5 SHORT	
5	DKUMN-L1F	#1-#2 SHORT	#4-#5 SHORT	#1-#2 SHORT	#5-#6 SHORT	Third Disk Unit
6	DKUMN-L1R	#1-#2 SHORT	#4-#5 SHORT	#2-#3 SHORT	#4-#5 SHORT	
7	DKUMN-L2F	#1-#2 SHORT	#4-#5 SHORT	#1-#2 SHORT	#5-#6 SHORT	Fourth Disk Unit
8	DKUMN-L2R	#1-#2 SHORT	#4-#5 SHORT	#2-#3 SHORT	#4-#5 SHORT	

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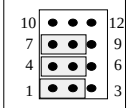
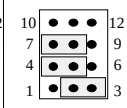
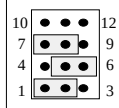
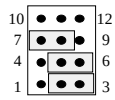
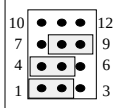
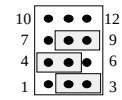
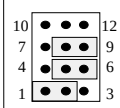
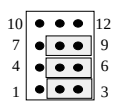
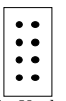
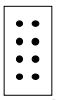
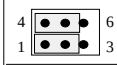
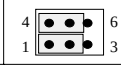
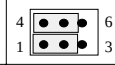
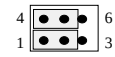
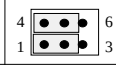
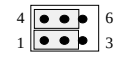
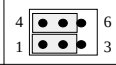
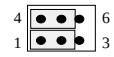
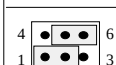
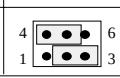
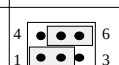
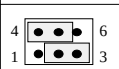
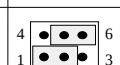
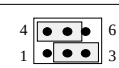
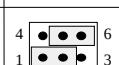
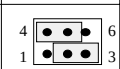
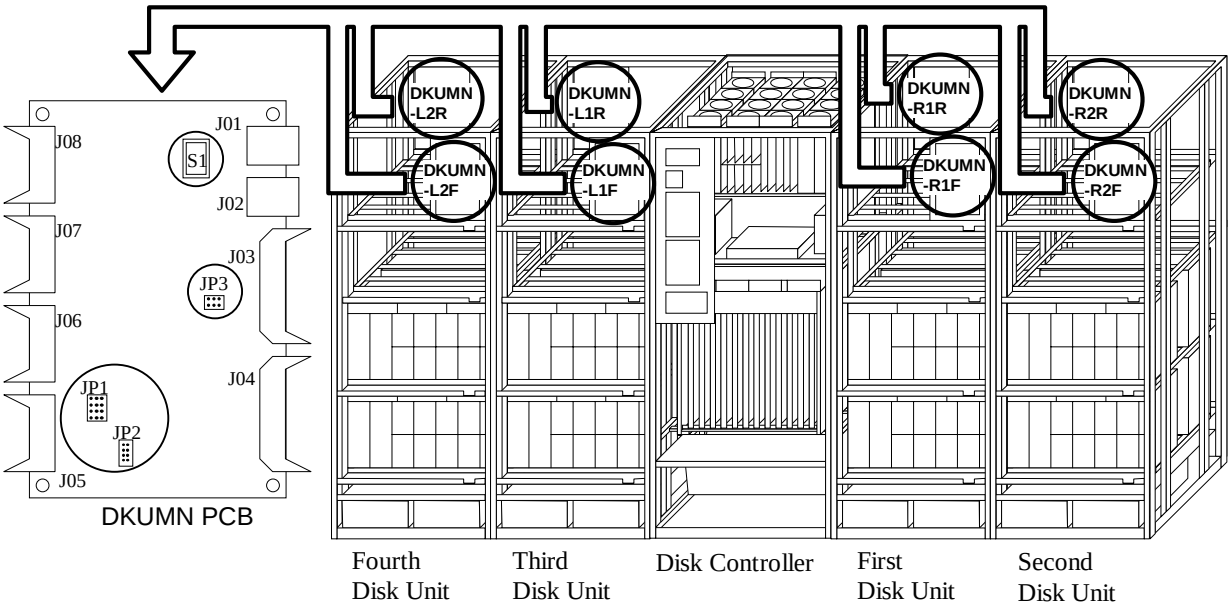
Table T18-3 DKUMN PCB Jumper Plug Positions

	1	2	3	4	5	6	7	8	Remarks
	DKUMN-R1F	DKUMN-R1R	DKUMN-R2F	DKUMN-R2R	DKUMN-L1F	DKUMN-L1R	DKUMN-L2F	DKUMN-L2R	
S1	DISABLE	DISABLE	DISABLE	DISABLE	DISABLE	DISABLE	DISABLE	DISABLE	-
JP1									-
JP2	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	 Not Used	 Not Used	-
JP3									Additional HDU Box Installed
									No Additional HDU Box Installed
	First Disk Unit		Second Disk Unit		Third Disk Unit		Fourth Disk Unit		-



Front View

3. Go to post-PROCEDURE t4 (REP04-880).

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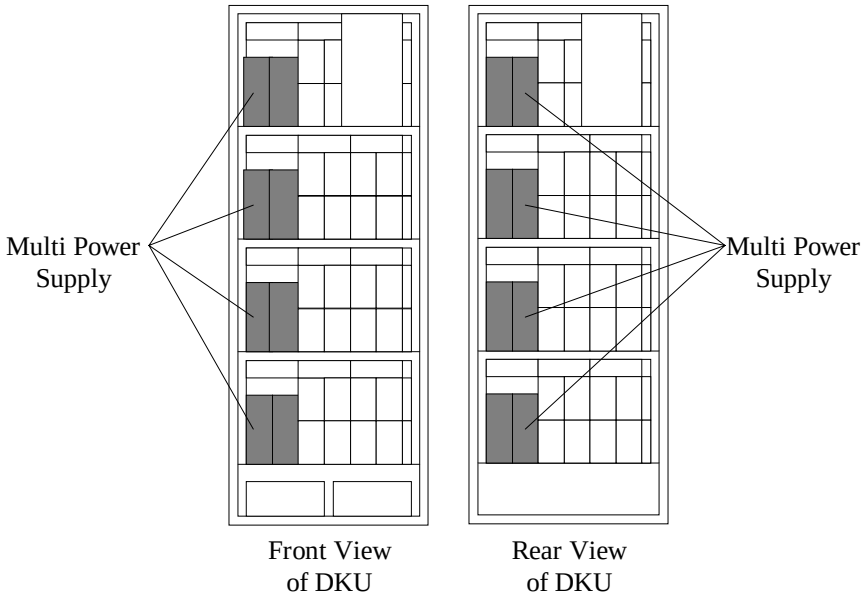
[HARDWARE T19]

Location	Function Name of Component		Part Name
Front or Rear of DKU	1	Multi Power Supply	• HS400-08C-S • HS400-08C-R • TSG-370HS • HS400-08C-W



Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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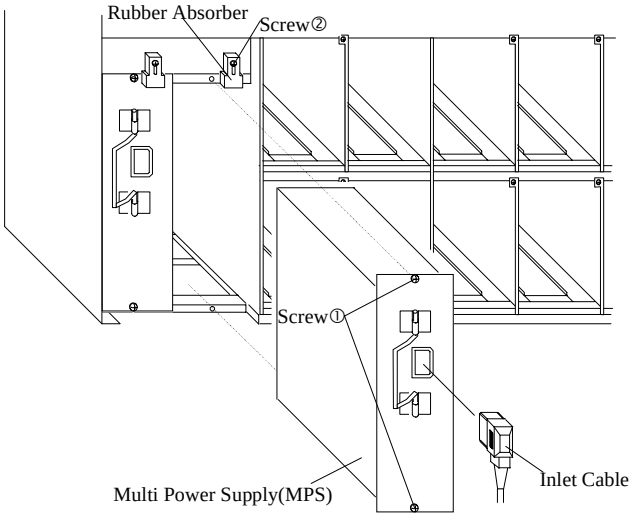
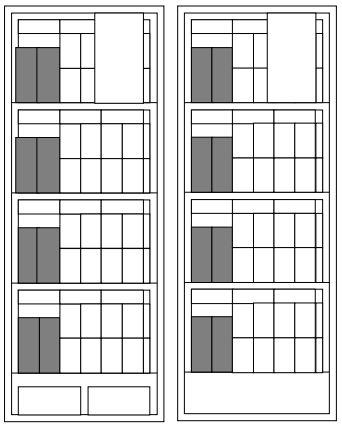
1. The following figure shows the correct way to replace the multi power supply(MPS).

   a. Set PS Enable/Disable Switch to Disable (DOWN).

> **⚠ CAUTION**
>
> A system down may be caused by setting the PS Enable/Disable switch of the power supply other than that to be replaced to "Disable". Make sure that it is a power supply to be replaced.

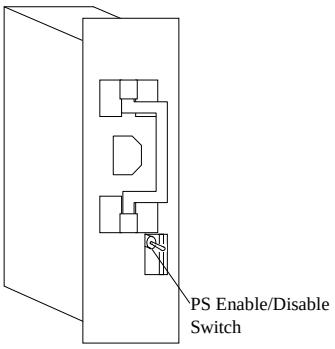
   b. Disconnect the inlet cable and remove the two screws①.
   c. Loosen the screw② and move up the rubber absorber.
   d. Remove the multi power supply(MPS).
   e. Perform the short circuit check on the spare power supply. (Refer to REP03-1805.)
   f. Confirm that PS Enable/Disable Switch of the spare PS is set to Disable (Down).
   g. With the rubber absorber set down, insert the spare PS. Shock caused by the insertion is absorbed by the rubber absorber.
   h. With the rubber absorber set up, push the MPS into the HDU box until secure. Then lower rubber absorber and secure it with the screw②.
   i. Secure the MPS with the two screws① and connect the inlet cable.
   j. Set PS Enable/Disable Switch to Enable (UP).



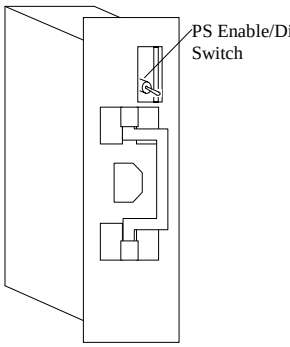


Front view of DKU

Rear view of DKU



Multi PS (type 'HS400-08C-S')
(type 'TSG-370HS')
(type 'HS400-08C-W')



Multi PS (type 'HS400-08C-R')

2. Go to SVP post procedure t4 [REP04-880].

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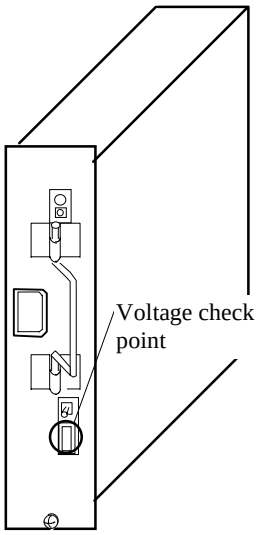
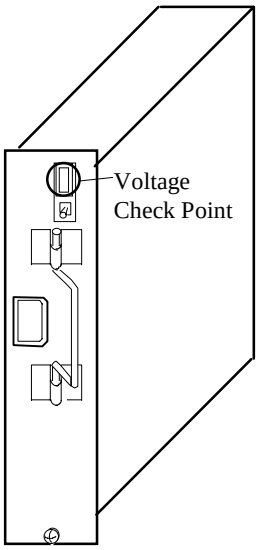
Procedure for short circuit check on the power supply

① Check the power supply for short circuit by connecting the voltage checking jig to the short circuit check point of the power supply as shown below.
② Measure the resistance at the check points on the individual power supply before installation shown below. Confirm that the measured resistance values are higher than those shown in the table below.



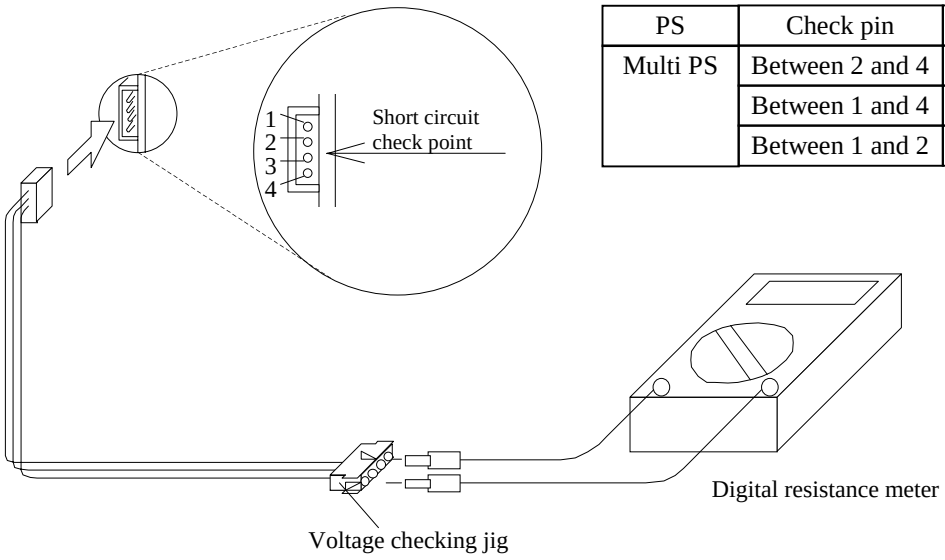
Multi PS (type 'HS400-08C-S')
(type 'TSG-370HS')
(type 'HS400-08C-W')



Multi PS (type 'HS400-08C-R')

Short Circuit Check Points

PS	Check pin	Resistance
Multi PS	Between 2 and 4	2KΩ + 10%
	Between 1 and 4	2KΩ + 10%
	Between 1 and 2	2.2KΩ + 10%



Short circuit check points

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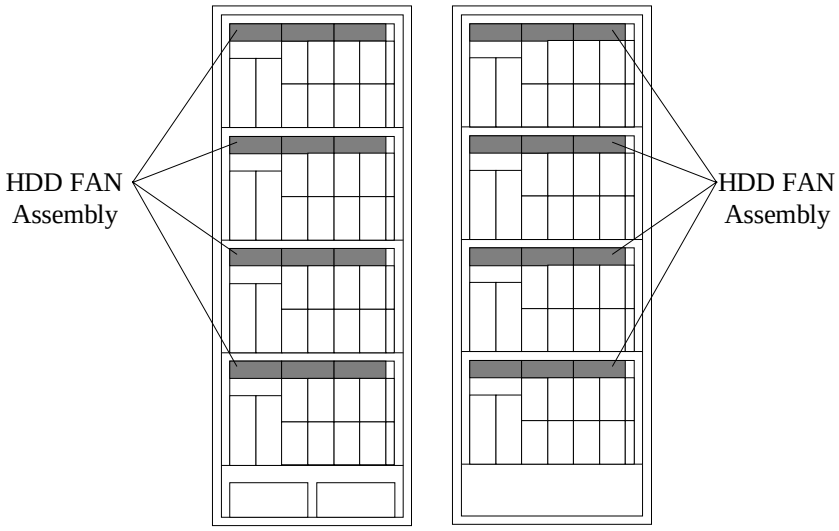
[HARDWARE T20]

Location	Function Name of Component	
Top of HDD Box	1	HDD FAN Assembly



Notice: Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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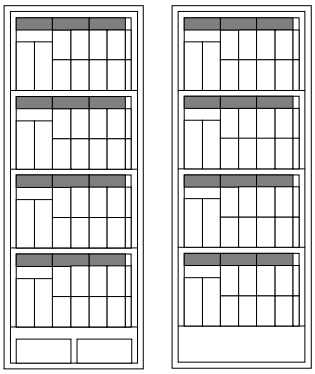
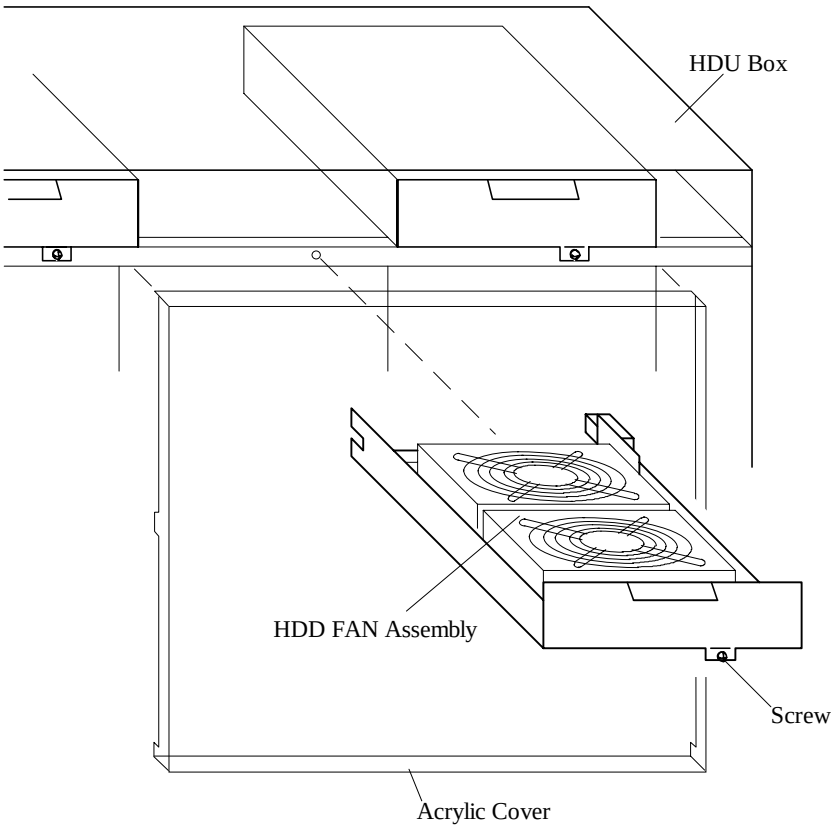
Hazardous rotating mechanism: Can cause injury if touched. Stay clear when machine is running.

1. The following figure shows the correct way to replace the HDD FAN assembly.



a. Remove the acrylic cover.
b. Remove the screw.
c. Replace the HDD FAN assembly.
d. Fasten the screw.
e. Attach the acrylic cover.



2. Go to SVP post procedure t4 [REP04-880].

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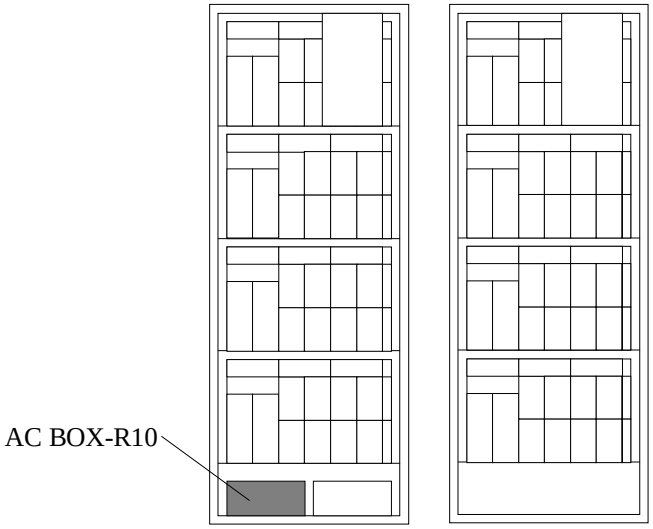
[HARDWARE T21]

Location	Function Name of Component		Part Name
Lower of DKU	1	AC BOX	• AC BOX-R10
(Reference) The related PCB for replacement of AC BOX-R10 1. PWRCTL-1 and PWRCTL-2 (Front PS Box in DKC) 2. Breaker Box-1 (Front PS Box in DKC) 3. Outlet Box (Lower front of DKC) 4. Circuit breakers on the power distribution panel that are connected to the AC BOX-R10 5. CE Panel (Front of DKC)			



Front View of DKU

Rear View of DKU

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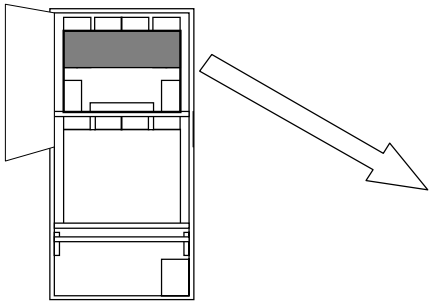
AC BOX-R10

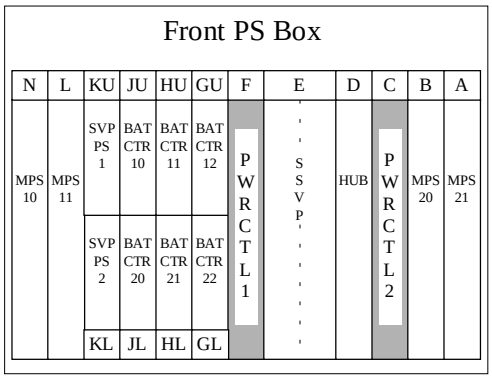
1. Connection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Connect the Alarm INH Jumpers to the connectors on the PWRCTL-1 and PWRCTL-2.



Front View of DKC



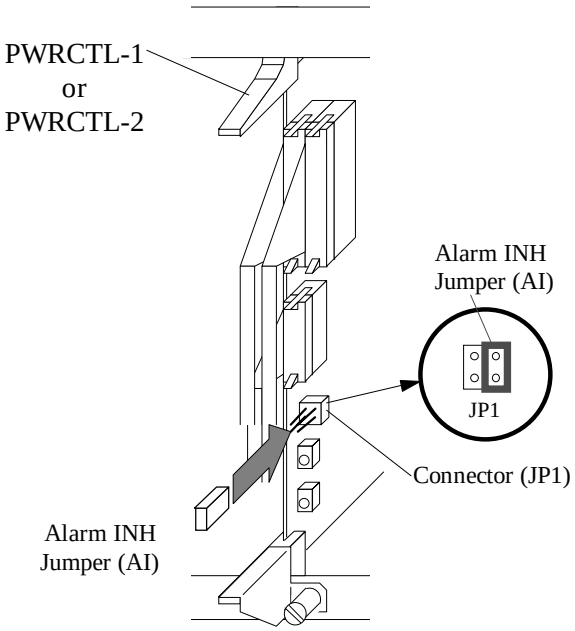


Fig. T21-1 Connection of Jumper

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2. Power Off the Component to be Replaced

⚠ WARNING

Be Careful of Electric Shock

- The power to the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.
- The circuit has residual voltage for one minute after turning off the breakers, so be sure to disconnect all the connectors after this period.

⚠ CAUTION

Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which could cause injury.

Table T21-1 Circuit Breakers to be Turned Off When Replacing AC BOX-R10

No.	Unit	Location No.	Breaker No.	Remarks
1	Disk Controller	Outlet Box	CB301	
2	Disk Controller	Outlet Box	CB302	Only IU Type
3	Disk Controller	Breaker Box-1	CB201	
4	First Disk Unit	AC BOX-R10	CB101	
5	First Disk Unit	AC BOX-R10	CB102	
6	First Disk Unit	AC BOX-R10	CB103	
7	Circuit breakers on the power distribution panel in the plant that are connected to the AC BOX-R10.			Failure to turn off may result in an electric shock

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a. Turn off the circuit breakers (CB201) on Breaker Box in the Disk Controller.

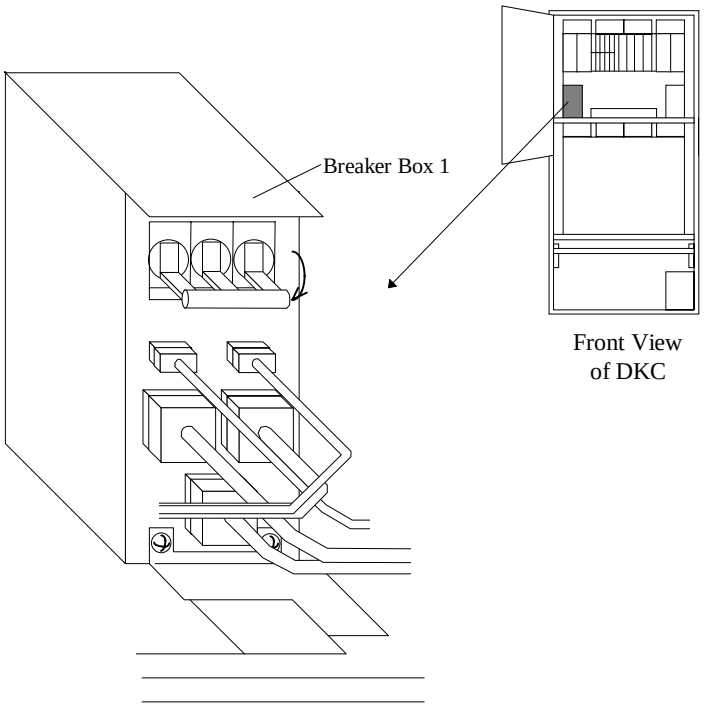

Fig. T21-2 Circuit Breakers to be Turned Off When Replacing AC BOX-R10

b. When the Outlet Box is installed, turn off the circuit breakers (CB301, CB302) on Outlet Box in the Disk Controller.

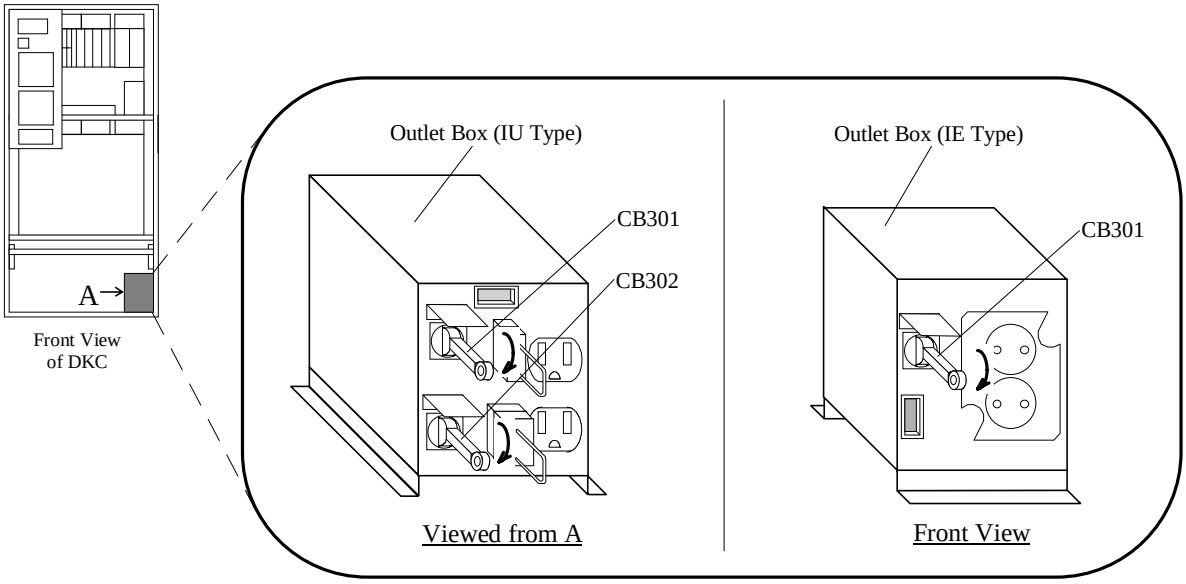

Fig. T21-3 Circuit Breakers to be Turned Off When Replacing AC BOX-R10

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c. Turn off the circuit breakers (CB101, CB102, CB103) on AC BOX-R10 in the First Disk Unit.

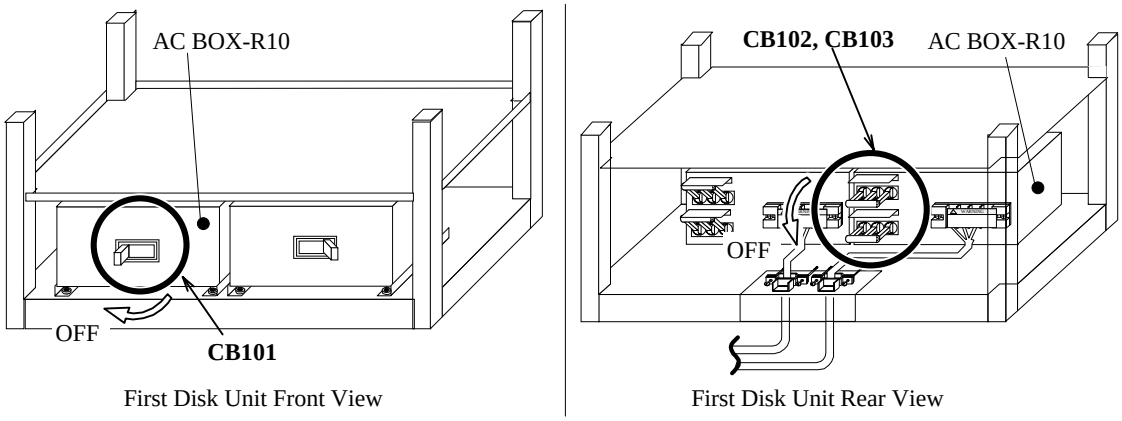

Fig. T21-4 Circuit Breakers to be Turned Off When Replacing AC BOX-R10

d. Turn off the circuit breakers on the power distribution panel in the plant that are connected to AC BOX-R10.

⚠ WARNING

Warning: You will get an electric shock if you fail to turn it off.
Start your work after turning off the breaker on the distribution board connected to the AC BOX-R10.

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3. AC Box Removal

a.Remove the plate from the rear of the Disk Unit as illustrated in Fig. T21-5.
Remove the two screws. Slide the plate toward the rear to remove it.

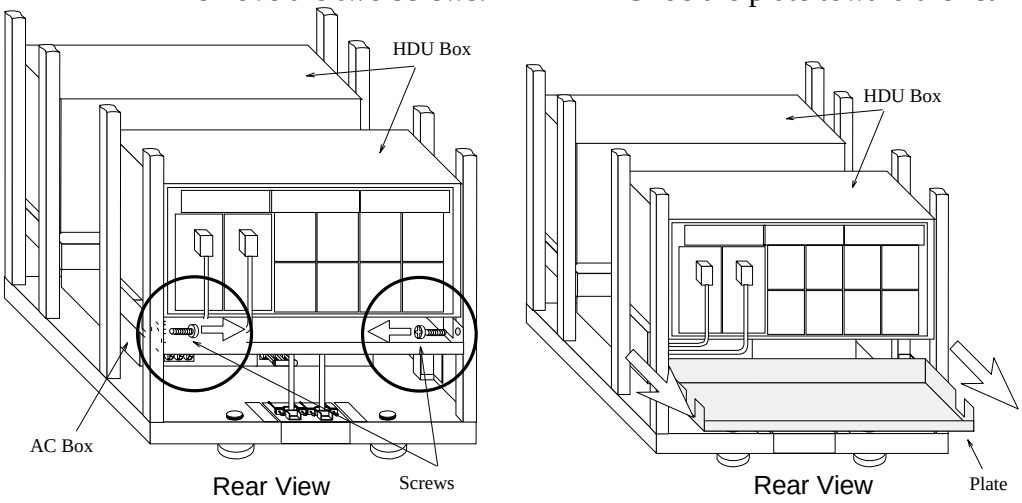

Fig. T21-5 Removal of Plate

b.Unplug cable connectors P101-1, P102-1, and P103-1 from AC BOX-R10.

⚠ WARNING

Be Careful of Electric Shock

- Be sure to turn off the breaker on the power distribution panel connected to AC BOX-R10 before operation.

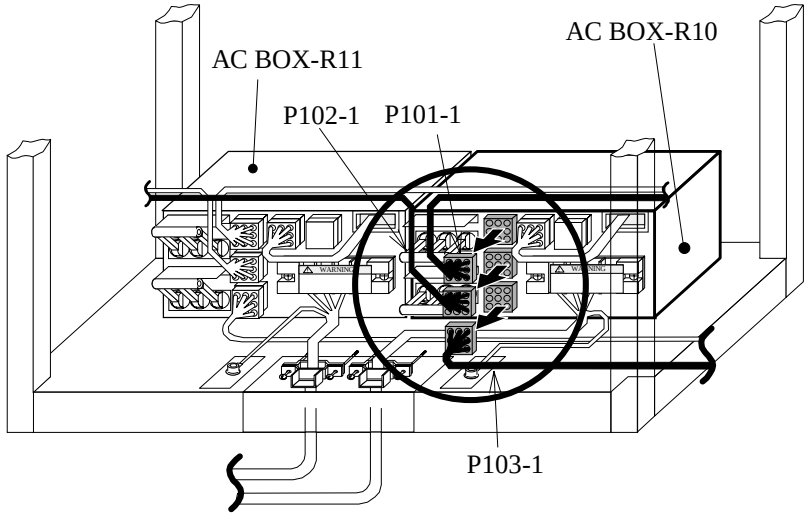

Fig. T21-6 Disconnection of Cable Connectors from AC BOX-R10

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c.Remove the terminal block cover and disconnect the AC power cable.

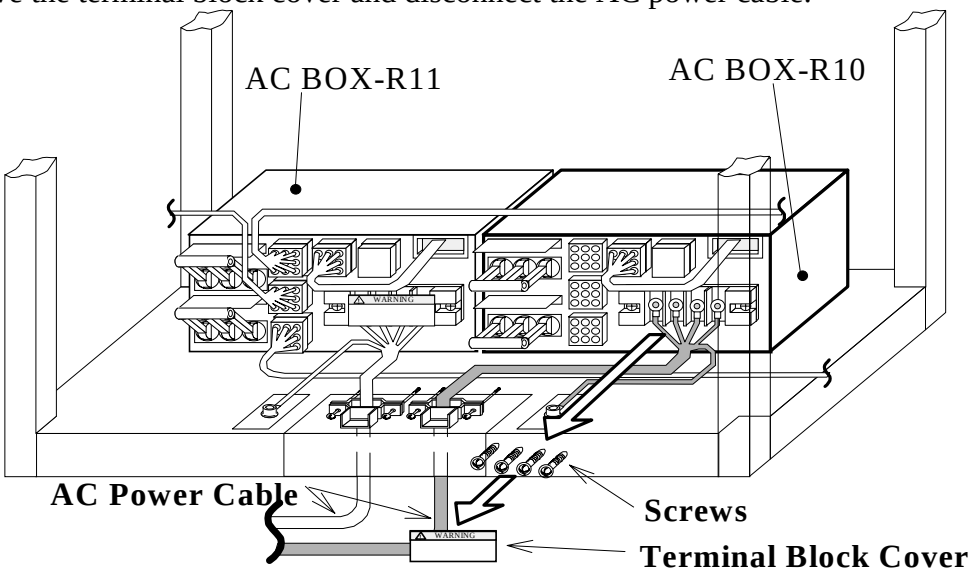

Fig. T21-7 Disconnection of AC Power Cable

d. Remove two screws from the front panel of AC BOX-R10.

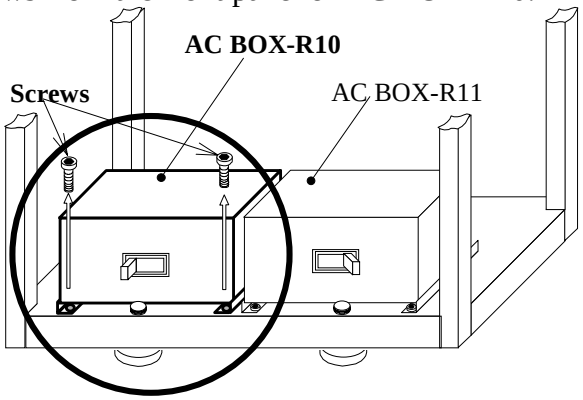

Fig. T21-8 Removal of Screws on AC BOX-R10

e. Slide AC BOX-R10 backward and pull it out.

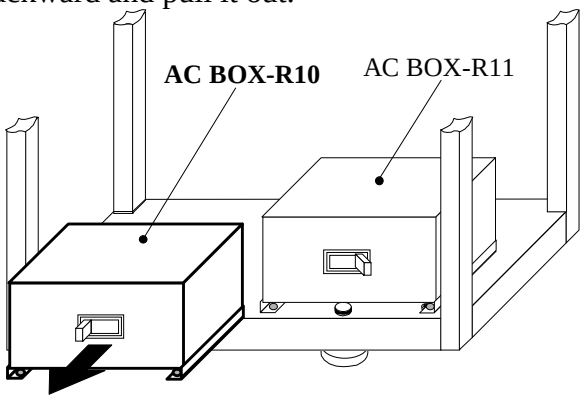

Fig. T21-9 Removal of AC BOX-R10

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4 New AC Box Installation

a.Check that the circuit breakers (CB101, CB102, CB103) on the new AC Box are turned off.

b.Slide the new AC Box from the front to the rear.

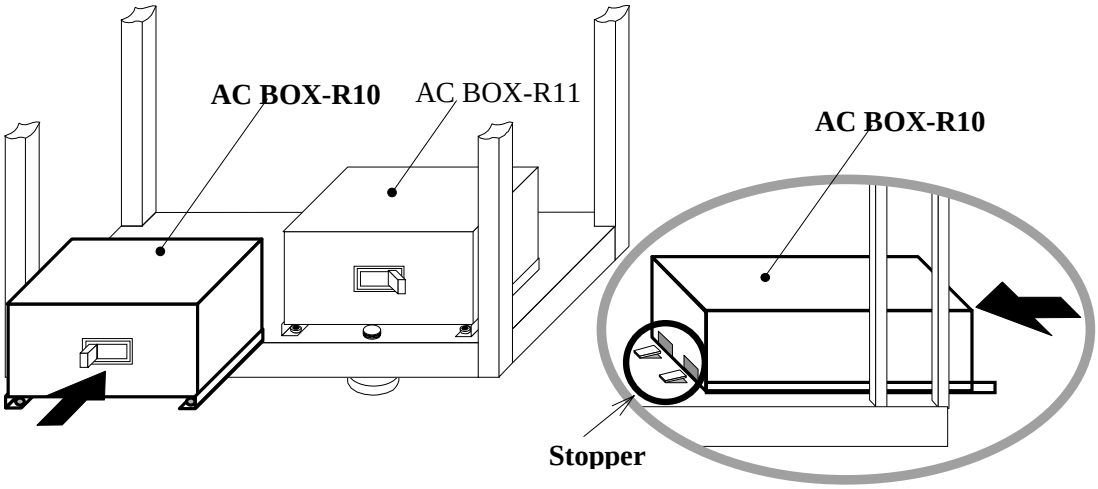

Fig. T21-10 Installation of New AC Box

c. Secure AC BOX-R10 at the front with the screws.

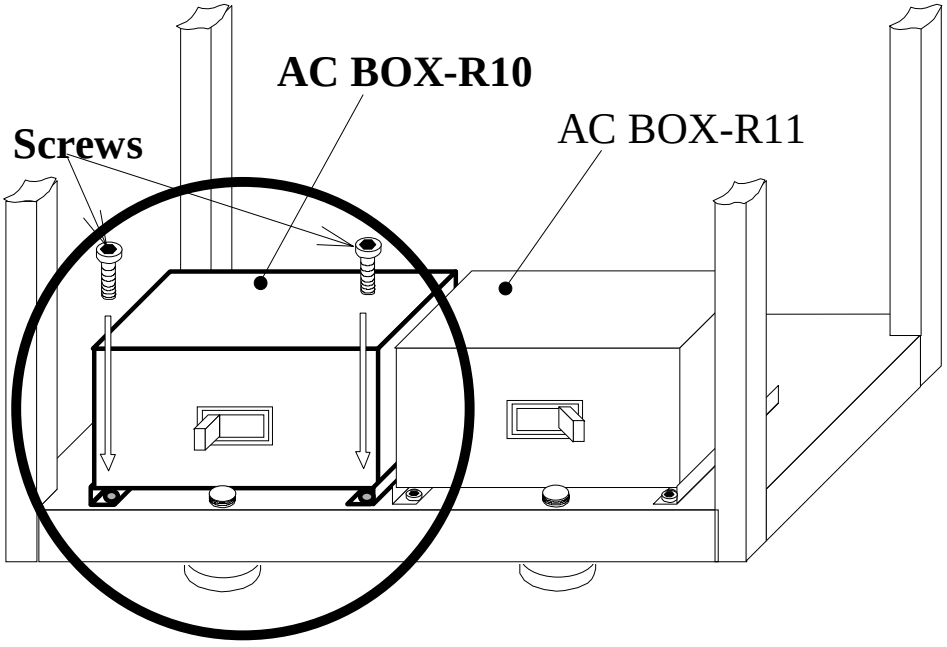

Fig. T21-11 Attachment of AC BOX-R10

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d. Connect the AC power cable to the terminal block. Attach the terminal block cover.

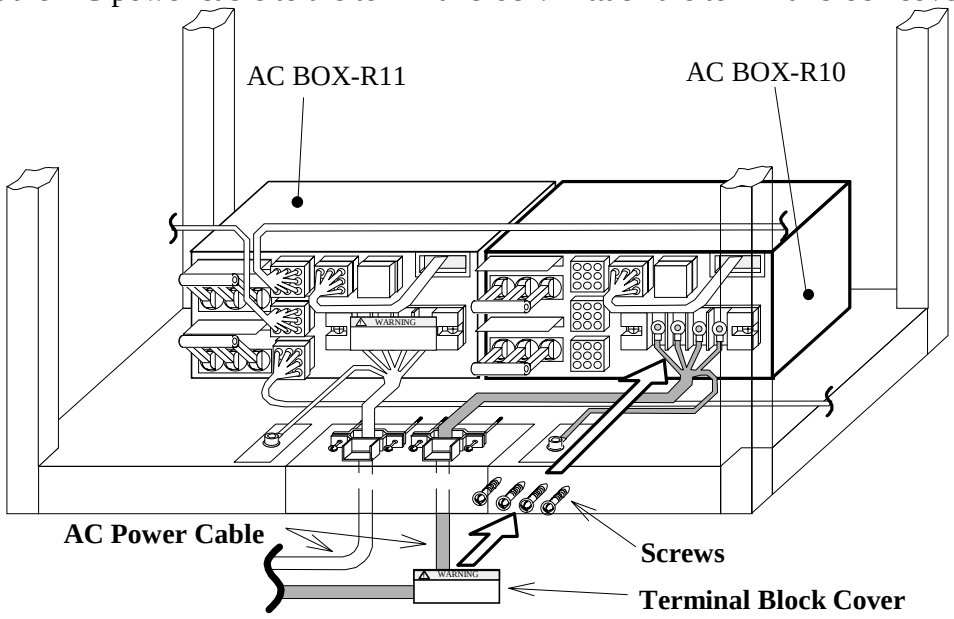
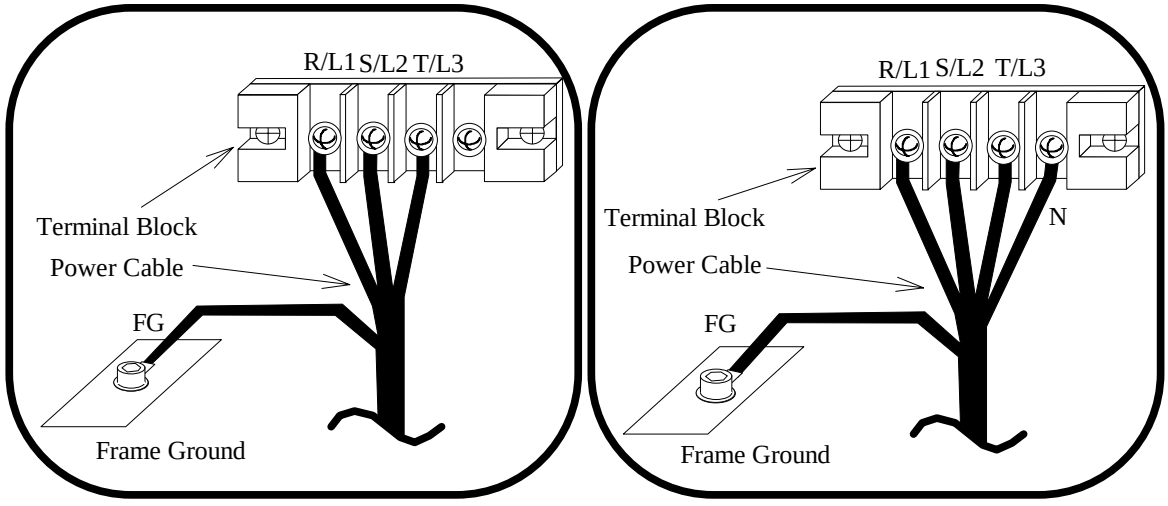


Fig. T21-12 Connection of AC Power Cable

Table T21-2 AC Power Cable Conductors and Jumper Cable (P104) Locations

No.	Model Number	Input Voltage	AC Power Cable Conductors	Jumper Cable (P104) Location	Remarks
1	DKU305IU	200-240Vac	4 (R,S,T,FG)	J104-1	J104-2 Dummy Connector
2	DKU305IE	380-415Vac	5 (R,S,T,N,FG)	J104-2	J104-1 Dummy Connector



DKU305IU DKU305IE

Fig. T21-13 Connection of AC Power Cable to Terminal Block

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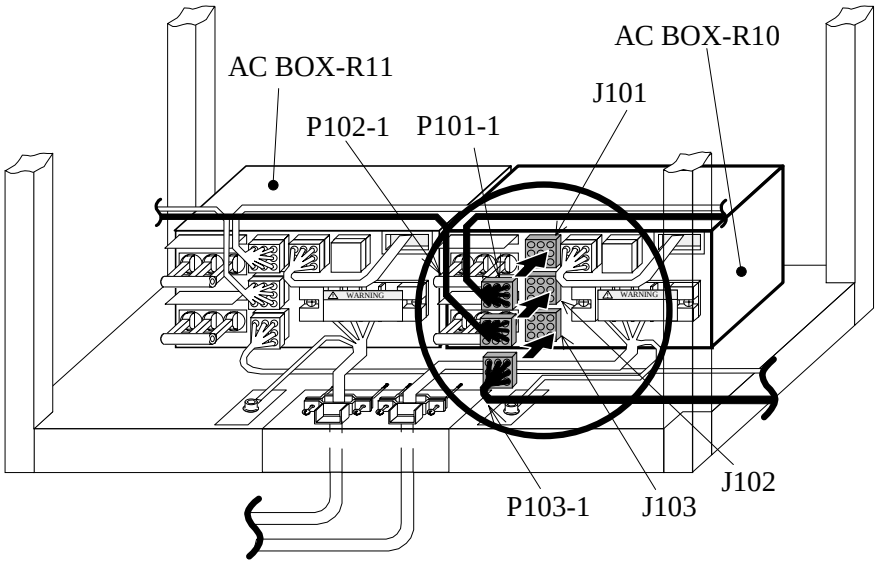
e. Connect the cables listed in Table T21-3.

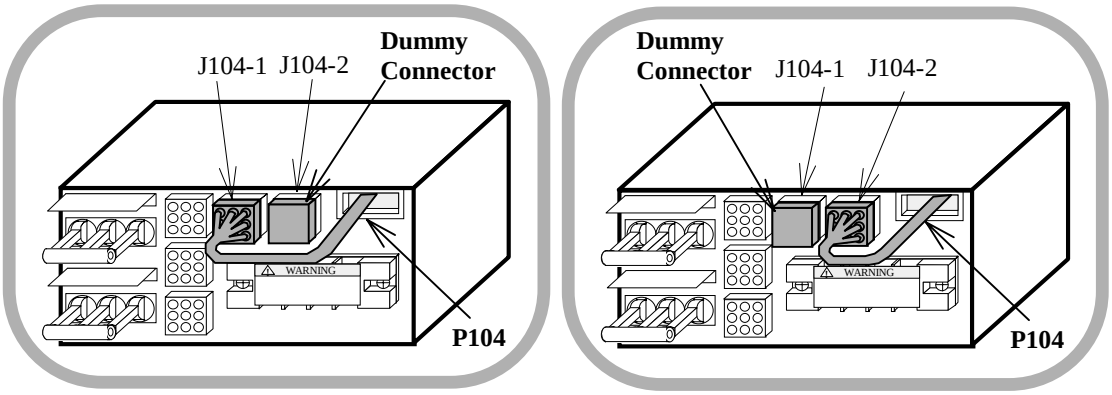
Table T21-3 Cable Connection of AC BOX-R10

No.	Cable No.	AC Box	Remarks
1	P101-1	J101	
2	P102-1	J102	
3	P103-1	J103	
4	P104	J104-1	DKU305IU
		J104-2	DKU305IE
5	Dummy Connector	J104-2	DKU305IU
		J104-1	DKU305IE



First Disk Unit Rear View

Fig. T-21-14 Cable Connection of AC BOX-R10



DKU305IU DKU305IE

Fig. T21-15 Setting of Jumper Cable P104

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f. Attach the plate.

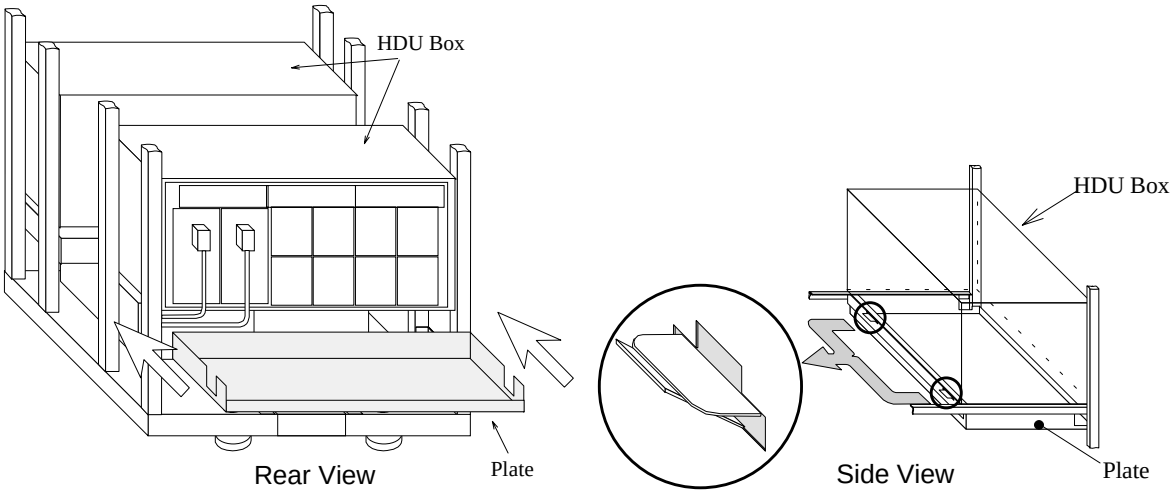

Fig. T21-16 Attachment of Plate

g. Secure the plate with the screws.

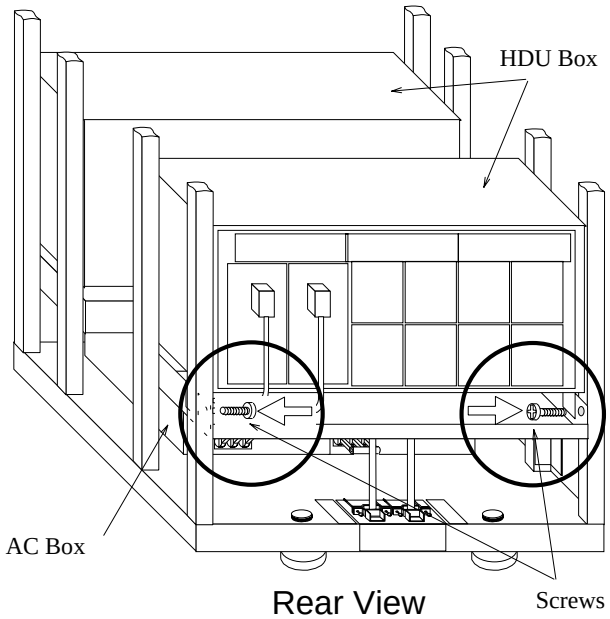

Fig. T21-17 Attachment of Plate

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5. Power On the Replacement Component

a. Turn on the circuit breakers on the power distribution panel that are connected to AC BOX-R10.

b. Turn on all the circuit breakers on AC BOX-R10.

c. Turn on all the circuit breakers listed in Table T21-1 [REP03-1850].

d. Turn “IND TEST / CHK RST” switch on the CE panel to “CHK RST”.

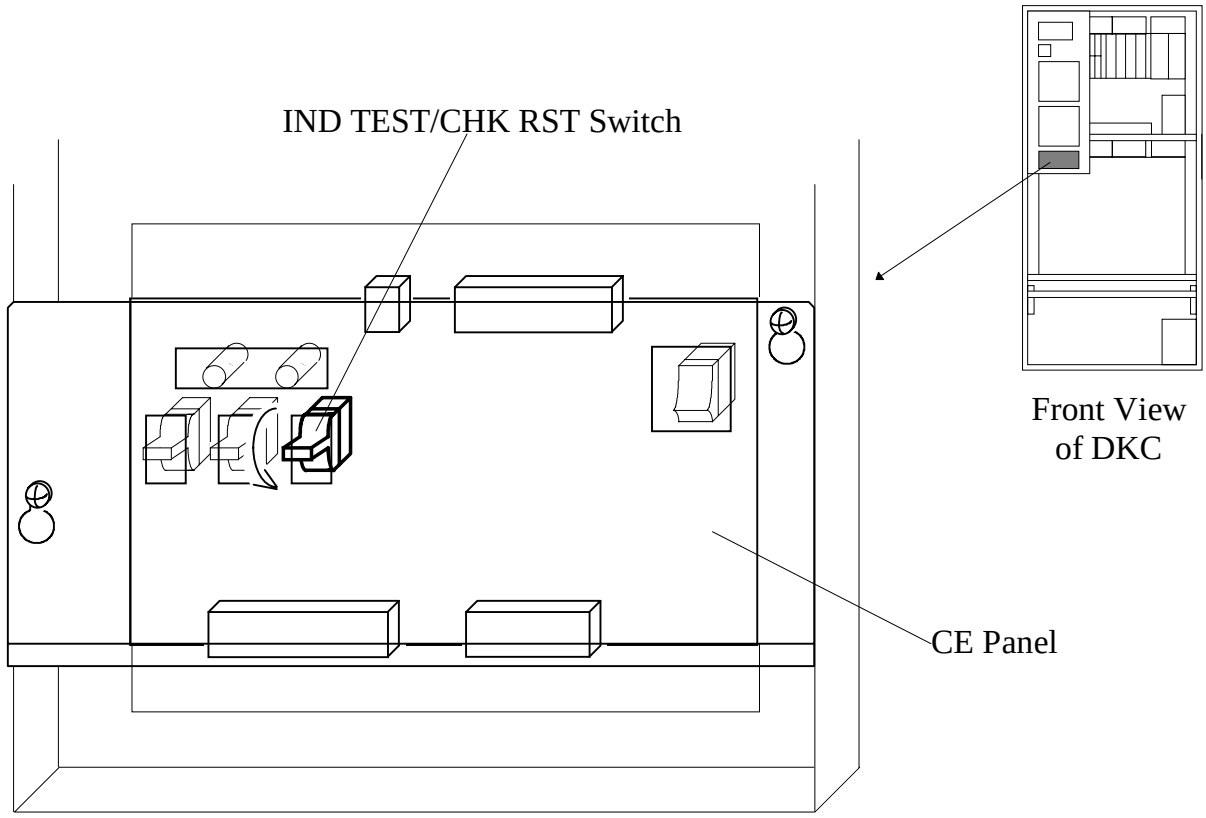

Fig. T21-18 Setting of IND TEST / CHK RST Switch

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6. Disconnection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Disconnect the Alarm INH Jumpers from the connectors on the PWRCTL-1 and PWRCTL-2.

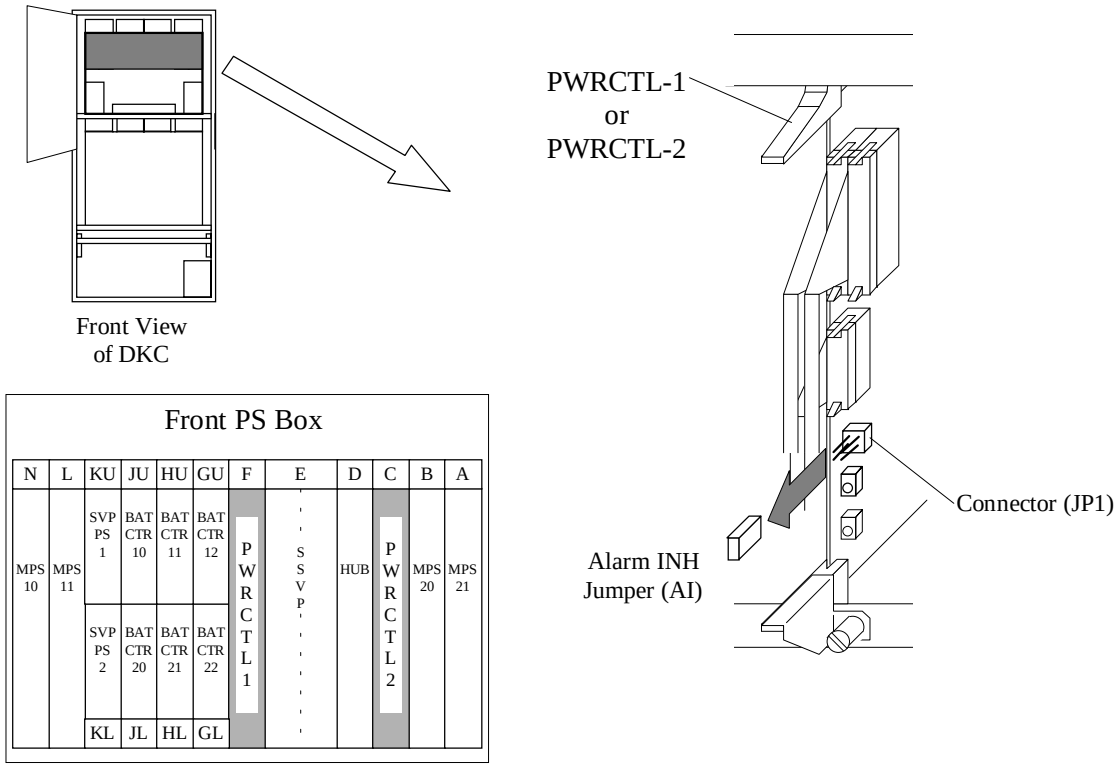

Fig. T21-19 Disconnection of Jumper

7. Go to SVP post-procedure t4 [REP04-880].

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[HARDWARE T22]

Location	Function Name of Component		Part Name
Lower of DKU	1	AC BOX (except AC BOX-R10)	• AC BOX-R11
	2		• AC BOX-R20, R21, L10, L11, L20, L21

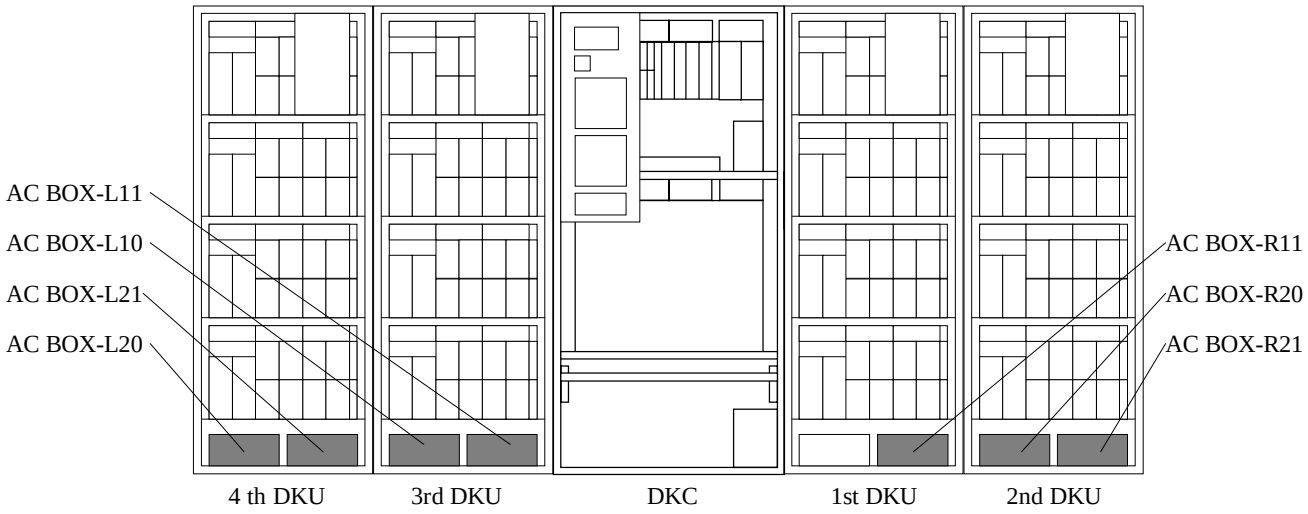
(Reference)

The related PCB for replacement of AC BOX-R11

1. PWRCTL-1 and PWRCTL-2 (Front PS Box in DKC)
2. Breaker Box-2 (Front PS Box in DKC)
3. Circuit breakers on the power distribution panel that are connected to the AC BOX-R11
4. CE Panel (Front of DKC)

The related PCB for replacement of AC BOX except AC BOX-R10 and AC BOX-R11

1. Circuit breakers on the power distribution panel that are connected to the AC BOX



Front View

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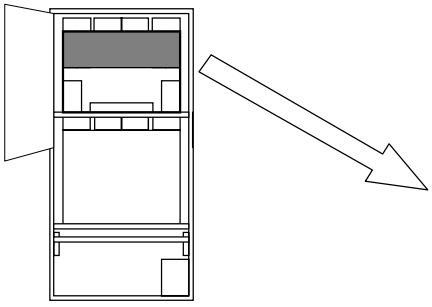
AC BOX-R11

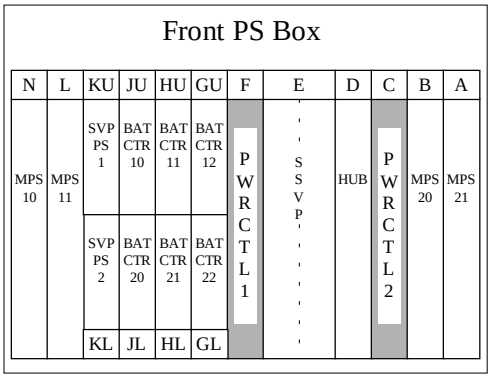
1. Connection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Connect the Alarm INH Jumpers to the connectors on the PWRCTL-1 and PWRCTL-2.



Front View of DKC



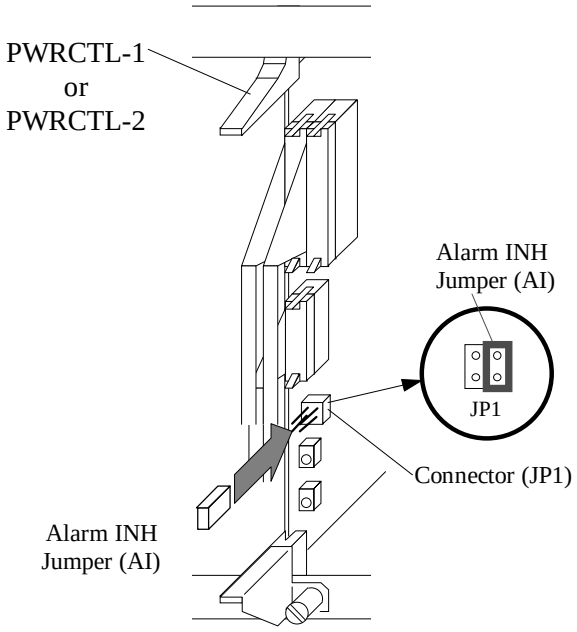


Fig. T22-1 Connection of Jumper

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2. Power Off the Component to be Replaced

⚠ WARNING

Be Careful of Electric Shock

- The power to the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.
- The circuit has residual voltage for one minute after turning off the breakers, so be sure to disconnect all the connectors after this period.

⚠ CAUTION

Mind Your Head

- Be sure to mind your head during operation, or you might hit your head against the movable rack, which could cause injury.

Table T22-1 Circuit Breakers to be Turned Off When Replacing AC BOX-R11

No.	Unit	Location No.	Breaker No.	Remarks
1	Disk Controller	Breaker Box-2	CB201	
2	First Disk Unit	AC BOX-R11	CB101	
3	First Disk Unit	AC BOX-R11	CB102	
4	First Disk Unit	AC BOX-R11	CB103	
5	Circuit breakers on the power distribution panel in the plant that are connected to the AC BOX-R11.			Failure to turn off may result in an electric shock.

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a. Turn off all the circuit breakers (CB201) on Breaker Box-2.

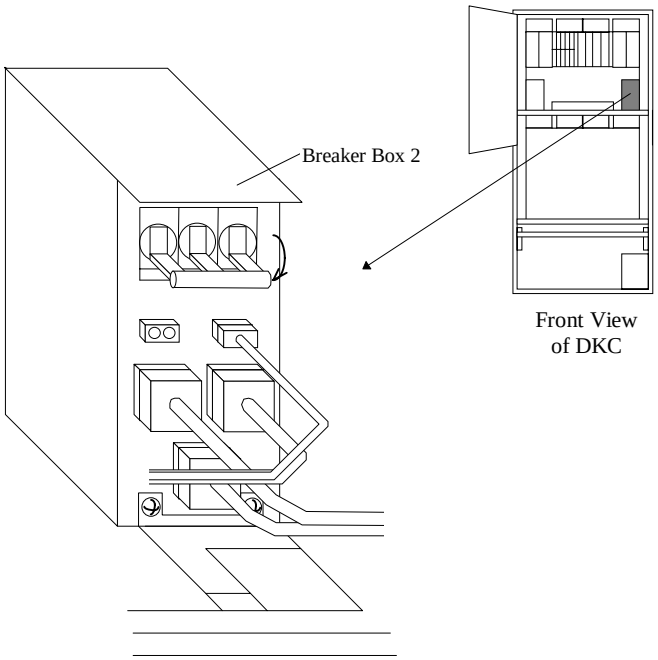

Fig. T22-2 Circuit Breakers to be Turned Off When Replacing AC BOX-R11

b. Turn off all the circuit breakers (CB101, CB102, and CB103) on AC BOX-R11.

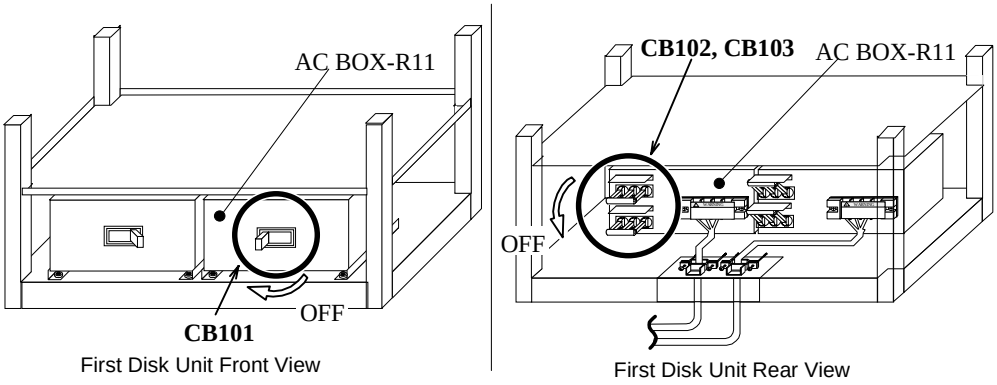

Fig. T22-3 Circuit Breakers to be Turned Off When Replacing AC BOX-R11

c. Turn off the circuit breakers on the power distribution panel in the plant that are connected to AC BOX-R11.

⚠ WARNING

Warning: You will get an electric shock if you fail to turn it off.
Start your work after turning off the breaker on the distribution board connected to the AC BOX-R11.

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3. AC Box Removal

a. Remove the plate from the rear of the Disk Unit as illustrated in Fig. T22-4.
Remove the two screws. Slide the plate toward the rear to remove it.

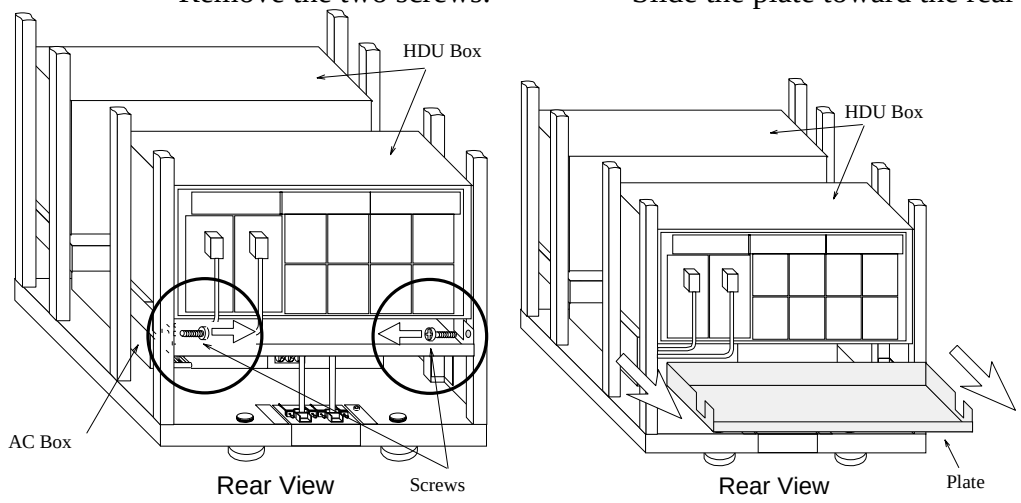

Fig. T22-4 Removal of Plate

b. Unplug cable connectors P101-2, P102-2, and P103-2 from AC BOX-R11.

⚠ WARNING

Be Careful of Electric Shock

• Be sure to turn off the breaker on the power distribution panel connected to AC BOX-R11 before operation.

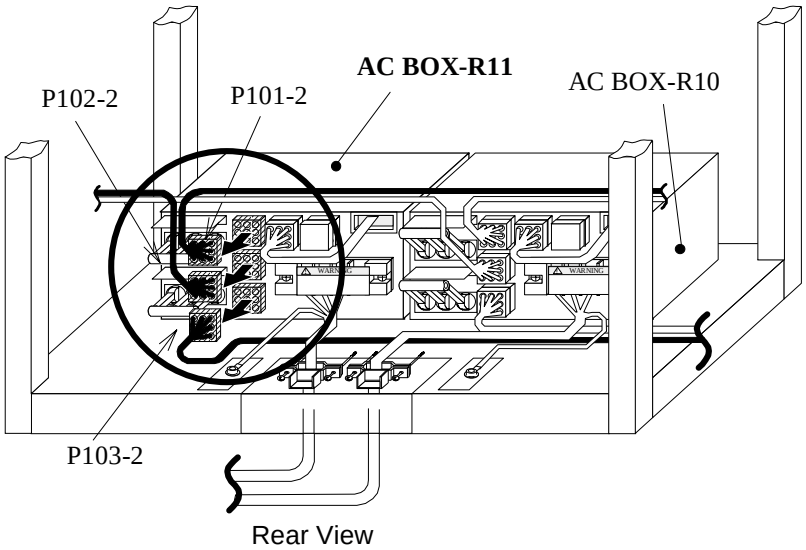

Fig. T22-5 Disconnection of Cable Connectors from AC BOX-R11

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c. Remove the terminal block cover and disconnect the AC power cable.

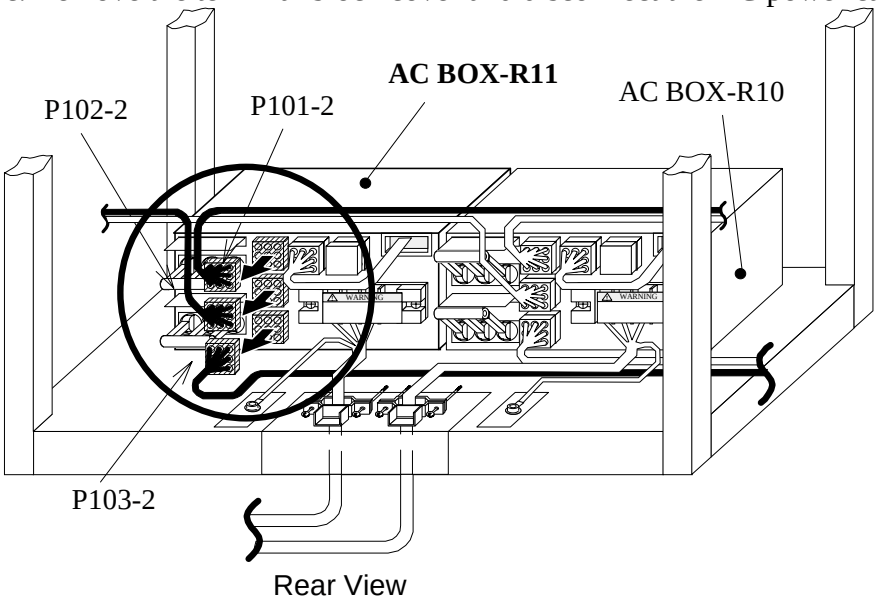

Fig. T22-6 Disconnection of AC Power Cable

d. Remove the two screws from the front panel of AC BOX-R11.

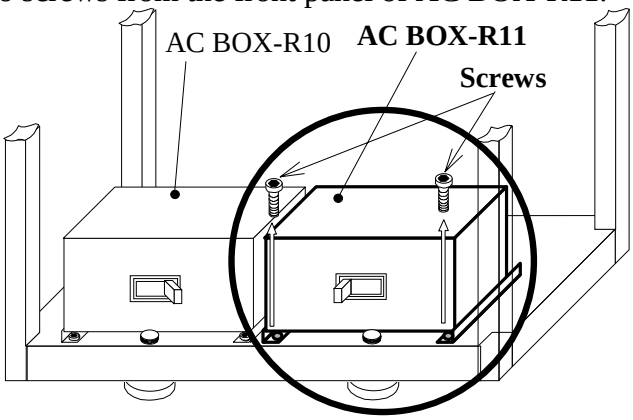

Fig. T22-7 Removal of Screws on AC BOX-R11

e. Slide the AC BOX-R11 backward and pull it out.

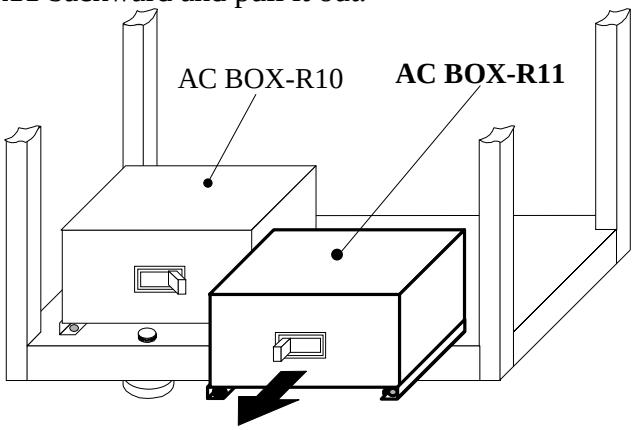

Fig. T22-8 Removal of AC BOX-R11

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4. New AC Box Installation

a. Check that the circuit breakers (CB101, CB102, CB103) on the new AC Box are turned off.

b. Slide the AC BOX-R11 from the front to the rear.

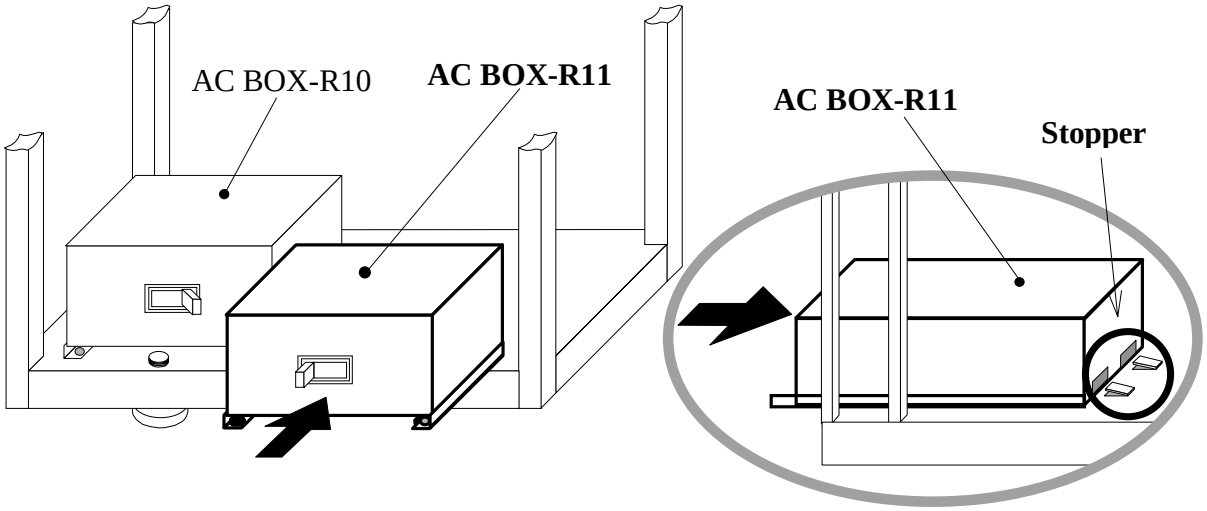

Fig. T22-9 Installation of AC BOX

c. Secure AC BOX-R11 at the front with the screws.

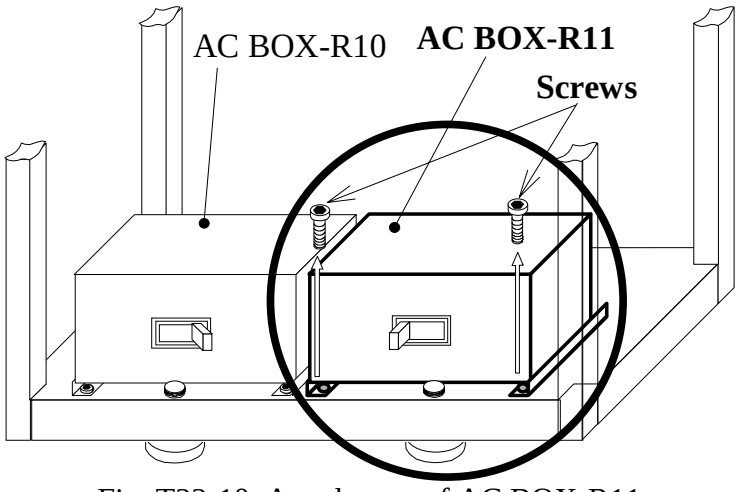

Fig. T22-10 Attachment of AC BOX-R11

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d. Connect the AC power cable to the terminal block. Attach the terminal block cover.

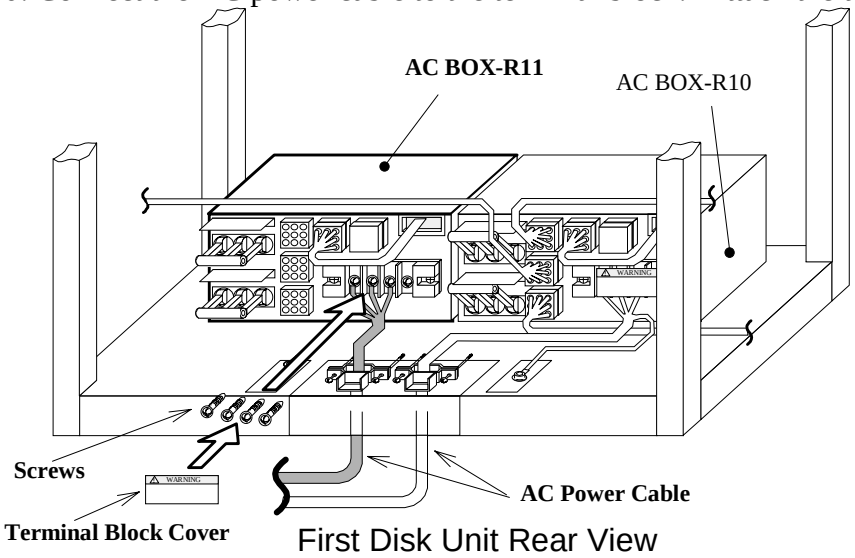

Fig. T22-11 Connection of AC Power Cable

Table T22-2 AC Power Cable Conductors and Jumper Cable (P104) Locations

No.	Model Number	Input Voltage	AC Power Cable Conductors	Jumper Cable (P104) Location	Remarks
1	DKU305IU	200-240Vac	4 (R,S,T,FG)	J104-1	J104-2 Dummy Connector
2	DKU305IE	380-415Vac	5 (R,S,T,N,FG)	J104-2	J104-1 Dummy Connector

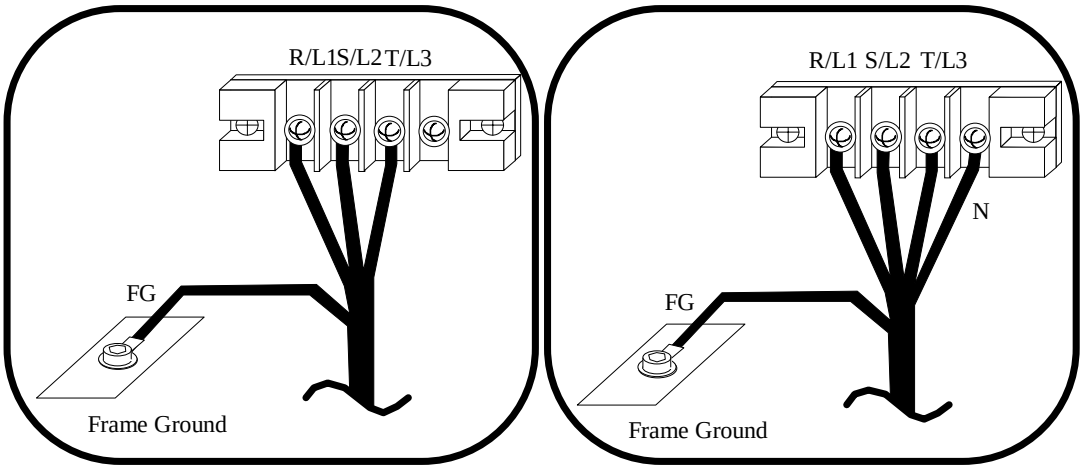

Fig. T22-12 Connection of AC Power Cable to Terminal Block

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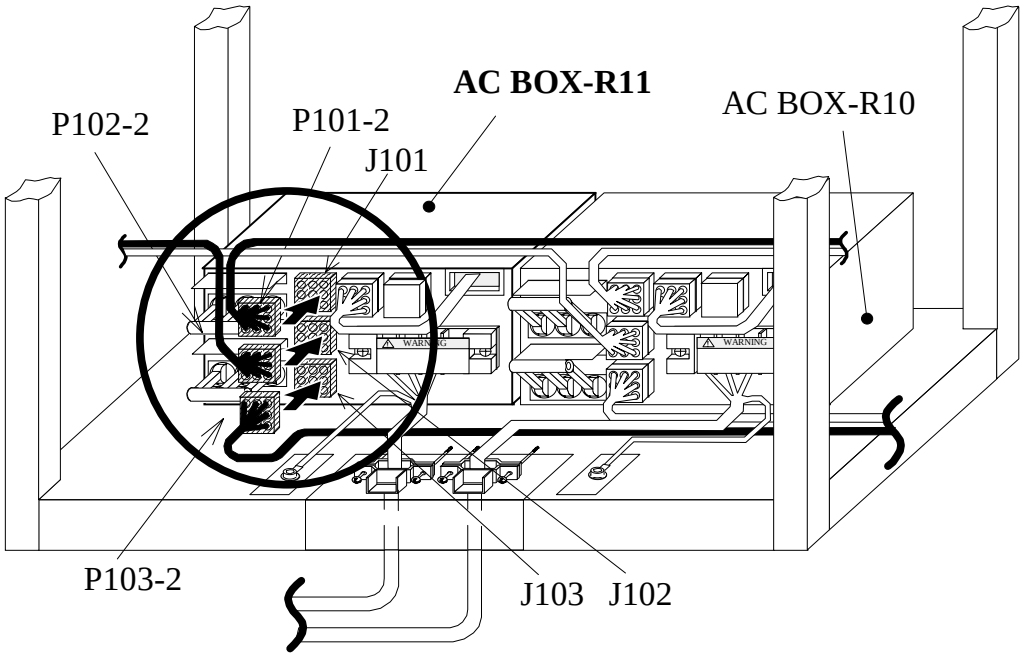
e. Connect the cables listed in Table T22-3.

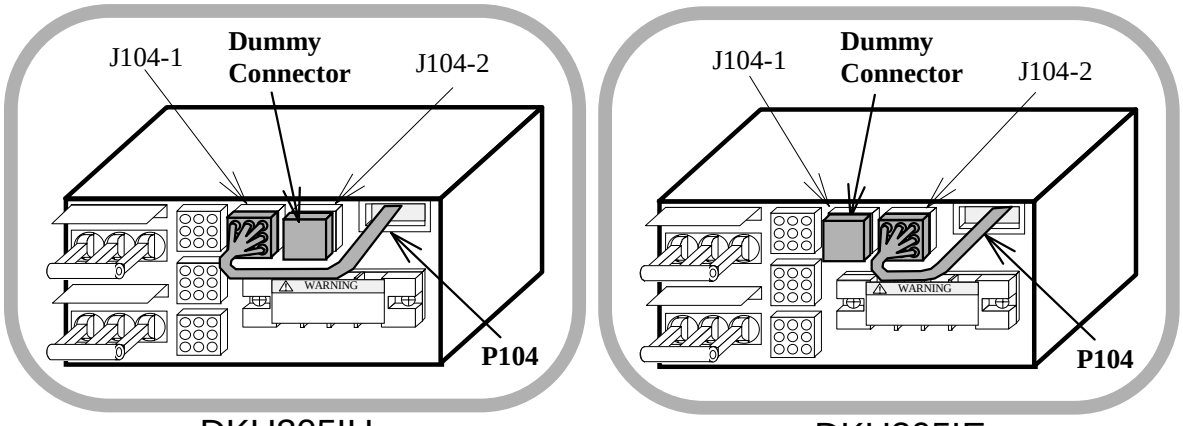
Table T22-3 Cable Connection of AC BOX-R11

No.	Cable No.	Connector No.	Remarks
1	P101-2	J101	
2	P102-2	J102	
3	P103-2	J103	
4	P104	J104-1	DKU305IU
		J104-2	DKU305IE
5	Dummy Connector	J104-2	DKU305IU
		J104-1	DKU305IE



First Disk Unit Rear View

Fig. T22-13 Cable Connection of AC BOX-R11



DKU305IU DKU305IE

Fig. T22-14 Setting of Jumper Cable P104

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f. Attach the plate

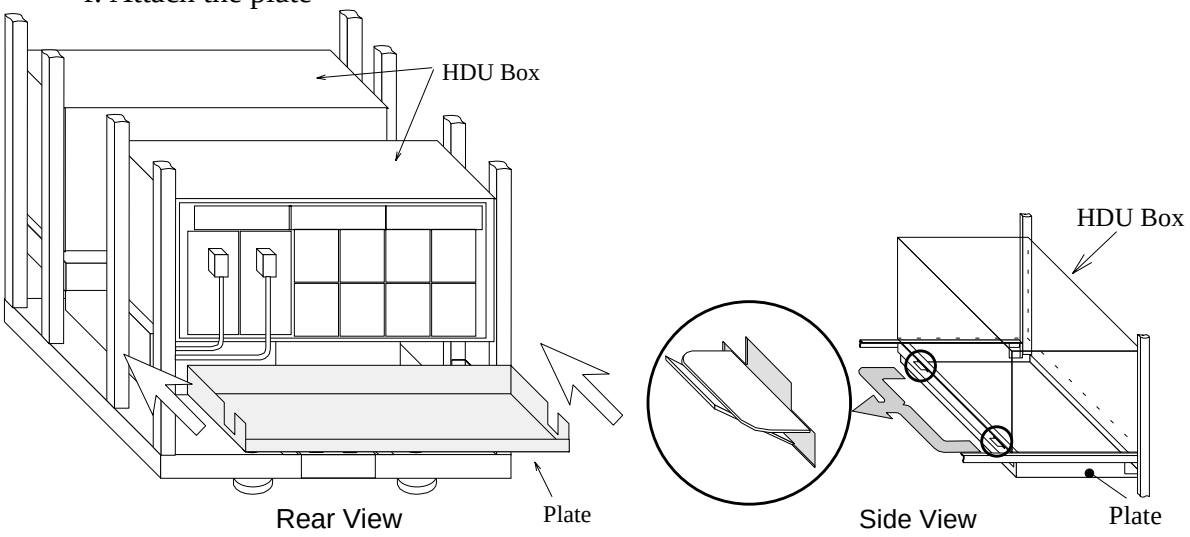

Fig. T22-15 Attachment of Plate

g. Secure the plate with the screws.

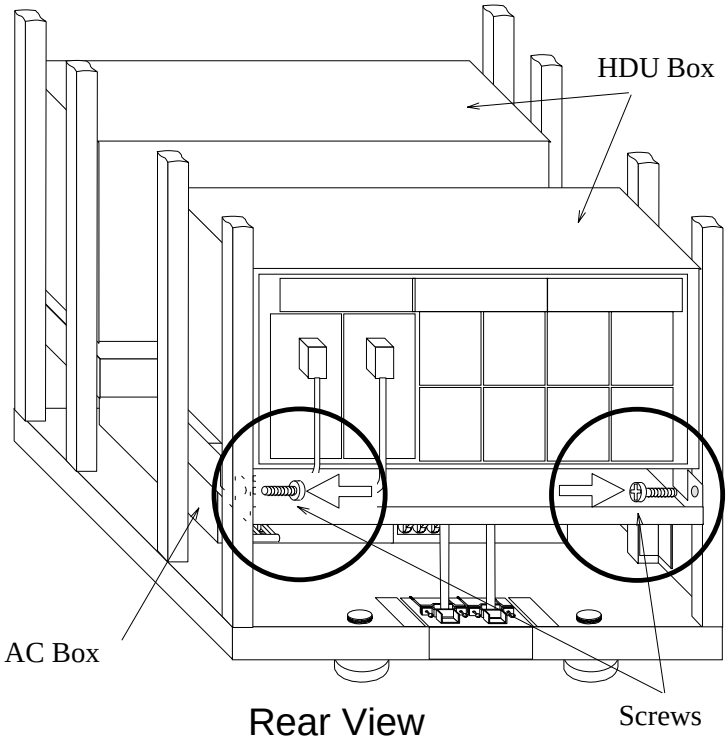

Fig. T22-16 Attachment of Plate

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5. Power On the Replacement Component

a. Turn on the circuit breakers on the power distribution panel that are connected to AC BOX-R11.

b. Turn on all the circuit breakers on AC BOX-R11.

c. Turn on all the circuit breakers listed in Table T22-1 [REP03-1980].

d. Turn “IND TEST / CHK RST” switch on the CE panel to “CHK RST”.

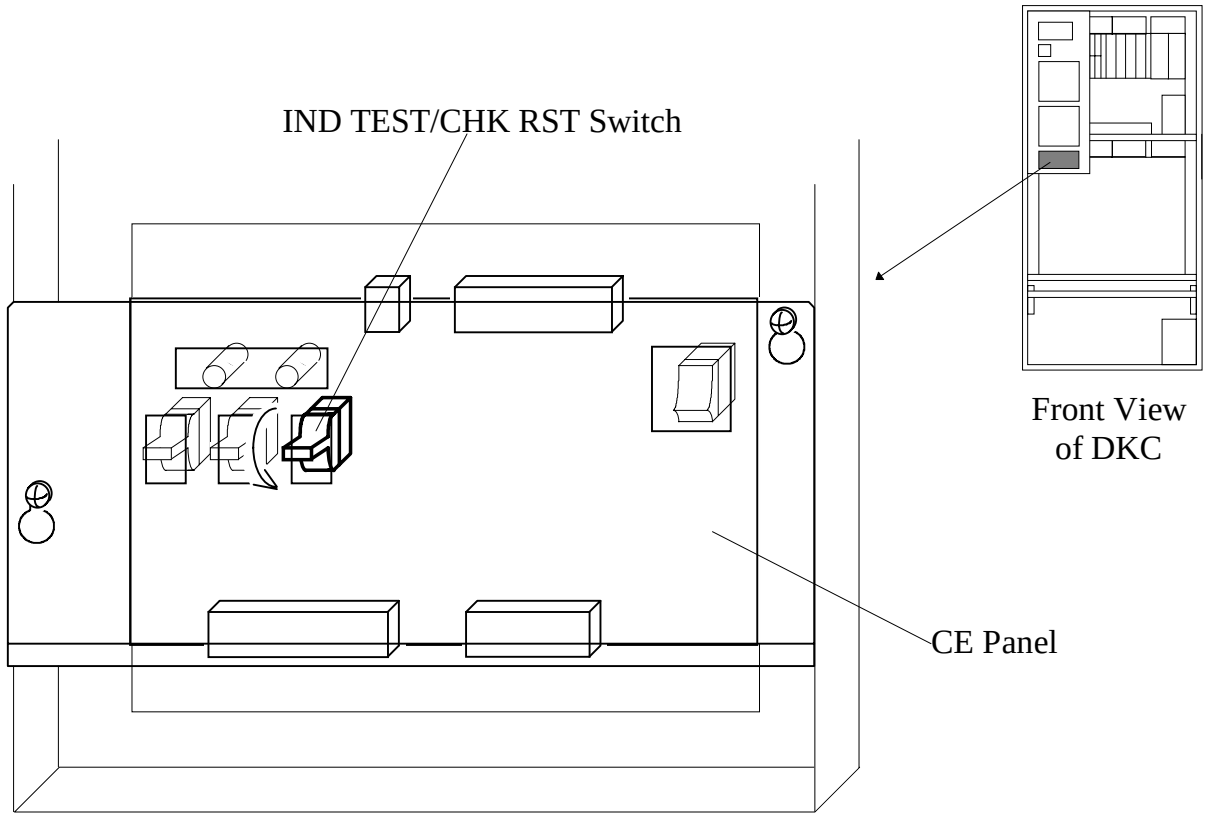

Fig. T22-17 Setting of IND TEST / CHK RST Switch

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6. Disconnection of the Jumper

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

a. Disconnect the Alarm INH Jumpers from the connectors on the PWRCTL-1 and PWRCTL-2.

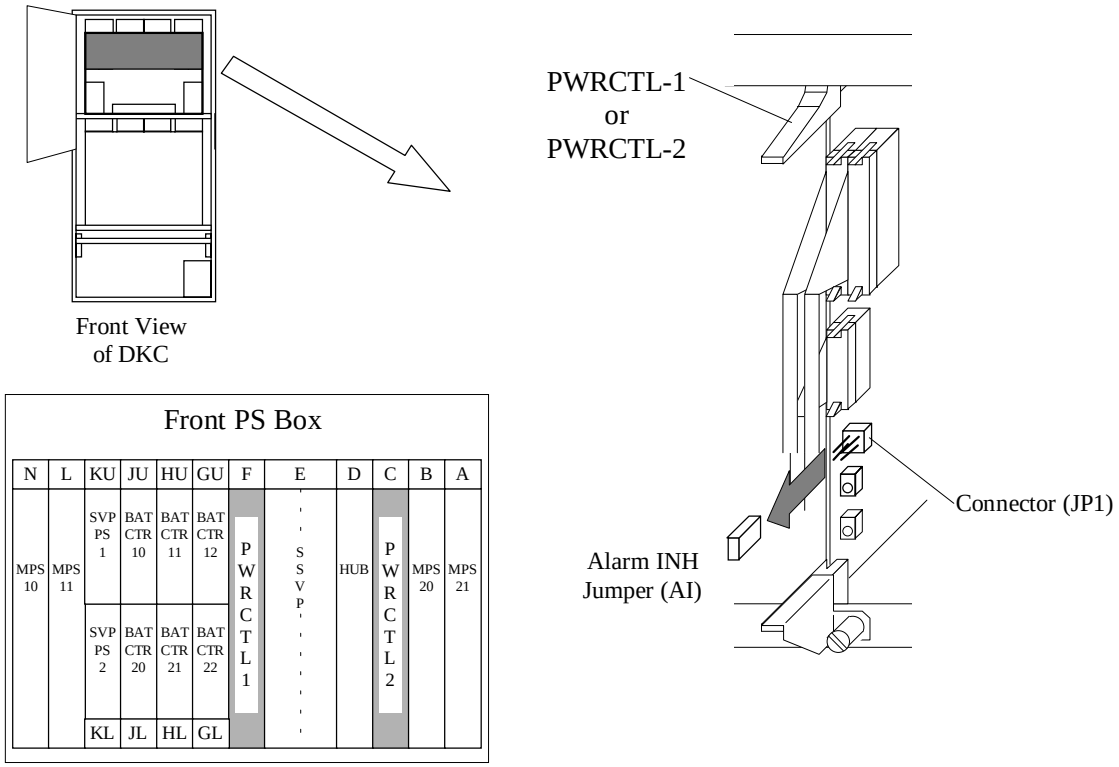

Fig. T22-18 Disconnection of Jumper

7. Go to SVP post-procedure t4 [REP04-880].

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Other AC Boxes

(AC BOX-R20, AC BOX-R21, AC BOX-L10, AC BOX-L11, AC BOX-L20, AC BOX-21)

⚠ WARNING

Be Careful of Electric Shock

- The power to the device is still on after turning off the breakers shown below.
- The device may be powered off when turning off the breakers not shown below.
- The circuit has residual voltage for one minute after turning off the breakers, so be sure to disconnect all the connectors after this period.

1. Power Off the Component to be Replaced

a. Turn off the circuit breakers for the AC Box to be replaced (CB101, CB102, and CB103).

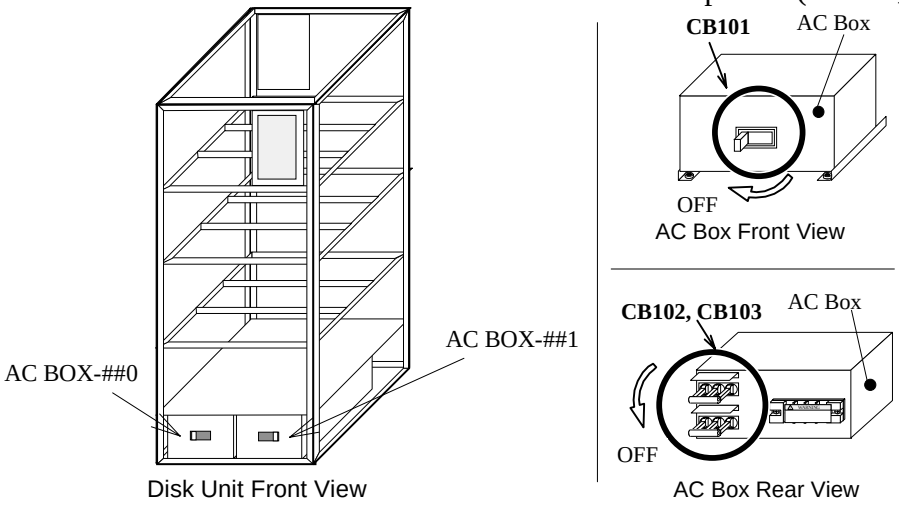

Fig. T22-19 AC Box Location

b. Turn off the circuit breakers on the power distribution panel in the plant that are connected to the AC Box to be replaced.

Failure to turn off may result in an electric shock.

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2. AC Box Removal

a. Remove the plate from the rear of the Disk Unit as illustrated in Fig. T22-20

Remove the two screws. Slide the plate toward the rear side to remove it.

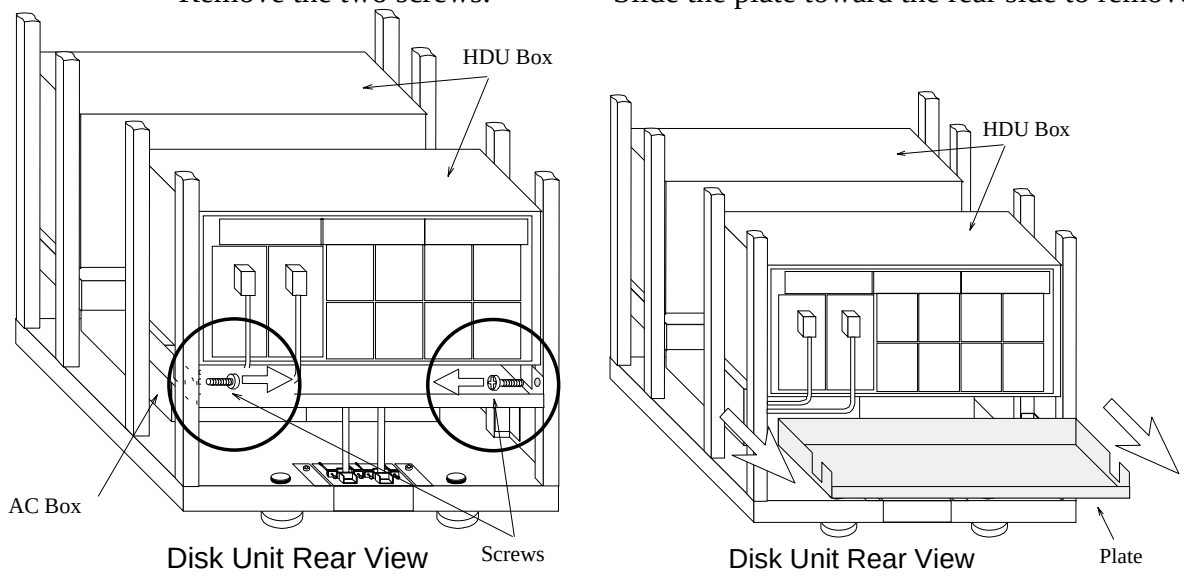

Fig. T22-20 Removal of Plate

⚠ WARNING

Be Careful of Electric Shock

• Be sure to turn off the breaker on the power distribution panel connected to replaced AC BOX.

b. Unplug cable connectors P101-# and P102-# from the AC Box to be replaced.

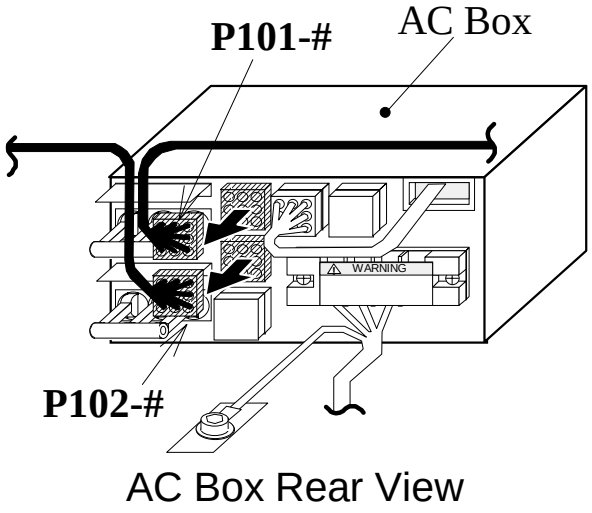

Fig. T22-21 Disconnection of Cable Connectors from AC Box

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c. Remove the terminal block cover and disconnect the AC power cable.

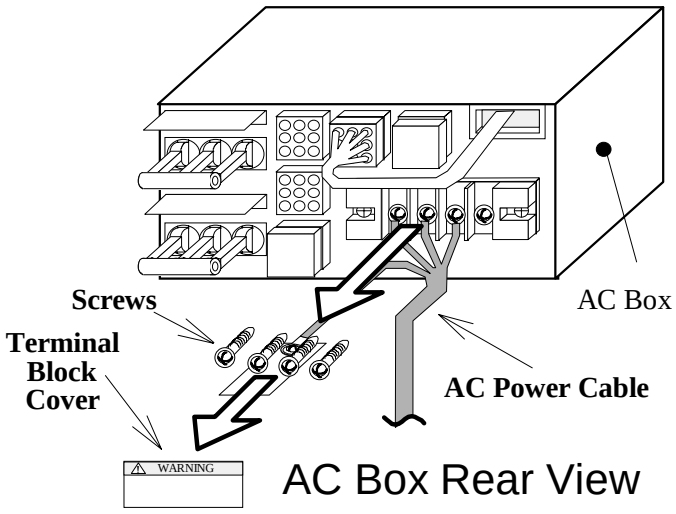

Fig. T22-22 Disconnection of AC Power Cable

d. Remove the two screws from the front panel of the AC Box to be replaced.
Slide the AC Box to be replaced backward and pull it out.

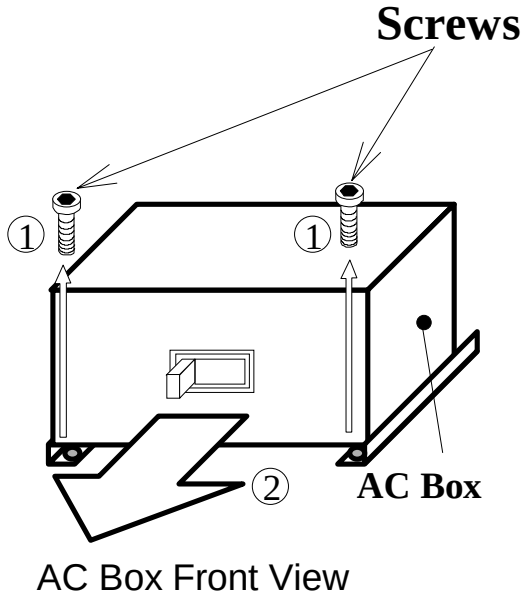

Fig. T22-23 Disconnection of AC Power Cable

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3. New AC Box Installation

a. Check that the circuit breakers (CB101, CB102, CB103) on the new AC Box are turned off.

b. Slide the replacement AC Box from the front to the rear.
Secure the replacement AC Box at the front side with the screws.

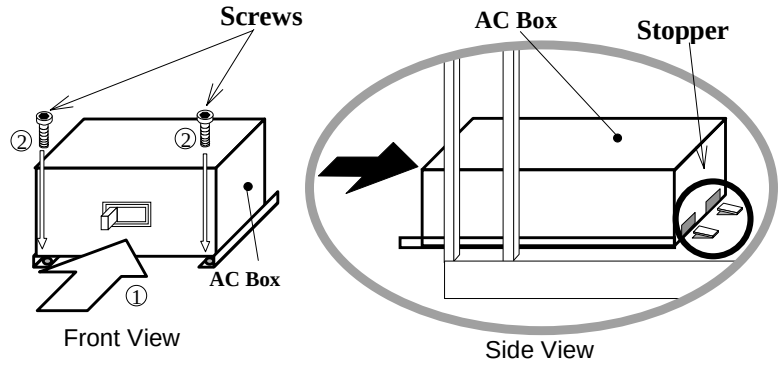

Fig. T22-24 New AC Box Installation

c. Connect the AC power cable to the terminal block. Replace the terminal block cover.

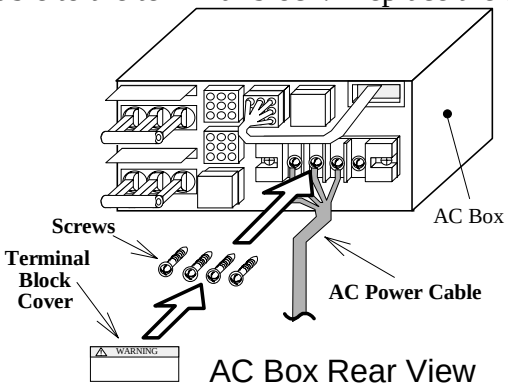

Fig. T22-25 Connection of AC Power Cable

Table T22-4 AC Power Cable Conductors and Jumper Cable (P104) Locations

No.	Model Number	Input Voltage	AC Power Cable Conductors	Jumper Cable (P104) Location	Remarks
1	DKU305IU	200-240Vac	4 (R,S,T,FG)	J104-1	J104-2 Dummy Connector
2	DKU305IE	380-415Vac	5 (R,S,T,N,FG)	J104-2	J104-1 Dummy Connector

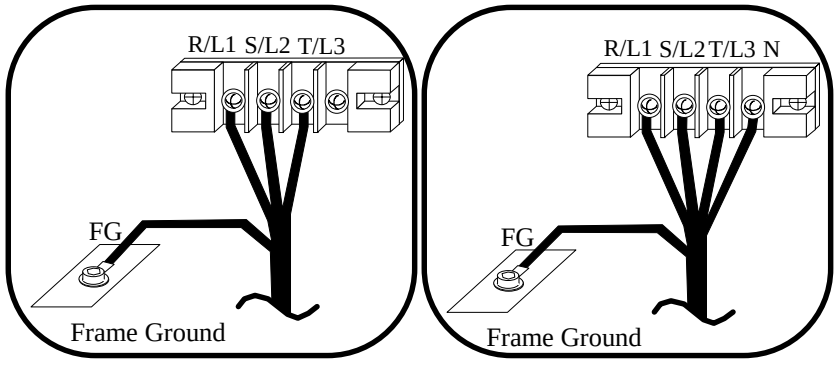

Fig. T22-26 Connection of AC Power Cable to Terminal Block

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d. Connect the cables listed in Table T22-5.

Table T22-5 AC Box Cables

No.	Cable No.	Connector No.	Remarks
1	P101-#	J101	
2	P102-#	J102	
3	P104	J104-1	DKU305IU
		J104-2	DKU305IE
4	Dummy Connector	J104-2	DKU305IU
		J104-1	DKU305IE
5	Dummy Connector	J103	

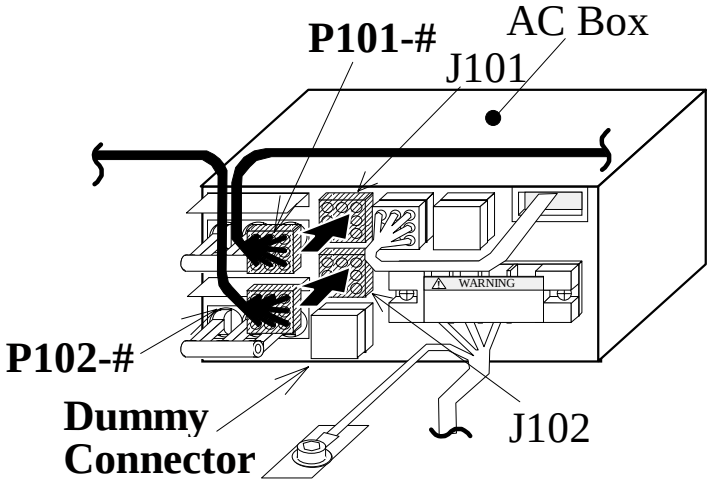

Fig. T22-27 Cable Connection of AC Box

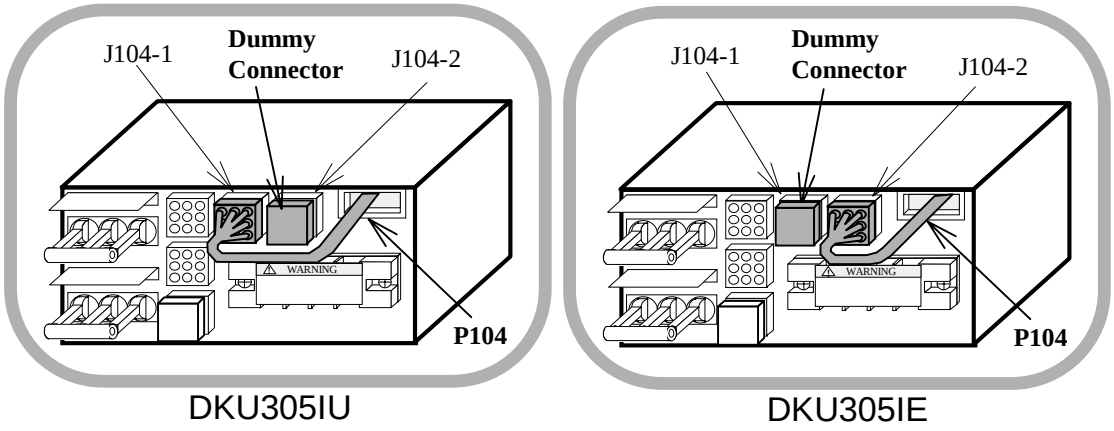

Fig. T22-28 Setting of Jumper Cable P104

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e. Attach the plate.

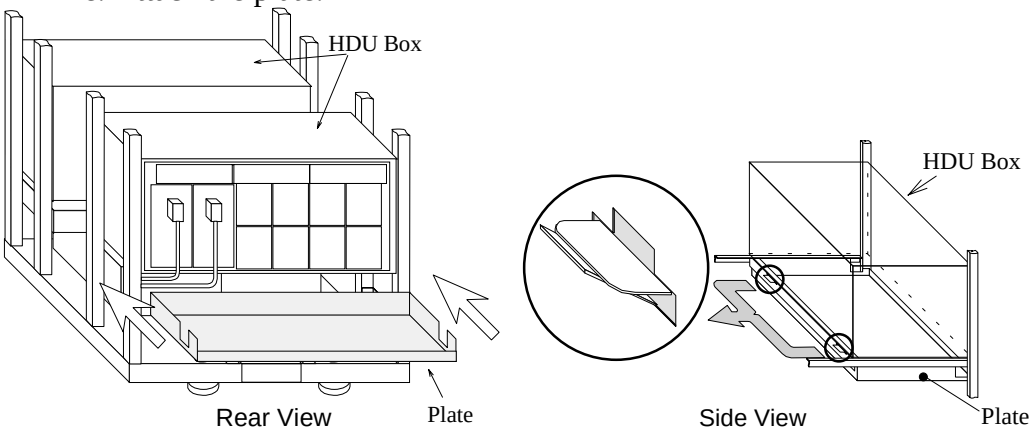

Fig. T22-29 Attachment of Plate

f. Secure the plate with the screws.

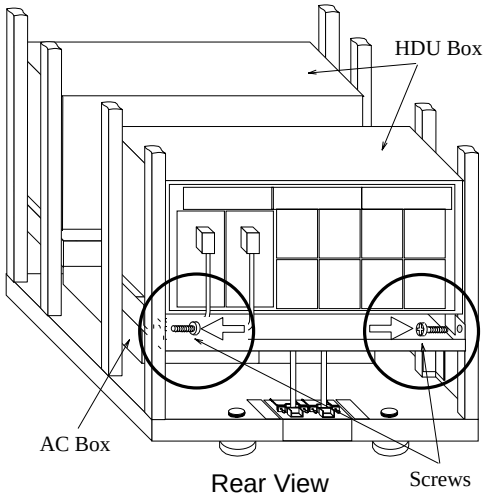

Fig. T22-30 Attachment the Plate

4. Power On the Replacement Component

a. Turn on the circuit breakers on the power distribution panel that are connected to the replacement AC Box.

b. Turn on all the circuit breakers on the replacement AC Box.

5. Go to SVP post-procedure t4 [REP04-880].

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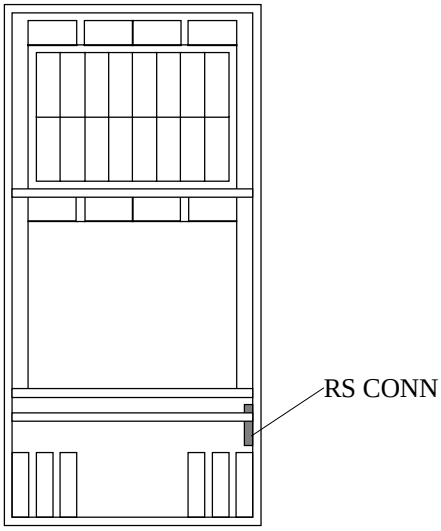
[HARDWARE T23]

Location	Function Name of Component		Part Name
Lower right rear of DKC	1	RS CONN	• SZ592-A



Rear View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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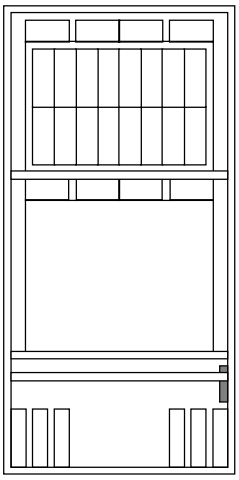
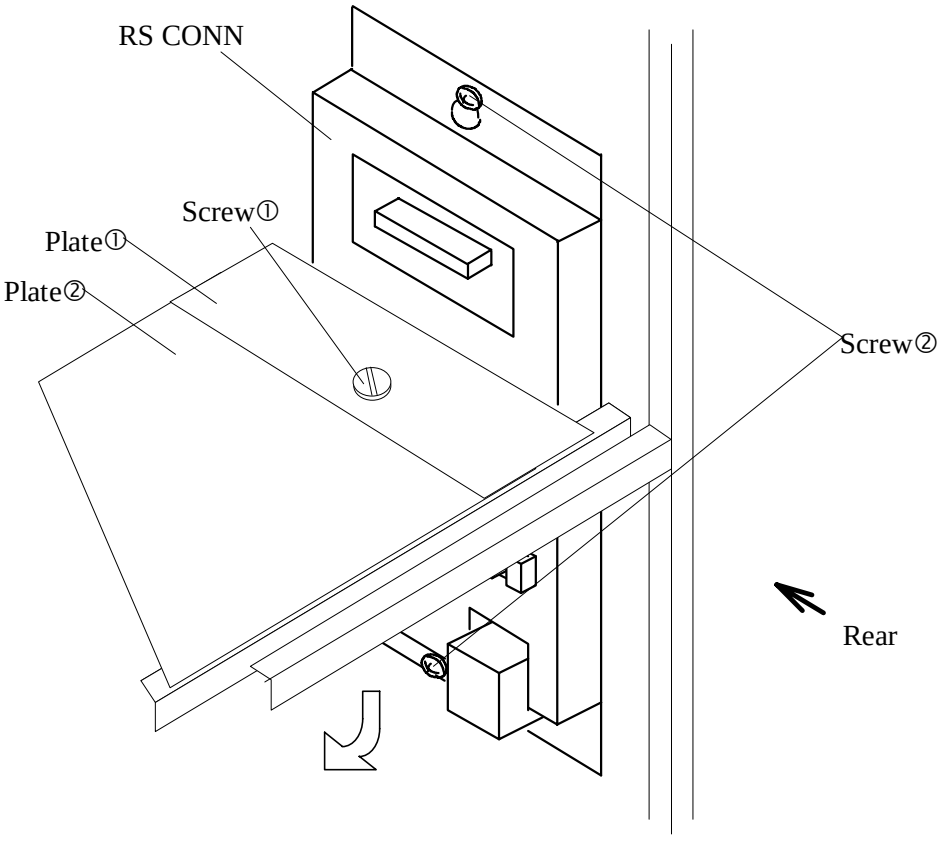
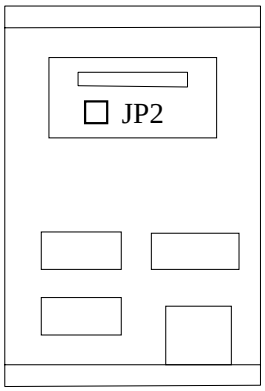
1. The following figure shows the correct way to replace the RS CONN.

a. Disconnect all cables from RS CONN.
b. Loosen the screw① and remove the plate①.
c. Loosen two screws② and remove RS CONN from the bottom of the plate②.
d. Set the jumper socket(JP2) of the spare PCB to the same positions as those of failed PCB.
e. Attach the RS CONN and fasten two screws②.
f. Attach the plate① and fasten the screw①.
g. Connect all the cables.



Rear View
of DKC





RS CONN

2. Go to SVP post procedure t1 [REP04-490].

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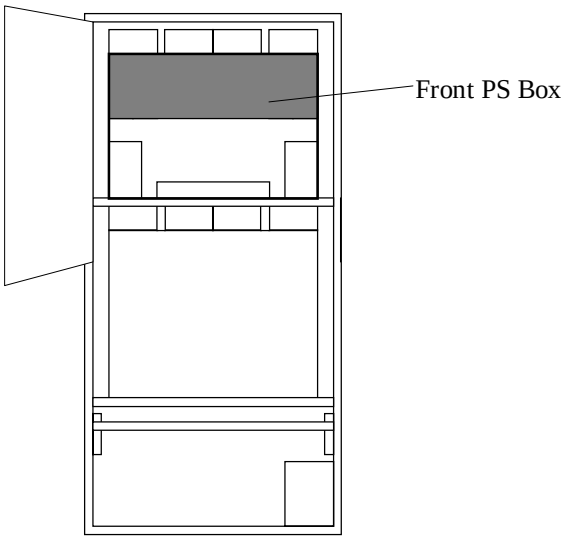
[HARDWARE T25]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	SVP PS 1 or 2	• SH111-A



Front View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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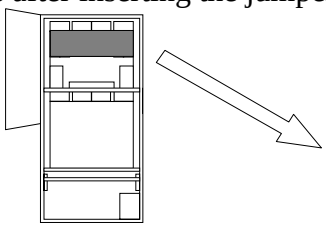
SVP PS 1 or 2

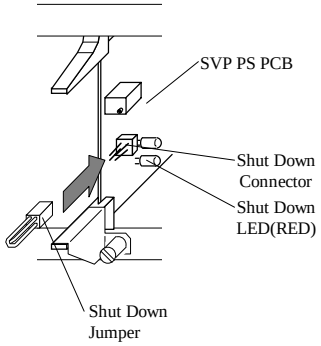
1. Check that the Shut Down LED is on. Connect the Shut Down Jumper to the Shut Down Connector. (only hot replace)

> **⚠ CAUTION**
> A system down may be caused if the Shut Down jumper socket is inserted in a PCB other than that to be replaced Make sure that it is the PCB to be replaced.

Wait for 15 seconds after inserting the jumper, then go to next operation.



Front View of DKC

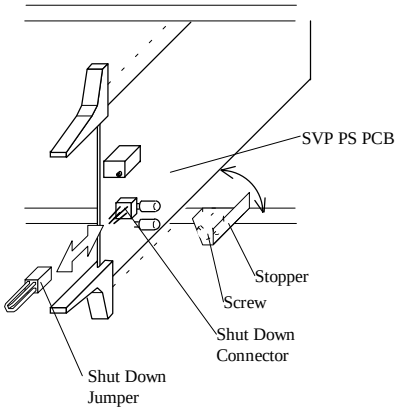


Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

2. Replace the SVP PS PCB.

a. Loosen the screw and rotate the stopper.
b. Remove the SVP PS PCB.
c. Remove the Shut Down Jumper and connect it to the spare PCB.
d. Insert the spare PCB.
e. Remove the Shut Down Jumper from the spare PCB.
f. Rotate the stopper and fasten the screw.



3. Go to SVP post procedure t3 [REP04-820].

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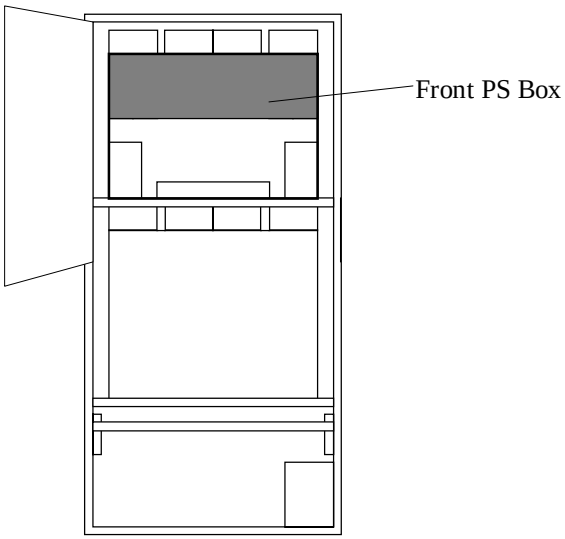
[HARDWARE T26]

Location	Function Name of Component		Part Name
Front PS Box in DKC	1	HUB PCB	• SH088-A



Front View
of DKC

Notice : Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will ensure that the IC and LSI on the PCB are protected from static electricity.

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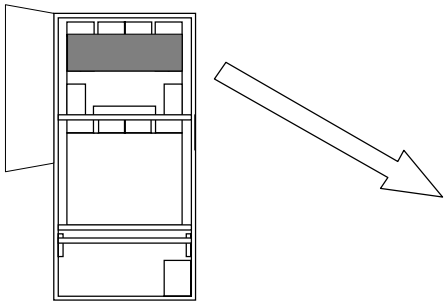
HUB

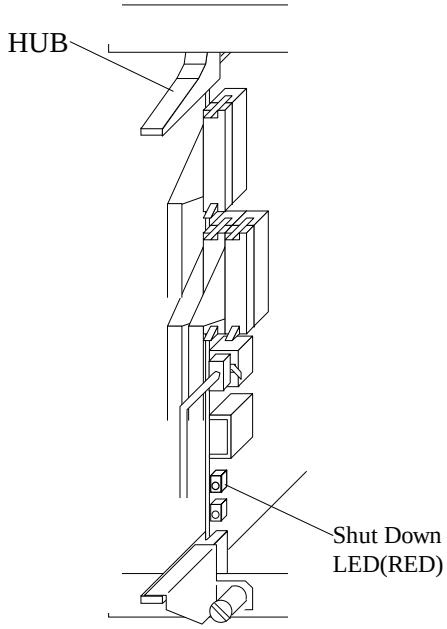
1. Check that the Shut Down LED is on. (only hot replace)



Front View
of DKC

Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTL 1	SSVP	HUB	PWR CTL 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						



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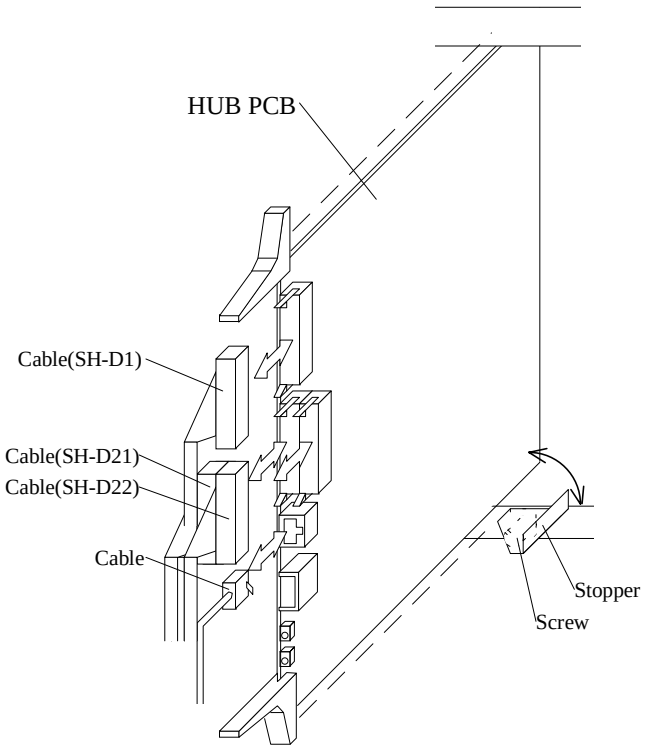
2. Replace the HUB PCB.

a. Loosen the screw and rotate the stopper.
b. Remove the cables from the HUB PCB.
c. Replace the HUB PCB and attach the cables.
d. Rotate the stopper and fasten the screw.



3. Go to SVP post procedure t1 [REP04-490].

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[POST-PROCEDURE a]

— OUTLINE —

① Execute CUDG on P-DEV.
② Specify recovery.
③ Copy back
④ SIM Complete

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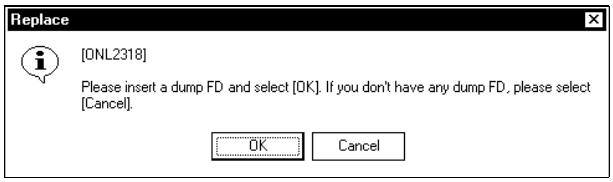
1. <Check the beginning of recovery>
   Please insert floppy disk and select (CL) [OK].
   Failure information of the physical device is written to the floppy disk.



   [Insert floppy disk :]
   "Please remove the FD." is displayed.
   Please remove the floppy disk and select (CL) [OK].

2. <Spin up the Physical Drive>
   "Spinning up..." is displayed.

3. <DKU INLINE>
   "DKU INLINE is now running..." is displayed.

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Blank Sheet

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4. <Replacement of the DKU micro-program>
   When the revision of the DKU micro-program in the SVP hard disk is newer than that in the PDEV, the following message appears on the screen.
   The message “Exchanging DKU micro-program...” appears.

5. <Restore Physical Drive>
   “Restoring...” is displayed.

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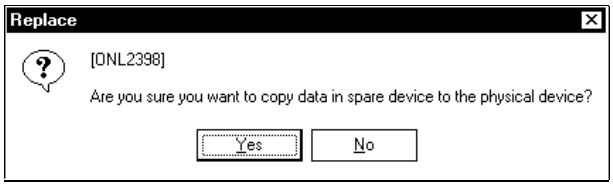
6. <Checking the Physical Drive>
"Checking..." is displayed.

7. <Check beginning of copyback>
Select (CL) [Yes] in response to "Are you sure you want to copy data in spare device to the physical device?".



8. <Check starting of copyback>
"Copying..." is displayed.
Select (CL) [OK] in response to "Copying data in spare device to the physical device has been started.".

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9. <SIM Complete>
   Go to SVP02-500.

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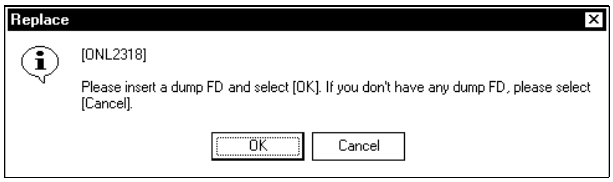
[POST-PROCEDURE b]

— OUTLINE —

① Execute CUDG on P-DEV.
② Specify recovery.
③ Correction copy
④ Reset ORM Error Count on the P-DEV.
⑤ Reset Threshole Counter
⑥ SIM Complete

Copyright ©1997, Hitachi, Ltd.

1. <Check the beginning of recovery>
   Please insert floppy disk and select (CL) [OK].
   Failure information of the physical device is written to the floppy disk.



   [Insert floppy disk :]
   "Please remove the FD." is displayed.
   Please remove the floppy disk and select (CL) [OK].

2. <Spin up the Physical Drive>
   "Spinning up..." is displayed.

3. <DKU INLINE>
   "DKU INLINE is now running..." is displayed.

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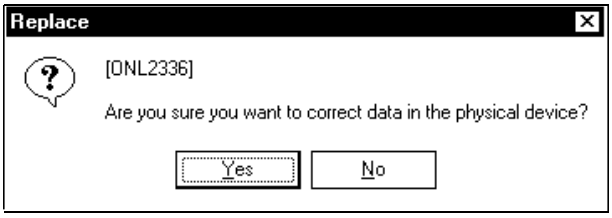
4. <Restore Physical Drive>
"Restoring..." is displayed.

5. <Checking the Drive Status>
"Checking..." is displayed.
Device is still blocked.

6. <Check beginning of correction copy>
Select (CL) [Yes] in response to "Are you sure you want to correct data in the physical device?".



7. <Correcting data>
"Correcting..." is displayed.

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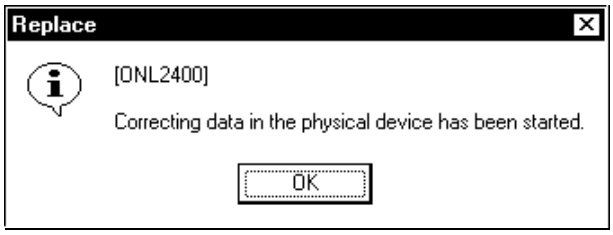
8. <Check the starting of Correction copy>
Select (CL) [OK] in response to “Correcting data in the physical device has been started.”.



9. <Check the end of P-DEV recovery>
Select (CL) [OK] in response to “Replace finished.”.

10. <SIM Complete>
Go to SVP02-500.

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[POST-PROCEDURE c]

— OUTLINE —

① Perform L-DEV formatting on P-DEV.
② Reset ORM Error Count on P-DEVs.
③ Recover with backup data.
④ Reset Threshold Counter
⑤ SIM Complete

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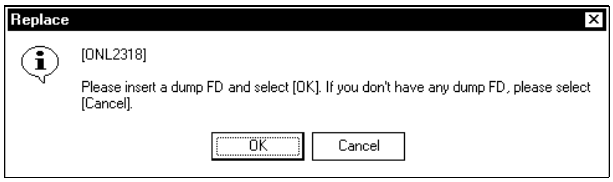
1. <Check the beginning of recovery>
   Please insert floppy disk and select (CL) [OK].
   Failure information of the physical device is written to the floppy disk.



   [Insert floppy disk :]
   "Please remove the FD." is displayed.
   Please remove the floppy disk and select (CL) [OK].

2. <Spin up the Physical Drive>
   "Spinning up..." is displayed.

3. <DKU INLINE>
   "DKU INLINE is now running..." is displayed.

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4. <Replacement of the DKU micro-program>
   When the revision of the DKU micro-program in the SVP hard disk is newer than that in the PDEV, the following message appears on the screen.
   The message “Exchanging DKU micro-program...” appears.

5. <Restore Physical Drive>
   “Restoring...” is displayed.

6. <Checking the Drive Status>
   “Checking...” is displayed.

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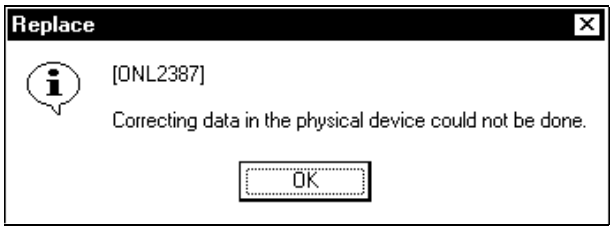
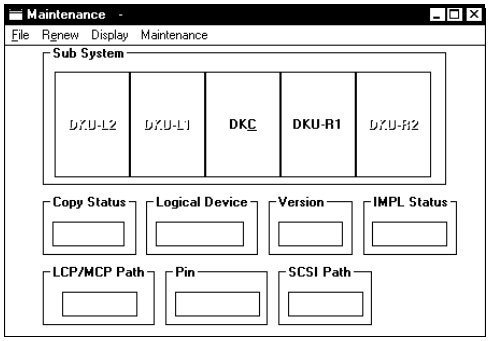
7. <Correction Copy disable message>
Select (CL) [OK] in response to “Correcting data in the physical device could not be done.”.



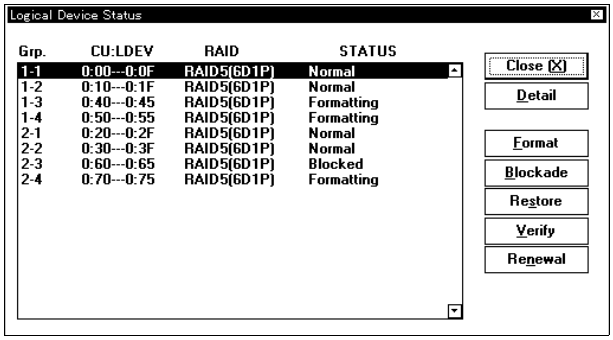
NOTICE
If a blocked HDD exists in the same parity group, replace the HDD.
After confirming that "NORMAL" is indicated for all the HDDs in the same parity group, execute an L-DEV formatting following the procedure below.

8. <Select [Logical Device]>
Select (CL) [Logical Device] from [Maintenance].

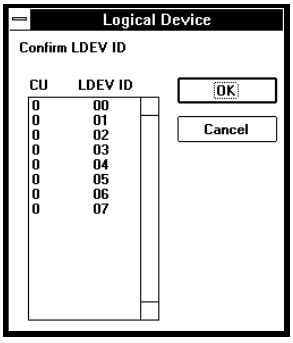


NOTICE
Before you perform following steps, be sure to call T.S.C.
Data housed in Logical Device will be lost due to formatting Logical Device.

9. <Logical Device Status>
Select (CL) [Format...].



10. <Format Logical Device>
Select (CL) corresponding LDEV from the LDEV ID list in the ‘Logical Device’ dialog box and select (CL) [OK].
If target LDEV was not blocked, return to ‘Logical Device Status’ dialog box.



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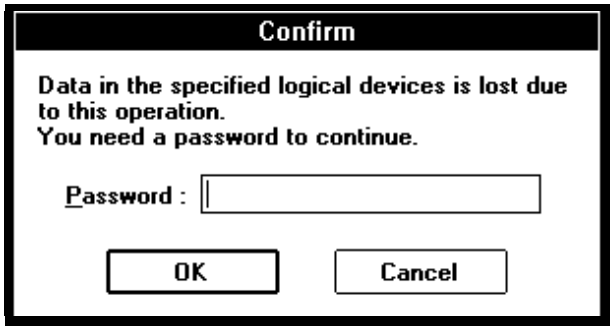
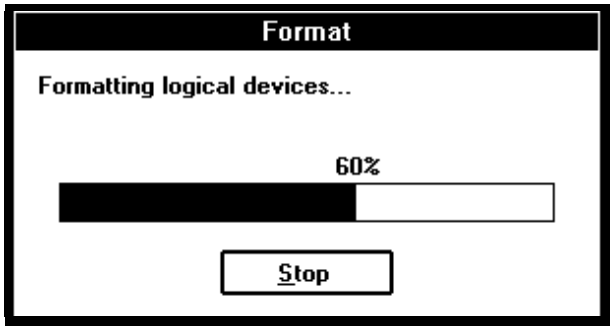
11. <Caution message for DATA lost>
"Data in the specified logical devices is lost due to this operation You need a password to continue." is displayed.
Enter the password and select (CL) [OK].

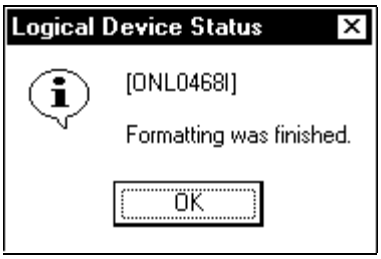


NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

12. <Check Formatting the logical Device>
"Formatting the logical device..." is displayed.



13. <Check the end of Format Logical Device>
Select (CL) [OK] in response to "Formatting was finished.".



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14. <SIM Complete>
    Go to SVP02-500.

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15. <Recover data>
Ask the customer for recovering data with backup data.

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[POST-PROCEDURE d]

— OUTLINE —

① Execute CUDG on P-DEV.
② Specify recovery.
③ Reset ORM Error Count on the P-DEV.
④ Reset Threshold Counter
⑤ SIM Complete

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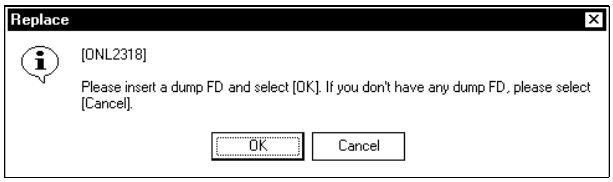
1. <Check the beginning of recovery>
   Please insert floppy disk and select (CL) [OK].
   Failure information of the physical device is written to the floppy disk.



   [Insert floppy disk :]
   "Please remove the FD." is displayed.
   Please remove the floppy disk and select (CL) [OK].

2. <Check the spin up process>
   "Spinning up..." is displayed.

3. <Check the INLINE process>
   "DKU INLINE is now running..." is displayed.

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4. <Replacement of the DKU micro-program>
   When the revision of the DKU micro-program in the SVP hard disk is newer than that in the PDEV, the following message appears on the screen.
   The message “Exchanging DKU micro-program...” appears.

5. <Restore Physical Drive>
   “Restoring...” is displayed.

6. <Check the end of P-DEV recovery>
   Select (CL) [OK] in response to “Replace finished.”.

7. <SIM Complete>
   Go to SVP02-500.

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[POST-PROCEDURE e]

— OUTLINE —

① Execute CUDG on cache.
② Specify recovery.
③ SIM Complete

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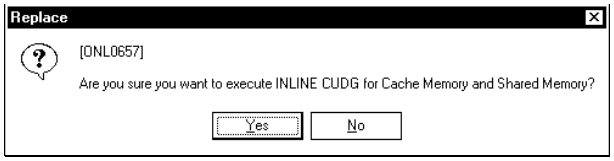
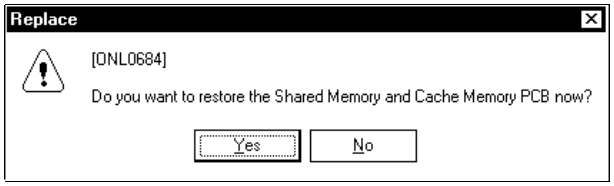
1. <Check the execution of INLINE CUDG>
   When you selected [Replace (INLINE)]:
   Select (CL) [No] in response to:
   * For CACHE (with SM)
   "Are you sure you want to execute INLINE CUDG for Cache Memory and Shared Memory?"
   * For CACHE
   "Are you sure you want to execute INLINE CUDG for Cache Memory?"



   When you selected [Replace]:
   Go to 2.

2. <INLINE CUDG>
   "INLINE CUDG is now running..." is displayed.

3. <Check the beginning of cache/SM recovery>
   Select (CL) [Yes] in response to:
   * For CACHE (with SM)
   "Do you want to restore the Shared Memory and Cache Memory PCB now?"
   * For CACHE ---------- [Go to step 3]
   "Do you want to restore the Cache Memory PCB now?"



NOTICE
Selecting "No" stops the recovery and places the cache in the status being blocked for maintenance.

4. <Restoring the Shared Memory>
   "Restoring the Shared Memory PCB..." is displayed.

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5. <Restoring the Cache Memory>
   "Restoring the Cache Memory PCB..." is displayed.

6. <Check the end of Cache/Shared Memory recovery>
   Select (CL) [OK] in response to "Replace finished.".

7. <SIM Complete>
   Go to SVP02-500.

8.
   Close 'cache-xx' window.
   Close 'cluster-n' window.
   Close 'DKC' window.

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[POST-PROCEDURE f]

— OUTLINE —

① Specify recovery for CHA/DKA.
② Path online (for CHA)
③ SIM Complete

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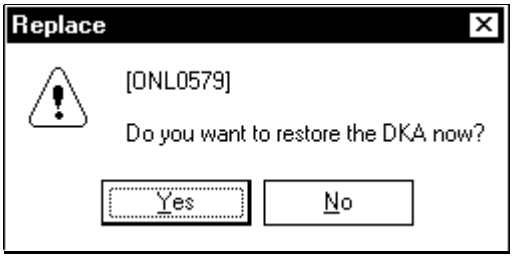
1. <Check the beginning of CHA/DKA recovery>
   Select (CL) [Yes] in response to:
   * For CHA
   “Do you want to restore the CHA now?”
   Go to step 3.
   * For DKA
   “Do you want to restore the DKA now?”
   Go to step 2.



NOTICE
Selecting "No" stops the CHA/DKA recovery and places it in the status being blocked for maintenance.

2.
   “DKU PATH INLINE is now running...” is displayed.
   (for DKA)

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3. <Check the CHA/DKA recovery processing>
   The following message is displayed:
   * For CHA
   “Restoring the CHA...”

   * For DKA
   “Restoring the DKA...”
   “SCSI BUS initialization process is running...”
   “Restoring the DKA...”

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4. <Check the end of CHA/DKA recovery>
   Select (CL) [OK] in response to “Replace finished.”.

NOTICE
Confirm the version of the exchanged CHA/DKA microprogram on the "STATUS" screen.

5. <Path on-line when CHA is replaced>
   Whenever a CHA is replaced, set the path (from the host) on the replaced CHA to ONLINE by your customer.

6. <SIM Complete>
   Go to SVP02-500.

7.
   Close ‘CHA-xx’ window.
   Close ‘cluster-n’ window.
   Close ‘DKC’ window.

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[POST-PROCEDURE h]

— OUTLINE —

① Specify recovery of DKA for SCSI BFR.
② SIM Complete

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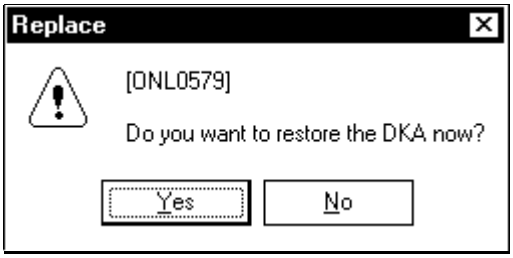
1. <Check the beginning of DKA recovery>
   Select (CL) [Yes] in response to “Do you want to restore the DKA now?”.



2. <DKU PATH INLINE>
   “DKU PATH INLINE is now running...” is displayed.

3. <Check DKA recovery processing>
   “Restoring the DKA...” is displayed.

4. <Check the end of SCSI BFR replace>
   Select (CL) [OK] in response to “Replace finished.”.

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5. <SIM Complete>
   Go to SVP02-500.

6.
   Close ‘HDU-xxx’ window.
   Close ‘DKU-xx’ window.

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[POST-PROCEDURE i]

— OUTLINE —

① Specify recovery for CHA/DKA.
② SIM Complete

NOTICE

This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

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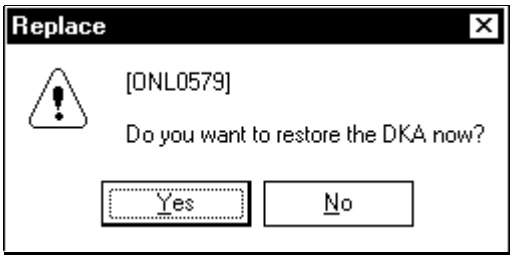
NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

1. <Check the beginning of DKA recovery>
   Select (CL) [Yes] in response to:
   “Do you want to restore the DKA now?”
   Go to step 2.



2.
   “DKU PATH INLINE is now running...” is displayed.

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NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

3. <Check the DKA recovery processing>
   The following message is displayed:
   “Restoring the DKA...”

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NOTICE
This processing is a special procedure for detecting a cause of a bus error.
Contact the technical support center before performing this processing.

4. <Check the end of DKA recovery>
   Select (CL) [OK] in response to “Replace finished.”.

5.

BLANK

6. <SIM Complete>
   Go to SVP02-500.

7.

   Close ‘DKA-xx’ window.
   Close ‘cluster-n’ window.
   Close ‘DKC’ window.

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[POST-PROCEDURE t1]

— OUTLINE —

① Specify end of special part replacement.
② Reinstall related parts.
③ Start environment monitor.
④ SIM Complete

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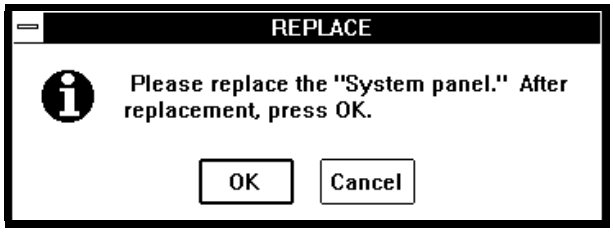
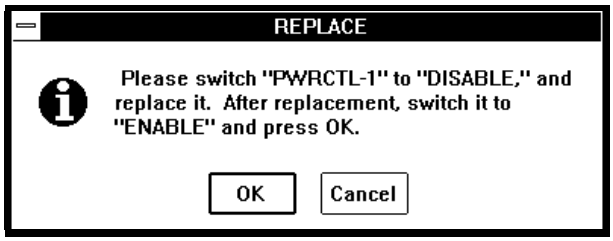
[1] Start of POST-PROCEDURE

1. <Check replacement of special part>
Select (CL) [OK] in response to “Please replace the "XXXXX." After replacement, press OK.”.
Valid “XXXXX” values are listed below.



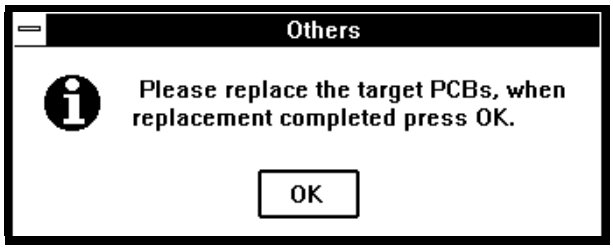
- System panel------ Go to [16] (REP04-790)
- PCI CONN-------- Go to [5] (REP04-560)
- RCU CONN ------ Go to [6] (REP04-570)
- EPO SW---------- Go to [7] (REP04-580)
- RS CONN--------- Go to [13] (REP04-760)
- OP panel 1/2 ------ Go to [2] (REP04-510)
- PWRCTL 1/2 ----- Go to [4] (REP04-550)
- OUTLET BOX --- Go to [13] (REP04-760)

Select (CL) [OK] in response to “Please switch "XXXXX" to "DISABLE," and replace it. After replacement, switch it to "ENABLE" and press OK.”
Valid “XXXXX” values are listed below.



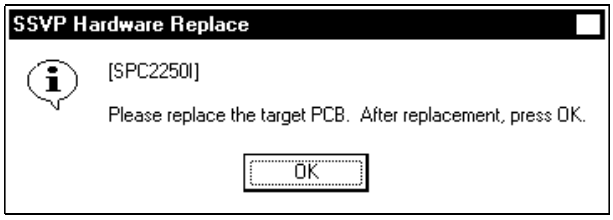
- CE panel---------- Go to [3] (REP04-540)

Select (CL) [OK] in response to “Please replace the target PCBs, when replacement completed press OK.”.



- TM PCB---------- Go to [10] (REP04-710)
- SVP ---------- Go to [9] (REP04-610)

Select (CL) [OK] in response to “Please replace the target PCB. After replacement, press OK.”.



- SSVP ---------- Go to [12] (REP04-740)
- HUB ---------- Go to [8] (REP04-600)

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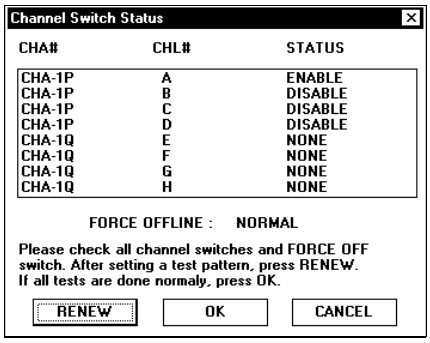
[2] OP panel

If all channel types are SCSI, execute only <LED TEST>.

1. <Diagnostic of SW. on OP panel>

Select (CL) [OK] in response to "Please set all channel switches to DISABLE, and FORCE OFF switch to NORMAL. Then press OK.".

Select (CL) [RENEW] in response to "Please check all channel switches, and FORCE OFF switch. After setting a test pattern, press RENEW.".
If all tests are done normally, select (CL) [OK].
Note: You can't test the channel which displayed "SCSI" or "NONE" at STATUS column.



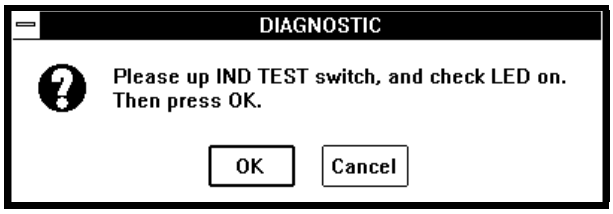
TEST PATTERN

PATTERN#	CHL#								FORCE
	A	B	C	D	E	F	G	H	OFF
1	○	×	×	×	×	×	×	×	×
2	×	○	×	×	×	×	×	×	×
3	×	×	○	×	×	×	×	×	×
4	×	×	×	○	×	×	×	×	×
5	×	×	×	×	○	×	×	×	×
6	×	×	×	×	×	○	×	×	×
7	×	×	×	×	×	×	○	×	×
8	×	×	×	×	×	×	×	○	×
9	×	×	×	×	×	×	×	×	○

○ : ENABLE (FORCE OFF switch. : OFF)
× : DISABLE (FORCE OFF switch. : NORMAL)

<LED TEST>

Select (CL) [OK] in response to "Please up IND TEST switch, and check LED on. Then press OK.".
If there are no parallel channels, go to [13] (REP04-760).



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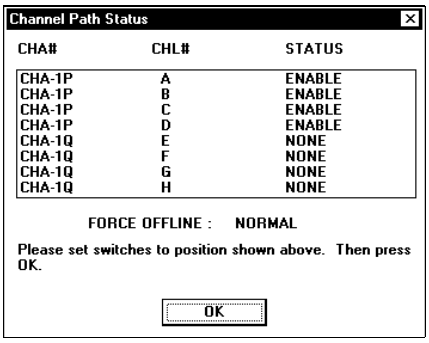
2. <Display CH SW status>

Check whether the CH switch settings are the same as those on the replaced OP panel. And select (CL) [OK].

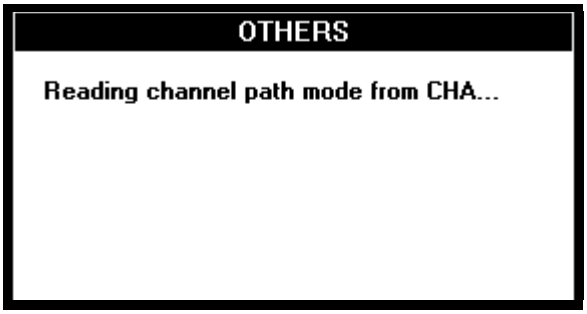


STATUS:
- ENABLE : Channel is enable (parallel channel)
- DISABLE : Channel is disable(parallel channel)
- SERIAL : Serial channel
- SCSI : SCSI channel
- BLOCKADE : Connected CHP is blocked up.
- NONE : Channel is not installed.

FORCE OFFLINE
- OFFLINE : FORCE OFFLINE
- NORMAL : NOT FORCE OFFLINE

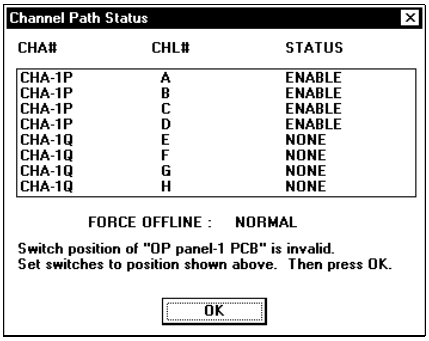
3. <Read channel mode>

"Reading channel path mode from CHA..." is displayed.
If all switches are set correctly, go to 6.
If some switches are illegal, go to 4.



4. <Channel switch incorrect>

Please set switches correctly, and select (CL) [OK].



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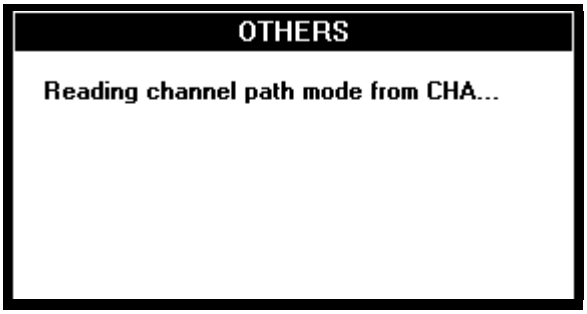
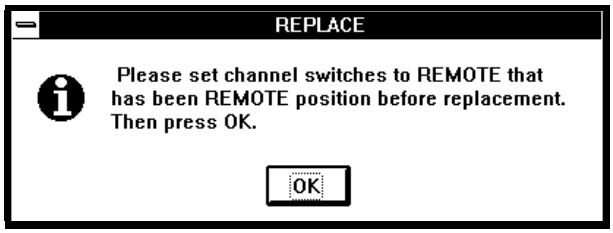
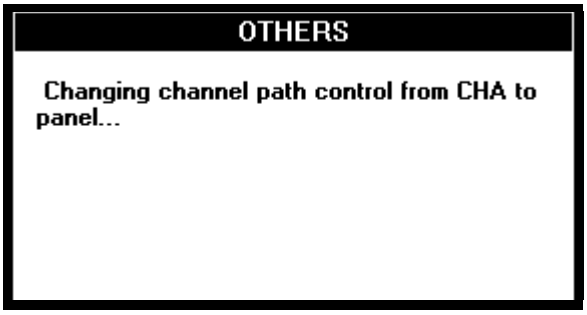
5. <Read channel mode>
"Reading channel path mode from CHA..." is displayed.
If all switches are set correctly, go to 6.
If some switches are illegal, go to 4.
If step 4 is performed twice, go to 8.



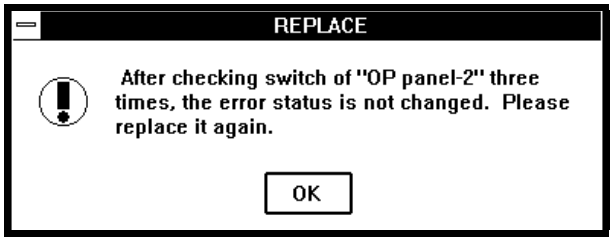
6. <Set channel switches to REMOTE>
Set channel switches to REMOTE that has been REMOTE position before replacement.
Refer to memorandum is 2 of PRE-PROCEDURE T1 [2] (REP02-520).
Select (CL) [OK].



7. <change CHP mode>
"Changing channel path control from CHA to panel..." is displayed.
Go to [13] (REP04-760).



8. <error status>
If step 4 is performed twice, the error message is displayed as shown on the right.
Select (CL) [OK], go to [14] (REP04-770).



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[3] CE panel

1. <Set REMOTE/LOCAL>
   Set REMOTE/LOCAL switch, in response to the message “Please set "REMOTE/LOCAL" switch of "CE panel""XXXXX". Then press OK.”.
   “XXXXX” represents “REMOTE” or “LOCAL”.
   After confirming that switch set, select (CL) [OK].
   Go to [11] (REP04-720).

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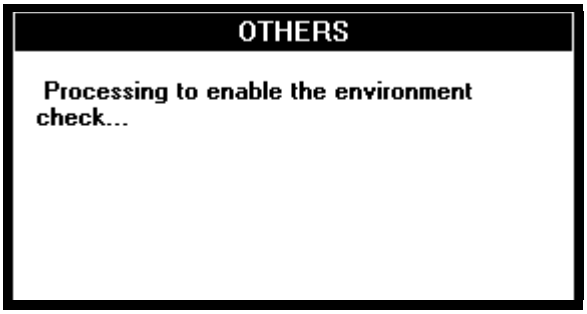
[4] PWRCTL 1/2

1. <Enable DKUMN>
   Enable DKUMN in response to “Please switch "XXXXX" of all DKU to "ENABLE." Then press OK.”. After confirming DKUMN is enabled, select (CL) [OK].

   XXXXX
   • For PWRCTL-1:
   [Power on DKUMN on front side of DKU]
   • For PWRCTL-2:
   [Power on DKUMN on rear side of DKU]

2. <Check environment monitor start processing>
   “Processing to enable the environment check...” is displayed.

   Go to [13] (REP04-760).



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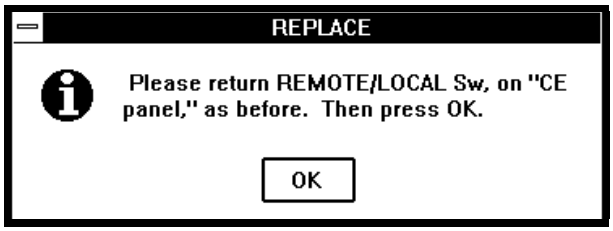
[5] PCI CONN

1. <Reset CE panel SW>
   Reset REMOTE/LOCAL SW to original value in response to “Please return REMOTE/LOCAL Sw, on "CE panel," as before. Then press OK.” (see HARDWARE T6) (REP03-1260 step 7).
   After checking SW setting, select (CL) [OK].
   Go to [13] (REP04-760).



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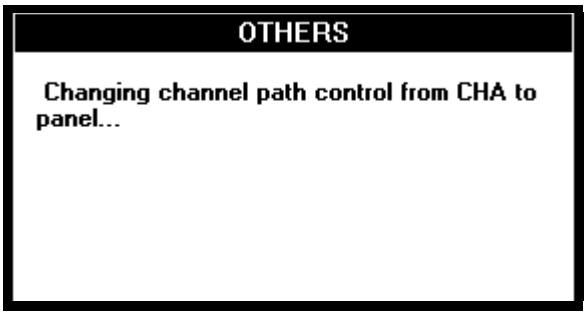
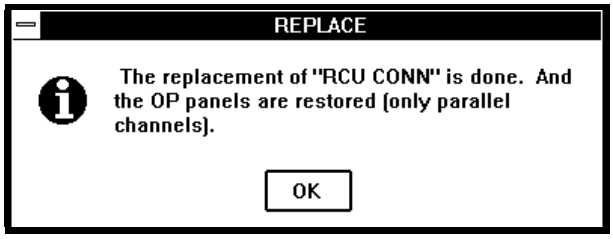
[6] RCU CONN

1. <Change CHP mode>
   "Changing channel path control from CHA to panel..." is displayed.



2.
   "The replacement of "RCU CONN" is done. And the OP panels are restored (only parallel channels)." is displayed.
   Select (CL) [OK].

   Go to [15] (REP04-780).



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[7] EPO SW

1.

The SVP automatically checks the EPO SW status.
Go to [11] (REP04-720).

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Blank Sheet

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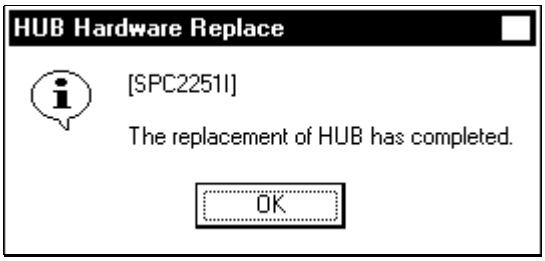
[8] HUB

1. The message “Restoring DKC-SVP communication. Wait...” is displayed.

   Wait about 5 minutes.

2. Select (CL) [OK] in response to “The replacement of HUB has completed.”.
   Go to [15] (REP04-780).



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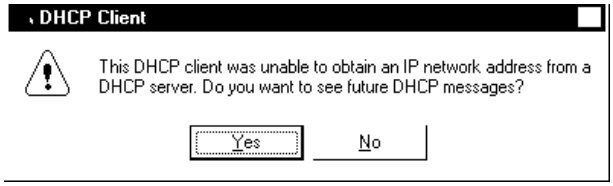
[9] SVP

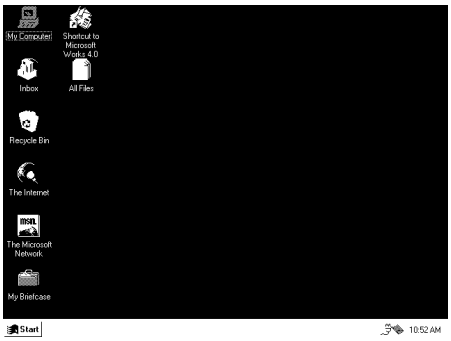
1. Powering up the SVP

1-1. Set LAN Card Driver

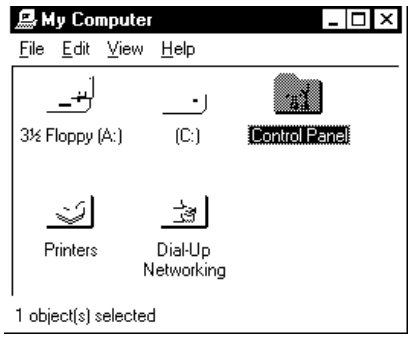
If SVP displays a message, “This DHCP client was unable to obtain an IP network address from a DHCP server. Do you want to see future DHCP messages?”, select (CL) [Yes].



(1) <Open “My Computer”>
Select (DC) “My Computer”.



(2) <Open “Control Panel”>
Select (DC) “Control Panel” from “My Computer”.



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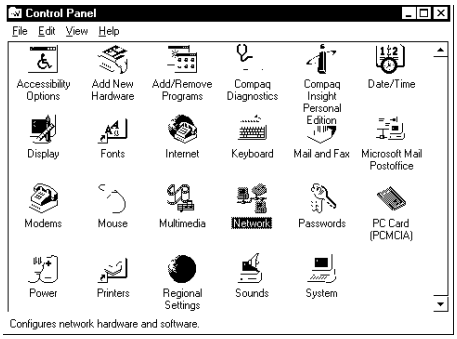
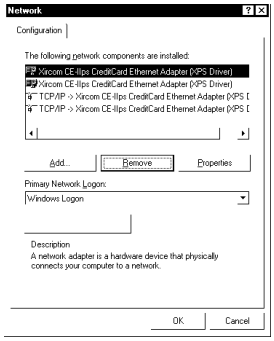
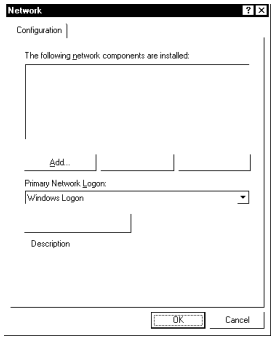
(3) <Open “Network”>
Select (DC) “Network” from “ Control Panel”.



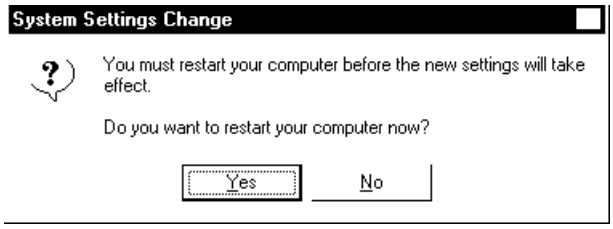
(4) <Delete “Network components”>
Select (CL) one of the “Network components” from “Configuration”, and select (CL) [Remove]. Delete other all “Network components” for this operation.



(5) <Close “Network”>
Select (CL) [OK] from “Configuration” of “Network”.



(6) <Reboot the SVP>
Select (CL) [Yes] in response to “You must restart your computer before the new settings will take effect.
Do you want to restart your computer now?”.



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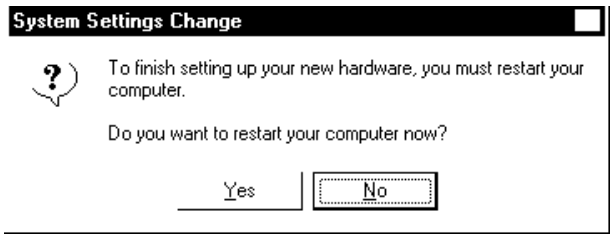
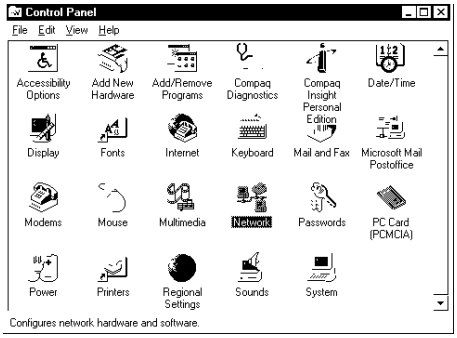
(7) <Check setting LAN Card Driver>
Select (CL) [No] in response to “To finish setting up your new hardware, you must restart your computer.
Do you want to restart your computer now?”.

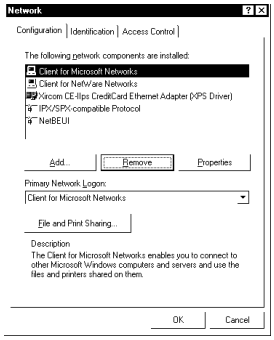


(8) <Open “Network”>
Select (DC) “Network” from “Control Panel”.

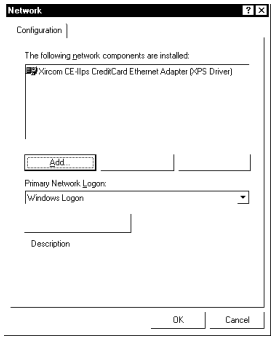


(9) <Delete “Network components”>
Select all “Network components” from “Configuration” of “Network” except the following necessary “Network components”, and select (CL) [Remove].

Necessary “Network components”
• Xircom CE-IIps Credit Card Ethernet Adapter [XPS Driver]
• Xircom Credit Card Ethernet Adapter 10/100



(10) <Add “Network components”>
Select (CL) [Add...] from “Configuration” of “Network”.



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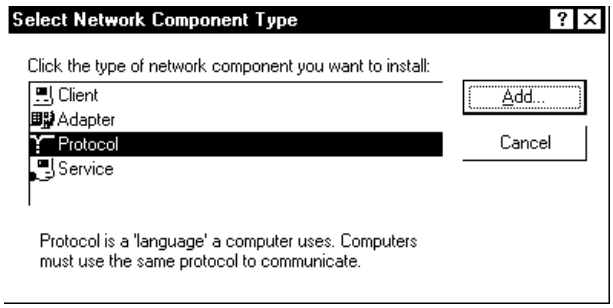
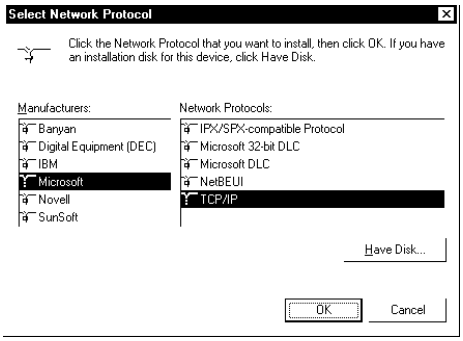
(11) <Add “Protocol”>

Select (CL) “Protocol” from “Select Network Components Type”, and select (CL) [Add...].



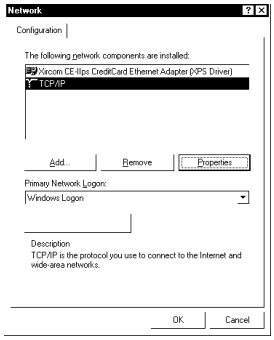
(12) <Select “Protocol”>

Select (CL) “Microsoft” from “Manufacturers”, and “TCP/IP” from “Network Protocols”, and select (CL) [OK].



(13) <Set “TCP/IP”>

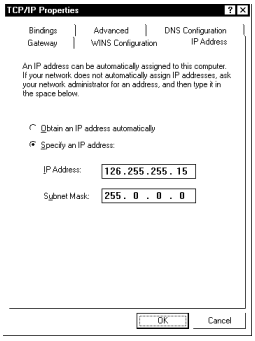
Select (CL) “TCP/IP” from “Configuration”, and select (CL) [Properties].



(14) <Select “IP Address”>

Select (CL) “IP Address”.

Select (CL) “Specify an IP Address”, and set “126.255.255.15” for “IP Address”, and set “255.0.0.0” for “Subnet Mask”, and select (CL) [OK].



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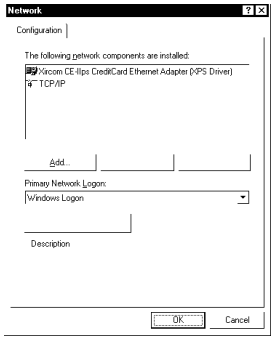
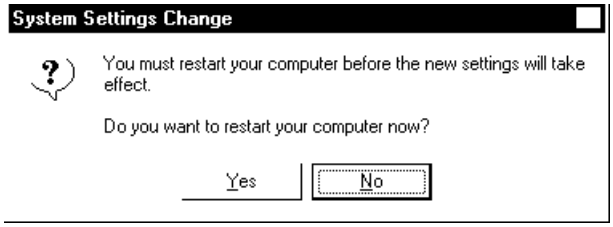
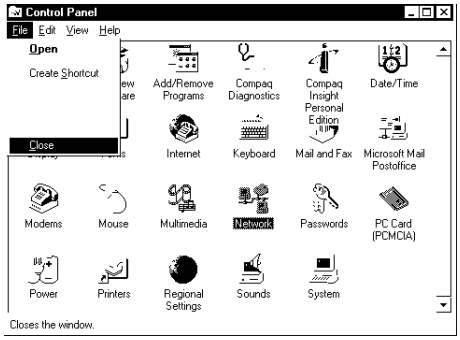
(15) <Close “Network”>
Select (CL) [OK] from “Configuration” of “Network”.



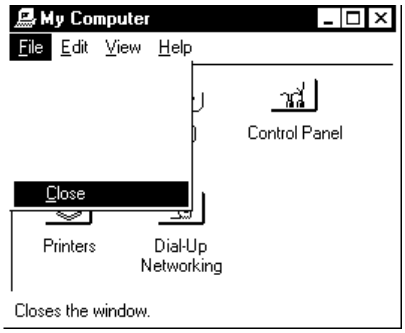
(16) <Check reboot SVP>
Select (CL) [No] in response to “You must restart your computer before the new settings will take effect.
Do you want to restart your computer now?”.



(17) <Close “Control Panel”>
Select (CL) [File] on “Control Panel”.
Select (CL) [Close].



(18) <Close “My Computer”>
Select (CL) [File] on “My Computer”.
Select (CL) [Close].



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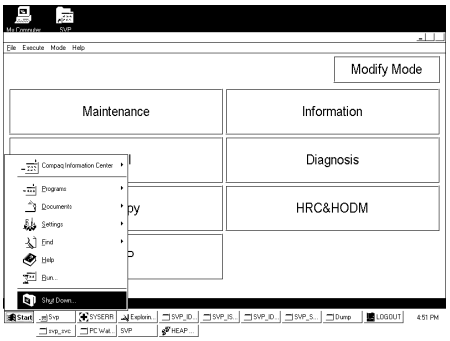
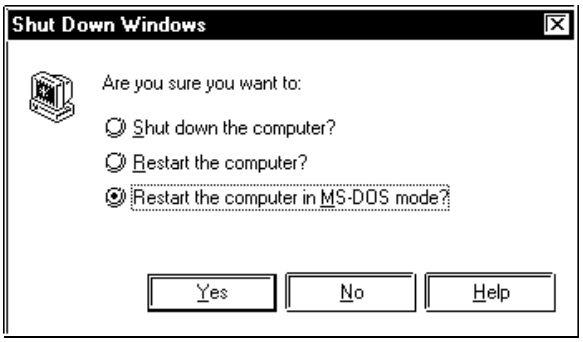
2. <Restart the computer in MS-DOS mode>

(1) <Shut Down Windows>
Select (CL) [Start].
Select (CL) [Shut Down].



(2) <Restart the computer in MS-DOS mode>
Select "Restart the computer in MS-DOS mode" from Shut Down Windows, and select (CL) [Yes] in response to "Are you sure you want to:".



3. <Installation of Micro-program>
① Insert the floppy disk of (1/24 or 1/31) into the FDD.
② Input "a:\setcopy.bat" in 'DOS prompt', and press the [Enter] key.
③ When the message "SET FD NO. (2/24 or 1/31)" is displayed, insert the floppy disk of (2/24 or 1/31) into the FDD and press the [Enter] Key.
④ Copy the remaining floppy disks ((3/24 or 3/31) through (24/24 or 31/31)) in succession in response to the displayed messages.
⑤ When the message "SET FD NO. (1/24 or 1/31)" is displayed, insert the floppy disk of (1/24 or 1/31) into the FDD and press the [Enter] key.
⑥ Remove the floppy disk of (1/24 or 1/31) from FDD.

4. <Copy the SVP information to HD>
① Insert the floppy disk of (1/24 or 1/31) into the FDD.
② Input "a:\pcconf.bat" in 'DOS prompt' and press the [Enter] key.
③ The message ""pcconf" change START!!" is displayed, when the message ""pcconf" change END!!" is displayed, file copy, is complete.
④ Press the [Enter] key, and remove the floppy disk of (1/24 or 1/31) from the FDD.

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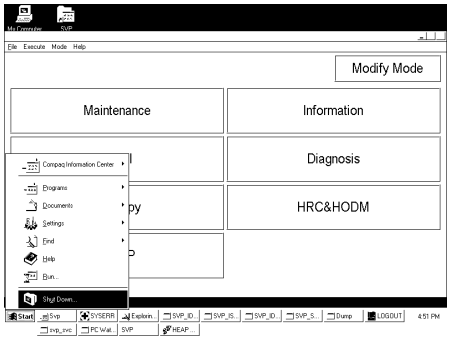
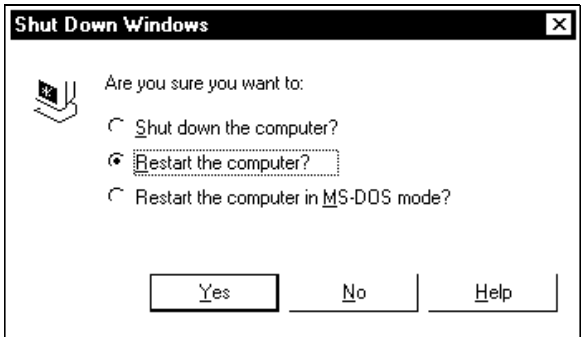
5. <Reboot the SVP>
① Reboot the SVP by [Alt], [Ctrl], and [Del] keys simultaneously.

6. <Installation of Program group and item>
① Insert the floppy disk of (1/24 or 1/31) into the FDD.
② Select (CL) [Start]. Select (CL) [Run...].
③ Input "a:\setup.exe" on 'open', and select (CL) [OK]. The 'SVP' and the 'Startup' groups will be made.
④ Remove the floppy disk of (1/24 or 1/31) from FDD.

6-1. <Reboot the SVP>
(1) <Shut Down Windows>
Select (CL) [Start].
Select (CL) [Shut Down].



(2) <Reboot the SVP>
Select (CL) "Restart the computer" from Shut Down Windows, and select (CL) [Yes] in response to "Are you sure you want to:"



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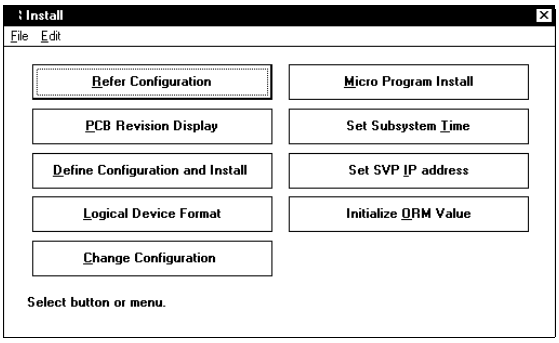
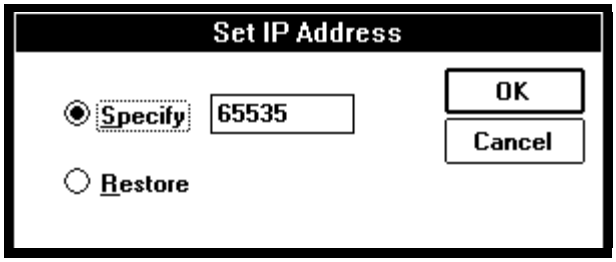
7. <Set IP address of SVP>

(1) <Open [Install]>
Select (CL) [Install] from 'SVP'.

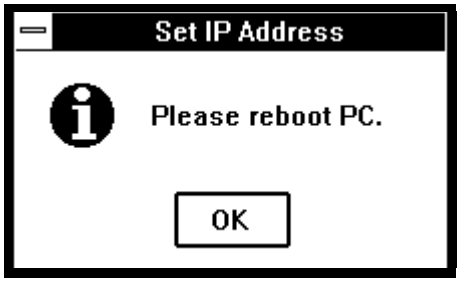
(2) <Select [Set Subsystem IP Address...]>
Select (CL) [Set Subsystem IP Address...] from 'Install'.



(3) <Set IP Address>
Select (CL) [Specify], Enter "Serial No.".
Select (CL) [OK].



(4) <Check SVP reboot>
Select (CL) [OK].



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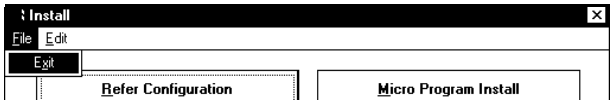
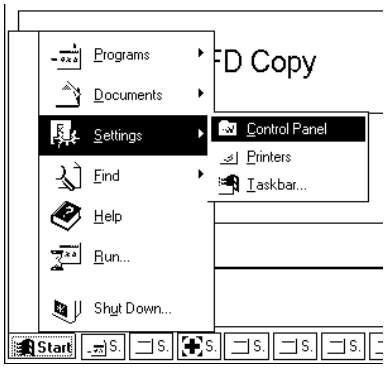
(5) <Select [Exit]>
Select (CL) [File].
Select (CL) [Exit].

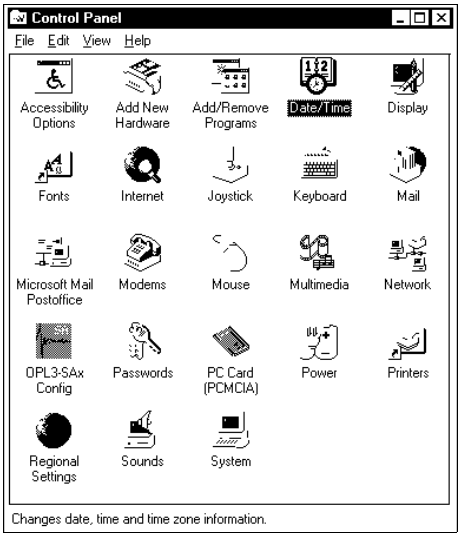


7-1. <Check of Time Zone setting>

(1) <Open [Control Panel]>
Select (DR) [Settings] and then [Control Panel] from [Start].



(2) <Open [Date/Time]>
Select (DC) [Date/Time] from [Control Panel].



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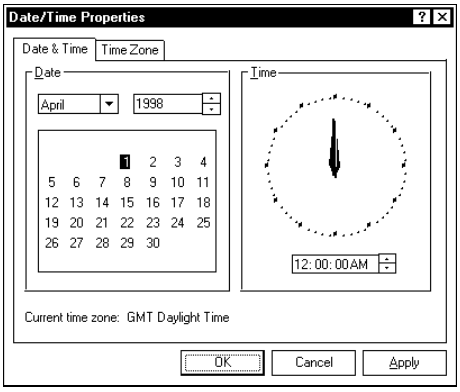
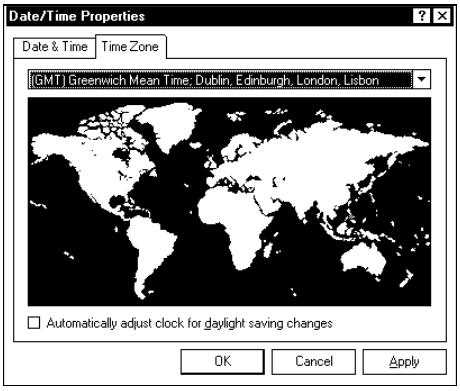
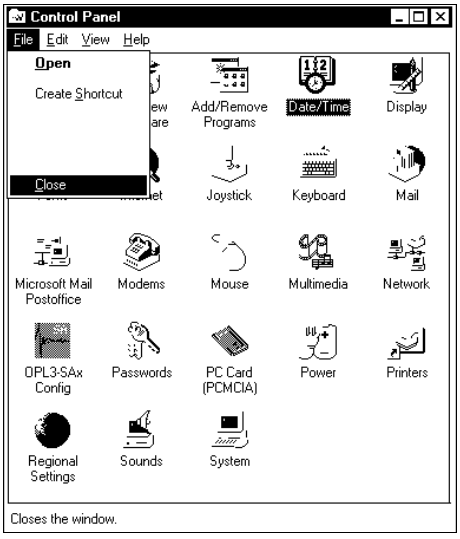
(3) <Select [Time Zone]>
Select (CL) [Time Zone].



(4) <Check the setting of [Time Zone]>
Make sure that the setting of [Time Zone] is "[GMT] Greenwich Mean Time; Dublin, Edinburgh, London, Lisbon". Also, make sure that a check box on the left of "Automatically adjust clock for daylight saving changes" is ☐ (without a check mark). Then, press [OK] (CL).



(5) <Close [Control Panel]>
Select (DR) [File] and then [Close] from [Control Panel].



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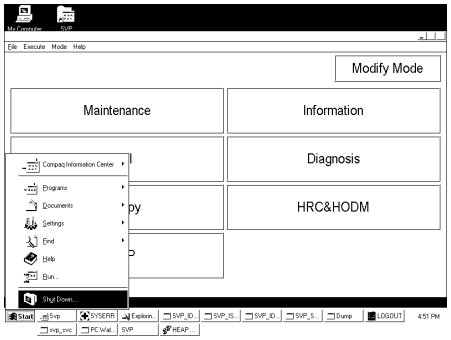
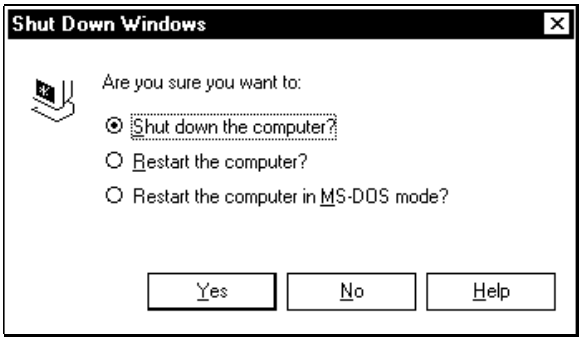
7-2. <TOD Setting>
See SVP02-10.

8. <Reboot the SVP>

(1) <Shut Down Windows>
Select (CL) [Start].
Select (CL) [Shut Down].



(2) <Shut down the SVP>
Select (CL) “Shut down the computer?” from Shut Down Windows, and select (CL) [OK] in response to “Are you sure you want to:”.



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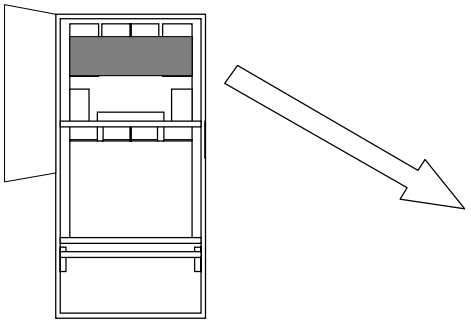
8-1. <Connect the RS232C cable>

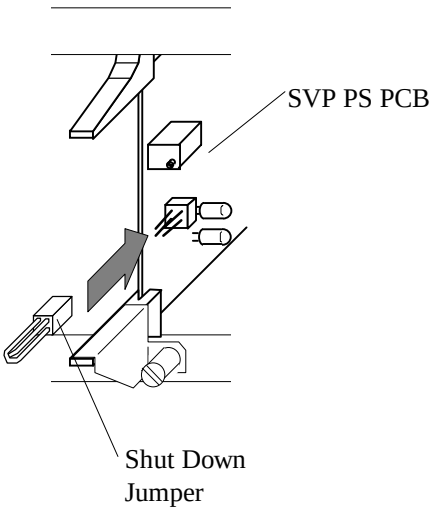
(1) Power Off SVP

① Insert the Shut Down Jumpers in SVPPS1 and SVPPS2.

② Wait for one minite.



Front View of DKC

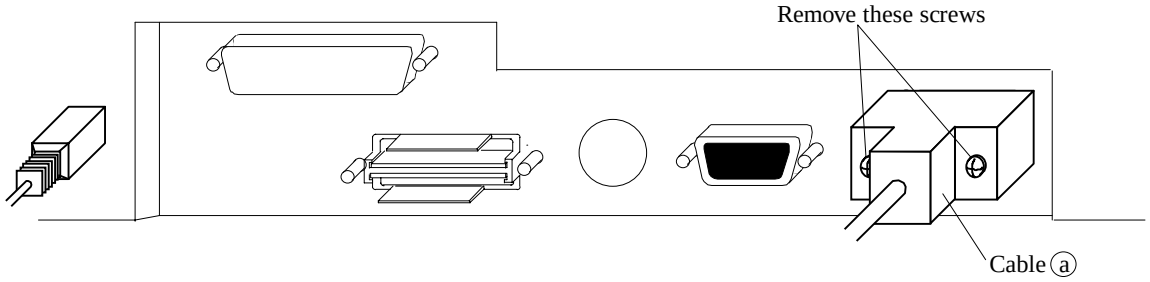


Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

(2) Connect the RS232C cable from the SVP

① Connect the ⓐ (RS232C cable) from the SVP



Rear View of SVP

(3) Remove the Shut Down Jumpers in SVPPS1 and SVPPS2.

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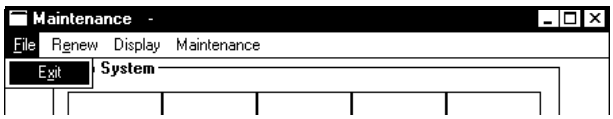
9. <Load the Configuration from the SM to the SVP's HDD>

(1) <Open [Maintenance]>
Wait a few minutes, message "Loading SVP Program... SVP requests to DKC can not be performed presently. Please wait..." will be extinguished.
Then select (CL) [Maintenance] form 'SVP'.

(2)
Check "Connection error occurred SVP-DKC." is not displayed.
If "Connection error occurred SVP-DKC" is displayed, see TRBL05-70.

(3) <Select [Exit]>
Select (CL) [File] from the "Maintenance".
Select (CL) [Exit].



10. <SSVP Reset>
Press the "SSVP ALARM RESET" switch (see ㉚ on page LOCATION03-40).
Open the "Maintenance" window and wait until the initializing SSVP message ceases to be displayed (for about 15 minutes).

11. <SIM Complete>
See SVP02-500.
[End of POST-PROCEDURE]

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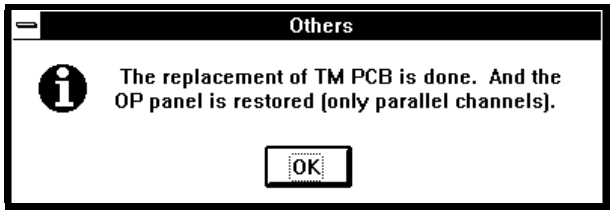
[10] TM PCB (Terminator)

If message to varied off the concerned channel path(s) was displayed, go to 2.
Else, go to 1.

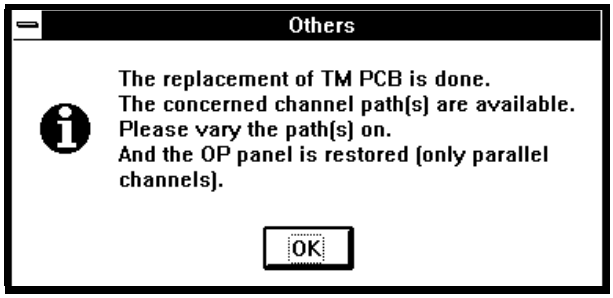
1.

Select (CL) [OK] in response to the displayed message after replacing.
Close 'BUS System' window.
Go to [15] (REP04-780).



2.

If the message is displayed as shown on the right, the concerned channel paths are available, please vary the paths on-line.
Select (CL) [OK].
Close 'BUS System' window.
Go to [15] (REP04-780).



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[11] DETACH JUMPER

1. <Detach jumper>
   Detach jumper from HUB in response to “Please detach "CE PANEL INH" jumper plug. Then press OK.”.
   After confirming that jumper is detached, select (CL) [OK].
   The SVP automatically checks that jumper plug is detached.
   Go to [13] (REP04-760).

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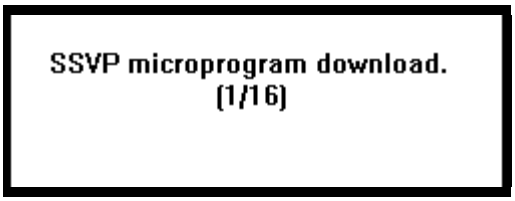
[12] SSVP

1.

The message “SSVP microprogram download.” is displayed. If the restore is successfully completed go to next step.



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2.

The message “The replacement of SSVP has completed.” is displayed. Select (CL) [OK]. Go to [15] (REP04-780).

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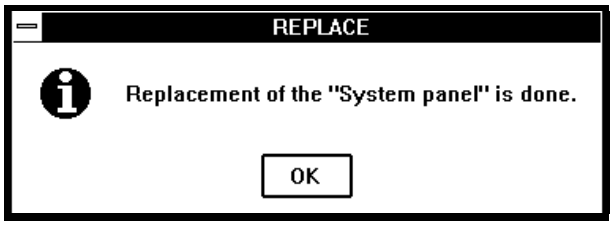
[13] ending check

1. <Check end of replacement>
   Select (CL) [OK] in response to “Replacement of the "XXXXX" is done.”.



2. <Confirm status>
   • PWRCTL-1/2
   Confirm the status display.
   If button is valid, go to [15] (REP04-780).
   If button is blinking, replace the target part again, or see TROUBLE SHOOTING SECTION.
   [End of POST-PROCEDURE]

   • Other PCB
   Go to [15] (REP04-780).

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[14] Replacement error

1.

The error message “Replacement of the "XXXXX" failed.” is displayed as shown on the right.
Select (CL) [OK].

[End of Replacement]

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[15] SIM Complete

See SVP02-500.
Close ‘DKC’ window.
Close ‘Maintenance’ window.

[End of POST-PROCEDURE]

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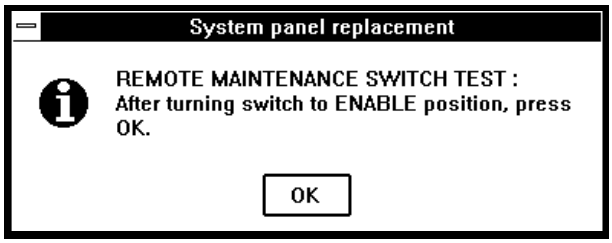
[16] System panel

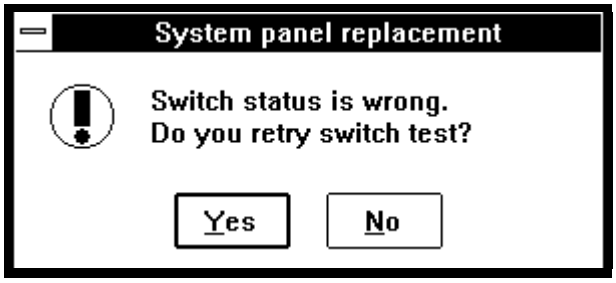
1.

Select (CL) [OK] in response to “REMOTE MAINTENANCE SWITCH TEST: After turning switch to ENABLE position, press OK.”.



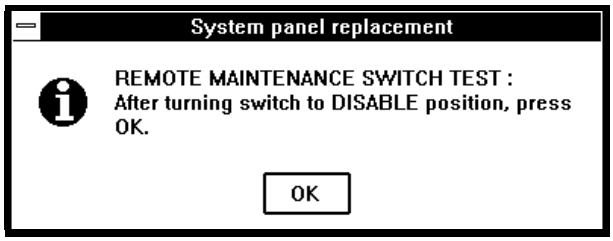
2.

If an error has occurred in the switch test, an error message is displayed.
If you select (CL) [Yes], go back to step 1.
If you select (CL) [No], go to [14] (REP04-770).



3.

Select (CL) [OK] in response to “REMOTE MAINTENANCE SWITCH TEST: After turning switch to DISABLE position, Press OK.”.



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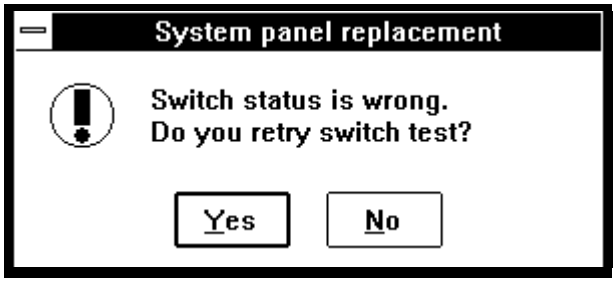
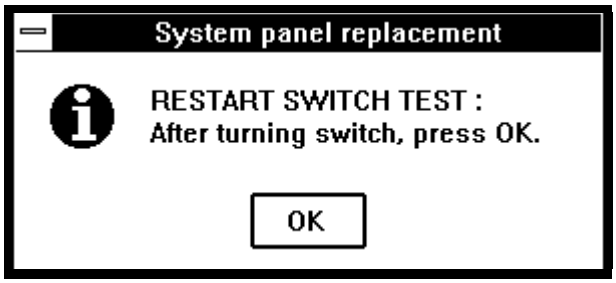
4.

If an error has occurred in the switch test, an error message is displayed.
If you select (CL) [Yes], go back to step 3.
If you select (CL) [No], go to [14] (REP04-770).



5.

Select (CL) [OK] in response to “RESTART SWITCH TEST: After turning switch, press OK.”.



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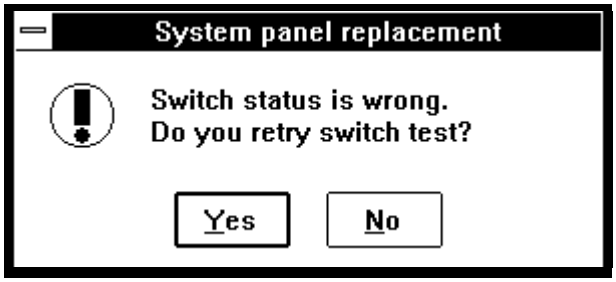
6.

If an error has occurred in the switch test, an error message is displayed.
If you select (CL) [Yes], go back step 5.
If you select (CL) [No], go to [14] (REP04-770).



7.

If switch test is successfully completed, go to [13] (REP04-760).

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[POST-PROCEDURE t3]

— OUTLINE —

① Specify end of special part replacement.
② Reinstall related parts.
③ Start environment monitor.
④ SIM Complete

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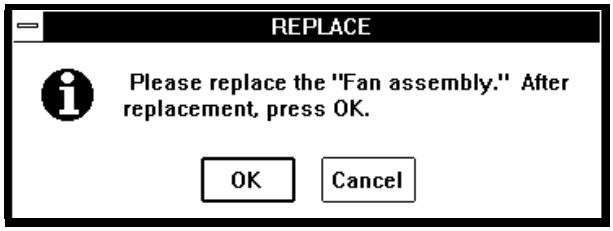
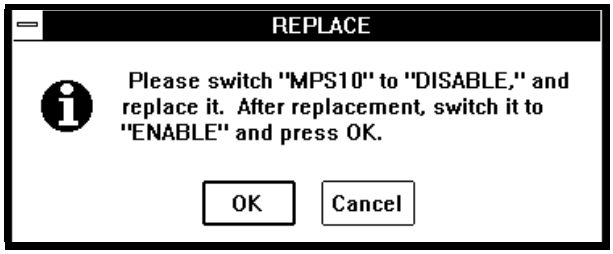
[1] START OF POST-PROCEDURE

1. <Check special part replacement>
   • 'xxPSn'
   When redundant power supply is not installed.
   ---------- Go to [6] (REP04-870)

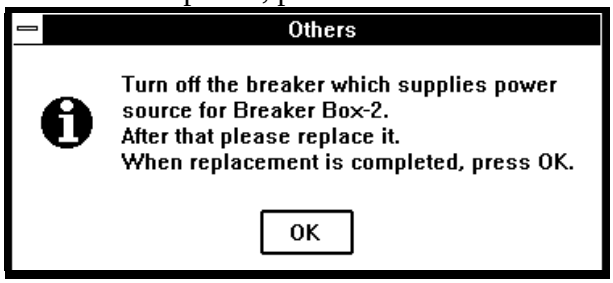
   Select (CL) [OK] in response to "Please replace the "XXXXX" After replacement, press OK.". Valid "XXXXX" values are listed below.
   • 'FAN'---------- Go to [2]-2 (REP04-850)
   • 'Battery' ---------- Go to [2]-2 (REP04-850)
   • 'TH'---------- Go to [2]-2 (REP04-850)
   • 'BATCTR'-------- Go to [2]-2 (REP04-850)
   • 'SVP PSn' -------- Go to [2] (REP04-850)



   Select (CL) [OK] in response to "Please switch "xxPSn" to "DISABLE," and replace it. After replacement, switch it to "ENABLE" and press OK.".
   • 'xxPSn'
   When redundant power supply is installed.
   ---------- Go to [2]-2 (REP04-850)



   Select (CL) [OK] in response to "Turn off the breaker which supplies power source for Breaker Box-n. After that please replace it. When replacement is completed, press OK.".
   • 'Breaker Box-n'
   When redundant power supply is installed
   ---------- Go to [2]-2 (REP04-850)
   Not installed.------ Go to [3] (REP04-860)



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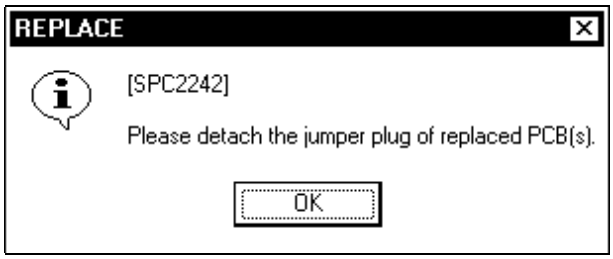
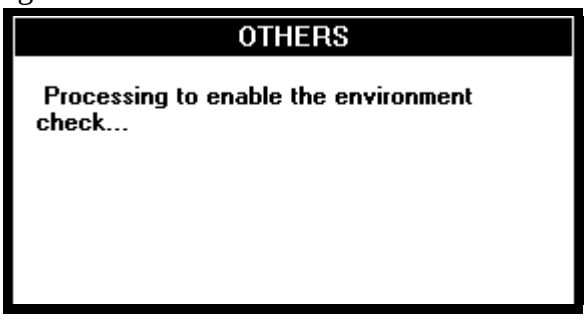
[2] FAN, PS, SVPPS, Battery, BATCTR, TH, Breaker Box

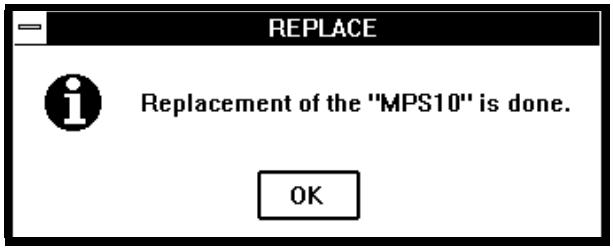
1. <Detach jumper>
   Detach jumper from replaced PCB in response to “Please detach the jumper plug of replaced PCB(s).”.
   After confirming that jumper is detached, select (CL) [OK].



2. <Checking the environment monitor start processing>
   “Processing to enable the environment check...” is displayed.



3. <Checking the end of replacement>
   Select (CL) [OK] in response to “Replacement of the "XXXXX" is done.”.



4. <Confirm status>
   • FAN, PS, SVPPS, Battery, BATCTR, TH
   Confirm the status display.
   If button is valid, go to [4] (REP04-870).
   If button is blinking, replace the target part again, or see TROUBLE SHOOTING SECTION.
   [End of POST-PROCEDURE]

   • Breaker Box-n
   Go to [4] (REP04-870).

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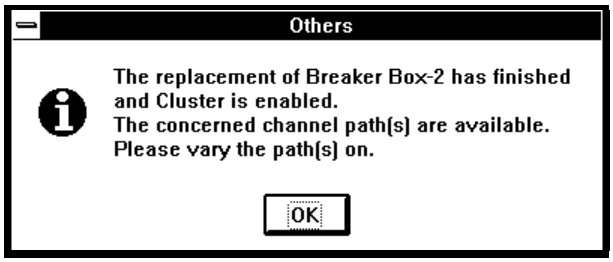
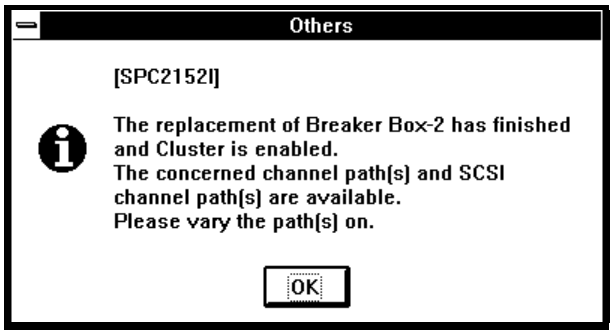
[3] Breaker Box-n

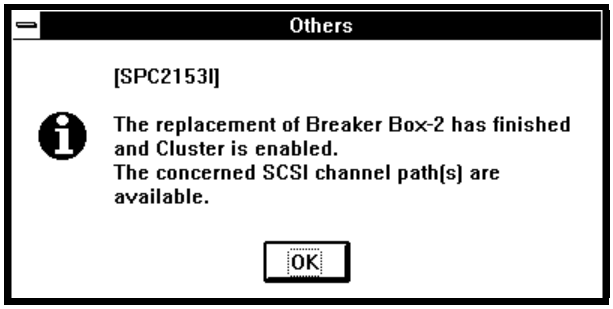
1. <checking end of replacement>
   - When only serial or parallel channels, or they are mixed.
     Select (CL) [OK] in response to "The replacement of Breaker Box-n has finished and Cluster is enabled. The concerned channel path(s) are available. Please vary the path(s) on.".



   - When SCSI channels and other kinds are mixed.
     Select (CL) [OK] in response to "The replacement of Breaker Box-n has finished and Cluster is enabled. The concerned channel path(s) and SCSI channel path(s) are available. Please vary the path(s) on.".



   - When only SCSI channels are installed.
     Select (CL) [OK] in response to "The replacement of Breaker Box-n has finished and Cluster is enabled. The concerned SCSI channel path(s) are available.".



Go to [4] (REP04-870).

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[4] Confirm Cluster

- PS, Breaker Box
  If Cluster is blocked, recover it.
  See SVP02-890.
  Go to [5] (REP04-870).
- FAN, Battery, BATCTR, TH, SVPPS
  Go to [5] (REP04-870).

---

[5] SIM Complete

See SVP02-500.
Close ‘Cluster-X’ window.
Close ‘DKC’ window.
Close ‘Maintenance’ window.

[End of POST-PROCEDURE]

---

[6] PS

1. <Recover Cluster>
   - 5VPS, 3VPS, MPS
     Recover cluster that include target PS.
     See SVP02-890.
     Go to [4] (REP04-870).

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[POST-PROCEDURE t4]

— OUTLINE —

① Specify end of special part replacement.
② Reinstall related parts.
③ Start environment monitor.
④ DKU Path Inline Test.
⑤ SIM Complete.

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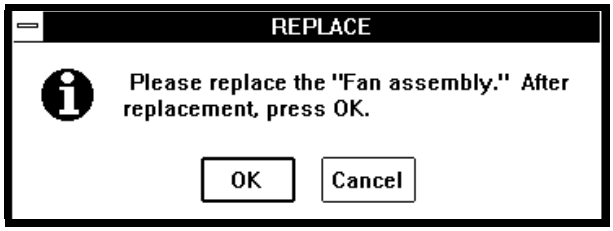
[1] Start of POST-PROCEDURE

1. <Making part replacement check>

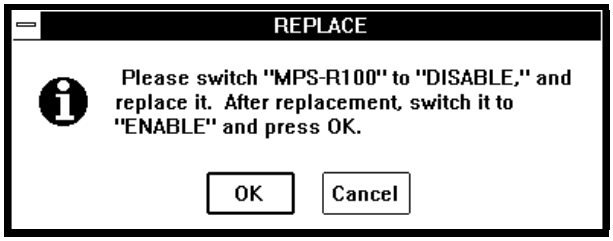
• FAN

Select (CL) [OK] in response to “Please replace the "XXXXX" After replacement, press OK.”
Valid “XXXXX” values are listed below.
‘FAN’---------- Go to [2]-2 (REP04-900)



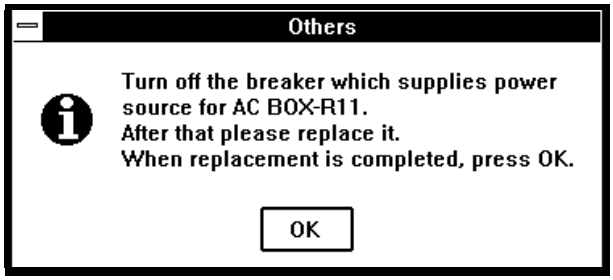
• MPS-n, DKUMN-n

Select (CL) [OK] in response to “Please switch "XXXXX" to "DISABLE," and replace it. After replacement, switch it to "ENABLE" and press OK.”.
‘MPS-n’ ---------- Go to [2]-2 (REP04-900)
‘DKUMN-R2n’, ‘DKUMN-L2n’
---------- Go to [2]-2 (REP04-900)
‘DKUMN-R1n’, ‘DKUMN-L1n’
---------- Go to [2] (REP04-900)



• AC BOX-n

Select (CL) [OK] in response to “Turn off the breaker which supplies power source for AC BOX-XXX. After that please replace it. When replacement is completed, press OK.”.



‘AC BOX-R1n’
When redundant power supply is installed
---------- Go to [2]-2 (REP04-900)
not installed--------- Go to [3] (REP04-920)
Other ‘AC BOX-n’
---------- Go to [4] (REP04-930)

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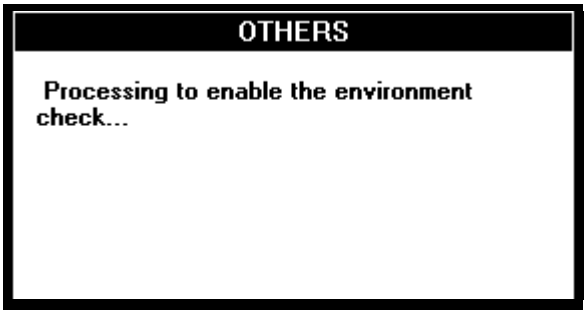
[2] DKUMN, FAN, MPS, AC BOX

1. <Enabling DKUMN>
When DKUMN-XXX (listed below) is installed, this message is displayed.
Enable DKUMN in response to “Please switch "DKUMN-XXX" to "ENABLE." Then press OK.”.
After confirming DKUMN-XXX is enabled, select (CL) [OK].

DKUMN-XXX:
- For DKUMN-R1F: XXX=R2F (“DKUMN-R2F”), Switch DKUMN-R2F to ENABLE.
- For DKUMN-R1R: XXX=R2R (“DKUMN-R2R”), Switch DKUMN-R2R to ENABLE.
- For DKUMN-L1F: XXX=L2F (“DKUMN-L2F”), Switch DKUMN-L2F to ENABLE.
- For DKUMN-L1R: XXX=L2R (“DKUMN-L2R”), Switch DKUMN-L2R to ENABLE.

2. <Checking environment monitor start processing>
“Processing to enable the environment check...” is displayed.



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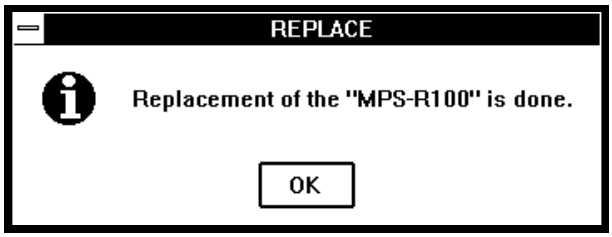
3. <Checking end of replacement>
Select (CL) [OK] in response to “Replacement of the "XXXXX" is done.”.



4. <Confirm status>
Confirm the status display.
If button is valid, go to [6] (REP04-940).
If button is blinking, replace the target part again, or TROUBLE SHOOTING SECTION.

[End of POST-PROCEDURE]

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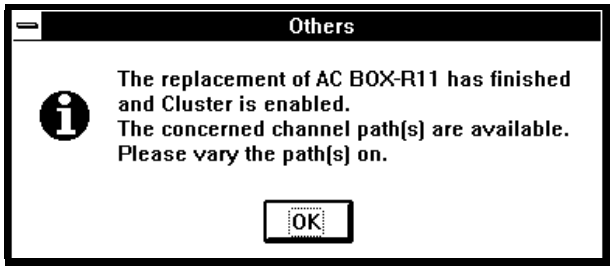
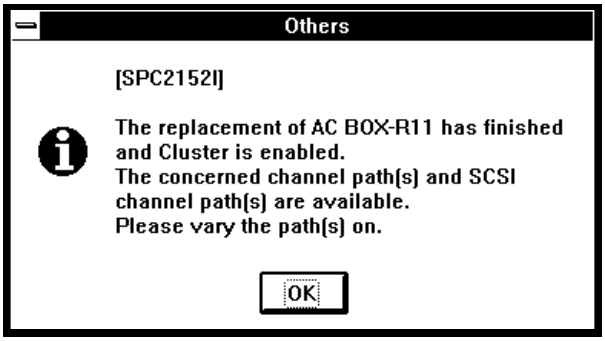
[3] AC BOX-R1n

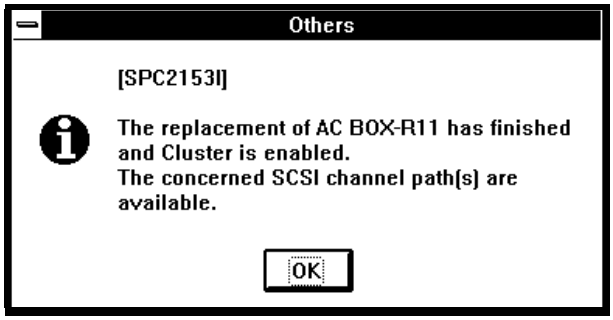
1. <End of replacement>
   If an error occurs, Go to [5] (REP04-940).
   - When only serial or parallel channels, or they are mixed.
     Select (CL) [OK] in response to "The replacement of AC BOX-R1n has finished and Cluster is enabled. The concerned channel path(s) are available. Please vary the path(s) on.".



   - When SCSI channels and other kinds are mixed.
     Select (CL) [OK] in response to "The replacement of AC BOX-R1n has finished and Cluster is enabled. The concerned channel path(s) and SCSI channel path(s) are available. Please vary the path(s) on.".



   - When only SCSI channels are installed.
     Select (CL) [OK] in response to "The replacement of AC BOX-R1n has finished and Cluster is enabled. The concerned SCSI channel path(s) are available.".



   Go to [6] (REP04-940).

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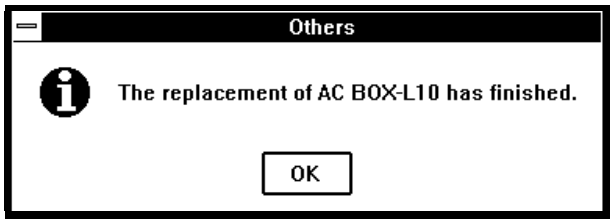
[4] AC BOX-n

1. <End of replacement>
   If an error occurs, go to [5] (REP04-940).
   Select (CL) [OK] in response to “The replacement of AC BOX-Rn/Ln has finished.”.
   Go to [6] (REP04-940).



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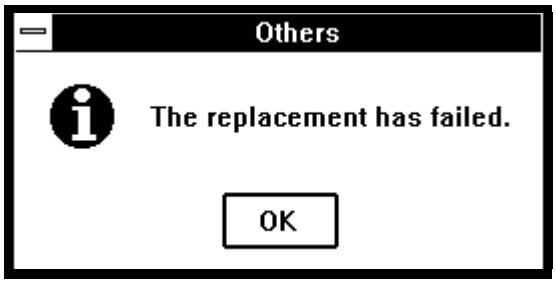
[5] Error

1. <Replacement error>
   Select (CL) [OK] in response to “The replacement has failed.”.



[End of POST-PROCEDURE]

---

[6] Confirm Cluster

- MPS-n, AC BOX-n
  If Cluster is blocked, recover it.
  See SVP02-890.
  Go to [7] (REP04-940).

- FAN, DKUMN-n
  Go to [7] (REP04-940).

---

[7] SIM Complete

See SVP02-500.
Close ‘HDU-xxx’ window. (When MPS-n or FAN)
Close ‘DKU-xx’ window.
Close ‘Maintenance’ window.

[End of POST-PROCEDURE]

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[POST-PROCEDURE u]

— OUTLINE —

① Execute CUDG on P-DEV.
② Specify recovery.
③ Correction copy
④ Reset ORM Error Count on the P-DEV.
⑤ Reset Threshole Counter
⑥ SIM Complete

NOTICE

This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

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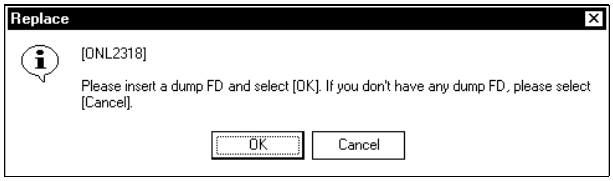
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

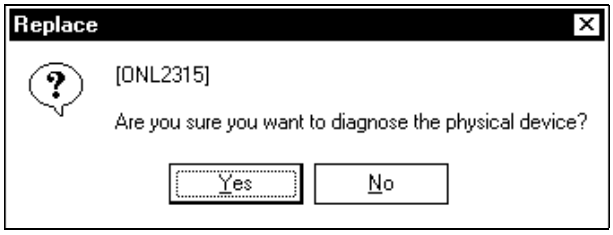
1. <Check the beginning of recovery>
   Please insert floppy disk and select (CL) [OK].
   Failure information of the physical device is written to the floppy disk.



   [Insert floppy disk :]
   "Please remove the FD." is displayed.
   Please remove the floppy disk and select (CL) [OK].

2. <Spin up the Physical Drive>
   "Spinning up..." is displayed.

3. <DKU INLINE>
   Select (CL) [No] in response to "Are you sure you want to diagnose the physical device?".



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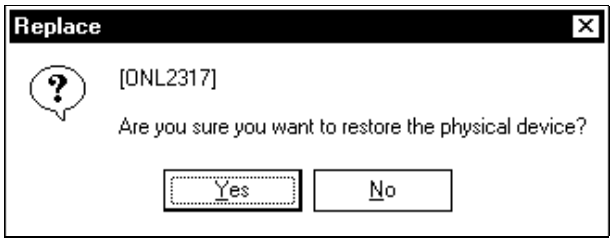
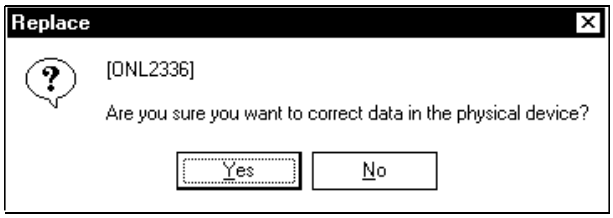
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

4. <Restore Physical Drive>
Select (CL) [Yes] in response to “Are you sure you want to restore the physical device?”.



5. <Checking the Drive Status>
“Checking...” is displayed.
Device is still blocked.

6. <Check beginning of correction copy>
Select (CL) [Yes] in response to “Are you sure you want to correct data in the physical device?”.



7. <Correcting data>
“Correcting...” is displayed.

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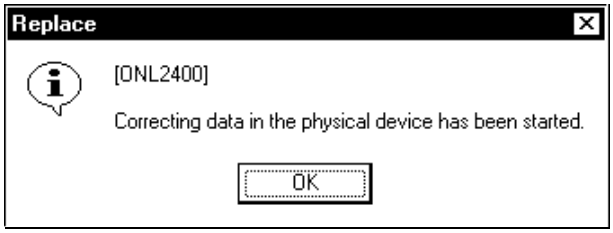
NOTICE
This processing is a special operation for detecting a cause of a SCSI bus error. Ask the technical support center about the appropriateness of the operation.

8. <Check the starting of Correction copy>
Select (CL) [OK] in response to “Correcting data in the physical device has been started.”.



9. <Check the end of P-DEV recovery>
Select (CL) [OK] in response to “Replace finished.”.

10. <SIM Complete>
Go to SVP02-500.

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DIAGNOSIS SECTION

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1 Types of Diagnoses

This subsystem's diagnostics consist of the five types of test routines listed below. They are selected according to the purpose and the part to be tested.

Table 1-1 Diagnostics Test Routines

Item No.	Type	Diagnosis	Part	Timing
1	CUDG3/ LCDG3	Initial diagnoses	CHA,DKA,CACHE/SHARED MEMORY	When DKC is powered on or CHA or DKA is replaced (automatic)
2	CUDG4 /LCDG4	Functional diagnoses executed when the unit is offline	CHA,DKA,CACHE/SHARED MEMORY	During installation (as specified by service personnel)
3	INLINE CUDG	Functional diagnoses executed when the unit is online	CACHE/SHARED MEMORY	When Cache or Shared memory is replaced or installed (automatic)
4	DKU INLINE	DKA-HDU functional (connection) check	DKA,SCSI BUFF,SCSI CTL,HDD	When an HDD is replaced (automatic) or during installation (as specified by service personnel)
5	LAN	LAN check between DKC and SVP	SVP,SSVP,DKA,CHA	When LAN communication error or communication time-out error is occurred.

Notes:
1. RUN Option can be set for CUDG4, LCDG4.
2. All RUN Option types are specified in Table 1-2, Table 1-3 and Table 1-4.
3. Because INLINE CUDG and DKU INLINE are executed automatically during Hot Replace, normally they are not executed.
4. Run Option set to a value other than "08" is valid only when performing DKU INLINE for one drive.

Table 1-2 CUDG RUN Option

Item No.	Run Option	If an error is not detected	If an error is detected
1	Normal	CUDG test will be executed only once.	CUDG test will be finished when an error is detected. And the error detail will be displayed on the SVP screen. After finishing the CUDG function, please refer to Diag log. (See 27 of DIAG04-90)
2	Loop	CUDG test will be executed continuously.	CUDG test will be finished when an error is detected. And the error detail will be displayed on the SVP screen. After finishing the CUDG function, please refer to Diag log. (See 27 of DIAG04-90)
3	Error Loop	CUDG test will be executed continuously.	Continuous CUDG test. And an error detail is displayed on the SVP screen. But the CUDG test will be continued testing.
4	Error Log	CUDG test will be executed continuously.	Continuous CUDG test. And an error detail will be displayed on the SVP screen. After finished the CUDG function, refer to Diag log. (See 27 of DIAG04-90)

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Table 1-3 DKU INLINE RUN Option

Item No.	RUN Option	Contents
1	01	Dynamic error display
2	02	Loop routine
3	03	Dynamic error display Loop routine
4	04	Link inhibit
5	05	Dynamic error display Link inhibit
6	06	Loop single routine
7	07	Dynamic error display Loop single routine
8	08	Reset RUN Option

Table 1-4 LCDG4 RUN Option

Item No.	RUN Option	If an error is detected
1	Normal	LCDG test will be executed only once. LCDG test will be finished when an error is detected. And the error detail will be displayed on the SVP screen. After finishing the LCDG function, please refer to Diag log. (See 27 of DIAG04-90)
2	Error Loop	Continuous execution of LCDG test. And an error detail will be displayed on the SVP screen. But the LCDG test will be continued testing.
3	Loop	Continuous execution of LCDG test. LCDG test will be finished when an error is detected. And an error detail will be displayed on the SVP screen. After finishing the LCDG function, please refer to Diag log. (See 27 of DIAG04-90)

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2 DIAG Details

2.1 CUDG3 (Control Unit Diagnosis 3)/LCDG3 (Link Control module Diagnosis 3)

CUDG3/LCDG3 is a collection of test routines that are started at system start time (when the unit power is turned on), prior to the execution of the main program and automatically check the basic functions of the unit to ensure the normal hardware operation of the system. The CUDG3/LCDG3 routines are listed in Table 2.1.

Table 2.1 CUDG3/LCDG3 Test Routines

Item No.	Routine Name	Function
1	CUDG3B	Local memory/RCHK diagnosis
2	CUDG3C0	MIC timer #5,6/interrupt diagnosis, LANC self-diagnosis
3	CUDG3C1	CHA PCB self-diagnosis
4	CUDG3C2	DKA PCB self-diagnosis
5	CUDG3C3	Shared resource diagnosis by all processors (SMP, SMC)
6	CUDG3C4	Shared resource diagnosis by all processors (DRR, CACHE)
7	CUDG3C5	Shared resource diagnosis by a delegated processor (SMC)
8	CUDG3C6	Shared resource diagnosis by a delegated processor (CACHE)
9	LCDG3	CS, for Serial/Parallel port, read/write test, internal diagnostic test, communication diagnostic test

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2.2 CUDG4 (Control Unit Diagnosis 4)/LCDG4 (Link Control module Diagnosis 4)

CUDG4/LCDG4 supports Cache memory/Shared memory read after full write tests and other tests that cannot be covered by CUDG3/LCDG3. It is executed by the service personnel when the unit is offline. After CUDG4/LCDG4, the subsystem PS OFF/ON is mandatory in order to return to ONLINE status of the subsystem. The CUDG4/LCDG4 test routines are listed in Table 2.2-1 and Table 2.2-2.

Table 2.2-1 CUDG4 Test Routines

Item No.	Routine Name	Function
1	P/K test Group	CHA/DKA diagnosis
2	SMC Normal test Group	SMC, SHARED MEMORY diagnosis (Normal test)
3	Cache Normal test Group	CACHE PCB, CACHE MEMORY diagnosis (Normal test)
4	SMC test Group	SMC, SHARED MEMORY diagnosis
5	Cache test Group	CACHE PCB, CACHE MEMORY diagnosis
6	Heatrun test Group	All the above tests are included.

Note 1: When 'Heatrun test Group' is selected, 'Run Option' settings are invalidated and diagnosis is executed under Heatrun mode.

Table 2.2-2 LCDG4 Test Routines

Item No.	Routine No.	Parameter	Contents of Test
1	10	—	(1) LCP Operation (2) LCP Register Test (3) Data Buffer Read/Write (4) SPS Function
2	20	—	(1) LCP-MP Communication Test (2) Data Transfer Test
3	30	CB750F	(1) Serial Channel Wraparound Test
4	40	—	(1) Optical Signal Defect Test
5	50	—	(1) Optical Signal Error Rate Check

Note 2: Routine 30 is used for running a serial channel wraparound test.
To execute Routine 30, the wraparound test connector is required.
Note 3: Routine 40 and Routine 50 are used for checking optical signals for the serial channel.
Note 4: If Routine 40 or Routine 50 is selected, RUN option will be selected only Normal.

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2.3 INLINE CUDG(INLINE Control Unit Diagnosis)

INLINE CUDG checks the validity of Cache memory and Shared memory when the entire disk subsystem is running normally. The INLINE CUDG test routines are listed in Table 2.3.

Table 2.3 INLINE CUDG Test Routines

Item No.	Routine Name	Function
1	Cache memory system	CACHE PCB, CACHE MEMORY diagnosis
2	Shared memory system	SMC (Shared Memory Control) diagnosis

2.4 DKU INLINE

The DKU INLINE execute the diagnosis of HDD equipped in DKU. The DKU INLINE test routines are listed in Table 2.4.

Table 2.4 DKU INLINE Test Routines

Item No.	Routine Name	Function
1	C1 Link series	HDD standalone test and check for normal operation against accesses from the higher-level unit (DKC)
2	DKU path inline	Check for connection between DKA (Disk Adapter) and HDU

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2.4.1 C1 Link series

The C1 Link series of test routines are used to ensure that the HDD is accessible to the Disk Controller when one is installed (a new or as an additional unit). This INLINE facility is also executed when a HDD is replaced during online processing as part of the recovery procedure to ensure that the HDD is normal. In this case, this INLINE facility runs automatically (with no SVP manipulation). The C1 Link series test routines are listed in Table 2.4.1.

Table 2.4.1 C1 Link Series Test Routines

Routine ID	Test Name	Function
C1	TEST UNIT READY & REQ.SENSE	Issues the TEST UNIT READY to the HDD and verifies that the status is GOOD or CHECK. The path is changed during this test to check both paths.
C2	START/STOP TEST	Issues the STOP COMMAND to the HDD and verifies that the command terminates normally. In 10 seconds, the test routine issues the START command and verifies that normal status is returned.
C3	INQUIRY	Checks the HDU-specific information.
C4	REZERO/ SEEK TEST	Executes CYL SEEK and REZERO and verifies that they terminate normally. Subsequently, perform seeks between 0 and 1, 0 and 2, 0 and 4, 0 and 8, 0 and 16, ..., 0 and 2048(cyl), 0 and MAX, and MAX and 0 to verify that the seeks terminate normally.
C5	READ/WRITE TEST	Make read/write tests on all heads on the CE cylinders and verifies that the tests terminate normally.
C6	ECC TEST	Writes all zeros to the HEAD#0 sectors on the CE cylinders and reads data including ECC with the READ LONG to verify the validity of the ECC data. The test routine also writes the bit-inverted data with the WRITE LONG and verifies that Correctable or Uncorrectable is reported when the written field is read.
C7	HDU SELF TEST	Activates the SCSI CTL self-diagnostics facility to check the following functions: · HDC functions (SEEK ERROR, SECTOR CHECK, FLAG CHECK, AM CHECK, ID CRC CHECK, DRIVE OVERRUN CHECK) · M-ESDI interface check (WRITE OK, M-ESDI INTERFACE PARITY, ILLEGAL COMMAND) · Drive write fault check (OFFSET WRITE, SERVO AREA WRITE, NRZ DATA PARITY ERROR, SYNCHRONOUS READ/WRITE GATE ON, WRITE TRANSITION)

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Notes:
1. All logical devices must be in the “BLOCKED” state. If not, the test routine will error-terminate. Refer to from SVP02-630 to SVP02-705 of SVP SECTION for all logical devices blocked.
2. The previous test routines must have been terminated normally before the pertinent test routine is started.
3. The Disk Controller should have been powered on normally.
4. Run Option setting to a value other than “08” is valid only when performing DKU INLINE for one drive.
5. After performing C1 Link Series, report on two SSB Log. (FM : 9F ErrCode : AE5A, E/F : E0 ErrCode : A772)

2.4.2 D8 Routine

D8 routine confirm the connection status of equipped HDD.

Note: Refer to Notes in C1 Link series.

2.4.3 DKU PATH INLINE

The DKU Path Inline is used to check that the connection between the DKA and the HDU is correct. The DKU path inline test routines are shown in Table 2.4.3.

Table 2.4.3 DKU PATH INLINE TEST ROUTINE

Routine ID	Test Name	Function
A0	SCSI cable connection check test	Checks whether the selected DKA and HDU are correctly connected.
A1	HDD read test	Executes the read test of the mounted HDD is executed.
A2	Failed HDD detection test	Detects the failed HDD and recovers it by using the reset function when an A0 10 or A0 20 error occurs.

Note: The routine A2 forcibly blocks the port of the HDD by using the individual SCSI RESET function for the HDD connected to the designated port of the selected DKA. Therefore, you must not do this operation expect for finding the factor of A010/A020 error.

2.5 LAN Checker

LAN checker analyses the LAN connection between DKC and SVP to determine whether the LAN error is caused by the physical connection or the communication software.

#	Test Name	Function
1	Hardware check	Checker executes “Ping” to all MPs. If the result is “no-response”, for a MP, the physical connection error has occurred between the MP and SVP.
2	Software check	Checker executes the communication between SVP and MPs whose result of #1 is “responsed”.

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3 DIAG Parts

The parts that are diagnosed by the DIAG test routines are shown in Figs. 3-1 through 3-5.

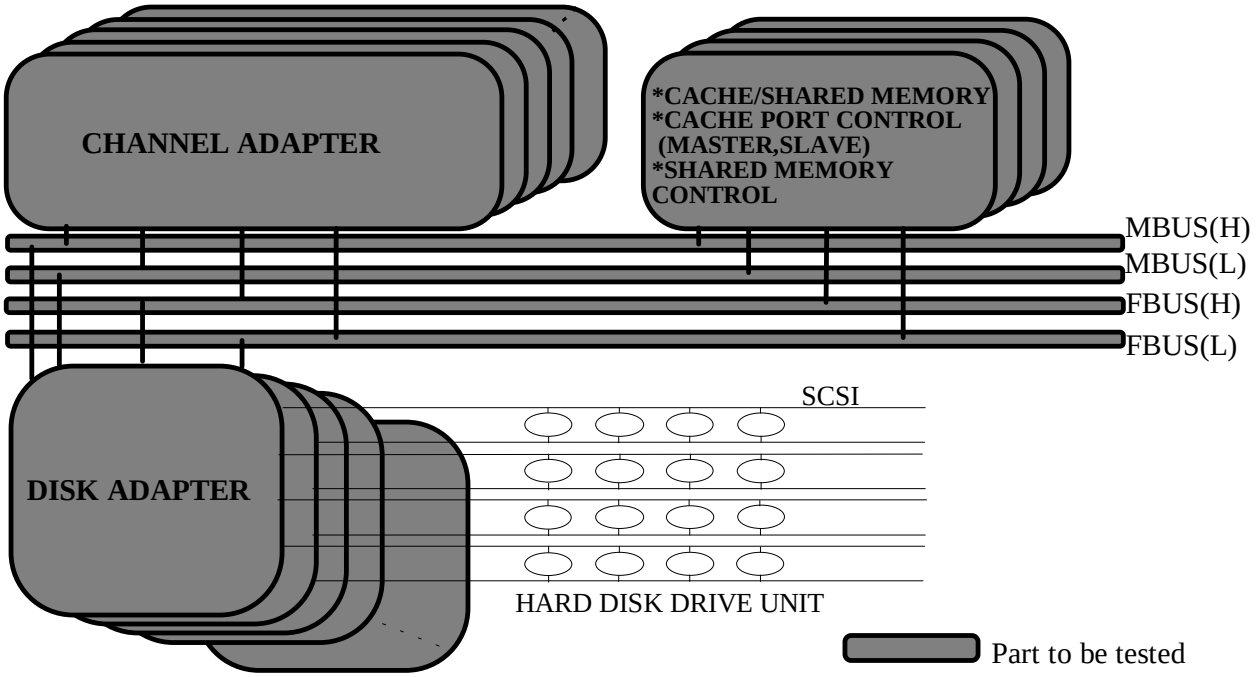

Fig. 3-1 Parts that are Subject to CUDG3/CUDG4 Tests

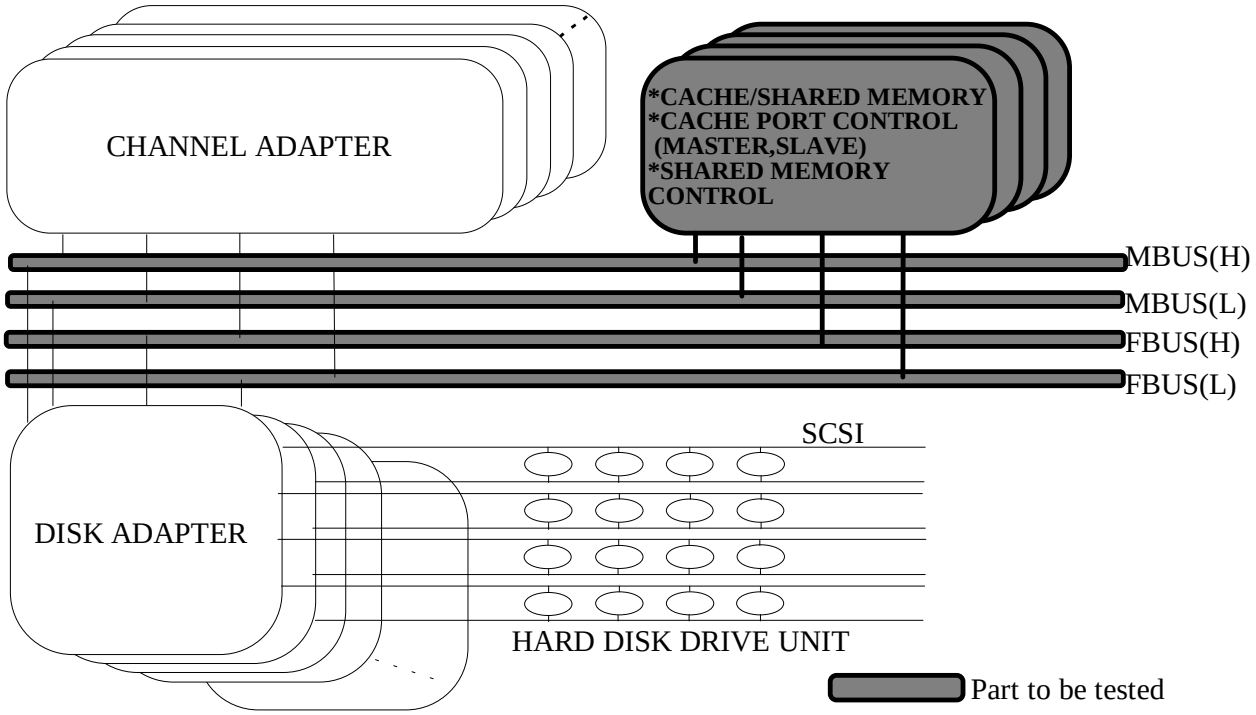

Fig. 3-2 Parts that are Subject to INLINE CUDG Tests

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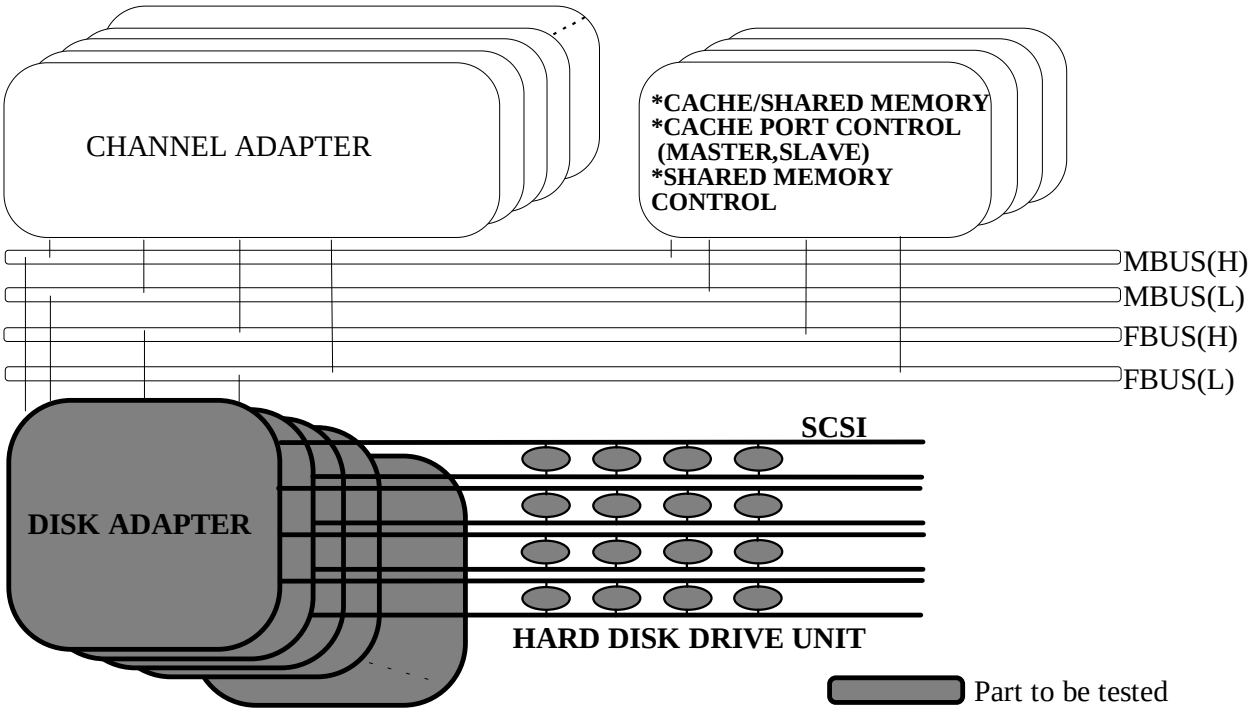

Fig. 3-3 Parts that are Subject to DKU INLINE Tests

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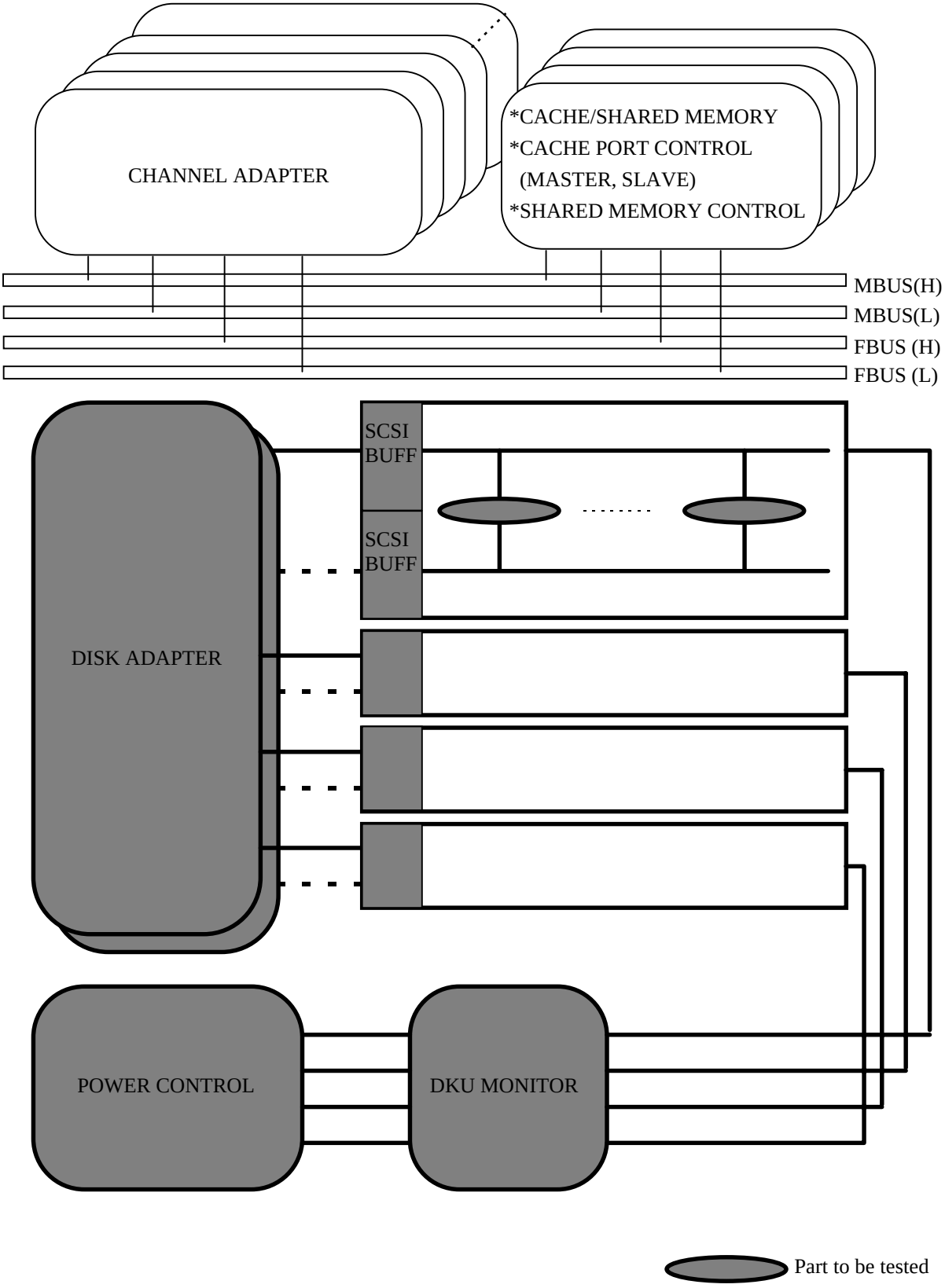

Fig. 3-4 Parts that are Subject to DKU PATH INLINE Tests

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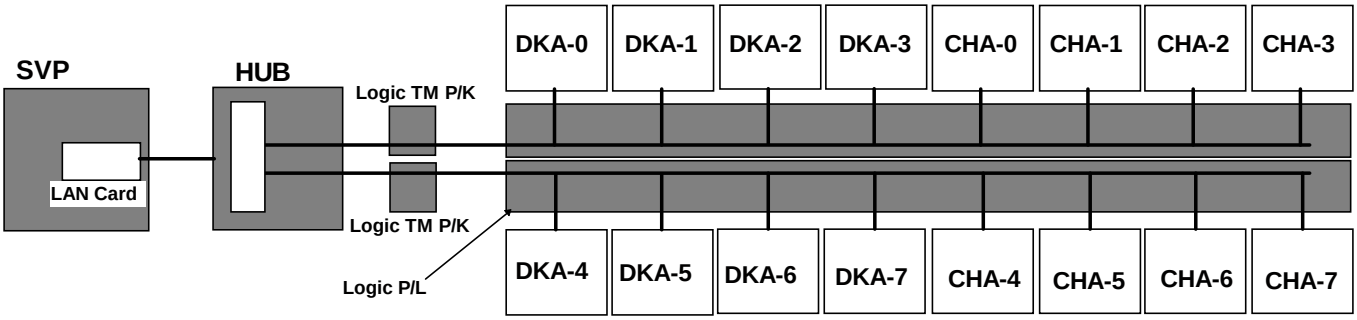

Fig. 3-5 Parts that are Subjects to LAN check

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4 DIAG Test Procedures (SVP Operations)

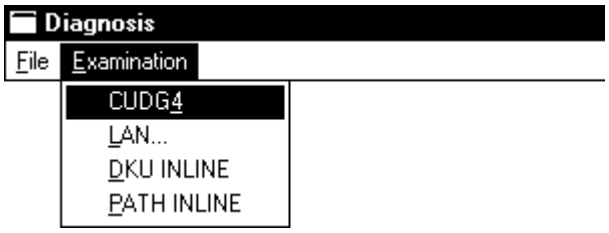
NOTICE
Powering off/on is required owing to the performance of this operation.

4.1 CUDG4/LCDG4 Test Procedures

1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Modify Mode].
   Select (CL) [Diagnosis].

3. <Activating CUDG>
   Select (DR) [CUDG4] from [Examination] in the Diagnosis menu.



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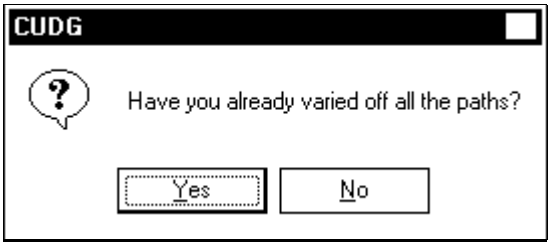
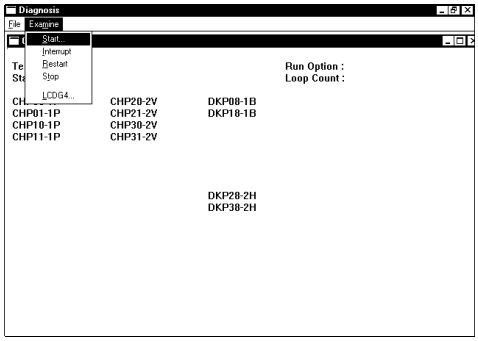
4. <Confirming that the channel path has been varied off>
An inquiry “Have you already varied off all paths?” is displayed.
Vary off the channel path, then select (CL) the [Yes] button.



5. <Selection of CUDG4/LCDG4>
In case of executing CUDG4, go to step 6.
In case of executing LCDG4, go to step 16.

6. <Start of CUDG4 test>
Select (DR) [Start] from [Examine] in the Diagnosis menu.



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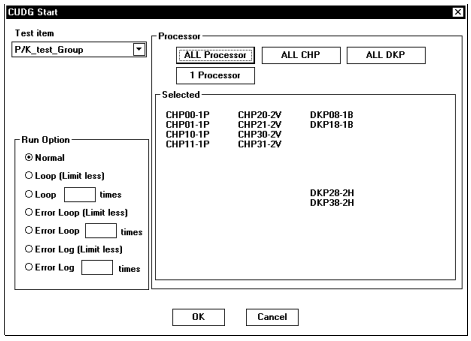
7. <Setting test parameters>

Select a test item, a test execution type, and a test object processor from Test Item, Run Option, and Processor respectively.
Select (CL) the [OK] button after all the selections are made.



[Test items]

P/K test Group	: Diagnosis on the CHA PCBs or DKA PCBs
SMC Normal test Group	: Diagnosis on the shared memory control (test on the normal system)
Cache Normal test Group	: Diagnosis on the cache platter (test on the normal system)
SMC test Group	: Diagnosis on the shared memory control
Cache test Group	: Diagnosis on the cache platter
Heatrun test Group	: All the above tests are included

Note 1: When 'Heatrun test Group' is selected, 'Run Option' settings are invalidated and diagnosis is executed under Heatrun mode.

[Run option (test execution types)]
Refer to DIAG01-10.

[Test object processors]

ALL Processor	: The test is executed on all the processors exist in the configuration.
ALL CHP	: The test is executed on all the CHPs exist in the configuration.
ALL DKP	: The test is executed on all the DKPs exist in the configuration.
1 Processor	: The test is executed on specified processor exist in the configuration. For details, see Item 15.

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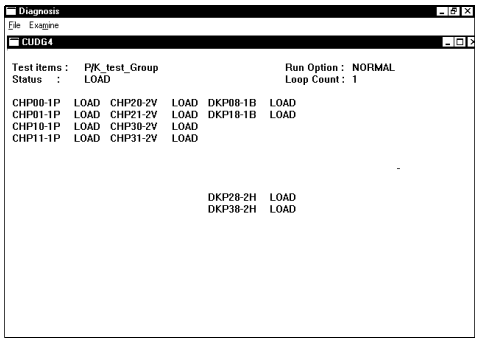
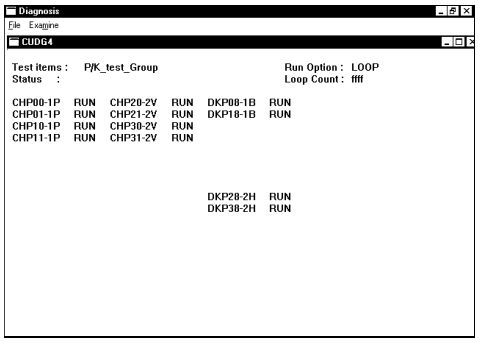
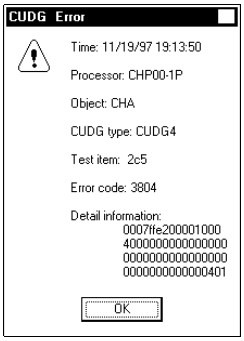
8. <Displaying CUDG4 loading>
Statuses of INIT, LOAD, and WAIT are displayed on the 'CUDG4' screen.
The illustration on the right shows the screen when the CUDG4 is being loaded.



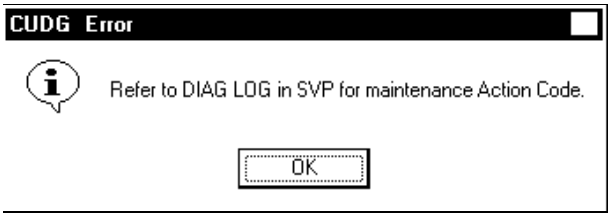
9. <Displaying RUN>
State of the run is displayed on the 'CUDG4' screen.
The illustration on the right shows the screen when the CUDG4 test is being executed.
Normal end ---------- Go to step 11.
Abnormal end -------- Go to step 10.



10. <Displaying error>
If an error occurs in CUDG4 test, CUDG Error window is displayed.
Confirm the type of the error, then select (CL) the [OK] button.
Refer to DIAG LOG according to the message.



To display DIAG LOG, see step 27.
To execute CUDG4 again, go to step 6.
To terminate CUDG4, go to step 12.



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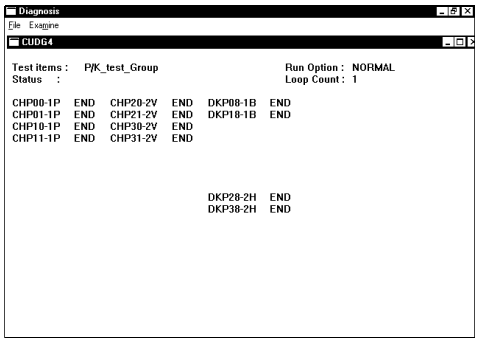
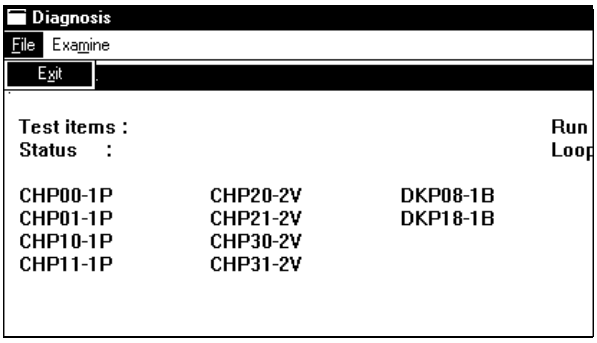
11. <Displaying END>

Status 'END' is displayed for the processor that CUDG4 test ends.
To continue CUDG4, go to step 6.
To terminate CUDG4, go to step 12.



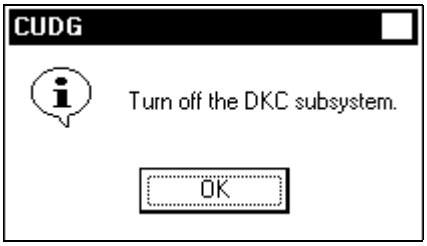
12. <Displaying Exit>

Select (CL) [Exit] from [File] in the Diagnosis menu.



13. <PS-OFF>

Turn off the DKC subsystem by performing the PS-OFF operation following the displayed instruction "Turn off the DKC subsystem", then select (CL) the [OK] button.
If the power is not turned off after PS-OFF operation, immediately turn off the breaker.



14. <Quitting the diagnosis screen and PS-ON>

The screen is returned to the initial screen.

Turn on the DKC Subsystem by performing the PS-ON operation.
If any error is detected in the CUDG4 test, go to step 27.

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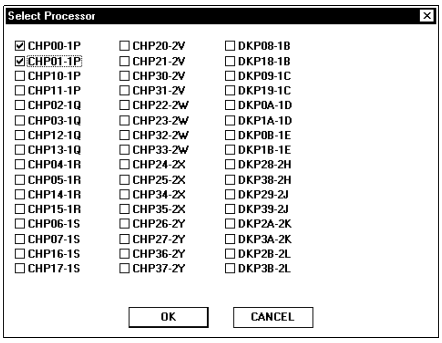
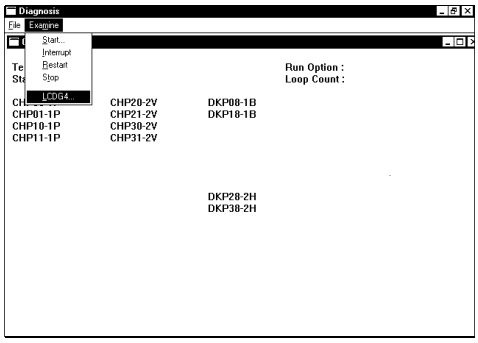
15. <Specifying a test object processor>

Select a processor on which the test is to be executed.
(Two or more processors can be selected.)
After specifying the processor(s), then select (CL) the [OK] button.
Go to step 7.



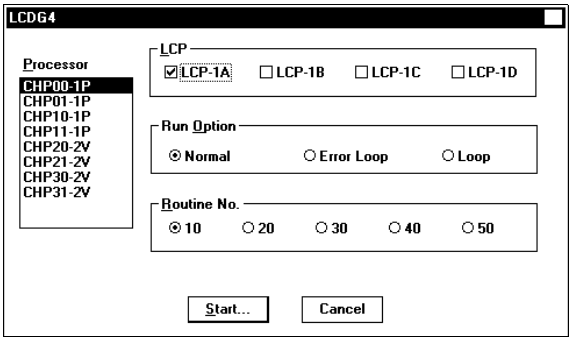
16. <Start of LCDG4 test>

Select (DR) [LCDG4...] from [Examine] on 'Diagnosis'.



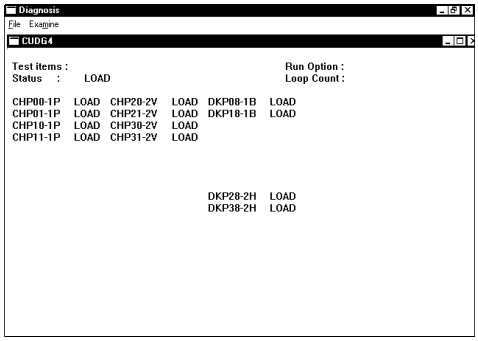
17. <Select [CHA], [LCP], [Run Option] and [Routine No.]>

Select (CL) [CHA], [LCP], [Run Option] and [Routine No.] in the 'LCDG4' dialog box.
Select (CL) [Start] button.
Refer to DIAG01-20, DIAG02-20.



18. <Display of [LOAD]>

Status [INIT], [LOAD], and [WAIT] are displayed in the 'CUDG4' dialog box.



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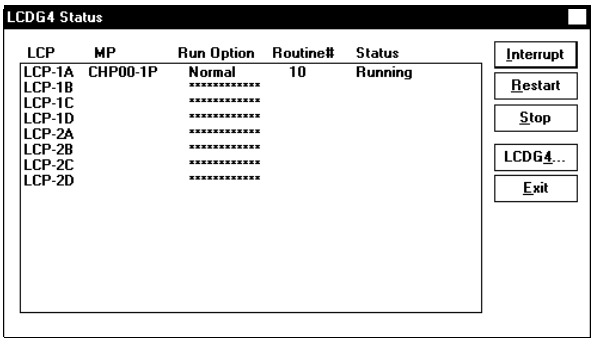
19. <Display of [Running]>

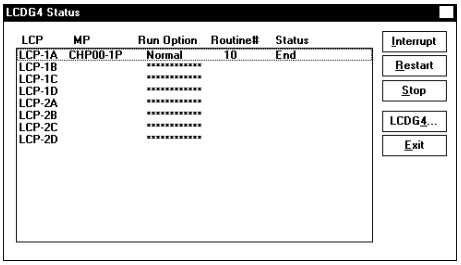
Status [Running] is displayed in the 'LCDG4 Status' dialog box.

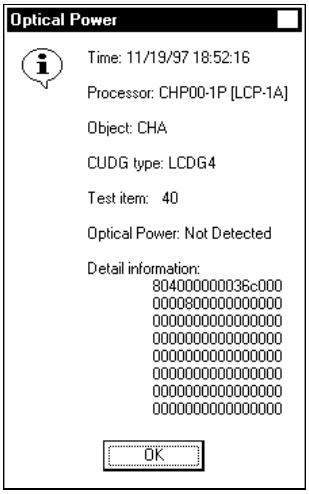
Go to 20. in case of Normal End.
Go to 21. in case of Abnormal End.

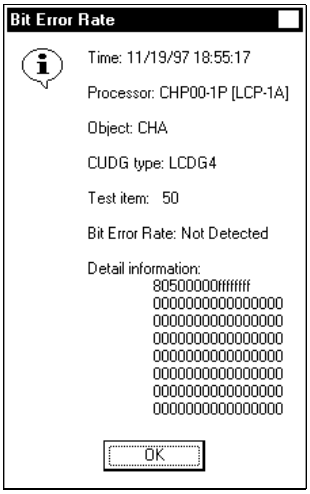


20. <Display of [End]>

Status [End] is displayed in the 'LCDG4 Status' dialog box.
When the routine number is 40, 'Optical Power' is displayed. Select (CL) [OK]. When the routine number is 50, 'Bit Error Rate' is displayed. Select (CL) [OK].
Go to 22.



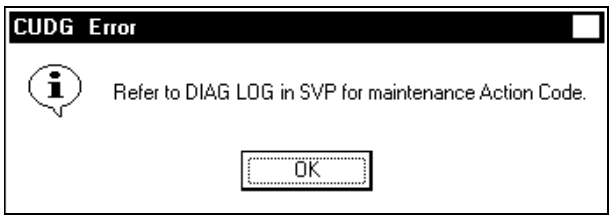


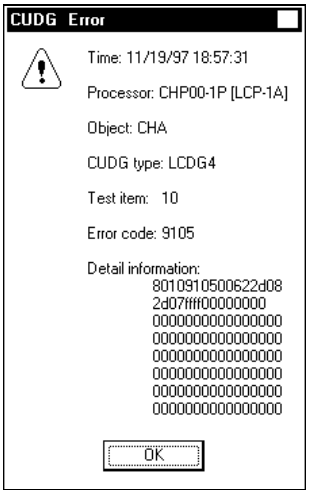


21. <Display of 'CUDG Error'>

After 'CUDG Error' is displayed, select (CL) [OK].

To display DIAG LOG, see step 27.





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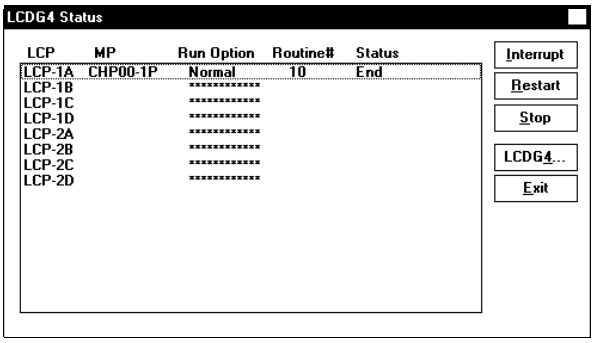
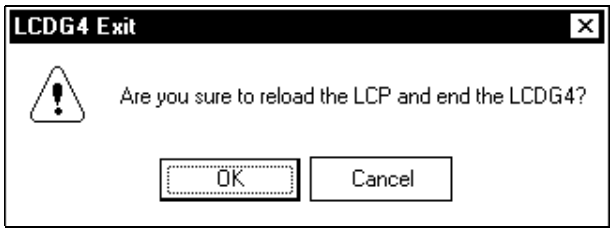
22. <Selection of continuation/termination of LCDG4>

To continue LCDG4, select (CL) [LCDG4] in 'LCDG4 Status' dialog box and go to step 17.
To terminate LCDG4, select (CL) [Exit] in 'LCDG4 Status' dialog box and go to step 23.



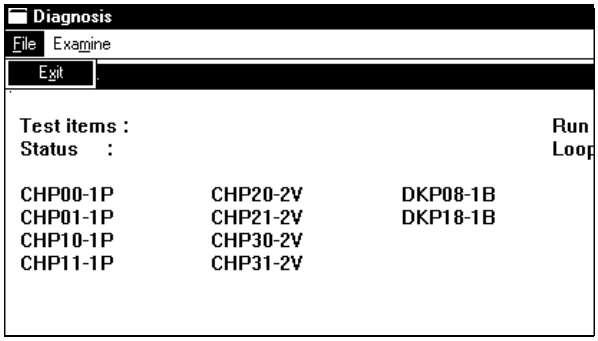
23. <End of LCDG4>

"Are you sure to reload the LCP and end the LCDG4?" is displayed.
Select (CL) [OK].



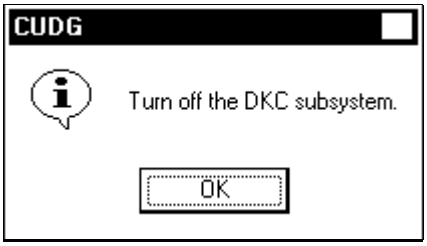
24. <Select [Exit]>

Select (DR) [Exit] from [File] on 'CUDG4'.



25. <PS-OFF>

After "Turn off the DKC subsystem." is displayed, turn off the DKC subsystem by the PS-OFF operation and then select
(CL) [OK].



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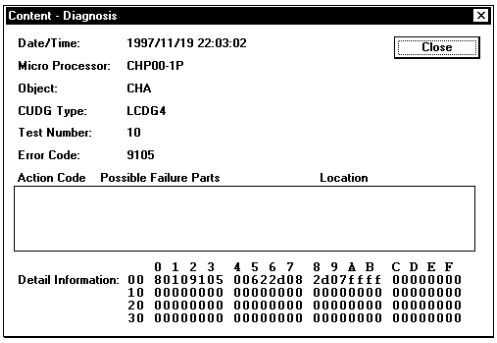
26. <End of the DIAGNOSIS screen>
The Initial screen is displayed.

Turn on the DKC subsystem by performing the PS-ON operation.
In case of error go to 27.

27. <See 'Diag Log'>
If CUDG4/LCDG4 ends with an error, select ACC from the 'Diag Log' dialog box in [INFORMATION] ICON.
See 2.2 Log indication in SVP section.

Note: Refer to ACC (ACTION-CODE) SECTION for ACC analysis.



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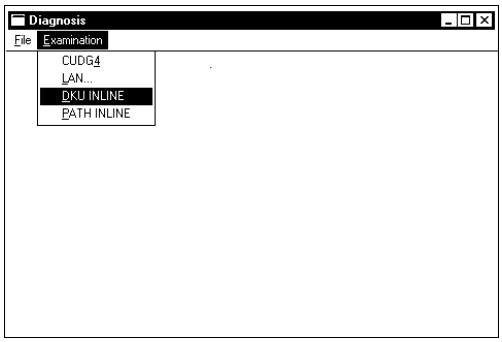
4.2 DKU INLINE Test Procedures

4.2.1 C1 Link series Test Procedures

1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Modify Mode].
   Select (CL) [Diagnosis].

3. <Select 'DKU INLINE'>
   'Diagnosis' window is displayed.
   And select (DR) [DKU INLINE] from [Examination] in the Diagnosis menu.



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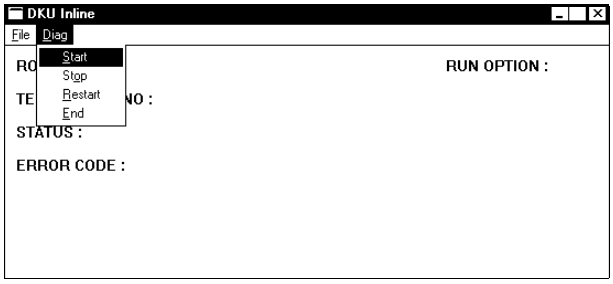
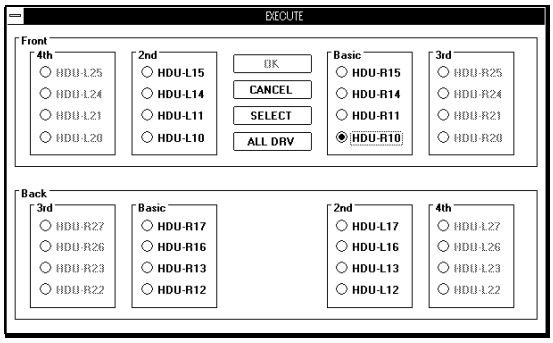
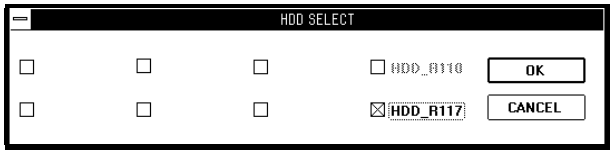
4. <Select [Start]>
Select (DR) [Start] form [Diag].



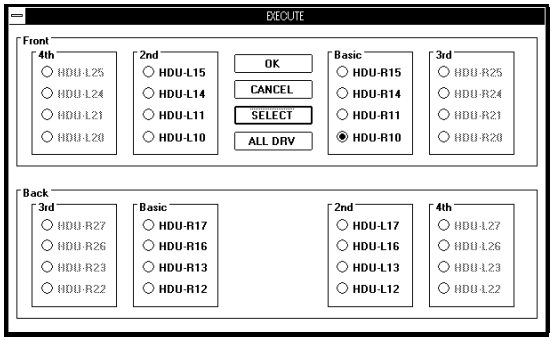
5. <Select HDU group to be tested>
Select (CL) the HDU group for which the test routine is to be executed from 'EXECUTE'.
Then select (CL) [SELECT] button.



6. <Select HDD to be tested>
Select (CL) HDD for which the test routine is to be executed from 'HDD SELECT'.
Then select (CL) [OK] button.



7. <Select [OK]>
Select (CL) [OK] button.



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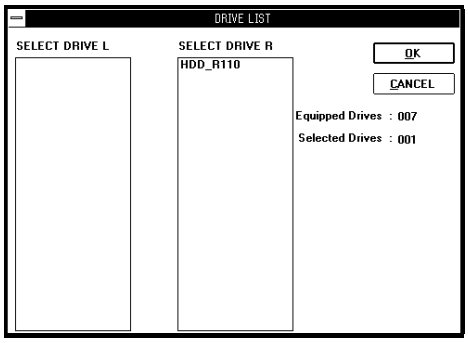
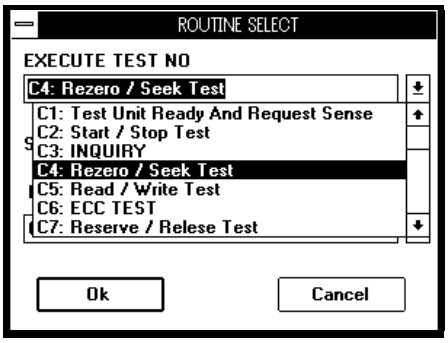
8. <Confirm HDD to be tested>
Confirm HDD to be tested in the 'DRIVE LIST'.
Then select (CL) [OK].

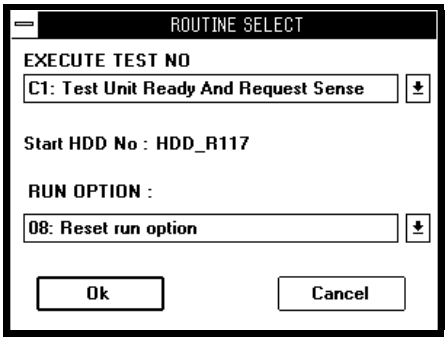


9. <Select [EXECUTE TEST NO] and [RUN OPTION]>
Select (DR) [EXECUTE TEST NO] and [RUN OPTION] from 'ROUTINE SELECT'.

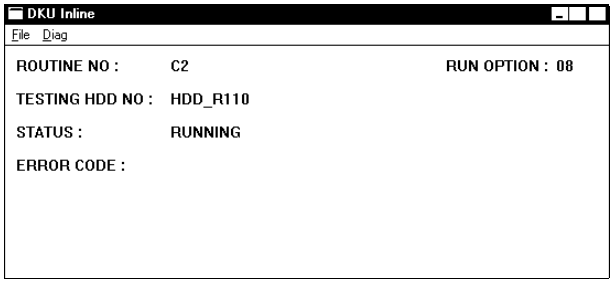
Note: Refer to "RUN OPTION terms" details listed in Table 1.1 for CUDG RUN Options.



10. <Execute routine>
Select (CL) [OK] button.



11. <Display of "RUNNING">
Status "RUNNING" is displayed.
Go to 12. in case of Normal End.
Go to 14. in case of Abnormal End.



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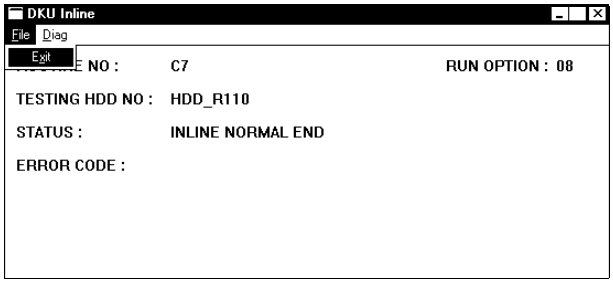
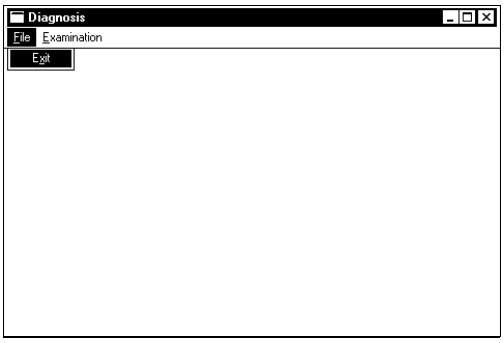
12. <DKU INLINE end>

After the status “INLINE NORMAL END” is displayed, select (DR) [Exit] from [File].



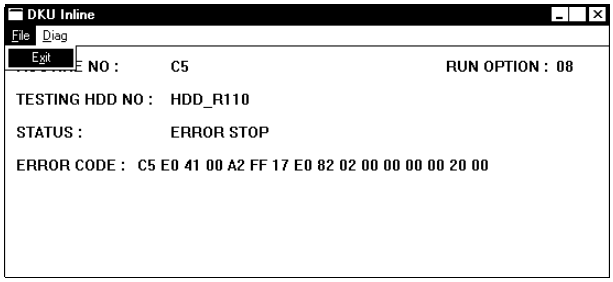
13. <Diagnosis end>

Select (DR) [Exit] from [File] in the Diagnosis menu.



14. <Error End>

“STATUS : ERROR STOP” is displayed.
Refer to Diag Log for details information.
Select (DR) [Exit] from [File].
Go to 13.



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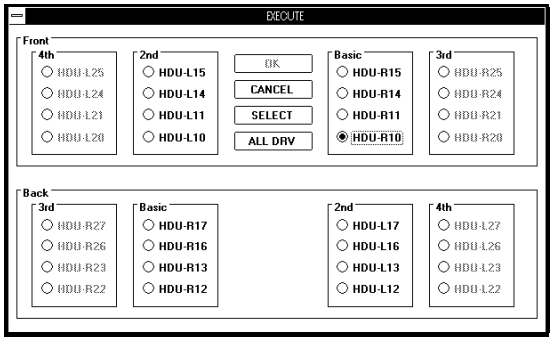
4.2.2 D8 routine Test Procedures

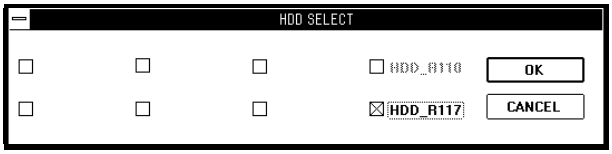
1. <Refer to C1 Link Procedures>
   Refer from 1 to 4 in C1 Link series Test Procedures.

2. <Select HDU group to be tested>
   Select HDU group to be tested, then select (CL) [SELECT], or [ALL DRV].

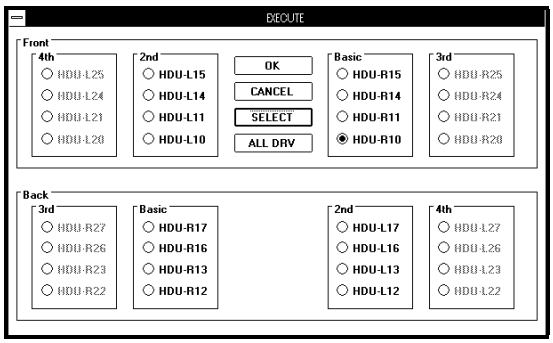
   In case of select [SELECT], go to 3.
   In case of select [ALL DRV], go to 5.



3. <Select HDD to be tested>
   Select HDD to be tested.
   Then select (CL) [OK].



4. <Select [OK]>
   Select (CL) [OK].



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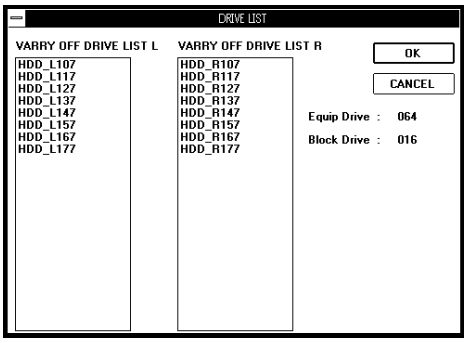
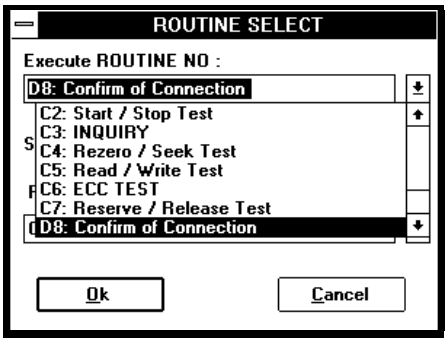
5. <Confirm of HDD>
Confirm HDD from 'DRIVE LIST'.
Then select (CL) [OK].

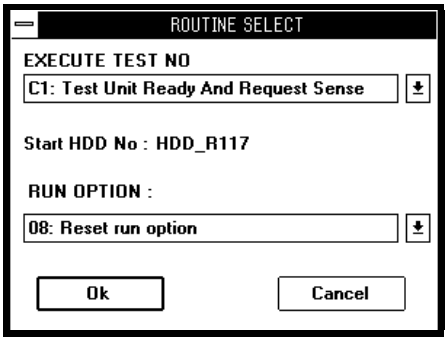


6. <Select D8 routine>
Select (CL) "D8: Confirm of Connection" from [Execute ROUTINE NO :].

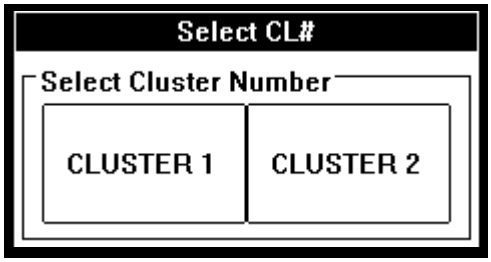


7. <Select Run Option>
Select Run Option from [RUN OPTION :].
Then select (CL) [OK].

Explanation of Run Option:
01 : All drive running.
02 ~ 08 : End when Error occurred.
("Restart" to next drive.)



8. <Select cluster>
Select cluster to be tested.
Select (CL) [CLUSTER1] or [CLUSTER2].



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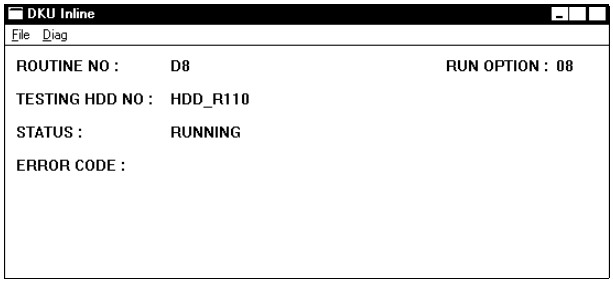
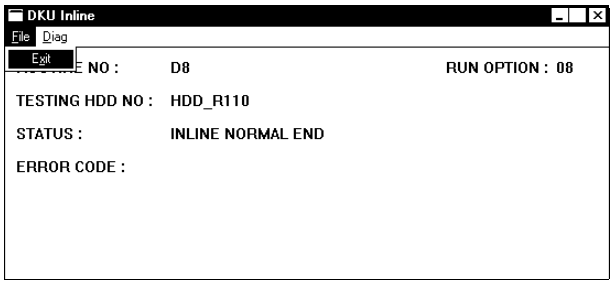
9. <Display of “RUNNING”>
Status “RUNNING” is displayed.

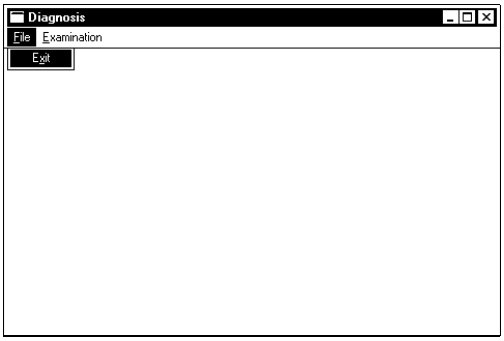
In case of normal end, go to 10.
In case of abnormal end (Single), go to 13.
In case of abnormal end (Multi), go to 12.



10. <DKU INLINE end>
After the status “INLINE NORMAL END” is displayed, select (DR) [Exit] from [File].



11. <Diagnosis end>
Select (DR) [Exit] from [File] in the Diagnosis menu.



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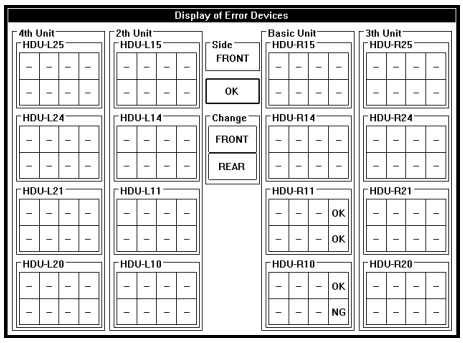
12. <Display of Error Drives>

Error Drives are displayed.
Change “FRONT” or “REAR” by [FRONT] and [REAR] button.
In case of End, select (CL) [OK].

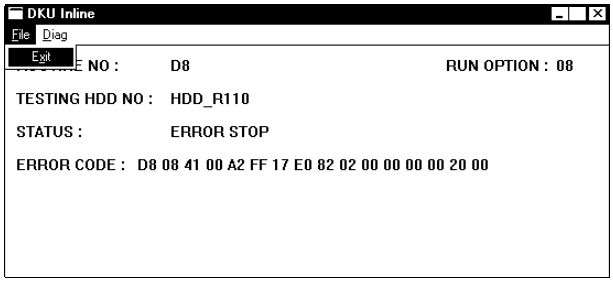


Explanation of symbol:
“--” : Unequipped drive.
“EQ” : Equipped drive.
“OK” : Normal end of select drive.
“NG” : Abnormal end of select drive.

13. <Error End>

“STATUS : ERROR STOP” is displayed.
Refer to Diag Log for details information.
Select (DR) [Exit] from [File].
Go to 11.

Refer to 2.2 Log indication in SVP section.



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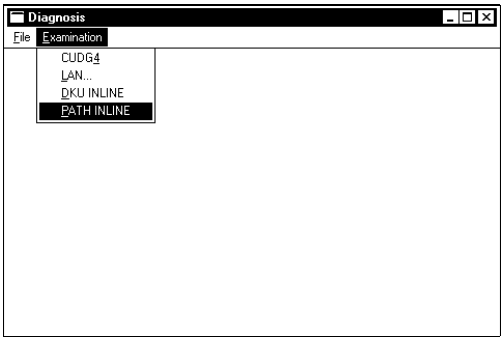
4.2.3 DKU PATH INLINE Test Procedures

4.2.3.1 A0 routine Test Procedures

1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Modify Mode].
   Select (CL) [Diagnosis].

3. <Select 'PATH INLINE'>
   'Diagnosis' window is displayed.
   And select (DR) [PATH INLINE] from [Examination] in the Diagnosis menu.



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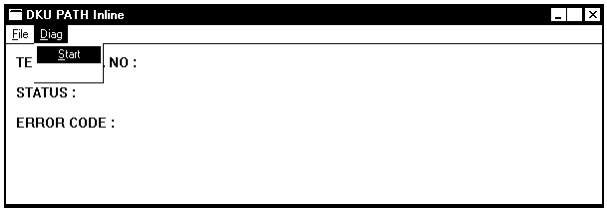
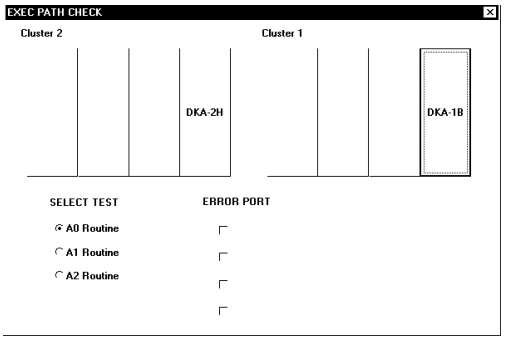
4. <Selecting [Start]>
Select (DR) [Start] from [Diag].

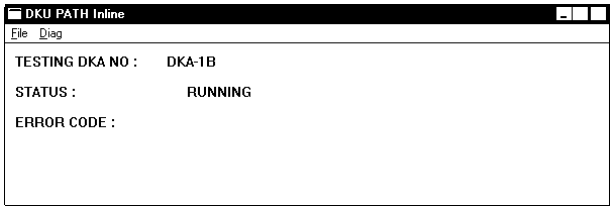


5. <Selecting the routine to be executed and the DKA to be diagnosed>
Select the routine and DKA from 'EXEC PATH CHECK'.

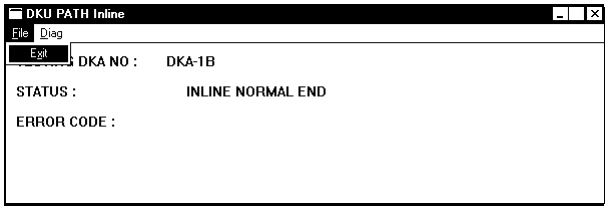


6. <Display of "RUNNING">
"RUNNING" is displayed in the STATUS field.

Normal end ------ Go to 7
Abnormal end --- Go to 8



7. <Completing diagnosis>
After "INLINE NORMAL END" is displayed in the STATUS field, select (DR) [Exit] from [File].
Go to 17.



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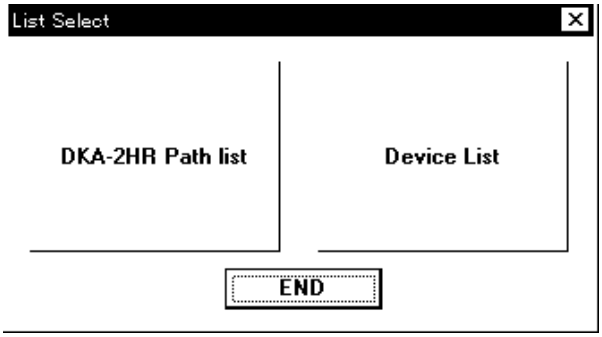
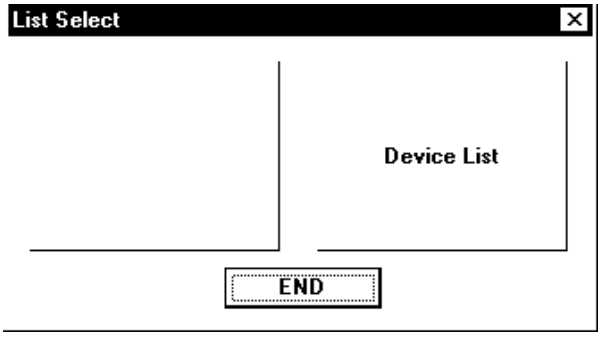
8. <Selecting [DKA-XX Path List] and [Device List]>

Select (CL) [DKA-XX Path List] or [Device List] from 'List Select'.



When the routine A0 is executed and there is Path List information, the [DKA-XX Path List] button and the [Device List] button can be selected.

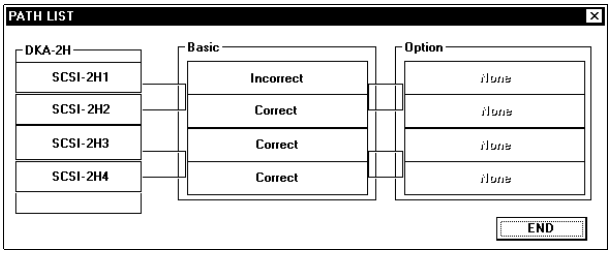
When the routine A0 is not executed and the routines A1 and A2 are executed, the [DKA-XX Path List] button cannot be selected but only the [Device List] button can be selected.



When [DKA-XX Path List] is selected, go to 9.
When [Device List] is selected, go to 11 or 14.
When [END] is selected, go to16.

9. <Selecting [Incorrect]>

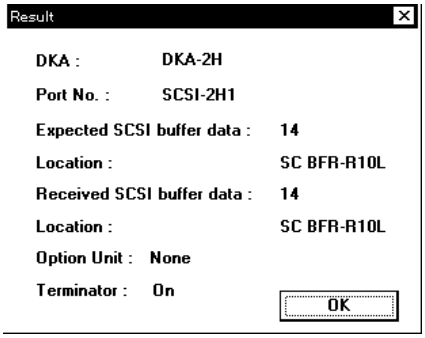
Select (CL) [Incorrect] from 'Path List'.



When [Incorrect] is selected, go to 10.
When [END] is selected, go to 8.

10. <Displaying 'Result'>

Select (CL) the [OK] button after 'Result' is selected.



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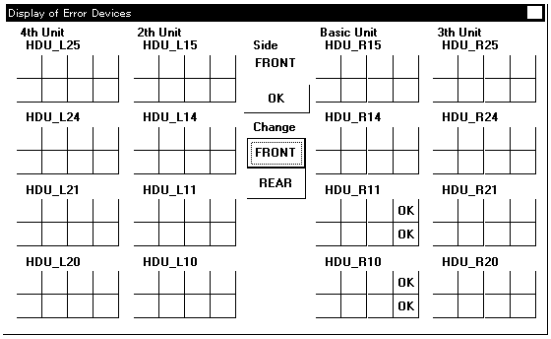
11. <Displaying 'Display of Error Devices' (in the normal state)>

"OK" is displayed in the PDEV installing position viewed from the front side.

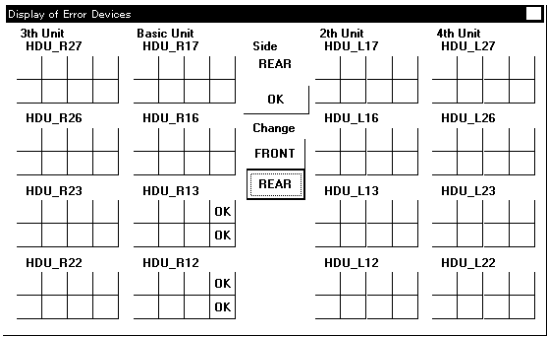
When [REAR] is selected, go to 12.
When [Pdev] is selected, go to 13.
When [OK] is selected, go to 8.



12. <Selecting [REAR]>

When the "REAR" button is selected, "OK" is displayed in the installing position viewed from the rear side.

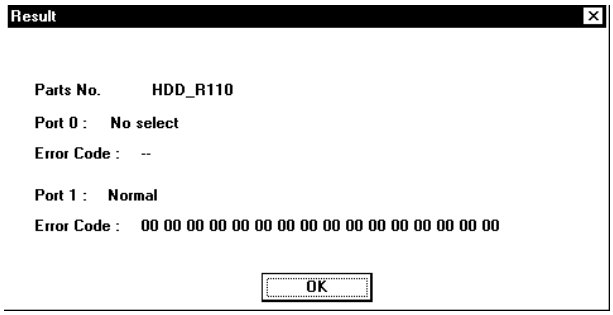
When [FRONT] is selected, go to 11.
When [Pdev] is selected, go to 13.
When [OK] is selected, go to 8.



13. <Displaying 'Result' (in the normal state)>

Select (CL) the [OK] button after 'Result' is displayed.

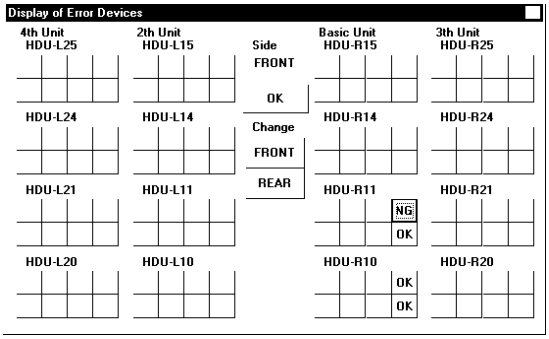
When [OK] is selected, go to 11 or 12.



14. <Displaying 'Display of Error Devices' (in the abnormal state)>

When an error occurs, "NG" is displayed in the installing position of the Pdev in which the error occurs.

When [OK] is selected, go to 11 or 12.



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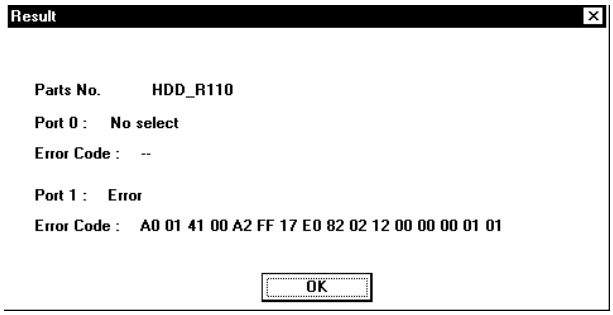
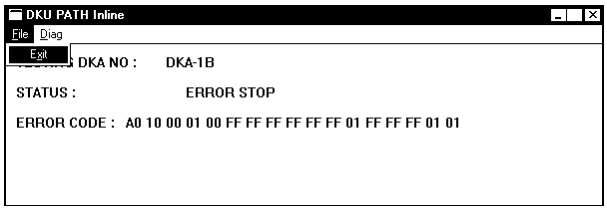
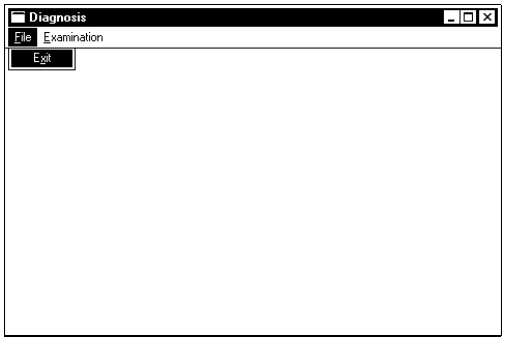
15. <Displaying ‘Result’ (in the abnormal state)>
When the button of each Pdev is selected, detailed result will be displayed (in the abnormal state).



16. <DKU Path inline end>
After “ERROR STOP” is displayed in the Status field, select (DR) [Exit] from [File].



17. <End of [Diagnosis]>
Select (DR) [Exit] from [File] in the Diagnosis menu.



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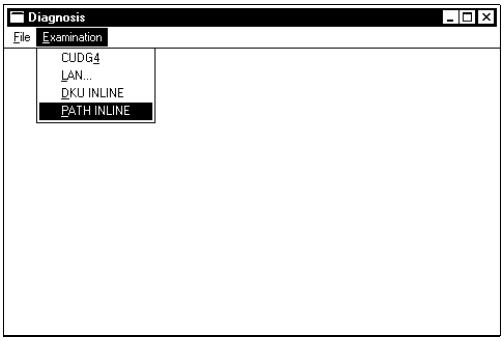
4.2.3.2 A1 routine Test Procedures

1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Modify Mode].
   Select (CL) [Diagnosis].

3. <Select 'PATH INLINE'>
   'Diagnosis' window is displayed.
   And select (DR) [PATH INLINE] from [Examination] in the Diagnosis menu.



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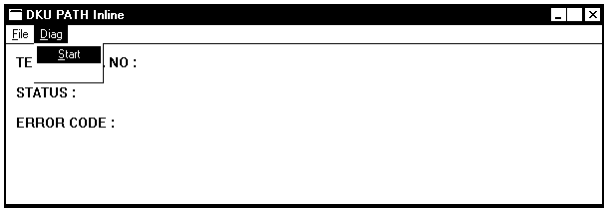
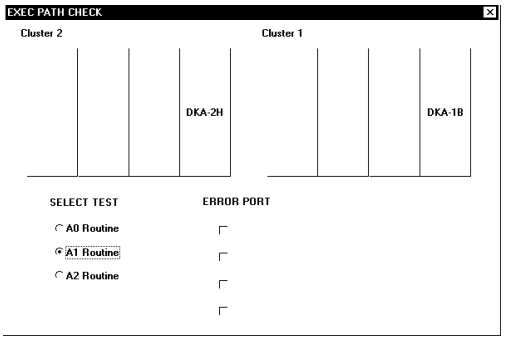
4. <Selecting [Start]>
Select (DR) [Start] from [Diag].

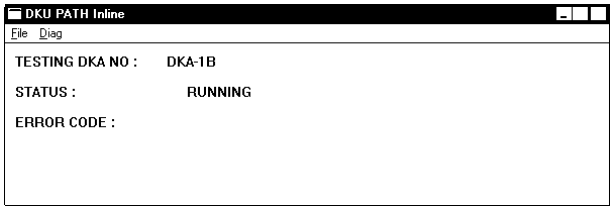


5. <Selecting the routine to be executed and the DKA to be diagnosed>
Select the routine and DKA from 'EXEC PATH CHECK'.

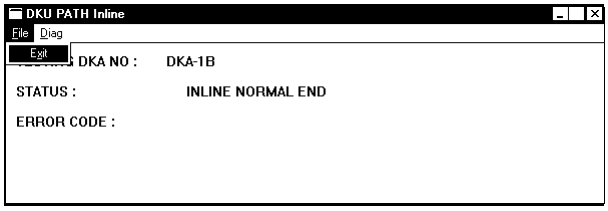


6. <Display of "RUNNING">
"RUNNING" is displayed in the STATUS field.

Normal end ------ Go to 7
Abnormal end --- Go to 8



7. <Completing diagnosis>
After "INLINE NORMAL END" is displayed in the STATUS field, select (DR) [Exit] from [File].
Go to 17.



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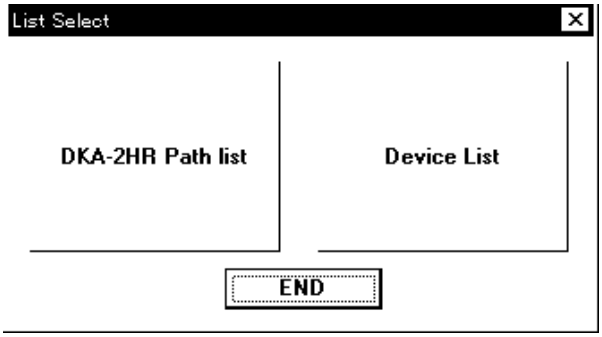
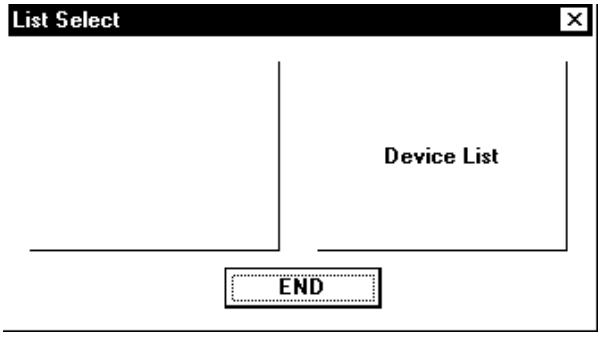
8. <Selecting [DKA-XX Path List] and [Device List]>

Select (CL) [DKA-XX Path List] or [Device List] from 'List Select'.



When the routine A0 is executed and there is Path List information, the [DKA-XX Path List] button and the [Device List] button can be selected.

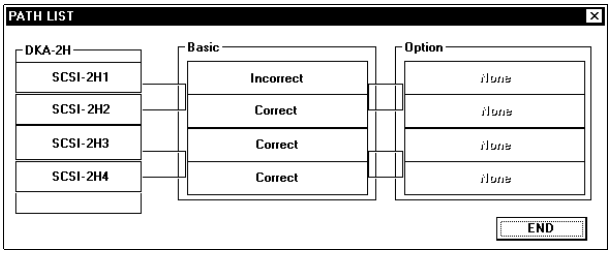
When the routine A0 is not executed and the routines A1 and A2 are executed, the [DKA-XX Path List] button cannot be selected but only the [Device List] button can be selected.



When [DKA-XX Path List] is selected, go to 9.
When [Device List] is selected, go to 11 or 14.
When [END] is selected, go to16.

9. <Selecting [Incorrect]>

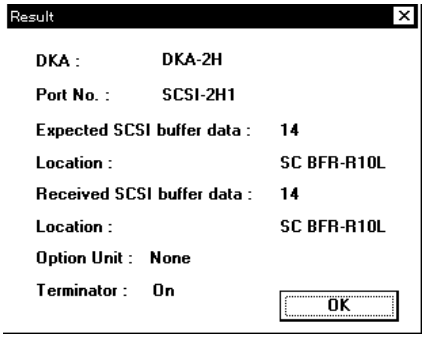
Select (CL) [Incorrect] from 'Path List'.



When [Incorrect] is selected, go to 10.
When [END] is selected, go to 8.

10. <Displaying 'Result'>

Select (CL) the [OK] button after 'Result' is selected.



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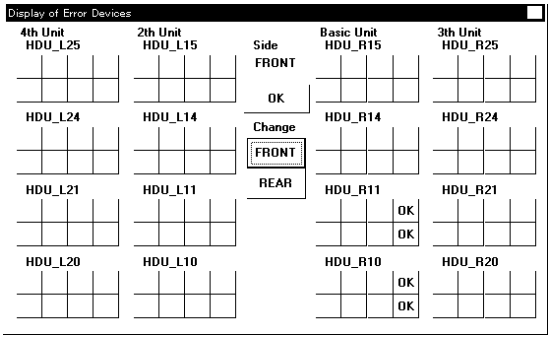
11. <Displaying 'Display of Error Devices' (in the normal state)>

"OK" is displayed in the PDEV installing position viewed from the front side.

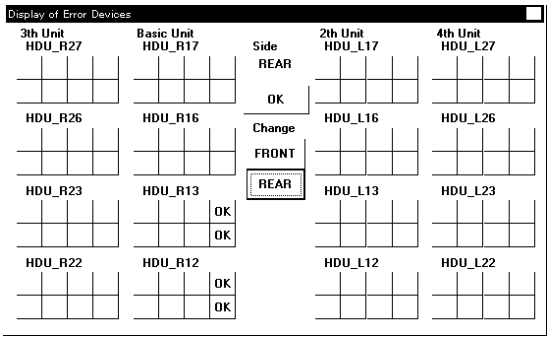
When [REAR] is selected, go to 12.
When [Pdev] is selected, go to 13.
When [OK] is selected, go to 8.



12. <Selecting [REAR]>

When the "REAR" button is selected, "OK" is displayed in the installing position viewed from the rear side.

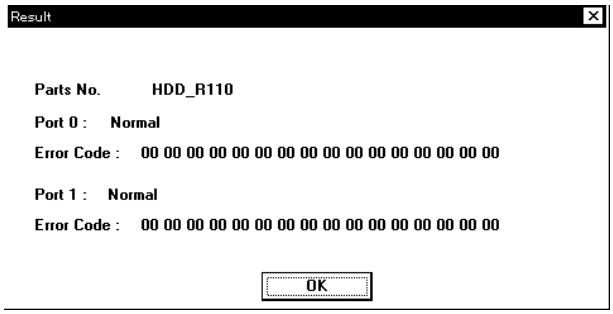
When [FRONT] is selected, go to 11.
When [Pdev] is selected, go to 13.
When [OK] is selected, go to 8.



13. <Displaying 'Result' (in the normal state)>

Select (CL) the [OK] button after 'Result' is displayed.

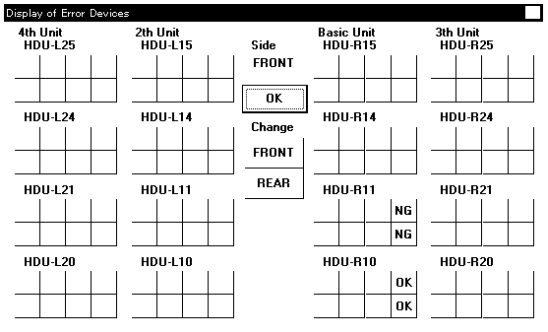
When [OK] is selected, go to 11 or 12.



14. <Displaying 'Display of Error Devices' (in the abnormal state)>

When an error occurs, "NG" is displayed in the installing position of the Pdev in which the error occurs.

When [OK] is selected, go to 11 or 12.



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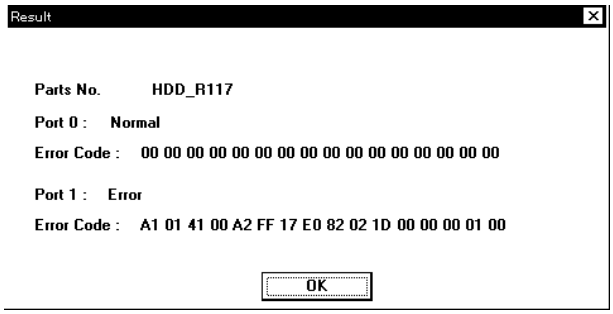
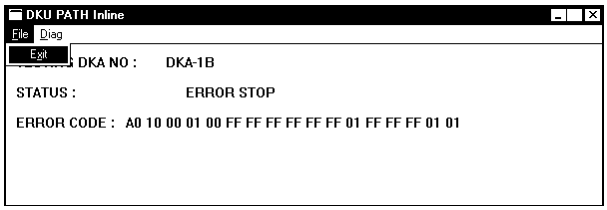
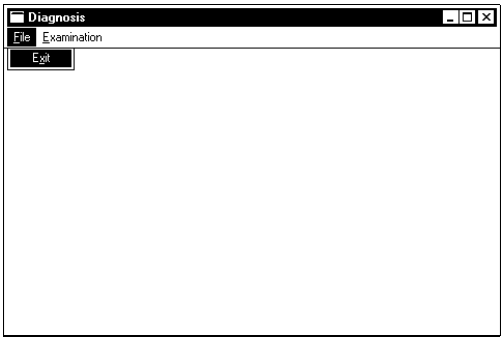
15. <Displaying 'Result' (in the abnormal state)>
When the button of each Pdev is selected, detailed result will be displayed (in the abnormal state).



16. <DKU Path inline end>
After "ERROR STOP" is displayed in the Status field, select (DR) [Exit] from [File].



17. <End of [Diagnosis]>
Select (DR) [Exit] from [File] in the Diagnosis menu.



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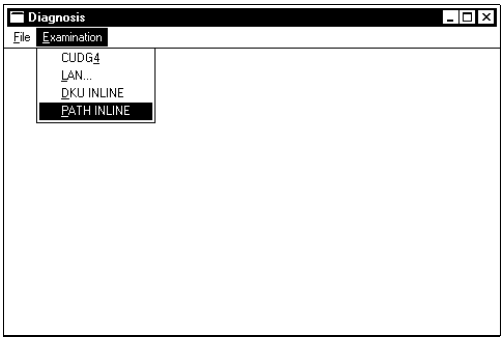
4.2.3.3 A2 routine Test Procedures

1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Test Mode].
   Select (CL) [Diagnosis].

   <Note>
   Please call Technical Support Center for asking how to change the mode to Test Mode.

3. <Select 'PATH INLINE'>
   'Diagnosis' window is displayed.
   And select (DR) [PATH INLINE] from [Examination] in the Diagnosis menu.



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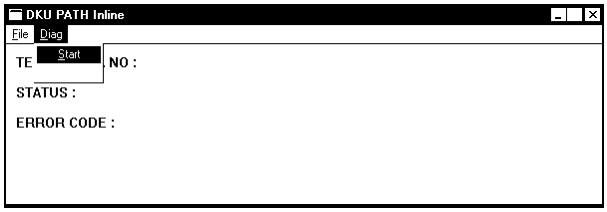
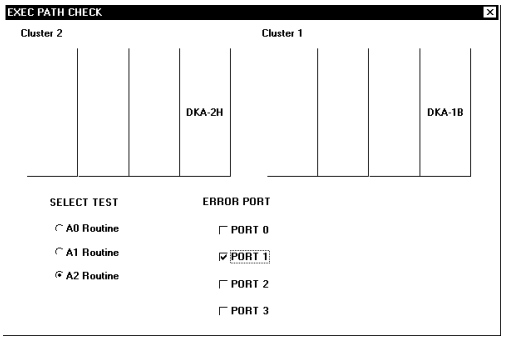
4. <Selecting [Start]>
Select (DR) [Start] from [Diag].

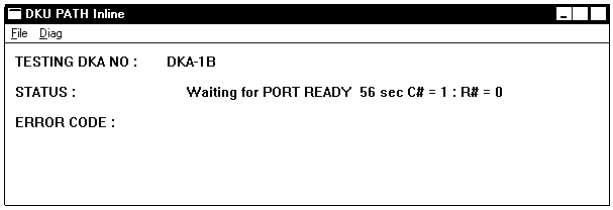


5. <Selecting the routine to be executed and the DKA to be diagnosed>
Select the routine and DKA from 'EXEC PATH CHECK'.

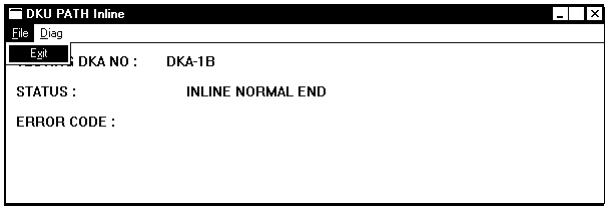


6. <Display of "RUNNING">
"RUNNING" is displayed in the STATUS field.
During execution of the routine A2, waiting for one minute occurs to cancel SCSI RESET.
"Waiting for PORT READY XX sec C#=XX R#=XX" is displayed in the STATUS field.

Normal end ------ Go to 7
Abnormal end --- Go to 8



7. <Completing diagnosis>
After "INLINE NORMAL END" is displayed in the STATUS field, select (DR) [Exit] from [File].
Go to 17.



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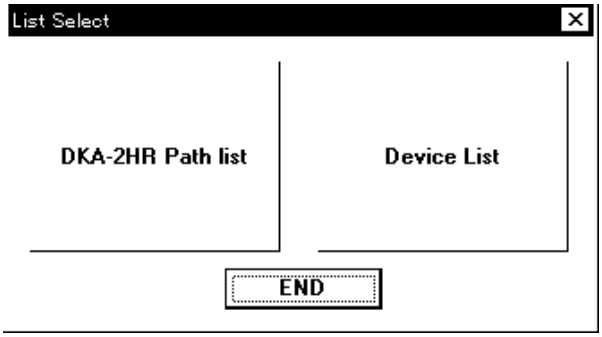
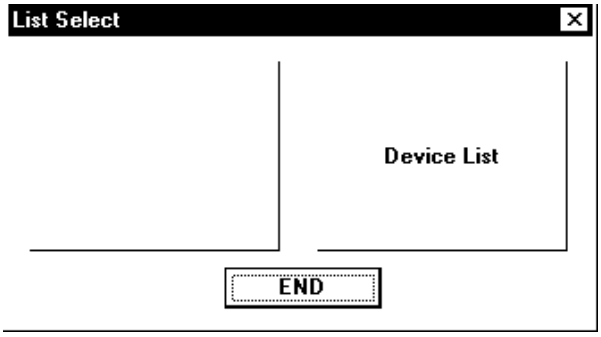
8. <Selecting [DKA-XX Path List] and [Device List]>
Select (CL) [DKA-XX Path List] or [Device List] from 'List Select'.

When the routine A0 is executed and there is Path List information, the [DKA-XX Path List] button and the [Device List] button can be selected.



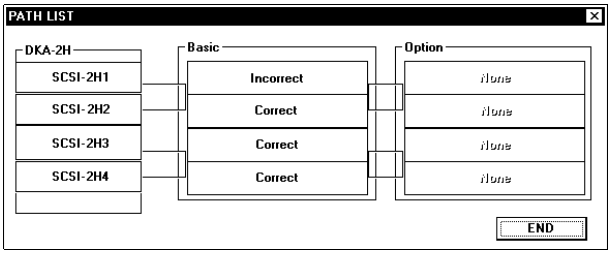
When the routine A0 is not executed and the routines A1 and A2 are executed, the [DKA-XX Path List] button cannot be selected but only the [Device List] button can be selected.

When [DKA-XX Path List] is selected, go to 9.
When [Device List] is selected, go to 11 or 14.
When [END] is selected, go to16.

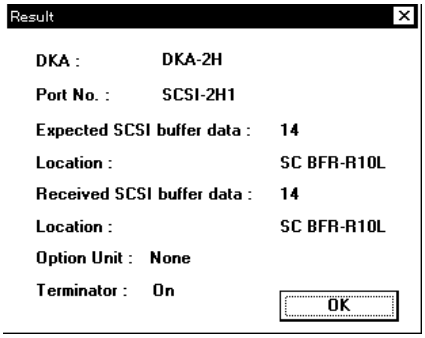


9. <Selecting [Incorrect]>
Select (CL) [Incorrect] from 'Path List'.

When [Incorrect] is selected, go to 11.
When [END] is selected, go to 8.



10. <Displaying 'Result'>
Select (CL) the [OK] button after 'Result' is selected.



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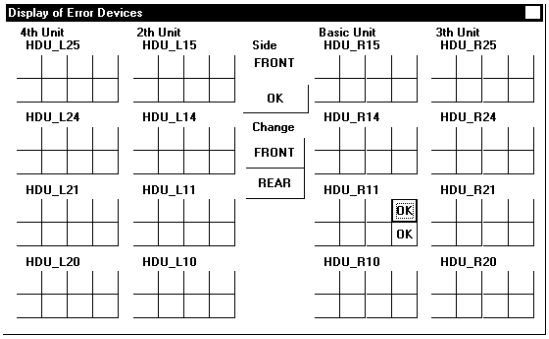
11. <Displaying 'Display of Error Devices' (in the normal state)>

"OK" is displayed in the PDEV installing position viewed from the front side.

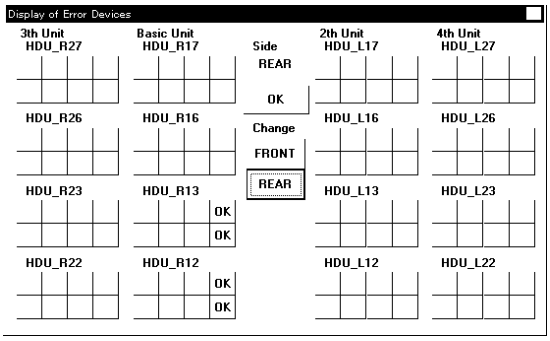
When [REAR] is selected, go to 11.
When [Pdev] is selected, go to 12.
When [OK] is selected, go to 8.



12. <Selecting [REAR]>

When the "REAR" button is selected, "OK" is displayed in the installing position viewed from the rear side.

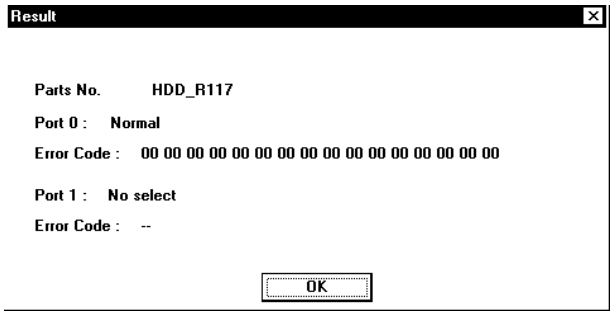
When [FRONT] is selected, go to 10.
When [Pdev] is selected, go to 12.
When [OK] is selected, go to 8.



13. <Displaying 'Result' (in the normal state)>

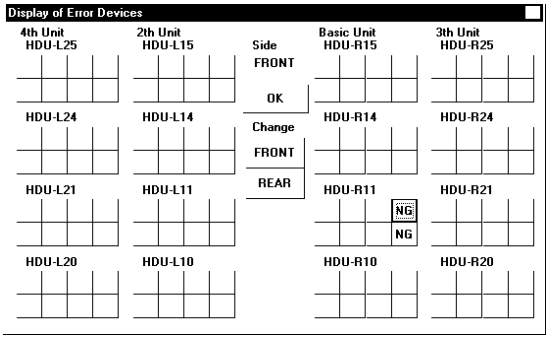
Select (CL) the [OK] button after 'Result' is displayed.

When [OK] is selected, go to 10 or 11.



14. <Displaying 'Display of Error Devices' (in the abnormal state)>

When an error occurs, "NG" is displayed in the installing position of the Pdev in which the error occurs.



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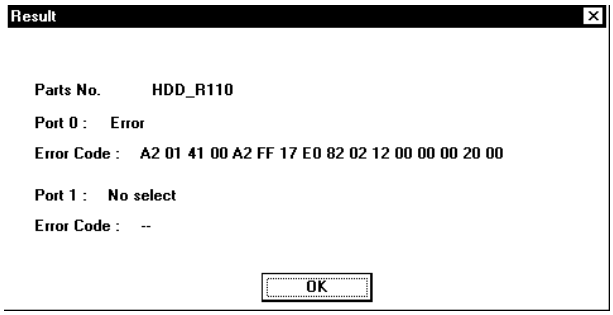
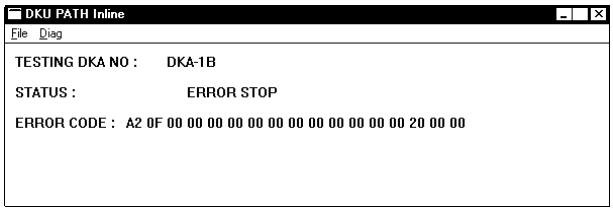
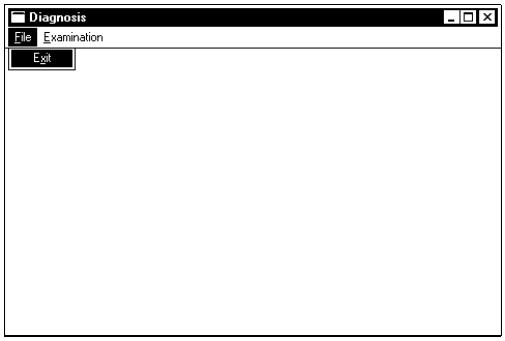
15. <Displaying ‘Result’ (in the abnormal state)>
When the button of each Pdev is selected, detailed result will be displayed (in the abnormal state).



16. <DKU Path inline end>
After “ERROR STOP” is displayed in the Status field, select (DR) [Exit] from [File].



17. <End of [Diagnosis]>
Select (DR) [Exit] from [File] in the Diagnosis menu.



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5 DIAG Trouble shooting

5.1 CUDG Trouble shooting

Procedures of CUDG Trouble Shooting vary with CUDG Error Opportunity.
The procedures are listed in Table 5.1 CUDG Trouble shooting Types.

Table 5.1 CUDG Trouble shooting Types

CUDG Error Opportunity	CUDG Trouble shooting Types	Procedure
IMPL, CHA/DKA Replace	CUDG3 Trouble shooting	Following Subsection 5.1.1
CUDG4	CUDG4 Trouble shooting	Following Subsection 5.1.2
CACHE Replace	INLINE CUDG Trouble shooting	Following Subsection 5.1.3

Note : If FPC is CACHE PCB or CACHE MEMORY MODULE, see Subsection 5.1.4 (DIAG05-50).

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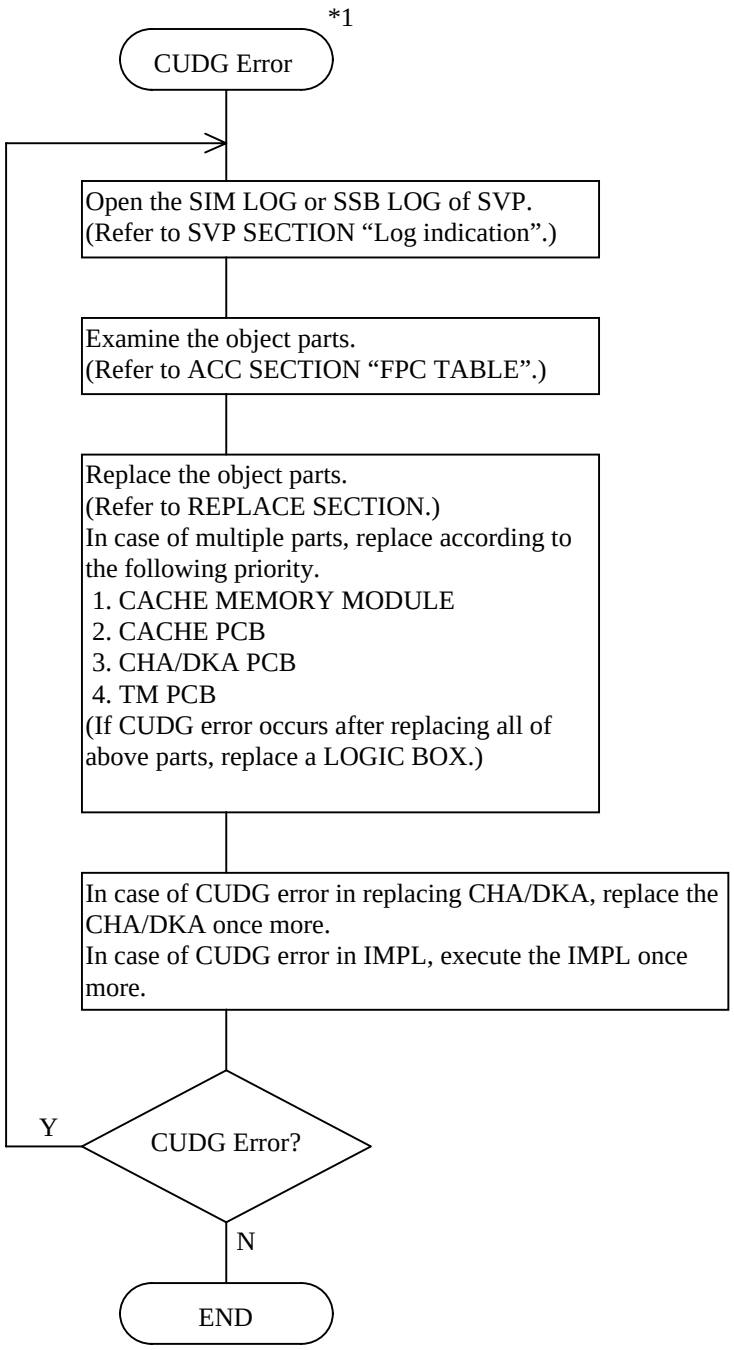
5.1.1 CUDG3 Trouble shooting



*1 CUDG Error Code is SIM REFERENCE CODE = (7601xx) or SSB ERROR CODE = (3306).
*2 See Subsection 5.1.4 (DIAG05-50).

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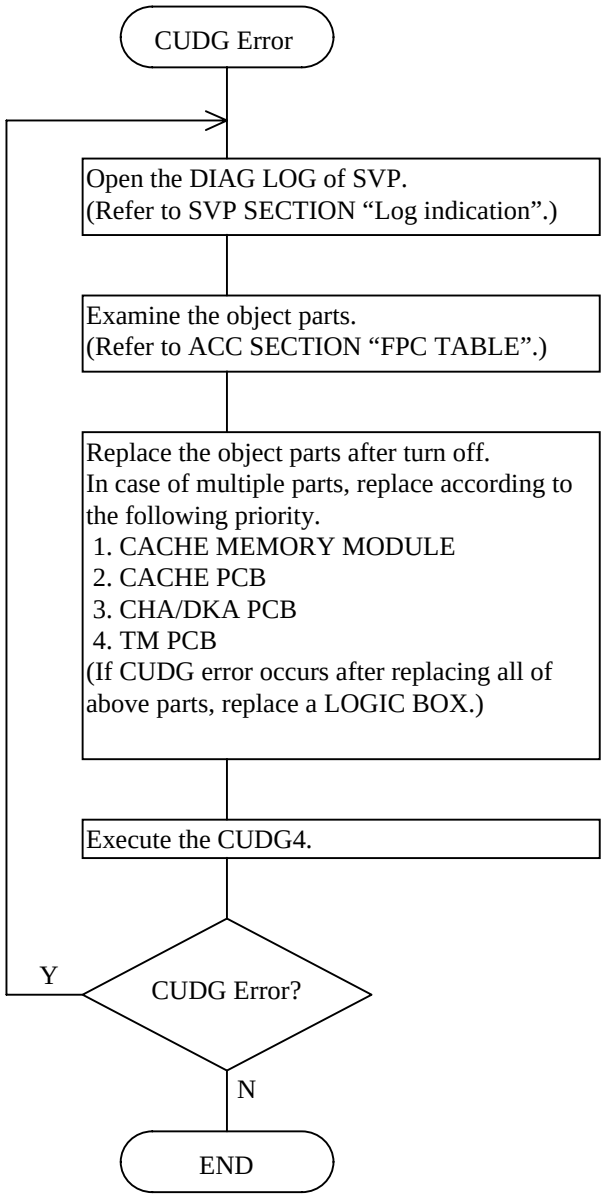
5.1.2 CUDG4 Trouble shooting



*1 See Subsection 5.1.4 (DIAG05-50).

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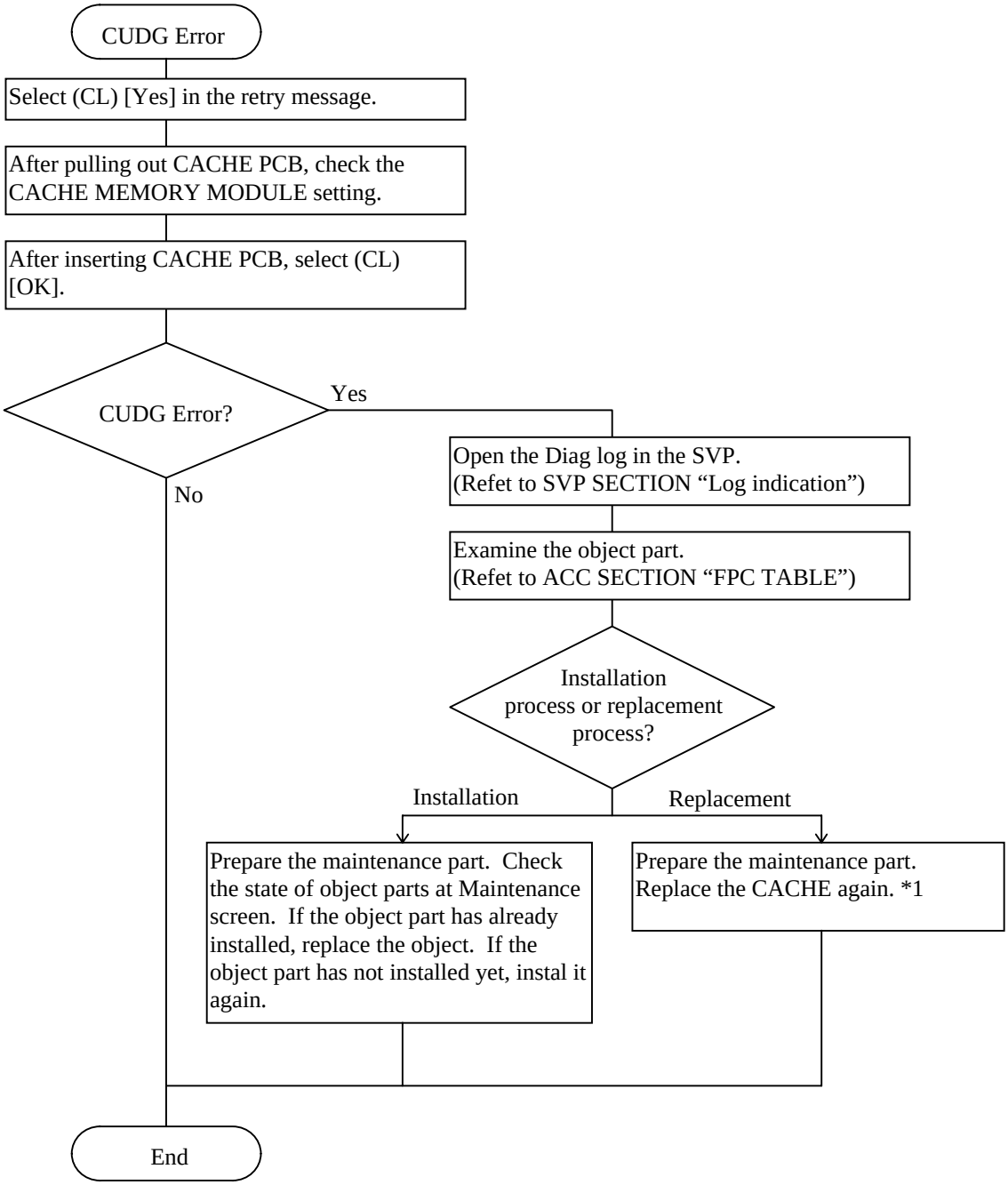
5.1.3 INLINE CUDG Trouble shooting

(1) Installation



*1 In case of multiple parts, replace according to the following priority.

1. CACHE MEMORY MODULE
2. CACHE PCB
3. CHA/DKA PCB
4. TM PCB

(If CUDG error occurred after replacing all of above parts, replace LOGIC BOX.)
If error part is CACHE MEMORY MODULE/CACHE PCB, refer to Subsection 5.1.4 (DIAG05-50).

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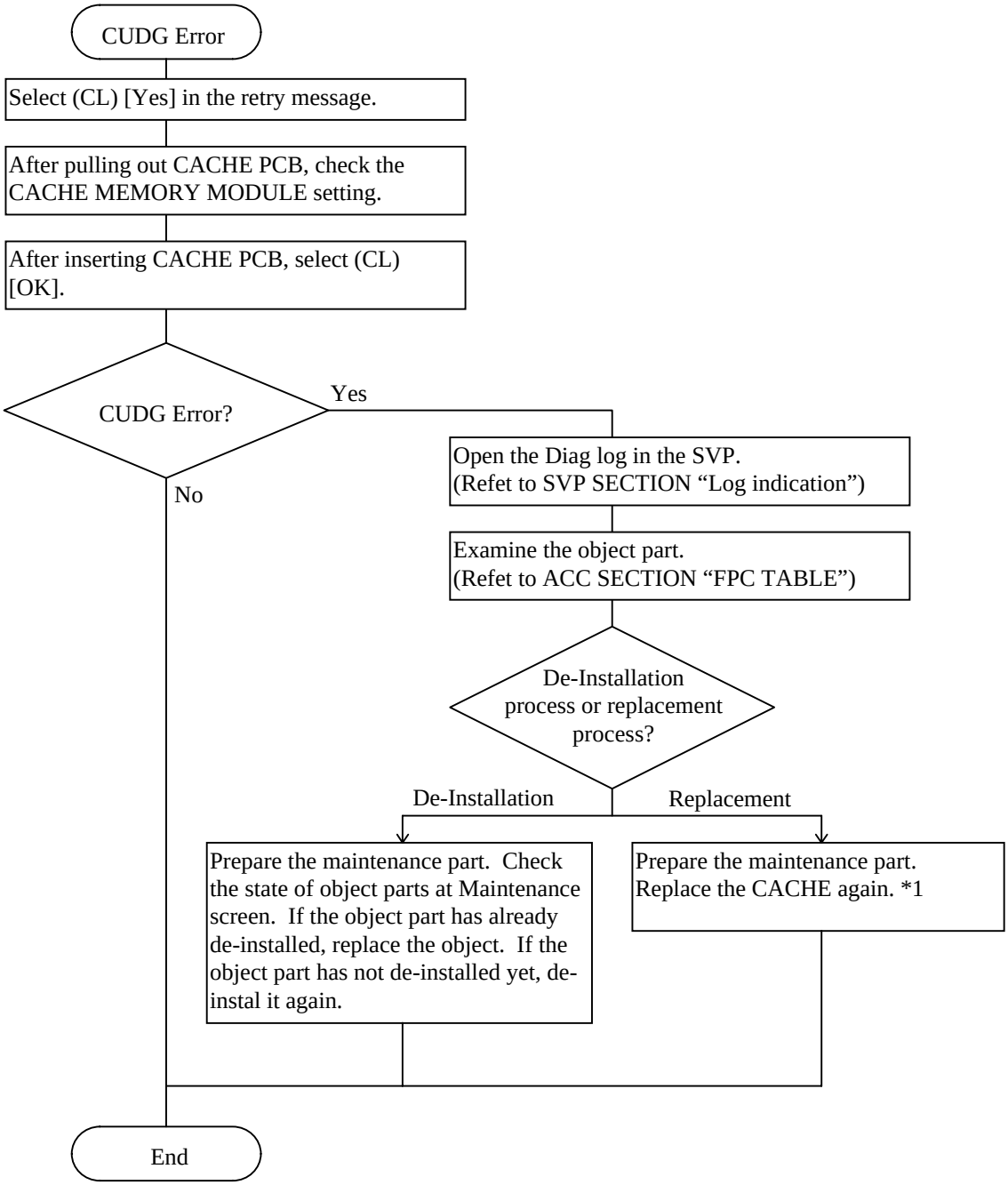
(2) De-Installation



*1 In case of multiple parts, replace according to the following priority.

1. CACHE MEMORY MODULE
2. CACHE PCB
3. CHA/DKA PCB
4. TM PCB

(If CUDG error occurred after replacing all of above parts, replace LOGIC BOX.)
If error part is CACHE MEMORY MODULE/CACHE PCB, refer to Subsection 5.1.4 (DIAG05-50).

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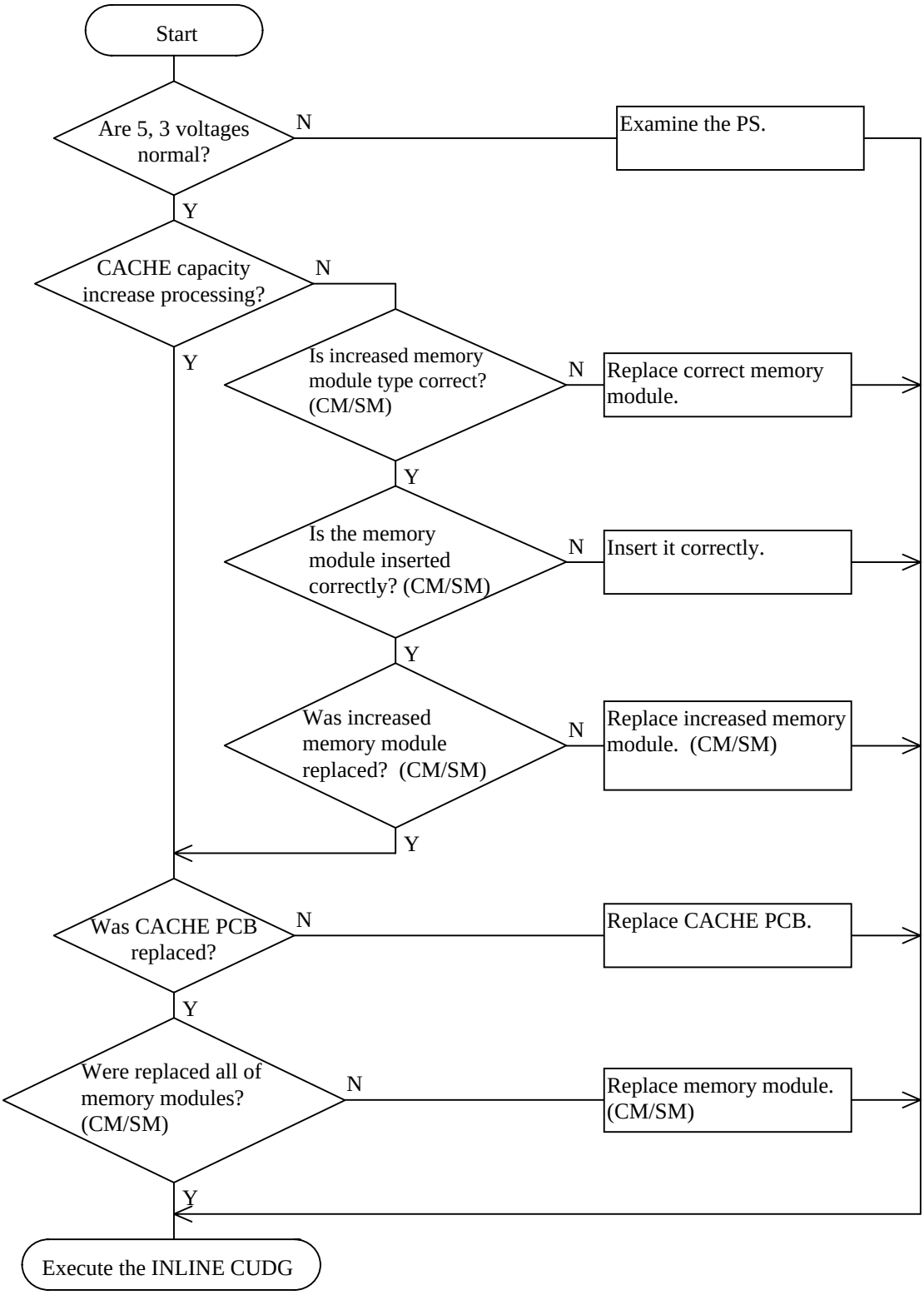
5.1.4 CACHE PCB, CACHE MEMORY MODULE Trouble shooting

If FPC is CACHE PCB, CACHE MEMORY MODULE, execute the following process.



*1 In case of multiple module groups, replace module groups one by one.
If CUDG error occurs after replacing , put them original position.

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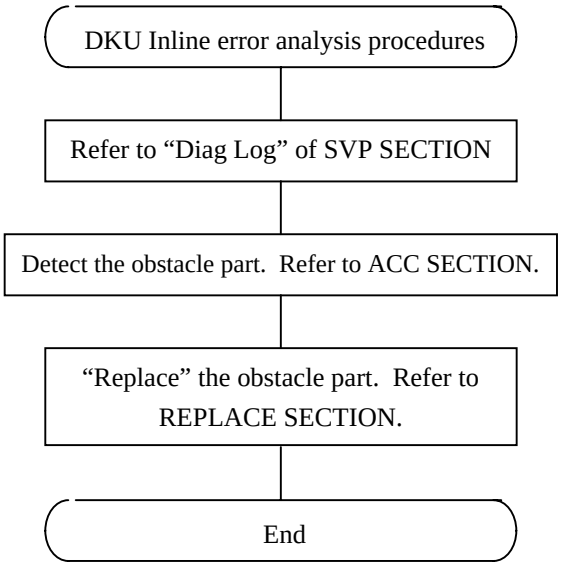
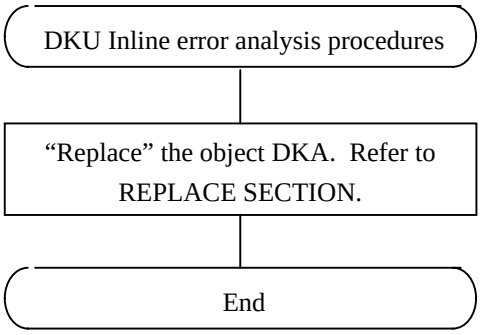
5.2 DKU INLINE Trouble shooting

Trouble shoot procedures (Except Error Code = “xx e3”)



Trouble shoot procedures (In case of Error Code = “xx e3”)



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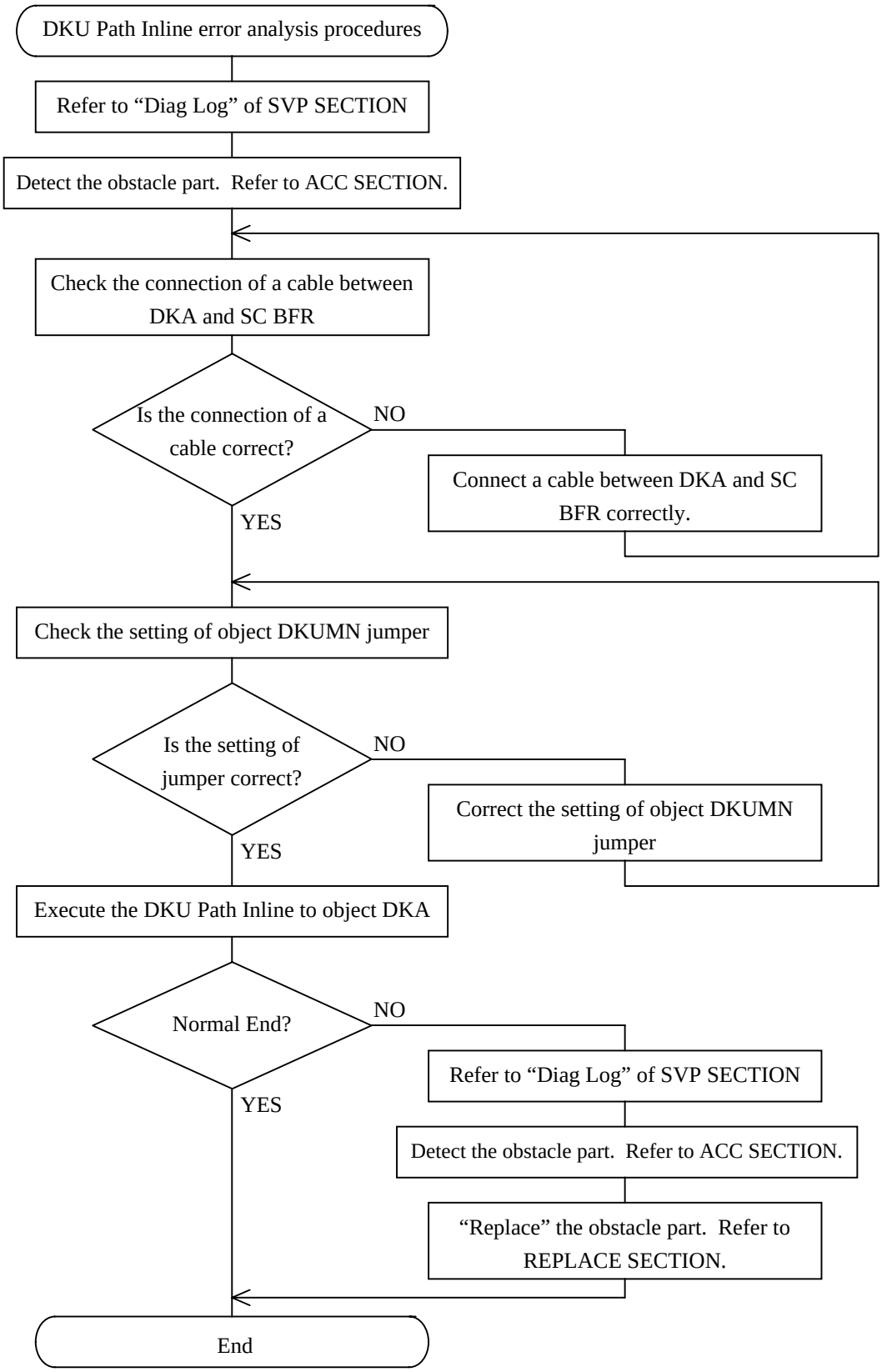
5.3 DKU PATH INLINE Trouble shooting

Trouble shoot procedures (In case of Error Code = “00 1c”, “01 9c”, “02 1d”, “03 9d”, “04 14”, “05 94”, “06 15” “07 95”, “00 0c”, “01 8c”, “02 0d”, “03 8d”, “04 04”, “05 84”, “06 05”, “07 85”)



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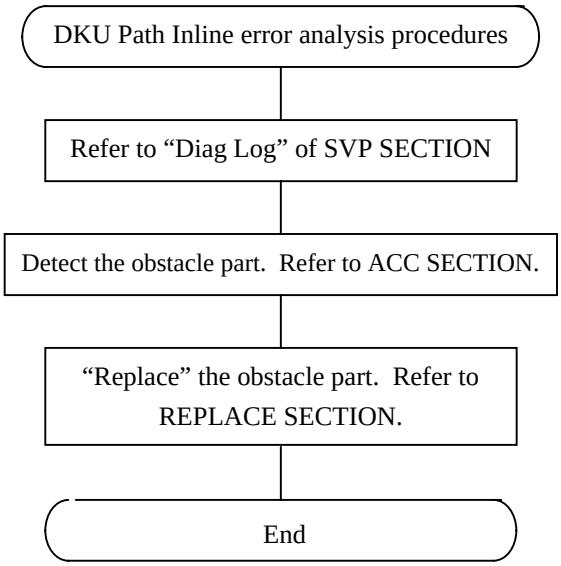
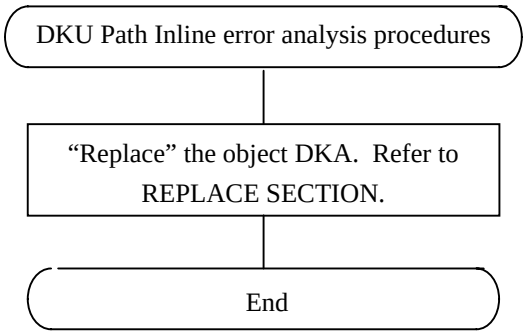
Trouble shoot procedures (Except Error Code = “a0 01”, “a0 02”)



Trouble shoot procedures (In case of Error Code = “xx e3”)



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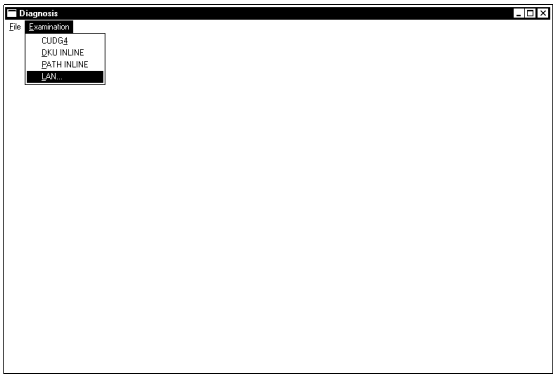
6 LAN Check Procedure

1. <Initial screen>

2. <Operation mode change>
   Change the mode to [Modify mode].
   Select (CL) [Diagnosis].

3. <Activating LAN...>
   Select (DR) [LAN...] from Examination in the Diagnosis menu.
   (The screen is changed to the LAN Check menu screen.)



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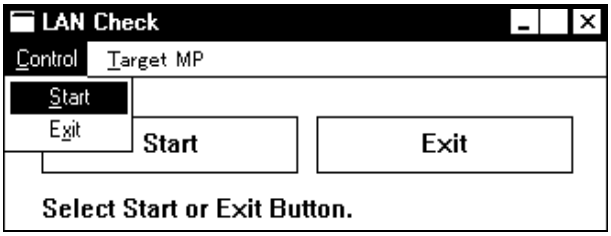
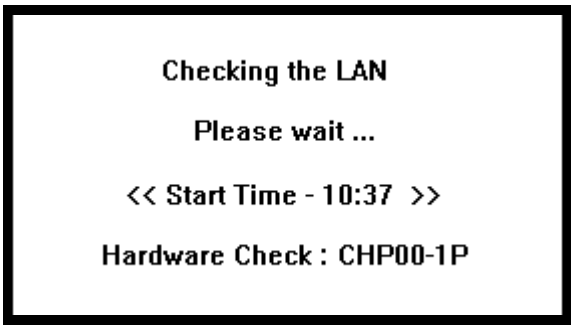
4. <Starting LAN Check>
Select (DR) [Start] from Control of the LAN Check menu.



<Supplementary explanation>
Although a default processor to execute a hardware diagnosis is an installed processor, all processors can be selected.

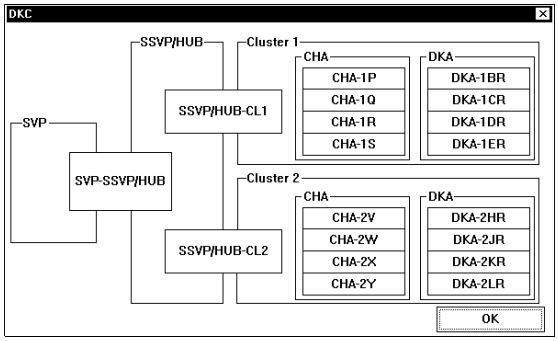
Installed processor : Select (CL) [Target MP] and then select (DR) [Equipped MP].
All processors : Select (CL) [Target MP] and then select (DR) [All MP].

5. <Displaying Wait message>
The Wait message is displayed. It changes to the result display screen a few minutes later.



6. <Displaying result>

(1) Adapter status display
When the Adapter button is selected, the screen is changed to that displaying the MP status.
The screen is returned to the LAN Check menu screen by selecting (CL) [OK].



[Explanation on statuses]
The status is shown by the appearance of the button as follows:
Black : The test object is normal.
Blinking : The test object is abnormal.
Gray : The test object is not installed.

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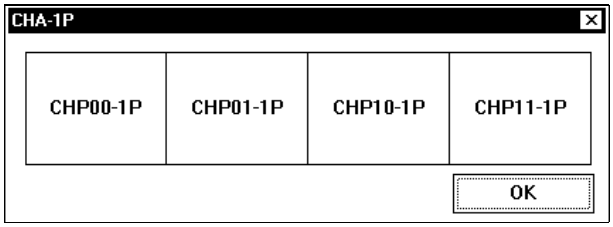
(2) MP status display

When the MP button is selected, the screen is changed to that displaying detailed status.
The screen is returned to that displaying the adapter status by selecting (CL) [OK].

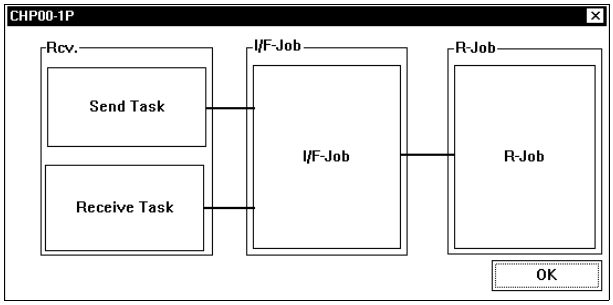


[Explanation on statuses]
The status is shown by the appearance of the MP button as follows:
Black : The concerning MP is normal.
Blinking : The test object is abnormal. However, for the MP which was normal at the time of an FF-Ping, "#" is indicated ahead MP name.
Gray : The test object is not installed.

[Supplemental explanation]
When the test object is not installed in the state that the hardware is abnormal:
The concerning MP is indicated in gray.
When the test object is not installed in the state that the hardware is normal:
The indication of the concerning MP is grayed and blinks.
When the test object is installed by an FF-Ping:
A character "#" is indicated ahead the MP name, and the name indication blinks.
When the test object is connected by an FF-Ping but not installed:
A character "#" is indicated ahead the MP name, and the name indication is grayed and blinks.

(3) Detailed status display

Detailed information on the concerning MP is displayed.
The screen is returned to that displaying the MP status by selecting (CL) [OK].



[Explanation on statuses]
The test result is shown by the appearance of the Tusk button as follows:
Black : The MP is normal from the viewpoint of software.
Blinking : The part indication of which is blinking has a problem.
Gray : Not diagnosed yet.

[Supplemental explanation]
There are five types of status as shown below:
When the hardware is abnormal : Rcv., I/F-JOB, and R-JOB are indicated in gray.
When the software is normal : Rcv., I/F-JOB, and R-JOB are indicated in black.
When the Rcv. is abnormal : Rcv. indication blinks, and I/F-JOB and R-JOB are indicated in gray.
When the I/F-JOB is abnormal : Rcv. is indicated in black, I/F-JOB indication blinks, and R-JOB is indicated in gray.
When the R-JOB is abnormal : Rcv. and I/F JOB are indicated in black and R-JOB indication blinks.

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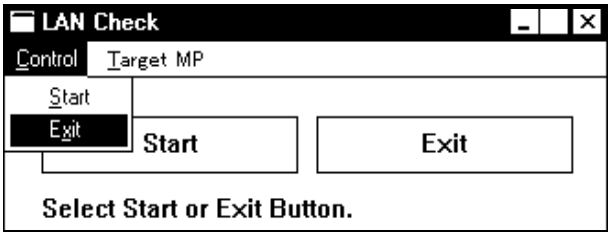
7. <Exiting from LAN Check>
   Select (DR) [Exit] from Control in the LAN Check menu.



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7 DIAG Errors

7.1 DKU INLINE Error Code List

Error Byte									Contents
01	02	03	04	05	06	07	08	09	
xx	D0								The file name is different.
xx	D1								Windows error
xx	D2								The file reading failed.
xx	D3								The file closing failed.
xx	D4								The object part is not installed.
xx	D5								The 1st parameter is invalid.
xx	D6								The 2nd parameter is invalid.
xx	D7								The 3rd parameter is invalid.
xx	D8								The 4th parameter is invalid.
xx	D9								The 5th parameter is invalid.
xx	DA								The 6th parameter is invalid.
xx	DB								The 7th parameter is invalid.
xx	DC								The 8th parameter is invalid.
xx	DD								The 9th parameter is invalid.
xx	DE								The 10th parameter is invalid.
xx	DF								The 11th parameter is invalid.

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Error Byte									Contents
01	02	03	04	05	06	07	08	09	
xx	E0								The TEST UNIT READY command failed.
xx	E1								The RESET CE MODE cannot be done.
xx	E2	Eye-catcher							The configuration information acquisition was done incorrectly.
xx	E3								Time-out of the communication between the DKC and SVP.
xx	E4								The sense key is not (0x00) when the TEST UNIT READY is normal.
xx	E5								The sense code-HI is not (0x00) when the TEST UNIT READY is normal.
xx	E6								The sense code-LOW is not (0x00) when the TEST UNIT READY is normal.
xx	E8	RETURN CODE				FC	FD		The configuration information acquisition command failed.
xx	E9								The SET CE MODE cannot be done.
xx	EA	Parameter from ONLINE							The specified HDD does not exist.
xx	EB								FUSE error
xx	EC								LED BUS PARITY error
xx	ED								SCSI R/W PARITY error

FC: Function code FD: Function detail

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
xx	F0									Communication error
xx	F1									Application Abort error
xx	F2									Windows error
xx	F3									Parameter error
xx	F4									Length error
xx	F5									Null Ptr error
xx	F6									DKC Reject error

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C0	01	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C0	02	DE								PHYSICAL WRITE was failed.
C0	03	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C0	04	DE								PHYSICAL READ was failed.
C0	05	RV	EV	BYTE	HD#					READ DATA compare error. (Expected Value=0xe5)
C0	08									TEST UNIT READY command was failed.
C0	10	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL WRITE command was failed.
C0	11	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ command was failed.

KEY : SENSE KEY FA : Factor DE : Detail RV : Receive Value EV : Expected Value
In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)
Refer to the SENSE CODE on page SSBLOG05-4520 for “Detail”.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C1	01									Invalid SENSE KEY in TEST UNIT READY. Ev:0x00
C1	02									Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x00
C1	03									Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
C1	04									Invalid Error Factor in TEST UNIT READY failed. Ev:0x12
C1	05									Invalid SENSE KEY in TEST UNIT READY failed. Ev:0x06
C1	06									Invalid SENSE CODE-HI in TEST UNIT READY failed. Ev:0x29
C1	07									Invalid SENSE CODE-LO in TEST UNIT READY failed. Ev:0x00
C1	08									TEST UNIT READY command was failed.
C1	09									Invalid SENSE KEY in TEST UNIT READY. Ev:0x00
C1	0A									Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x00
C1	0B									Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
C1	0C									Hard Error of SCSI BUFF has occurred.

Ev : Expected value

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C2	01	RETURN CODE				FA	KEY	SENSE CODE		STOP UNIT command was failed.
C2	02	RETURN CODE				FA	KEY	SENSE CODE		Return Code in TEST UNIT READY Command reported 0x00000000.
C2	03	RETURN CODE				FA	KEY	SENSE CODE		Return Code in TEST UNIT READY Command reported 0x0F001740.
C2	04									Invalid Error Factor in TEST UNIT READY failed. Ev:0x17
C2	05									Invalid SENSE KEY in TEST UNIT READY failed. Ev:0x02
C2	06									Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x04
C2	07									Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
C2	08									2nd TEST UNIT READY command was failed.
C2	09									Invalid SENSE KEY in TEST UNIT READY. Ev:0x00
C2	0A									Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x00
C2	0B									Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
C2	0C	RETURN CODE				FA	KEY	SENSE CODE		START UNIT command was failed.

KEY : SENSE KEY FA : Factor Ev : Expected value

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)

In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C3	01	RETURN CODE				FA	KEY	SENSE CODE		INQUIRY command was failed.
C3	02	ED								Data compare error.

KEY : SENSE KEY FA : Factor ED : Expected Data
In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C4	01	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed.
C4	02	DE								Error occurred during SEEK TEST.

KEY : SENSE KEY FA : Factor DE : Detail

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)

In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C5	01	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C5	02	DE								PHYSICAL WRITE was failed.
C5	03	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C5	04	DE								PHYSICAL READ was failed.

KEY : SENSE KEY FA : Factor DE : Detail
In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)
Refer to the SENSE CODE on page SSBLOG05-4520 for “Detail”.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C5	10	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL WRITE was failed.
C5	11	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ was failed.

KEY : SENSE KEY FA : Factor
In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)
Refer to the SENSE CODE on page SSBLOG05-4520 for “Detail”.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C6	01	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C6	02	DE								PHYSICAL WRITE1 operation was failed.
C6	03	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C6	04	DE								PHYSICAL READ2 operation was failed.
C6	05	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C6	06	DE								WRITE LONG3 operation was failed.
C6	07	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C6	08	DE								PHYSICAL READ4 operation was failed.
C6	09	DE								READ DATA compare error. (Expected value=0x00)
C6	0A	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C6	0B	DE								WRITE LONG5 operation was failed.
C6	0C	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C6	0D	DE								PHYSICAL READ6 operation was failed.
C6	0E	DE								READ DATA compare error. (Expected value=0x00)
C6	0F	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.

KEY : SENSE KEY FA : Factor DE : Detail

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)

In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C6	10	DE								WRITE LONG7 operation was failed.
C6	11	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C6	12	DE								Not became uncorrectable error during PHYSICAL READ8.
C6	13	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C6	14	DE								WRITE LONG9 operation was failed.
C6	15	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C6	16	DE								Not became uncorrectable error during PHYSICAL READ10.
C6	17	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during WRITE OP CHK.
C6	18	DE								WRITE LONG11 operation was failed.
C6	19	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed during READ OP CHK.
C6	1A	DE								READ12 operation was failed.
C6	1B									READ DATA compare error. (Expected value=0x00)
C6	1C									Making ECC Check Data of WRITE LONG5 was failed.
C6	1D									Making ECC Check Data of WRITE LONG7 was failed.
C6	1E									Making ECC Check Data of WRITE LONG9 was failed.
C6	1F									INQUIRY command was failed.

KEY : SENSE KEY FA : Factor DE : Detail

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)
Refer to the SENSE CODE on page SSBLOG05-4520 for “Detail”.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C6	20	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL WRITE1 command was failed.
C6	21	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ2 command was failed.
C6	22	RETURN CODE				FA	KEY	SENSE CODE		WRITE LONG3 command was failed.
C6	23	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ4 command was failed.
C6	24	RETURN CODE				FA	KEY	SENSE CODE		WRITE LONG5 command was failed.
C6	25	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ6 command was failed.
C6	26	RETURN CODE				FA	KEY	SENSE CODE		WRITE LONG7 command was failed.
C6	27	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ8 command was failed.
C6	28	RETURN CODE				FA	KEY	SENSE CODE		WRITE LONG9 command was failed.
C6	29	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ10 command was failed.
C6	2A	RETURN CODE				FA	KEY	SENSE CODE		WRITE LONG11 command was failed.
C6	2B	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ12 command was failed.
C6	2E									Not became Correctable error.
C6	2F									Not became Uncorrectable error.

KEY : SENSE KEY FA : Factor

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)
Refer to the SENSE CODE on page SSBLOG05-4520 for “Detail”.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
C7	01	RETURN CODE				FA	KEY	SENSE CODE		SELF TEST command was failed.
C7	02	RE	FA	KEY	SENSE CODE					Error occurred during SELF TEST. (Result=00)

KEY : SENSE KEY FA : Factor RE : Result

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)

In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D1	01	RETURN CODE				FA	KEY	SENSE CODE		STOP UNIT command was failed.
D1	02	RETURN CODE				FA	KEY	SENSE CODE		Return Code in TEST UNIT READY Command reported 0x00000000.
D1	03	RETURN CODE				FA	KEY	SENSE CODE		Return Code in TEST UNIT READY Command reported 0x0F001740.
D1	04									Invalid Error Factor in TEST UNIT READY failed. Ev:0x17
D1	05									Invalid SENSE KEY in TEST UNIT READY failed. Ev:0x02
D1	06									Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x04
D1	07									Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
D1	08									2nd TEST UNIT READY command was failed.
D1	09									Invalid SENSE KEY in TEST UNIT READY. Ev:0x00
D1	0A									Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x00
D1	0B									Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
D1	0C									RESET CE MODE command was failed.
D1	0D									SET CE MODE command was failed.

KEY : SENSE KEY FA : Factor

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)

In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D2	20	Input value				FD value				Invalid Product Number.
D2	22									FD Read Error.
D2	23									FD Write Error.
D2	24	BYTE#		HD	FD	HEAD				Compare Error of Management Area.

SC : SENSE CODE HD : HD value FD : FD value

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D2	30									PHYSICAL READ command was failed.
D2	31									RECEIVE DIAG command was failed.
D2	32									PHYSICAL READ was failed.
D2	33									PHYSICAL WRITE command was failed.
D2	34									RECEIVE DIAG command was failed.
D2	35									PHYSICAL WRITE was failed.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D2	40									Invalid Phase Data.
D2	41									Sum check error.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	01									Correction coefficient of servo side position sensitivity is below “0.7”.
D3	02									Correction coefficient of servo side position sensitivity is above “1.3”.
D3	03									Correction coefficient of following gain is below “0.7”.
D3	04									Correction coefficient of following gain is above “1.3”.
D3	05									Correction coefficient of seek loop gain is below “0.7”.
D3	06									Correction coefficient of seek loop gain is above “1.3”.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	10									Get TABLE ADDRESS command was failed. (M-ESDI)
D3	11									NOP command was failed. (M-ESDI)
D3	13									RECEIVE DIAG command was failed. (SCSI)
D3	14									COMMAND STATUS ERROR.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	20									Set HI ADDRESS command was failed. (M-ESDI)
D3	21									Set LOW ADDRESS command was failed. (M-ESDI)
D3	22									2 BYTE MEMORY READ command was failed. (M-ESDI)
D3	23									NOP command was failed. (M-ESDI)
D3	24									RECEIVE DIAG command was failed. (SCSI)
D3	25									COMMAND STATUS ERROR.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	30									Get VYESDI RTN ADDRESS command was failed. (M-ESDI)
D3	31									NOP command was failed. (M-ESDI)
D3	32									RECEIVE DIAG command was failed. (SCSI)
D3	33									COMMAND STATUS ERROR.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	40									Set HI ADDRESS command was failed. (M-ESDI)
D3	41									Set LOW ADDRESS command was failed. (M-ESDI)
D3	42									Set command value (measurement option) was failed.
D3	43									Set HI ADDRESS command was failed. (M-ESDI)
D3	44									Set LOW ADDRESS command was failed. (M-ESDI)
D3	45									Set command value (measurement cylinder) was failed.
D3	46									Set HI ADDRESS command was failed. (M-ESDI)
D3	47									Set LOW ADDRESS command was failed.(M-ESDI)
D3	48									Set command value (measurement command) was failed.
D3	49									Measurement execution command was failed. (M-ESDI)
D3	4A									REQUEST STATUS command was failed. (M-ESDI)
D3	4B									NOP command was failed. (M-ESDI)
D3	4C									RECEIVE DIAG command was failed. (SCSI)
D3	4D									Measurement result is abnormal.
D3	4E									ATTENTION RESET command was failed. (M-ESDI)
D3	4F									REZERO command was failed. (M-ESDI)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	50									Set HI ADDRESS command was failed. (M-ESDI)
D3	51									Set LOW ADDRESS command was failed. (M-ESDI)
D3	52									Get measurement value command was failed. (M-ESDI)
D3	53									NOP command was failed. (M-ESDI)
D3	54									RECEIVE DIAG command was failed. (SCSI)
D3	55									COMMAND STATUS ERROR.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	60									PHYSICAL READ command was failed.
D3	61									RECEIVE DIAG command was failed.
D3	62									COMMAND STATUS ERROR.
D3	63									PHYSICAL WRITE command was failed.
D3	64									RECEIVE DIAG command was failed.
D3	65									COMMAND STATUS ERROR.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D3	70									Set HI ADDRESS command was failed. (M-ESDI)
D3	71									Set LOW ADDRESS command was failed. (M-ESDI)
D3	72									Set write data command was failed. (M-ESDI)
D3	73									Set HI ADDRESS command was failed. (M-ESDI)
D3	74									Set LOW ADDRESS command was failed. (M-ESDI)
D3	75									2 BYTE MEMORY READ command was failed. (M-ESDI)
D3	76									NOP command was failed. (M-ESDI)
D3	77									RECEIVE DIAG command was failed. (M-ESDI)
D3	78									COMMAND STATUS ERROR.
D3	79									Write data compare error.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D4	03	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG was command failed.
D4	04									READ operation was failed.
D4	11	RETURN CODE				FA	KEY	SENSE CODE		PHYSICAL READ command was failed.

KEY : SENSE KEY FA : Factor

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)

In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D6	20	Input value				FD value				Invalid Product Number.
D6	22									FD Read Error.
D6	23									FD Write Error.
D6	24	BYTE#		HD	FD	HEAD				Compare Error of Management Area.

SC : SENSE CODE HD : HD value FD : FD value

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D6	30									PHYSICAL READ command was failed.
D6	31									RECEIVE DIAG command was failed.
D6	32									PHYSICAL READ was failed.
D6	33									PHYSICAL WRITE command was failed.
D6	34									RECEIVE DIAG command was failed.
D6	35									PHYSICAL WRITE was failed.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D7	20	Input value				FD value				Invalid Product Number.
D7	22									FD Read Error.
D7	23									FD Write Error.
D7	24	BYTE#		HD	FD	HEAD				Compare Error of Management Area.

SC : SENSE CODE HD : HD value FD : FD value

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D7	30									PHYSICAL READ command was failed.
D7	31									RECEIVE DIAG command was failed.
D7	32									PHYSICAL READ was failed.
D7	33									PHYSICAL WRITE command was failed.
D7	34									RECEIVE DIAG command was failed.
D7	35									PHYSICAL WRITE was failed.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
D8	08									TEST UNIT READY command was failed.

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7.2 PATH INLINE Error Code List

Error Byte								Contents
01	02	03	04	05	06	07	08	
Ax	E0							CE MODE cannot be set.
Ax	E1							CE MODE cannot be reset.
Ax	E2	Eye-catcher						Got bad Structure Information.
Ax	E3							Communication of between DKC and SVP was TIME OUT.
Ax	E4							Invalid SENSE KEY in TEST UNIT READY. Ev:0x00
Ax	E5							Invalid SENSE CODE-HI in TEST UNIT READY. Ev:0x00
Ax	E6							Invalid SENSE CODE-LOW in TEST UNIT READY. Ev:0x00
Ax	E7	Eye-catcher						No equipped DKA!
Ax	E8	RETURN CODE				FC	FD	Structure Information command was failed.

FC : Function Code FD : Function Detail

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
Ax	F0									Communication Error
Ax	F1									Application Abort
Ax	F2									Windows Error
Ax	F3									Parameter Error
Ax	F4									Length Error
Ax	F5									Null Ptr Error
Ax	F6									DKC Reject

Ev : Expected value

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Error Byte											Contents
01	02	03	04	05	06	07	08	09	10	11	
A0	01	RETURN CODE				Factor	KEY	SENSE CODE			The INQUIRY command failed.
A0	02		ED								The acquired data did not coincide with the expected value.
A0	03										A hardware error was detected by the SCSI error detection function.
A0	04										A FUSE error was detected.
A0	05										A SCSI parity error was detected.
A0	06										Shut Down LED is ON
A0	1x	DKA#	CDEV	RDEV	CDEV	RDEV	CDEV	RDEV	CDEV	RDEV	A partial paths defect error
A0	2x	DKA#	CDEV	RDEV	CDEV	RDEV	CDEV	RDEV	CDEV	RDEV	An all paths defect error
10 or 20		When each of lower 4 bits is 0									The INQUIRY command failed.
11 or 21		When bit 7 is 1									A hardware error was detected by the SCSI error detection function.
12 or 22		When bit 6 is 1									A FUSE error was detected.
14 or 24		When bit 7 is 1									A SCSI parity error was detected.
A0	4x										Shut Down LED is ON
A0	01	FF	FF	FF	FF	00	00	00	00	00	No drive is connected to the DKA.

KEY : SENSE KEY ED : Expected value

Refer to interruption codes on page SSBLOG05-4400 when KEY is “E0”, or refer to sense keys on page SSBLOG05-4520 when KEY is other than “E0”.

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Error Byte																	Contents
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	
DKA#	EV	RV	EV	RV	EV	RV	EV	RV	EV	RV	EV	RV	EV	RV	EV	RV	SCSI data compare error.
	Port 1		Port 2		Port 3		Port 4		Port 1		Port 2		Port 3		Port 4		
	Basic Unit								Option Unit								
(Ex.1) No Extended Unit																	
00	1C	RV	3C	RV	5C	RV	7C	RV									SCSI data compare error.(DKA-1B)
01	9C	RV	BC	RV	DC	RV	FC	RV									SCSI data compare error.(DKA-1C)
02	1D	RV	3D	RV	5D	RV	7D	RV									SCSI data compare error.(DKA-1D)
03	9D	RV	BD	RV	DD	RV	FD	RV									SCSI data compare error.(DKA-1E)
04	14	RV	34	RV	54	RV	74	RV									SCSI data compare error.(DKA-2H)
05	94	RV	B4	RV	D4	RV	F4	RV									SCSI data compare error.(DKA-2J)
06	15	RV	35	RV	55	RV	75	RV									SCSI data compare error.(DKA-2K)
07	95	RV	B5	RV	D5	RV	F5	RV									SCSI data compare error.(DKA-2L)
(Ex.2) Equipped Extended Unit																	
00	0C	RV	2C	RV	4C	RV	6C	RV	1A	RV	3A	RV	5A	RV	7A	RV	SCSI data compare error.(DKA-1B)
01	8C	RV	AC	RV	CC	RV	EC	RV	9A	RV	BA	RV	DA	RV	FA	RV	SCSI data compare error.(DKA-1C)
02	0D	RV	2D	RV	4D	RV	6D	RV	1B	RV	3B	RV	5B	RV	7B	RV	SCSI data compare error.(DKA-1D)
03	8D	RV	AD	RV	CD	RV	ED	RV	9B	RV	BB	RV	DB	RV	FB	RV	SCSI data compare error.(DKA-1E)
04	04	RV	24	RV	44	RV	64	RV	12	RV	32	RV	52	RV	72	RV	SCSI data compare error.(DKA-2H)
05	84	RV	A4	RV	C4	RV	E4	RV	92	RV	B2	RV	D2	RV	F2	RV	SCSI data compare error.(DKA-2J)
06	05	RV	25	RV	45	RV	65	RV	13	RV	33	RV	53	RV	73	RV	SCSI data compare error.(DKA-2K)
07	85	RV	A5	RV	C5	RV	E5	RV	93	RV	B3	RV	D3	RV	F3	RV	SCSI data compare error.(DKA-2L)

EV : Expected Value RV : Received Value*

* See attached sheets (A) ~ (B) for detailed definition.

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
A1	01	RETURN CODE				FA	KEY	SENSE CODE		DIAG READ command was failed.
A1	02	RETURN CODE				FA	KEY	SENSE CODE		RECEIVE DIAG command was failed.
A1	03									PHYSICAL READ was failed.
A1	10									Detect Error Drive

KEY : SENSE KEY FA : Factor

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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Error Byte										Contents
01	02	03	04	05	06	07	08	09	10	
A2	01	RETURN CODE				FA	KEY	SENSE CODE		INQUIRY command was failed.
A2	0F									Detect Error Drive

KEY : SENSE KEY FA : Factor

In case of KEY is “E0”, refer to Interruption Status Code in SSBLOG05-4400.
(SENSE CODE HI = Interruption Status Code)
In case of KEY isn’t “E0”, refer to SSBLOG05-4520.
(SENSE CODE HI = ADDITIONAL SENSE CODE,
SENSE CODE LO = ADDITIONAL SENSE CODE QUOLIFIRE)

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(A) Error Bit definition

bit 0							bit 7
PA4	PA5	PA6	TERM	PA0	PA1	PA2	PA3

PA4, 5, 6 : HDU BOX#
TERM : Terminator '0': Termination off / '1': Terminator on
PA0 : CL# '1': CL PATH / '0': CL2 PATH
PA1, 2, 3 : DKU# (DKUMN-XXX : determined by JP1 jumper setting)

Ex : DKA00, CDEV#0, RDEV#0
Expected value 0x0C

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(B) SCSI Buffer Address (Expected Value)

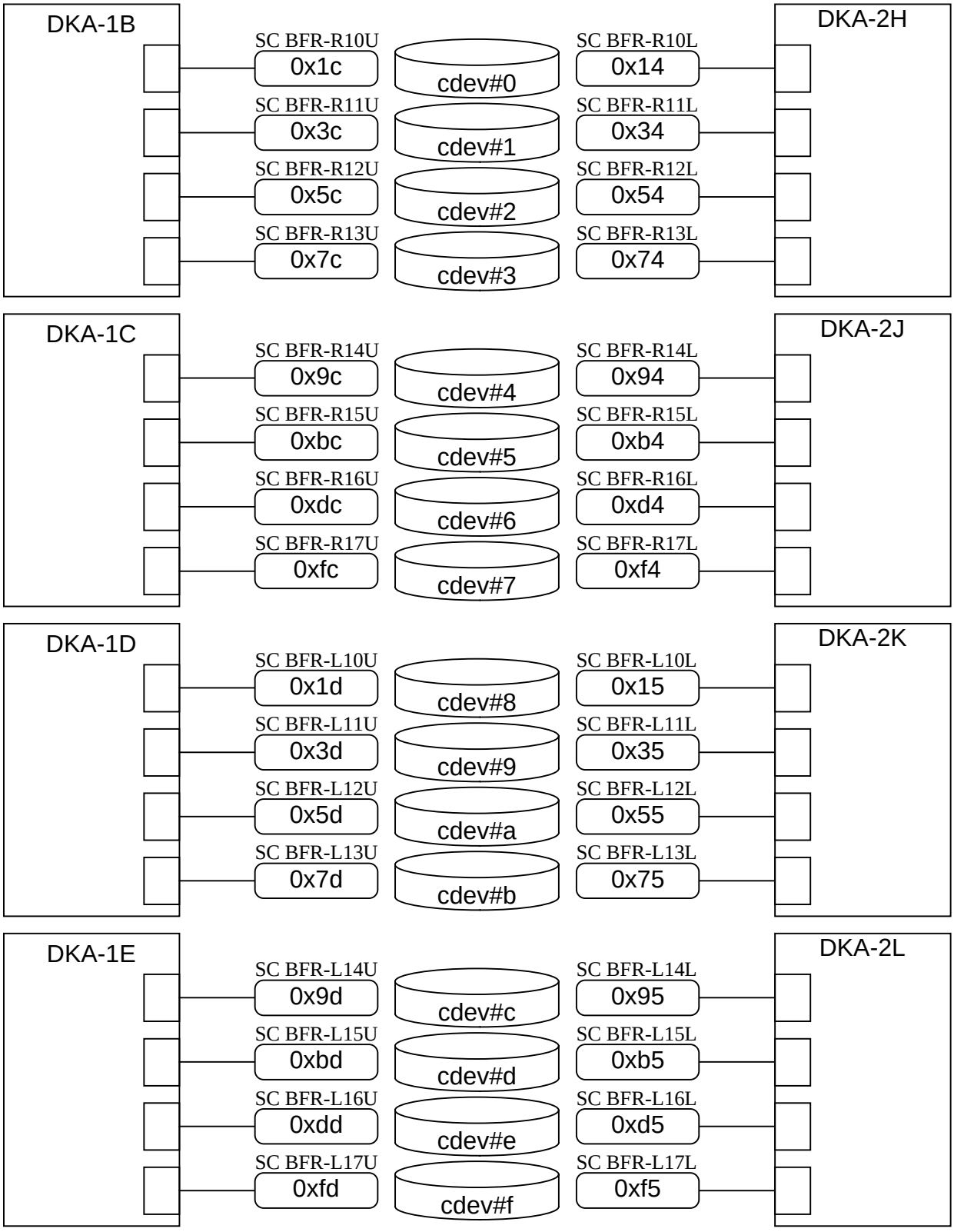

Fig. 7.2-1 DKA Path Address mapping (No Extended Unit : Basic Unit)

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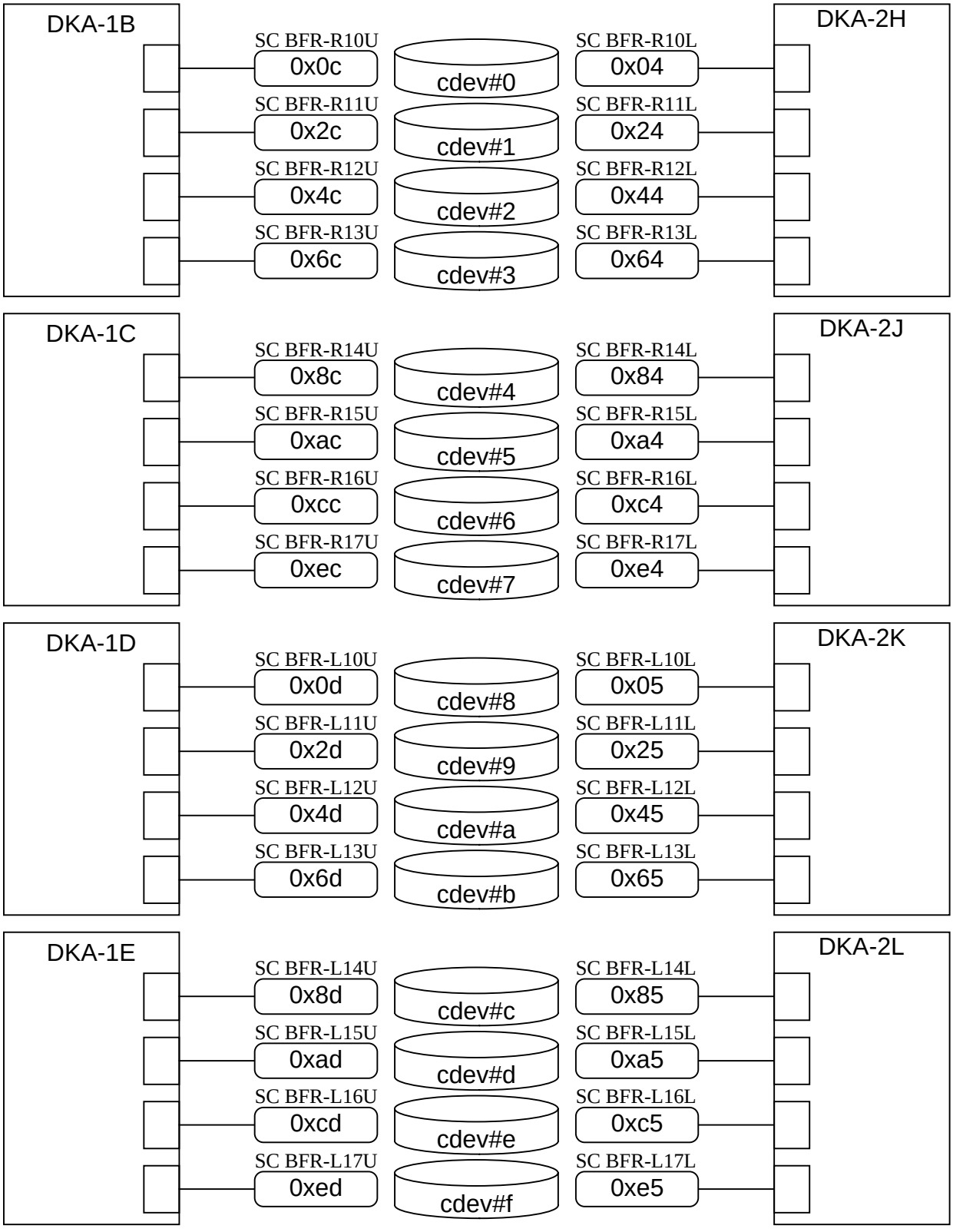

Fig. 7.2-2 DKA Path Address mapping (Equipped Extended Unit : Basic Unit)

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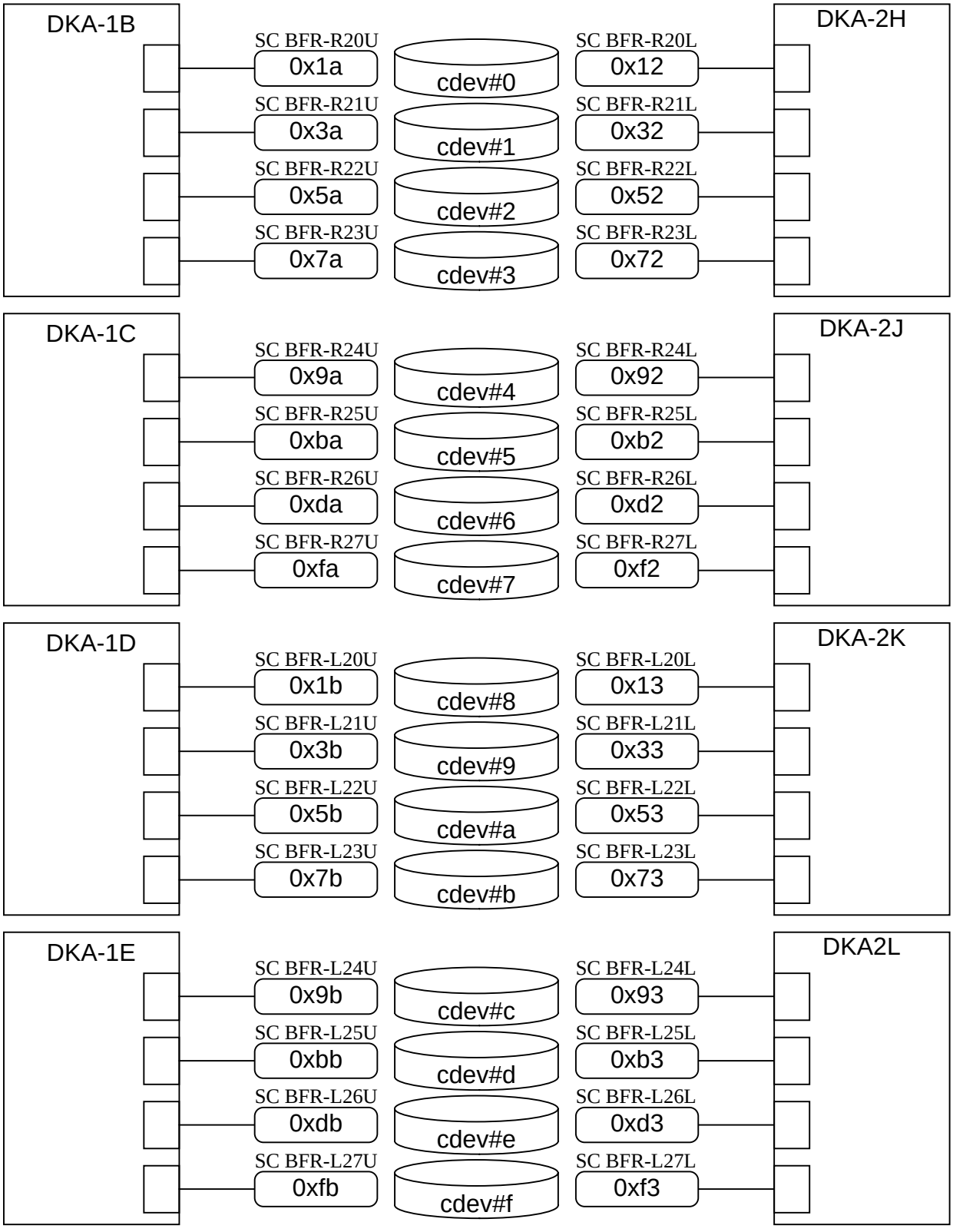

Fig. 7.2-3 DKA Path Address mapping (Extended Unit)

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7.3 CUDG error code list

7.3.1 Test item

Type	Error code
Test item	0064:SIP data register test 0065:SIP SEQ register test 0066:SIP pointer register test 0067:SIP LRC register test(CUDG3) 0068:SIP LRC register test(CUDG4/5) 0069:SIP counter register test(type1) 006A:SIP counter register test(++) 006B:SIP counter register test(--) 006C:SIP counter register test(type2) 006D:SIP adding/subtracking machine test 006E:SIP CBICNT register test 006F:SIP PNDCNT register test 0070:SIP CBF test 0071:SIP ALU test 0072:SIP SIP operation test 0073:SIP FORCE CHK2 operation test 0074:SIP data transfer Test

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Type	Error code
Test item	00C8:SMC register test_1(all bits) 00C9:SMC register test_2(easy test) 00CA:SMC ECC test_1(all correctable error patterns) 00CB:SMC ECC test_2(all uncorrectable error patterns) 00CC:SMC ECC test_3(easy patterns for uncorrectable errors) 00CD:SMC function test_1(single read/write) 00CE:SMC function test_2(rewrite) 00CF:SMC function test_3(byte write) 00D0:SMC function test_4(read modification write) 00D1:SMC function test_5(double read/write) 00D2:SMC function test_6(memory block) 00D3:SMC function test_7(ALL_LOCK) 00D4:SMC function test_8(timer) 00D5:SMC BUS error test_1(check code error) 00D6:SMC BUS error test_2(command parameter error) 00D7:SMC SMC hardware error test 00D8:SMC memory test_1(all memory read/write) 00D9:SMC memory test_2(address line error detection) 00DA SMC memory test_3(DRAM self-refresh) 00DB:SMC ECC test_4(address error patterns) 00DD:SMC memory test_4 (easy patterns for address line error detection) 00DE:SMC SIMM Check

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type	Error code
Test item	012C:DRR register test 012D:DRR SEQ register test 012E:DRR count register test 012F:DRR count operation test 0130:DRR memory test 0131:DRR address line test 0132:DRR arithmetic circuit test 0133:DRR DRR BUFF#1->BSA test 0134:DRR BSA->DRR BUFF#0 test 0135:DRR DRR BUFF#0->BSA test 0136:DRR BSA->DRR BUFF#1 test 0138:DRR LRC check circuit test 0139:DRR DRR arithmetic test 1(DRR BUFF#0) 013A:DRR DRR arithmetic test 1(DRR BUFF#1) 013B:DRR DRR arithmetic test 2(DRR BUFF#0) 013C:DRR DRR arithmetic test 2(DRR BUFF#1) 0145:DRR DRR BUFF#1->CACHE 0146:DRR CACHE-DRR BUFF#0 0147:DRR DRR BUFF#0->CACHE 0148:DRR CACHE->DRR BUFF#1 0155:DRR force error test 1 0156:DRR force error test 2 0157:DRR force error test 3 0158:DRR force error test 4 0159:DRR force error test 5(MODE parity error) 015A:DRR force error test 5(DATA parity error) 015B:DRR force error test 6(CMD parity error) 015C:DRR force error test 6(DATA parity error) 015D:DRR force error test 7 015E:DRR force error test 8 015F:DRR force error test 9 0161:DRR force error test 10 0162:DRR force error test 11 0163:DRR force error test 12(TRI register) 0164:DRR force error test 12(DMO register) 0166:DRR force error test 13 0167:DRR force error test 14 0168:DRR force error test 15(CNT parity error) 0169:DRR force error test 15(POINTER parity error)

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Type	Error code
Test item	0901:DRR 64CMD DRR BUFF#1->BSA test 0902:DRR 64CMD BSA->DRR BUFF#0 test 0903:DRR 64CMD DRR BUFF#0->BSA test 0904:DRR 64CMD BSA->DRR BUFF#1 test 0905:DRR correspondence test 0906:DRR correspondence test (MAIN) 0907:DRR LA change test

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Type	Error code
Test item	0190:CACHE register read/write test 0191:CACHE ECC circuit test 00 0192:CACHE ECC circuit test 10 0193:CACHE ECC circuit test 11 0194:CACHE ECC circuit test 20 0195:CACHE ECC circuit test 21 0197:CACHE SLRC test 0198:CACHE MEM ERROR register test 0199:CACHE memory read/write test 019A:CACHE rewrite test 019B:CACHE BUSY test_1 019C:CACHE force error test_10 019D:CACHE force error test_11 019E:CACHE force error test_12 019F:CACHE force error test_13 01A0:CACHE force error test_14 01A1:CACHE ENTOFF test 01A2:CACHE memory read/write 2 test 01A3:CACHE BUSY test_2 01A4:CACHE force error test_21 01A5:CACHE force error test_22 01A6:CACHE memory test_1 01A7:CACHE memory test_2 01A9:CACHE self-refresh test 01AB:CACHE SIMM check

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Type	Error code
Test item	01F5:MIC LANC self test 01F6:MIC LANC external loop back test 01F8:MIC Timer#0 control block test 01F9:MIC Timer#1 control block test 01FA:MIC Timer#2 control block test 01FB:MIC Timer#3 control block test 01FC:MIC Timer#4 control block test 01FD:MIC Timer#5 control block test 01FE:MIC Timer#6 control block test 01FF:MIC interrupt test 0200:MIC interrupt controller test 0201:MIC reset control test 0202:MIC XR control test 0203:MIC synchronous stop function test 020F:SMP read only register test 0210:SMP read/write register test 0211:MIC abnormal system test 0803:SMP MP correspondence test 0804:SMP Broad cast test 0805:SMP SM access test 0806:SMP Burst access test 0807:SMP Resources rock test 0808:SMP Burden dispersion test 0227:RCHK read/write register all bit ON/OFF test 0228:RCHK special data patterns register read/write test 0229:RCHK read only/write only register test 022A:RCHK ECC test1 022B:RCHK ECC test2 022C:RCHK ECC test3 022D:LM R/W test

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Type	Error code
Test item	0701:SCA register initialize test 0702:SCA data register W/R test 0703:SCA SEQ register W/R test 0704:SCA pointer register W/R test 0705:SCA counter register W/R test 0706:SCA adder counter W/R test 0707:SCA LRC check circuit test 0708:SCA LBA check circuit test 0709:SCA LA check circuit test 070A:SCA CACHE address test 0711:SCA RAM test 0712:SCA error latch test 0261:SCA data transfer test

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Type	Error code
Test item	02BC:BSA SIP micro-access test 02BD:BSA SCA micro-access test 02BE:BSA DRR micro-access test 02BF:BSA read/write test for all registers 02C0:BSA read/write test for all memory 02C1:BSA address count test 02C2:BSA data transfer control 02C3:BSA LRC test 02C4:BSA micro-access simulation trouble test 02C5:BSA F-BUS transfer test (CHA) 02C6:BSA F-BUS transfer test (DKA) 0A01:BSA BTL LOOP test (CHA) 0A02:BSA BTL LOOP test (DKA)

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Type	Error code
Test item	0400:MIC MPCH1 test (MPCH sequence error force check test) 0401:MIC MPCH2 test (MPCH equal error detection test) 0402:MIC MPCH3 test (MPCH time out test) 0403:MIC MPCH4 test (MPCH force error function test) 0404:MIC MPCH5 test (error select function test) 0405:MIC SRAM1 test (CHK1BREG test) 0406:MIC SRAM4 test (MICPER test1) 0407:MIC SRAM5 test (MICPER test2) 0408:MIC SRAM13H test (SRAM parity error force and reset check) 0409:MIC SRAM16H test (C1WSTS register test) 040A:MIC SRAM18 test (MICPER mask test) 040B:MIC SRAM19 test (CHK1BSTMICCHK1BSTS function test) 040C:MIC SRAM12H test (SRAM limit access test) 040F:MIC SRAM15 test (A/B REG BYTE R/W test) 0410:MIC SRAM14H test (SRAM write protect violation error check) 0411:MIC SRAM marching test 0412:MIC SRAM R/W test 0420:MIC SRAM byte write test 0B00:MIC SRMJX test 0B01:MIC SRMJ00 test 0B02:MIC SRM21H test 0B03:MIC FM register R/W test_1 0B04:MIC FM register R/W test_2 0B05:MIC FM error occurrence test 0B06:MIC error occurrence XR3H test 0B07:MIC error occurrence XR5H test 0B08:MIC error occurrence HSRM02A test 0B09:MIC MIC00 test 0B0A:MIC PORT test 0B0B:MIC TRACE test

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Type	Error code
Test item	0500:SCSI PBA external register test 0501:SCSI CHP data transmit register test1 0502:SCSI CHP data transmit register test2 0503:SCSI CHP data transmit register test3 0504:SCSI CHP data transmit register test4 0505:SCSI CHP data transmit register test5 0506:SCSI CHP data transmit register test6 0507:SCSI CHP data transmit register test7 0508:SCSI CHP data transmit register test8 0509:SCSI PCI device register test1 050A:SCSI PCI device register test2 050B:SCSI PCI device register test3 050C:SCSI PCI device register test4 050D:SCSI SBSA0 data transmit buffer write / read test 050E:SCSI SBSA0 data line test 050F:SCSI SBSA1 data transmit buffer write / read test 0510:SCSI SBSA1 data line test 0511:SCSI SBSA0 common register test 0512:SCSI SBSA0 data transmit control register test 0513:SCSI SBSA0 PCI device data transmit register test 0514:SCSI SBSA1 common register test 0516:SCSI SBSA1 data transmit control register test 0517:SCSI SBSA1 PCI device data transmit register test 0518:SCSI external memory write /read test 0519:SCSI external memory data line test 051A:SCSI external memory hardware access test 051B:SCSI external memory hardware address line test2

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Type	Error code
Test item	0601:Tachyon LPA test 0602:Tachyon LPA initialize 0603:Tachyon LPA initialize check 0604:Tachyon PCI to PCI Bridge Unit initialize check 0605:Tachyon i960HD-RD communication check 0606:Tachyon PFA test

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Type	Error code
Test item	03E8:MAIN machine constitution data acquisition process 03E9:MAIN Cache register initialize process 03EB:MAIN SM equipment status acquisition process 03EC:MAIN SM equipment status acquisition process

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Type	Error code
Test item	0c00:HEALTH CHECK Timer#4 Test 0c03:HEALTH CHECK LM(DRAM) Test 0c04:HEALTH CHECK SM Test 0c05:HEALTH CHECK FM Test

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7.3.2 Error Code

Type	Error code
Error code	SIP data register test 2710:data register discrepancy error 2726:CHK1B occurrence error SIP SEQ register test 2728:SEQ register A discrepancy error 2729:SEQ register B discrepancy error 273E:CHK1B occurrence error SIP pointer register test 2740:pointer register A discrepancy error 2741:pointer register B discrepancy error (fixed data) 2742:pointer register B discrepancy error 2756:CHK1B occurrence error SIP counter register test(type1) 2758:counter register A discrepancy error 2759:counter register B discrepancy error 276E:CHK1B occurrence error SIP force CHK2 occurrence check test 2770:No FORCE PARITY error occurrence error 2771:No HARDWARE error occurrence error 2786:CHK1B occurrence error SIP CBF test 2788:read data discrepancy error 279E:CHK1B occurrence error SIP ALU test 27A0:compare value discrepancy error 27A1:Arithmetic value discrepancy error 27B6:CHK1B occurrence error SIP CBICNT register test 27B8:CBICNT register A discrepancy error 27B9:CBICNT register B discrepancy error 27BA:CBICNT register A discrepancy error (expected value data) 27CE:CHK1B occurrence error SIP PNDCNT register test 27D0:PNDCNT register A discrepancy error 27D1:PNDCNT register B discrepancy error 27D2:PNDCNT register A discrepancy error(mask data) 27D3:PNDCNT register A discrepancy error(mask data) 27E6:CHK1B occurrence error

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Type	Error code
Error code	SIP LRC register test(CUDG3) 27E8:LRC register A discrepancy error(CUDG3) 27E9:LRC register B discrepancy error(CUDG3) 27EA:LRC register AB discrepancy error(CUDG3) 27FE:CHK1B occurrence error SIP counter register test(++) 2800:Counter register A discrepancy error(type1 increment) 2801:Counter register B discrepancy error(type1 increment) 2802:Increase/decrease check error 2816:CHK1B occurrence error SIP counter register test(--) 2818:Counter register A discrepancy error(type1 decrement) 2819:Counter register B discrepancy error(type1 decrement) 281A:Increase/decrease check error 282E:CHK1B occurrence error SIP counter register test(type2) 2830:Counter register A discrepancy error(type2) 2831:Counter register B discrepancy error(type2) 2846:CHK1B occurrence error SIP adding/subtracking machine test 2848:Counter register A discrepancy error 2849:Counter register B discrepancy error 284A:Counter register A discrepancy error(expected value) 284B:Counter register B discrepancy error(expected value) 285E:CHK1B occurrence error SIP SIP operation test 2f45:CHK2 occurrence error 2f46:data unmatch error 2f48:time out error 2f5A:CHK1B occurrence error SIP LRC register test(CUDG4,5) 2878:LRC register A discrepancy error(CUDG4,5) 2879:LRC register B discrepancy error(CUDG4,5) 287A:LRC register AB discrepancy error(CUDG4,5) 288E:CHK1B occurrence error SIP data transfer test 2f2c:Lsi rev. unmatch 2f2d:CHK2 occurrence error 2f2e:data unmatch error 2f2f:pading data unmatch 2f30:time out error 2f42:CHK1B occurrence error

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Type	Error code
Error code	SMC register test_1(all bits) 28A0:ON bit error 28A1:OFF bit error 28A2:Waitting for transfer end error 28B6:CHK1B/3 occurrence error SMC register test_2(easy test) 28B8:5 data read error 28B9:A data read error 28BA:Waitting for transfer end error 28CE:CHK1B/3 occurrence error SMC memory test_1(all memory read/write) 28D0:All 1 data read error 28D1:All 0 data read error 28D2:Waitting for transfer end error 28E6:CHK1B/3 occurrence error SMC function test_1(single read/write) 28EA:Waitting for transfer end error 28EC:Diagnosis area(first) single read error 28ED:Diagnosis area(last) single read error 28FE:CHK1B/3 occurrence error SMC memory test_2 (address line error detection) 2900:address data read error 2901:Waitting for transfer end error 2916:CHK1B/3 occurrence error SMC memory test_3(DRAM self-refresh) 2918:Self-refresh mode setting error 2919:Self-refresh mode disabling error 291A:All 1 data read error 291B:Self-refresh mode setting error 291C:Self-refresh mode disabling error 291D:All 0 data read error 291E:Waitting for transfer end error 292E:CHK1B/3 occurrence error

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Type	Error code
Error code	SMC function test_5(double read/write) 2930:Diagnosis area(first)S-WR A-side S-RD error 2931:Diagnosis area(first)S-WR B-side S-RD error 2932:Diagnosis area(last)S-WR A-side S-RD error 2933:Diagnosis area(last)S-WR B-side S-RD error 2934:Diagnosis area(first)D-WR A-side S-RD error 2935:Diagnosis area(first) D-WR B-side S-RD error 2936:Diagnosis area(last) D-WR A-side S-RD error 2937:Diagnosis area(last) D-WR B-side S-RD error 2938:Diagnosis area(first) D-WR D-RD error 2939:Diagnosis area(last) D-WR D-RD error 293A:Diagnosis area(first)S-WR D-RD compare error not occurrence 293B:Waitting for transfer end error 2946:CHK1B/3 occurrence error SMC function test_4(RMW) 2948:Diagnosis area(first) RMW read error 2949:Diagnosis area(last) RMW read error 294A:Waitting for transfer end error 295E:CHK1B/3 occurrence error SMC function test_6(memory block) 2960:Normal memory write/read error 2961:timeout error detection error 2962:Waitting for transfer end error 2976:CHK1B/3 occurrence error SMC function test_7(ALL_LOCK) 2978:BUSY error 2979:ALL_LOCK 5 data error 297A:Data read error(0x01234567) 297B:Data read error(0x89abcdef) 297C:Double LOCK error 297D:ALL_LOCK 5 data error 297E:ALL_LOCK A data error 297F:read after write discrepancy error (ready state) 2980:Non-not-ready error (not-ready state) 2981:read data expected data discrepancy error (CUDG mode & not-ready state) 2982:read after write discrepancy error (CUDG mode & not-ready state) 2983:Waitting for transfer end error 298E:CHK1B/3 occurrence error

RMW:read modification write S-RD:single read S-WR:single write
D-RD:double read D-WR:double write

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Type	Error code
Error code	SMC function test_8(timer) 2990:Timer read error 2991:Timer value increment difference error 2992:Waitting for transfer end error 29A6:CHK1B/3 occurrence error SMC function test_2(rewrite) 29A8:No correctable error occurrence error 29A9:Correctable error occurrence data read error 29AA:Correctable error occurrence error 29AB:No correctable error occurrence data read error 29AC:No correctable error occurrence error (not rewrite) 29AD:read data expected data discrepancy error (not rewrite) 29AE:Waitting for transfer end error 29BE:CHK1B/3 occurrence error SMC ECC test_1 (all correctable error patterns) 29C0:Correctable error 29C1:Data read error 29C2:Correctable error occurrence error 29C3:Correctable error occurrence data read error 29C4:Waitting for transfer end error 29D6:CHK1B/3 occurrence error SMC ECC test_2/3 (all uncorrectable error patterns, easy patterns for uncorrectable errors) 29D8:No uncorrectable error occurrence error (on the fixed-bit basis) 29D9:No uncorrectable error occurrence error (fixed error pattern) 29DA:No uncorrectable error occurrence error (all error patterns) 29DB:Waitting for transfer end error 29EE:CHK1B/3 occurrence error

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Type	Error code
Error code	SMC bus error test 1 29F0:Waitting for transfer end error 29F1:CUDG mode reset error 29F2:Waitting for transfer end error 29F3:No timeout error occurrence error 29F4:No addess check code error occurrence error 29F5:Waitting for transfer end error 29F6:CUDG mode reset error 29F7:Waitting for transfer end error 29F8:No bus check error occurrence error 29F9:No command check code error occurrence error 29FA:Waitting for transfer end error 29FB:CUDG mode reset error 29FC:Waitting for transfer end error 29FD:No bus check error occurrence error 29FE:No data check code error occurrence error 29FF:Waitting for transfer end error 2A06:CHK1B/3 occurrence error

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Type	Error code
Error code	SMC bus error test_2(command parameter error) 2A08:Waitting for transfer end error 2A09:CUDG mode reset error 2A0A:Waitting for transfer end error 2A0B:No ANY error occurrence error 2A0C:No transfer frequency error occurrence error 2A0D:Waitting for transfer end error 2A0E:CUDG mode reset error 2A0F:Waitting for transfer end error 2A10:No ANY error occurrence error 2A11:No bus command error occurrence error 2A12:Waitting for transfer end error 2A13:CUDG mode reset error 2A14:Waitting for transfer end error 2A15:No ANY error occurrence error 2A16:No transfer mode error occurrence error 2A17:Waitting for transfer end error 2A1E:CHK1B/3 occurrence error SMC SMC hardware error test 2A20:No board error occurrence error 2A21:No timer parity error occurrence error 2A22:board error reset error 2A23:Waitting for transfer end error 2A36:CHK1B/3 occurrence error SMC function test_3(byte write) 2A38:Diagnosis area(first)read error 2A39:Diagnosis area(last)read error 2A3A:Waitting for transfer end error 2A4E:CHK1B/3 occurrence error SMC ECC test_4(address error pattern) 2A50:No uncorrectable error occurrence error 2A51:Waitting for transfer end error 2A66:CHK1B/3 occurrence error SMC Memory test_4(easy patterns for address line error detection) 2F14:CHK3 error after SM write 2F15:Data compare error 2F16:CHK3 error after SM read 2F17:Waitting for transfer end error 2F2A:CHK1B/3 occurrence error SMC SIMM check 2f5c:SM SIMM unmatch

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Type	Error code
Error code	DRR data register test 2A94:Read data discrepancy error 2A95:Reset error 2AAA:CHK1B occurrence error DRR SEQ register test 2AAC:SEQ register A read discrepancy error 2AAD:SEQ register B read discrepancy error 2AC2:CHK1B occurrence error DRR counter register test 2AC4:Counter register A read discrepancy error 2AC5:Counter register B read discrepancy error 2AC6:Counter register A non-reset error 2AC7:Counter register B non-reset error 2ADA:CHK1B occurrence error DRR count operation test 2ADC:Counter register A read discrepancy error 2ADD:Counter register B read discrepancy error 2AF2:CHK1B occurrence error DRR DRR BUFF memory test 2B0C:Upper register read data discrepancy error 2B0D:Lower register read data discrepancy error 2B22:CHK1B occurrence error DRR DRR BUFF address line test 2AF4:Upper register read address line data discrepancy error 2AF5:Lower register read address line data discrepancy error 2B0A:CHK1B occurrence error DRR arithmetic circuit test 2B28:ADD2 register read data discrepancy error 2B3A:CHK1B occurrence error DRR LRC check circuit test 2B3C:LRC arithmetic result check error 2B52:CHK1B occurrence error

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Type	Error code
Error code	DRR BSA->DRR BUFF#0/#1 test 2B6C:Data transfer error 2B6D:CHK2 error factor check error (BSA→DRR BUFF) 2B6E:Read data discrepancy error 2B6F:BSA micro-access request error 2B82:CHK1B occurrence error DRR DRR BUFF#0/#1->BSA test 2B84:Data transfer error 2B85:CHK2 error factor check error (DRR BUFF→BSA) 2B86:Read data discrepancy error 2B87:BSA micro-access request error 2B9A:CHK1B occurrence error DRR arithmetic test 1(DRR BUFF#0/1) 2B9C:Data transfer error 2B9D:CHK2 error factor check error 2B9E:Read data discrepancy error 2B9F:BSA micro-access error 2BB2:CHK1B occurrence error DRR arithmetic test 2(DRR BUFF#0/1) 2BB4:Data transfer error 2BB5:CHK2 error factor check error 2BB6:Read data discrepancy error 2BB7:BSA micro-access error 2BCA:CHK1B occurrence error DRR CACHE->DRR BUFF#0/#1 2C2C:Data transfer error 2C2D:CHK2 error factor check error (CACHE→DRR BUFF) 2C2E:Read data discrepancy error 2C2F:BSA micro-access request error 2C42:CHK1B occurrence error DRR DRR BUFF#0/#1->CACHE 2C44:Data transfer error 2C45:CHK2 error factor check error (DRR BUFF→CACHE) 2C46:Read data discrepancy error 2C47:BSA micro-access request error 2C5A:CHK1B occurrence error

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Type	Error code
Error code	DRR force error test 1 2CEC:No ADR INVALID occurrence error 2CED:Read only register write error 2CEE:READY OFF NO ACCESS error 2CEF:BYTE NO ACCESS error 2D02:CHK1B occurrence error DRR force error test 2 2D04:No address parity occurrence error 2D05:No micro-write data parity occurrence error 2D06:No micro-read data parity occurrence error 2D1A:CHK1B occurrence error DRR force error test 3 2D1C:Data transfer error 2D1D:No COMMAND INVALID occurrence error (representative register) 2D1E:No COMMAND INVALID occurrence error (factor register) 2D1F:No VALUE INVALID occurrence error (representative register) 2D20:No VALUE INVALID occurrence error (factor register) 2D32:CHK1B occurrence error

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Type	Error code
Error code	DRR force error test 4 2D34:No SBUS GRANT ID PARITY occurrence error (representative register) 2D35:No SBUS GRANT ID PARITY occurrence error (factor register) 2D4A:CHK1B occurrence error DRR force error test 5 2D4C:No BSA I/F mode output signal parity occurrence error (factor register) 2D62:CHK1B occurrence error DRR force error test 6 2D64:Timeout error 2D65:No BSA I/F mode input signal parity occurrence error (factor register) 2D66:BSA micro-access request error 2D7A:CHK1B occurrence error DRR force error test 7 2D7C:Data transfer error 2D7D:No CHK2 representative register setting error 2D7E:No CHK2 factor register setting error 2D7F:BSA micro-access request error 2D92:CHK1B occurrence error DRR force error test 8 2D94:Data transfer error 2D95:DRR BUFF write address parity error(representative register) 2D96:DRR BUFF write address parity error(factor register) 2D97:DRR BUFF read address parity error(representative register) 2D98:DRR BUFF read address parity error(factor register) 2D99:BSA micro-access request error 2DAA:CHK1B occurrence error DRR force error test 9 2DAC:Data transfer error 2DAD:No DRR BUFF input data signal parity occurrence error (representative register) 2DAE:No DRR BUFF input data signal parity occurrence error(factor register) 2DAF:BSA micro-access request error 2DC2:CHK1B occurrence error

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Type	Error code
Error code	DRR force error test 10 2DC4:Data transfer error 2DC5:No DRR BUFF output data signal parity occurrence error (representative register) 2DC6:No DRR BUFF output data signal parity occurrence error(factor register) 2DC7:BSA micro-access request error 2DDA:CHK1B occurrence error DRR force error test 12 2DF4:Data transfer error 2DF5:No data transfer systemTRI¥DMO parity occurrence error (representative register) 2DF6:No data transfer systemTRI¥DMO parity occurrence error (factor register) 2DF7:BSA micro-access request error 2E0A:CHK1B occurrence error DRR force error test 13 2E0C:Data transfer error 2E0D:No parity generator error occurrence error (representative register) 2E0E:No parity generator error occurrence error (factor register) 2E0F:BSA micro-access request error 2E22:CHK1B occurrence error DRR force error test 15 2E3C:Data transfer error 2E3D:No CNT/POINTER parity occurrence error (representative register) 2E3E:No CNT/POINTER parity occurrence error (factor register) 2E3F:BSA micro-access request error 2E52:CHK1B occurrence error

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Type	Error code
Error code	DRR 64CMD DRR BUFF#0/#1→BSA test 0100:BSA micro-access request error 0200:Data transfer error 0300:CHK2 error factor check error (DRR BUFF→BSA) 0300:Read data discrepancy error 0400:BSA micro-access request error 0800:CHK1B occurrence error DRR 64CMD BSA→DRR BUFF#0/#1 test 0100:BSA micro-access request error 0200:Data transfer error 0300:CHK2 error factor check error (BSA→DRR BUFF) 0600:Read data discrepancy error 0700:BSA micro-access request error 0800:CHK1B occurrence error DRR correspondence BUFF test 0100:status register read CHK1B error 0200:status register read/write CHK1B error 0300:status register data compare error 0400:BUFF read CHK1B error 0500:spetial data compare error 0600:BUFF read CHK1B error 0700:increment data compare error 0800:BUFF read CHK1B error 0900:decrement data compare error 8000:CHK1B occurrence error DRR correspondence BUFF test (MAIN) 0100:time out (5ms) 0200:time out (5ms) 0300:time out (5ms) 0400:time out (5ms) 0500:time out (5ms)

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Type	Error code
Error code	DRR LA change test 0100:Register compare error 0200:Register reset error 1100:Counter register increment error (REG:CCLA1M) 1200:Counter register increment error (REG:CCLA2M) 1300:Counter register reset error 2100:Arithmetic answer error (REG:CELA0) 2200:Arithmetic answer error (REG:CELA1M) 2300:Arithmetic answer error (REG:CELA2M) 2400:Arithmetic answer error (REG:CCLA0) 2500:Arithmetic answer error (REG:CCLA1M) 2600:Arithmetic answer error (REG:CCLA2M) 3100:BSA micro-access error 3200:Data transfer error (DRR BUFF#1->BSA) 3300:CHK2 error factor check error(DRR BUFF#1->BSA) 3400:Data transfer error (BSA->DRR BUFF#0) 3500:CHK2 error factor check error(BSA->DRR BUFF#0) 3600:LA data compare error 0040:CHK1B occurrence error

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Type	Error code
Error code	CACHE register read/write test 2F44:Cache register read error 2F45:Cache register write error 2F4D:Register compare discrepancy error 2F5A:CHK1B occurrence error CACHE ECC circuit test 00 2F5C:Cache register read error 2F5D:Cache register write error 2F5E:Cache memory read error 2F5F:Cache memory write error 2F64:Memory compare discrepancy error 2F65:Register compare discrepancy error 2F66:Error phase compare after read discrepancy error 2F67:Error phase compare after write discrepancy error 2F72:CHK1B occurrence error CACHE ECC circuit test 10 2F74:Cache register read error 2F75:Cache register write error 2F76:Cache memory read error 2F77:Cache memory write error 2F7C:Memory compare discrepancy error 2F7D:Register compare discrepancy error 2F7E:Error phase compare after read discrepancy error 2F7F:Error phase compare after write discrepancy error 2F8A:CHK1B occurrence error CACHE ECC circuit test 11 2F8C:Cache register read error 2F8D:Cache register write error 2F8E:Cache memory read error 2F8F:Cache memory write error 2F94:Memory compare discrepancy error 2F95:Register compare discrepancy error 2FA2:CHK1B occurrence error

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Type	Error code
Error code	CACHE ECC circuit test 20 2FA4:Cache register read error 2FA5:Cache register write error 2FA6:Cache memory read error 2FA7:Cache memory write error 2FAC:Memory compare discrepancy error 2FAD:Register compare discrepancy error 2FAE:Error phase compare after read discrepancy error 2FAF:Error phase compare after write discrepancy error 2FBA:CHK1B occurrence error CACHE ECC circuit test 21 2FBC:Cache register read error 2FBD:Cache register write error 2FBE:Cache memory read error 2FBF:Cache memory write error 2FC4:Memory compare discrepancy error 2FC5:Register compare discrepancy error 2FC6:Error phase compare after read discrepancy error 2FC7:Error phase compare after write discrepancy error 2FD2:CHK1B occurrence error

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Type	Error code
Error code	CACHE MEM ERROR register test 3003:Cache register read error 3004:Cache register write error 3005:Cache memory read error 3006:Cache memory write error 300D:Register compare discrepancy error 300E:Error phase compare after read discrepancy error 300F:Error phase compare after write discrepancy error 301A:CHK1B occurrence error 301B:parameter error CACHE memory read/write test 1 301C:Cache register read error 301D:Cache register write error 301E:Cache memory read error 301F:Cache memory write error 3024:Cache Memory correctable,uncorrectable error 3026:Error phase compare after read discrepancy error 3027:Error phase compare after write discrepancy error 3032:CHK1B occurrence error CACHE rewrite test 3035:Cache register write error 3036:Cache memory read error 3037:Cache memory write error 303C:Memory compare discrepancy error 303E:Error phase compare after read 303F:Error phase compare after write discrepancy error 304A:CHK1B occurrence error

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Type	Error code
Error code	CACHE BUSY test 1 304D:Cache register write error 304E:Cache memory read error 304F:Cache memory write error 3054:Memory compare discrepancy error 3056:Error phase compare after read discrepancy error 3062:CHK1B occurrence error CACHE force error 10(overrun detection) 3064:Cache register read error 3065:Cache register write error 3067:Cache memory write error 306D:Register compare discrepancy error 306F:Error phase compare after write discrepancy error 307A:CHK1B occurrence error CACHE force error 11 (High bus system error detection) 307C:Cache register read error 307D:Cache register write error 307F:Cache memory write error 3085:Register compare discrepancy error 3087:Error phase compare after write discrepancy error 3092:CHK1B occurrence error CACHE force error 12(Low bus system error detection) 3094:Cache register read error 3095:Cache register write error 3097:Cache memory write error 309D:Register compare discrepancy error 309F:Error phase compare after write discrepancy error 30AA:CHK1B occurrence error CACHE force error 13(error detection within the board) 30AC:Cache register read error 30AD:Cache register write error 30AF:Cache memory write error 30B5:Register compare discrepancy error 30B7:Error phase compare after write discrepancy error 30C2:CHK1B occurrence error

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Type	Error code
Error code	CACHE force error test 14(register code error detection) 30C4:Cache register read error 30C5:Cache register write error 30CE:Error phase compare after read discrepancy error 30CF:Error phase compare after write discrepancy error 30DA:CHK1B occurrence error CACHE ENTOFF test 30DC:Cache register read error 30DD:Cache register write error 30E5:Register compare discrepancy error 30F2:CHK1B occurrence error 30F3:Parameter error CACHE memory read/write test 2 30F4:Cache register read error 30F5:Cache register write error 30F6:Cache memory read error 30F7:Cache memory write error 30FA:CACHE TO CACHE error 30FB:Memory double write error 30FC:Memory compare discrepancy error 30FE:Error phase compare after read discrepancy error 30FF:Error phase compare after write discrepancy error 310A:CHK1B occurrence error CACHE BUSY test 2 310D:Cache register write error 310E:Cache memory read error 310F:Cache memory write error 3112:CACHE TO CACHE error 3114:Memory compare discrepancy error 3116:Error phase compare after read discrepancy error 3117:Error phase compare after write discrepancy error 3122:CHK1B occurrence error CACHE force error test 21 3124:Cache register read error 3125:Cache register write error 3127:Cache memory write error 312D:Register compare discrepancy error 312F:Error phase compare after write discrepancy error 313A:CHK1B occurrence error

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Type	Error code
Error code	CACHE force error test 22 (Low bus system error detection) 313C:Cache register read error 313D:Cache register write error 313F:Cache memory write error 3145:Register compare discrepancy error 3147:Error phase compare after write discrepancy error 3152:CHK1B occurrence error CACHE memory test 1 3154:Cache register read error 3155:Cache register write error 315C:Cache memory correctable,uncorrectable error 315D:Register compare discrepancy error 316A:CHK1B occurrence error CACHE memory test 2 316C:Cache register read error 316D:Cache register write error 3174:Cache memory correctable,uncorrectable error 3175:Register compare discrepancy error 3182:CHK1B occurrence error CACHE self-refresh test 319C:Cache register read error 319D:Cache register write error 319F:Cache memory write error 31A4:Cache memory correctable,uncorrectable error 31A5:Register compare discrepancy error 31A7:Error phase compare after write discrepancy error 31B2:CHK1B occurrence error CACHE SIMM check 3214:Cache register read error 3215:Cache register write error 3220:Cache P/K unmatch 3223:Construction error 3224:Module not setting 3225:Module unmatch error 322A:CHK1B occurrence error

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Type	Error code
Error code	MIC/SMP LANC self-diagnosis test 327C:Self-diagnosis error MIC/SMP LANC external loopback test 3294:Externalloopback diagnosis error MIC/SMP Timer test(#0-#6) 32C4:Timer register read/write error 32C5:Count up error 32C6:Carry error 32C7:Interrupt control circuit error 32C8:Timer start/stop control circuit error 32C9:Parity error detection circuit error 32DA:CHK1B occurrence error MIC/SMP interrupt test 32DC:INTEN register read/write error 32DD:No INT factor occurrence error (NMI¥INTSTSbit) 32DE:No INT factor occurrence error (NMI¥LVLXSTSbit) 32DF:No INT factor occurrence error (NMI¥LVLXREGbit) 32E0:Synchronous circuit monitor error (NMI) 32E1:No INT factor occurrence error (INT0-7¥INTSTSbit) 32E2:No INT factor occurrence error (INT0-7¥LVLXSTSbit) 32E3:No INT factor occurrence error (INT0-7¥LVLXREGbit) 32E4:Synchronous circuit monitor error (INT0-7) 32F2:CHK1B occurrence error

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Type	Error code
Error code	MIC/SMP interrupt device diagnosis 32F4:CHA transfer INT occurrence interrupt information obtainment error 32F5:ADP transfer INT occurrence interrupt information obtainment error 32F6:CHA transfer INT mask interrupt information obtainment error 32F7:ADP transfer INT mask interrupt information obtainment error 32F8:DRR transfer INT occurrence interrupt information obtainment error 32F9:SCA transfer INT occurrence interrupt information obtainment error 32FA:DRR transfer INT mask interrupt information obtainment error 32FB:SCA transfer INT mask interrupt information obtainment error MIC/SMP reset control block test 330C:Reset error 3322:CHK1B occurrence error MIC/SMP XR control block test 3324:Read data discrepancy error 333A:CHK1B occurrence error MIC/SMP synchronous stop function test 333C:Synchronous stop error 3352:CHK1B occurrence error

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Type	Error code
Error code	MIC/SMP SMP Read-Only register test 342C:XR bus data parity error 3442:CHK1B occurrence error MIC/SMP SMP read/write register test 3444:CUDG mode error(Fbus & Mbus lock) 3445:CUDG mode error(Fbus lock) 3446:CUDG mode error(Mbus lock) 3447:CUDG mode error(hardware trouble) 3448:XR bus data parity error 3449:Register read/write data discrepancy error 344A:XR bus data parity error 345A:CHK1B occurrence error MIC/SMP MIC abnormal system test 345C:MIC internal test 345D:MIC interrupt report line error 345E:CHK1B occurrence error 3472:CHK1B occurrence error

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Type	Error code
Error code	SMP MP correspondence test 0100:trancefer end error 0200:M bus initialize error 0300:Self MP status read error 0400:SMP_MPSTATUS read & compare error 8000:CHK1B occurrence error SMP Broad cast test 0100:trancefer end error 0200:M bus initialize error 0300:Self MP broad cast error 0400:SMP_BCAST read & compare error 0500:SMP_BCAST reset error 8000:CHK1B occurrence error SMP SM access test 0100:trancefer end error 0200:M bus initialize error 0300:Diag area bottom address write CHK3 error 0400:Diag area bottom address read & compare error 0500:Diag area bottom address specify data write & read & compare error 0600:CHK3 occurrence error 0700:All address specify data write & read & compare error 0800:CHK3 occurrence error 0900:trancefer end error 8000:CHK1B occurrence error

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Type	Error code
Error code	SMP Burst access test 0100:trancefer end error 0200:M bus initialize error 0300:Burst area bottom address 4 burst write CHK3 error 0400:Burst area bottom address 4 burst read CHK3 error 0500:Burst area bottom address 4 burst data compare error 0600:Burst area all address 4 burst write CHK3 error 0700:Burst area all address 4 burst read CHK3 error 0800:Burst area all address 4 burst data compare error 0900:Burst area bottom address 2 burst write CHK3 error 0a00:Burst area bottom address 2 burst read CHK3 error 0b00:Burst area bottom address 2 burst data compare error 0c00:Burst area all address 2 burst write CHK3 error 0d00:Burst area all address 2 burst read CHK3 error 0e00:Burst area all address 2 burst data compare error 0f00:trancefer end error 8000:CHK1B occurrence error

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Type	Error code
Error code	SMP Resources rock test 0100:trancefer end error 0200:M bus initialize error 0300:SMP_LNEW,SMP_FLNEW data compare error 0400:SMP_LOLD,SMP_FLOLD data compare error 0500:Resources rock arithmetic circuit SMP_LNEW expletive data compare error 0600:CHK3 error 0700:Resources rock arithmetic circuit SMP_LOLD expletive data compare error 0800:Diag area Resources rock access SMP_LNEW expletive data compare error 0900:CHK3 error 0a00:Diag area Resources rock access SMP_LOLD expletive data compare error 0b00:trancefer end error 8000:CHK1B occurrence error

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Type	Error code
Error code	SMP Burden dispersion test 0100:trancefer end error 0200:M bus initialize error 0300:M/H bus DIAG area write SMP_FSEL expletive data compare error 0400:M/H bus DIAG area read SMP_FSEL expletive data compare error 0500:M/H bus DIAG area data compare error 0600:M/L bus DIAG area write SMP_FSEL expletive data compare error 0700:M/L bus DIAG area read SMP_FSEL expletive data compare error 0800:M/L bus DIAG area data compare error 0900:M/H bus DIAG area 4 burst write CHK3 error 0a00:M/H bus DIAG area 4 burst write SMP_FSEL expletive data compare error 0b00:M/H bus DIAG area 4 burst read CHK3 error 0c00:M/H bus DIAG area 4 burst read SMP_FSEL expletive data compare error 0d00:M/H bus DIAG area 4 burst data compare error 0e00:M/L bus DIAG area 4 burst write CHK3 error 0f00:M/L bus DIAG area 4 burst write SMP_FSEL expletive data compare error 1000:M/L bus DIAG area 4 burst read CHK3 error 1100:M/L bus DIAG area 4 burst read SMP_FSEL expletive data compare error 1200:M/L bus DIAG area 4 burst data compare error 1300:M/H bus DIAG area 2 burst write CHK3 error 1400:M/H bus DIAG area 2 burst write SMP_FSEL expletive data compare error 1500:M/H bus DIAG area 2 burst read CHK3 error 1600:M/H bus DIAG area 2 burst read SMP_FSEL expletive data compare error 1700:M/H bus DIAG area 2 burst data compare error 1800:M/L bus DIAG area 2 burst write CHK3 error 1900:M/L bus DIAG area 2 burst write SMP_FSEL expletive data compare error 1a00:M/L bus DIAG area 2 burst read CHK3 error 1b00:M/L bus DIAG area 2 burst read SMP_FSEL expletive data compare error 1c00:M/L bus DIAG area 2 burst data compare error

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Type	Error code
Error code	SMP Burden dispersion test 1d00:M/H bus DIAG area resources rock access SMP_FSEL expletive data compare error 1e00:M/H bus DIAG area resources rock access SMP_LNEW expletive data compare error 1f00:M/H bus DIAG area resources rock access CHK3 error 2000:M/H bus DIAG area resources rock access SMP_LOLD expletive data compare error 2100:M/H bus DIAG area resources rock access SMP_FSEL expletive data compare error 2200:M/L bus DIAG area resources rock access SMP_FSEL expletive data compare error 2300:M/L bus DIAG area resources rock access SMP_LNEW expletive data compare error 2400:M/L bus DIAG area resources rock access CHK3 error 2500:M/L bus DIAG area resources rock access SMP_LOLD expletive data compare error 2600:M/L bus DIAG area resources rock access SMP_FSEL expletive data compare error 2700:Trancefer end error 8000:CHK1B occurrence error

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Type	Error code
Error code	RCHK read/write register all bit ON/OFF test 4268:CE.DIAG mode set error 4269:Read/write data discrepancy error RCHK Specific data pattern register read/write test 4280:CE.DIAG mode set error 4281:Read data expected value discrepancy error RCHK Read-Only/Write-Only register test 4298:CE.DIAG mode set error 4299:ERSTS0 register set expected value discrepancy error 429A:ERSTS0 register reset expected value discrepancy error 429B:Factor register reset error 429C:Factor register reset error 429D:ERSTS0 register reset error 429E:Factor register reset error

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Type	Error code
Error code	RCHK ECC test 1 42B0:LM#0 after correction data error 42B1:LM#0 syndrome pattern error 42B2:LM#1 after correction data error 42B3:LM#1 syndrome pattern error RCHK ECC test 2 42C8:Correctable count error(1) 42C9:Correctable count error(2-7) 42CA:Correctable count error(8) 42CB:No CHK occurrence error 42CC:No CHK1B occurrence error 42CD:Error detection address error 42CE:BE0-3 signal error 42CF:Read/write signal error 42D0:Before correction data error 42D1:Before correction check bit error 42D2:After correction data error 42D3:After correction check bit error 42D4:Syndrome error 42D5:Check bit,syndrome error 42D6:Before correction data error 42D7:1 bit error reset error 42D8:CECNT0 all 0 error RCHK ECC test 3 42E0:No occurrence count overflow occurrence error(LM#0) 42E1:After correction data error (LM#0) 42E2:After correction check bit error(LM#0) 42E3:Syndrome error(LM#0) 42E4:No occurrence count overflow occurrence error(LM#1) 42E5:After correction data error (LM#1) 42E6:After correction check bit error(LM#1) 42E7:Syndrome error(LM#1) LM R/W test 42F8:LM correctable error 42F9:CHK1B occurrence error

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Type	Error code
Error code	SCA register initialize test 0100:expect data compare error 0200:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA data register test 0100:expect data compare error(data pattern1) 0200:expect data compare error(data pattern2) 0300:expect data compare error(data pattern3) 0400:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA SEQ register test 0100:expect data compare error(data A) 0200:expect data compare error(data B) 0300:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA pointer register test 0100:expect data compare error(master register) 0200:expect data compare error(slave register) 0300:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA counter register test 0100:expect data compare error(master register) 0200:expect data compare error(slave register) 0300:CHK1B occurrence error 0400:expect data compare error(master register) 0500:CHK1B occurrence error 0600:expect data compare error(master register upper) 0700:expect data compare error(slave register lower) 0800:CHK1B occurrence error 0900:expect data compare error(master register) 0B00:CHK1B occurrence error 0C00:expect data compare error(master register) 0D00:expect data compare error(master register) 0E00:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end)

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Type	Error code
Error code	SCA adder counter W/R test 0100:expect data compare error(master register1) 0200:expect data compare error(master register2) 0300:expect data compare error(master register3) 0400:expect data compare error(slave register1) 0500:expect data compare error(slave register2) 0600:expect data compare error(slave register3) 0700:CHK1B occurrence error 0800:expect data compare error(master register1) 0900:expect data compare error(master register2) 0A00:expect data compare error(master register3) 0B00:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA LRC check circuit register test 0100:expect data compare error(master register) 0200:expect data compare error(slave register) 0300:CHK1B occurrence error 0400:expect data compare error(master register) 0500:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA LBA check circuit register test 0100:expect data compare error(master register) 0200:expect data compare error(slave register) 0300:CHK1B occurrence error 0400:expect data compare error(master register) 0500:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA LA check circuit test 0100:expect data compare error(master register1) 0200:expect data compare error(master register2) 0300:CHK1B occurrence error 0400:expect data compare error(master register1) 0500:expect data compare error(master register2) 0600:CHK1B occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end)

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Type	Error code
Error code	SCA Cache address test 0100:Cache address bus test error(master) 0200:Cache address bus test error(slave) 1000:segment length bus test error 2000:bit map bus test error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA RAM test 0100:address data write CHK1B error 0200:address data read H data compare error 0300:address data read L data compare error 0400:address data read CHK1B error 0500:specifick data write CHK1B error 0600:specifick data read H data compare error 0700:specifick data read L data compare error 0800:specifick data read CHK1B error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA error latch test 0100:SCHK1 occurrence error 0200:MIC SCA CHK1 occurrence error (A side) 0300:MIC SCA CHK1 occurrence error (B side) 0400:MIC SCA CHK1 occurrence error (A/B side) 0500:SCHK1 occurrence error 1000:CHK2 latch check 1100:CHK2 latch check 1200:CHK2 latch check 1300:CHK2 latch check 1400:CHK2 latch check 1500:CHK2 latch check 1600:CHK2 latch check 1700:CHK2 latch check 1800:SCHK2 occurrence error 0000:CHK1B occurrence error(test start) FF00:CHK1B occurrence error(test end) SCA data transfer test 3642:data transfer error 3658:CHK1B occurrence error

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Type	Error code
Error code	BSA SIP micro-access test 3714:Read data discrepancy error 372A:CHK1B occurrence error BSA SCA micro-access test 372C:Read data discrepancy error 372D:BSA micro-access request error 3742:CHK1B occurrence error BSA DRR micro-access test 3744:Read data discrepancy error 3745:BSA micro-access request error 375A:CHK1B occurrence error BSA read/write test for all registers 375C:register read/write error 3772:CHK1B occurrence error BSA read/write test for all memory 3774:Memory read/write error 378A:CHK1B occurrence error BSA address count test 378C:Address counter read/write error 37A2:CHK1B occurrence error BSA data transfer control test 37A4:read error within sequence 37BA:CHK1B occurrence error BSA LRC test 37D4:LRC register read/write error 37EA:CHK1B occurrence error BSA simulation trouble test 37EC:FORCE ERR detection error 3802:CHK1B occurrence error

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Type	Error code
Error code	BSA Fbus transfer test(CHA) 3804:CACHE memory write error 3805:CACHE memory write error phase compare error 3806:CACHE memory read error 3807:CACHE memory read error phase compare error 3808:data compare error 3809:CACHE register write error 381A:CHK1B occurrence error BSA Fbus transfer test(DKA) 3804:BSA micro-access request error 3805:data transfer time out 3806:CHK2 factor error 3807:data compare error 3808:CHK2 factor error 3809:data compare error 381A:CHK1B occurrence error BSA BTL LOOP test (CHA) 0100:H data compare error 0200:L data compare error 8000:CHK1B occurrence error BSA BTL LOOP test (DKA) 0100:BSA micro-access request error 0300:2bus mode H data compare error 0400:2bus mode L data compare error 0500:Hbus mode H data compare error 0600:Lbus mode L data compare error 0700:BSA micro-access request error 0800:transfer end time out 0900:BSA micro-access request error 0040:CHK1B occurrence error

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Type	Error code
Error code	MIC MPCH1test 4000:Initialize test 4001:Force sequence error (PH1) 4002:Force sequence error (PH2) 4003:Force sequence error (PH3) 4004:Force sequence error (PH4) 4005:Force sequence error (PH5) MIC MPCH2test 4010:All0 compare test 4011:All5 compare test 4012:Increment data compare test 4013:Decrement data compare test 4014:Force compare error test MIC MPCH3test 4020:Normal case test1 4021:Normal case test2 4022:MRST cancel test 4023:Force time out occurrence test(CHK1A) 4024:Force time out occurrence test(WCHK1) MIC MPCH4test 4030:Force time out error test 4031:Force timer parity error test MIC MPCH5test 4040:Sequence error not occurrence test 4041:Sequence error CHK1A test 4042:Sequence error WCHK1 test 4043:Timeout error not occurrence test 4044:Timeout error CHK1A test 4045:Timeout error WCHK1 test 4046:Compare error not occurrence test 4047:Compare error CHK1A test 4048:Compare error WCHK1 test 4049:Timer parity error not occurrence test 404A:Timer parity error CHK1B test

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Type	Error code
Error code	MIC SRAM1test 4050:Normal register check 1 4051:Normal register check 2 4052:Normal register check 3 4053:Normal register check 4 4054:Force error occurrence check 1 4055:Force error occurrence check 2 4056:Force error occurrence check 3 4057:CHK1B reset check MIC SRAM4test 4060:MICCHK1B not occurrence check 4061:MICPER not occurrence check 4062:MICPER occurrence check 4063:MICCHK1B occurrence check 4064:CHK1B occurrence check 4065:MICPER reset check 4066:MICCHK1B reset check 4067:CHK1B reset check MIC SRAM5test 4070:MICPER not occurrence check 4071:CHK1B not occurrence check 4072:MICPER occurrence check 4073:MICCHK1B occurrence check 4074:CHK1B occurrence check 4075:MICPER check 4076:MICCHK1B check 4077:CHK1B check 4078:MICPER reset check 4079:MICCHK1B reset check 407A:CHK1B check 407B:CHK1B reset check MIC SRAM13Htest 4080:Read error not occurrence check 1 4081:Read error not occurrence check 2 4082:Read error not occurrence check 3 4083:Read error not occurrence check 4 4084:SRAM error not occurrence check 4085:SRAM error occurrence check 1 4086:SRAM error occurrence check 2 4087:SRAM error occurrence check 3 4088:SRAM error occurrence check 4 4089:SRAM error reset check 408A:SRAM error not occurrence check

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Type	Error code
Error code	MIC SRAM116Htest 4090:Initialize error not occurrence check 4091:Force WCHK1 occurrence check 4092:WCHK1 reset check 4093:CHK1A 2time WCHK1 occurrence check 4094:MPCH WCHK1 occurrence check 4095:WCHK1 reset check 4096:CHK1A (RCHK occurrence) check 4097:CHK1A1 reset check 4098:CHK1A (SRAM occurrence) check 4099:CHK1A reset check 409A:CHK1A (MPCH occurrence) check 409B:CHK1A reset check MIC SRAM18test 40A0:Initialize MICPER not occurrence check 40A1:Initialize CHK1B not occurrence check 40A2:Mask MICPER not occurrence check 40A3:Mask MICCHK1B not occurrence check 40A4:Mask CHK1B not occurrence check 40A5:Normal MICPER occurrence check 40A6:Normal MICCHK1B occurrence check 40A7:Normal CHK1B occurrence check 40A8:MICPER reset check 40A9:MICCHK1B reset check 40AA:CHK1B check 40AB:CHK1B reset check MIC SRAM19Htest 40B0:Initialize error not occurrence check 40B1:Force SRAMCHK1B occurrence check 40B2:Force MICPER occurrence check 40B3:MPC counter force parity error detection check MIC SRAM12Htest 40C0:Limitte in access (normal) test 40C1:Limitte out access (error) test 40C2:SRAMERR reset check 40C3:SRAM INH MODE check 40C4:SRAMERR reset check

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Type	Error code
Error code	MIC SRAM15test 40F0:A REG R/W check (PH0) 40F1:A REG R/W check (PH1) 40F2:A REG R/W check (PH2) 40F3:A REG R/W check (PH3) 40F4:B REG R/W check (PH0) 40F5:B REG R/W check (PH1) 40F6:B REG R/W check (PH2) 40F7:B REG R/W check (PH3) MIC SRAM14test 4100:Lower address -4 write check (PH0) 4101:Lower address +4 write check (PH1) 4102:SRAMERR reset check 4103:Upper address -4 write check (PH2) 4104:SRAMERR reset check 4105:Upper address +4 write check (PH3) MIC SRAM marching test 4110:0data write error 4111:0data read error 4112:0data discrepancy error 4113:1data write error 4114:1data read error 4115:1data discrepancy error 4116:0data write error MIC SRAM R/W test 4120:01data R/W error 4121:01data R/W discrepancy error 4122:55data R/W error 4123:55data R/W discrepancy error 4124:AAdata R/W error 4125:AAdata R/W discrepancy error 4126:FFdata R/W error 4127:FFdata R/W discrepancy error 4128:Address line low 2byte data R/W error 4129:Address line low 2byte data R/W discrepancy error 412A:Address line high 2byte data R/W error 412B:Address line high 2byte data R/W discrepancy error 412C:00data R/W error 412D:00data R/W discrepancy error

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Type	Error code
Error code	MIC SRAM byte write test 4200:Low data R/W test (0x11223344) 4201:High data R/W test (0x55667788) 4202:Low data R/W test (0x55667788) 4203:High data R/W test (0x11223344)

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Type	Error code
Error code	SCSI PBA external register test 5000:XRPBA00 read / write error 5001:XRPBA01 read error 5002:XRPBA02 read error 5003:XRPBA03 read error 5004:XRPBA04 read / write error 5005:XRPBA06 read / write error 5006:XRPBA07 read error 5007:XRPBA08 read error SCSI CHP data transmit register test1 5008:XRPBA20 read / write error 5009:XRPBA21 read / write error 500A:XRPBA22 read / write error 500B:XRPBA23 read / write error SCSI CHP data transmit register test2 500C:XRPBA24 read / write error 500D:XRPBA26 read / write error SCSI CHP data transmit register test3 500E:XRPBA25 read / write error 500F:XRPBA27 read / write error SCSI CHP data transmit register test4 5010:XRPBA28 read / write error SCSI CHP data transmit register test5 5011:XRPBA29 read / write error SCSI CHP data transmit register test6 5012:XRPBA2A read / write error SCSI CHP data transmit register test7 5013:XRPBA2B read / write error SCSI CHP data transmit register test8 5014:XRPBA2C read error 5015:XRPBA2D read error 5016:XRPBA2E read error

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Type	Error code
Error code	SCSI PCI device register test1 5017:PCI register test read error SCSI PCI device register test2 501F:selected PCI device 0, XRPBA68 read / write error 5020:selected PCI device 1, XRPBA68 read / write error 5021:selected PCI device 2, XRPBA68 read / write error 5022:selected PCI device 3, XRPBA68 read / write error SCSI PCI device register test3 5023:selected PCI device 0, XRPBA69 read / write error 5024:selected PCI device 1, XRPBA69 read / write error 5025:selected PCI device 2, XRPBA69 read / write error 5026:selected PCI device 3, XRPBA69 read / write error SCSI PCI device register test4 5027:selected PCI device 0, XRPBA6A read / write error SCSI SBSA0 data transmit buffer write / read test 5030:buffer write / read test error SCSI SBSA0 data line test 5031:data line test error SCSI SBSA1 data transmit buffer write / read test 5032:buffer write / read test error SCSI SBSA1 data line test 5033:data line test error SCSI SBSA0 common register test 5034:BSA register test read error SCSI SBSA0 data transmit control register test 5035:CHP register test read error SCSI SBSA0 PCI device data transmit register test 5036:PCI device data transmit register test read error SCSI SBSA1 common register test 5037:BSA register test read error SCSI SBSA1 data transmit control register test 5039:CHP register test read error SCSI SBSA1 PCI device data transmit register test 503A:PCI device data transmit register test read error SCSI external memory write /read test 503B:external memory write / read test error SCSI external memory data line test 503C:external memory write / read test error SCSI external memory hardware access test 503D:external memory write / read test error SCSI external memory hardware address line test2 503E:external memory write / read test error

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Type	Error code
Error code	Tachyon LPA test 0000:CHK1B/3 occurrence error 0010:LPA_PnVID/PnDID register read/write error 0020:LPA register read error 0030:Communication Memory data line error 0040:Communication Memory address line error 0050:Transfer Memory data line error 0060:Transfer Memory address line error Tachyon LPA initialize 0000:CHK1B/3 occurrence error 0010:LPA initialize error Tachyon LPA initialize check 0000:CHK1B/3 occurrence error 0010:CHK1B occurred 0011:compare error Tachyon PCI to PCI Bridge Unit initialize check 0000:CHK1B/3 occurrence error 0010:CHK1B occurred 0011:compare error Tachyon i960HD-RD communication check 0000:CHK1B/3 occurrence error 0010:communication error 0020:header compare error 0021:data compare error Tachyon PFA test 0000:CHK1B/3 occurrence error 0010:PFA_PnMSADR register read/write error 0020:PFA register read error 0030:F-Bus register error 0040:Parameter Memory data line error 0050:Parameter Memory address line error

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Type	Error code
Error code	<<CUDG main>> SSB area(LM)over flow check(CUDG3) 3E80:SSB(error information)area over flow Machine constitution data acquisition (CUDG3/4/5/INLINE) 3E81:machine constitution data acquisition function error FM sum-check test(CUDG3) 3E82:Sum check data discrepancy error Hang-up timer(CUDG4/5) 3E83:Hang-up error Cache register initialize(INLINE CUDG) 3E84:Cache register write transfer error SM(CUDG3) 3E86:Waitting for transfer end error (master sequencer) SM(CUDG3) 3E87:SM check error

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Type	Error code
Error code	HEALTH CHECK Timer#4 Test 0100:MP abnormal or Timer#4 abnormal HEALTH CHECK LM(DRAM) Test 0100:LM R/W Data Compare error HEALTH CHECK SM Test 0100:SM R/W Data Compare error HEALTH CHECK FM Test 00xx:FM SUM Data Compare error (xx:Block Number)

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PERIODIC CHECK SECTION

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3.2 DKU ..... PERIOD 03-10
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1. PERIODIC CHECK LIST

The following table shows the items of the periodic check for the DKC and DKU.
When the parts are replaced , refer to 'PARTS REPLACEMENT SECTION' of this manual.

Table 1-1 Periodic Check List

No.	Item	Tools	Frequency of Periodic Check	Check Time	DKC DKU	Reference Page
1	Check of DC voltage	• Digital voltmeter • Voltage check fixture	Once per year	5 min. per logical part	DKC DKU	PERIOD 02-10 to PERIOD 02-100
2	Check of air filter	• Vacuum cleaner	Once per year	10 min.	DKC DKU	PERIOD 03-10
3	Check and Replacement of battery	• Philips screwdriver	See Table 4.2-2 on page PERIOD 04-20	Replacement time: 10 min. per battery.	DKC	PERIOD 04-10 to PERIOD 04-20

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2. Check of DC Voltage

a. Measure DC +5V, DC +12V, and DC +3.3V current at the check point with a digital voltmeter. Refer to the following table and figure:
   Table 2-1 'Range of Acceptable DC Voltage' on PERIOD 02-10
   Fig. 2-1 'Location of Power Supplies' on PERIOD 02-20
   Fig. 2-2 'Location of Voltage Check Point' on PERIOD 02-30

Table 2-1 Range of Acceptable DC Voltage

No.	Logic Part	Standard DC Voltage (Between +DC and GRD)	Acceptable Range (Between +DC and GRD)	Power Supply Location	Remarks
1	Cluster 1 Logic	+5V	+4.90V to +5.20V	5VPS10	
2				5VPS11	
3				5VPS12	
4				5VPS13	
5		+3.3V	+3.25V to +3.45V	3VPS10	
6				3VPS11	
7				3VPS12	
8				3VPS13	
9		+5V/+12V	5V : +4.75V to +5.25V	MPS10	
10		(multi)	12V : +11.4V to +12.6V	MPS11	
11	Cluster 2 Logic	+5V	+4.90V to +5.20V	5VPS20	
12				5VPS21	
13				5VPS22	
14				5VPS23	
15		+3.3V	+3.25V to +3.45V	3VPS20	
16				3VPS21	
17				3VPS22	
18				3VPS23	
19		+5V/+12V	5V : +4.75V to +5.25V	MPS20	
20		(multi)	12V : +11.4V to +12.6V	MPS21	
21	HDU-XX0	+5V/+12V	5V : +4.75V to +5.25V	MPSXX00	
22		(multi)	12V : +11.4V to +12.6V	MPSXX01	
23	HDU-XX1	+5V/+12V	5V : +4.75V to +5.25V	MPSXX10	
24		(multi)	12V : +11.4V to +12.6V	MPSXX11	
23	HDU-XX2	+5V/+12V	5V : +4.75V to +5.25V	MPSXX20	
26		(multi)	12V : +11.4V to +12.6V	MPSXX21	
27	HDU-XX3	+5V/+12V	5V : +4.75V to +5.25V	MPSXX30	
28		(multi)	12V : +11.4V to +12.6V	MPSXX31	
29	HDU-XX4	+5V/+12V	5V : +4.75V to +5.25V	MPSXX40	
30		(multi)	12V : +11.4V to +12.6V	MPSXX41	
31	HDU-XX5	+5V/+12V	5V : +4.75V to +5.25V	MPSXX50	
32		(multi)	12V : +11.4V to +12.6V	MPSXX51	
33	HDU-XX6	+5V/+12V	5V : +4.75V to +5.25V	MPSXX60	
34		(multi)	12V : +11.4V to +12.6V	MPSXX61	
35	HDU-XX7	+5V/+12V	5V : +4.75V to +5.25V	MPSXX70	
36		(multi)	12V : +11.4V to +12.6V	MPSXX71	

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b. To check the output voltage of the power supplies, measure it with the voltmeter, by connecting the voltmeter to the voltage check point.
If the output voltage of the power supply is not within the acceptable DC voltage, replace it to the spare part. Refer to REPLACE SECTION [REP01-160].

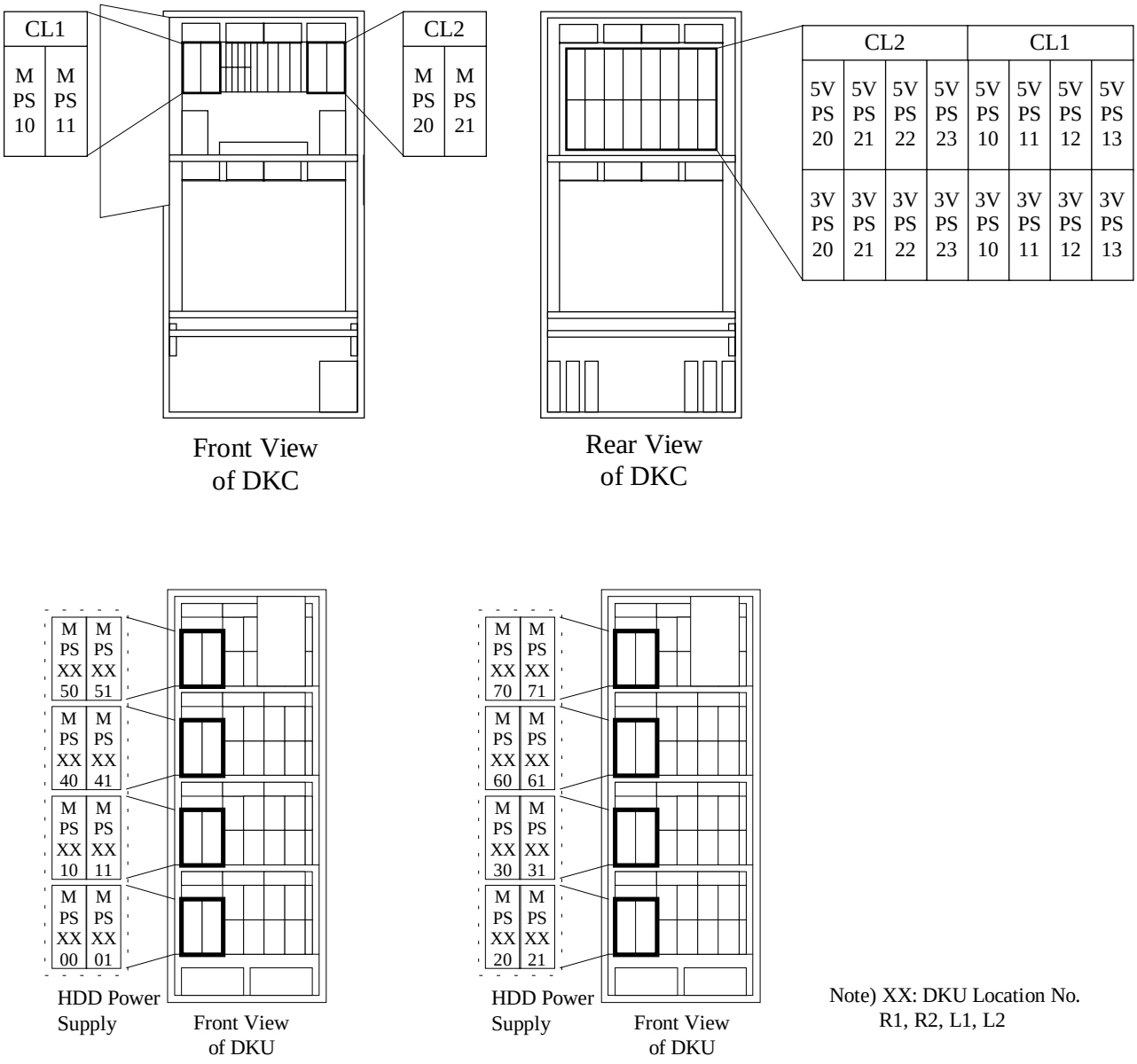

Fig.2-1 Location of Power Supplies

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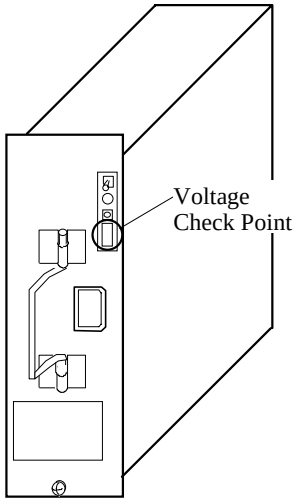
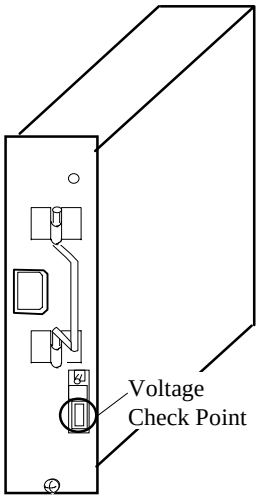
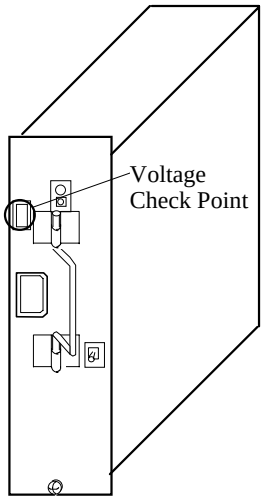


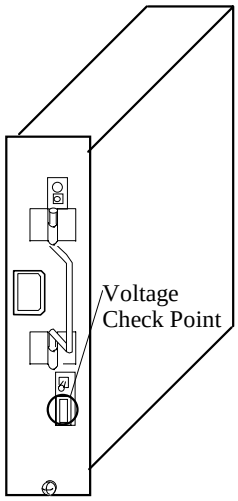
5V PS (type 'HS05065C-S')
3V PS (type 'HS03075C-S')
Multi PS (type 'HS300-04C-R')



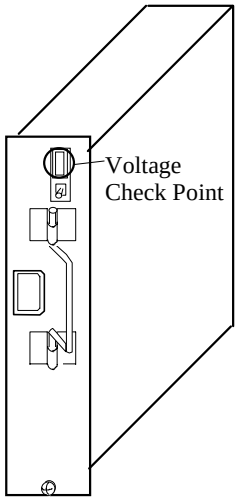
5V PS (type 'TAH-325HSA')
5V PS (type 'HS05065C-W')
3V PS (type 'TAH-264HSA')
3V PS (type 'HS03075C-W')



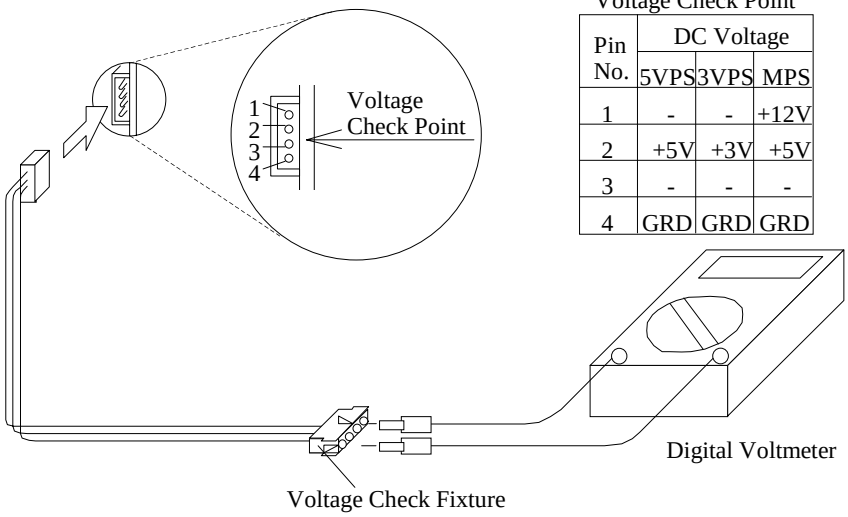
Multi PS (type 'HS300-04C-V')
Multi PS (type 'TSG-370HS-C')



Multi PS (type 'HS400-08C-S')
(type 'TSG-370HS')
(type 'HS400-08C-W')



Multi PS (type 'HS400-08C-R')
(type 'HS400-08GR')



Voltage Check Point

Pin No.	DC Voltage		
	5VPS	3VPS	MPS
1	-	-	+12V
2	+5V	+3V	+5V
3	-	-	-
4	GRD	GRD	GRD

Fig. 2-2 Location of Voltage Check Point

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3. Cleaning of Air Filter

3.1 DKC

Clean the air filters located at the bottom of the Front and Rear Logic Boxes and inside the front and rear doors.
The location of the air filters are shown in Fig. 3.1-1.

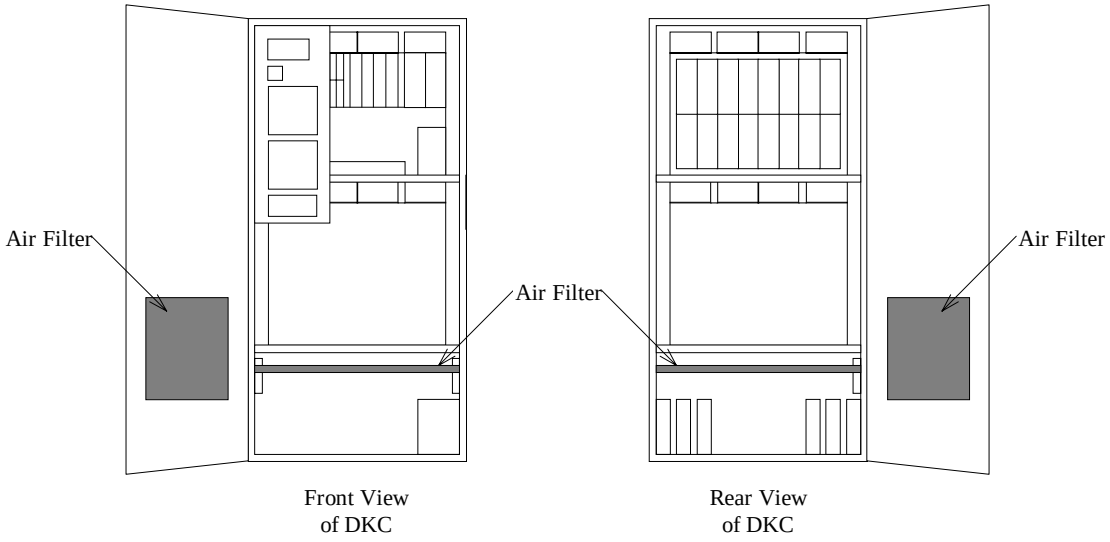

Fig. 3.1-1 Air Filter Location in DKC

3.2 DKU

Clean the air filters located inside the front and rear doors.
The location of the air filters are shown in Fig. 3.2-1.

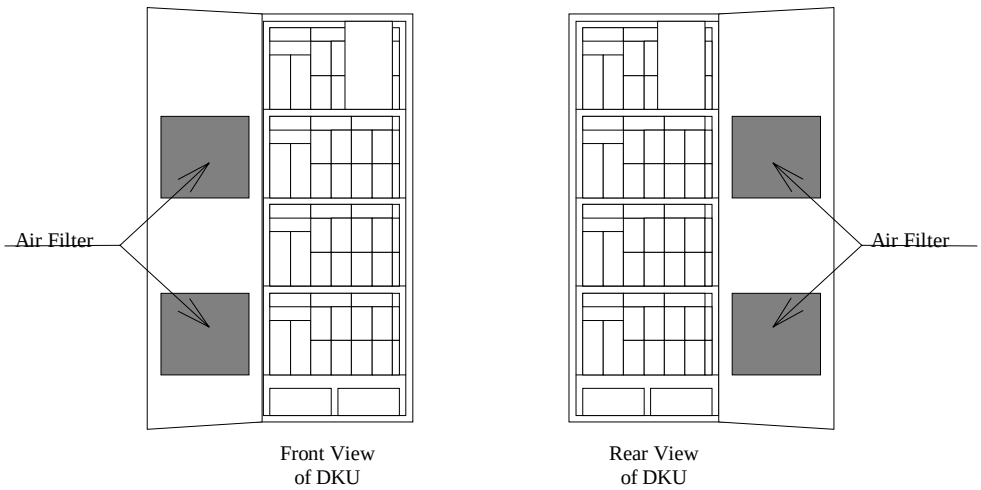

Fig. 3.2-1 Air Filter Location in DKU

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4. Check and Replacement of Battery

4.1 Type of battery

The DKC has the batteries shown in Table 4.1.-1 and Fig. 4.1-1.

Table 4.1-1 Batteries used in DKC

No.	Battery Name	Logic Part	ALARM LED on Operator Panel	Warning Detecting Voltage
1	BATTERY-10	Cluster 1 Shared Memory	SUB-SYSTEM ALARM	Less than 3.8V
2	BATTERY-11	Cluster 1 Cache Memory		
3	BATTERY-12	Cluster 1 Cache Memory		
4	BATTERY-20	Cluster 2 Shared Memory		
5	BATTERY-21	Cluster 2 Cache Memory		
6	BATTERY-22	Cluster 2 Cache Memory		

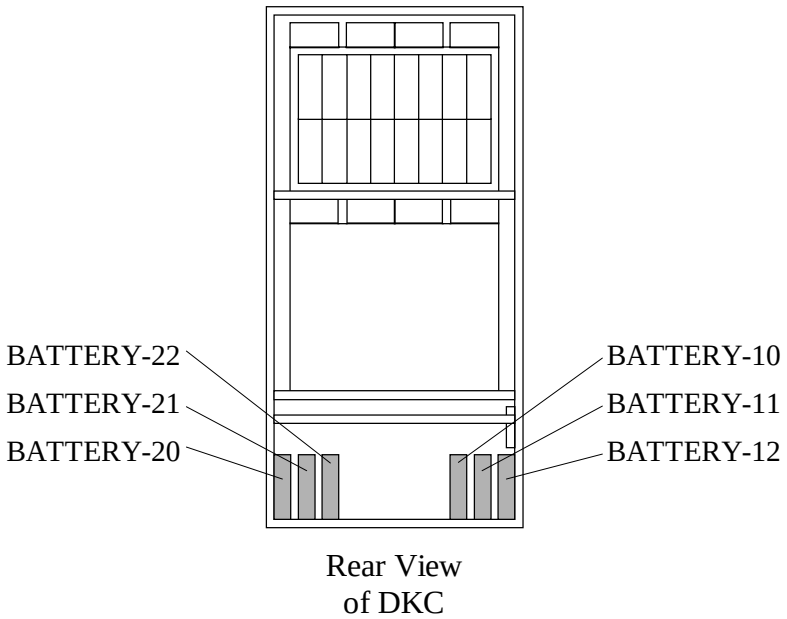

Fig. 4.1-1 Battery Location

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4.2 Specification of battery

Specifications of the batteries mounted on the DKC are shown in Table 4.2-1.
Replace the battery, in case that a battery warning is detected, even though battery charging time passes 8 hours.

Table 4.2-1 Specification of the battery

No.	Type of Battery		Maximum Back-up Time	Charging Time Necessary after Back-up
1	For SM		168 hours (7 days)	8 hours
2	For CM	Configuration with SH024-A only	96 hours (4 days)	8 hours
		Configuration with SH100-A only	48 hours (2 days)	
		Configuration with mixture of SH024-A and SH100-A		

Specifications of the batteries for the spare parts are shown in Table 4.2.-2.
Replace the battery, in case that the battery is used more than 2.5 years.

Table 4.2-2 Specification of the battery (spare parts)

No.	Type of Battery	Charging Time and Frequency of Battery for Spare Parts	Life
1	For SM	Time : 48 hours (2 days) Frequency : Once every six months (Note) Use the DKC for charging.	2.5 years
2	For CM		2.5 years

4.3 Replacing of battery

Refer to REPLACE SECTION [REP01-150 Work ID RT14] in this manual.

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SVP SECTION

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11.2.6 Data Term Screen SVP11-110
11.2.7 File Operation Screen SVP11-110
11.2.8 Change Attribute Screen SVP11-120
11.2.9 History Screen SVP11-120
11.2.10 Automatic Migration History Screen SVP11-130
11.3 Start HIHSM SVP11-180
11.4 Monitor the data SVP11-190
11.4.1 Start monitoring SVP11-190
11.4.2 Stop monitoring SVP11-200
11.4.3 Set the term to display the monitoring data SVP11-210
11.4.4 Save monitoring data to FD SVP11-220
11.5 Changing the volume attribution SVP11-230
11.5.1 Changing the volume attribution to “Reserved” SVP11-230
11.5.2 Changing the volume attribute to “Normal” SVP11-240
11.6 Manual Migration SVP11-250
11.6.1 Manual Migration SVP11-250
11.6.2 Migration Status SVP11-270
11.6.3 Stop migration SVP11-280
11.7 Automatic Migration SVP11-290
11.7.1 Set/Reset the Fixed parity group SVP11-290
11.7.2 Set the evaluating schedule and migration time SVP11-300
11.7.3 Make the migration plan SVP11-310
11.7.4 Set the evaluating schedule and migration time SVP11-350
11.7.5 Make the migration plan SVP11-380
11.8 Display the volume usage rate SVP11-390
11.9 Display the history SVP11-400
11.9.1 History Screen SVP11-400
11.9.2 Display the history for automatic migration function SVP11-410

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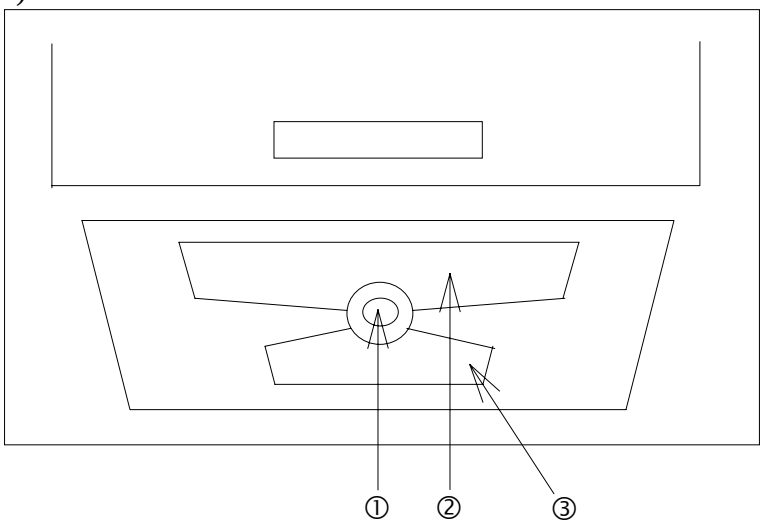
1 How to Operate the SVP (PC)

This manual describes how to operate the SVP (PC) with a trackball.

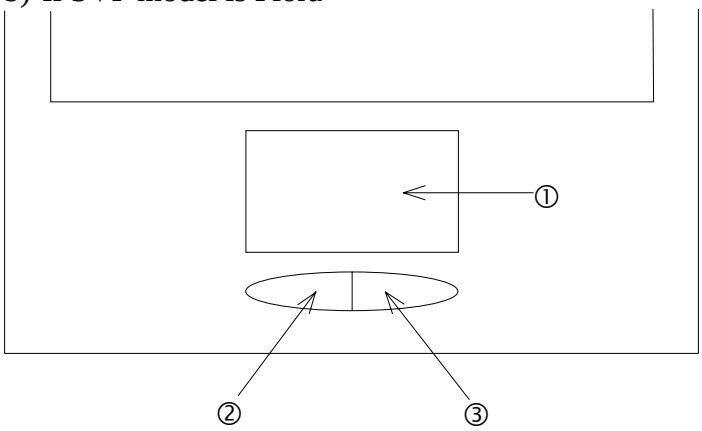
1.1 How to use a trackball or touchpad

a) If SVP model is Armada



① : Trackball
Rotate this device to move the pointer to a desired position.
② : Button
Pressing this button selects an item on which the pointer is placed.
③ : Not used

b) If SVP model is Flora



① : Touchpad
Trace this device to move the pointer to a desired position.
② : Button
Pressing this button selects an item on which the pointer is placed.
③ : Not used

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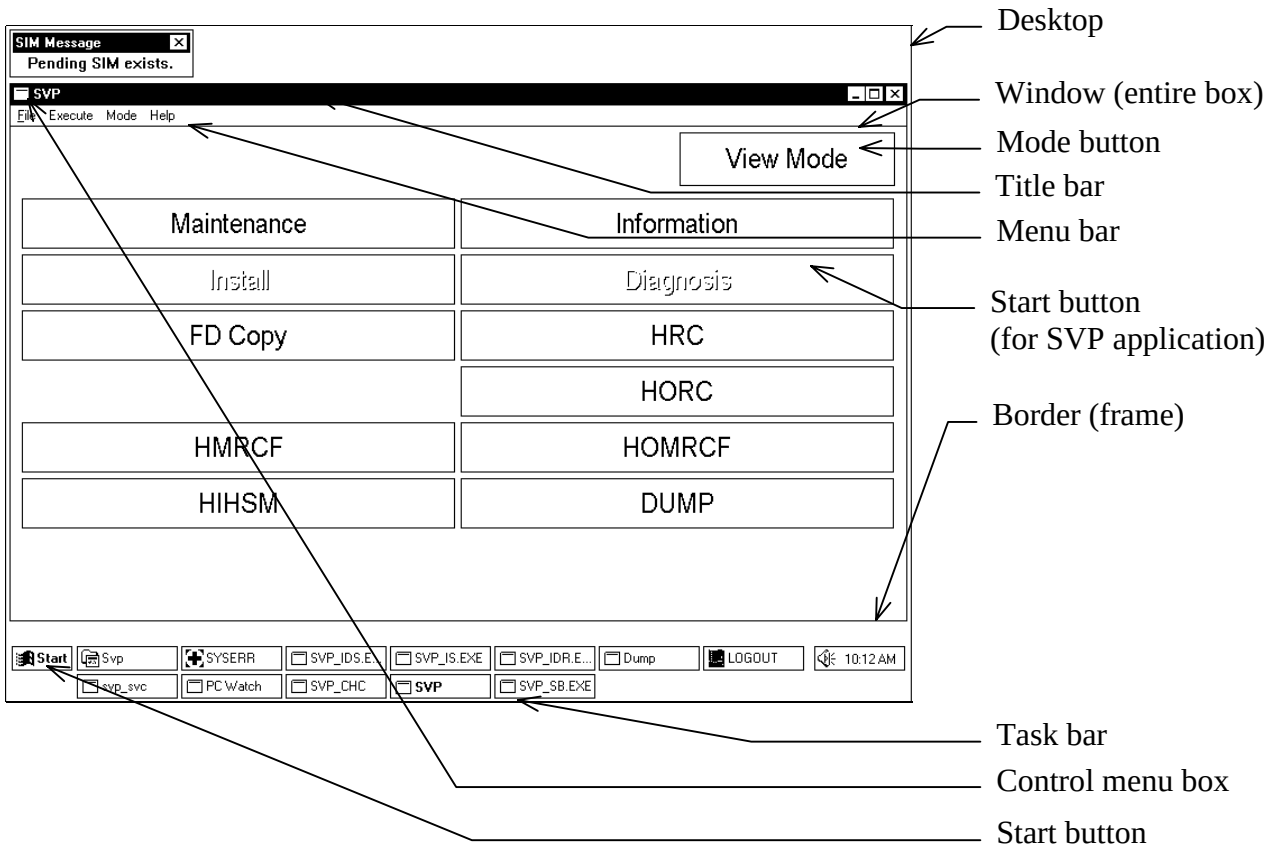
1.2 Windows Screen Component Nomenclature

Either of the following windows is displayed.



(Note)
Each SVP screen on this maintenance manual is a sample, and it may not be the same as the actual screen.

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1.3 How to use Windows

(1) Notation

In this manual, “select” has the following three meanings, and (CL), (DC), or (DR) is added to the word for each meaning.

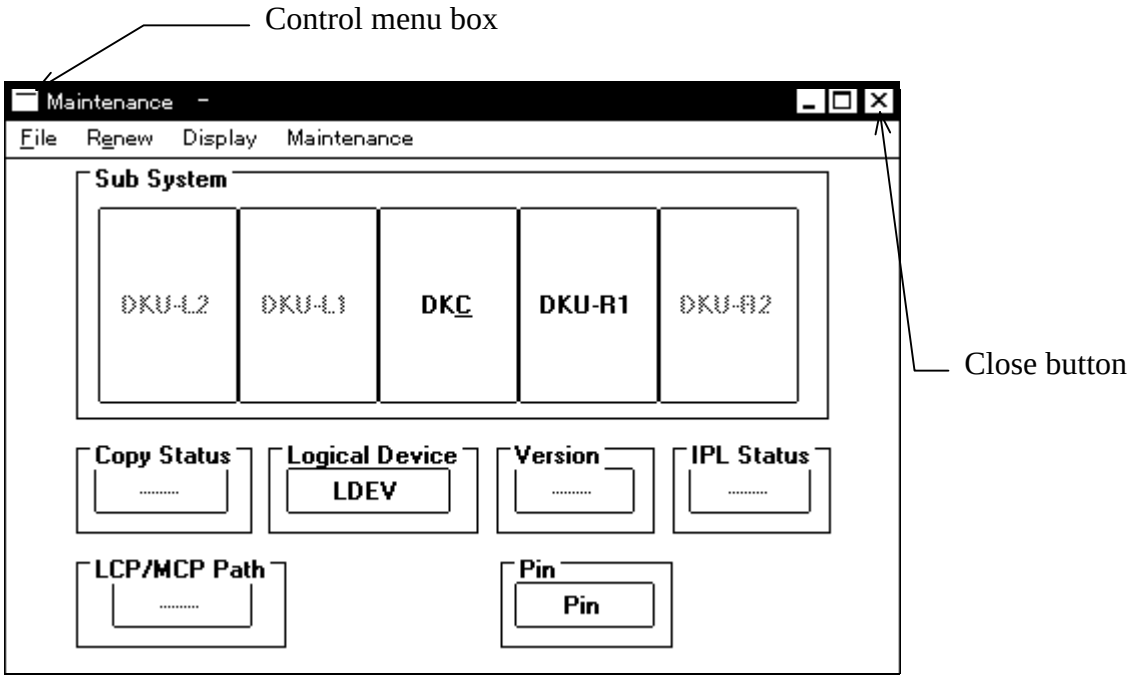
(CL) Click:
Quickly press and release the button above the trackball.
(DC) Double-click:
Click the button above the trackball or touchpad twice in rapid succession.
(DR) Drag:
To hold down the button above the trackball or touchpad while you rotate the trackball or trace the touchpad to move the pointer to a desired position. Then release the button.

example)
Select (DC) the [Install] icon in the ‘SVP’ window.

Move the pointer to [Install] with the trackball or touchpad. Then click the button above the trackball or touchpad twice in rapid succession.

(2) Close

“Close” means to close the aplication window.
(Double-click the control menu box of the window or click the close button for Windows 95.)



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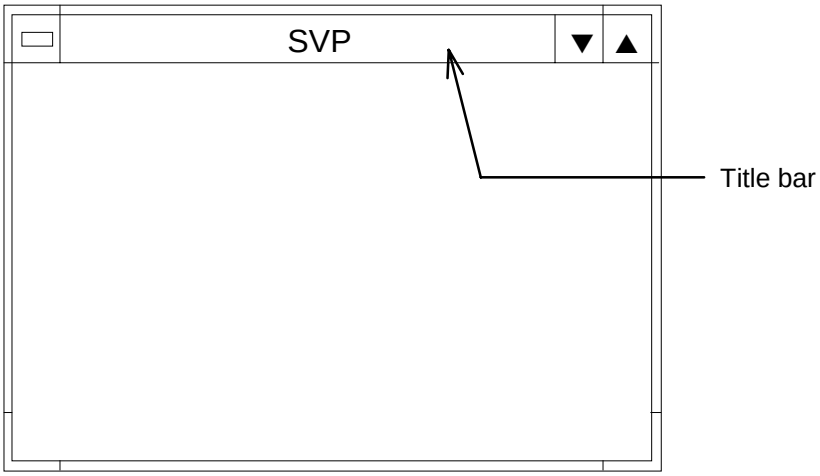
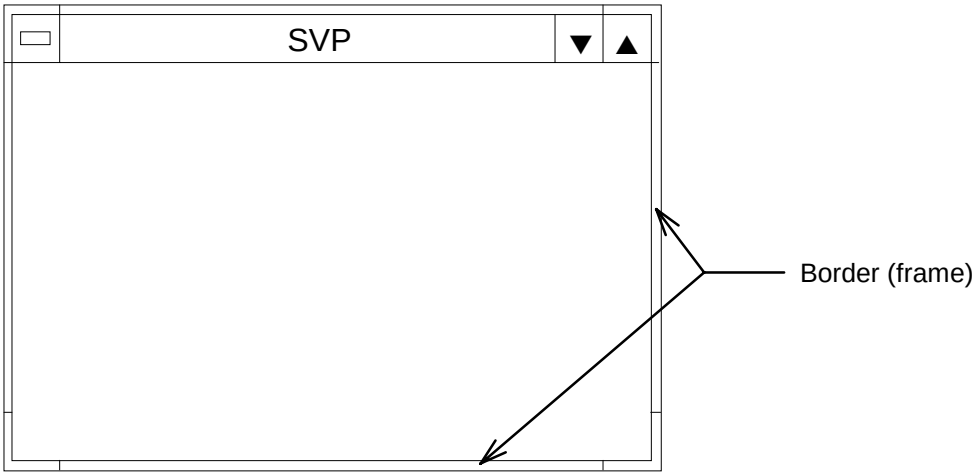
(3) Moving the Window

Move the pointer to the title bar with the trackball.
While pressing the button, move the window with the trackball or touchpad (DR) to a desired position and release the button.



(4) Changing the window size

Move the pointer to the window border (frame) (the pointer changes to the double- headed arrow). While pressing the button, move the border (the border changes to the broken line) until the window becomes a desired size, and release the button.



(5) Switching the screen (when two or more screens are opened)

While pressing the ALT key , press TAB (or ESC) until your desired window title is displayed, and release the ALT key.

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1.4 Power On

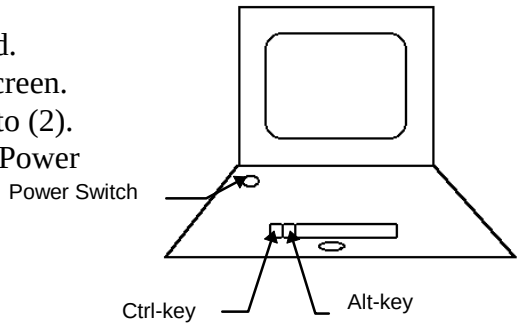
Usually, SVP start automatically at the breakers-ON.
If some problem occurred and you must start SVP, do as following procedures.

a) If SVP model is Armada

(1) Power On SVP

a. Press Power Switch on the SVP keyboard.

b. Watch messages displayed on the SVP screen.
If following messages are displayed, Go to (2).
Otherwise, power off (press Alt + Ctrl + Power Switch) and on SVP to retry. (*1)
After retrying twice, replace SVP.



[Message]
xxxx KB OK
Starting Windows95
(Some other messages)

(2) Windows Start (SVP Start)

a. Wait a few minutes until Windows system will start.

b. Read message displayed on the SVP screen. (Go to SVPMSG section)
Otherwise, power off (press Alt + Ctrl + Power Switch) and on SVP to retry. (*1)
After retrying twice, replace SVP.
[End of Power On]

*1: If you press only Power Switch on the SVP keyboard when SVP and Windows system are active, these systems will be frozen.
You should be sure to press Alt + Ctrl + Power Switch for power off SVP.

*2: If Windows 95 doesn't start, check the following items.
(1) Is the DKC "CE mode" ?
(2) The two LEDs at the LAN cable socket are always on?

If above two conditions are satisfied, pull out LAN cable until Windows 95 is starting.

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b) If SVP model is Flora

(1) Power On SVP

a. Insert the Shut Down Jumpers in SVPPS1 and SVPPS2 (See LOCATION06-20).
b. Wait for one minute.
c. Remove the Shut Down Jumpers in SVPPS1 and SVPPS2 (See LOCATION06-20).
d. Watch messages displayed on the SVP screen.
   If following messages are displayed, Go to (2)
   Otherwise, Go to a, b and c.
   After retrying twice, replace SVP.

[Message]
   xxxx KB OK
   Starting Windows95
   (Some other messages)

(2) Windows Start (SVP Start)

a. Wait a few minutes until Windows system will start.
b. Read message displayed on the SVP screen. (Go to SVPMSG section)
   Otherwise, Go to (1) a, (1) b and (1) c.
   After retrying twice, replace SVP.
   [End of Power On]

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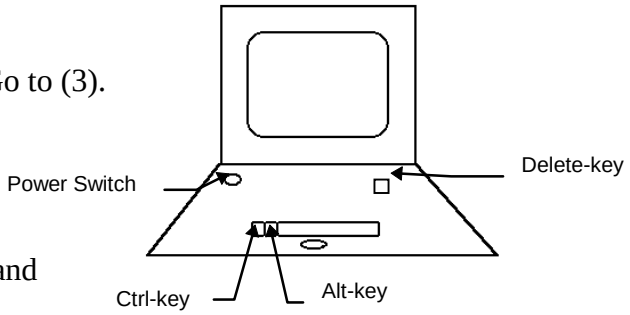
1.5 Power Off

a) If SVP model is Armada

(1) What is running?

a. See what is displayed.
If Windows is displayed, Go to (2).
If DOS prompt is displayed, like "C:\>", Go to (3).



(2) Exit Windows(Stop SVP)

a. Select (CL) "Start button".
b. Select (CL) "Shut Down".
c. Select (CL) "Shut Down the computer?", and
Select (CL) [Yes].
[End of Power Off]

(3) Power Off SVP

a. Press 2 keys —— Ctrl-key and Alt-key ——, and Power Switch simultaneously.
[End of Power Off]

Note : Do not press only Power Switch key.
Because, since SVP does not stop to perfection, we do not guarantee the operation of SVP after re-power on.
If only Power Switch key was pressed, please power off SVP.

b) If SVP model is Flora

(1) What is running?

a. See what is displayed.
If Windows is displayed, Go to (2).
If DOS prompt is displayed, like "C:\>", Go to (3).

(2) Exit Windows(Stop SVP)

a. Select (CL) "Start button".
b. Select (CL) "Shut Down".
c. Select (CL) "Shut Down the computer?", and
Select (CL) [Yes].
[End of Power Off]

(3) Power Off SVP

a. If replace of SVP
Insert the Shut down Jumpers in SVPPS1 and SVPPS2 (See LOCATION06-20).
Wait for one minute.
Replace SVP.
Remove the Shut Down Jumpers in SVPPS1 and SVPPS2 (See LOCATION06-20).
b. If reboot of SVP
Insert the Shut Down Jumpers in SVPPS1 and SVPPS2 (See LOCATION06-20).
Wait for one minute.
Remove the Shut Down Jumpers in SVPPS1 and SVPPS2 (See LOCATION06-20).

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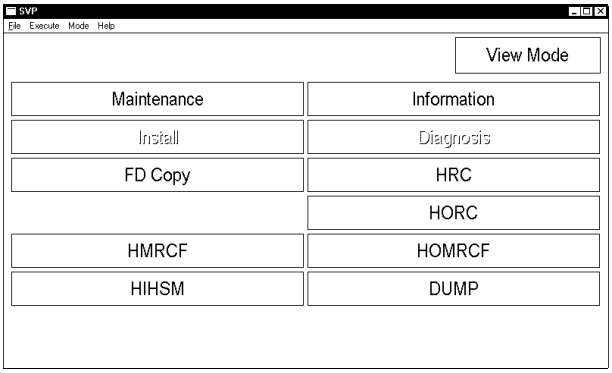
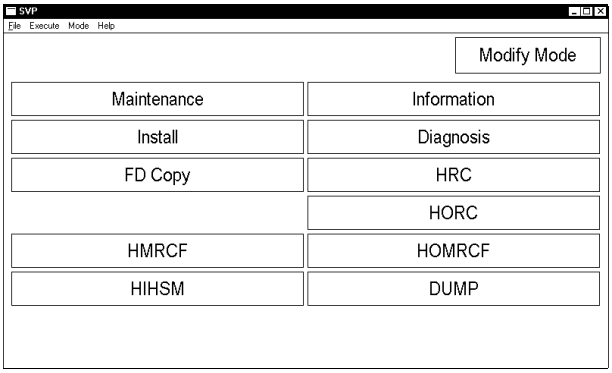
1.6 Mode

(1) View Mode
In view mode, only referring the subsystem status can be allowed.



(2) Modify Mode
In modify mode, referring and changing the subsystem status can be allowed.

For example, log/pin data indication and status display on MAINTENANCE are available in any mode, but replacement is available in only modify mode.



Note : When view mode, pending SIMs (if exist) are reported to host.

(3) Change Mode
If you push (CL) [View Mode] button, it changes [Modify Mode], and SVP changes Modify Mode.
If you push (CL) [Modify Mode] button, it changes [View Mode], and SVP changes View Mode.

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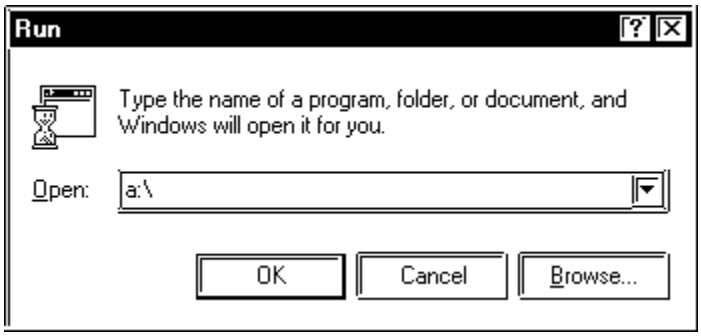
1.7 Run

(1) <Select the [Run]>
Select (CL) the [Run...] in the [Start button].

(2) <Input file name>
Input file name in 'Open' and select (CL) [OK].



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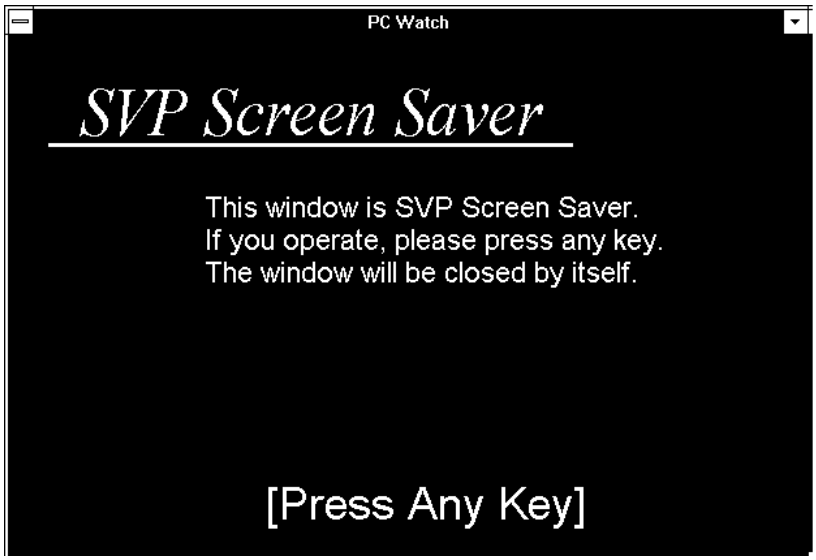
1.8 Screen Saver, and SVP reboot function

This function executes SVP reboot at intervals of a certain duration, one time per day.
Normally, the function displays a new windows for Screen Saver.

(1) SVP (PC) reboot
When SVP detects the reboot time under displaying the Screen Saver, the function will reboot SVP automatically. But, if other applications of SVP are executing, the function will stop rebooting, and wait until the next time will arrive.

(2) Screen Saver

1. If there is no access from keyboard or mouse during 60 minutes, and other SVP applications windows are closed, SVP will open the screen saver window.



2. Normally, the function becomes icon.

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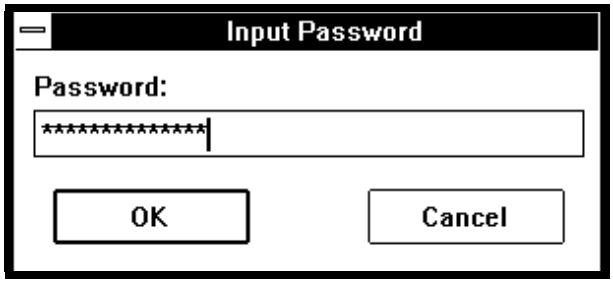
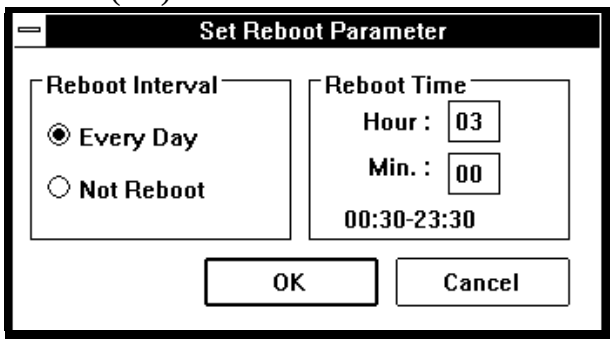
(3) Setting reboot timer

1. Please select (DC) “PC Watch” Icon.

2. SVP will displays “Input Password” screen. Please enter the password and select (CL) “OK”.



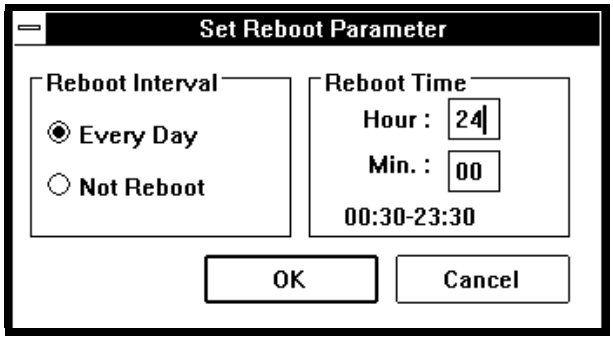
3. Next, SVP will displays “Set Reboot Parameter” Screen. Please input Reboot interval and Reboot time, and select (CL) “OK”.



① Reboot Interval
Every Day : one time per day.
Not Reboot : not available to reboot.

② Reboot Time
Reboot time will be set.
Notice:
The SVP usually receives a TH/ORM log data from DKC-Main at 23:30 - 0:30, so that you can not input those time.

If you input the reboot time as 24:00 or above timer 23:30 - 0:30, will move the focus.



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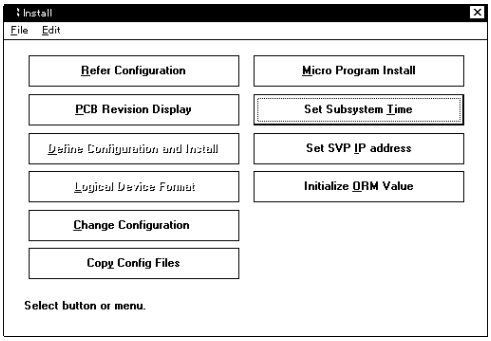
2 Function of the SVP

2.1 TOD (Time Or Date) setting

(1) Change the mode to [Modify Mode] from [View Mode] (CL).

(2) Select (CL) [Install].

(3) Select (CL) [Set Subsystem Time] in the 'Install' window.



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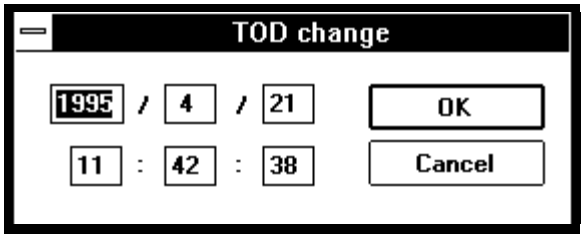
(4) Specify the date (year, month and day) and time (hour, minute and second) and select (CL) [OK].



(5) Close the ‘Install’ window.

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2.2 Log indication

[1] SSB Log ---------- SVP02-40
[2] SIM Log ---------- SVP02-60
[3] Detail Log ---------- SVP02-80
[4] Reset Log ---------- SVP02-90
[5] Power Event Log ---------- SVP02-100
[6] Incident Log ---------- SVP02-110
[7] LCP/MCP Log ---------- SVP02-130
[8] Diagnosis Log ---------- SVP02-140
[9] Copy History Log ---------- SVP02-145
[10] MP# - Location correspondence table ---------- SVP02-165

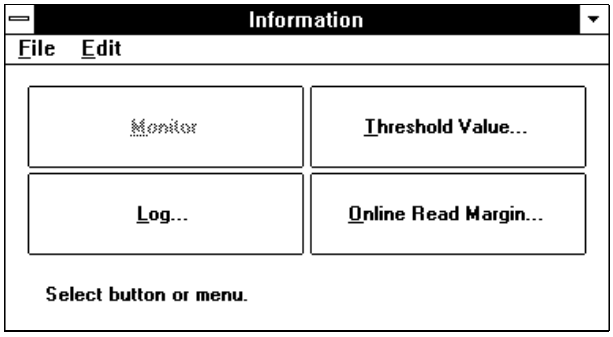
Indication condition

If there is no corresponding log, you cannot select any log from the menu.

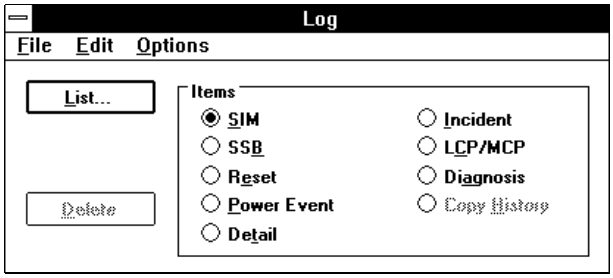
Do this first:

(1) Select (CL) [Information].

(2) Select (CL) [Log...].



(3) 'Log' dialog box is displayed.



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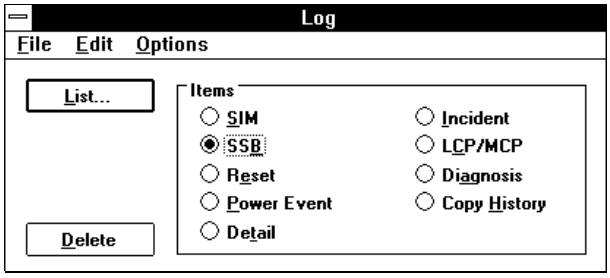
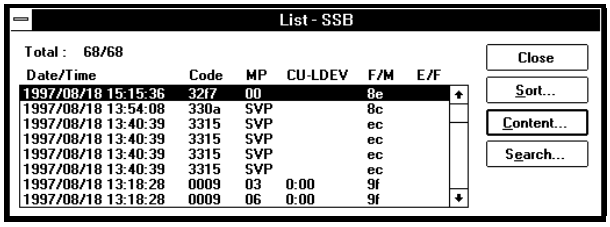
[1] SSB Log

(1) Select (CL) [SSB] in the 'Log'.
Select (CL) [List].

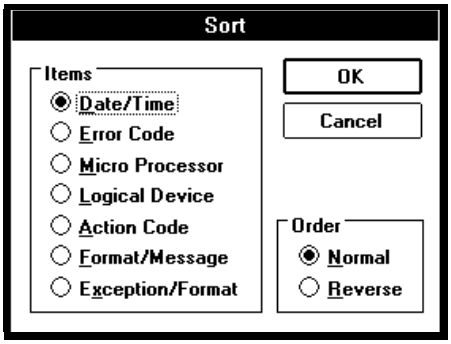


(2) Select (CL) data to be indicated in the 'List-SSB' dialog box and select (CL) [Content...].



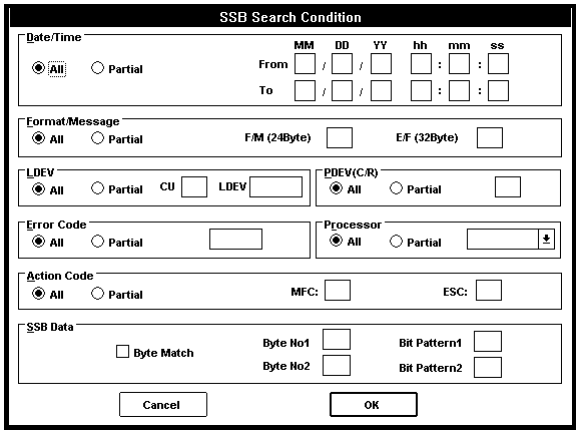
Note1: To sort and list items, select (CL) [Sort...] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].

Note2: To search for the desired log, select (CL) [Search...]. Then set the log for which you want to search individual List in the 'SSB Search Condition' dialog box and select (CL) [OK].



Note3: In case of the log data exceeded 1000 cases (Denominator of the total displays 1000 or more), the log data can be displayed from new data to 1000 data out of the entry sequence on SVP.
The entry sequence sometimes differs from occurrence order of the log.
Perform search function in order to check occurrence order.

Note4: Please do not change an application's window until search function finish.



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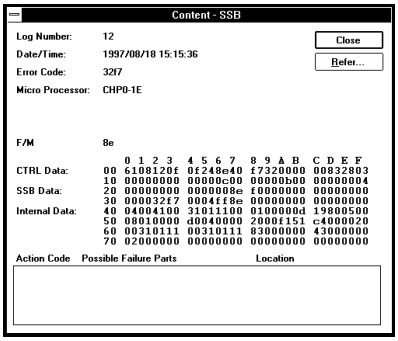
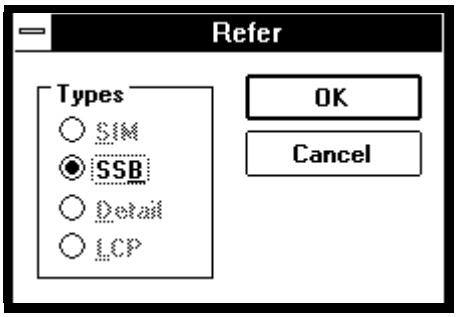
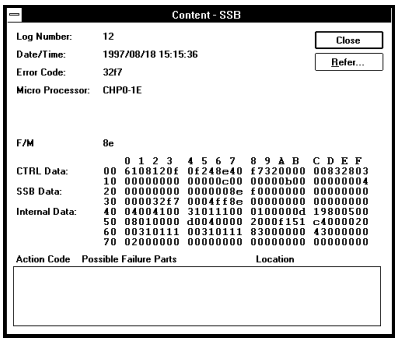
(3) The detailed data is displayed in the ‘Content-SSB’ dialog box.
Select (CL) [Refer...] in the ‘Content-SSB’ dialog box to display the relative log is displayed.



(4) Select (CL) the log to be displayed in the ‘Refer’ dialog box.
([SSB] is selected in this example.)



(5) Display the log to be selected.
(‘SSB Log’ is displayed in this example.)
See SSB LOG Section



(6) Select (CL) [Close] in the ‘Content-SSB’ dialog box.
Select (CL) [Close] in the ‘List-SSB’ dialog box.
Close the ‘Log’ dialog box and close the ‘Information’ window.

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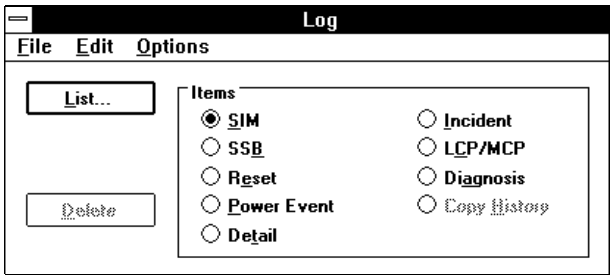
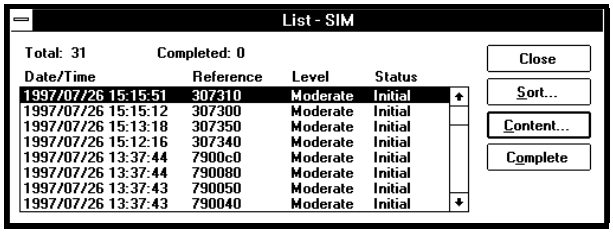
[2] SIM Log

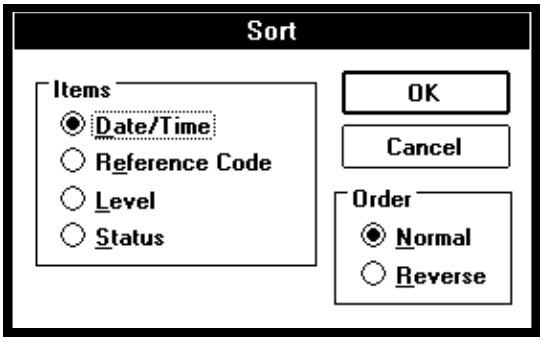
Note: When SIM log exists after SVP started up, the 'SIM Message' window is displayed.

(1) Select (CL) [SIM] in the 'Log' dialog box.
Select (CL) [List...].



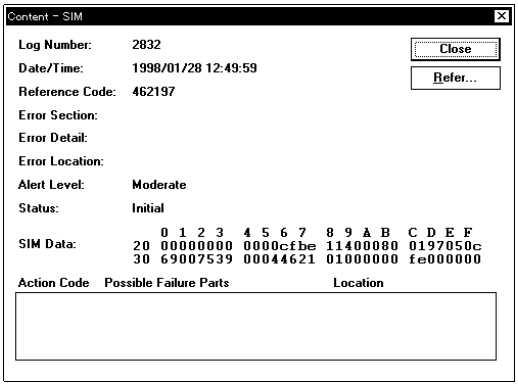
(2) Select (CL) data to be indicated in the 'List-SIM' dialog box and select (CL) [Content...].
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) The 'Content-SIM' dialog box is displayed.
Select (CL) [Refer...] in the 'Content-SIM' dialog box, when the relative log is displayed.

Note1: In WCHK1 dump and ABEND dump received SIM (RC = 3080X0, 3081X0), the system error code is indicated in the format [YYYY] as in Reference Code 3080X0[YYYY].
Note2: If Reference Code is 73XX00 or 1400X0, perform the recovery procedure for LAN error. (see TRBL05-70.)



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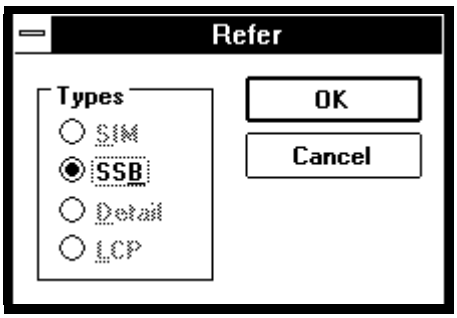
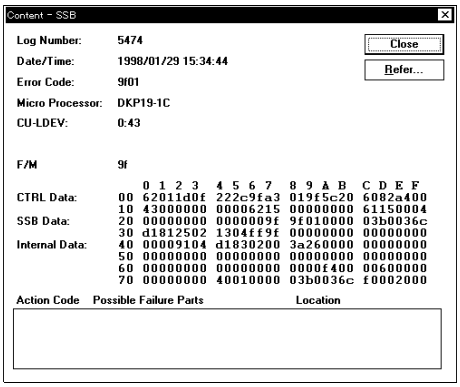
(4) Select (CL) the log to be displayed in the 'Refer' dialog box.
([SSB] is selected in this example.)



(5) The selected log is displayed.
('Content-SSB' is displayed in this example.)



(6) Select (CL) [Close] in the 'Content-SSB' dialog box.
Select (CL) [Close] in the 'Content-SIM' dialog box.
Select (CL) [Close] in the 'List-SIM' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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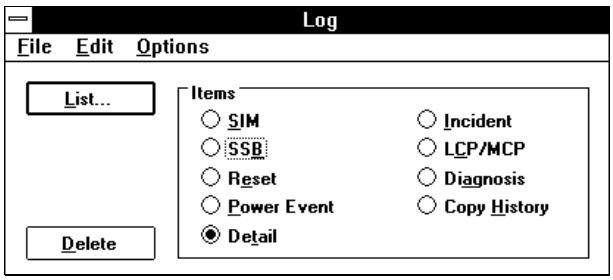
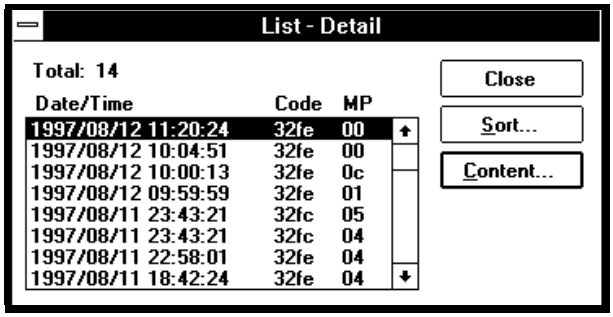
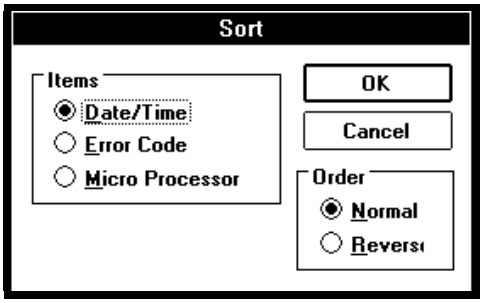
[3] Detail Log

(1) Select (CL) [Detail] in the 'Log' dialog box.
Select (CL) [List...].

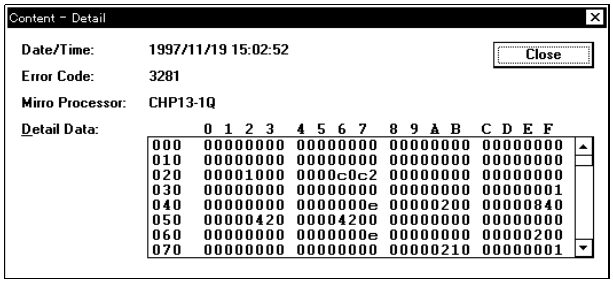


(2) Select (CL) data to be indicated in the 'List-Detail' dialog box and select (CL) [Content...].
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) The 'Content - Detail' dialog box is displayed.



(4) Select (CL) [Close] in the 'Content - Detail' dialog box.
Select (CL) [Close] in the 'List-Detail' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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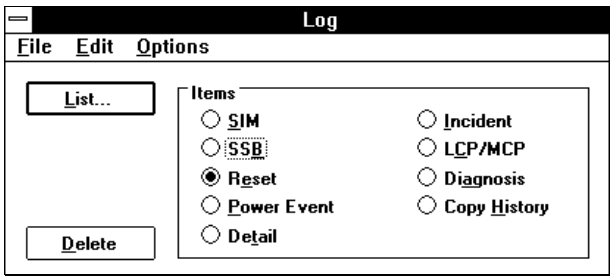
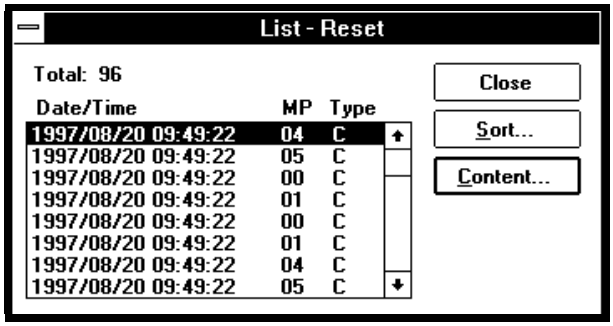
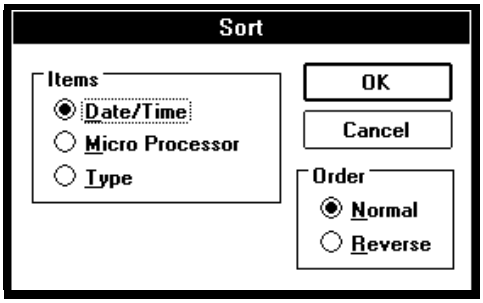
[4] Reset Log

(1) Select (CL) [Reset] in the 'Log' dialog box.
Select (CL) [List...].

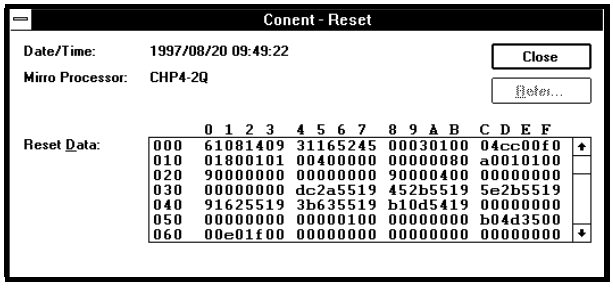


(2) Select (CL) data to be indicated in the 'List-Reset' dialog box and select (CL) [Content...].
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Reset Log Sort' dialog box, and select (CL) [OK].





(3) The 'Content-Reset' dialog box is displayed.



(4) Select (CL) [Close] in the 'Content-Reset' dialog box.
Select (CL) [Close] in the 'List-Reset' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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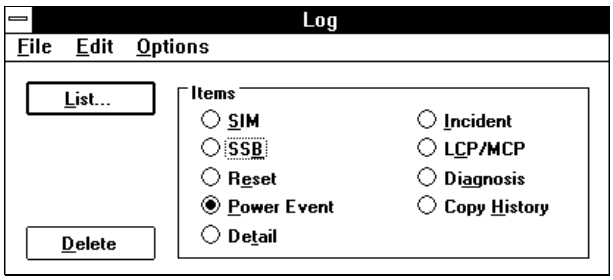
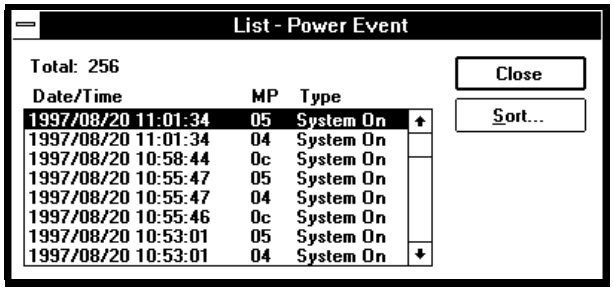
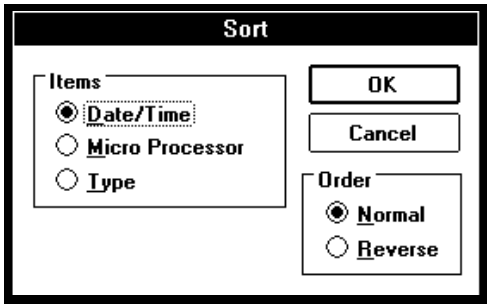
[5] Power Event Log

(1) Select (CL) [Power Event] in the 'Log' dialog box.
Select (CL) [List...].



(2) The 'List-Power Event' dialog box is displayed.
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) Select (CL) [Close] in the 'List-Power Event' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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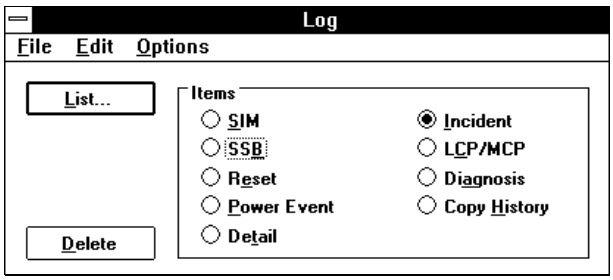
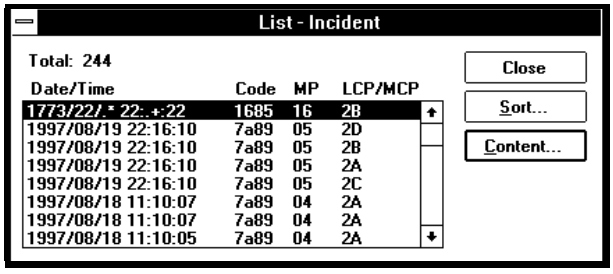
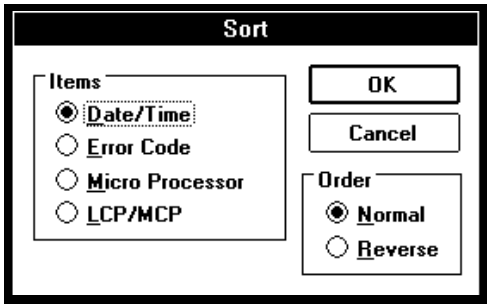
[6] Incident Log

(1) Select (CL) [Incident] in the 'Log' dialog box.
Select (CL) [List...].

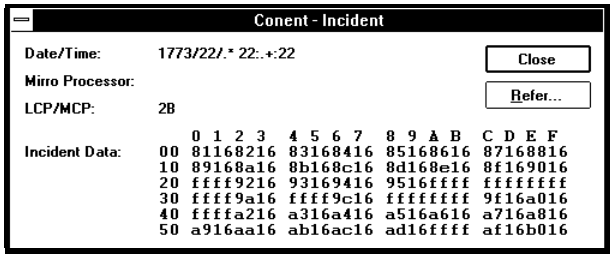


(2) Select (CL) data to be indicated in the 'List-Incident' dialog box and select (CL) [Content...].
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) The 'Content-Incident' dialog box is displayed.



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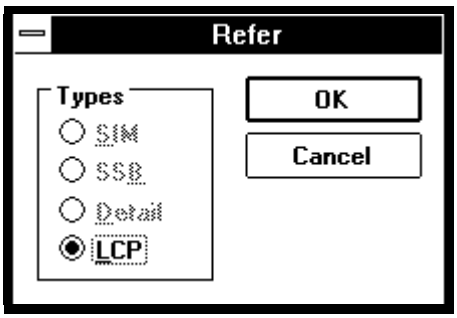
(4) To display the relative log, select (CL) [Refer...] in the 'Content-Incident' dialog box.
Select (CL) the log type to be displayed in the 'Refer' dialog box and then select (CL) [OK].



(5) Select (CL) [Close] in the 'Content-Incident' dialog box.
Select (CL) [Close] in the 'List-Incident' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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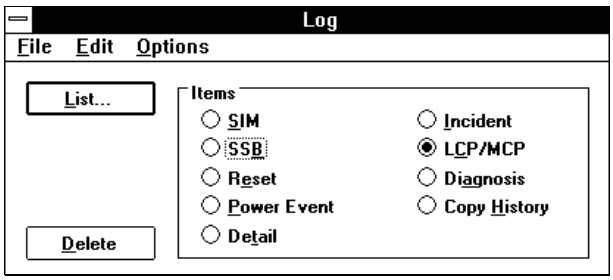
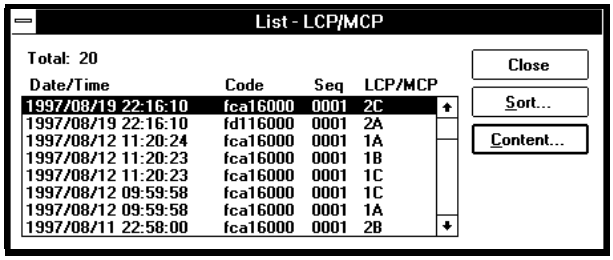
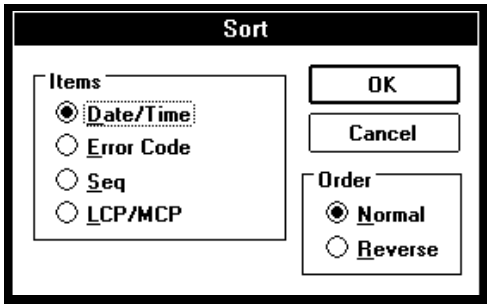
[7] LCP/MCP Log

(1) Select (CL) [LCP/MCP] in the 'Log' dialog box.
Select (CL) [List...].

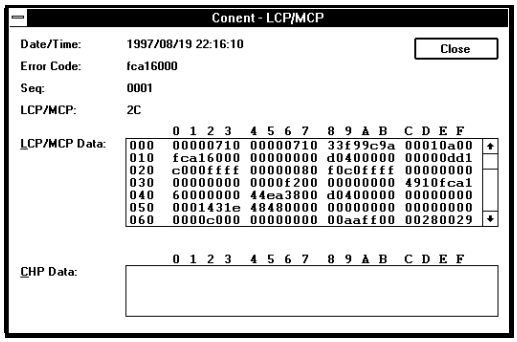


(2) Select (CL) data to be indicated in the 'List-LCP/MCP' dialog box and select (CL) [Content...].
Note:To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) The 'Content-LCP/MCP' dialog box is displayed.



(4) Select (CL) [Close] in the 'Content-LCP/MCP' dialog box.
Select (CL) [Close] in the 'List-LCP/MCP' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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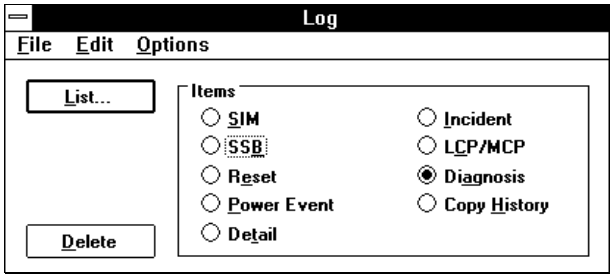
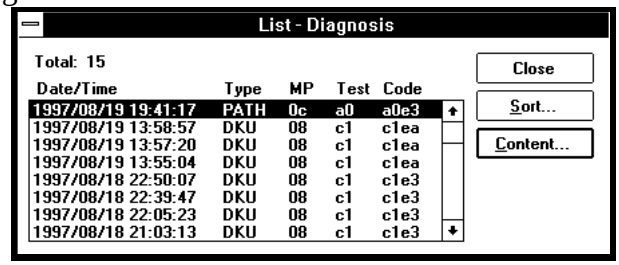
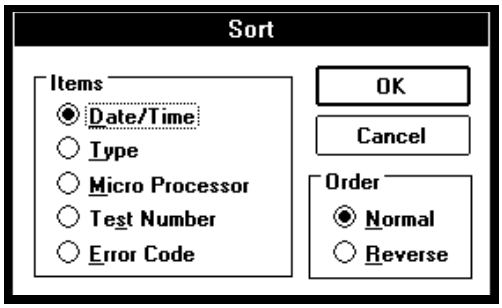
[8] Diagnosis Log

(1) Select (CL) [Diagnosis] in the 'Log' dialog box.
Select (CL) [List...].

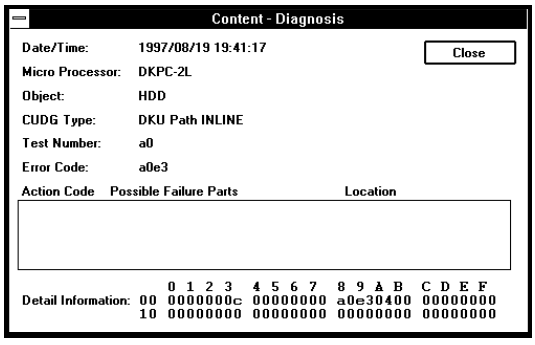


(2) Select (CL) data to be indicated in the 'List-Diagnosis' dialog box and select (CL) [Content...].
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) The 'Content-Diagnosis' dialog box is displayed.



(4) Select (CL) [Close] in the 'Content-Diagnosis' dialog box.
Select (CL) [Close] in the 'List-Diagnosis' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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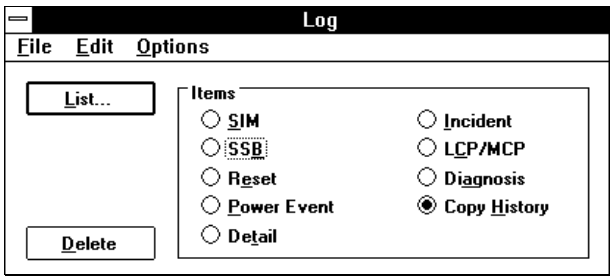
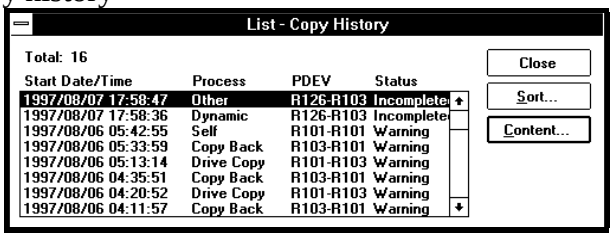
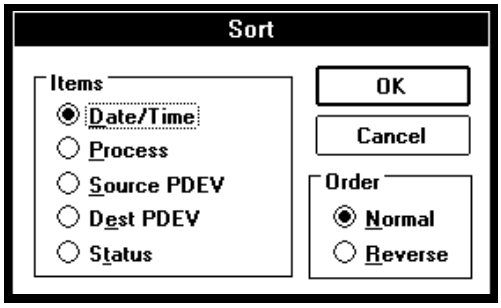
[9] Copy History Log

(1) Select (CL) [Copy history] in the 'Log' dialog box.
Select (CL) [List...].

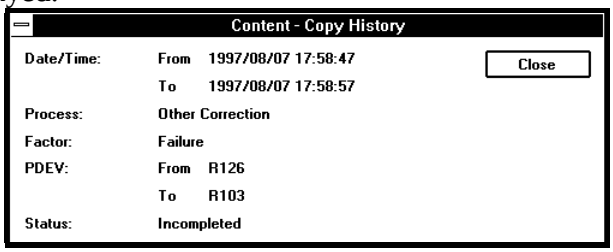


(2) Select (CL) data to be indicated in the 'List-Copy history' dialog box and select (CL) [Content...].
Note: To sort and list items, select (CL) [Sort] first.
Then select (CL) the desired item in the [Items] and [Order] options in the 'Sort' dialog box, and select (CL) [OK].





(3) The 'Content-Copy History' dialog box is displayed.



(4) Select (CL) [Close] in the 'Content-Copy History' dialog box.
Select (CL) [Close] in the 'List- Copy History' dialog box.
Close the 'Log' dialog box and close the 'Information' window.

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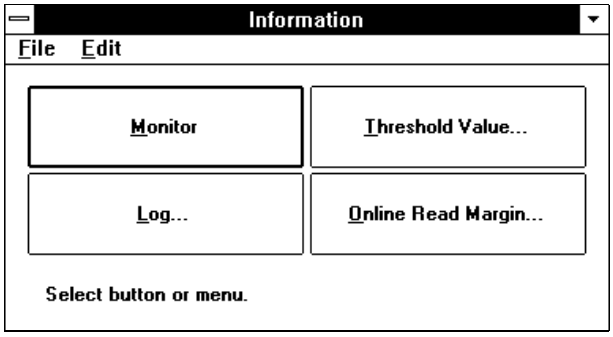
2.3 Log delete

[1] SSB Log
[2] SIM Log
[3] Detail Log
[4] Reset Log
[5] Power Event Log
[6] Incident Log
[7] LCP/MCP Log
[8] Diagnosis Log
[9] Copy History Log

(1) Select (CL) the [Information] in the 'SVP' window.

(2) Select (CL) [Log] in the 'Information' dialog box.



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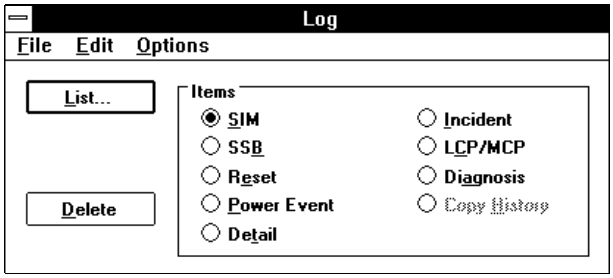
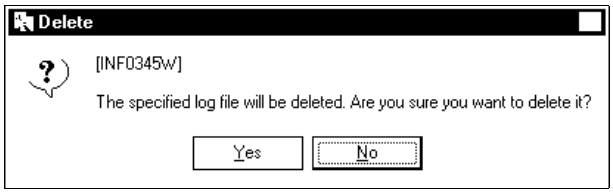
(3) In the Log dialog box, select (CL) an item to be deleted.
Select (CL) [Delete].



(4) Select (CL) [Yes] in the 'Delete' dialog box.



(5) Close the 'Log' dialog box and close the 'Information' window.

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[10] MP# - Location correspondence table

Location				MP#
CHA	Cluster1	CHA-1P	CHP00-1P	00
			CHP01-1P	01
			CHP10-1P	02
			CHP11-1P	03
		CHA-1Q	CHP02-1Q	04
			CHP03-1Q	05
			CHP12-1Q	06
			CHP13-1Q	07
		CHA-1R	CHP04-1R	08
			CHP05-1R	09
			CHP14-1R	0a
			CHP15-1R	0b
		CHA-1S	CHP06-1S	0c
			CHP07-1S	0d
			CHP16-1S	0e
			CHP17-1S	0f
	Cluster2	CHA-2V	CHP20-2V	10
			CHP21-2V	11
			CHP30-2V	12
			CHP31-2V	13
		CHA-2W	CHP22-2W	14
			CHP23-2W	15
			CHP32-2W	16
			CHP33-2W	17
		CHA-2X	CHP24-2X	18
			CHP25-2X	19
			CHP34-2X	1a
			CHP35-2X	1b
		CHA-2Y	CHP26-2Y	1c
			CHP27-2Y	1d
			CHP36-2Y	1e
			CHP37-2Y	1f
DKA	Cluster1	DKA-1B	DKP08-1B	20
			DKP18-1B	21
		DKA-1C	DKP09-1C	22
			DKP19-1C	23
		DKA-1D	DKP0A-1D	24
			DKP1A-1D	25
		DKA-2E	DKP0B-2E	26
			DKP1B-2E	27
	Cluster2	DKA-2H	DKP28-2H	28
			DKP38-2H	29
		DKA-2J	DKP29-2J	2a
			DKP39-2J	2b
		DKA-2K	DKP2A-2K	2c
			DKP3A-2K	2d
		DKA-2L	DKP2B-2L	2e
			DKP3B-2L	2f

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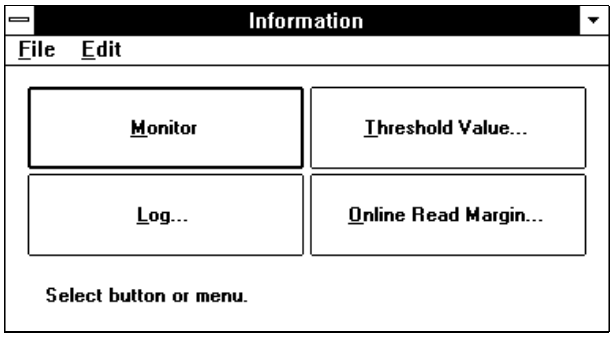
2.4 Monitoring

[1] Displaying a graph for items ---------- SVP02-180
[2] Displaying the operation ratio of the processor ---------- SVP02-200
[3] Displaying the use ratio of the cache and the write pending data ratio in a tabular form
---------- SVP02-220
[4] Displaying the read hit ratio in a tabular form ---------- SVP02-230
[5] Displaying the use ratio of the BUS in a tabular form ---------- SVP02-240

(1) Select (CL) the [Information] in the 'SVP' window.

(2) Select (CL) [Monitor] in the 'Information' window



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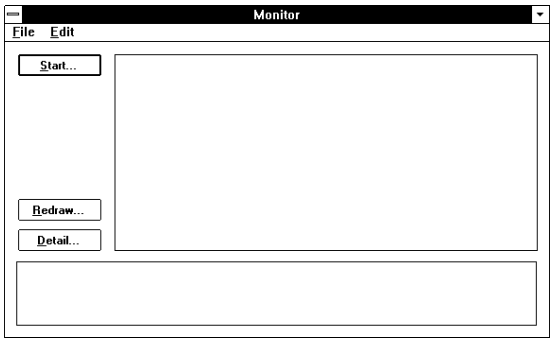
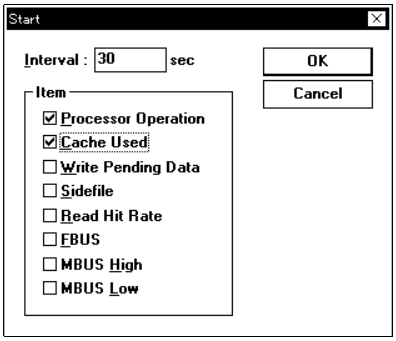
[1] Displaying a graph for items

(1) Select (CL) [Start...].

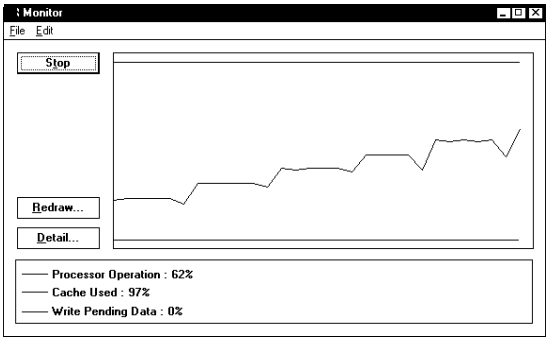


(2) Select (CL) [Interval] , [File Output] , and [Item] in the 'Monitoring' dialog box and select (CL) [OK].
Note 1 : "Interval" indicates a time interval from 5 to3600 at which samples are taken.
Note 2 : Up to three items can be selected in the "Item" list box. The selectable values are:

Processor Operation	: Operation ratio of the processor
Write Pending Data	: Write pending data ratio
Cache Used	: Use ratio of the cache
Read Hit Rate	: Read hit ratio of the subsystem
Sidefile	: Sidefile ratio of the subsystem
FBUS	: Use ratio of the FBUS
MBUS High	: Use ratio of the MBUS (High)
MBUS Low	: Use ratio of the MBUS (Low)



(3) After a few minutes, a graph is displayed for the item selected in step (2).



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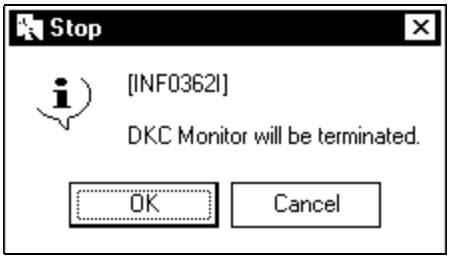
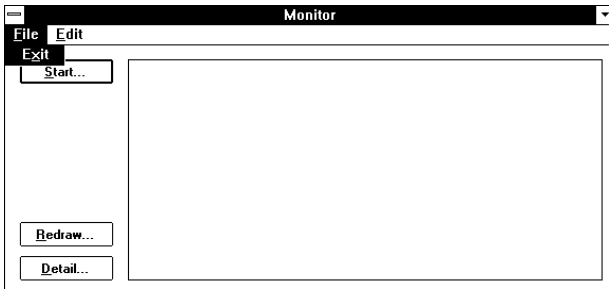
(4) When [Stop] is selected (CL) during the display of the graph, displaying is interrupted.
If [OK] is selected (CL) in the 'Stop' dialog box, displaying is stopped.



(5) Select (CL) the [File] menu in the 'Monitor' and select (DR) [Exit].



(6) Close the 'Monitor' dialog box and close the 'Information' window.

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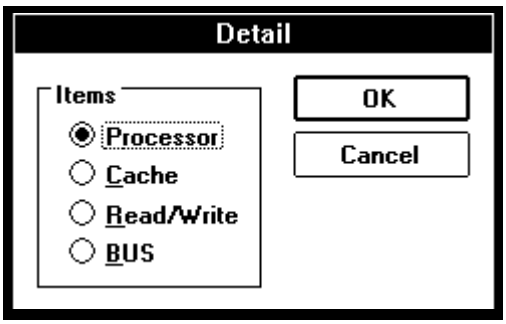
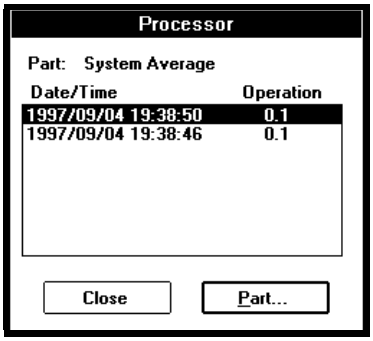
[2] Displaying the operation ratio of the processor

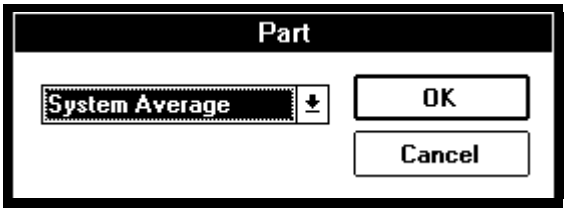
(1) Display a graph (see steps listed above).
Select (CL) [Processor Operation] in the “Item” list box.
Select (CL) [Detail...] and select (CL) [Processor].



(2) Select (CL) [Part...] in the ‘Processor’ dialog box.



(3) Select (DR) the contents of “Parts” in the ‘Part’ dialog box and select (CL) [OK].
Note: In the Parts list box, the following values are selectable.



System Average : Average in the system
CHP[CHA] Average : Average for the CHP
DKP[DKA] Average : Average for the DKP
CHP00-1P : Average for a particular processor

-
-
-

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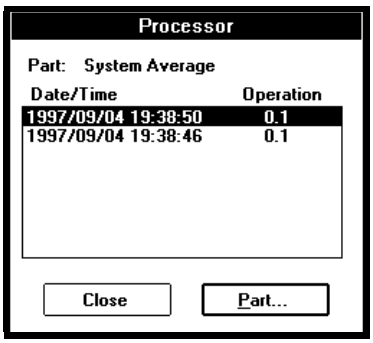
(4) Select (CL) [Close] in the ‘Processor’ dialog box.



(5) Close the ‘Monitor’ dialog box and close the ‘Information’ window.

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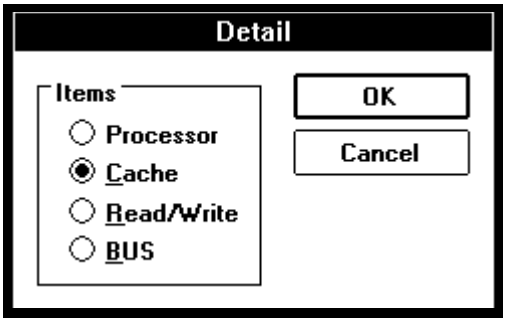
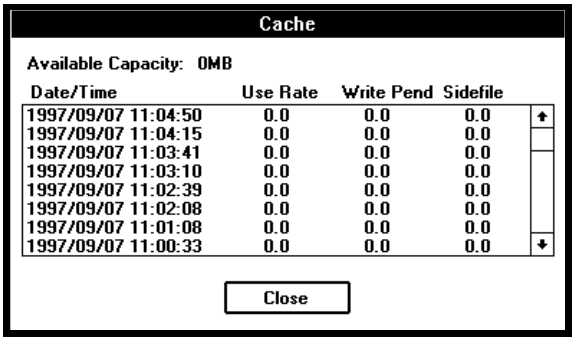
[3] Displaying the use ratio of the cache and the write pending data ratio in a tabular form.

(1) Display a graph (see section [1] (SVP02-180) above).
Select (CL) [Write Pending Data], [Cache Used] or [Sidefile] in the “Item” list box.
Select (CL) [Detail...] in the ‘Monitor’. Select (CL) [Cache] in the ‘Detail’ and select (CL) [OK].



(2) Select (CL) [Close] in the ‘Cache’ dialog box.



(3) Close the ‘Monitor’ dialog box and close the ‘Information’ window.

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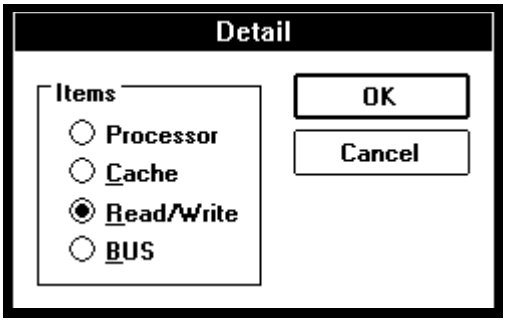
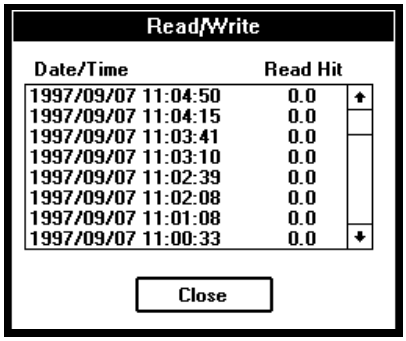
[4] Displaying the read hit ratio in a tabular form

(1) Display a graph by executing steps (1) to (5) in "[1] Displaying a graph for items" in advance.
In step (2), select (CL) [Read Hit Rate] in the "Item" list box.
Select (CL) [Detail...] in the 'Monitor'. Select (CL) [Read/Write] in the 'Detail' and select (CL) [OK].



(2) Select (CL) [Close] in the 'Read/Write' dialog box.



(3) Close the 'Monitor' window and close the 'Information' window.

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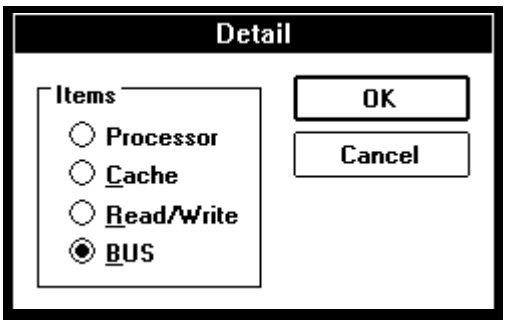
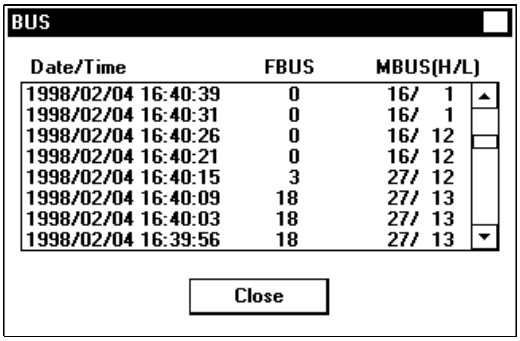
[5] Displaying the use ratio of the BUS in a tabular form

(1) Display a graph by executing steps (1) to (5) in "[1] Displaying a graph for items" in advance. Select (CL) [Detail...] in the 'Monitor'. Select (CL) [BUS] in the 'Detail' and select (CL) [OK].



(2) Select (CL) [OK] in the 'BUS' dialog box.



(3) Close the 'Monitor' window and close the 'Information' window.

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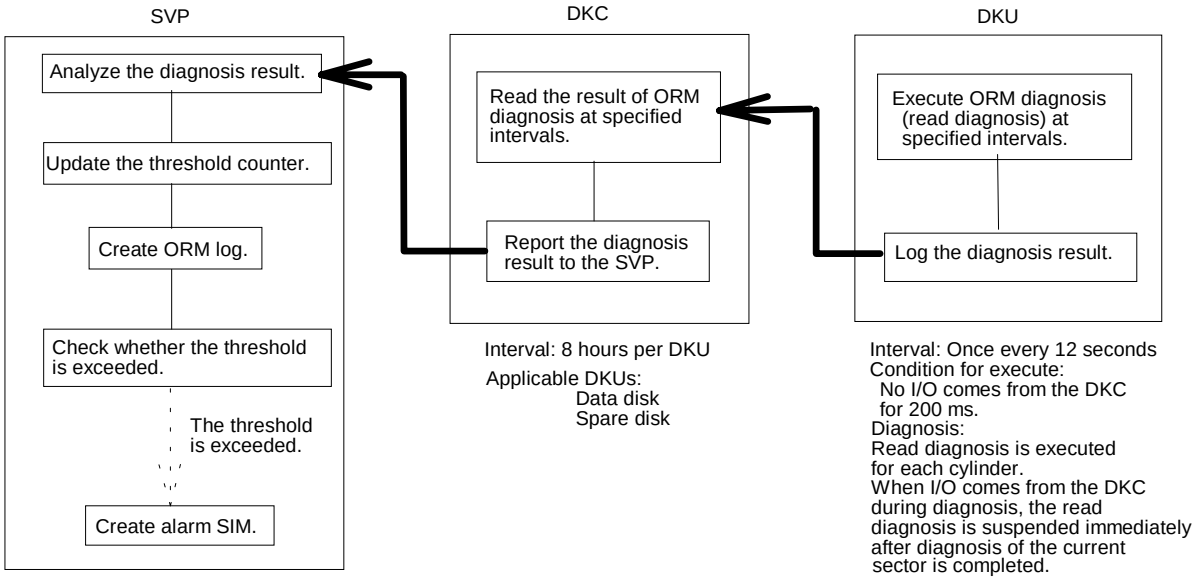
2.6 Online read margin (ORM)

[Overview]
The on-line read margin test (ORM) function is a read diagnostic function provided for preventive maintenance of disk drives. The diagnostic is automatically executed in each SCSI drive. The DKC reads the diagnostic result at specified intervals and reports it to the SVP.
The SVP calculates the error ratio to the threshold value which is set in advance, and indicates it in the OVER RATE Display (see [1], (2)). When the Rate in the display exceeds 100%, it means the error count is exceeding the threshold, the SVP creates the warning SIM. It is, however, not reported to the Host. The disk drive reporting the SIM should be exchanged with higher priority than other normal drives.



The SVP classifies the errors into six types in the Over Rate Counter Display. They are Unrecovered Read Error, Recovered Read Error, Unrecovered Seek error, Recovered Seek Error, Not Ready and Other Errors. Each has three types of counters indicated as Today, 7 days and Total. Refer to [1], (4) for the Over Rate Counter Display. In the OVER RATE Display, the error ratio which has the largest number among those classified types is displayed for each drive to represent each error.

The warning SIMs to be reported in the ORM are shown below.

ORM SIM and Reference Code

No	Error Type	Reference Code	Meaning
1	Unrecovered Read Error	5020	Drive Media Error
2	Recovered Read Error		
3	Unrecovered Seek Error	5010	Drive Unit Error
4	Recovered Seek Error		
5	Not Ready		
6	Other Errors		

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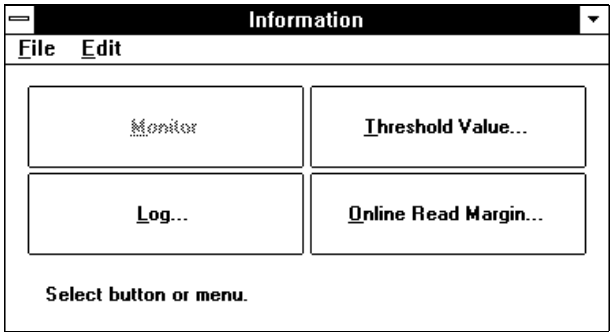
[1] Displaying an error count, thresholds, and log ---------- SVP02-270
[2] Resetting an error count ---------- SVP02-300
[3] Displaying thresholds ---------- SVP02-320
[4] Altering a threshold ---------- SVP02-330
[5] Displaying the ORM running status ---------- SVP02-350
[6] Resetting thresholds ---------- SVP02-360

(1) Check SVP Mode.
Following operation needs SVP Mode is 'Modify'. (See SVP 01-70)
[2] Resetting an error count
[4] Altering a threshold
[6] Resetting thresholds

(2) Select (CL) the [Information] in the 'SVP' window.

(3) Select (CL) [Online Read Margin...] in the 'Information' window.



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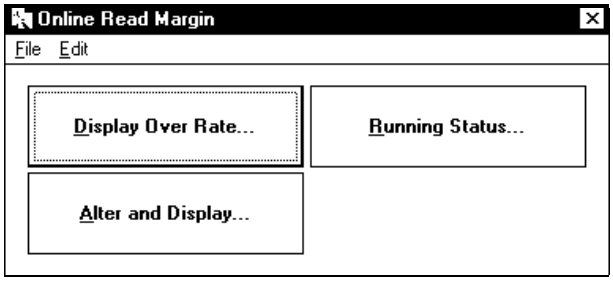
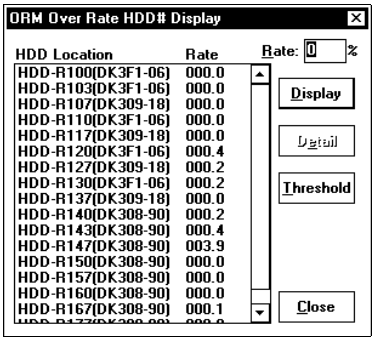
[1] Displaying an error count, thresholds, and log

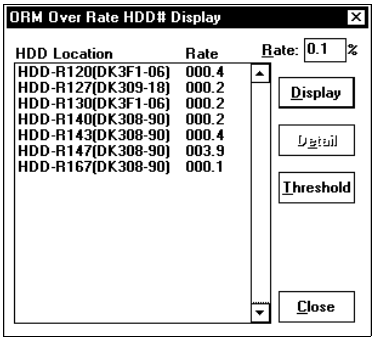
(1) Select (CL) [Display Over Rate...] in the 'Online Read margin' window.



(2) Enter a number from 0 to 100 at "Rate" in the 'ORM Over Rate HDD# Display' dialog box. Select (CL) [Display]. Then only the HDDs which have the rate of equal to or greater than the input number at "Rate" will appear in the display.
Rate : ratio of the number of errors for the threshold value.



(3) When more detail information is needed for the particular drive, select (CL) the HDD from the "HDD Location" list box. Select (CL) [Detail].



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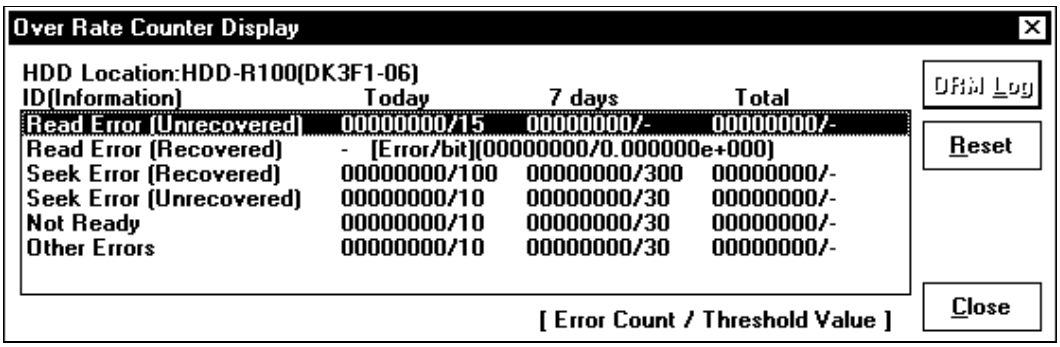
(4) In the 'Over Rate Counter Display' dialog box, select (CL) the error for which detailed log is to be displayed from the "ID" list box. Select (CL) [ORM LOG].



The errors detected in the ORM are classified into six types of error category. Each error has the following definition.

a) Read Error [Unrecovered]
A disk media error was detected. After ten times retries, the error was judged that it might become a serious media error which could not be recovered with ECC or retries.

b) Read Error [Recovered]
A disk media error was detected. After ten times retries, the error was judged that it was an intermittent read error and recoverable, and included in the error rate management for the preventive maintenance.

c) Seek Error [Recovered]
A seek error was detected. After ten times retries, the error was judged to be recoverable.

d) Seek Error [Unrecovered]
A seek error was detected. After ten times retries, the error was judged to be unrecoverable.

e) Not Ready
Not Ready status of the drive was detected.

f) Other Errors
Any error which does not belong to the above classification was detected.

They are also managed with different time periods. "Today" is for one day count and cleared at AM 0:00 every day. "7 days" is for the cumulative value in the latest 7 days. "Total" shows the total cumulative count.

In this Over Rate Counter Display, each error category indicates the Error Count and the Threshold value except for the Read Error [Recovered]. The "-" for the Threshold value means no threshold is set.

Only the Read Error [Recovered] has an error rate expression. It is not managed with error count per day, per 7 days or Total. The error rate of the Read Error [Recovered] is calculated in the following formula:

Error rate = Number of error sectors/Number of ORM scan bits

Note 1) Only the result from approximately the latest one volume scan in ORM is used for the calculation.

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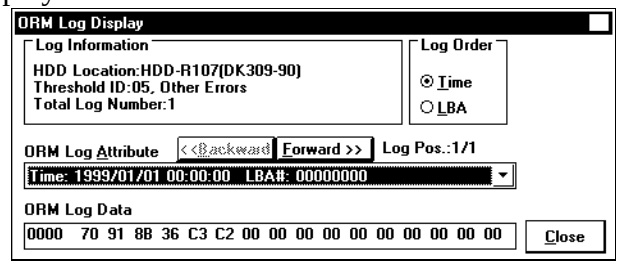
In the example display, “4.13e-011” means the error rate is “3.18×10^{-10}”. This is corresponding to the raw error count and scan bits shown as “00000001/2.422270e+010”, where the error count is one sector and the scan bits is 2.422270×10^{10}.

(5) The nature of the error selected in step (4) is displayed.
(In this example, the nature of “Other Errors” is displayed.)



Byte	Bit	Name	Explanation
0 - 3		UCT	Time when the diagnostic result was reported from the DKC to the SVP
4	7	Log Valid	When this bit is 1, it indicates that this log is valid.
	6	Address Valid	When this bit is 1, it indicates that the address information in bytes 8 to F is valid
	5 - 4	(Reserved)	Reserved
	3 - 0	Sense Key	Error sense key in the SCSI drive report. (*1)
5		Additional Sense Code	Additional sense code in the SCSI drive report .(*1)
6		Sense Code Qualifier	Additional sense code qualifier in the SCSI drive report. (*1)
7		Seek Error Count	Number of seek errors within 10 seek error retries.
8 - 9		CC	Address of the cylinder where the error occurred.
A		H	Address of the head where the error occurred.
B		S	Address of the sector where the error occurred.
C - F		LBA	LBA where the error occurred.

*1 Definition and contents of the error codes are same as those of the SSB for ordinary DKU errors.

(6) Select (CL) [Close] in the ‘ORM Log Display’ dialog box.

(7) Select (CL) [Close] in the ‘Over Rate Counter Display’ dialog box.

(8) Select (CL) [Close] in the ‘ORM Over Rate HDD# Display’ dialog box.

(9) Close the ‘Information’ window.

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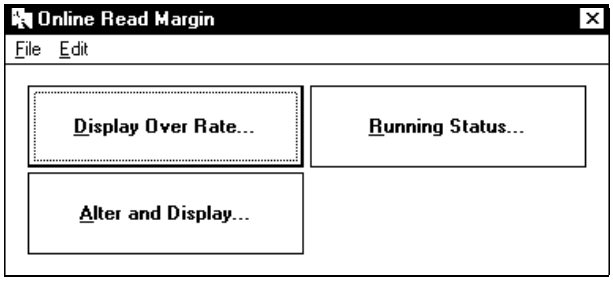
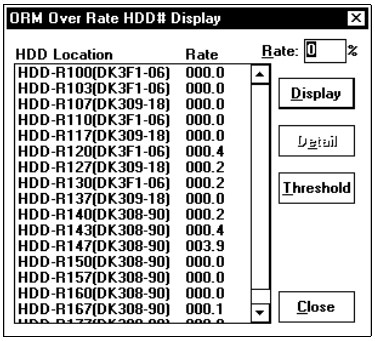
[2] Resetting an error count

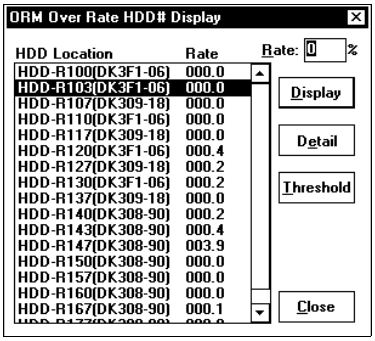
(1) Select (CL) [Display Over Rate...] in the 'Online Read Margin' window.



(2) Enter a number from 0 to 100 at 'Rate' in the 'ORM Over Rate HDD# Display' dialog box. Select (CL) [Display]. Then only the HDDs which have the rate of equal to or greater than the input number at "Rate" will appear in the display.
Rate : ratio of the number of errors for the threshold value.



(3) In the 'ORM Over Rate HDD# Display' dialog box, select (CL) the HDD for which an error count and thresholds are to be reset from the "HDD Location" list box. Select (CL) [Detail].



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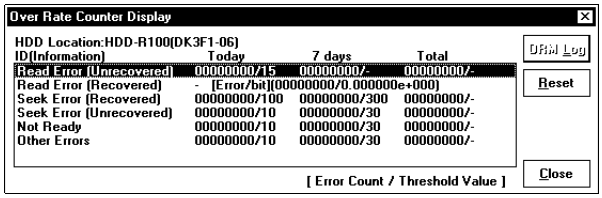
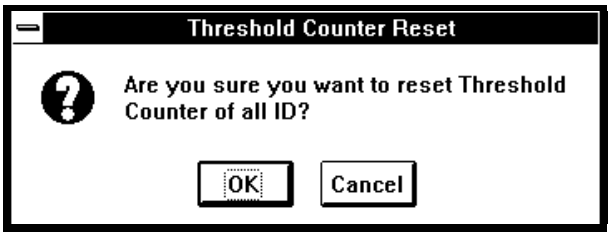
(4) In the ‘Over Rate Counter Display’ dialog box, select (CL) [Reset].



(5) Select (CL) [OK] in the ‘Threshold Counter Reset’ dialog box.



(6) Select (CL) [Close] in the ‘Over Rate Counter Display’ dialog box.

(7) Select (CL) [Close] in the ‘ORM Over Rate HDD# Display’ dialog box.

(8) Close the ‘Information’ window.

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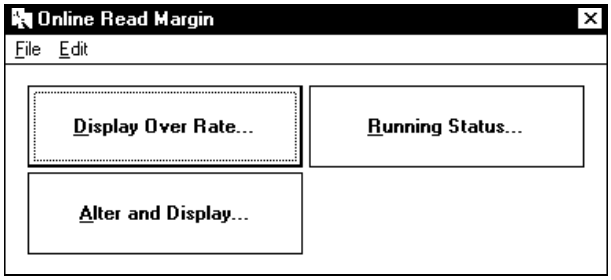
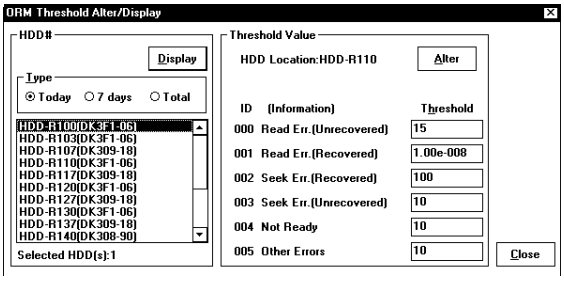
[3] Displaying thresholds

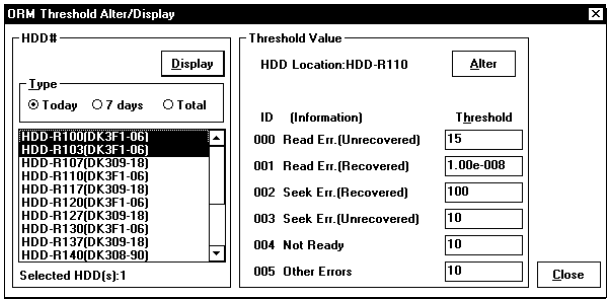
(1) Select (CL) [Alter and Display] in the 'Online Read Margin' window.



(2) In the 'ORM Threshold Alter/Display' dialog box, select (CL) an HDD from the "HDD#" list box and select (CL) [Display]. In order to display threshold of another interval, select (CL) the interval from the "Type" list box.

Note: Multiple HDDs can be selected (CL) from the "HDD#" list box while the control key is being held down. In this case, each "Threshold" field in the "Threshold Value" list box shows the threshold for the HDD that is highlighted in the "HDD#" list box.





(3) Select (CL) [Close] in the 'ORM Threshold Alter/Display' dialog box and close the 'Information' window.

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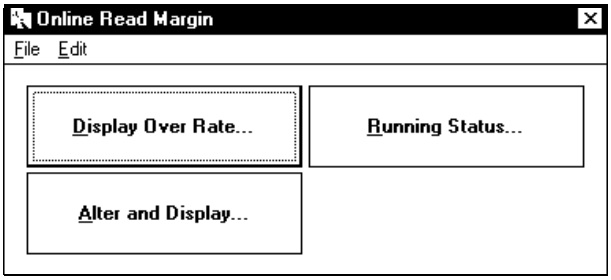
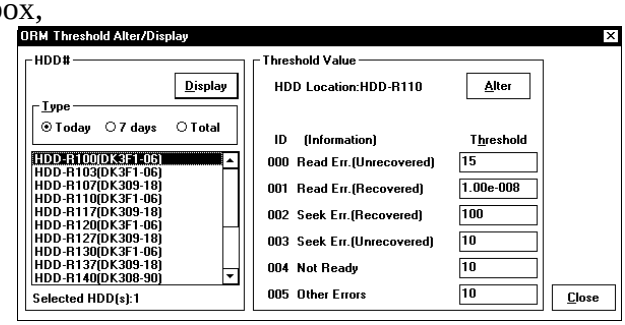
[4] Altering a threshold

(1) Select (CL) [Alter and Display...] in the 'Online Read Margin' window.

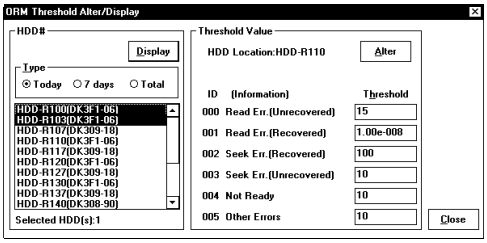


(2) In the 'ORM Threshold Alter/Display' dialog box, select (CL) an HDD from the "HDD#" list box and select (CL) [Display]. In order to display threshold of another interval, select (CL) the interval from the "Type" list box.



(3) In the 'ORM Threshold Alter/Display' dialog box, alter the threshold in the "Threshold" field in the "Threshold Value" list box. Then select (CL) [Alter].

Note: When multiple HDDs are selected in the "HDD#" list box, the thresholds of all HDDs are altered to the same value.



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(4) Select (CL) [OK] in the 'Alter Threshold Value' dialog box.

(5) Select (CL) [Close] in the 'ORM Threshold Alter/Display' dialog box and close the 'Information' window.

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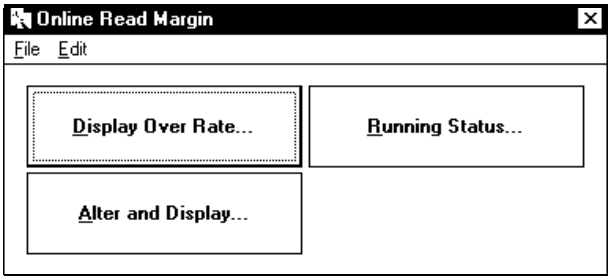
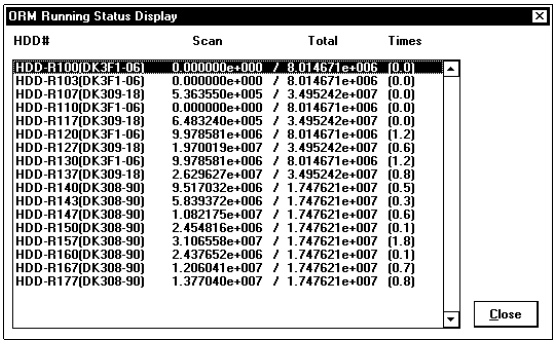
[5] Displaying the ORM running status

(1) Select (CL) [Running Status...].



(2) In the 'ORM Running Status Display' dialog box, the ORM running status is displayed as the number of sectors.
Note: The "HDD#" list box shows the location numbers of HDDs. "Scan" shows the number of scanned sectors.
"Total" shows the total number of sectors in the drive. "Times" shows the number of times the entire drive was scanned.



(3) Select (CL) [Close] in the 'ORM Running Status Display' dialog box and close the 'Information' window.

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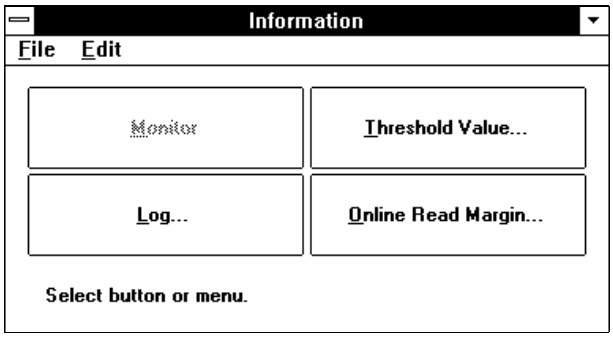
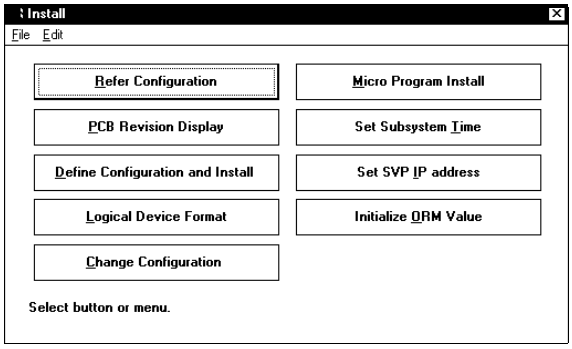
[6] Resetting thresholds

(1) Select (CL) [File]-[Exit] in the 'Information' window.

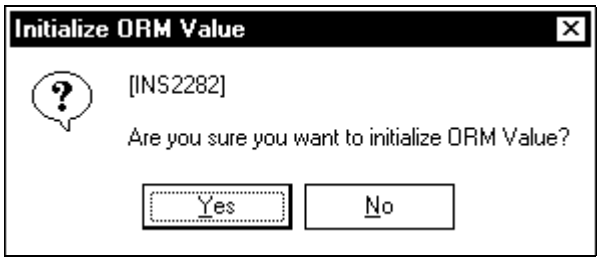


(2) Select (CL) [Install] in the 'SVP'.

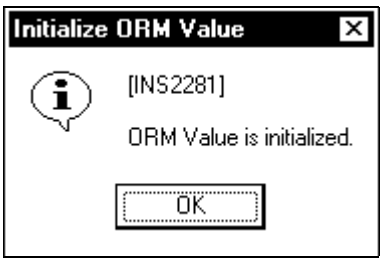
(3) Select (CL) [Initialize ORM Value] in the 'Install' window.



(4) Select (CL) [Yes] in the 'Initialize ORM Value' dialog box.



(5) Select (CL) [OK] in the 'Initialize ORM Value' dialog box.



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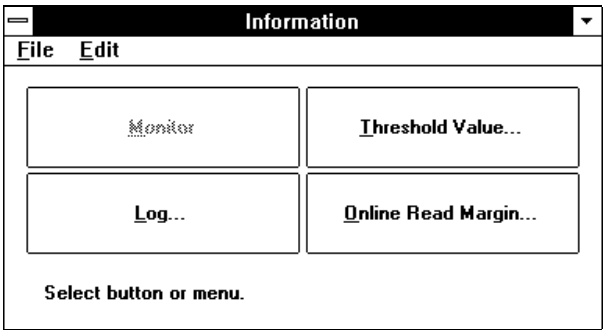
2.7 SIM Reporting Specification

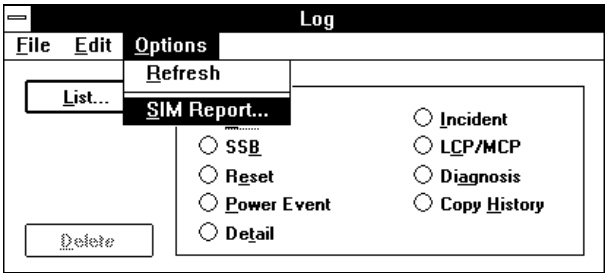
[1] DKC SIM
[2] Cache SIM
[3] Media SIM
[4] Device SIM

(1) Select (CL) [Information].

(2) Select (CL) [Log...] in the 'Information'.



(3) Select (DR) [SIM Report...] from the [Options] menu in the 'Log' dialog box.



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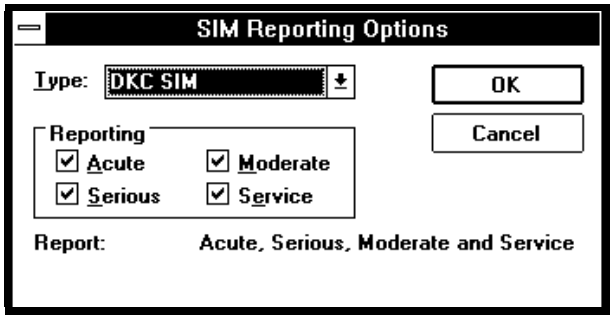
(4) Select (CL) SIM report type from the 'Type' list box.

Type : DKC SIM
Cache SIM
Media SIM
Device SIM



Select (CL) the level to be reported in the 'SIM Reporting Option' dialog box, and also select (CL) [OK].

SIM message report level are arranged as follows in order of the higher level.
Acute > Serious > Moderate > Service
Selecting of a level means all higher levels are to be reported.

(5) Close the 'Log' dialog box and also close the 'Information' window.

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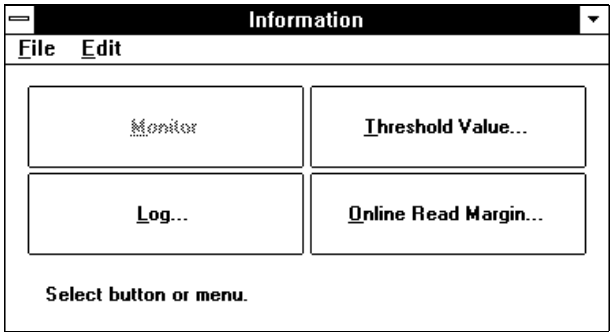
2.8 Management of drive threshold values

[1] Displaying threshold values ---------- SVP02-400
[2] Altering threshold value ---------- SVP02-410
[3] Displaying an error count ---------- SVP02-430
[4] Resetting an error count ---------- SVP02-440

(1) Check SVP Mode.
Following operation needs SVP Mode is 'Modify'. (See SVP01-70)
[2] Altering threshold value
[4] Resetting an error count

(2) Select (CL) the [Information] in the 'SVP' window.

(3) Select (CL) [Threshold Value...] in the 'Information'.



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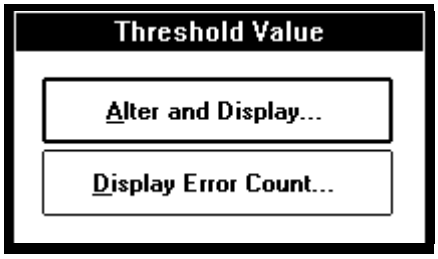
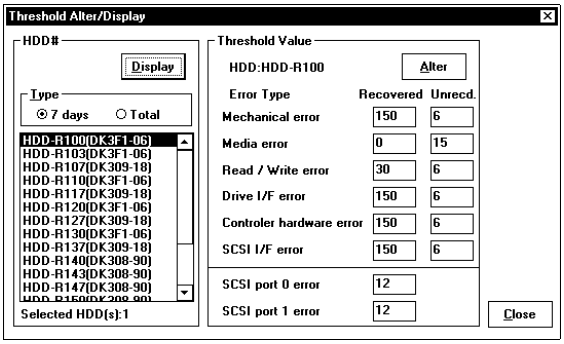
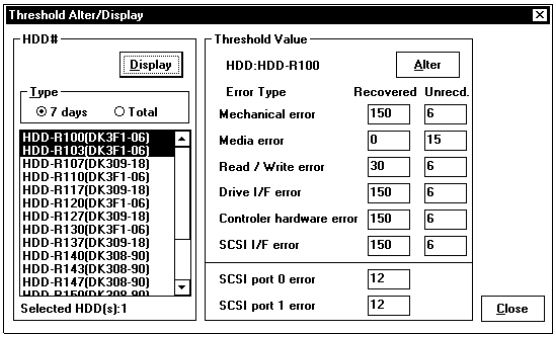
[1] Displaying threshold values

(1) Select (CL) [Alter and Display...] in the 'Threshold Value'



(2) Select (CL) an HDD location from the "HDD#" list box in the 'Threshold Alter/Display' dialog box and select (CL) [Display].
In order to display threshold of another interval, select (CL) the interval from the "Type" list box.
Note: Multiple HDD locations can be selected (CL) from the "HDD#" list box while the control key being held down. The threshold value in the "Threshold Value" list box shows the threshold value for the HDD location that is highlighted in the "HDD#" list box.
Recovered: Threshold of errors recoverable by retry.
Unrecd: Threshold of errors not recoverable by retry.





(3) Select (CL) [Close] in the 'Threshold Alter/Display' dialog box and close the 'Information' window.

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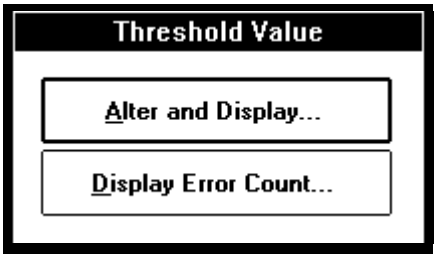
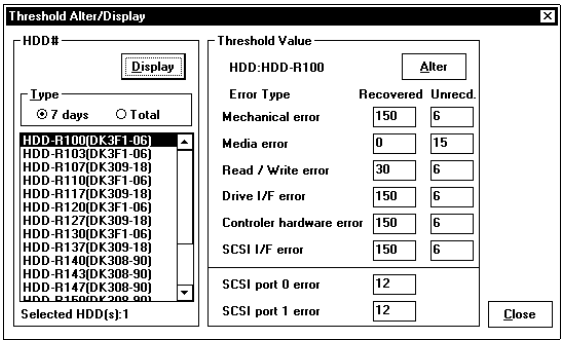
[2] Altering threshold value

(1) Select (CL) [Alter and Display...] in the 'Threshold Value'.

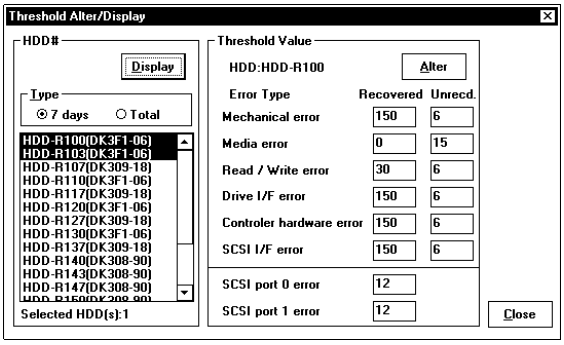


(2) Select (CL) an HDD location from the "HDD#" list box in the 'Threshold Alter/Display' dialog box and select (CL) [Display]. In order to display threshold of another interval, select (CL) the interval from the "Type" list box.



(3) Alter a threshold value in the "Threshold Value" list box in the 'Threshold Alter/Display' dialog box. Then select (CL) [Alter].

Note: When multiple HDD location are selected (CL) from the "HDD#" list box while the control key being hold down, the thresholds for the all selected HDDs are modified to the same value.



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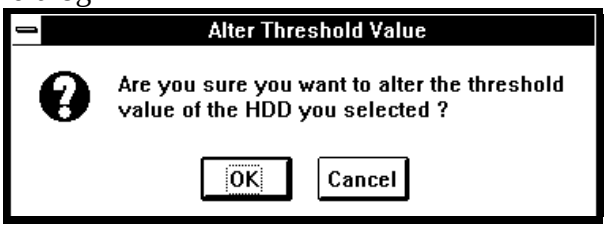
(4) Select (CL) [OK] in the 'Alter Threshold Value' dialog box.



(5) Select (CL) [Close] in the 'Threshold Alter/Display' dialog box and close the 'Information' window.

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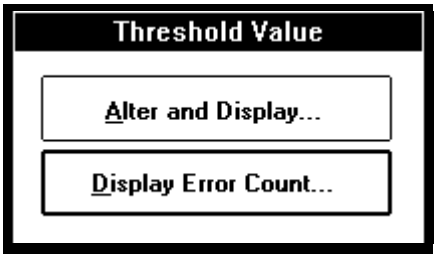
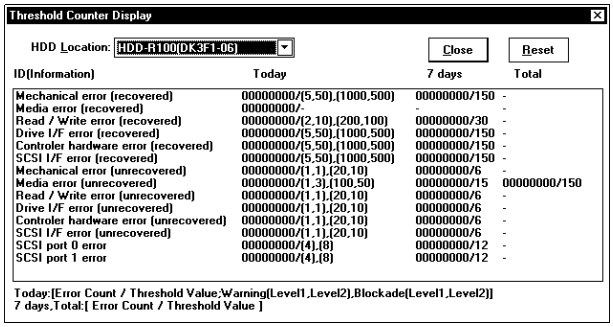
[3] Displaying an error count

(1) Select (CL) [Display Error Count...] in the 'Threshold Value'.



(2) Select (CL) an HDD location from the "HDD Location" drop-down list in the 'Threshold Counter Display' dialog box to display the error count for the HDD.



(3) Select (CL) [Close] in the 'Threshold Counter Display' dialog box and close the 'Information' window.

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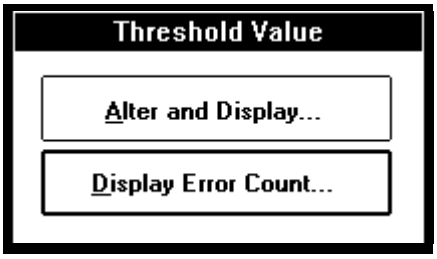
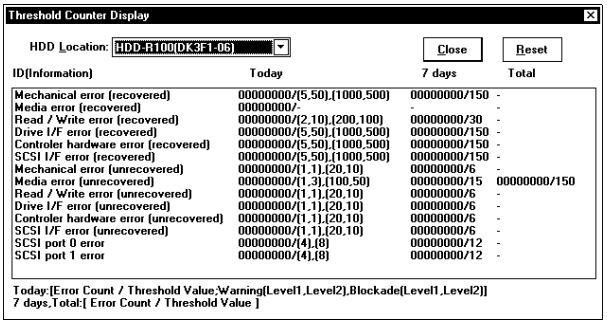
[4] Resetting an error count

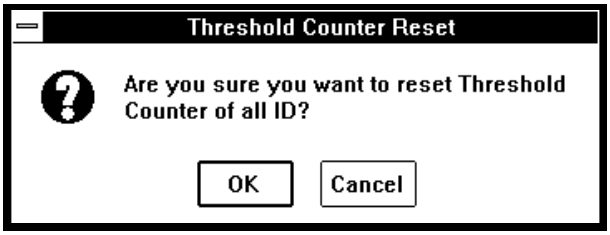
(1) Select (CL) [Display Error Count...] in the 'Threshold Value'.



(2) Select (CL) the HDD location , for which you want to reset the error count, from the "HDD Location" drop-down list in the 'Threshold Counter Display' dialog box and also select (CL) [Reset].



(3) Select (CL) [OK] in the 'Threshold Counter Reset' dialog box.



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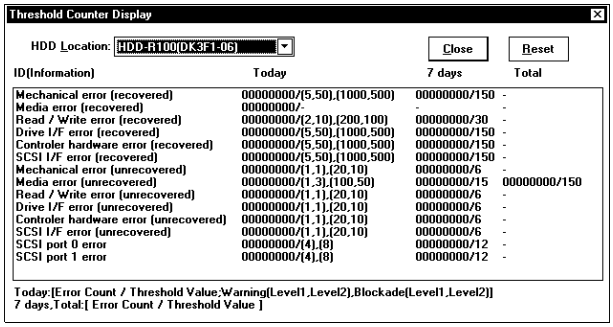
(4) After confirming that the error count has been reset in the 'Threshold Counter Display' dialog box select (CL) [Close] and close the 'Information' window.



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2.9 DUMP/LOG FD Copy

Auto DUMP is useful because you can select the dump data type and the output media.
When you use Auto Dump (refer to “2.11 Dump”), please select Type (Rapid) and Media (FD or HDD).

Note) You can use FD Copy as usual.

The first operation.
(1) Select (CL) [FD Copy].

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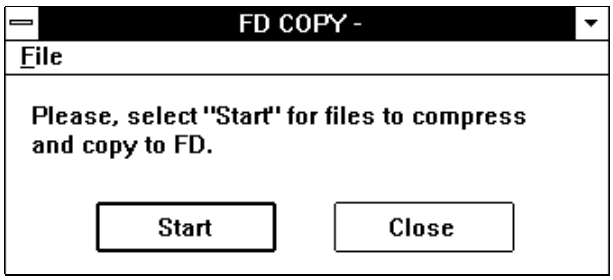
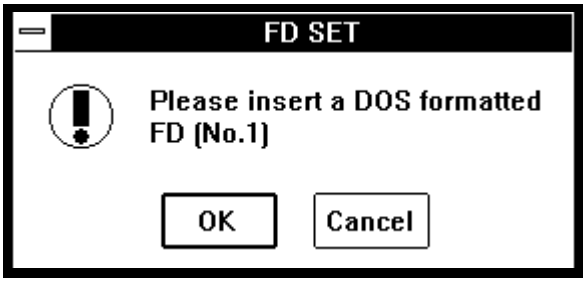
Copying the dump and log files to a floppy disk.

(1) Select (CL) [Start] in the ‘FD Copy” dialog box.



(2) The message “Please insert a DOS formatted FD (NO.1) ” will be displayed in the ‘FD SET’ dialog box.
In response to this message, insert a floppy disk and select (CL) [OK].



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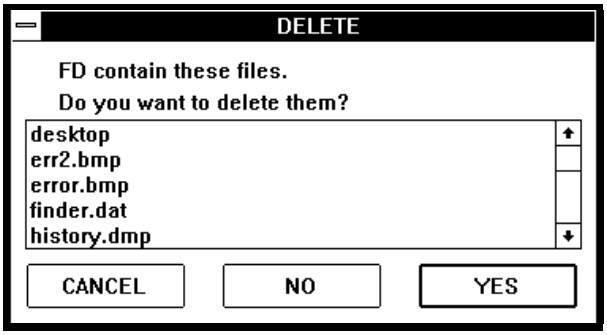
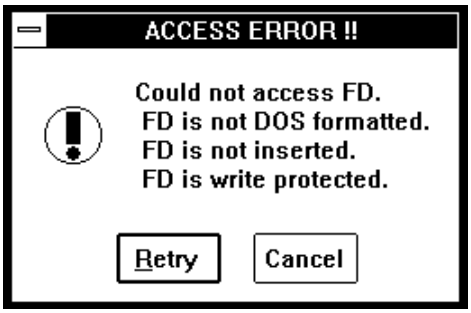
(3) If the floppy disk contains files, the message “FD contain these files. Do you want to delete them ?” is displayed.
If you want to delete these files, select (CL) [YES] and proceed to step (4).
If you don’t want to delete these files, select (CL) [NO] and proceed to step (4).
If an error occurs, check the items indicated by the ‘ACCESS ERROR!!’ dialog box then select (CL) [Retry].
(You will go to the beginning of step (4).)





(4) The message “Compressing files...” is displayed, and compressing is started.

(5) The message “Copying files to FD...” is displayed, and copying is started.
(If the capacity of the floppy disk becomes insufficient, go back to step (2) and replace the floppy disk with a new one.)

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(6) The message “Delete DUMP files in HDD.” is displayed in the ‘DUMP DELETE’ dialog box.
Select (CL) [OK] and delete DUMP files in HDD.

(7) Close the ‘Fdcopy’ dialog box.

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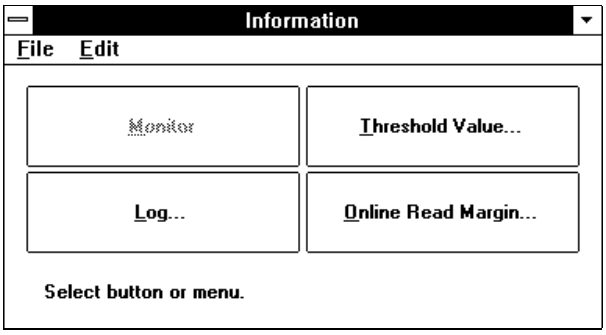
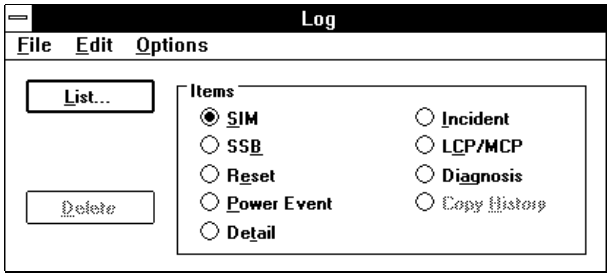
2.10 SIM Log Complete

(1) Select (CL) [Information].

(2) Select (CL) [Log...] in the 'Information' dialog box.



(3) Select (CL) [SIM] and [List...] in the 'Log'.



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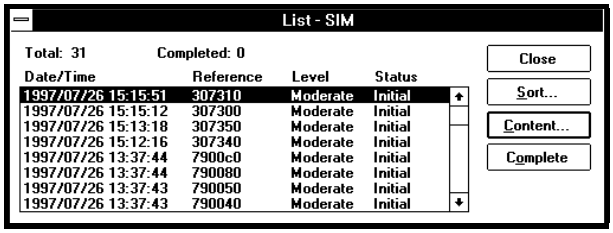
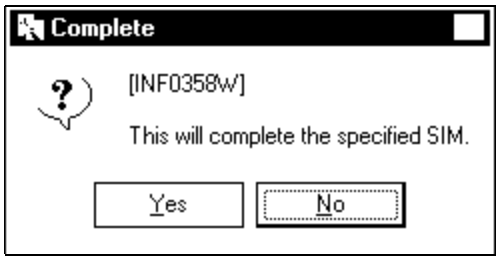
(4) Select (CL) data to be completed in the 'List-SIM' dialog box and select (CL) [Complete].



(5) Select (CL) [Yes] in the 'Complete' dialog box.



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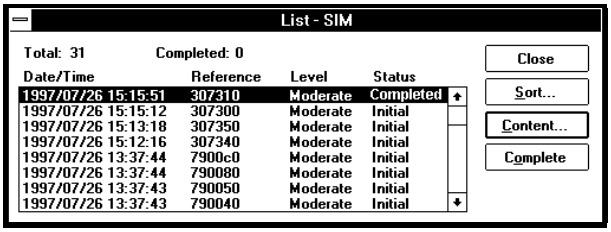
(6) In the ‘List-SIM’ dialog box, make sure that “Completed” is displayed in the status.



(7) Select (CL) [Close] in the ‘List-SIM’ dialog box.
Close the ‘Log’ dialog box and close the ‘Information’ window.

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2.11 Dump

Auto Dump is useful because you can select the dump data type and the output media.
So please use Auto Dump in order to get dump information.

Note 1) Please use DUMP in order to select MP.
Note 2) You can use DUMP as usual.

[1] Manual Dump

(1) Select (CL) [Dump] in the 'SVP' window.

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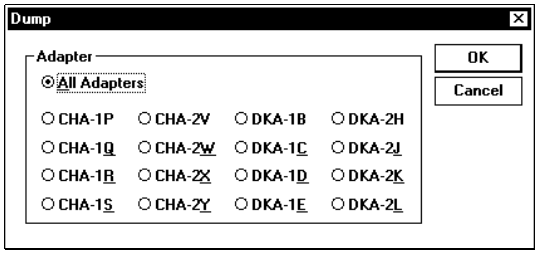
(2) Select (CL) processor in the [Adapter] in the 'Dump' dialog box, and select (CL) [OK]. [All Adapters] indicates that dumps for all processors are collected.

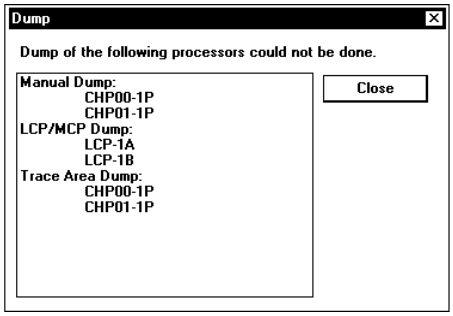


(3) The message "Receiving memory dump..." "Receiving trace area dump..." "Receiving LCP/MCP dump..." is displayed.
Note: "LCP" is displayed as a processor name during the collection of the dump for MCP. (Within about 1 minute)

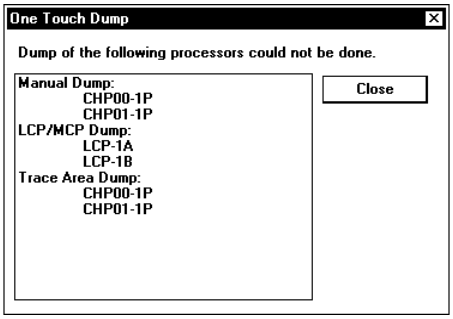
If the memory dump is finished normally, please go to (6).
If some errors occur, please go to (4).

(4) When some errors occur, SVP displays a following dialog box.
After the operation in (4-1) or (4-2), please go to (1) to retry the collection of the dump.

(4-1) Select (CL) [Close] in the 'Dump' dialog box.



(4-2) If you selected [All Adapters] at step (2), select (CL) [Close] in the 'One Touch Dump'.



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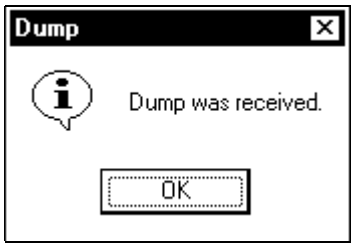
(5) If you want to copy the Dump file to a floppy disk, perform ‘Dump FD Copy’.
(Refer to 2.9 DUMP/LOG FD Copy)

(6) The message “Dump was received” is displayed in the ‘Dump’ dialog box, and select (CL) [OK].



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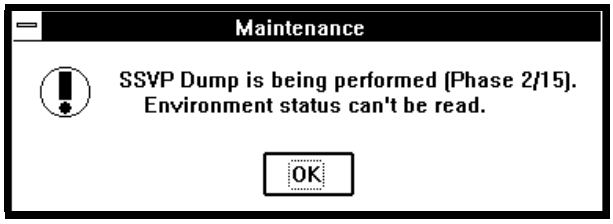
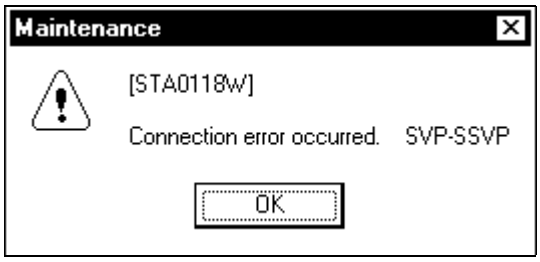
[2] SSVP DUMP

(1) Push the SSVP DUMP switch.
(see “3.2 Other switches and LEDs” on page LOCATION03-40.)

(2) Open Maintenance display (see SVP section). Confirm that the message “SSVP Dump is being performed [XXXX]. Environment status can’t be read.” is displayed and select (CL) [OK].



If the message “Connection error occurred. SVP-SSVP” is displayed, check the wiring connection and select (CL) [OK] to start from step (1) again. If step (1) is performed three times and the same message “Connection error occurred. SVP-SSVP”is displayed, replace SSVP (see REP01-150).



(3) SSVP ALARM lamp blinks after completion of dump.
(Within about 40 minutes after performing step (1))

(4) Copy dump file to FD.
Perform “2.9 DUMP/LOG FD Copy” on page SVP02-460.

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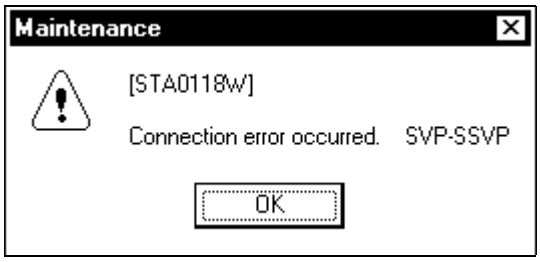
(5) Push SSVP Alarm Reset switch and implement SSVP again.
(see “3.2 Other switches and LEDs” on page LOCATION03-40.)

(6) Open Maintenance display.
Confirm that the message “Initializing SSVP [XXXX]. Please wait.” is displayed and select (CL) [OK].

If the message “Connection error occurred .SVP-SSVP” is displayed, select (CL) [OK] to perform step (5) again.
If step (5) is performed three times and the same message “Connection error occurred. SVP- SSVP” is displayed, replace SSVP (see REP01-150).



(7) Open Maintenance display again after waiting for about 20 minutes.
If two messages shown at step (6) are not displayed, the SSVP implementation is completed.

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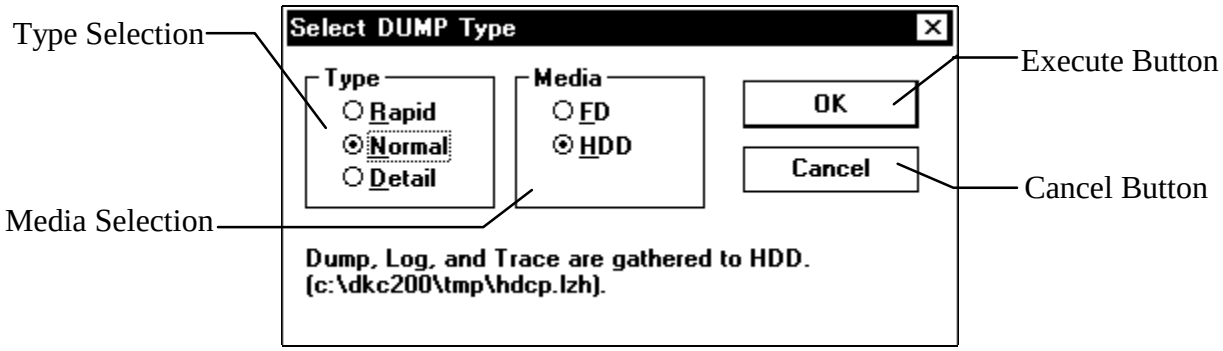
[3] Auto Dump

(1) Select(CL) [**AutoDump**] button

(2) Select one of three dump types and one of two media types, and select (CL) [OK].



<Dump Type>

(a)Rapid This dump type is to get log information, SVP operation history, or configuration information. SVP will compress these files automatically. The compressed files will be stored in a few FDs. This dump type will be used when the initial analysis of error is need. In this case, you should gather the files used by this type and send it to the Center. After sending this files, you should gather dump data by selection "Normal" type and send it to the Center to be able to analysis more detail.

(b)Normal This dump type is to get dump data (you can get DUMP information of all adapters.) adding to the log files used by "Rapid" type. SVP will compress these dump files automatically. You should get dump data by using this dump type after sending the "Rapid" type of data to Center.

(c)Detail This type is to get monitor information adding to the dump files used by "Normal" type. This data will be need when the performance of the DKC want to be checked. If there is no order to get these data, you do not need to use this type.

<Media>

(a)FDD SVP will store the compressed files to FD. If the data could not be hold in one FD, SVP will divide the compressed files into smaller files and store them into several FDs. If you cannot transfer the compressed files to your center from the SVP, you could use this media type to save files into several FDs and transfer them by using other PC which can connect to the center.

(b)HDD SVP will store the compressed files to HDD. The file name is "c:\dkc200\tmp\hdcp.lzh". If you can transfer the files to your center directly, this type will be useful. (Notice When operating the maintenance, SVP will sometimes delete the files. Do not use the maintenance operation before sending the files to your center.)

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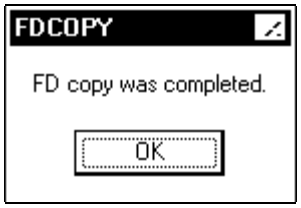
(3) Executing Auto Dump
SVP will execute Auto Dump. Please refer to the following section during the process.
2.8 DUMP/LOG FD Copy
2.10 DUMP

(4) Finish Auto Dump
After finishing the auto dump function, SVP will display the message, "FD Copy was completed". Select (CL) [OK] to end this process.



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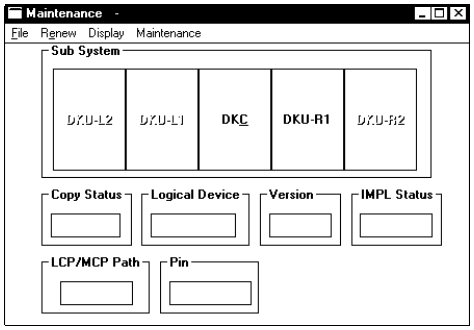
2.12 Logical Device Maintenance

2.12.1 Logical Device

[1] Physical Device List ---------- SVP02-600
[2] FORMAT Logical Device ---------- SVP02-610
[3] Block Logical Device ---------- SVP02-630
[4] Restore the Logical Device ---------- SVP02-650
[5] Refer the system configuration data ---------- SVP02-670
[6] Verify Logical Device ---------- SVP02-680
[7] LDEV recovery for multiple PDEV failure ---------- SVP02-700

(1) Select (CL) the [Maintenance] in the ‘SVP’ window.

(2) Select (CL) [Logical Device] in the ‘Maintenance’.



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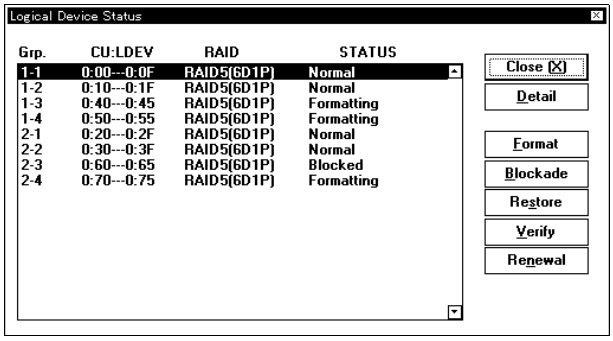
(3) “Logical Device Status” is displayed.



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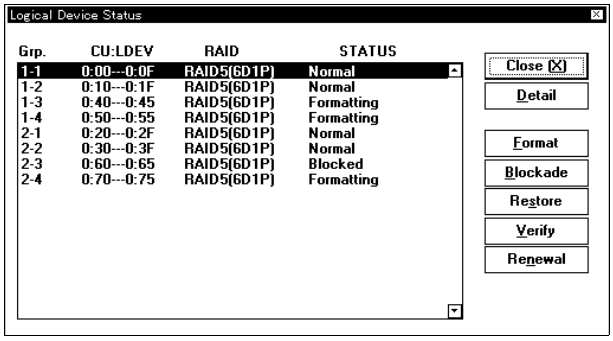
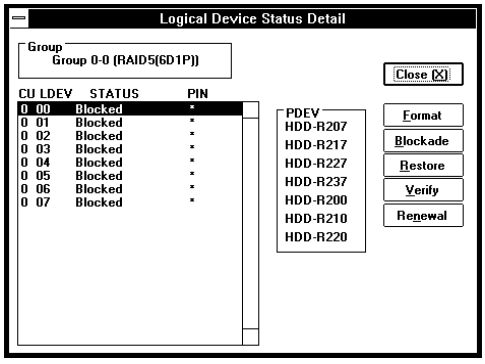
[1] Physical Device List

(1) Select (CL) an LDEV from the LDEV list box in the 'Logical Device Status' dialog box and select (CL) [Detail].



(2) 'Logical Device Status Detail' is displayed. And select (CL) [Close].



(3) Select (CL) [Close] in the 'Logical Device Status' dialog box. Close the 'General Status Display' window.

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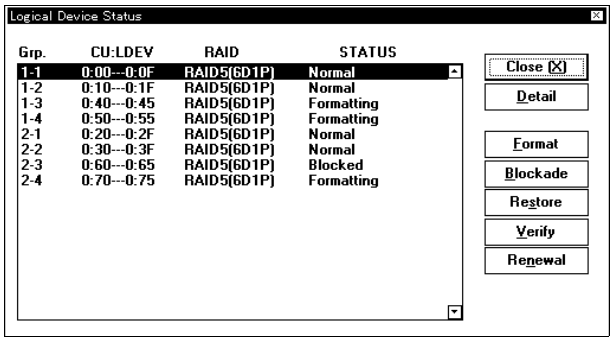
[2] FORMAT Logical Device

NOTICE
Executing this operation may cause a serious error such as a system down or a data loss. Accordingly, confirmation of the appropriateness of the operation and input of a password on the succeeding password input screen is required.

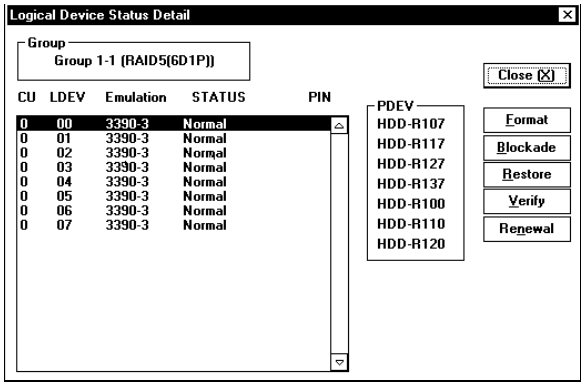
(1) Select (CL) ECC group from the LDEV list box in the 'Logical Device Status' dialog box.



Format by Ldev unit :
Select (CL) [Detail] -----Go to (2-1)
Format by ECC group :
Select (CL) [Format] ----Go to (2-2)
(It can select multiple item at once)

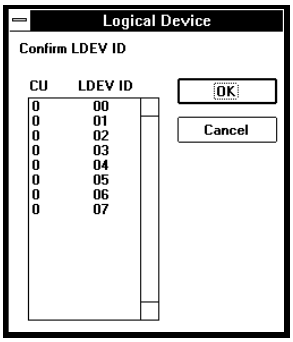
Note: Execute Format Logical Device after you confirm the target Logical Device is blocked.

(2-1) Select (CL) LDEVs which you want to format from "Logical Device Status Detail", and select (CL) [Format]. Go to (2-2).
(It can select multiple items at once.)



(2-2) Select (CL) corresponding LDEV from the LDEV ID list in the 'Logical Device' dialog box and select (CL) [OK].

If target LDEV was not blocked, return to 'Logical Device Status' dialog box.



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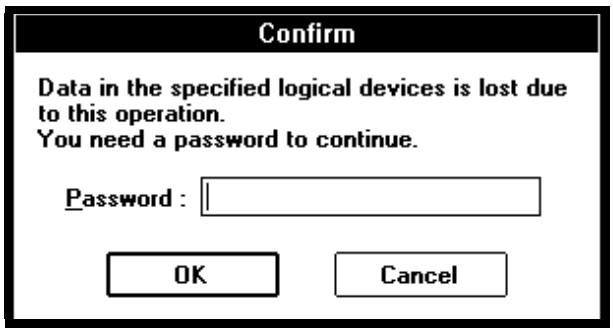
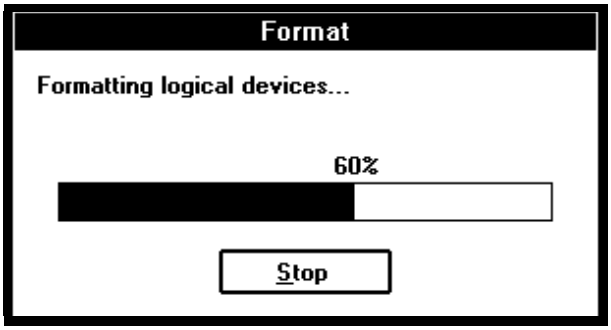
(3) "Data in the specified logical devices is lost due to this operation. You need a password to continue." is displayed.
Enter the password and select (CL) [OK].



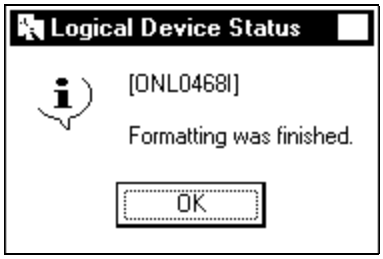
NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(4) "Formatting the logical device..." is displayed.



NOTICE
When REFER CONFIG etc. is executed during LDEV FORMAT of open volume, there is the rare case that MAINTENANCE WINDOW may disappear. Then please reboot SVP and execute LDEV FORMAT again.
For your information, even if rebooting SVP, LDEV FORMAT is executed without intermission. When you open LDEV FORMAT WINDOW again, you can see the current status of LDEV FORMAT.

(5) Select (CL) [OK] in response to "Formatting was finished.".



(6) Select (CL) [Close] in the 'Logical Device Status' dialog box.
Close the 'Maintenance' window.

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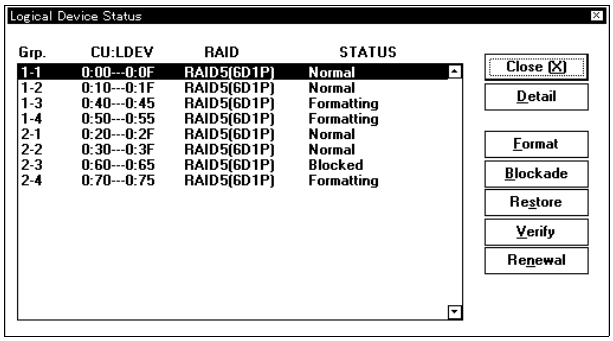
[3] Block Logical Device

NOTICE
Executing this operation may cause a serious error such as a system down or a data loss. Accordingly, confirmation of the appropriateness of the operation and input of a password on the succeeding password input screen is required.

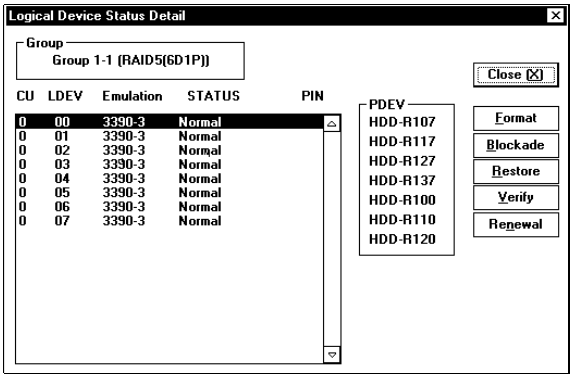
(1) Select (CL) ECC group from the LDEV list box in the 'Logical Device Status' dialog box.



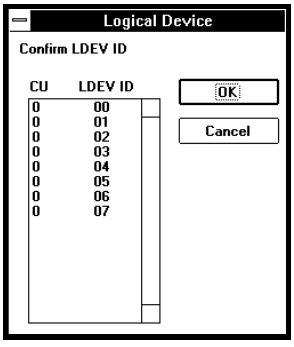
Blockade by Ldev unit :
Select (CL) [Detail] ------ Go to (2-1)
Blockade by ECC group :
Select (CL) [Blockade] -- Go to (2-2)
(It can select multiple item at once)

NOTICE
Execute Format Logical Device after you confirm the target Logical Device is blocked.

(2-1) Select (CL) LDEVs which you want to format from "Logical Device Status Detail", and select (CL) [Blockade]. Go to (2-2).
(It can select multiple items at once.)



(2-2) Select corresponding LDEV from the LDEV ID list in the 'Logical Device' dialog box and select (CL) [OK].



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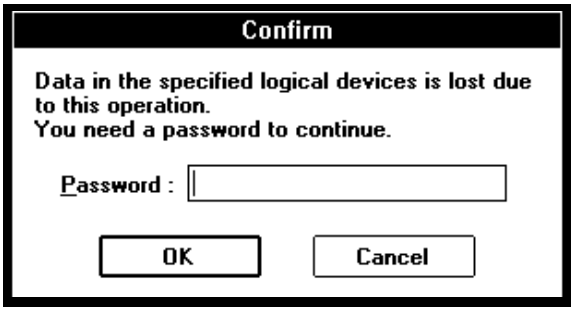
(3) "Data in the specified logical devices is lost due to this operation. You need a password to continue." is displayed.
Enter the password and select (CL) [OK].



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(4) "Blocking the logical device..." is displayed.

(5) Select (CL) [OK] in response to "Blocking the logical device is completed.".

(6) Select (CL) [Close] in the 'Logical Device Status' dialog box.
Close the 'Maintenance' window.

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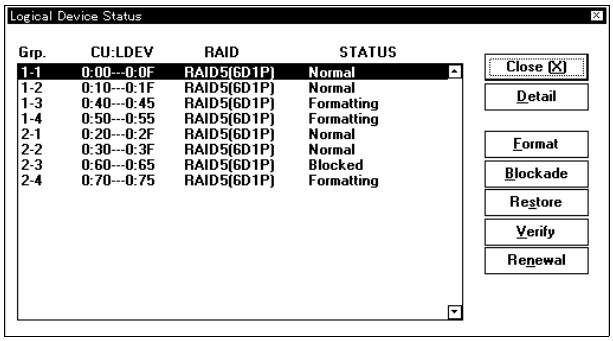
[4] Restore the Logical Device

NOTICE
Executing this operation may cause a serious error such as a system down or a data loss. Accordingly, confirmation of the appropriateness of the operation and input of a password on the succeeding password input screen is required.

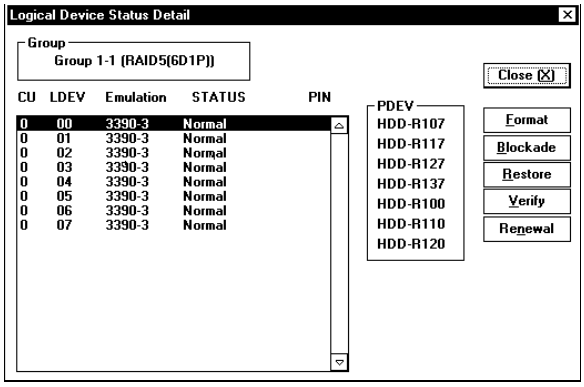
(1) Select (CL) ECC group from the LDEV list box in the 'Logical Device Status' dialog box.



Restore by Ldev unit :
Select (CL) [Detail] -----Go to (2-1)
Restore by ECC group :
Select (CL) [Restore]----Go to (2-2)
(It can select multiple item at once)

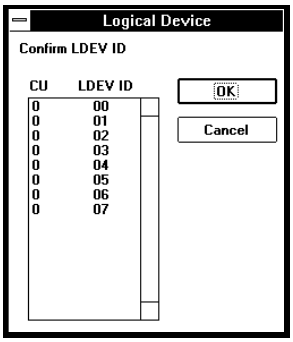
Note: Execute Restore Logical Device after you confirm the target Logical Device is blocked.

(2-1) Select (CL) LDEVs which you want to format from "Logical Device Status Detail", and select (CL) [Restore]. Go to (2-2).
(It can select multiple items at once.)



(2-2) Select (CL) corresponding LDEV from the LDEV ID list in the 'Logical Device' dialog box and select (CL) [OK].

If target LDEV was not blocked, return to 'Logical Device Status' dialog box.



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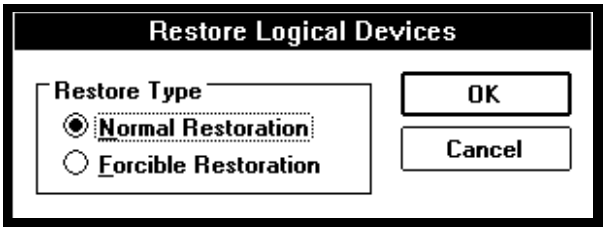
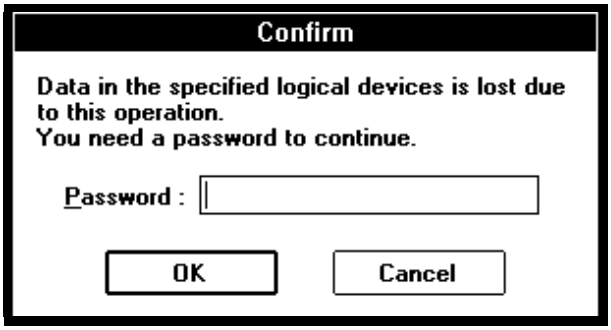
(3) Select (CL) corresponding item from the Restore Type in the 'Restore Logical Device' dialog box and select (CL) [OK].



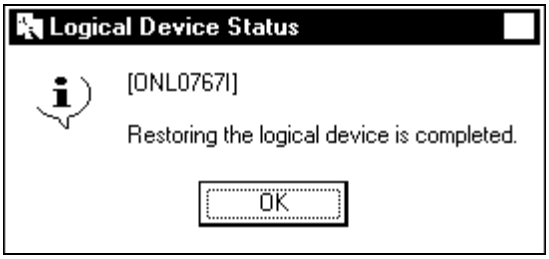
If "Forcible Restoration" is selected, the message "Data in the specified logical devices is lost due to this operation.
You need a password to continue." is displayed.
Enter the password and select (CL) [OK].



NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(4) "Restoring..." is displayed.

(5) Select (CL) [OK] in response to "Restoring the logical device is completed.".



(6) Select (CL) [Close] in the 'Logical Device Status' dialog box.
Close the 'Maintenance' window.

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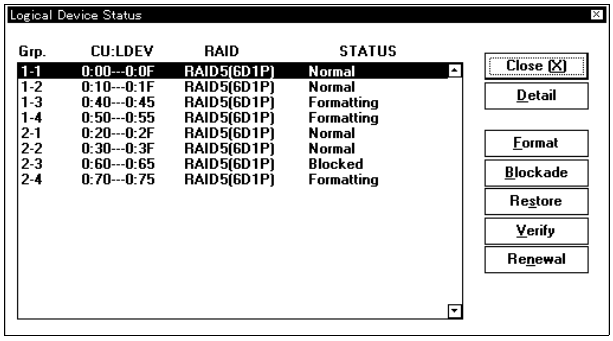
[5] Refer the system configuration data

(1) Select (CL) [Renewal] in the ‘Logical Device Status’ dialog box.



(2) “Reading the subsystem configuration...” is displayed.

(3) Select (CL) [Close] in the ‘Logical Device Status’ dialog box.
Close the ‘Maintenance’ window.

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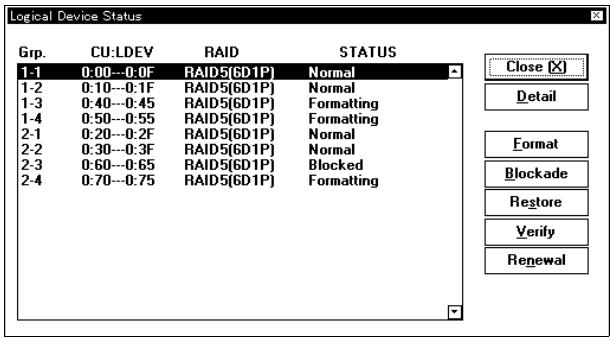
[6] Verify Logical Device

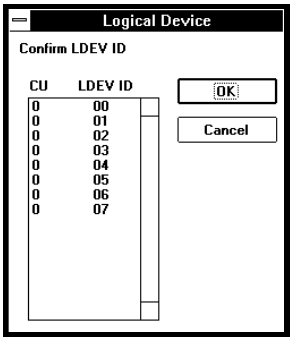
NOTICE
Executing this operation may cause a serious error such as a system down or a data loss. Accordingly, confirmation of the appropriateness of the operation and input of a password on the succeeding password input screen is required.

(1) Select (CL) an LDEV from the LDEV list box in 'Logical Device Maintenance List' dialog box and select (CL) [Verify...].



(2) Select (CL) corresponding LDEV from the LDEV ID list in the 'Logical Device' dialog box and select (CL) [OK].

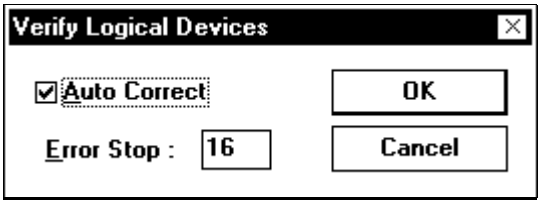
If target LDEV was not Normal, return to 'Logical Device Status' dialog box.



(3-1) Enter the password and select (CL) [OK].

NOTICE
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss and requires an input of a password. Ask the technical support center about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

Select (CL) 'Auto Correct' or input the value of Error Stop, and select (CL) [OK].



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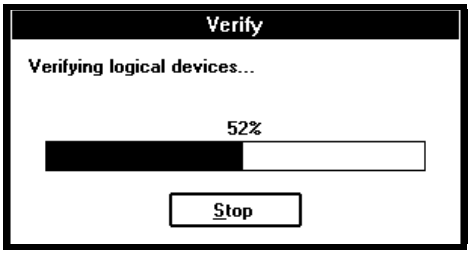
(3-2) "Verifying logical devices..." is displayed.
If you want to stop the check, select (CL) [Stop].
Go to (6)
If the parity error is not beyond the 'Error Stop' value, go to (4).
If the error is beyond the value, go to (5).



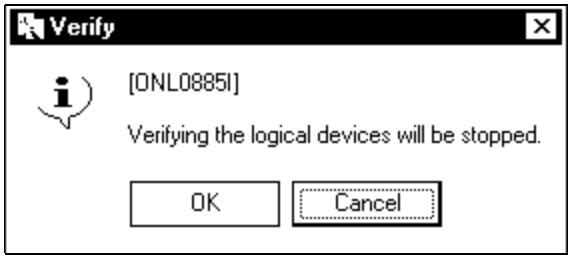
(4) If parity has errors less than the specified "Error Stop", "Verifying the logical devices is finished." is displayed.

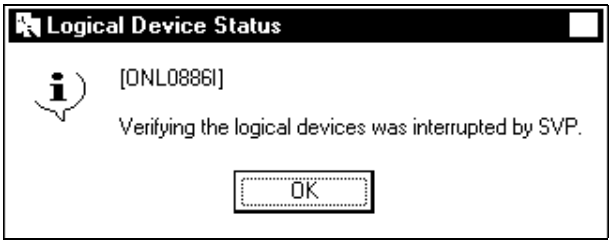
Go to (7)

(5) If parity has errors more than the specified "Error Stop", "Verifying the logical device is stopped." is displayed.

Go to (7)

(6) If [Stop] is selected (CL) and [OK] in response to inquiry message is selected (CL), "Verifying the logical devices was interrupted by SVP." is displayed.





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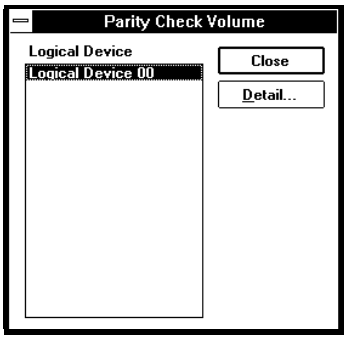
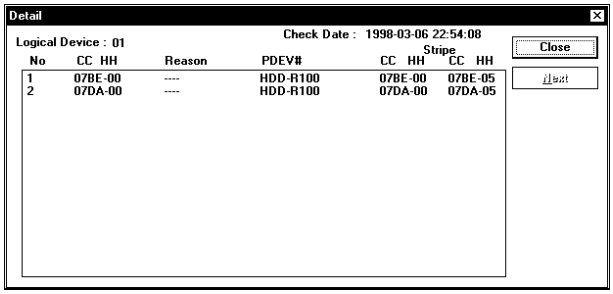
(7) Select (CL) [OK] in response to the message (4) ~ (6).
Select (CL) [Close] in the 'Logical Device Status' dialog box,
Close the 'Maintenance' window.

(8) LDEV to exist parity errors is displayed. Select (CL) LDEV to be indicated in the 'Parity Check Volume' dialog box and select (CL) [Detail...].



(9) Detail of parity errors.
(When "No." exist more than 17, select (CL) [Next].)



(10) Select (CL) [Close] in the 'Detail' dialog box.
Select (CL) [Close] in the 'Parity Check Volume' dialog box.

(11) Select (CL) [close] in the 'Logical Device Status' dialog box.
Close the 'Maintenance' window.

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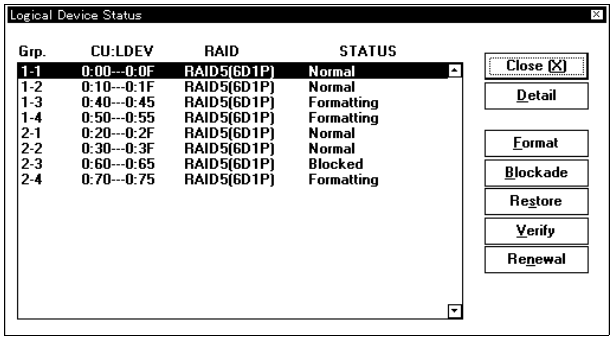
[7] LDEV recovery for multiple PDEV failure

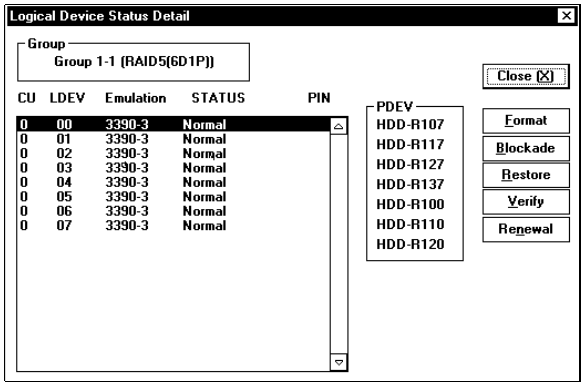
(1) Select (CL) ECC group from the LDEV list box in the 'Logical Device Status' dialog box.



Restore by Ldev unit :
Select (CL) [Detail] -----Go to (2-1)
Restore by ECC group :
Select (CL) [Restore]----Go to (2-2)
(It can select multiple item at once)

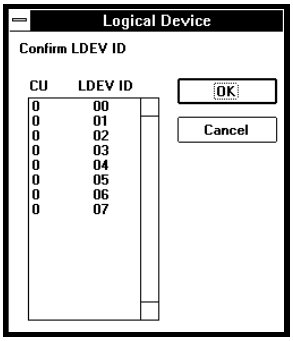
Note: Execute Restore Logical Device after you confirm the target Logical Device is blocked.

(2-1) Select (CL) LDEVs which you want to format from "Logical Device Status Detail", and select (CL) [Restore]. Go to (2-2).
(It can select multiple items at once.)



(2-2) Select (CL) corresponding LDEV from the LDEV ID list in the 'Logical Device' dialog box and select (CL) [OK].

If target LDEV was not blocked, return to 'Logical Device Status' dialog box.



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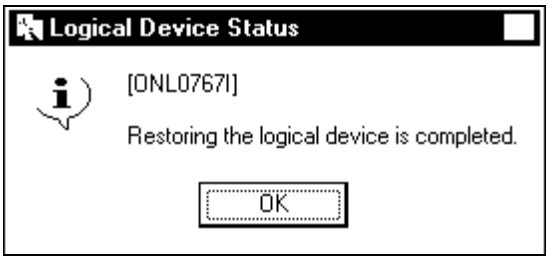
(3)

BLANK

(4) “Restoring...” is displayed.

(5) Select (CL) [OK] in response to “Restoring the logical devices is completed.”.



(6) Select (CL) [Close] in the ‘Logical Device Status’ dialog box.
Close the ‘Maintenance’.

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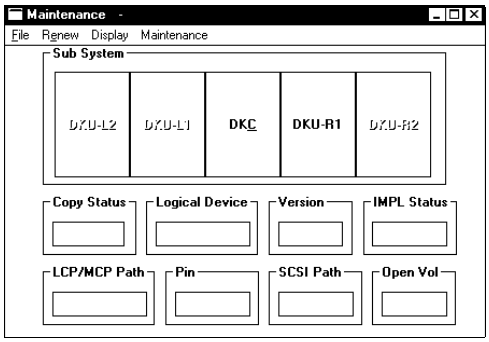
2.12.2 Open VOL

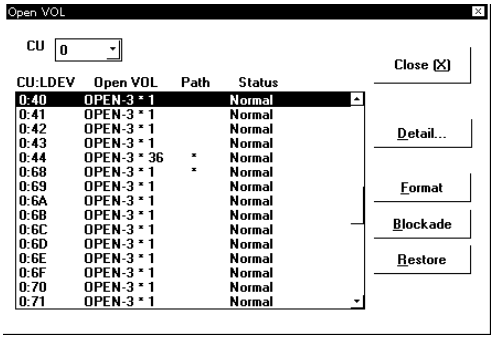
[1] FORMAT Open VOL ---------- SVP02-707
[2] Block Open VOL ---------- SVP02-709
[3] Restore Open VOL ---------- SVP02-709B

(1) Select (CL) the [Maintenance] in the 'SVP' window.

(2) Select (CL) [Open VOL] in the 'Maintenance'.



(3) 'Open VOL' is displayed.



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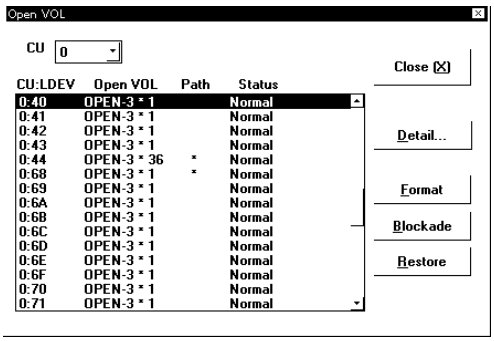
[1] FORMAT Open VOL

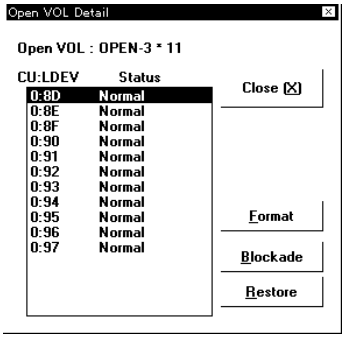
(1) Select (CL) Open VOL from the Open VOL list box in the 'Open VOL' window.



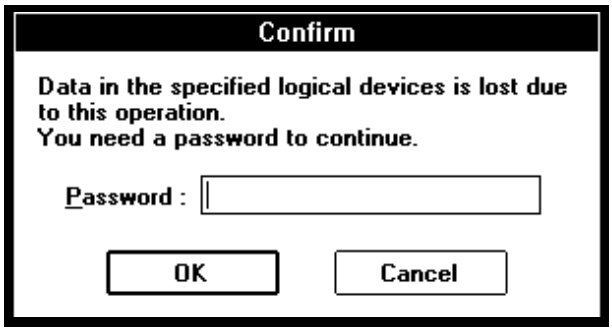
Format by LDEV unit:
Select (CL) [Detail] -------- Go to (2)
Format by Open VOL:
Select (CL) [Format] ------- Go to (3)
(It can select multiple item at once.)

Note: Execute Format Open VOL after you confirm the target Open VOL is blocked.

(2) Select (CL) LDEVs which you want to format form 'Open VOL Detail' window, and select (CL) [Format]. Go to (3).
(It can select multiple items at once.)



(3) "Data in the specified logical devices is lost due to this operation. You need a password to continue." is displayed.
Enter the password and select (CL) [OK].



Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.

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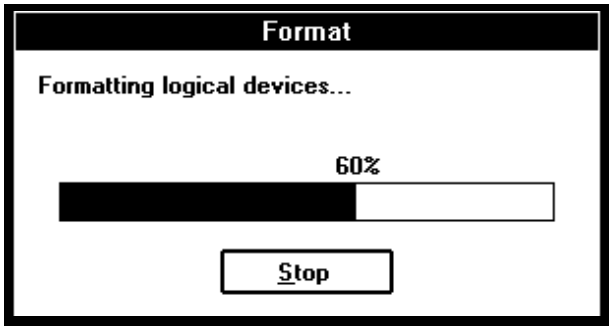
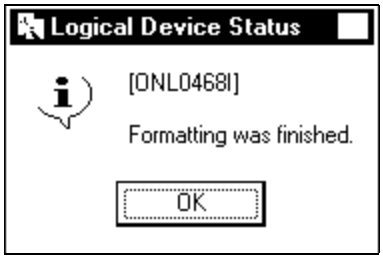
(4) “Formatting the logical device...” is displayed.



(5) Select (CL) [OK] in response to “Formatting was finished.”.



(6) Select (CL) [Close] in the ‘Open VOL’ window.
Close the ‘Maintenance’ window.

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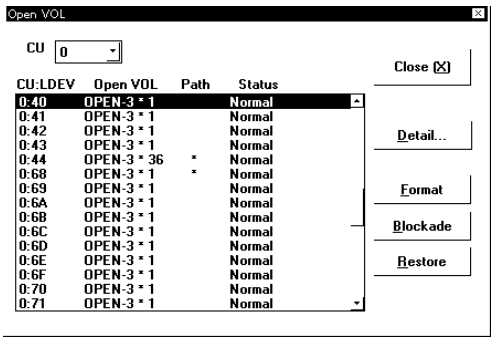
[2] Block Open VOL

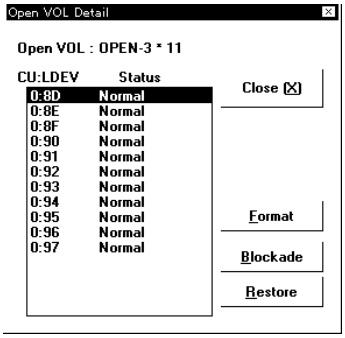
(1) Select (CL) Open VOL from the Open VOL list box in the 'Open VOL' window.

Blocked by LDEV unit:
Select (CL) [Detail] -------- Go to (2)
Blocked by Open VOL:
Select (CL) [Block]--------- Go to (3)
(It can select multiple items at once.)

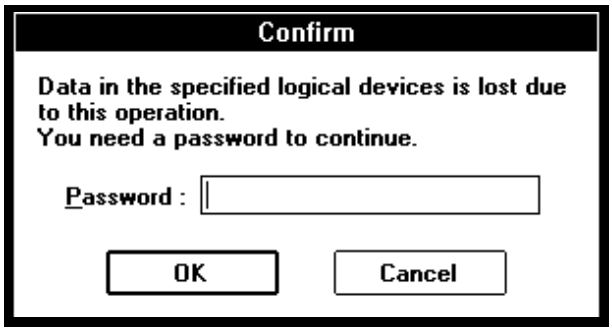
Note: Execute Format Open VOL after you confirm the target Open VOL is blocked.



(2) Select (CL) LDEVs which you want to block from 'Open VOL Detail' window, and select (CL) [Blockade]. Go to (3).
(It can select multiple items at once.)



(3) "Data in the specified logical devices is lost due to this operation. You need a password to continue." is displayed.
Enter the password and select (CL) [OK].
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.



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(4) “Blocking the logical device...” is displayed.

(5) Select (CL) [OK] in response to “Blocking the logical device is completed.”.

(6) Select (CL) [Close] in the ‘Open VOL’ window.
Close the ‘Maintenance’ window.

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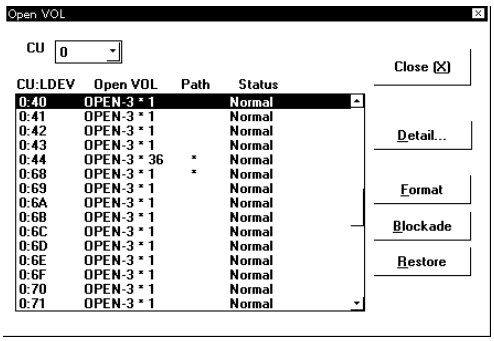
[3] Restore Open VOL

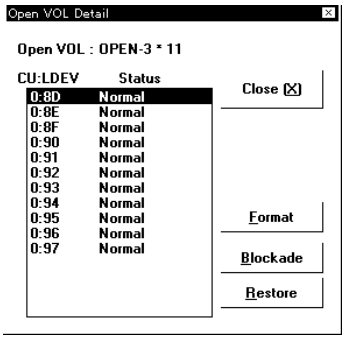
(1) Select (CL) Open VOL from the Open VOL list box in the 'Open VOL' window.



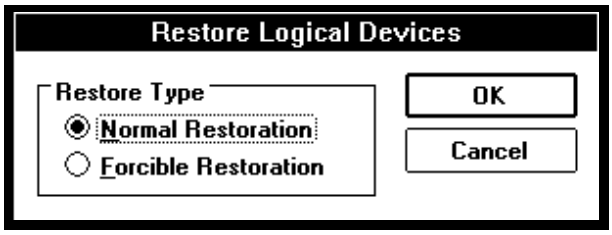
Restore by LDEV unit:
Select (CL) [Detail] -------- Go to (2)
Restore by Open VOL:
Select (CL) [Restore]------- Go to (3)
(It can select multiple items at once.)

Note: Execute Restore Open VOL after you confirm the target Open VOL is blocked.

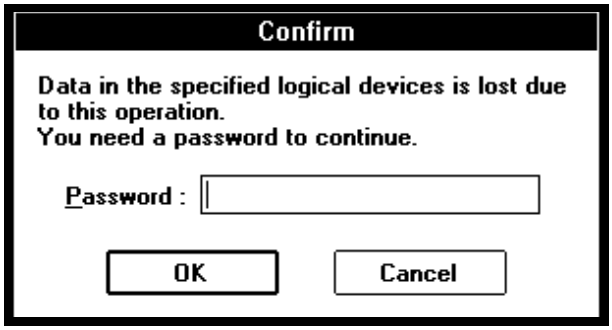
(2) Select (CL) LDEVs which you want to restore from 'Open VOL Detail' window, and select (CL) [Restore]. Go to (3).
(It can select multiple items at once.)



(3) Select (CL) corresponding item from the Restore Type in the 'Restore Logical Device' window and select (CL) [OK].



If "Forcible Restoration" is selected, the message "Data in the specified logical devices is lost due to this operation. You need a password to continue." is displayed.
Enter the password and select (CL) [OK].
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.



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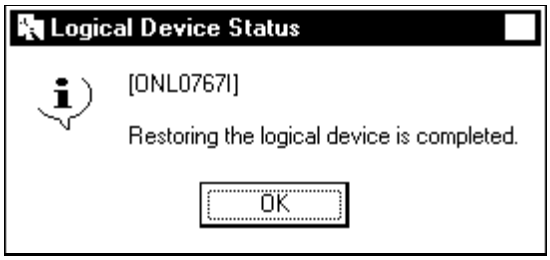
(4) “Restoring...” is displayed.

(5) Select (CL) [OK] in response to “Restoring the logical device is completed.”.



(6) Select (CL) [Close] in the ‘Open VOL’ window.
Close the ‘Maintenance’ window.

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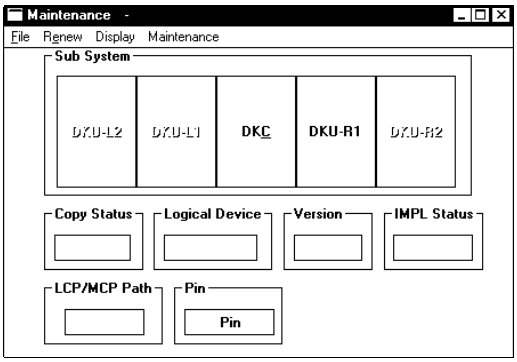
2.13 Pin Data indication

Prerequisite operation
(1) Select (CL) [Maintenance].

(2) Select (CL) [PIN] in the ‘Maintenance’ dialog box.



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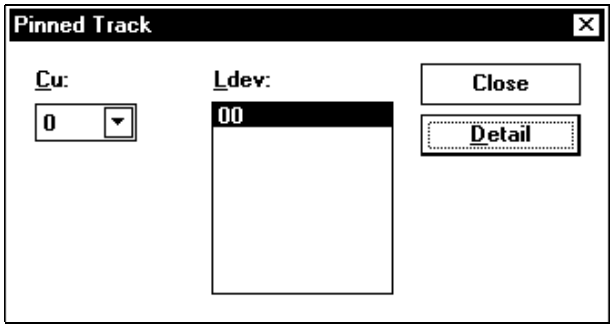
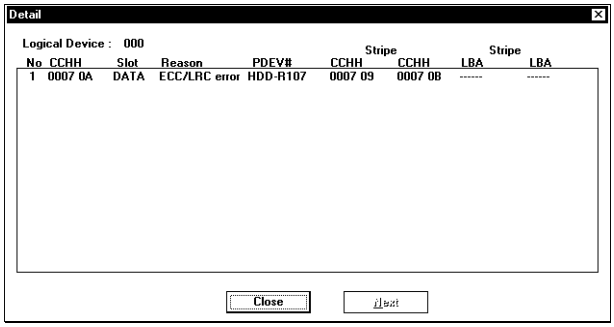
(3) Displaying the LDEVs which has Pin Slots.
Select (CL)a LDEV in the 'Pin Volume' dialog box and select (CL) [Detail...].
(Note) After Pin Slot recovers, the LDEV which was reported as Pin Slot SIM will be not displayed in the box.



(4) Displays the detail of a Pin Slot.
If there are more than 17 Pin Slots, [Next] button will be enable to display other Pin Slots.)
(Note) If a Pin Slot has some trouble, but it can be recovered, the detail of the Pin Slot will not be displayed.
In case of OPEN-LDEV, only LBA's are displayed. But, if LBA of the Pin Slot can't be displayed, "-----" is displayed in both CCHH and LBA columns.



(5) Select (CL) [Close] in the 'Detail' dialog box.
Select (CL) [Close] in the 'Pin Volume' dialog box.
Close the 'General Status' window.

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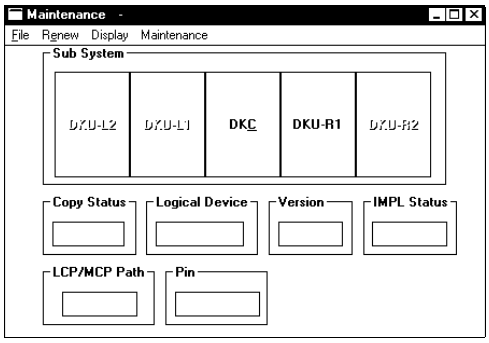
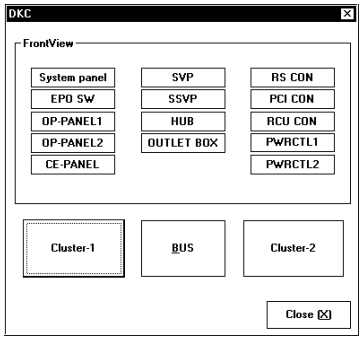
2.14 Multi PCB Replace

(1) <Set path offline>
Set the path offline from HOST when replacing CHA.

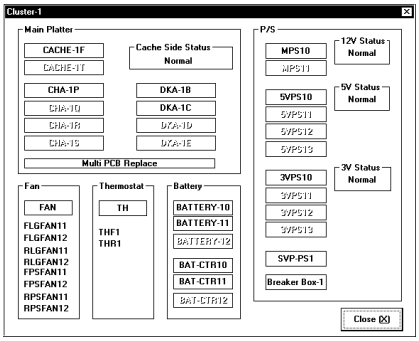
(2) <Maintenance>
'Maintenance' window is displayed.
In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



(3) <DKC screen>
Select (CL) [Cluster] in the 'DKC'.



(4) <Select Multi PCB Replace>
Select (CL) [Multi PCB Replace].
Selecting (CL) [Close] returns you to step (3).



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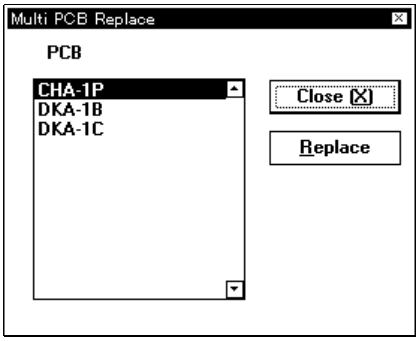
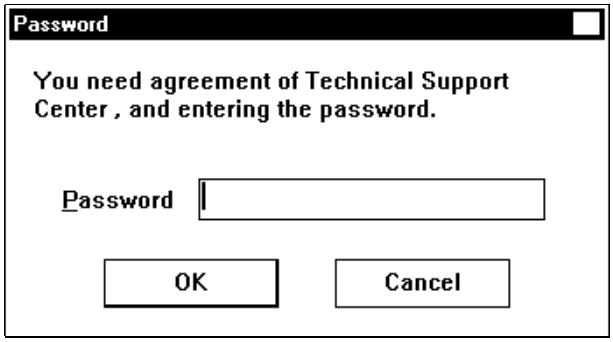
(5) <Select CHA/DKA>
Select (CL) CHA/DKA PCB.
Select (CL) [Replace].



NOTICE
When the subsystem is placed online, ask the customer to place it offline.

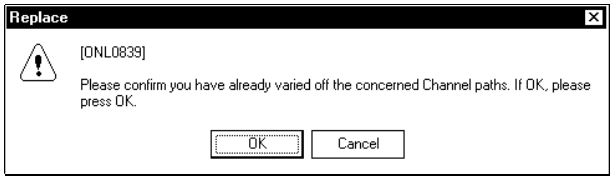
NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

(6) <Enter Password>
Enter the password in response to [Password?] and select (CL) [OK].

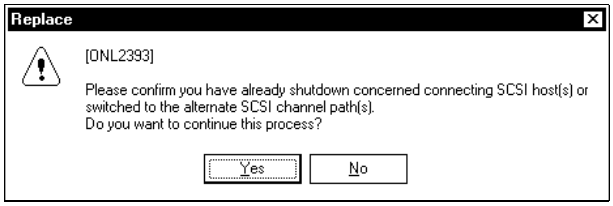


NOTICE
Executing this operation may cause a serious error such as a system down or a data loss.
Accordingly, confirmation of the appropriateness of the operation and input of a password on the succeeding password input screen is required.

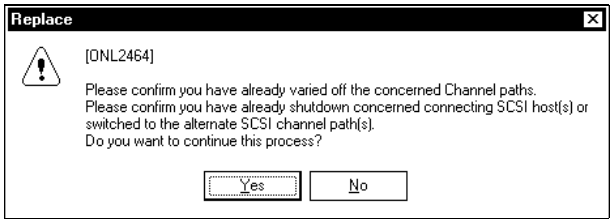
(7) <Confirm Channel Path offline>
Select (CL) [OK] in response to "Please confirm you have already varied off the concerned Channel paths. If OK, please press OK."



If SCSI channel adapter is installed:
After you confirm that you have stopped concerned SCSI Channel paths, select (CL) [OK].



CHA and CHA (SCSI) are exist:
After you confirm that you have stopped concerned Channel paths and SCSI channel paths, select (CL) [OK].



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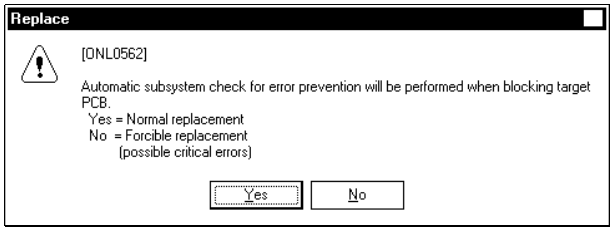
(8) <Caution message for system down>

NOTICE
Select (CL) [Yes] in response to the message below.



"Automatic subsystem check for error prevention will be performed when blocking target PCB.
Yes = Normal replacement
No = Forcible replacement
(Possible critical errors)"

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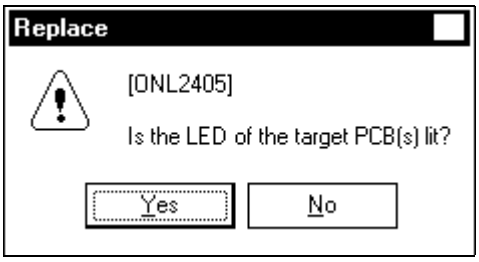
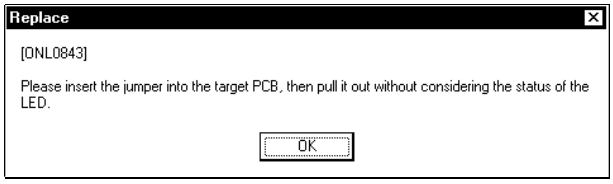
(9) <CHA/DKA blocking>
* For CHA
"The CHA-xx is being blocked..."
* For DKA
"The DKA-xx is being blocked..."

(10) <Check to see if shut down LED is lit>
Select (CL)
* [Yes] if LED is on
* [No] if LED is off
in response to "Is the LED of the target PCB(s) lit?".
If [No] is selected:
Select in response to "Is the LED of the target PCB(s) lit?" again.



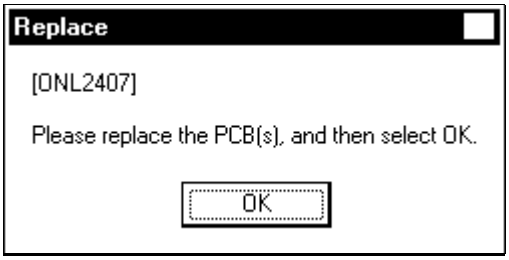
NOTICE
If the jumper is inserted in the wrong PCB, a system down may be caused.

<Forcing shut down LED on>
If [No] is selected twice:
Insert a jumper in response to "Please insert jumper into the target PCB, then pull it out without considering the status of the LED".
(Refer REP03-90)



For CHA (SERIAL)	HARDWARE C (REP03-80)
CHA (PARALLEL)	HARDWARE D (REP03-110)
For SCSI	HARDWARE E (REP03-140)
For FIBRE	HARDWARE F (REP03-170)
DKA	HARDWARE G (REP03-200)

(11) <Beginning of CHA/DKA Replacement>
"Please replace the PCB(s), and then select OK." is displayed. Select (CL) [OK] after replacing the PCBs.



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(12) <Replace CHA / DKA>

For CHA (Serial)	Go to HARDWARE C (REP03-80)
For CHA (Parallel)	Go to HARDWARE D (REP03-110)
For SCSI	Go to HARDWARE E (REP03-140)
For FIBRE	Go to HARDWARE F (REP03-170)
For DKA	Go to HARDWARE G (REP03-200)

---

(13)

Select (CL) [OK] in response to “Please replace the PCB(s). After replacement, please press OK.”

“Waiting for Power Event... Usually, several minutes (maximum 10 minutes)” is displayed.

---

(14) <Check the CHA/DKA recovery processing>

The following message is displayed:

* For CHA

“CHA-xx is being checked...”

“Restoring the CHA-xx...”

* For DKA

“Restoring the DKA-xx...”

“DKA-xx is being path recovered...”

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(15) <Check the end of CHA/DKA recovery>
Select (CL) [OK] in response to “Replace finished.”.

NOTICE
When one or more PCBs are replaced normally, “Replace finished.” will be displayed. So please confirm PCBs’ status.

(16) <Path on-line when CHA is replaced>
Whenever a CHA is replaced, set the path (from the host) on the replaced CHA to ONLINE by your customer.

(17) <SIM Complete>
Go to SVP02-500.

(18)
Close ‘Multi PCB Replace’ window.
Close ‘Cluster-n’ window.
Close ‘Maintenance’ window.

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2.16 System Option

[Over view]

Change following system option when the system operates.

<1> Spare Disk Recovering - Select the performance density when data is copied to a spare disk. (correction copy and drive copy)

- Interleave : Everytime 4-slot copy is completed, copy job sleeps for the time dependent on load of HOST I/O.
- Offline : No sleep. (No considering HOST job)

NOTICE
Please do not use if no channel paths is varied offline.

<2> Disk Copy Pace ---------- Specification of copy pace is supported with the “Interleave” mode at Spare Disk Recovering. 3 modes are supported.

- Medium : Optimization mode. The copy time depends on load of HOST I/O.
- Faster : Copy job is prior to HOST job.
- Slower : HOST job is prior to copy job.

<3> Copy Operation ----------

- Dynamic Sparing : Copy automatic to a spare disk if disk failure exceeded the threshold value.
- Correction Copy : Execute correction copy to a spare disk automatically when one drive has blocked.

(1) Select (CL) [Install].

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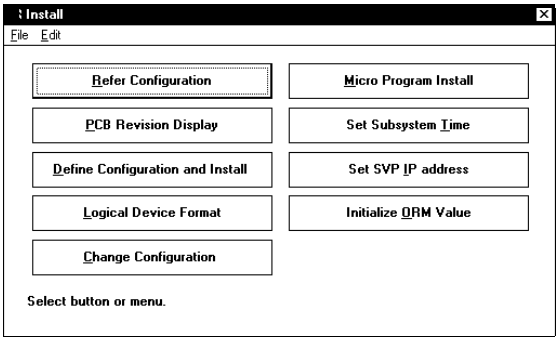
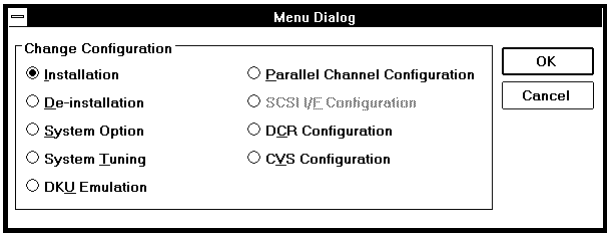
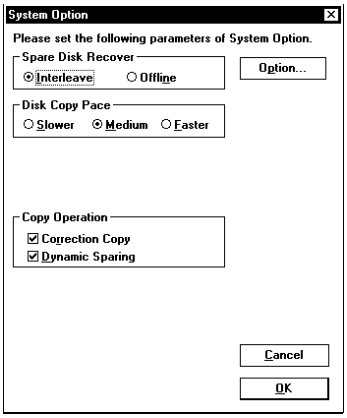
(2) Select (CL) the [Change Configuration] menu in the 'Install' window and select (CL) [OK].



(3) Select (CL) [System Option] menu in the 'Menu Dialog' window and select (CL) [OK].



(4) Select (CL) the desired item in the 'System Option' dialog box, and select (CL) [OK].



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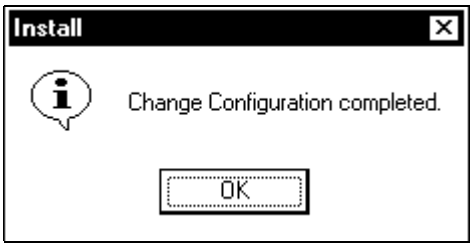
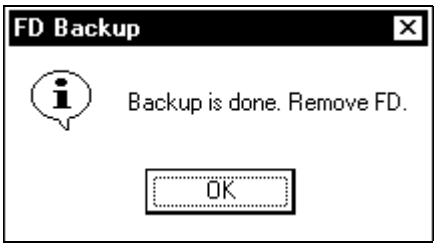
(5) “Loading configuration...” is displayed.

(6) “Change configuration completed.” is displayed.
Select (CL) [OK].



(7) “Reading subsystem configuration data...” is displayed.
“Please insert config FD in FDD.” is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

(8) When this procedure is completed, message “Back up is done. Remove FD.” is displayed.
Remove the FD, select (CL) [OK].



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(9) Close the ‘Install’ window.

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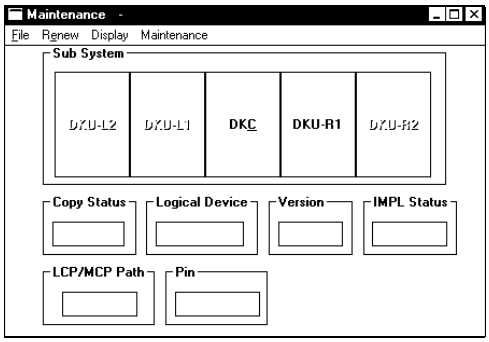
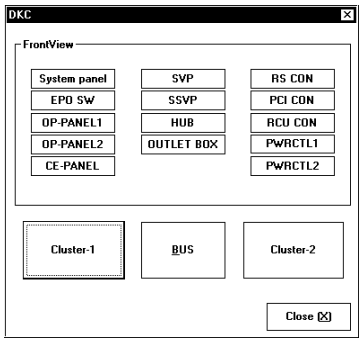
2.17 Recovery Procedure for Bus

(1) Select (CL) [Maintenance].

(2) Select (CL) [DKC] in the 'Maintenance' dialog box.

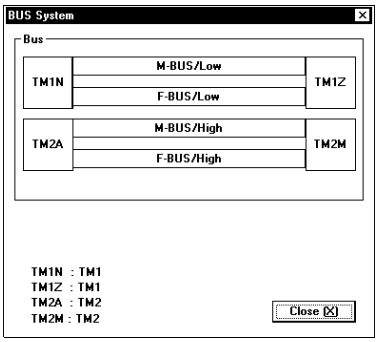


(3) Select (CL) [BUS] in the 'DKC. '



(4) Select(CL) blocked bus [XXXX] to be recovered from 'Bus System'.
Valid [XXXX] values are listed below.

- [M-BUS/Low] M-BUS(Low)
- [F-BUS/Low] F-BUS (Low)
- [M-BUS/High] M-BUS(High)
- [F-BUS/High] F-BUS (High)



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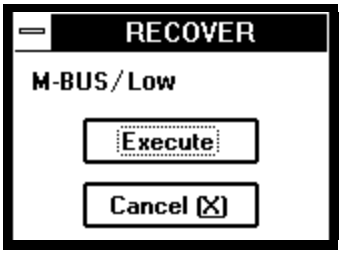
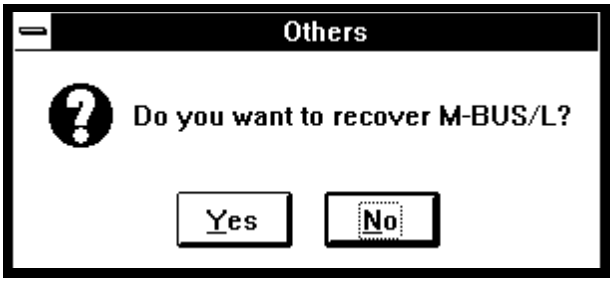
(5) Make sure that the designation is correct.
Then select(CL) [Execute].



(6) Select [Yes] (CL) in response to “Do you want to recover XXXX?”.
XXXX represents one of the bus names listed in
step (4).



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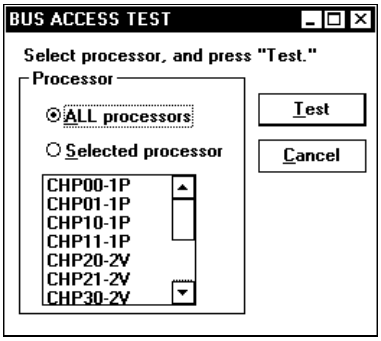
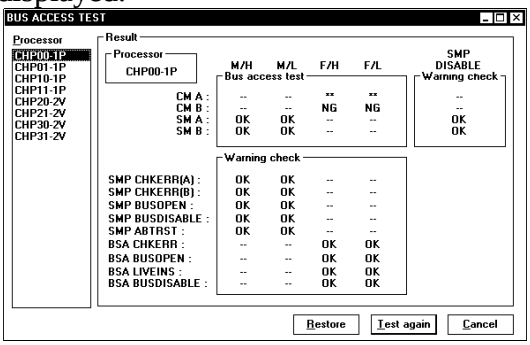
(7) Select a processor that execute bus access test, and select [Test] (CL).
If you select “ALL processors”, bus access test will be executed at all listed processor.



(8) Bus access test has finished normally, and the result is displayed.



• If you select single processor in step (7).
Processor(in Result) Processor selected in step(7).

• If you select “ALL processors” in step (7).
Processor(List box) - Processor that failure has occurred.
Processor(in Result) Processor selected in Processor(List box).
Note : If failure has not occurred at all processors, no string has displayed at Processor(List box) and “ALL” at Processor(in Result).

Bus access test OK - : Failure has not occurred.
NG : Failure has occurred.
** : Memory is blocked.
-- : This term is not tested.

Warning check (*1) - OK : Warning has not occurred.
NG : Warning has occurred.
-- : This term is not checked.

*1 When warning check is not supported, all columns are “--”.

If blocked bus isn’t a failure part, you select [Restore] and recover the bus.
Refer to the following table:
“Patterns of bus access test result and guessed failure parts” (SVP02-820 ~ 840).
“NG column of warning check result and guessed failure parts”(SVP02-850)
If you select [Restore] (CL), go to (9).
If you select [Test again] (CL), go to (7).
If some errors have occurred at bus access test, go to (7).

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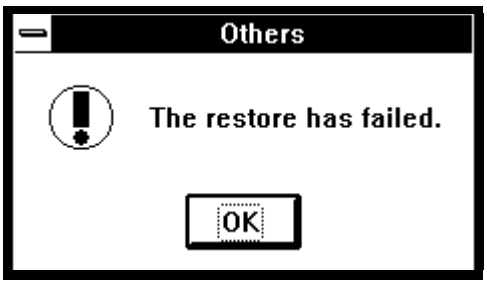
(9) Select (CL) [OK] in response to “The restore has finished.”.

If an error has occurred, the message “The restore has failed.” is displayed as shown on the right. Select (CL) [OK].



(10) Select (CL) [Close] in the ‘BUS System’ dialog box.
Select (CL) [Close] in the ‘DKC’ dialog box.
Close the ‘Maintenance’ window.
Return to TRBL05-20.

Patterns of bus access test result and guessed failure parts

(1) MBUS

	Pattern			Failure Part
1		MBUS H	MBUS L	1.Nothing
	SM A	OK	OK	
	SM B	OK	OK	
2		MBUS H	MBUS L	1.Shared Memory A failure
	SM A	NG	NG	
	SM B	OK	OK	
3		MBUS H	MBUS L	1.Shared Memory B failure
	SM A	OK	OK	
	SM B	NG	NG	
4		MBUS H	MBUS L	1.M BUS H failure
	SM A	NG	OK	
	SM B	NG	OK	
5		MBUS H	MBUS L	1.M BUS L failure
	SM A	OK	NG	
	SM B	OK	NG	

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	Pattern	Failure Part
6	MBUS H: NG, MBUS L: OK (SM A); MBUS H: OK, MBUS L: OK (SM B)	1.M BUS H failure 2.(Shared Memory A failure)
7	MBUS H: OK, MBUS L: OK (SM A); MBUS H: NG, MBUS L: OK (SM B)	1.M BUS H failure 2.(Shared Memory B failure)
8	MBUS H: OK, MBUS L: NG (SM A); MBUS H: OK, MBUS L: OK (SM B)	1.M BUS L failure 2.(Shared Memory A failure)
9	MBUS H: OK, MBUS L: OK (SM A); MBUS H: OK, MBUS L: NG (SM B)	1.M BUS L failure 2.(Shared Memory B failure)

(2).FBUS

	Pattern	Failure Part
1	FBUS H: OK, FBUS L: OK (CM A); FBUS H: OK, FBUS L: OK (CM B)	1.Nothing
2	FBUS H: NG, FBUS L: NG (CM A); FBUS H: OK, FBUS L: OK (CM B)	1.CACHE A failure
3	FBUS H: OK, FBUS L: OK (CM A); FBUS H: NG, FBUS L: NG (CM B)	1.CACHE B failure
4	FBUS H: NG, FBUS L: OK (CM A); FBUS H: NG, FBUS L: OK (CM B)	1.F BUS H failure
5	FBUS H: OK, FBUS L: NG (CM A); FBUS H: OK, FBUS L: NG (CM B)	1.FBUS L failure
6	FBUS H: NG, FBUS L: OK (CM A); FBUS H: OK, FBUS L: OK (CM B)	1.FBUS H failure 2.(CACHE A failure)

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	Pattern	Failure Part
7	<table><tr><td></td><td>FBUS H</td><td>FBUS L</td></tr><tr><td>CM A</td><td>OK</td><td>OK</td></tr><tr><td>CM B</td><td>NG</td><td>OK</td></tr></table>	1.FBUS H failure 2.(CACHE B failure)
8	<table><tr><td></td><td>FBUS H</td><td>FBUS L</td></tr><tr><td>CM A</td><td>OK</td><td>NG</td></tr><tr><td>CM B</td><td>OK</td><td>OK</td></tr></table>	1.FBUS L failure 2.(CACHE A failure)
9	<table><tr><td></td><td>FBUS H</td><td>FBUS L</td></tr><tr><td>CM A</td><td>OK</td><td>OK</td></tr><tr><td>CM B</td><td>OK</td><td>NG</td></tr></table>	1.FBUS L failure 2.(CACHE B failure)

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NG column of warning check result and guessed failure parts

① Bus

	NG column		
	Bus	Check item	Failure part
1	M/H	SMP CHKERR(A)	DKA ALL, CHA ALL, TM(2A/2M), CPK(1F), Platter
2	M/H	SMP CHKERR(B)	DKA ALL, CHA ALL, TM(2A/2M), CPK(2G), Platter
3	M/H	SMP BUSOPEN	DKA ALL, CHA ALL, TM(2A/2M), Platter
4	M/H	SMP BUSDISABLE	DKA ALL, CHA ALL, TM(2A/2M), Platter
5	M/H	SMP ABTRST	DKA ALL, CHA ALL, TM(2A/2M), Platter
6	M/L	SMP CHKERR(A)	DKA ALL, CHA ALL, TM(1N/1Z), CPK(1F), Platter
7	M/L	SMP CHKERR(B)	DKA ALL, CHA ALL, TM(1N/1Z), CPK(2G), Platter
8	M/L	SMP BUSOPEN	DKA ALL, CHA ALL, TM(1N/1Z), Platter
9	M/L	SMP BUSDISABLE	DKA ALL, CHA ALL, TM(1N/1Z), Platter
10	M/L	SMP ABTRST	DKA ALL, CHA ALL, TM(1N/1Z), Platter
11	F/H	BSA CHKERR	DKA ALL, CHA ALL, TM(2A/2M), CPK ALL, Platter
12	F/H	BSA BUSOPEN	DKA ALL, CHA ALL, TM(2A/2M), Platter
13	F/H	BSA LIVEINS	DKA ALL, CHA ALL, TM(2A/2M), CPK ALL, Platter
14	F/H	BSA BUSDISABLE	DKA ALL, CHA ALL, TM(2A/2M), Platter
15	F/L	BSA CHKERR	DKA ALL, CHA ALL, TM(1N/1Z), CPK ALL, Platter
16	F/L	BSA BUSOPEN	DKA ALL, CHA ALL, TM(1N/1Z), Platter
17	F/L	BSA LIVEINS	DKA ALL, CHA ALL, TM(1N/1Z), CPK ALL, Platter
18	F/L	BSA BUSDISABLE	DKA ALL, CHA ALL, TM(1N/1Z), Platter

② SM

	NG column		
	SM	Check item	Failure Part
1	SM A	SMP DISABLE	DKA ALL, CHA ALL, TM(2A/2M), Platter
2	SM B	SMP DISABLE	DKA ALL, CHA ALL, TM(1N/1Z), Platter

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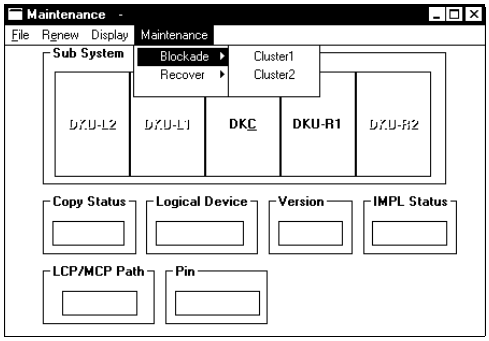
2.18 Blocking of Cluster

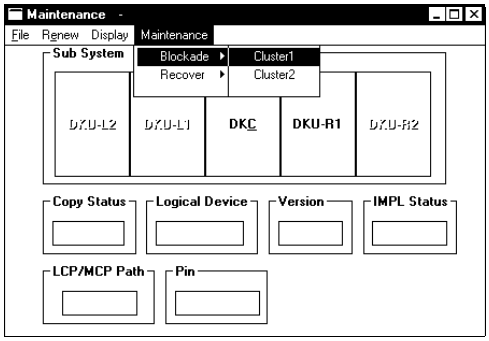
NOTICE
These following procedure is very special. Please ask your TSC if you can do.

(1) Select (CL) [Maintenance].

(2) Select (CL) the [Maintenance] menu in the 'Maintenance' dialog box and select(DR) [Blockade].



(3) Select (DR) the [Cluster-n] to be blocked.



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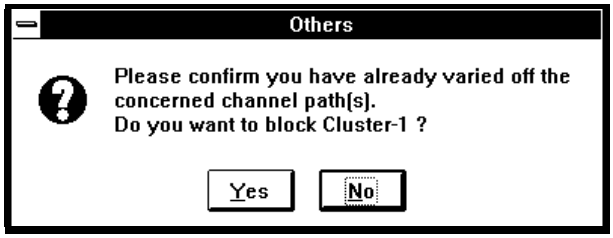
(4) Beginning Block

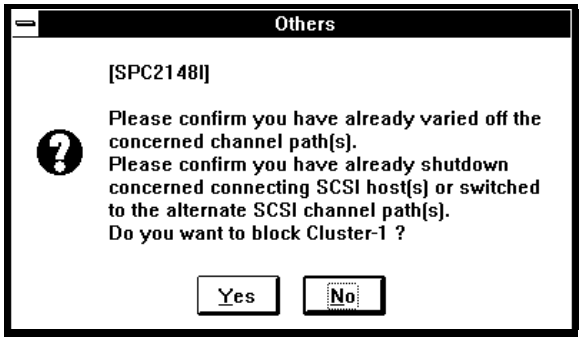
• When only serial or parallel channels, or they are mixed.

Select [Yes] (CL) in response to “Please confirm you have already varied off the concerned channel path(s). Do you want to block xxxxx?”.



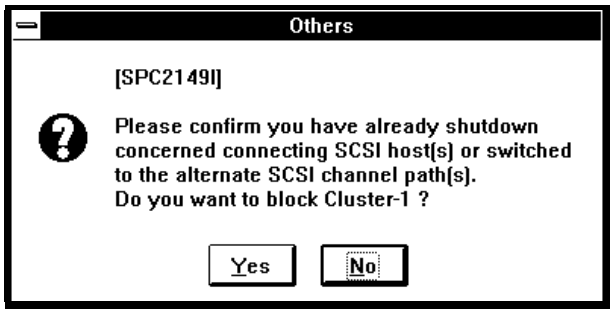
• When SCSI channels and other kinds are mixed.

Select [Yes] (CL) in response to “Please confirm you have already varied off the concerned channel path(s). Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to block xxxxx?”.



• When only SCSI channels are installed.

Select [Yes] (CL) in response to “Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to block xxxxx?”.



Valid xxxxx values are listed below.

• Cluster-1

• Cluster-2

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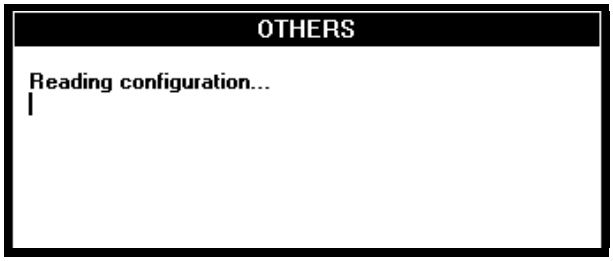
(5) Processing to Cluster block.



"Reading configuration..."
"Blocking cache memory..."
"Blocking shared memory..."
"Blocking Bus..."
"Blocking CHA..."
"Blocking DKA..."
"Blocking CHP..."
"Blocking DKP..."
"Blocking Cluster failure report..."
"Processing to disable the environment check..."

(6) End of Cluster block
Select [OK] (CL) in response to "The blockade has finished. Cluster is blocked.".

(7) Close the 'Maintenance' window.

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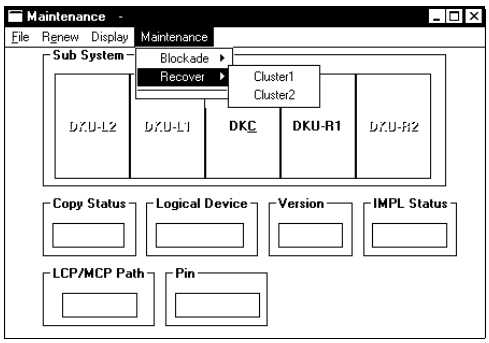
2.19 Recovering of Cluster

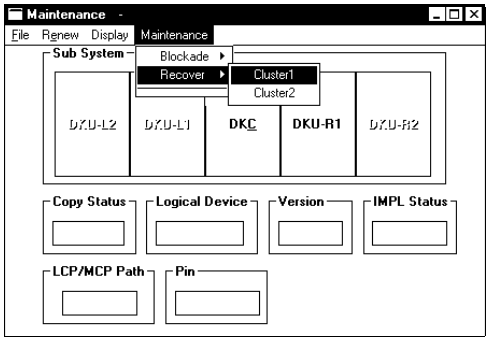
Note : Before recovering of Cluster, please reboot SVP.

(1) Select (CL) [Maintenance]

(2) Select (CL) the [Maintenance] menu in the 'Maintenance' and select(DR) [Recover].



(3) Select (DR) [Cluster-n] to be recovered.



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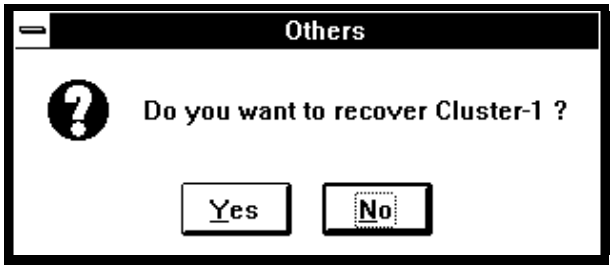
(4) Beginning Recover
Select [Yes] (CL) in response to “Do you want to recover xxxx?”.

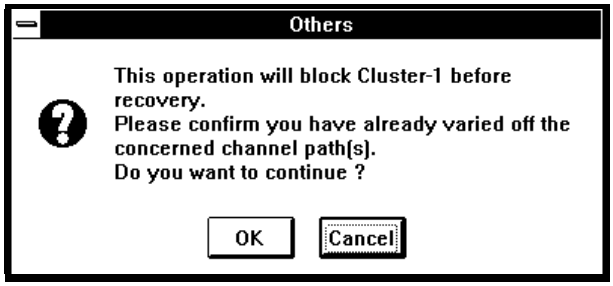


Valid xxxx values are listed below.
• Cluster-1
• Cluster-2

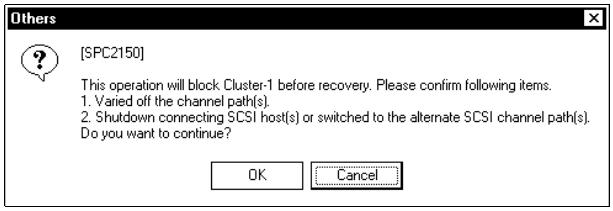
If Cluster 1/2 is fail. Go to (5)
If Cluster 1/2 is blockade. Go to (8)
If Cluster 1/2 is normal. Go to (9)

---

(5) Confirm varied Off-line.
• When only serial or parallel channels, or they are mixed.
Select [OK] (CL) in response to “This operation will block xxxxx before recovery. Please confirm you have already varied off the concerned channel path(s). Do you want to continue?”.



• When SCSI channels and other kinds are mixed.
Select [OK] (CL) in response to “This operation will block xxxxx before recovery. Please confirm following items.
1. Varied off the channel path(s).
2. Shutdown connecting SCSI host(s) or switched to the alternate SCSI channel path(s).
Do you want to continue?”.



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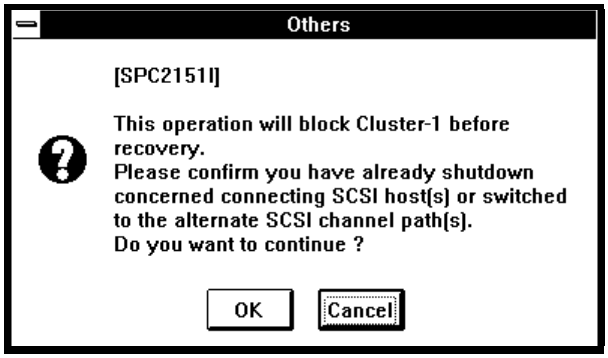
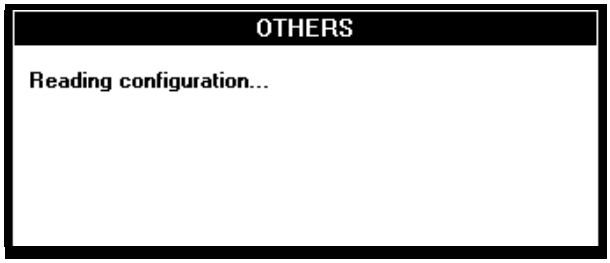
• When only SCSI channels are installed.
Select [OK] (CL) in response to “This operation will block xxxxx before recovery. Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to continue?”.



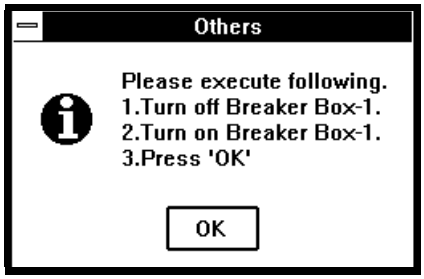
Valid xxxxx values are listed below.
• Cluster-1
• Cluster-2

(6) Processing to Cluster block.

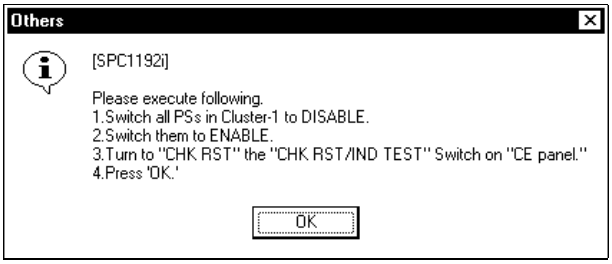


“Reading configuration...”
“Checking status of Cluster...”
“Blocking Cluster...”
“Blocking cache memory...”
“Blocking shared memory...”
“Blocking Bus...”
“Blocking CHA...”
“Blocking DKA...”
“Blocking CHP...”
“Blocking DKP...”
“Blocking Cluster failure report...”
“Processing to disable the environment check...”

(7) When redundant PS is not installed, select [OK] (CL) response to “Please execute following.
1.Turn off Breaker Box-X. 2.Turn on Breaker Box-X.
3.Press ‘OK’.”.



When redundant PS is installed, select [OK] (CL) response to “Please execute following.
1.Switch All PSs in Cluster-X to DISABLE.
2.Switch them to ENABLE. 3.Turn to "CHK RST" the "CHK RST/IND TEST" Switch on "CE panel." 4.Press 'OK.'”.



Valid X values are listed below.
• Cluster-1 --- 1
• Cluster-2 --- 2

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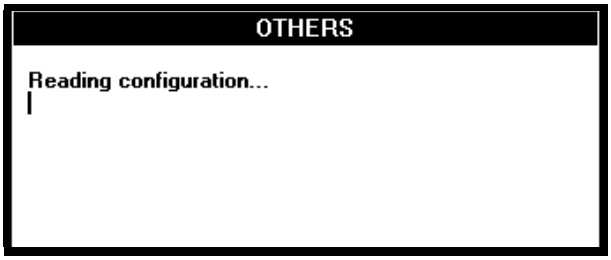
(8) The SVP automatically checks the power supplies to determine if cluster is recoverable.

(9) Processing to Cluster recover.



"Reading configuration..."
"Checking status of Cluster..."
"Restoring Cluster..."
"Checking Power on..."
"Waiting for Power Event...
Usually, several minutes(maximum 15 minutes)"
"Restoring DKA..."
"Restoring DKA (SCSI Path)..."
"Restoring DKP Path..."
"Restoring CHA..."
"Restoring Cluster failure report..."
"Restoring Bus..."
"Running INLINE CUDG..."
"Restoring shared memory..."
"Restoring cache memory..."
"Processing to enable the environment check..."

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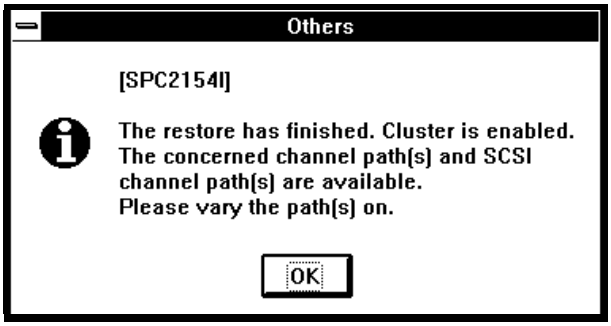
(10) End of Cluster Recover

• When only serial or parallel channels, or they are mixed.

Select (CL) [OK] in response to “The restore has finished. Cluster is enabled. The concerned channel path(s) are available. Please vary the path(s) on.”.

• When SCSI channels and other kinds are mixed.

Select (CL) [OK] in response to “The restore has finished. Cluster is enabled. The concerned channel path(s) and SCSI channel path(s) are available. Please vary the path(s) on.”.



• When only SCSI channels are installed.

Select (CL) [OK] in response to “The restore has finished. Cluster is enabled. The concerned SCSI channel path(s) are available.”.

(11) Close the ‘Maintenance’ window.

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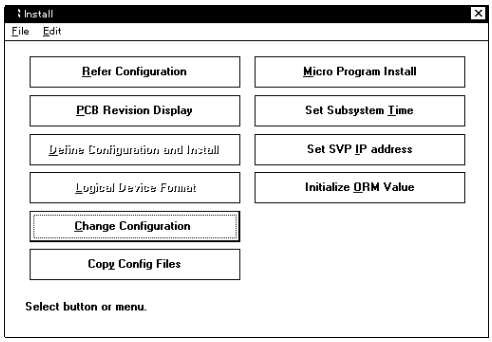
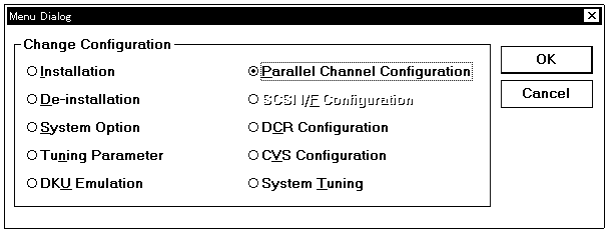
2.20 Parallel Configuration

(1) Select (CL) [Install].

(2) Select (CL) [Change Configuration] in the 'Install' dialog box.



(3) Select (CL) [Parallel Channel Configuration] in the 'Menu Dialog' dialog box and select (CL) [OK].



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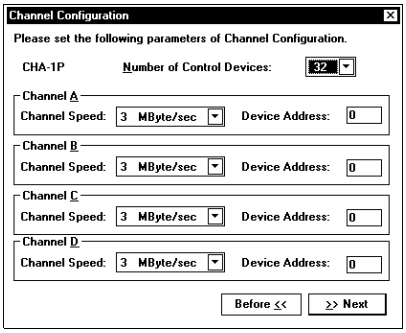
(4) Set parallel channel configuration
Define the device configuration information from 'Channel Configuration'.
After setting up all items, select (CL) [OK].



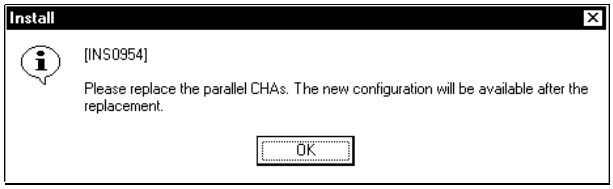
- Change the value of Number of Control Device, if necessary.
- Content in the Channel Speed Combo box can be changed, if necessary.
- Value of the Device Address for each port can be changed, if necessary.

By pressing the [>>Next] button, the screen advances to that for the next PCB. When the current screen is that for the last PCB, the setting is terminated.
By pressing the [Before<<] button, the screen returns to that for the previous PCB. When the current screen is that for the first PCB, the setting is canceled.

---

(5)

Repeat the above operation for all the MCP PCBs installed.



"Loading Configuration..." is displayed.

Please replace the parallel CHAs. The new configuration will be available after the replacement.

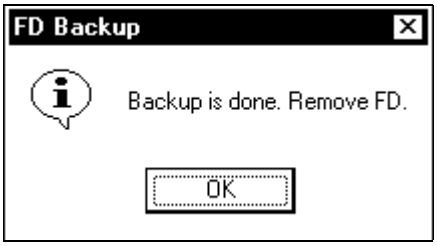
Select (CL) [OK].

---

(6) "Reading subsystem configuration data..." is displayed.
"Please insert config FD in FDD." is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

---

(7) When this procedure is completed, message "Back up is done. Remove FD." is displayed.
Remove the FD, select (CL) [OK].



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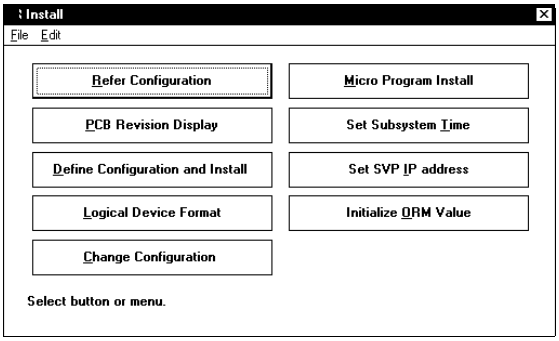
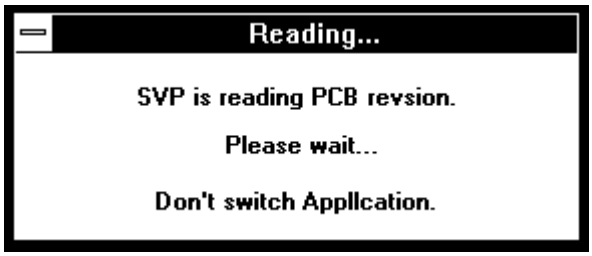
2.22 PCB Revision Display

(1) Select (CL) [Install] in the ‘SVP’ window.

(2) Select (CL) [PCB Revision Display] in the ‘Install’ window.



(3) ‘Reading’ is displayed.



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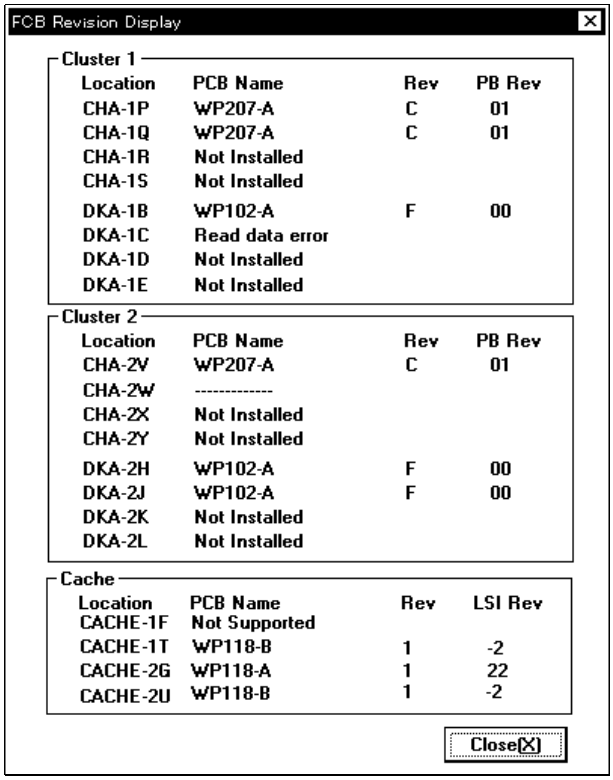
(4) PCB Revisions are displayed.

Meaning of comments in the PCB Name.
'----------' ;
Revision data isn't written on this PCB.
'Not Installed' ;
PCB isn't installed on this location or PCB on this location is failed.
'Communication Error' ;
Communication Error has occurred in reading PCB revision.
'Not Supported' ;
This function is not supported.

A byte code of "LSI Rev" shows "CMC Revision" and "SMC Revision".
[LSI Rev] : X Y
X: CMC Revision
Y: SMC Revision



(5) Select(CL) [Close] in the 'PCB Revision Display' dialog box.

(6) Close the 'Install' window.

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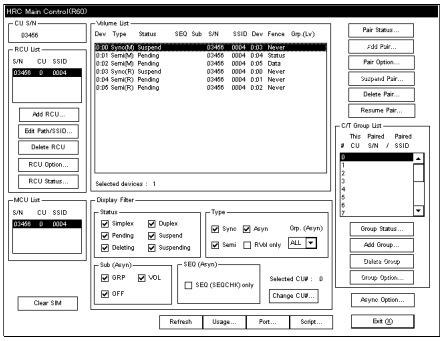
2.23 HRC&HODM Operation

2.23.1 Referring to the Path Status

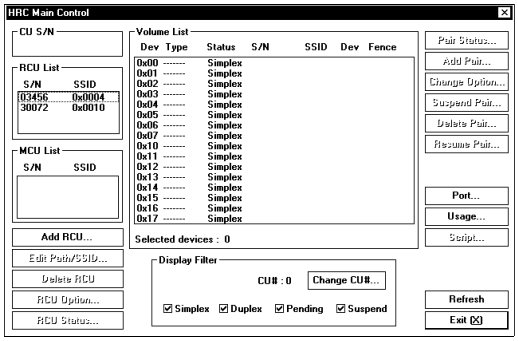
Refer to the MCU-RCU connection status. This operation is possible only from the MCU.

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting an RCU
   Set the CU# corresponding to the CU image address of the subsystem.
   Select an RCU whose path status is desired to be referred to from the RCU list (see the figure) on the HRC (HODM) screen. (Two or more RCUs cannot be selected here.)



(HRC)



(HODM)

3. Displaying the RCU status
   Select (CL) the [RCU Status...] button on the HRC (HODM) screen to display the RCU Status screen.

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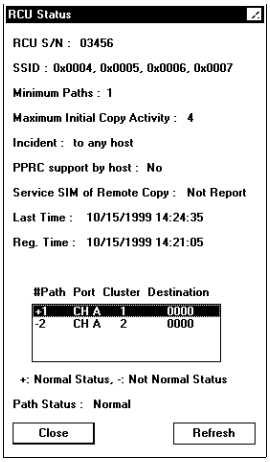
4. Selecting a path to be displayed

The path list is displayed on the RCU Status screen. Select a path whose status is desired to be displayed from the list. (Two or more paths cannot be selected here.)



5. Updating the path status

Select (CL) the [Refresh] button on the RCU Status screen to update the screen display. When updating the screen display, select (CL) the [Refresh] button. When closing the screen, select (CL) the [Close] button.

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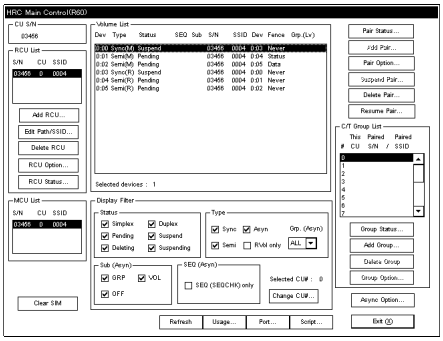
2.23.2 Referring to the Pair Status

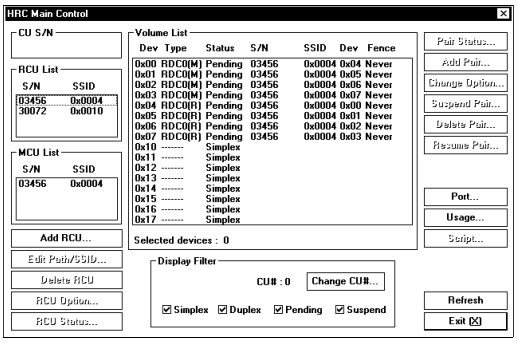
Refer to the object volume pair status. The screen data displayed will differ between when this operation is executed from only the MCU and when it is executed from the RCU.

1. Displaying the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting a volume
   Set the CU# corresponding to the CU image address of the subsystem.
   Select a volume whose status is desired to be referred to from the volume list (see the figure) on the HRC (HODM) screen. (Select only one volumes here although two or more volume can be selected from the list.)

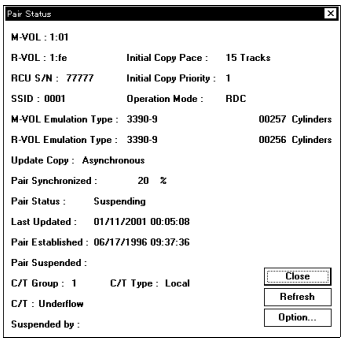


(HRC)



(HODM)

3. Displaying the pair status
   Select (CL) the [Pair Status...] button on the HRC (HODM) screen. The Pair Status screen will appear.
   (The figure is HODM Pair Status screen.)



4. Updating the pair status
   Select (CL) the [Refresh] button on the Pair Status screen. This operation updates the display of the pair status. Press (CL) the [Close] button to close the screen.

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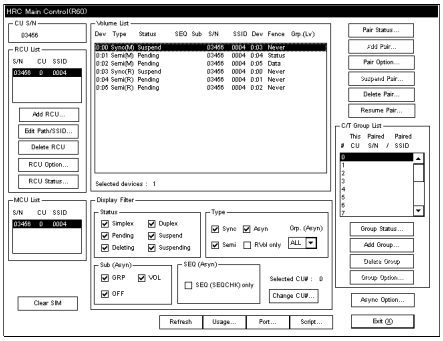
2.23.3 Suspending the Volume Pair(s)

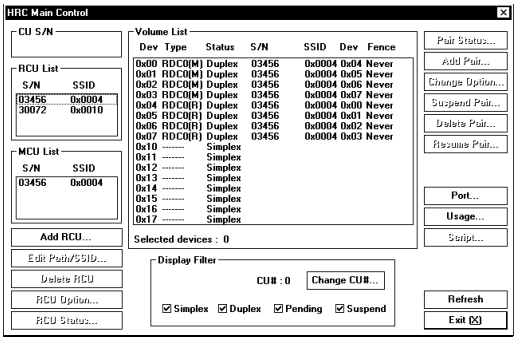
This operation suspends the object volume pair(s). The operation can be executed from both the MCU and the RCU.

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting the volume pair(s)
   Set the CU# corresponding to the CU image address of the subsystem.
   Select the volume pair(s) desired to be suspended from the volume list (see the figure) on the HRC (HODM) screen.

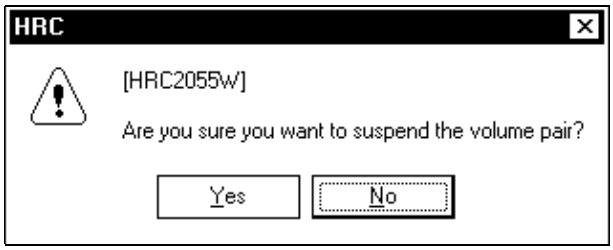


(HRC)



(HODM)

3. Instructing a suspension
   Select (CL) the [Pair Suspend...] button on the HRC (HODM) screen. A confirmation message will appear. To suspend the pair really, press (CL) the [Yes] button. The Suspend Pair screen will appear.



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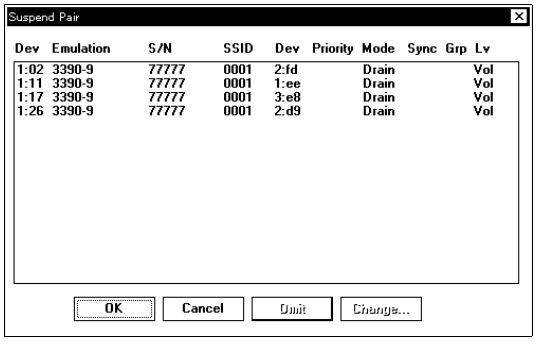
4. Confirm the suspension volume pairs

Confirm the suspension volume pairs that are displayed to the Suspend pair screen and select (CL) [OK] button and go to 6.
If you want to change suspend parameters of HRC pairs, select the volume pairs from the volume list and select (CL) [Change...] button and go to 5.
If you want to omit the volume pair suspension, select the volume pairs from the volume list and select (CL) [Omit] button.

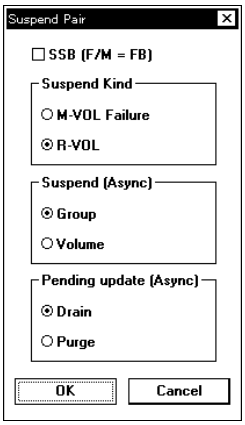


5. Inputting the suspending parameters

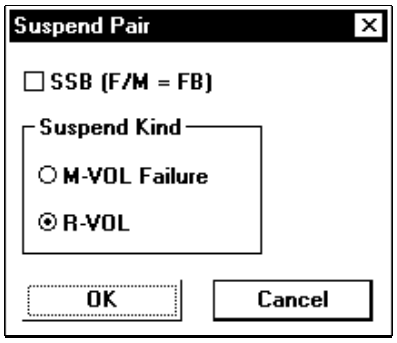
Press (CL) the [OK] button on the Suspend Pair screen to execute the suspending processing.

- SSB [F/M= FB]
  This parameter specifies whether to issue a suspension report with SSB[F/M= FB].
- Suspend type
  This parameter specifies which instruction is to be issued, an M-VOL suspension or an R-VOL suspension. Only “R-VOL” can be specified for asynchronous copy pairs.
- Suspend (Async)
  This parameter specifies the kind of suspension.
  “Group” means all volume pair(s) suspension which are assigned to the same C/T group as the specified volume pair(s).
  “Volume” means only specified volume pair(s) will be suspended.
  This parameter can be specified HRC asynchronous copy volume pairs only. If 2 or more volume pairs are specified, only “Volume” can be specified.
- Pending update (Async)
  This parameter specifies the method of the release of the Record set.
  “Drain” means that the volume pair(s) should be suspended after all pending record set are settled.
  “Purge” means that the volume pair(s) should be suspended even if pending record set remain. The pending record set will be copied when the Resume Pair operated.
  This parameter can be specified HRC asynchronous copy volume pair(s) only.

Notice : If you specify “Drain”, you must stop I/O from the hosts beforehand.



(HRC)



(HODM)

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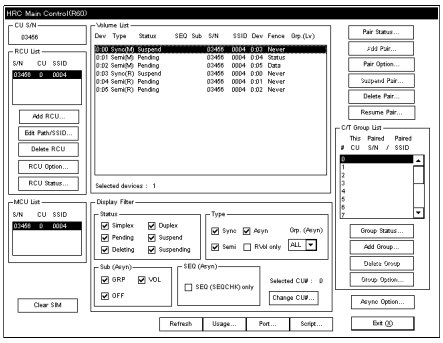
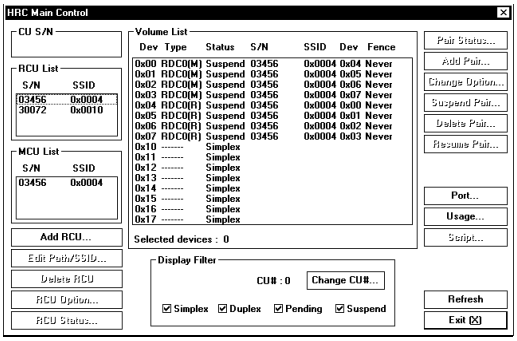
6. Verifying the suspension

Verify if the volume pair selected from the volume list (see the figure) is in the suspended status or not by pressing (CL) the [Refresh] button on the HRC (HODM) screen.



(HRC)



(HODM)

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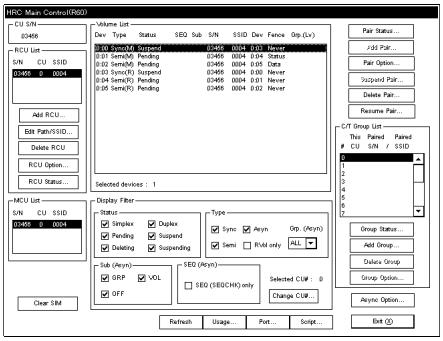
2.23.4 Resuming the Suspended Pair(s)

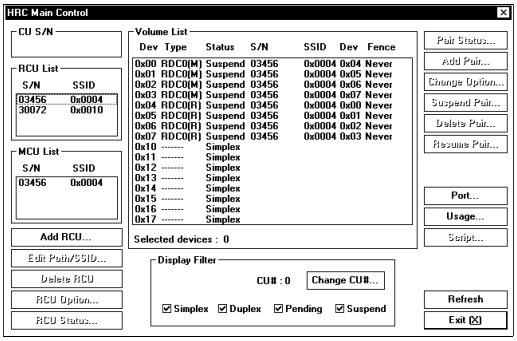
This operation resumes the volume pair(s) suspended. The operation can be performed only from the MCU.

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting the volume pair(s)
   Set the CU# corresponding to the CU image address of the subsystem.
   Select the volume pair(s) desired to be resumed from the volume list (see the figure) on the HRC (HODM) screen to resume it.
   Select the [Resume Pair...] button on the HRC (HODM) screen. The Resume Pair screen will appear.

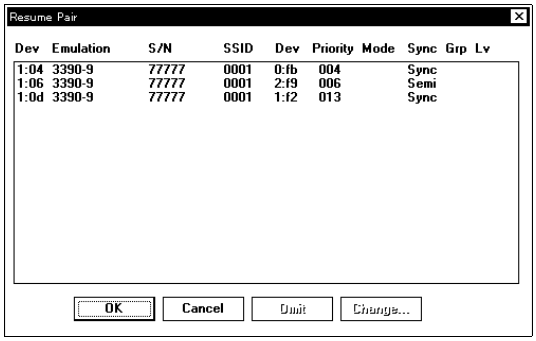


(HRC)



(HODM)

3. Confirm a resume parameter
   Confirm a resume option on the Resume Pair screen.
   Select (CL) the [OK] button on the Resume Pair screen and go to 6.
   If you want to change resume parameter, select the volume pairs from the volume list and select (CL) [Change...] button and go to 4.1 (HRC) or 4.2 (HODM).
   If you want to omit resume pair, select the volume pairs from the volume list and select (CL) [Omit] button.



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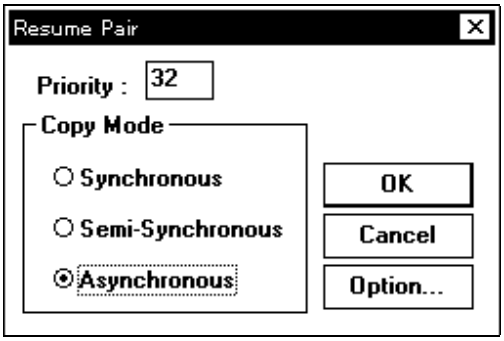
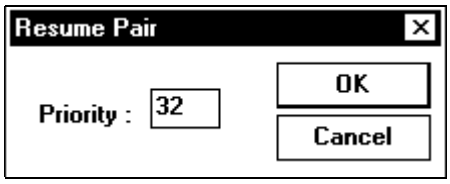
4.1 Inputting the resume parameter (HRC)

On the Resume pair screen, perform the following.
Input the initial copy priority to the Priority.
Select one of the copy mode indicated at Copy Mode.
(If the Copy Mode is “Asynchronous”, it cannot be changed.)
If you want to set pair option, press (CL) [Option...] button and go to 5.
When all operations above are finished, press (CL) the [OK] button (see the figure) and go to 3.



4.2 Inputting the resume parameter (HODM)

On the Resume pair screen, perform the following.
Input the initial copy priority to the Priority.
When all operations above are finished, press (CL) the [OK] button (see the figure) and go to 3.



5. Setting HRC pair option

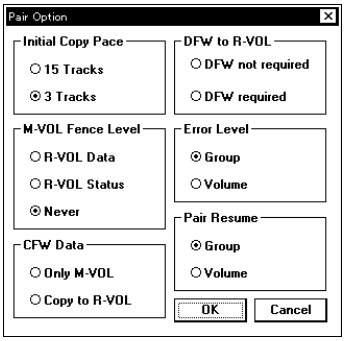
On the Pair Option screen, perform the following.
Set one of the following in Initial Copy Pace.
- 15 Tracks
- 3 Tracks

Set one of the following in M-VOL Fence Level.
(Fixed “Never” when asynchronous copy pair resuming)
- R-VOL Data
- R-VOL Status
- Never

Set one of the following in Error Level.
(Effective only asynchronous copy pair.)
- Group
- Volume

Set one of the following in Pair Resume.
(Effective only asynchronous copy pair.)
- Group
- Volume

If 2 or more volumes are specified, you can specify “Volume” only.
When all above operation are finished, press (CL) [OK] button. Then go to 4.1.



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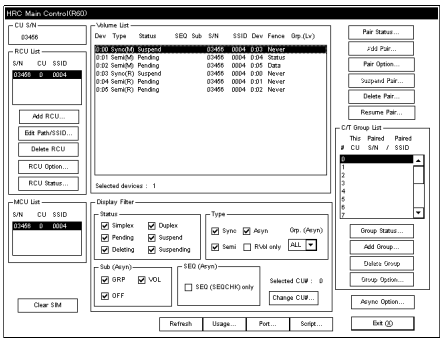
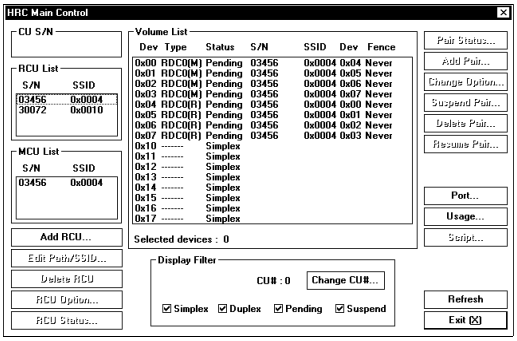
6. Verifying the resumption

Verify if the volume pair(s) selected from the volume list (see the figure) is in the pending (or duplex) status by pressing (CL) the [Refresh] button on the HRC (HODM) screen.



(HRC)



(HODM)

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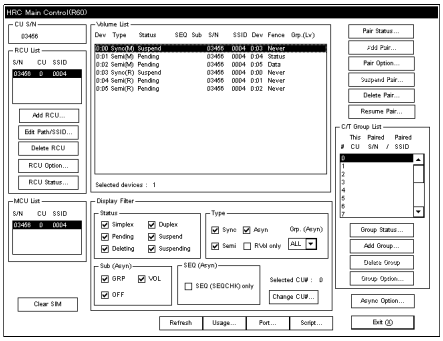
2.23.5 Deleting the Existing HRC Pair(s)

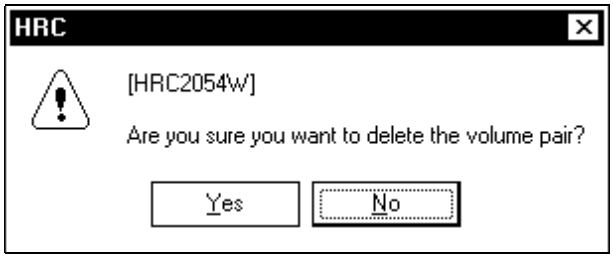
This operation deletes the HRC pair(s). The operation can be performed from both the MCU and the RCU.

1. Display the HRC screen.
   Select (CL) [HRC] in the 'SVP' window.

2. Selecting the volume pair(s)
   Set the CU# corresponding to the CU image address of the subsystem.
   Select the volume pair(s) desired to be deleted from the volume list (see the figure) on the HRC screen.



3. Instructing the deletion
   Select (CL) the [Delete Pair...] button on the HRC screen. The confirmation message will appear. To delete the pair(s) really, press (CL) the [Yes] button. Then Delete Pair screen will appear.



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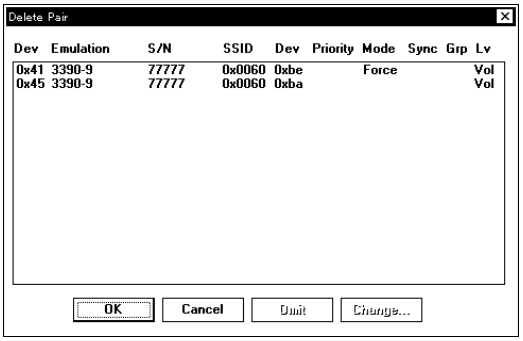
4. Confirm the deletion volume pairs

Confirm the deletion volume pairs that are displayed to the Delete pair screen and select (CL) [OK] button and go to 6.
If you want to change delete parameters, select the volume pairs from the volume list and select (CL) [Change...] button and go to 5.
If you want to omit the volume pair deletion, select the volume pairs from the volume list and select (CL) [Omit] button.



5. Inputting a deleting parameter

Press (CL) the [OK] button on the Delete Pair screen to execute the deletion and go to 4.

• Delete Pair by Force

This parameter deletes the selected pair(s) forcibly regardless of the status of the communication between MCU and RCU.

• Delete All Pairs

By using this parameter, you can delete all pairs (This operation could not be done against the asynchronous pairs.) In the step (2), you can use this option when you select one volume (it is not asynchronous copy) and select Delete Pair by Force.

Set one of the following in Delete. (Effective only asynchronous copy pair.)

• C/T
• Group
• Volume

“C/T” means all volumes deletion which displayed in “Sub” column of Volume List of HRC Main Control screen as “GRP”.

“C/T” can be specified only for undermentioned conditions :

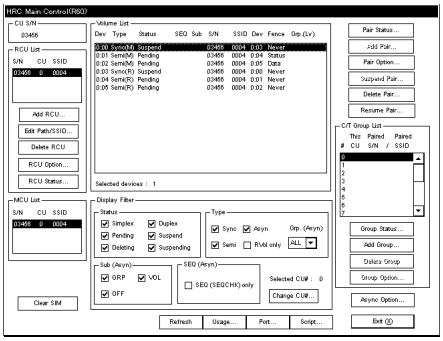
• Only one volume is specified.
• The specified volume is R-VOL.
• The specified volume is neither “Suspending” status nor “Deleting” status.

“Group” means all volume pair(s) deletion which is(are) assigned to the same C/T group as the specified volume pair(s).

“Volume” means only specified volume pair(s) will be deleted.

6. Verifying the pair(s) deleted

Verify if the volume pair(s) selected from the volume list (see the figure) is(are) in the simplex status by pressing (CL) the [Refresh] button on the HRC screen.



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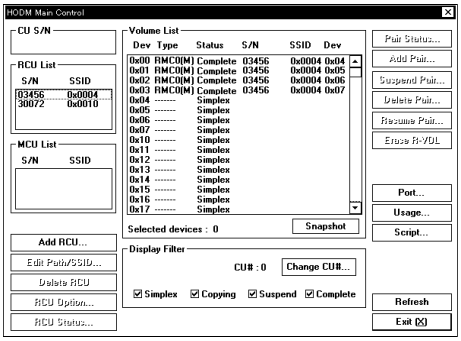
2.23.6 Deleting the Existing HODM Pair(s)

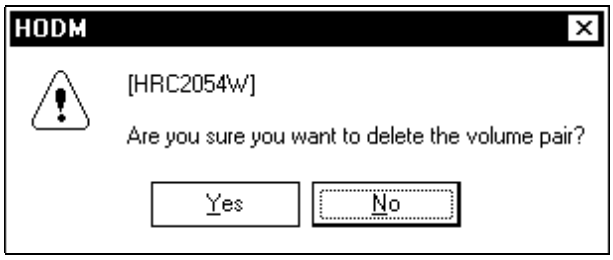
This operation deletes the HODM pair(s). The operation can be performed only from the MCU.

1. Display the HODM screen.
   Select (CL) [HODM] in the 'SVP' window.

2. Selecting the volume(s)
   Set the CU# corresponding to the CU image address of the subsystem.
   Select the volume pair(s) desired to be deleted from the volume list (see the figure) on the HODM screen.



3. Instructing a deletion
   Press (CL) the [Delete Pair...] button on the HODM screen. The confirmation message will appear. To delete the pair(s) really, press (CL) the [Yes] button. The Delete Pair screen will appear.



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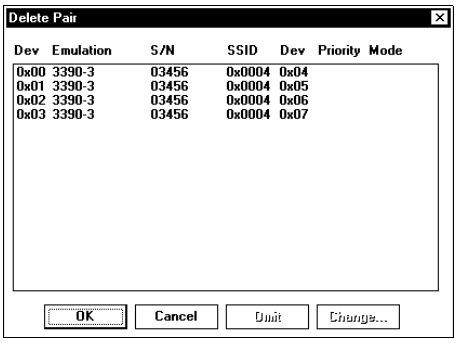
4. Confirm the deletion volumes

Confirm the deletion volumes that are displayed to the Delete pair screen and select (CL) [OK] button and go to 6.
If you want to change delete parameters, select the volumes from the volume list and select (CL) [Change...] button and go to 5.
If you want to omit the volume deletion, select the volumes from the volume list and select (CL) [Omit] button.

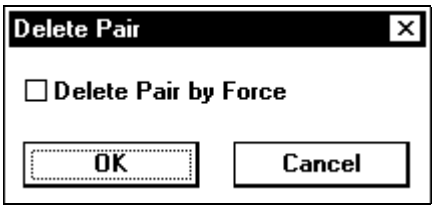


5. Inputting a deleting parameter

Press (CL) the [OK] button on the Delete Pair screen to execute the deletion and go to 4.

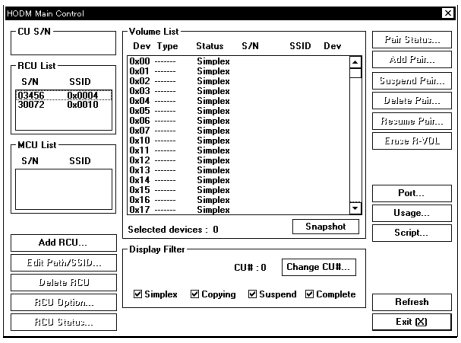
- Delete by Force

This parameter deletes the selected pair(s) forcibly regardless of the status of the communication between MCU and RCU.



6. Verifying the pair(s) deleted

Verify if the volume(s) selected from the volume list (see the figure) is(are) in the simplex status by pressing (CL) the [Refresh] button on the HODM screen.



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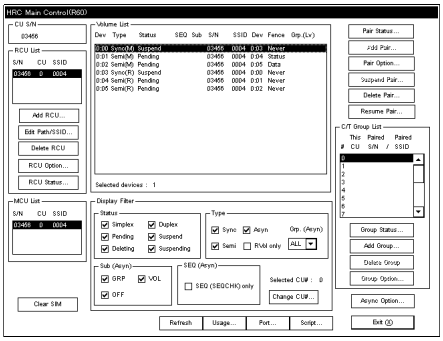
2.23.7 Deleting an RCU Registered

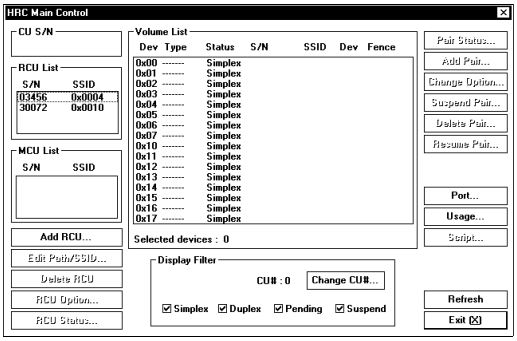
This function deletes an RCU. The function can be executed only from the MCU.

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting an RCU
   Set the CU# corresponding to the CU image address of the subsystem.
   Select an RCU desired to be deleted from the RCU list (see the figure) on the HRC (HODM) screen. (Only one RCU can be selected here.)

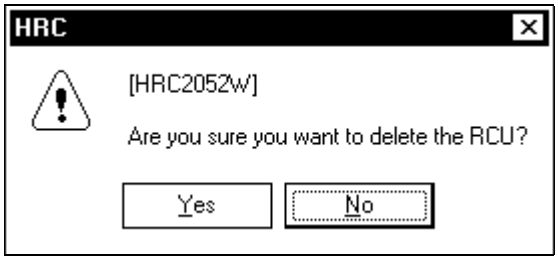


(HRC)



(HODM)

3. Instructing the deletion
   Select (CL) the [Delete RCU] button on the HRC (HODM) screen. The confirmation message will appear. To delete the RCU really, press (CL) the [Yes] button.



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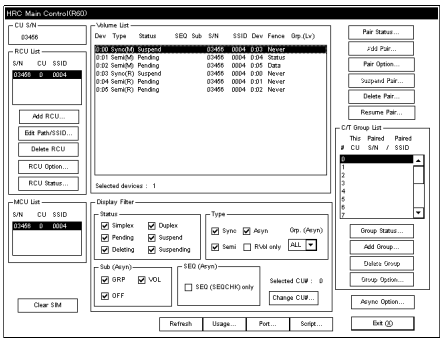
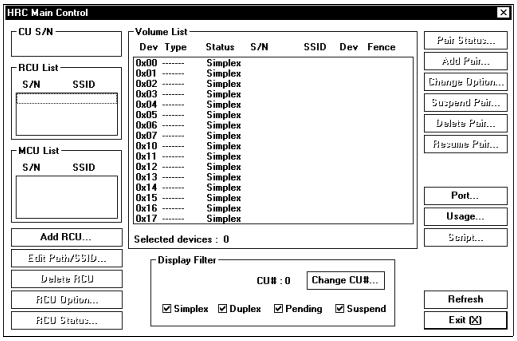
4. Verifying the RCU deletion

Press (CL) the [Refresh] button on the HRC (HODM) screen to verify if the RCU selected from the RCU list (see the figure) is deleted.



(HRC)



(HODM)

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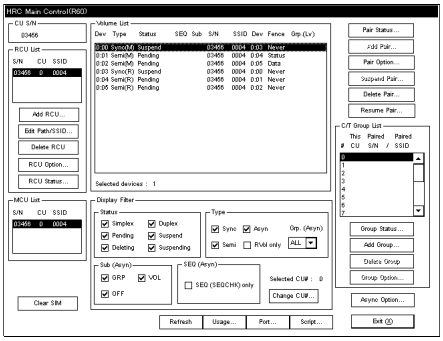
2.23.8 Adding the Path(s) to the RCU

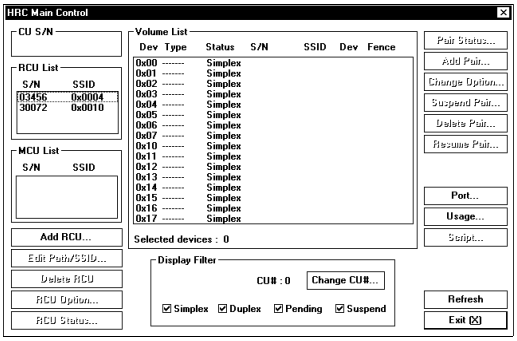
This operation adds the path(s) to the RCU already registered. The operation can be performed from both the MCU and the RCU.

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting an RCU
   Set the CU# corresponding to the CU image address of the subsystem.
   Select an RCU the number of paths to which is desired to be increased from the RCU list (see the figure) on the HRC (HODM) screen. (Only one RCU can be selected here.)

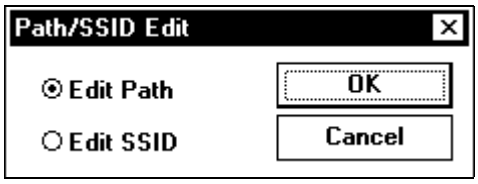


(HRC)



(HODM)

3. Selecting a function
   Select (CL) the [Edit Path/SSID...] button on the HRC (HODM) screen.
   The Path/SSID Edit screen will appear.
   Select (CL) the [Edit Path] radio button then press (CL) the [OK] button on the screen.



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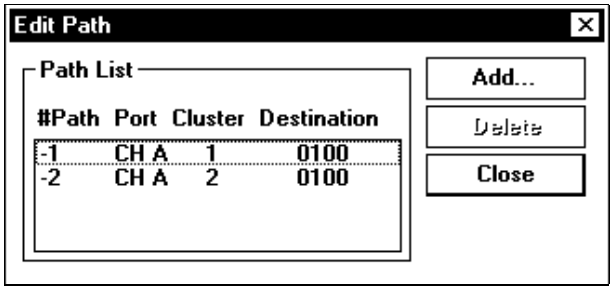
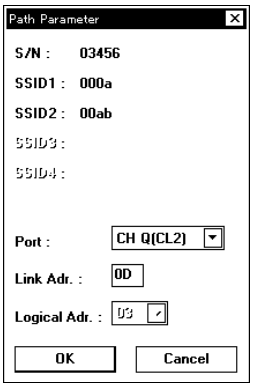
4. Instructing the addition of the path(s)
The Edit Path screen will appear. Then press (CL) the [Add...] button on the screen.

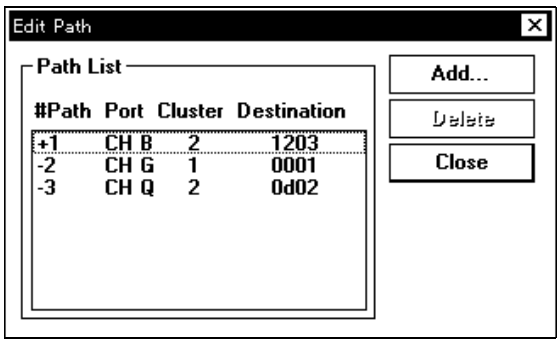


5. Inputting the parameters
When the Path Parameter screen appears, input the necessary parameters and press (CL) the [OK] button.
- Port
  Specify the RCP port.
- Destination link address
  Specify the RCU side link address. When the ESCD is to be used, input the RCU-connected link address. When the ESCD is not used, input '00'.
- Logical address



HRC:
The Logical address can not be specified.
HODM:
Please select a logical address which are defined as CU images (00 through 03) in the RCU.
(Notes) DKC210I : It has only #00 as CU image.
DKC80I-3 : When the RCU is MPSD, select “00”. When the RCU is SPSD, select “00” or “01” according to the device position.
Other DKC : There are some DKCs that have four CU images (00 through 03).). In this case, please select corresponding logical address according to the device position.

6. Verifying the path added
Make sure on the Edit Path screen that the specified path has been added correctly.



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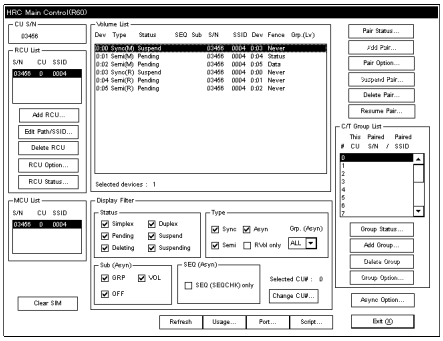
2.23.9 Reducing the Path(s) from the RCU

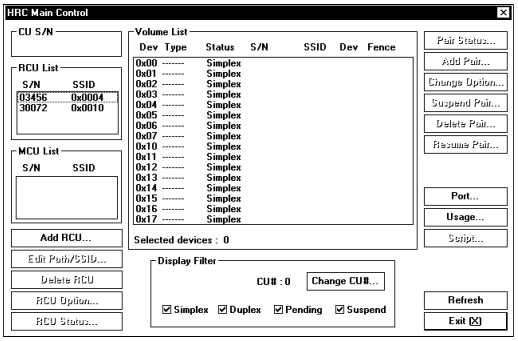
This operation reduces the number of paths connected to an RCU registered already.

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting an RCU selection
   Set the CU# corresponding to the CU image address of the subsystem.
   Select an RCU the number of paths to which is desired to be reduced from the RCU list (see the figure) on the HRC (HODM) screen. (Only one RCU can be selected here.)

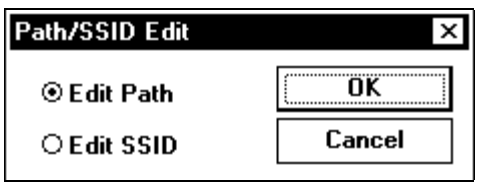


(HRC)



(HODM)

3. Instructing the reduction of the path(s)
   Select (CL) the [Edit Path/SSID...] button on the HRC (HODM) screen. The Edit Path/SSID screen will appear.
   Select (CL) the [Edit Path] radio button then press (CL) the [OK] button on the screen.



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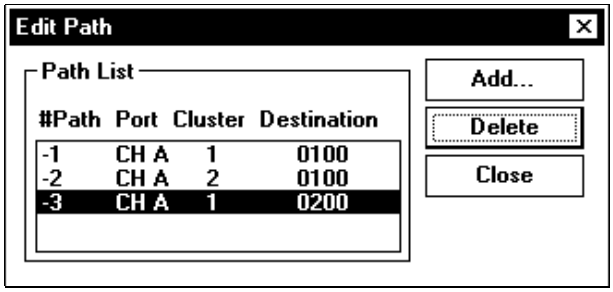
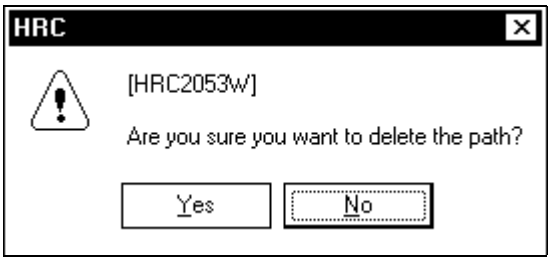
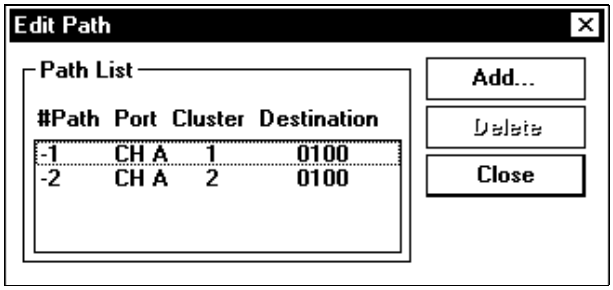
4. Selecting a path to be deleted
Select a path desired to be deleted from the path list displayed on the Edit Path screen and press (CL) the [Delete] button.



5. Confirmation message
When the confirmation message appears, confirm the path to be deleted and press (CL) the [Yes] button.



6. Verifying the path deleted
Make sure on the Edit Path screen that the path specified has been deleted correctly.



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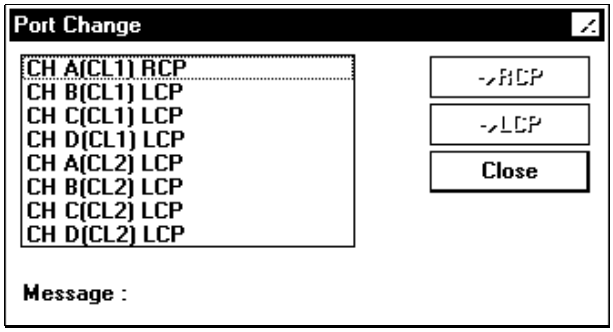
2.23.10 Changing the Port Type

This operation specifies which port type is selected, LCP (to connect to the host) or RCP (to connect to the RCU).

1. Display the HRC (HODM) screen.
   Select (CL) [HRC] ([HODM]) in the 'SVP' window.

2. Selecting the processing to change the port type
   Select (CL) the [Port...] button on the on the HRC (HODM) screen to display the Path Change screen.



3. Instructing the port change
   When the port list and the port types are displayed in the list box on the Path Change screen, select one or more ports whose type(s) is(are) to be changed.
   To select LCP for the port type, press the [-> LCP] button. Then go to step 4.
   To select RCP for the port type, press the [-> RCP] button. Then go to step 5.

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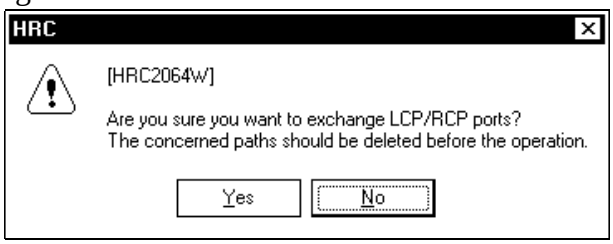
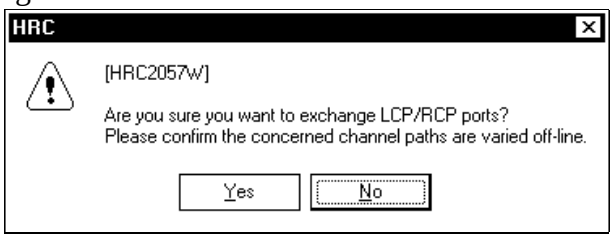
4. Confirmation message and indication of executing status

When the confirmation message appears, confirm the port(s) whose type(s) is(are) to be changed again. If it is correct, press (CL) the [Yes] button.
Status of execution is displayed in the "Message" field on the Port Change screen.
Go to step 6.



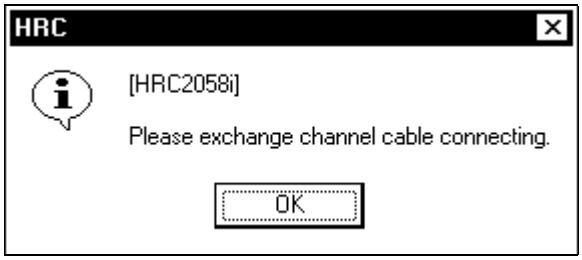
5. Confirmation message and indication of executing status

When the confirmation message appears, confirm the port(s) whose type(s) is(are) to be changed again. If it is correct, press (CL) the [Yes] button.
Status of execution is displayed in the "Message" field on the Port Change screen.



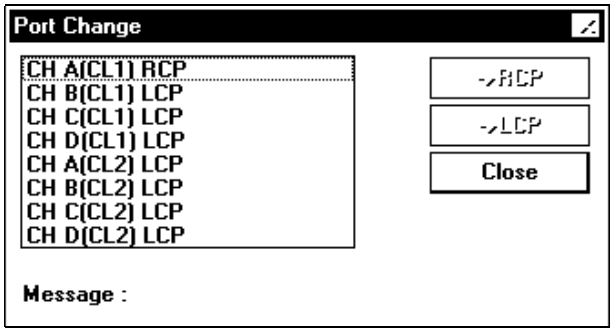
6. Indication message

After exchanging channel cable connecting, press (CL) the [OK] button.



7. Verifying port change

After the change is finished, make sure on the Port Change screen that the type(s) of the specified port(s) has(have) been changed correctly.



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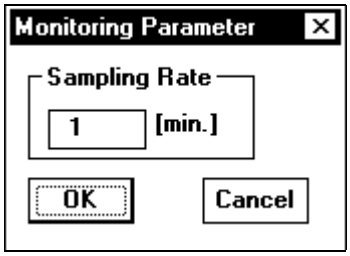
2.23.11 Displaying HRC/HODM Operation Status

This operation displays a graphic indication of the HRC/HODM operation status.

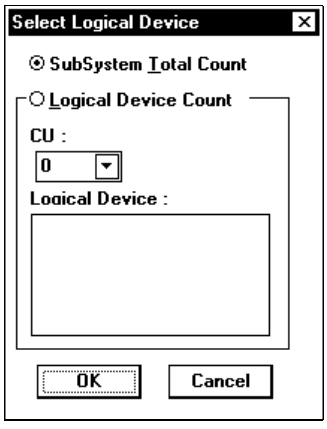
1. Display the HRC (HODM) screen.

   To display HRC operation of some devices:
   Select (CL) [HRC] in the 'SVP' window.
   To display HODM operation of some devices:
   Select (CL) [HODM] in the 'SVP' window.
   To display HRC and HODM operation of Subsystem:
   Select (CL) either [HRC] or [HODM] in the 'SVP' window.

2. Setting a sampling rate
   Press (CL) the [Usage...] button on the on the HRC (HODM) screen to display the Sampling Rate Setting screen. Then, input a sampling rate and press (CL) the [OK] button. (Sampling rate can be set within 1 to 546 minutes in steps of 1 minute.)



3. Selecting an object device
   When the valid logical device list is displayed in the list box on the Select Logical Device screen, select a logical device and press (CL) the [OK] button. To display the information of the whole subsystem, select "Sub System".



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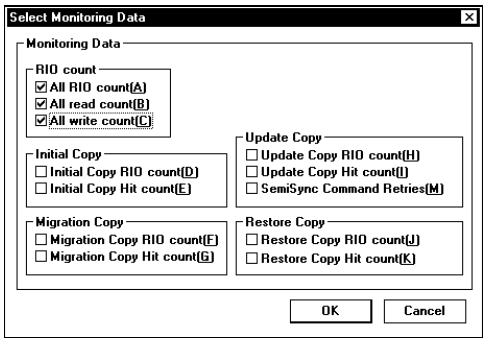
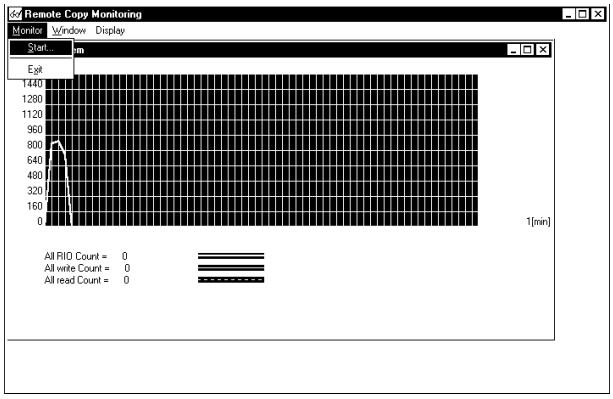
4. Selecting information desired to be acquired

Select one or more data items on the Select Monitoring Data screen, then press (CL) the [OK] button.



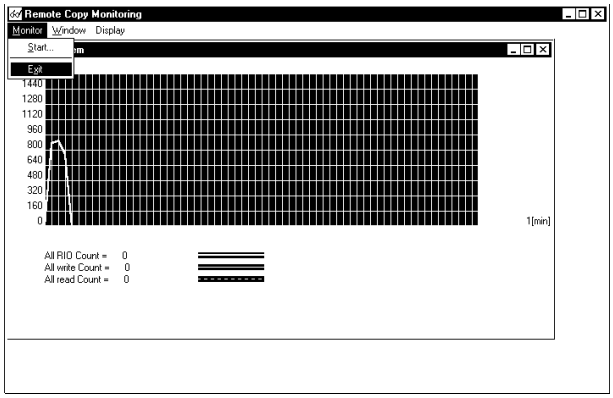
5. Displaying the operation information

The Operation Information Display window appears. To view operation information of other devices, select Monitor-Start from the menu and go to step 3. (Two or more screens can be displayed at a time.)



6. Terminating the operation information display

To terminate the operation information display, select Monitor-Exit to return to the HRC (HODM) screen.



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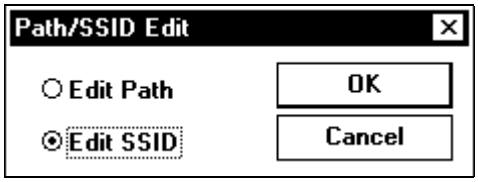
2.23.12 Adding the SSID(s) to the RCU

This operation adds the SSID(s) to the RCU already registered. The operation can be performed from both the MCU and the RCU.

1. Selecting an RCU
   Set the CU# corresponding to the CU image address of the subsystem.
   Display the HRC (HODM) screen and select (CL) an RCU from RCU List which is desired to be increased SSIDs. (Only one RCU can be selected here.)

2. Selecting a function
   Select (CL) the [Edit Path SSID...] button on the HRC (HODM) screen.
   The Path/SSID Edit screen will appear.

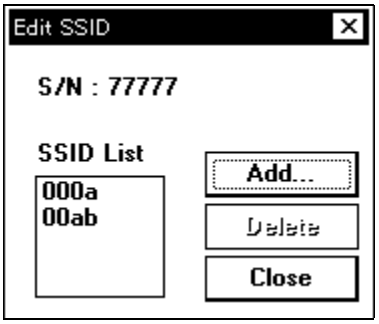
   Select (CL) the [Edit SSID] radio button then press (CL) the [OK] button on the screen.



3. Confirming the number of SSID(s)
   The Edit SSID screen will appear.

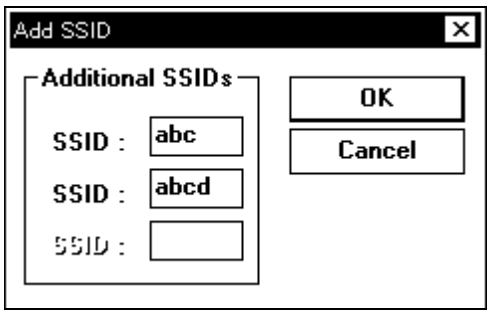
   Press (CL) [Add] button on the screen.
   (See the figure.)

   Note: If 4 SSIDs are registered on the RCU, you can not add a SSID further. ([Add...] button will be not active.)



4. Adding the SSID(s) to the RCU
   The Add SSID screen will appear.

   Input 4-digit hexadecimal SSID(s) number in SSID, then press (CL) [OK] button.



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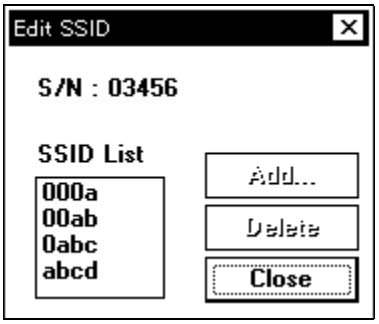
5. Verifying the SSIDs added

Make sure on the Edit SSID screen that the specified SSIDs have been added correctly.



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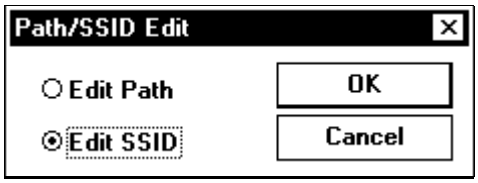
2.23.13 Reducing the SSID(s) from the RCU

This operation reduces the SSID(s) from the RCU already registered.

1. Selecting an RCU
   Set the CU# corresponding to the CU image address of the subsystem.
   Display the HRC (HODM) screen and select (CL) an RCU from RCU List which is desired to be reduced SSIDs. (Only one RCU can be selected here.)

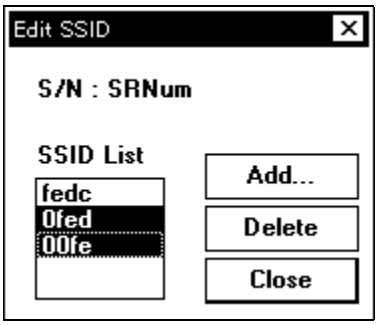
2. Selecting a function
   Select (CL) the [Edit Path SSID...] button on the HRC (HODM) screen.
   The Path/SSID Edit screen will appear.

   Select (CL) the [Edit SSID] radio button then press (CL) the [OK] button on the screen.

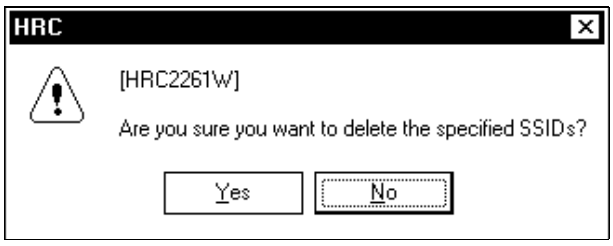


3. Selecting SSID(s) to be deleted
   The Edit SSID screen will appear.

   Select SSIDs desired to be deleted from the SSID List displayed on the Edit SSID screen and press (CL) [Delete] button (See the figure).



4. Confirmation message
   When the confirmation message appears, confirm the SSIDs to be deleted and press (CL) the [Yes] button.



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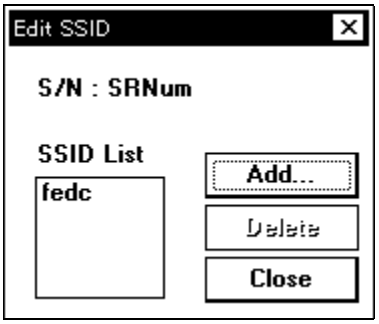
5. Verifying the SSIDs deleted

Make sure on the Edit SSID screen that the specified SSIDs have been deleted correctly.



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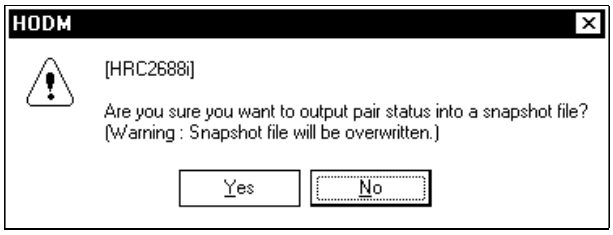
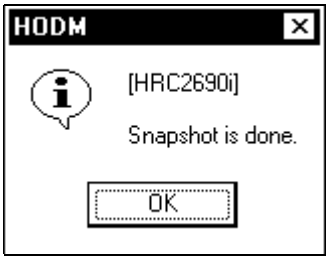
2.23.14 HODM Snapshot

This operation creates or overwrites a text file, in which HODM pairs status is described.

1. Confirmation message
   Select (CL) the [Snapshot] button on the HODM screen.
   The confirmation message will appear.
   If you want to create or overwrite a snapshot file, press (CL) the [Yes] button.



2. End of snapshot
   After HODM snapshot is done, press (CL) [OK] button, and confirm the contents of snapshot file (C:\DKC200\DUMP\SVP\HODMSNAP.TXT).



(Note: All HODM pairs whose status are “Complete” or “Suspend” are listed.)

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A sample snapshot file is as follows:

(1)
<Snapshot at 08/04/98 09:43:46>

(2) S/N	(3) CU	(4) SSID	(5) M-VOL	(6) R-VOL	(7) Emulation	(8) Prio	(9) Status	(10) Establish		(11) Update	
SRNum	1	0001	04	fb	3390-9	004	Suspend	06/16/1998	09:37:36	06/20/1998	00:05:08
SRNum	1	0001	3e	c1	3390-9	062	Complete	06/16/1998	09:37:50	06/19/1998	01:15:17
77777	3	000a	82	7d	3390	130	Suspend	06/17/1998	11:04:36	07/01/1998	21:39:32
77777	3	000a	84	7b	3390	132	Complete	06/17/1998	11:51:36	08/03/1998	22:00:05

(1) The time you have done the snapshot.
(2) “S/N” means the RCU sequence number of the volume shown as “M-VOL”.
(3) “CU” means the CU# of the volume shown as “M-VOL”.
(4) “SSID” means the SSID (hexadecimal) of the RCU shown as “S/N”.
(5) “M-VOL” means the M-VOL# (hexadecimal).
(6) “R-VOL” means the R-VOL# (hexadecimal).
(7) “Emulation” means the device emulation type of the volume shown as “M-VOL”.
(8) “Prio” means the copy priority of the volume shown as “M-VOL”.
(9) “Status” means the pair status of the volume shown as “M-VOL”.
(10) “Establish” means the pair establish time of the volume shown as “M-VOL”.
(11) “Update” means the last update time of the volume shown as “M-VOL”.

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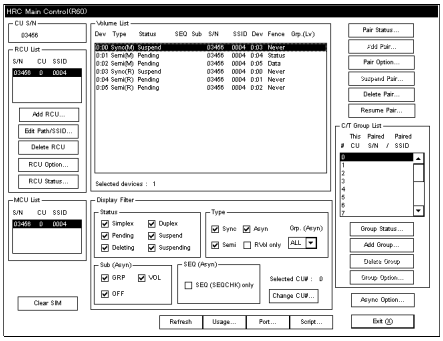
2.23.15 Referring the C/T group status

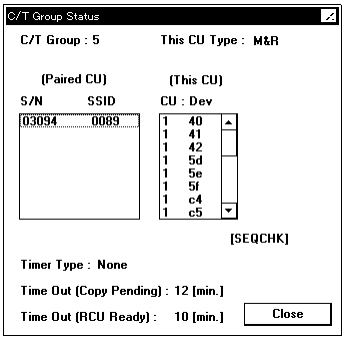
This operation shows the specified C/T group status.

1. Display the HRC screen
   Select (CL) [HRC] in the 'SVP' window.

2. Selecting a C/T group
   Select a C/T group whose status is desired to be referred to from the C/T Group List (see the figure) on the HRC screen. (Only one C/T group can be selected here.)



3. Confirming the C/T group status
   Select (CL) the [Group Status...] button on the HRC screen.
   The C/T Group Status screen will appear.
   Press (CL) the [Close] button to close the screen.



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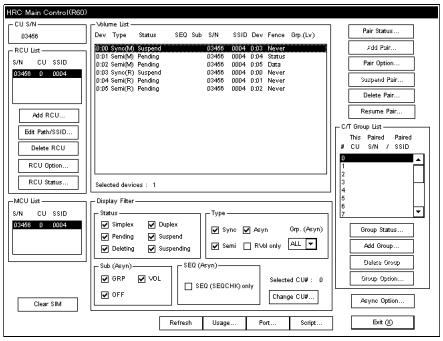
2.23.16 Releasing the using C/T group

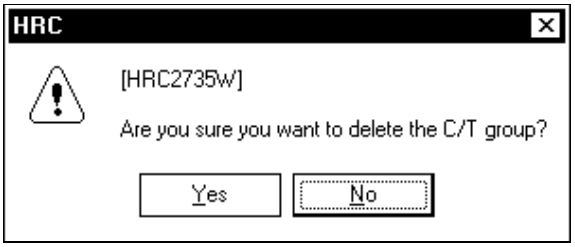
This operation releases the specified C/T group already used. This operation can be performed only from the MCU.

1. Display the HRC screen
   Select (CL) [HRC] in the 'SVP' window.

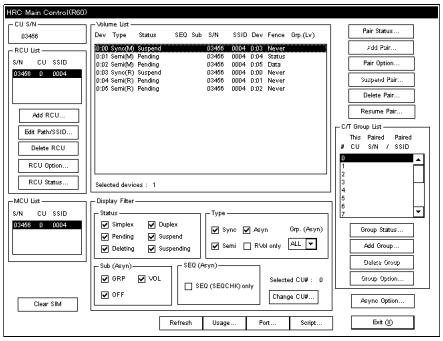
2. Selecting a C/T group
   Select a C/T group desired to be released from the C/T Group List (see the figure) on the HRC screen. (Only one C/T group can be selected here.)



3. Instructing a release
   Press (CL) the [Delete Group] button on the HRC screen. The confirmation message will appear. To release the C/T group really, press (CL) the [Yes] button.



4. Verifying the C/T group released
   Verify if the C/T group selected from C/T Group List (see the figure) is displayed as blank.



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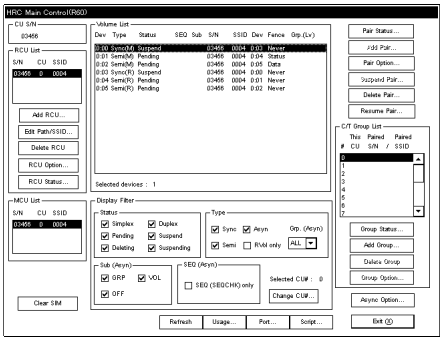
2.23.17 Changing the using C/T group parameters

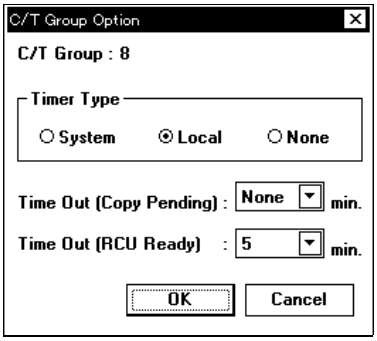
This operation changes the specified C/T group parameters which already used.
This operation can be performed only from the MCU.

1. Display the HRC screen
   Select (CL) [HRC] in the 'SVP' window.

2. Selecting a C/T group
   Select a C/T group desired to be changed from the C/T Group List (see the figure) on the HRC screen. (Only one C/T group can be selected here.)



3. Inputting the C/T group parameters
   Press (CL) [Group Option...] button on the HRC screen. The C/T Group Option screen will appear.
   On the C/T Group Option screen, perform the following.
   Select the timer type of the C/T indicated at Timer Type.
   Select maximum delay time of update data from combo-box at Time Out (Copy Pending).
   Select maximum waiting time for the RCU gets ready from combo-box at Time Out (RCU Ready).
   When all the above operations are finished, press (CL) the [OK] button.



4. Verifying the C/T group status
   Open the C/T Group Status screen, then verify the C/T group parameters are correctly changed. (Refer to 2.23.15)

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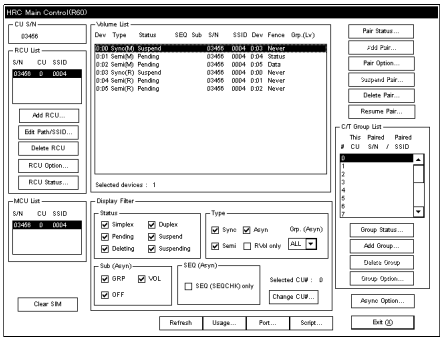
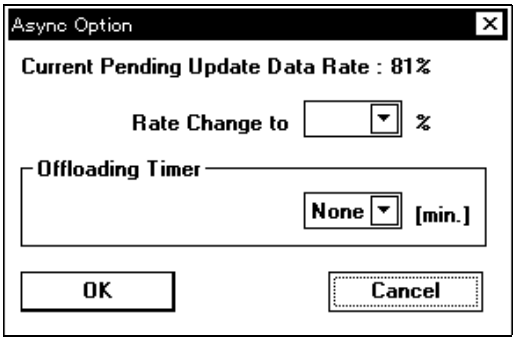
2.23.18 Changing the asynchronous option parameters

This operation changes the asynchronous option parameters.

1. Display the HRC screen
   Select (CL) [HRC] in the 'SVP' window.
   The HRC screen will appear.
   Press (CL) the [Async Option...] button on the HRC screen.



2. Inputting the asynchronous option parameters
   The Async Option screen will appear.
   On the Async Option screen, perform the following.
   If there is necessity for changing the occupation rate of pending update data among the Record Set, select a number of rate from combo-box at Rate Change to.
   (Note: If there is a C/T group used by HORC, the rate cannot be changed.)
   Select monitoring time for the Record Set from combo-box indicated at Offloading Timer.
   When all the above operations are finished, press (CL) the [OK] button.



3. Verifying the asynchronous option parameters
   Open the Async Option screen again, then verify the occupation rate indicated at Current Pending Update Data Rate is correct.
   Verify the monitoring time indicated at Offloading Timer is correct, too.

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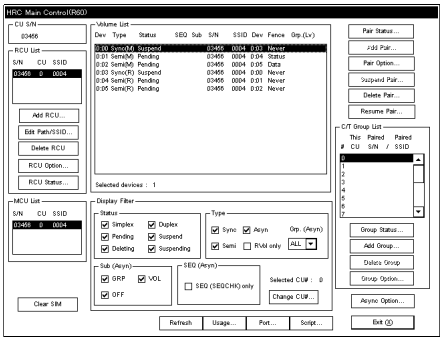
2.23.19 Clear reported SIM

This section is described how to clear reported SIM.

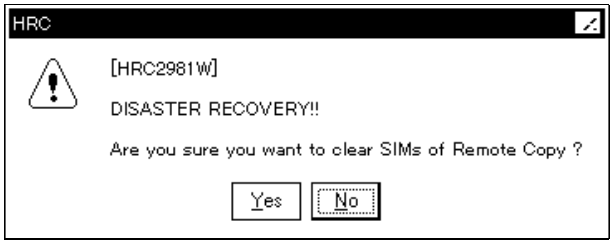
1. Open HRC screen
   Select (CL) [HRC] in the SVP window.

2. Clear reported SIM
   Select (CL) [Clear SIM] in the HRC window.



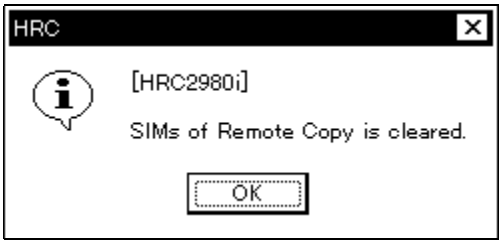
3. Execute
   Select (CL) [Yes] in the confirmation message if you want to clear.

   Notice: This operation clears HODM/HORC SIM(s) too.



4. End message
   Select (CL) [OK] in the end message.
   When SIM is cleared, the SUBSYSTEM MESSAGE lamp of the SYSTEM PANEL is turned off.

   Notice: The SUBSYSTEM MESSAGE lamp is not turned off when there are SIM other than a remote copy.
   It occasionally takes about 30 minutes until the SUBSYSTEM MASSAGE lamp is turned off.



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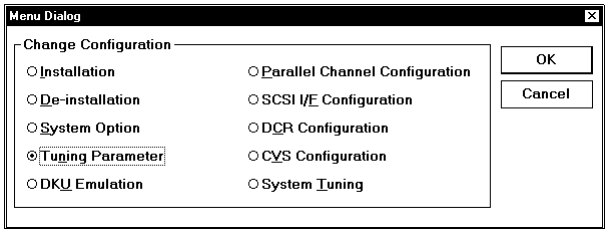
2.24 Tuning Parameter

(1) Exchange threshold information. (See MICRO-FC08-10)

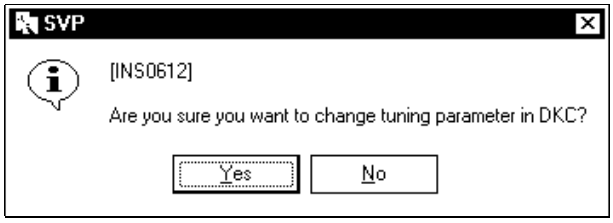
(2) Select (CL) [Install].

(3) Select (CL) [Change Configuration] menu in the 'Install' window and select (CL) [OK].

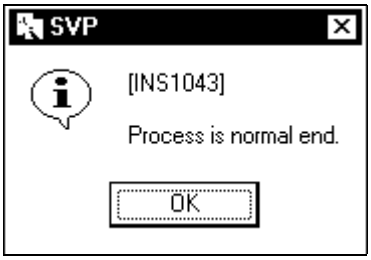
(4) Select (CL) the [Tuning Parameter] menu in the 'Menu Dialog' window and select (CL) [OK].



(5) Select (CL) [Yes] for a message of confirming.



(6) Select (CL) [OK] for a message of finishing.



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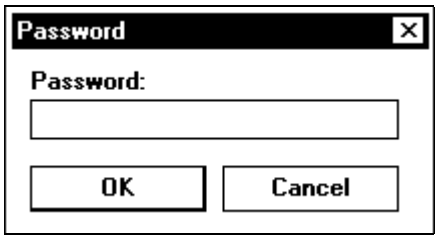
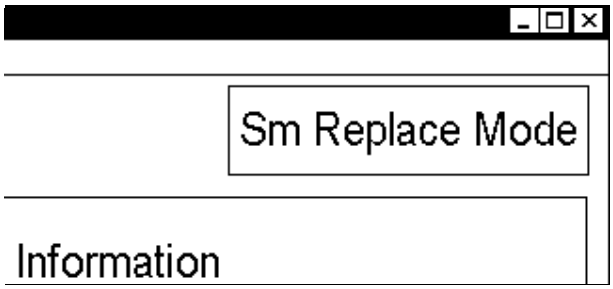
2.25 Change SM Module group size

1. Close the all SVP functions.

2. <Enter the password>
   Press “Shift+Ctrl+S” in the ‘SVP’ window.
   Enter the password, and select (CL) [OK].
   (Please call Technical Support Center for asking it.)



3. <SM Replace Mode>
   ‘Sm Replace Mode’ is displayed.
   Select (CL) [Maintenance].



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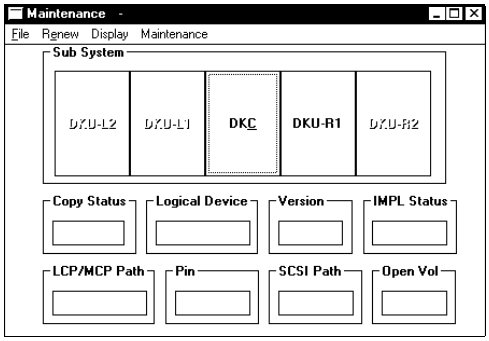
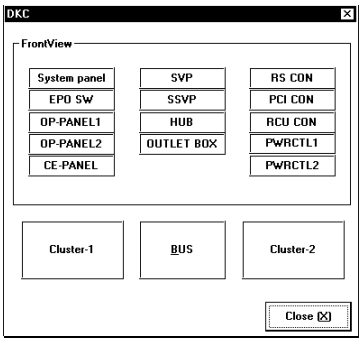
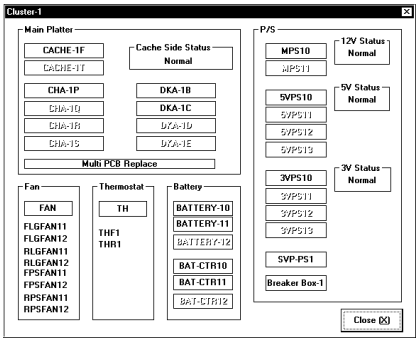
4. <Maintenance window>
'Maintenance' window is displayed.
In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



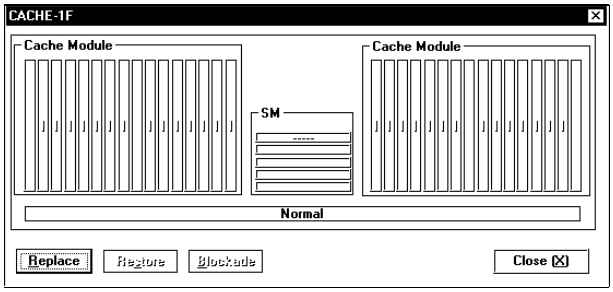
5. <DKC screen>
Select (CL) [Cluster-n] in the 'DKC'.



6. <Select Cache>
Select (CL) part.



7. <Replace>
Check status display.
Select (CL) [Replace].



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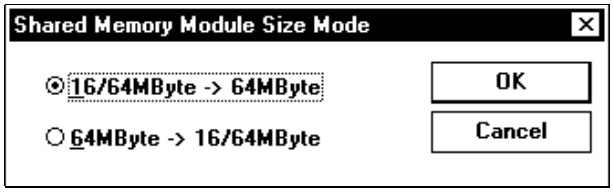
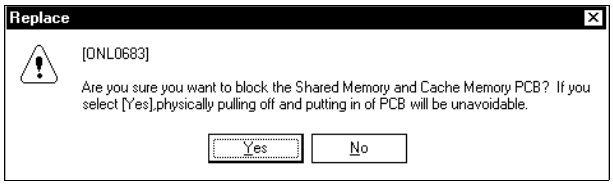
8. <Change the Shared Memory Module Size>
Select (CL) module size in the 'Shared Memory Module Size Mode', and select (CL) [OK].



9. <Check beginning of cache blocking>
Select (CL) [Yes] after making sure that the package to be blocked is correct in response to:
"Are you sure you want to block the Shared Memory and Cache Memory PCB? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable."



10. <Cache blocking>
"The Cache Memory PCB is being blocked." is displayed.
"The Shared Memory PCB is being blocked…" is displayed.

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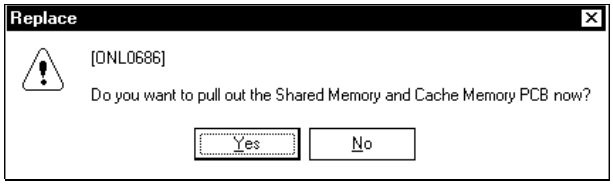
11. <Check removal of cache>
    Select (CL) [Yes] in response to:
    "Do you want to pull out the Shared Memory and Cache Memory PCB now?"



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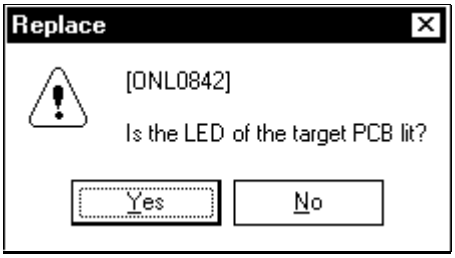
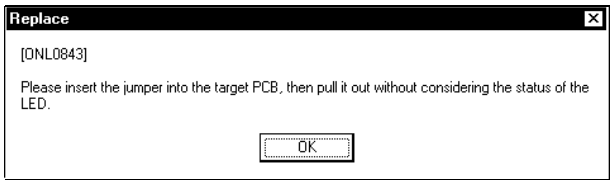
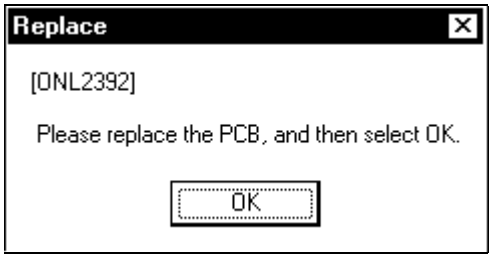
12. <Check shut down LED>
Select (CL)
* [Yes] if LED is on
* [No] if LED is off
in response to “Is the LED of the target PCB lit?”.



<Forcing shut down LED on>
If [No] is selected:
Insert a jumper in response to “Please insert jumper into the target PCB, then pull it out without considering the status of the LED”.
(Refer REP03-60)
Go to step 9.



13. <Cache Replacement>
“Please replace the PCB, and then select OK.” is displayed.
(Select (CL) [OK] after replacing the PCB.)



14. <Replace cache PCB>
Replace cache.

See HARDWARE B (REP03-50)

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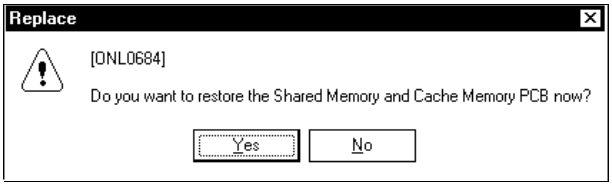
15. <Check the beginning of cache/SM recovery>
Select (CL) [Yes] in response to:
"Do you want to restore the Shared Memory and Cache Memory PCB now?"



16. <Restoring the Shared Memory>
"Restoring the Shared Memory PCB..." is displayed.

17. <Restoring the Cache Memory>
"Restoring the Cache Memory PCB..." is displayed.

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18. <Check the end of Cache/Shared Memory recovery>
Select (CL) [OK] in response to “Replace finished.”.

19.
Close ‘CACHE-xx’ window.
Close ‘Cluster-n’ window.
(If finishing in the Cluster-2 side, go to 21.)

20. <Change the Shared Memory module size in Cluster-2 side>
Perform steps 5 to 19.
Select [Cluster-2], [CACHE-2G].

21.
Close ‘DKC’ window.
Close ‘Maintenance’ window.
Change the mode to [View Mode].

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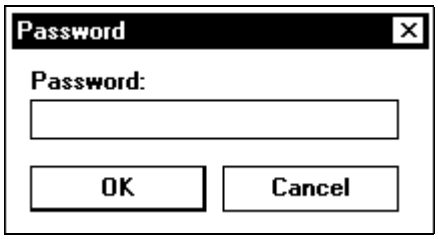
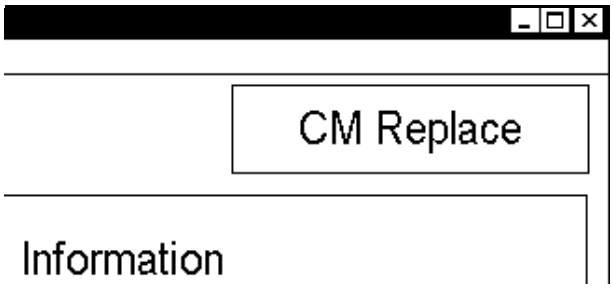
2.26 Change CM Module group size

1. Close the all SVP menu.

2. <Enter the password>
   Press “Shift+Ctrl+C” in the ‘SVP’ window.
   Enter the password, and select (CL) [OK].
   (Please call Technical Support Center for asking it.)



3. <CM Replace Mode>
   ‘CM Replace’ is displayed.
   Select (CL) [Maintenance].



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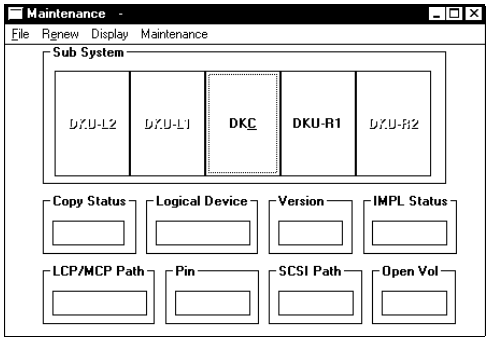
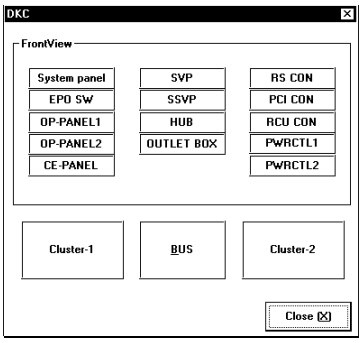
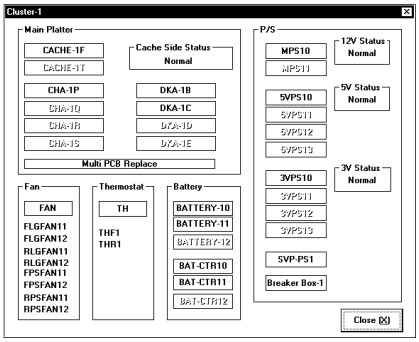
4. <Maintenance window>
'Maintenance' window is displayed.
In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



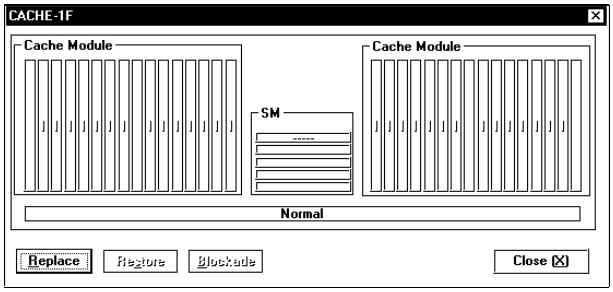
5. <DKC screen>
Select (CL) [Cluster-n] in the 'DKC'.



6. <Select Cache>
Select (CL) part.



7. <Replace>
Check status display.
Select (CL) [Replace].



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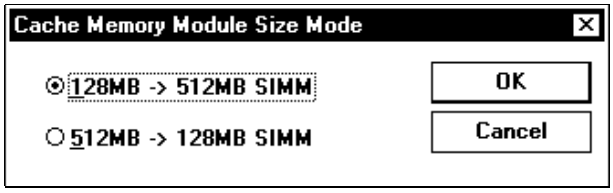
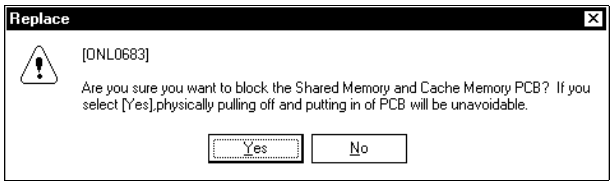
8. <Change the Cache Memory Module Size>
Select (CL) module size in the 'Cache Memory Module Size Mode', and select (CL) [OK].



9. <Check beginning of cache blocking>
Select (CL) [Yes] after making sure that the package to be blocked is correct in response to:
"Are you sure you want to block the Shared Memory and Cache Memory PCB? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable."



10. <Cache blocking>
"The Cache Memory PCB is being blocked." is displayed.
"The Shared Memory PCB is being blocked…" is displayed.

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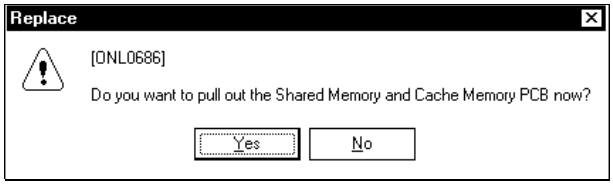
11. <Check removal of cache>
    Select (CL) [Yes] in response to:
    "Do you want to pull out the Shared Memory and Cache Memory PCB now?"



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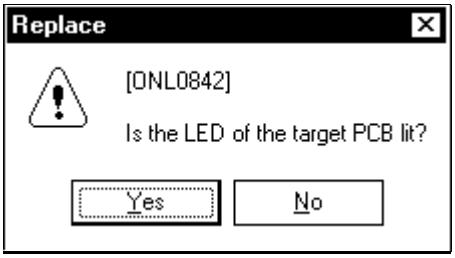
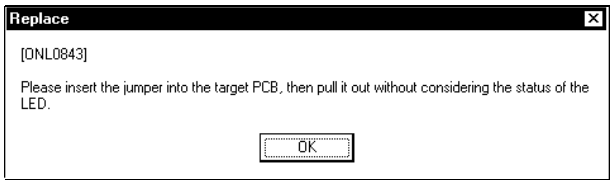
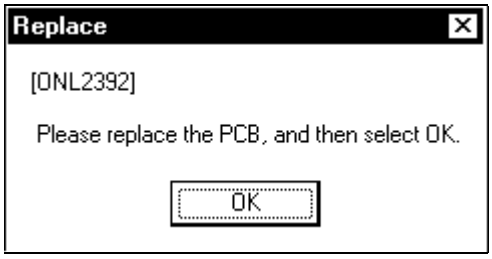
12. <Check shut down LED>
Select (CL)
* [Yes] if LED is on
* [No] if LED is off
in response to “Is the LED of the target PCB lit?”.



<Forcing shut down LED on>
If [No] is selected:
Insert a jumper in response to “Please insert jumper into the target PCB, then pull it out without considering the status of the LED”.
(Refer REP03-60)
Go to step 9.



13. <Cache Replacement>
“Please replace the PCB, and then select OK.” is displayed.
(Select (CL) [OK] after replacing the PCB.)



14. <Replace cache PCB>
Replace cache.

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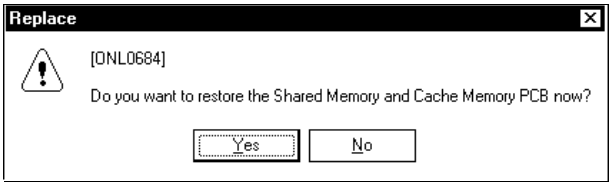
15. <Check the beginning of cache/SM recovery>
Select (CL) [Yes] in response to:
"Do you want to restore the Shared Memory and Cache Memory PCB now?"



16. <Restoring the Shared Memory>
"Restoring the Shared Memory PCB..." is displayed.

17. <Restoring the Cache Memory>
"Restoring the Cache Memory PCB..." is displayed.

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18. <Check the end of Cache/Shared Memory recovery>
Select (CL) [OK] in response to “Replace finished.”.

19.
Close ‘CACHE-xx’ window.
Close ‘Cluster-n’ window.
(If finishing in the Cluster-2 side, go to 21.)

20. <Change the Cache Memory module size in Cluster-2 side>
Perform steps 5 to 19.
Select [Cluster-2], [CACHE-2G].

21.
Close ‘DKC’ window.
Close ‘Maintenance’ window.
Change the mode to [View Mode].

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2.27 HORC Operation (for OPEN VOL)

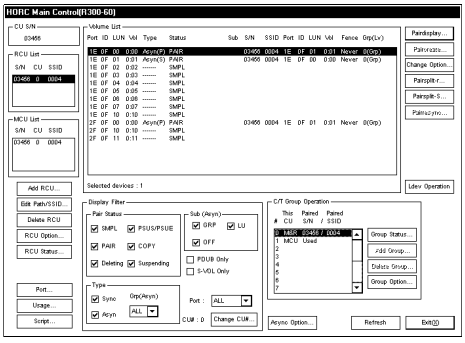
If SVP Micro-program version is not over “51-36-01”, refer to the “2.28 HORC Operation (for LDEV) (SVP02-1560)”.

2.27.1 Referring to the Path Status

Refer to the MCU-RCU connection status. This operation is possible only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the ‘SVP’ window.

2. Selecting an RCU
   Select an RCU whose path status is desired to be referred to from the RCU list (see the figure) on the HORC screen. (Two or more RCUs cannot be selected here.)



3. Displaying the RCU status
   Select (CL) the [RCU Status...] button on the HORC screen to display the RCU Status screen.

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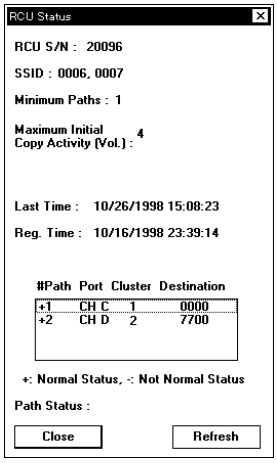
4. Selecting a path to be displayed

The path list is displayed on the RCU Status screen. Select a path whose status is desired to be displayed from the list. (Two or more paths cannot be selected here.)



5. Updating the path status

Select (CL) the [Refresh] button on the RCU Status screen to update the screen display. When updating the screen display, select (CL) the [Refresh] button. When closing the screen, select (CL) the [Close] button.

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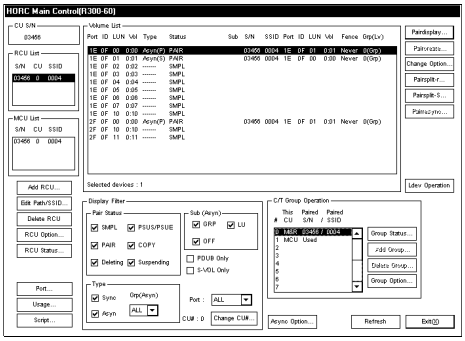
2.27.2 Referring to the Pairdisplay of OPEN VOL (open volume)

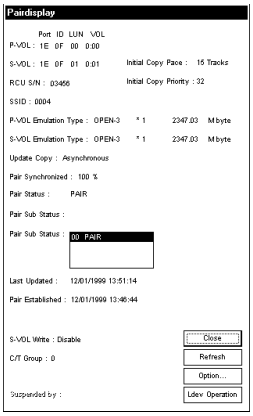
Refer to the object volume Pairdisplay of OPEN VOL (open voluem). The screen data displayed will differ between when this operation is executed from only the MCU and when it is executed from the RCU.

1. Displaying the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting a volume
   Select a volume whose status is desired to be referred to from the volume list (see the figure) on the HORC screen. (Select only one volumes here although two or more volume can be selected from the list.)



3. Displaying the Pairdisplay of OPEN VOL
   Select (CL) the [Pairdisplay...] button on the HORC screen. The Pairdisplay screen will appear.



4. Updating the Pairdisplay of OPEN VOL
   Select (CL) the [Refresh] button on the Pairdisplay screen. This operation updates the display of the Pairdisplay. Press (CL) the [Close] button to close the screen.

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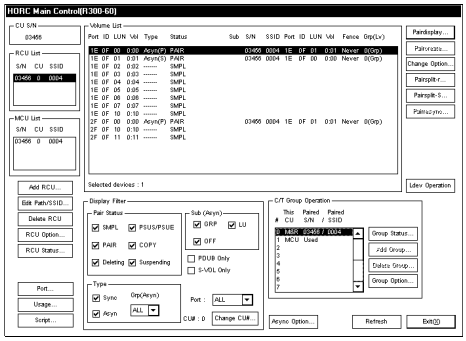
2.27.3 Referring to the Pairdisplay of LDEV

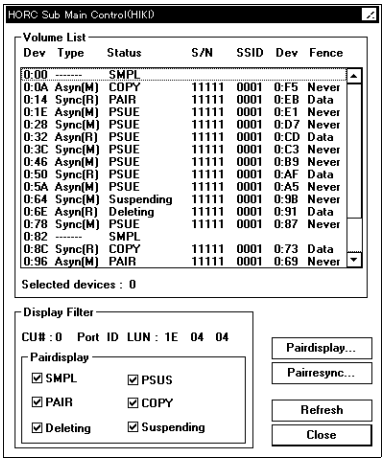
Refer to the object volume Pairdisplay of LDEV. The screen data displayed will differ between when this operation is executed from only the MCU and when it is executed from the RCU.

1. Displaying the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting a volume
   Select a volume whose status is desired to be referred to from the volume list (see the figure) on the HORC screen. (Select only one volumes here although two or more volume can be selected from the list.)
   Select (CL) the [Ldev Operation] button on the HORC screen.
   This operation display the HORC sub screen.



3. Selecting a LDEV
   Select a LDEV whose status is desired to be referred to from the volume list (see the figure) on the HORC sub screen.



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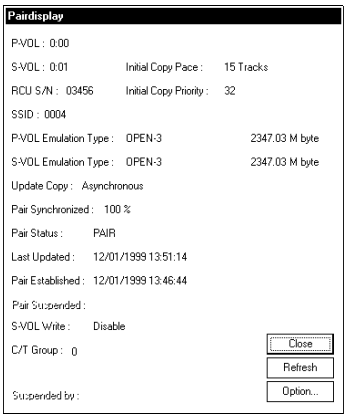
4. Displaying the Pairdisplay of LDEV
Select (CL) the [Pairdisplay...] button on the HORC sub screen. The Pairdisplay of LDEV screen will appear.



5. Updating the Pairdisplay of LDEV
Select (CL) the [Refresh] button on the Pairdisplay screen. This operation updates the display of the Pairdisplay. Press (CL) the [Close] button to close the screen.

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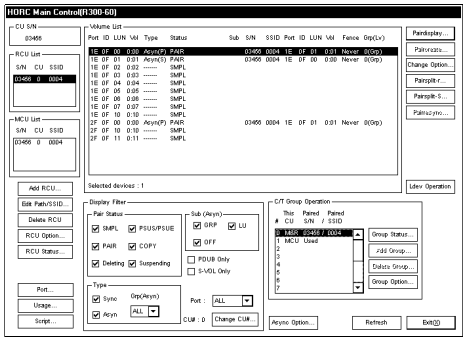
2.27.4 Suspending the Volume Pair(s) of OPEN VOL (open volume)

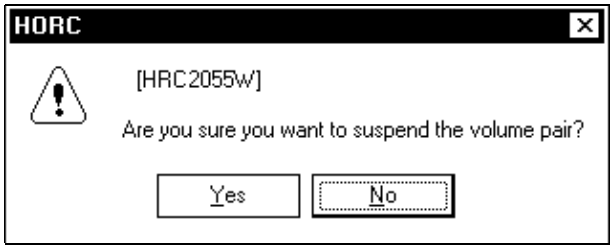
This operation suspends the object volume pair(s). The operation can be executed from both the MCU and the RCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume(s)
   Select the volume(s) desired to be suspended from the volume list (see the figure) on the HORC screen.
   (You can select several volumes. However, you can't select the synchronous copy pair and asynchronous copy pair at the same time.)



3. Instructing a suspension
   Select (CL) the [Pairsplit-r...] button on the HORC screen. A confirmation message will appear. To suspend the pair really, press (CL) the [Yes] button. The Pairsplit-r screen will appear.



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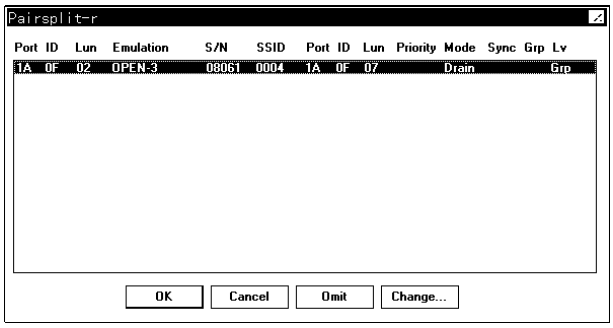
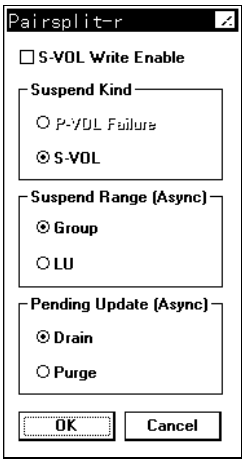
4. Confirm the suspension volumes

Confirm the suspension volumes that are displayed to the Pairsplit-r screen and select (CL) [OK] button and go to 6.
If you want to change suspend parameters, select the volumes from the volume list and select (CL) [Change...] button and go to 5.
If you want to omit the volume suspension, select the volumes from the volume list and select (CL) [Omit] button.



5. Inputting the suspending parameters

Press (CL) the [OK] button on the Pairsplit-r screen to execute the suspending processing.



- S-VOL Write Enable
  This parameter specifies whether to enable S-VOL to write.
  If you want to use this parameter, select “S-VOL” in Suspend Kind parameter.
- Suspend kind
  This parameter specifies which instruction is to be issued, an P-VOL suspension or an S-VOL suspension. “P-VOL Failure”cannot be specified for asynchronous copy pairs.
- Suspend Range (Async)
  This parameter specifies the kind of suspension.
  “Group” means all volume pair(s) suspension which are assigned to the same C/T group as the specified volume pair(s).
  “LU” means only specified volume pair(s) will be suspended. If 2 or more volume pairs are specified, this parameter is fixed to “LU”.
  This parameter can be spedcified HORC asynchronous copy volume pairs only.
- Pending update (Async)
  This parameter specifies the method of the release of the Record set.
  “Drain” means that the volume pair(s) should be suspended after all pending record set are settled. If “Drain” is specified, please stop I/O from the hosts.
  “Purge” means that the volume pair(s) should be suspended even if pending record set remain. The pending record set will be copied when the Pairresync operated.
  This parameter can be specified HORC asynchronous copy volume pair(s) only.

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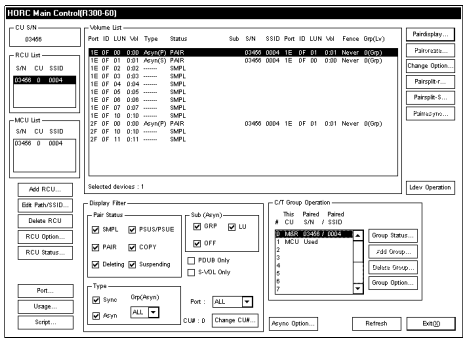
6. Verifying the suspension

Verify if the volume selected from the volume list (see the figure) is in the suspended status or not by pressing (CL) the [Refresh] button on the HORC screen.



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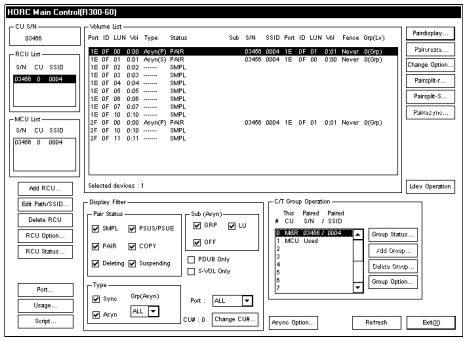
2.27.5 Resuming the Suspended Pair(s) of OPEN VOL (open volume)

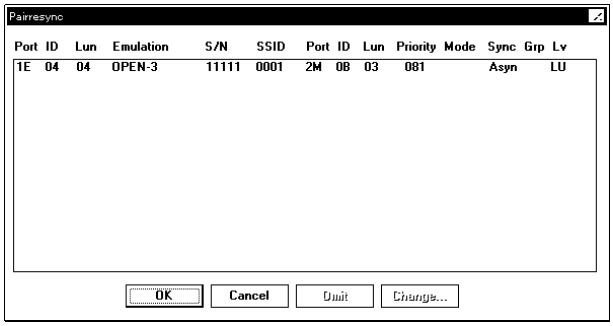
This operation resumes the volume pair(s) of OPEN VOL suspended. The operation can be performed only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume(s)
   Select the volume(s) desired to be resumed from the volume list (see the figure) on the HORC screen to resume it.
   Select the [Pairresync...] button on the HORC screen.
   The Pairresync screen will appear.
   (You can select several volumes. However, you can't select the synchronous copy pair and asynchronous copy pair at the same time.)



3. Confirm a resume parameter
   Confirm a resume option on the Pairresync screen.
   Select (CL) the [OK] button on the Pairresync screen and go to 5.
   If you want to change resume parameter, select the volumes from the volume list and select (CL) [Change...] button and go to 4.
   If you want to omit Pairresync, select the volumes from the volume list and select (CL) [Omit] button.



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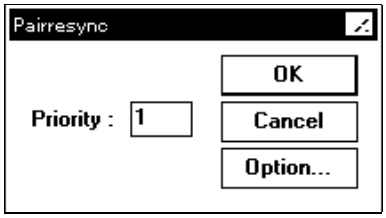
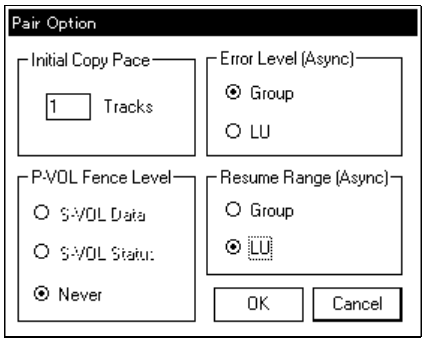
4. Inputting the resume parameter



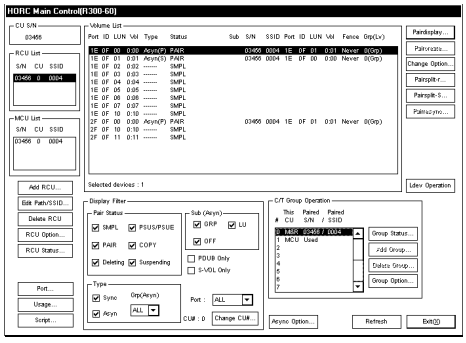
On the Resume HORC pair Parameter Input screen, perform the following.
Input the initial copy priority to the Priority.
In the case of asynchronous copy pairs, you can't input the initial copy prionity if the Resume Range (see 5.) is "Group".
If you want to set pair option, press (CL) [Option...] button and go to 5.
When all operations above are finished, press (CL) the [OK] button (see the figure) and go to 3.

5. Setting HORC pair option



On the Pair Option screen, perform the following.
Set one of the following in Initial Copy Pace.
• 1 ~ 15 Tracks
Set one of the following in P-VOL Fence Level.
(Fixed "Never" when asynchronous copy pairing)
• S-VOL Data
• S-VOL Status
• Never
Set one of the following in Error Level.
(Effective only asynchronous copy pairing and Resume Range is "LU".)
• Group
• LU
Set one of the following in Resume Range.
(Effective only asynchronous copy pairing. If 2 or more volume pairs are specified, this parameter is fixed to "LU".)
• Group
• LU
When all above operation are finished, press (CL) [OK] button.
Then go to 4.

6. Verifying the resumption



Verify if the volume(s) selected from the volume list (see the figure) is in the COPY (or PAIR) status by pressing (CL) the [Refresh] button on the HORC screen.

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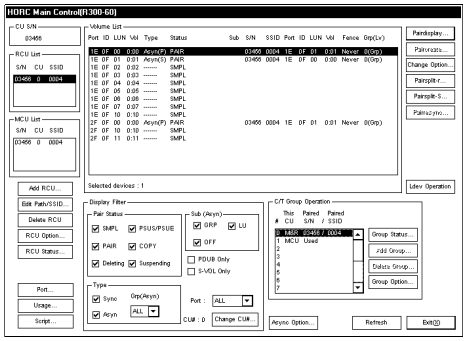
2.27.6 Resuming the Suspended Pair(s) of LDEV

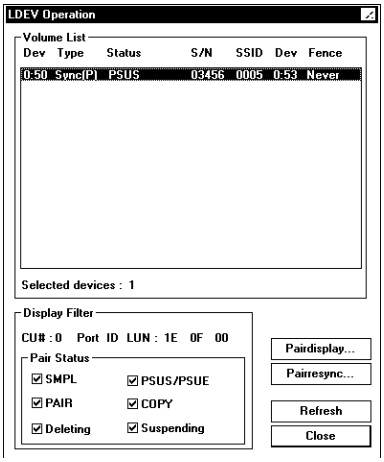
This operation resumes the volume pair(s) of LDEV suspended. The operation can be performed only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume of OPEN VOL
   Select the volume desired to be resumed from the volume list (see the figure) on the HORC screen to resume it.
   Select the [Ldev Operation...] button on the HORC screen.
   The HORC Sub screen screen will appear.



3. Selecting the volume(s) of LDEV
   Select the volume(s) desired to be resumed from the volume list (see figure) on the HORC Sub screen to resume it.
   Select (CL) the [Pairresync...] button on the HORC screen.
   The Pairresync screen will appear.



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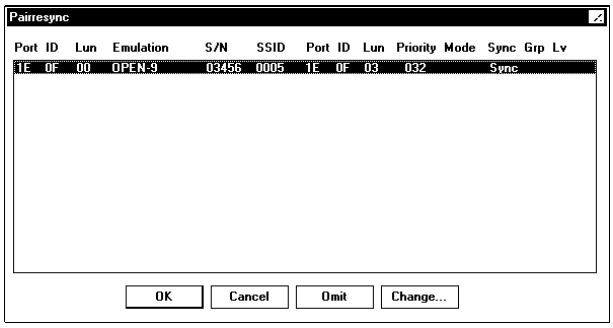
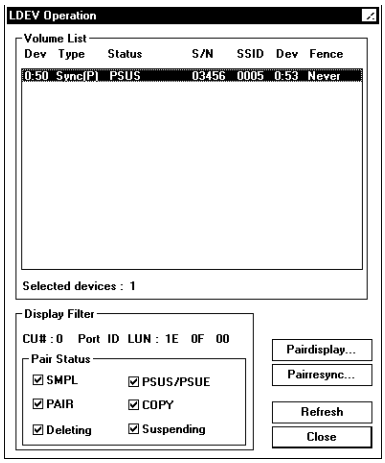
4. Confirm a resume parameter

Confirm a resume option on the Resume HORC Pair screen.
Select (CL) the [OK] button on the Resume HORC Pair screen and go to 5.
If you want to omit Pairresync, select the volumes from the volume list and select (CL) [Omit] button.



5. Verifying the resumption

Verify if the volume(s) selected from the volume list (see the figure) is in the COPY (or PAIR) status by pressing (CL) the [Refresh] button on the HORC sub screen.



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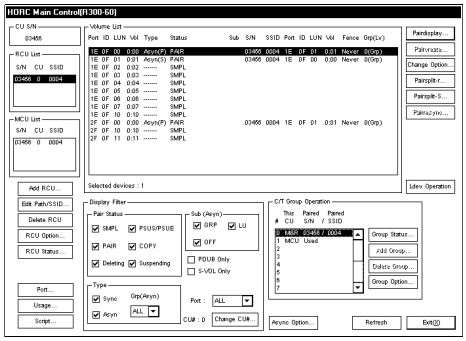
2.27.7 Deleting the Existing HORC Pair(s)

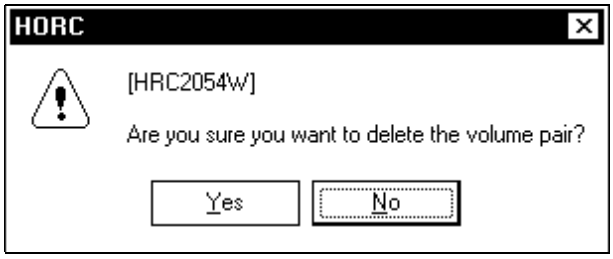
This operation deletes the HORC pair(s). The operation can be performed from both the MCU and the RCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume(s)
   Select the volume pair(s) desired to be deleted from the volume list (see the figure) on the HORC screen.
   (You can select several volumes. However, you can't select the synchronous copy pair and asynchronous copy pair at the same time.)



3. Instructing the deletion
   Select (CL) the [Pairsplit-S...] button on the HORC screen. The confirmation message will appear. To delete the pair(s) really, press (CL) the [Yes] button. Then Pairsplit-S screen will appear.



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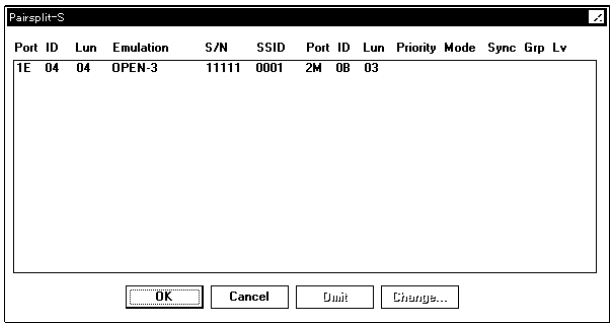
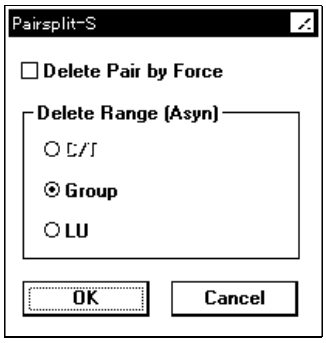
4. Confirm the deletion volumes

Confirm the deletion volumes that are displayed to the Pairsplit-S screen and select (CL) [OK] button and go to 6.
If you want to change delete parameters, select the volumes from the volume list and select (CL) [Change...] button and go to 5.
If you want to omit the volume deletion, select the volumes from the volume list and select (CL) [Omit] button.



5. Inputting a deleting parameter

Press (CL) the [OK] button on the Pairsplit-S screen to execute the deletion and go to 4.



• Delete Pair by Force

This parameter deletes the selected pair(s) forcibly regardless of the status of the communication between MCU and RCU. In the case of asynchronous copy pairs, "Delete Pair by Force" can be specified if the Delete Range is "Group". Set one of the following in Delete Range (Asyn).
(Effective only asynchronous copy pair. Fixed "LU" if 2 or more volumes are specified.)

• C/T
• Group
• LU

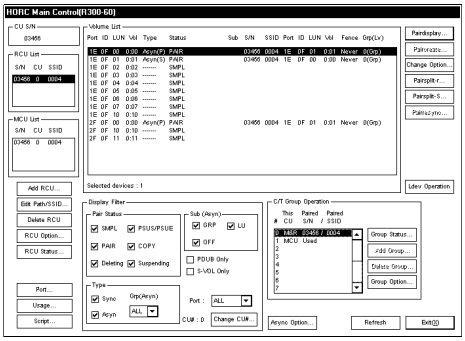
"C/T" means all pair(s) deletion which have the same C/T as the specified pair.
"C/T" can be specified only if the specified pair is :

• S-VOL
• Neither "Suspending" status nor "Deleting" status

"Group" means all pair(s) deletion which is(are) assigned to the same C/T group as the specified pair.
"LU" means only specified pair(s) will be deleted.

6. Verifying the pair(s) deleted

Verify if the volume(s) selected from the volume list (see the figure) is(are) in the SMPL status by pressing (CL) the [Refresh] button on the HORC screen.



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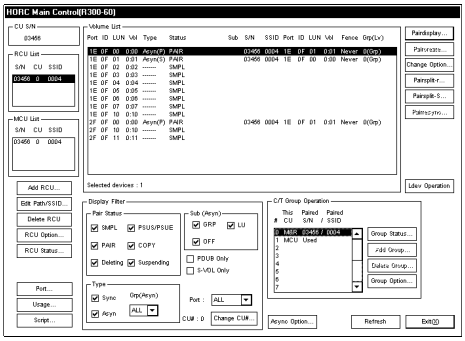
2.27.8 Deleting an RCU Registered

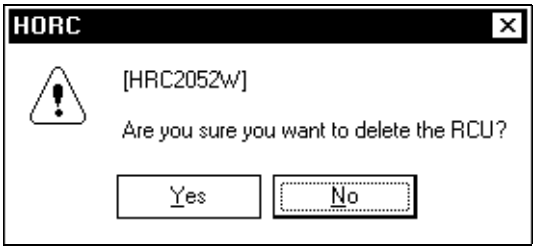
This function deletes an RCU. The function can be executed only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

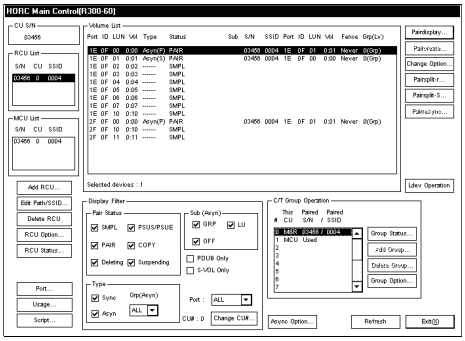
2. Selecting an RCU
   Select an RCU desired to be deleted from the RCU list (see the figure) on the HORC screen. (Only one RCU can be selected here.)



3. Instructing the deletion
   Select (CL) the [Delete RCU] button on the HORC screen. The confirmation message will appear. To delete the RCU really, press (CL) the [Yes] button.



4. Verifying the RCU deletion
   Press (CL) the [Refresh] button on the HORC screen to verify if the RCU selected from the RCU list (see the figure) is deleted.



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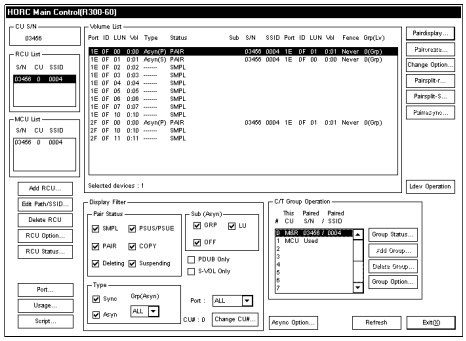
2.27.9 Adding the Path(s) to the RCU

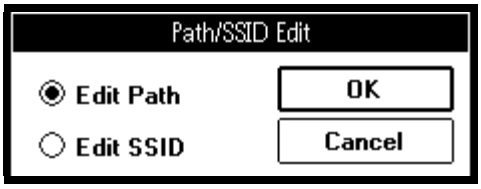
This operation adds the path(s) to the RCU already registered. The operation can be performed from both the MCU and the RCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting an RCU
   Select an RCU the number of paths to which is desired to be increased from the RCU list (see the figure) on the HORC screen. (Only one RCU can be selected here.)



3. Selecting a function
   Select (CL) the [Edit Path/SSID...] button on the HORC screen.
   The Path/SSID Edit screen will appear.
   Select (CL) the [Edit Path] radio button then press (CL) the [OK] button on the screen.



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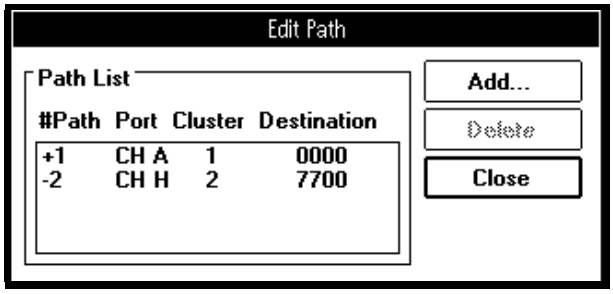
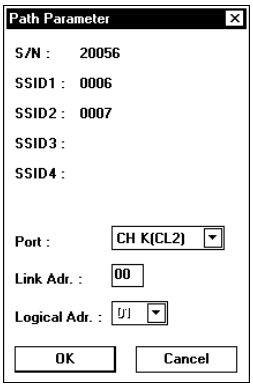
4. Instructing the addition of the path(s)
The Edit Path screen will appear. Then press (CL) the [Add...] button on the screen.

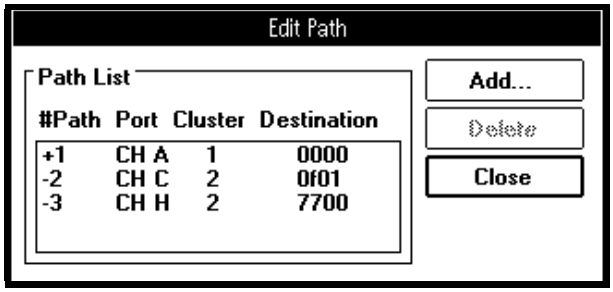


5. Inputting the parameters
When the Path Parameter screen appears, input the necessary parameters and press (CL) the [OK] button.
- Port :
  Specify the RCP port.
- Link Adr. :
  Specify the RCU side link address. When the ESCD is to be used, input the RCU-connected link address. When the ESCD is not used, input '00'.
- Logical Adr. :

As for the logical address, the CU number which was already registered by the RCU addition is displayed.



6. Verifying the path added
Make sure on the Edit Path screen that the specified path has been added correctly.



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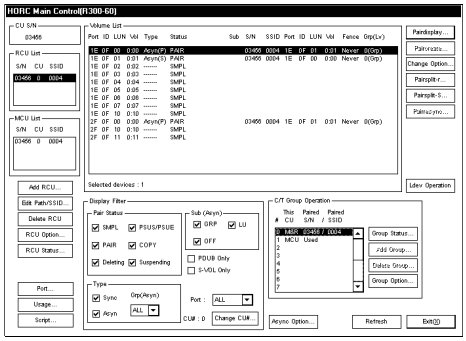
2.27.10 Reducing the Path(s) from the RCU

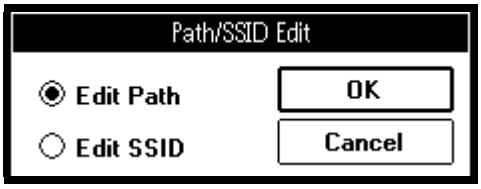
This operation reduces the number of paths connected to an RCU registered already.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting an RCU selection
   Select an RCU the number of paths to which is desired to be reduced from the RCU list (see the figure) on the HORC screen. (Only one RCU can be selected here.)



3. Instructing the reduction of the path(s)
   Select (CL) the [Edit Path/SSID...] button on the HORC screen. The Edit Path/SSID screen will appear.
   Select (CL) the [Edit Path] radio button then press (CL) the [OK] button on the screen.



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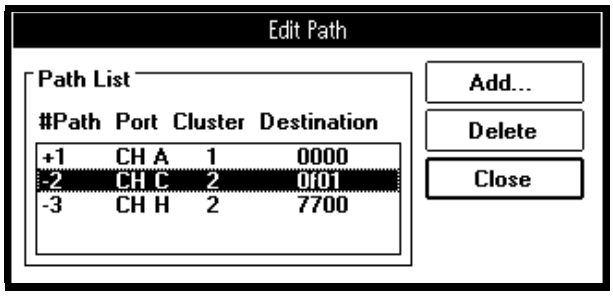
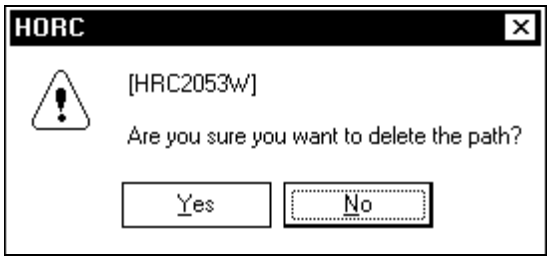
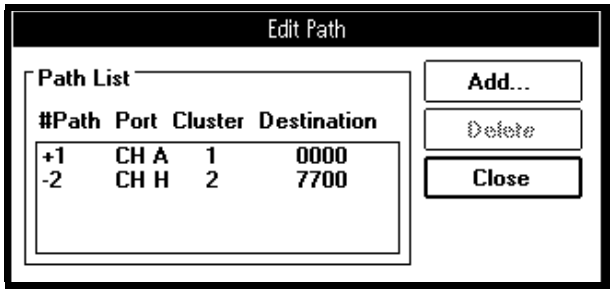
4. Selecting a path to be deleted
Select a path desired to be deleted from the path list displayed on the Edit Path screen and press (CL) the [Delete] button.



5. Confirmation message
When the confirmation message appears, confirm the path to be deleted and press (CL) the [Yes] button.



6. Verifying the path deleted
Make sure on the Edit Path screen that the path specified has been deleted correctly.



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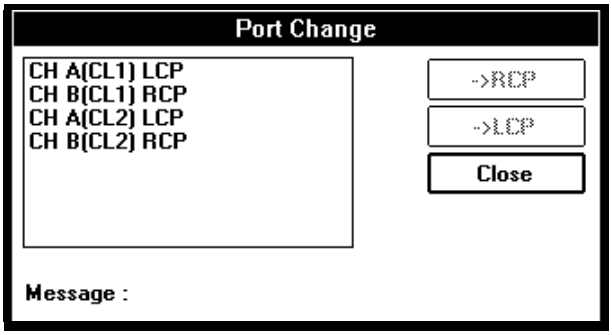
2.27.11 Changing the Port Type

This operation specifies which port type is selected, LCP (to connect to the host) or RCP (to connect to the RCU).

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the processing to change the port type
   Select (CL) the [Port...] button on the on the HORC screen to display the Path Change screen.



3. Instructing the port change
   When the port list and the port types are displayed in the list box on the Path Change screen, select one or more ports whose type(s) is(are) to be changed.
   To select LCP for the port type, press the [-> LCP] button. Then go to step 4.
   To select RCP for the port type, press the [-> RCP] button. Then go to step 5.

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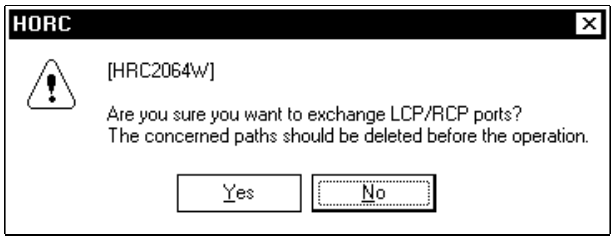
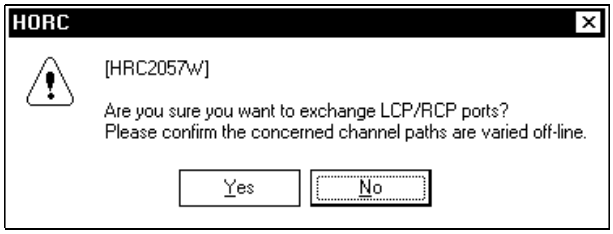
4. Confirmation message and indication of executing status

When the confirmation message appears, confirm the port(s) whose type(s) is(are) to be changed again. If it is correct, press (CL) the [Yes] button.
Status of execution is displayed in the "Message" field on the Port Change screen.
Go to step 6.



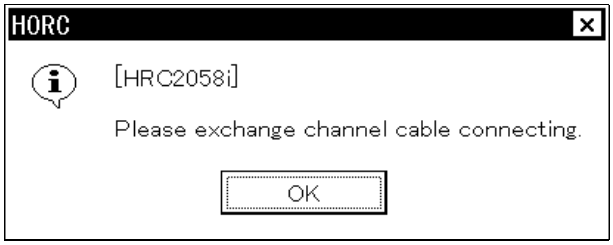
5. Confirmation message and indication of executing status

When the confirmation message appears, confirm the port(s) whose type(s) is(are) to be changed again. If it is correct, press (CL) the [Yes] button.
Status of execution is displayed in the "Message" field on the Port Change screen.



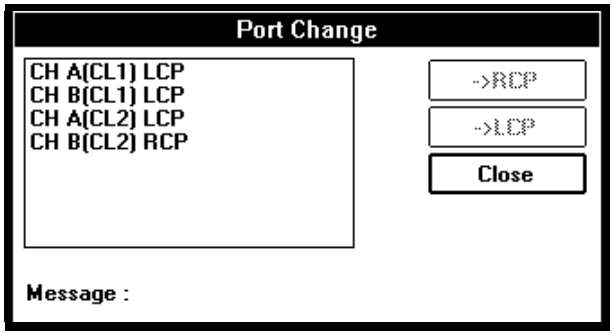
6. Indication message

After exchanging channel cable connecting, press (CL) the [OK] button.



7. Verifying port change

After the change is finished, make sure on the Port Change screen that the type(s) of the specified port(s) has(have) been changed correctly.



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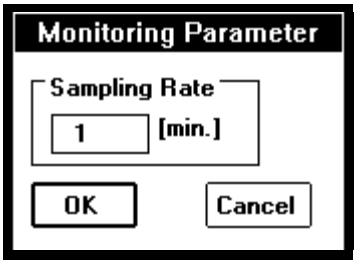
2.27.12 Displaying HORC Operation Status

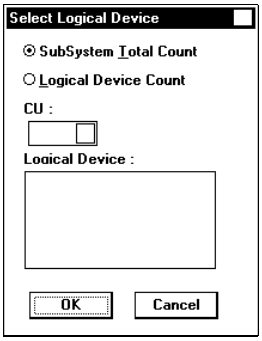
This operation displays a graphic indication of the HORC operation status.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Setting a sampling rate
   Press (CL) the [Usage...] button on the on the HORC screen to display the Sampling Rate Setting screen. Then, input a sampling rate and press (CL) the [OK] button. (Sampling rate can be set within 1 to 546 minutes in steps of 1 minute.)



3. Selecting an object device
   When the valid logical device list is displayed in the list box on the Select Logical Device screen, select a logical device and press (CL) the [OK] button. To display the information of the whole subsystem, select "Sub System".



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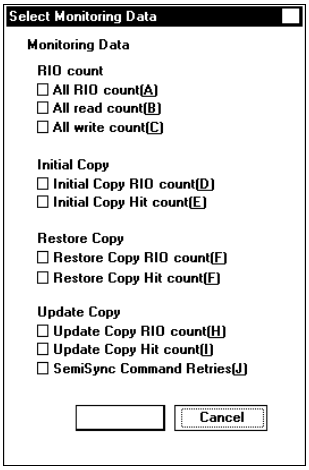
4. Selecting information desired to be acquired
Select one or more data items on the Select Monitoring Data screen, then press (CL) the [OK] button.



5. Displaying the operation information
The Operation Information Display window appears. To view operation information of other devices, select Monitor-Start from the menu and go to step 3. (Two or more (MAX. 15) screens can be displayed at a time.)

6. Terminating the operation information display
To terminate the operation information display, select Monitor-Exit to return to the HORC screen.

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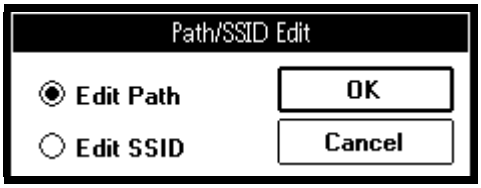
2.27.13 Adding the SSID(s) to the RCU

This operation adds the SSID(s) to the RCU already registered. The operation can be performed from both the MCU and the RCU.

1. Selecting an RCU
   Display the HORC screen and select (CL) an RCU from RCU List which is desired to be increased SSIDs. (Only one RCU can be selected here.)

2. Selecting a function
   Select (CL) the [Edit Path SSID...] button on the HORC screen.
   The Path/SSID Edit screen will appear.

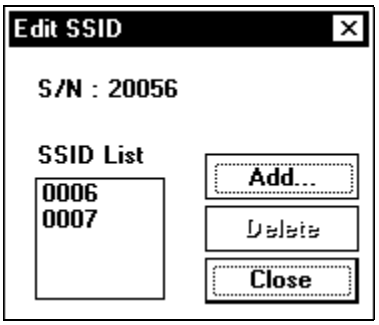
   Select (CL) the [Edit SSID] radio button then press (CL) the [OK] button on the screen.



3. Confirming the number of SSID(s)
   The Edit SSID screen will appear.

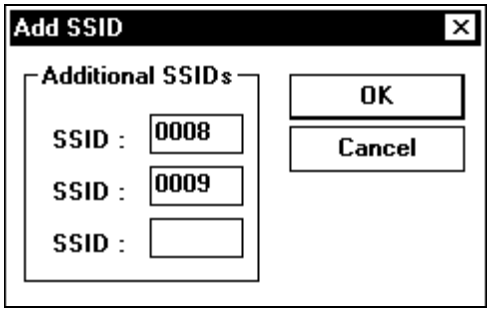
   Press (CL) [Add] button on the screen.
   (See the figure.)

   Note: If 4 SSIDs are registered on the RCU, you can not add a SSID further. ([Add...] button will be not active.)



4. Adding the SSID(s) to the RCU
   The Add SSID screen will appear.

   Input 4-digit hexadecimal SSID(s) number in SSID, then press (CL) [OK] button.



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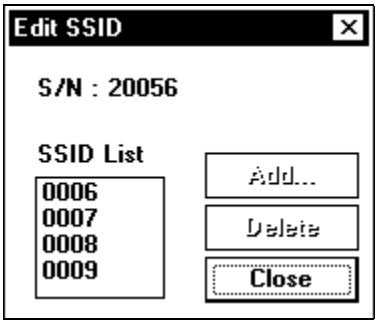
5. Verifying the SSIDs added

Make sure on the Edit SSID screen that the specified SSIDs have been added correctly.



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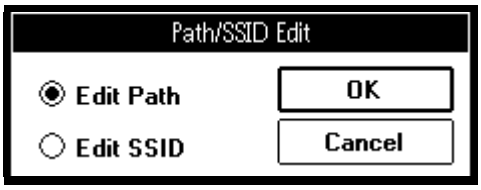
2.27.14 Reducing the SSID(s) from the RCU

This operation reduces the SSID(s) from the RCU already registered.

1. Selecting an RCU
   Display the HORC screen and select (CL) an RCU from RCU List which is desired to be reduced SSIDs. (Only one RCU can be selected here.)

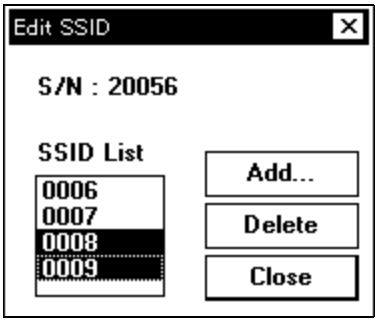
2. Selecting a function
   Select (CL) the [Edit Path SSID...] button on the HORC screen.
   The Path/SSID Edit screen will appear.

   Select (CL) the [Edit SSID] radio button then press (CL) the [OK] button on the screen.



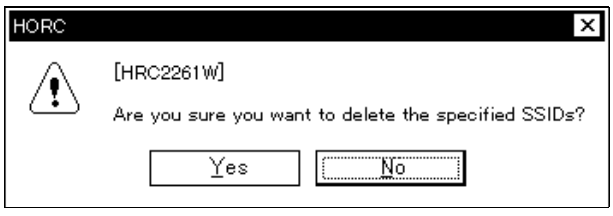
3. Selecting SSID(s) to be deleted
   The Edit SSID screen will appear.

   Select SSIDs desired to be deleted from the SSID List displayed on the Edit SSID screen and press (CL) [Delete] button (See the figure).



4. Confirmation message
   A confirmation message will appear.

   If wanting to delete the SSID really, press (CL) the [YES] button.



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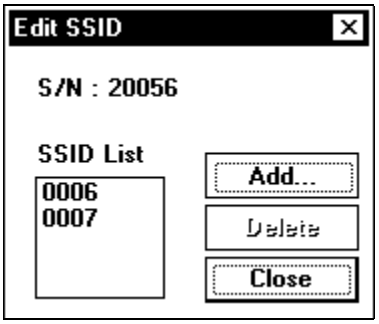
5. Verifying the SSIDs added
   Make sure on the Edit SSID screen that the specified SSIDs have been deleted correctly.



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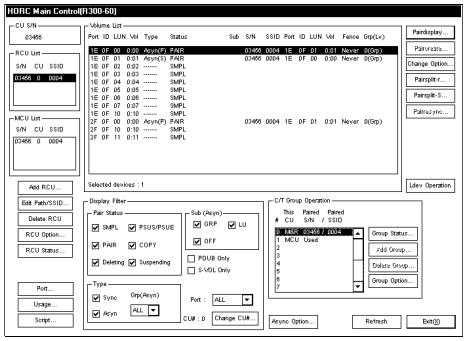
2.27.15 Referring the C/T group status

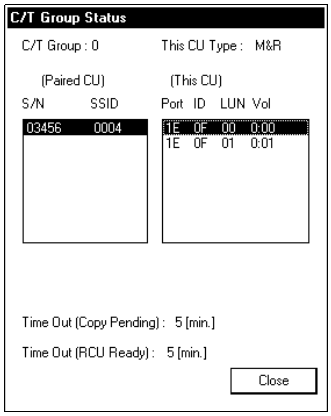
This operation shows the specified C/T group status.

1. Display the HORC screen
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting a C/T group
   Select a C/T group whose status is desired to be referred to from the C/T Group List (see the figure) on the HORC screen.
   (Only one C/T group can be selected here.)
   (Note: C/T groups which are assigned by HRC are not displayed on the list.)



3. Confirming the C/T group status
   Select (CL) the [Group Status...] button on the HORC screen.
   The C/T Group Status screen will appear.
   Press (CL) the [Close] button to close the screen.



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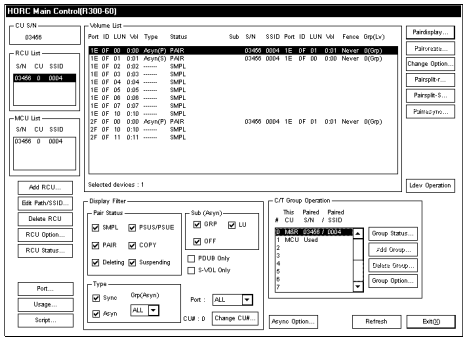
2.27.16 Releasing the using C/T group

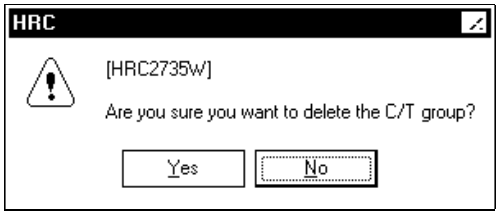
This operation releases the specified C/T group already used.
This operation can be performed only from the MCU.

1. Display the HORC screen
   Select (CL) [HORC] in the 'SVP' window.

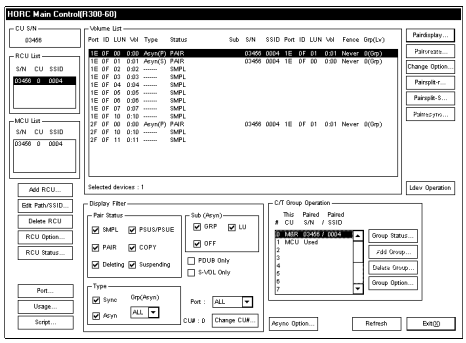
2. Selecting a C/T group
   Select a C/T group desired to be released from the C/T Group List (see the figure) on the HORC screen. (Only one C/T group can be selected here.)
   (Note: C/T groups which are assigned by HRC are not displayed on the list.)



3. Instructing a release
   Press (CL) the [Delete Group] button on the HORC screen. The confirmation message will appear. To release the C/T group really, press (CL) the [Yes] button.



4. Verifying the C/T group released
   Verify if the C/T group selected from C/T Group List (see the figure) is displayed as blank.



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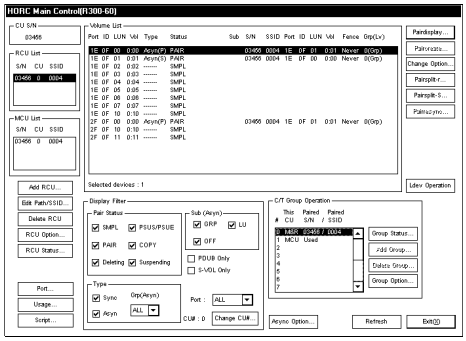
2.27.17 Changing the using C/T group parameters

This operation changes the specified C/T group parameters which already used.
This operation can be performed only from the MCU.

1. Display the HORC screen
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting a C/T group
   Select a C/T group desired to be changed from the C/T Group List (see the figure) on the HORC screen. (Only one C/T group can be selected here.)
   (Note: C/T groups which are assigned by HRC are not displayed on the list.)



3. Inputting the C/T group parameter
   Press (CL) [Group Option...] button on the HORC screen. The C/T Group Option screen will appear.
   On the C/T Group Option screen. Perform the following.
   Select the timer type of the C/T indicated at Timer Type.
   Select maximum delay time of update data from combo-box at Time Out (Copy Pending).
   Select maximum waiting time for the RCU gets ready from combo-box at Time Out (RCU Ready).
   When all the above operations are finished, press (CL) the [OK] button.

4. Verifying the C/T group status
   Open the C/T Group Status screen, then verify the C/T group parameters are correctly changed. (Refer to 2.27.15)

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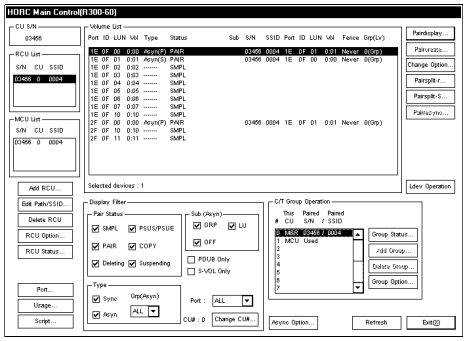
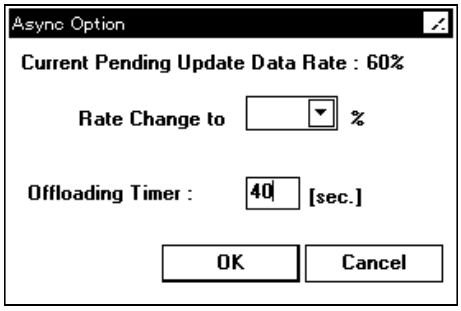
2.27.18 Changing the asynchronous option parameters

This operation changes the asynchronous option parameters.

1. Display the HORC screen
   Select (CL) [HORC] in the 'SVP' window.
   The HORC screen will appear Press (CL) the [Async Option...] button on the HORC screen.



2. Inputting the asynchronous option parameters
   The Async Option screen will appear.
   On the Async Option screen, perform the following. If there is necessity for changing the occupation rate of pending update data among the Record set, select a number of rate from combo-box at Rate Change to.
   (Notice1)
   If the C/T group(s) which is(are) assigned by HORC is(are) exist, the rate can not be changed.
   (Notice2)
   When using SVP version 51-44-XX, the rate can be turned within 40 through 70. When using 51-45-XX or later, it can be turned within 30 through 70.
   Select monitoring time for the Record Set form combo-box indicated at Offloading Timer. (1 ~ 255)
   When all the above operations are finished, press (CL) the [OK] button.



3. Verifying the asynchronous option parameters
   Open the Async Option screen again, then verify the occupation rate indicated at Current Pending Update Data Rate is correct.
   Verify the monitoring time indicated at Offloading Timer is correct, too.

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2.28 HORC Operation (for LDEV)

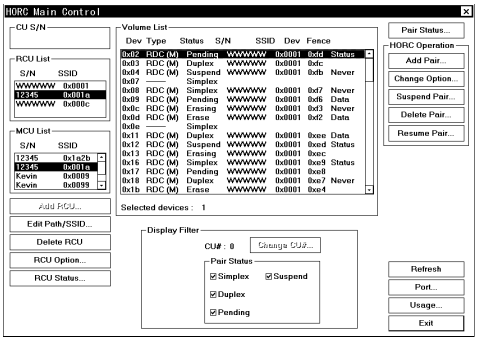
If SVP Micro-program version is over “51-36-01”, refer to the “2.27 HORC Operation (for OPEN VOL) (SVP02-1350)”.

2.28.1 Referring to the Path Status

Refer to the MCU-RCU connection status. This operation is possible only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the ‘SVP’ window.

2. Selecting an RCU
   Select an RCU whose path status is desired to be referred to from the RCU list (see the figure) on the HORC screen. (Two or more RCUs cannot be selected here.)



3. Displaying the RCU status
   Select (CL) the [RCU Status...] button on the HORC screen to display the RCU Status screen.

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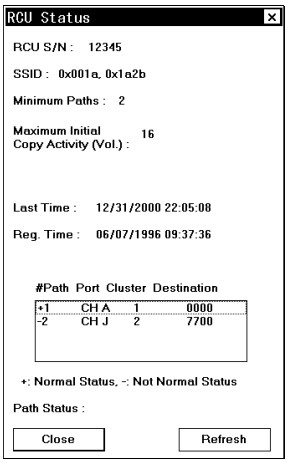
4. Selecting a path to be displayed

The path list is displayed on the RCU Status screen. Select a path whose status is desired to be displayed from the list. (Two or more paths cannot be selected here.)



5. Updating the path status

Select (CL) the [Refresh] button on the RCU Status screen to update the screen display. When updating the screen display, select (CL) the [Refresh] button. When closing the screen, select (CL) the [Close] button.

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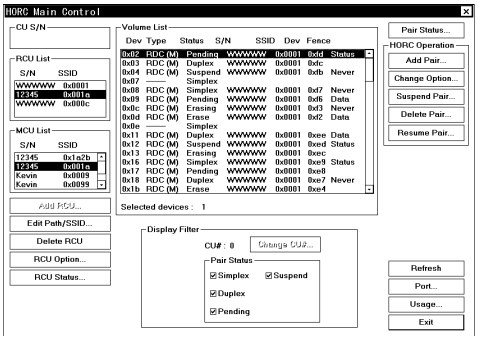
2.28.2 Referring to the Pair Status

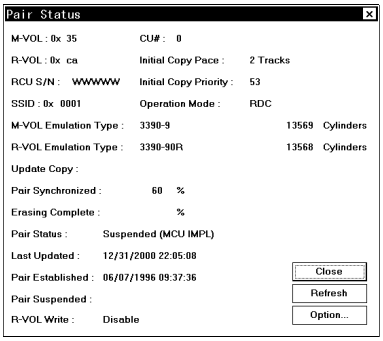
Refer to the object volume pair status. The screen data displayed will differ between when this operation is executed from only the MCU and when it is executed from the RCU.

1. Displaying the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting a volume
   Select a volume whose status is desired to be referred to from the volume list (see the figure) on the HORC screen. (Select only one volumes here although two or more volume can be selected from the list.)



3. Displaying the pair status
   Select (CL) the [Pair Status...] button on the HORC screen. The Pair Status screen will appear.



4. Updating the pair status
   Select (CL) the [Refresh] button on the Pair Status screen. This operation updates the display of the pair status. Press (CL) the [Close] button to close the screen.

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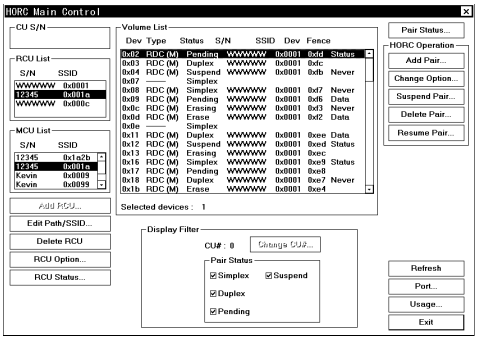
2.28.3 Suspending the Volume Pair(s)

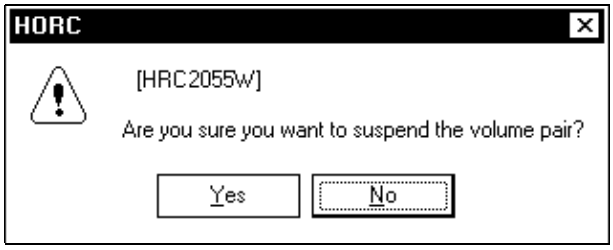
This operation suspends the object volume pair(s). The operation can be executed from both the MCU and the RCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume(s)
   Select the volume(s) desired to be suspended from the volume list (see the figure) on the HORC screen.



3. Instructing a suspension
   Select (CL) the [Suspend Pair...] button on the HORC screen. A confirmation message will appear. To suspend the pair really, press (CL) the [Yes] button. The Suspend Pair screen will appear.



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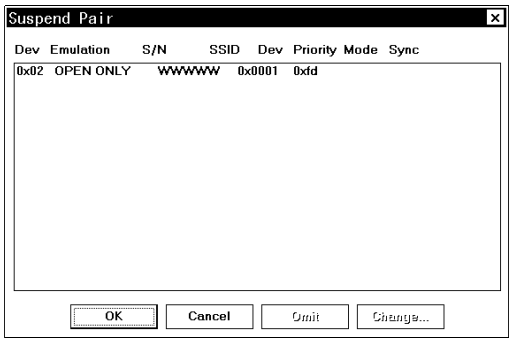
4. Confirm the suspension volumes

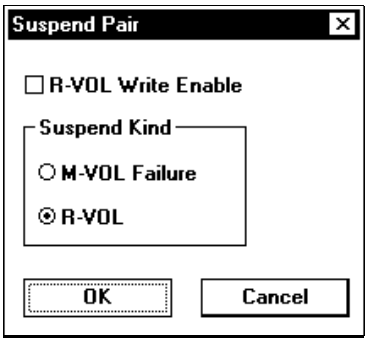
Confirm the suspension volumes that are displayed to the Suspend pair screen and select (CL) [OK] button and go to 6.
If you want to change suspend parameters, select the volumes from the volume list and select (CL) [Change...] button and go to 5.
If you want to omit the volume suspension, select the volumes from the volume list and select (CL) [Omit] button.



5. Inputting the suspending parameters

Press (CL) the [OK] button on the Suspend Pair screen to execute the suspending processing.

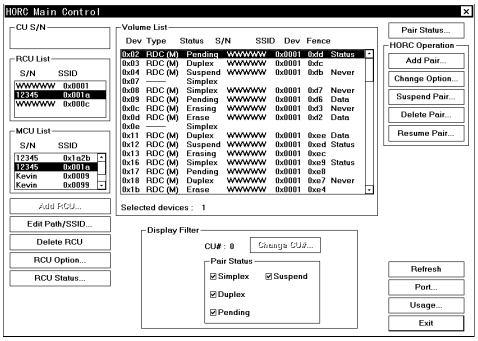
- R-VOL Write Enable
  This parameter specifies whether to enable R-VOL to read/write.
  If you want to use this parameter, select “R-VOL” in Suspend Kind parameter.
- Suspend kind
  This parameter specifies which instruction is to be issued, an M-VOL suspension or an R-VOL suspension.



Notice : During the initial copy, M-VOL suspension is rejected. (Error Code = 0102)

6. Verifying the suspension

Verify if the volume selected from the volume list (see the figure) is in the suspended status or not by pressing (CL) the [Refresh] button on the HORC screen.



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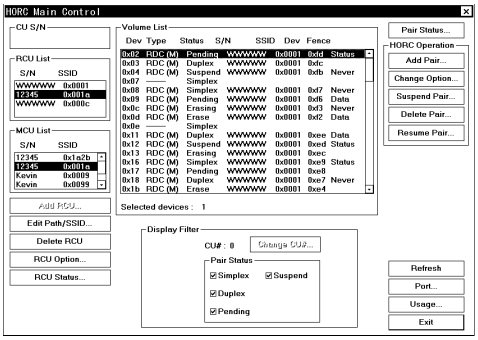
2.28.4 Resuming the Suspended Pair(s)

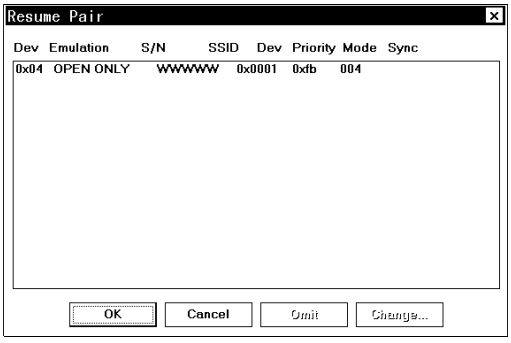
This operation resumes the volume pair(s) suspended. The operation can be performed only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume(s)
   Select the volume(s) desired to be resumed from the volume list (see the figure) on the HORC screen to resume it.
   Select the [Resume Pair...] button on the HORC screen.
   The Resume Pair screen will appear.



3. Confirm a resume parameter
   Confirm a resume option on the Resume HORC Pair screen.
   Select (CL) the [OK] button on the Resume HORC Pair screen and go to 5.
   If you want to change resume parameter, select the volumes from the volume list and select (CL) [Change...] button and go to 4.
   If you want to omit resume pair, select the volumes from the volume list and select (CL) [Omit] button.



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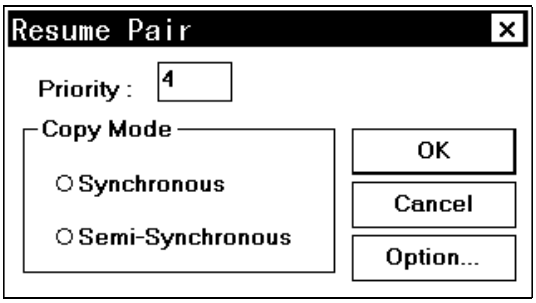
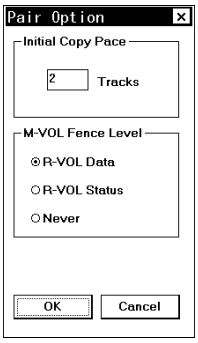
4. Inputting the resume parameter

On the Resume HORC pair Parameter Input screen, perform the following.
Input the initial copy priority to the Priority.
Select one of the copy mode indicated at Copy Mode.
If you want to set pair option, press (CL) [Option...] button and go to 5.
When all operations above are finished, press (CL) the [OK] button (see the figure) and go to 3.



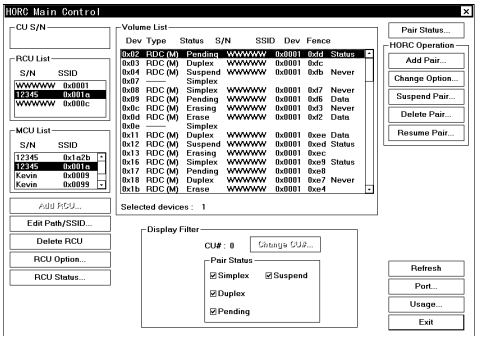
5. Setting HORC pair option

On the Pair Option screen, perform the following.
Set one of the following in Initial Copy Pace.
• 1 ~ 15 Tracks
Set one of the following in M-VOL Fence Level.
• R-VOL Data
• R-VOL Status
• Never
When all above operation are finished, press (CL) [OK] button.
Then go to 4.



6. Verifying the resumption

Verify if the volume(s) selected from the volume list (see the figure) is in the pending (or duplex) status by pressing (CL) the [Refresh] button on the HORC screen.



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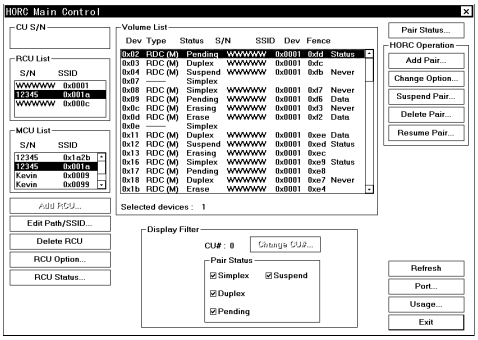
2.28.5 Deleting the Existing HORC Pair(s)

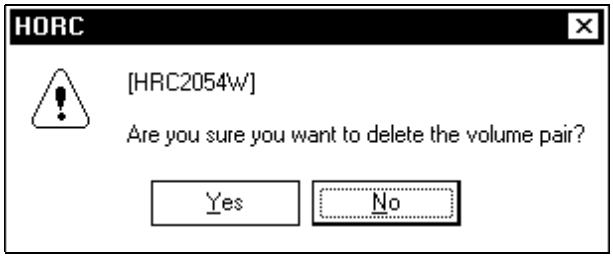
This operation deletes the HORC pair(s). The operation can be performed from both the MCU and the RCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the volume(s)
   Select the volume pair(s) desired to be deleted from the volume list (see the figure) on the HORC screen.



3. Instructing the deletion
   Select (CL) the [Delete Pair...] button on the HORC screen. The confirmation message will appear. To delete the pair(s) really, press (CL) the [Yes] button. Then Delete Pair screen will appear.



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4. Confirm the deletion volumes

Confirm the deletion volumes that are displayed to the Delete pair screen and select (CL) [OK] button and go to 6.

If you want to change delete parameters, select the volumes from the volume list and select (CL) [Change...] button and go to 5.

If you want to omit the volume deletion, select the volumes from the volume list and select (CL) [Omit] button.

5. Inputting a deleting parameter

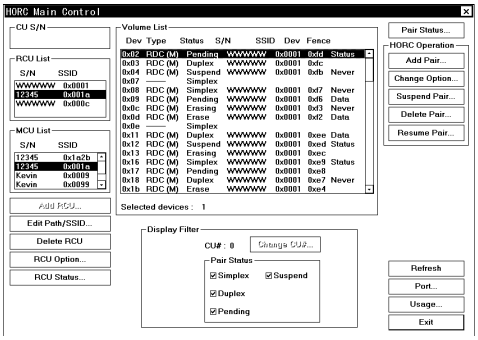
Press (CL) the [OK] button on the Delete Pair screen to execute the deletion and go to 4.

• Delete by Force

This parameter deletes the selected pair(s) forcibly regardless of the status of the communication between MCU and RCU.

6. Verifying the pair(s) deleted

Verify if the volume(s) selected from the volume list (see the figure) is(are) in the simplex status by pressing (CL) the [Refresh] button on the HORC screen.



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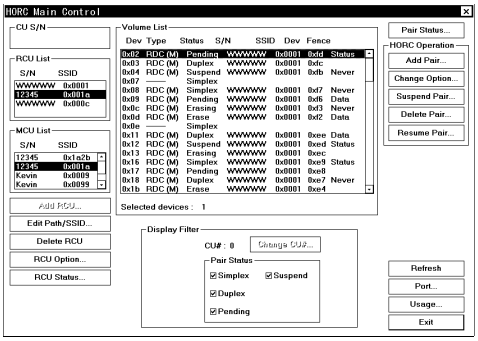
2.28.6 Deleting an RCU Registered

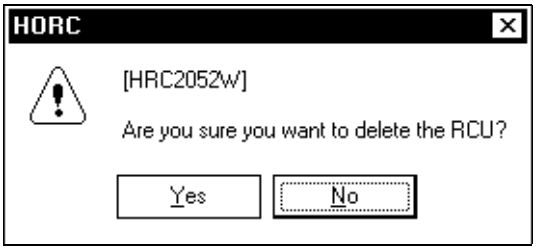
This function deletes an RCU. The function can be executed only from the MCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

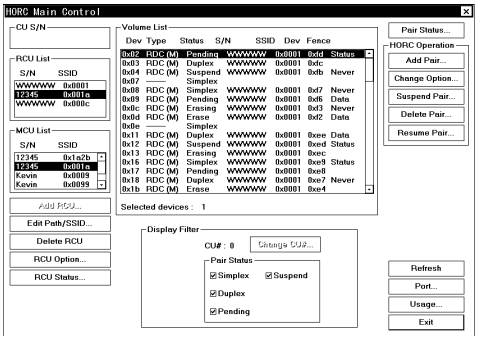
2. Selecting an RCU
   Select an RCU desired to be deleted from the RCU list (see the figure) on the HORC screen. (Only one RCU can be selected here.)



3. Instructing the deletion
   Select (CL) the [Delete RCU] button on the HORC screen. The confirmation message will appear. To delete the RCU really, press (CL) the [Yes] button.



4. Verifying the RCU deletion
   Press (CL) the [Refresh] button on the HORC screen to verify if the RCU selected from the RCU list (see the figure) is deleted.



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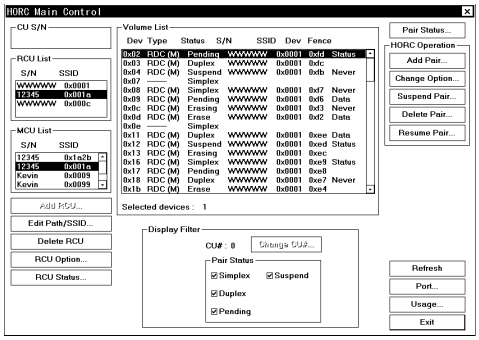
2.28.7 Adding the Path(s) to the RCU

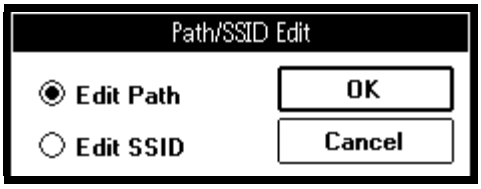
This operation adds the path(s) to the RCU already registered. The operation can be performed from both the MCU and the RCU.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting an RCU
   Select an RCU the number of paths to which is desired to be increased from the RCU list (see the figure) on the HORC screen. (Only one RCU can be selected here.)



3. Selecting a function
   Select (CL) the [Edit Path/SSID...] button on the HORC screen.
   The Path/SSID Edit screen will appear.
   Select (CL) the [Edit Path] radio button then press (CL) the [OK] button on the screen.



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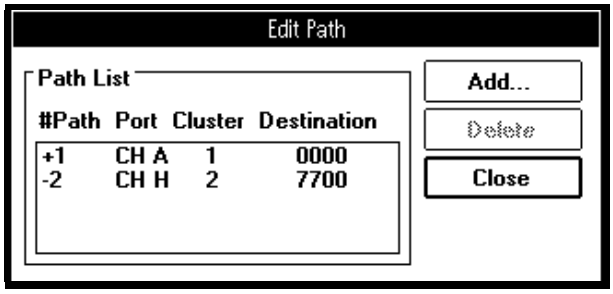
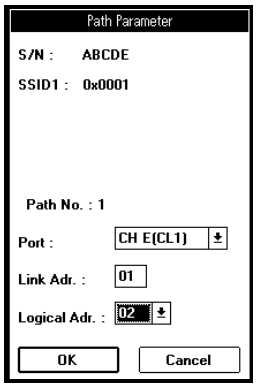
4. Instructing the addition of the path(s)
   The Edit Path screen will appear. Then press (CL) the [Add...] button on the screen.

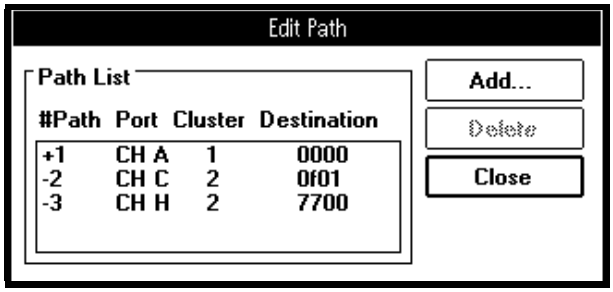


5. Inputting the parameters
   When the Path Parameter screen appears, input the necessary parameters and press (CL) the [OK] button.
   - Port
     Specify the RCP port.
   - Destination link address
     Specify the RCU side link address. When the ESCD is to be used, input the RCU-connected link address. When the ESCD is not used, input '00'.
   - Logical address

     Please select only 00 as a logical address.



6. Verifying the path added
   Make sure on the Edit Path screen that the specified path has been added correctly.



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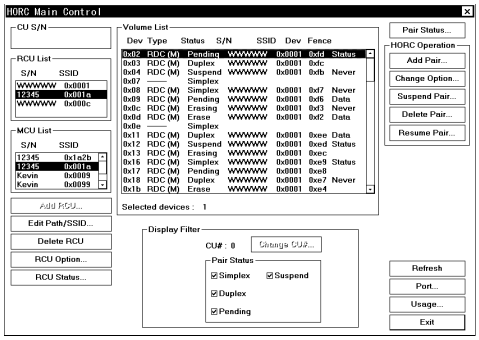
2.28.8 Reducing the Path(s) from the RCU

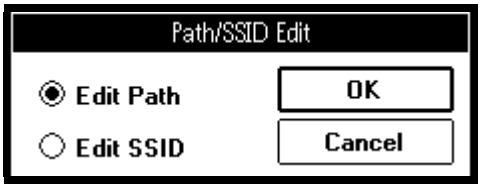
This operation reduces the number of paths connected to an RCU registered already.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting an RCU selection
   Select an RCU the number of paths to which is desired to be reduced from the RCU list (see the figure) on the HORC screen. (Only one RCU can be selected here.)



3. Instructing the reduction of the path(s)
   Select (CL) the [Edit Path/SSID...] button on the HORC screen. The Edit Path/SSID screen will appear.
   Select (CL) the [Edit Path] radio button then press (CL) the [OK] button on the screen.



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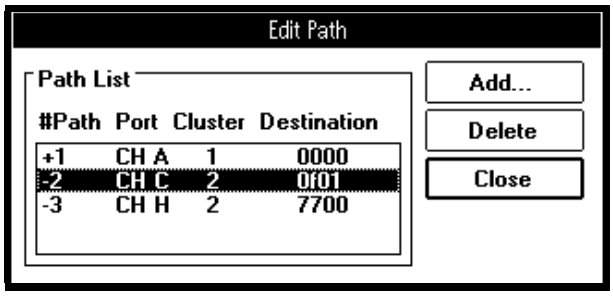
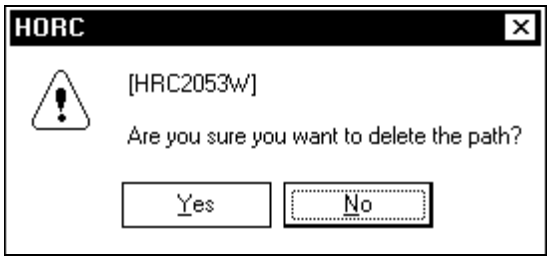
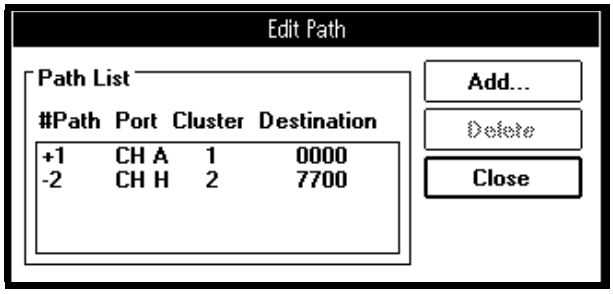
4. Selecting a path to be deleted
Select a path desired to be deleted from the path list displayed on the Edit Path screen and press (CL) the [Delete] button.



5. Confirmation message
When the confirmation message appears, confirm the path to be deleted and press (CL) the [Yes] button.



6. Verifying the path deleted
Make sure on the Edit Path screen that the path specified has been deleted correctly.



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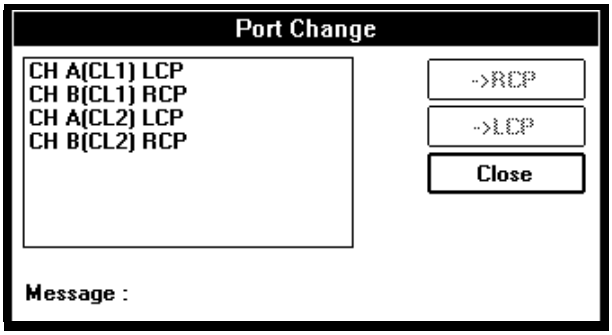
2.28.9 Changing the Port Type

This operation specifies which port type is selected, LCP (to connect to the host) or RCP (to connect to the RCU).

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Selecting the processing to change the port type
   Select (CL) the [Port...] button on the on the HORC screen to display the Path Change screen.



3. Instructing the port change
   When the port list and the port types are displayed in the list box on the Path Change screen, select one or more ports whose type(s) is(are) to be changed.
   To select LCP for the port type, press the [-> LCP] button. Then go to step 4.
   To select RCP for the port type, press the [-> RCP] button. Then go to step 5.

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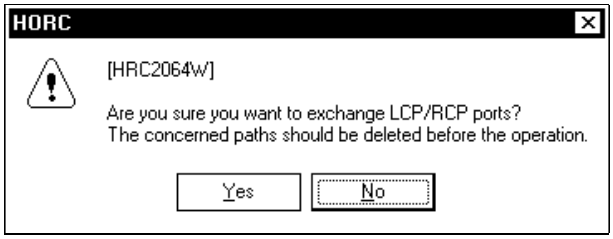
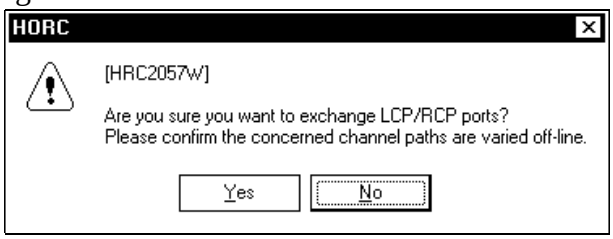
4. Confirmation message and indication of executing status

When the confirmation message appears, confirm the port(s) whose type(s) is(are) to be changed again. If it is correct, press (CL) the [Yes] button.
Status of execution is displayed in the "Message" field on the Port Change screen.
Go to step 6.



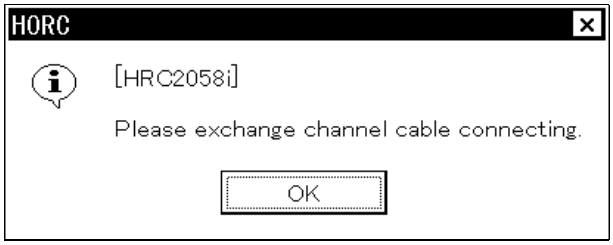
5. Confirmation message and indication of executing status

When the confirmation message appears, confirm the port(s) whose type(s) is(are) to be changed again. If it is correct, press (CL) the [Yes] button.
Status of execution is displayed in the "Message" field on the Port Change screen.



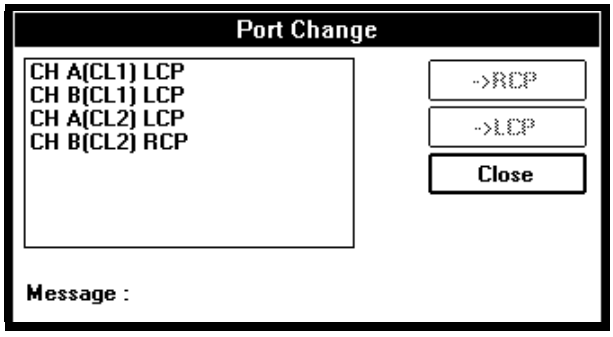
6. Indication message

After exchanging channel cable connecting, press (CL) the [OK] button.



7. Verifying port change

After the change is finished, make sure on the Port Change screen that the type(s) of the specified port(s) has(have) been changed correctly.



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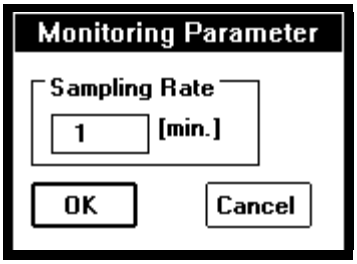
2.28.10 Displaying HORC Operation Status

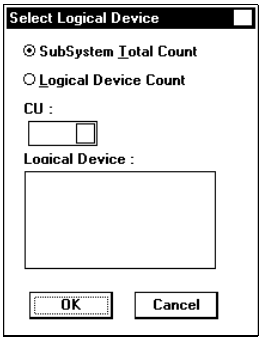
This operation displays a graphic indication of the HORC operation status.

1. Display the HORC screen.
   Select (CL) [HORC] in the 'SVP' window.

2. Setting a sampling rate
   Press (CL) the [Usage...] button on the on the HORC screen to display the Sampling Rate Setting screen. Then, input a sampling rate and press (CL) the [OK] button. (Sampling rate can be set within 1 to 546 minutes in steps of 1 minute.)



3. Selecting an object device
   When the valid logical device list is displayed in the list box on the Select Logical Device screen, select a logical device and press (CL) the [OK] button. To display the information of the whole subsystem, select "Sub System".



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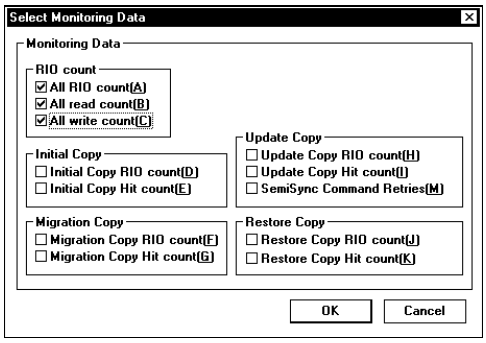
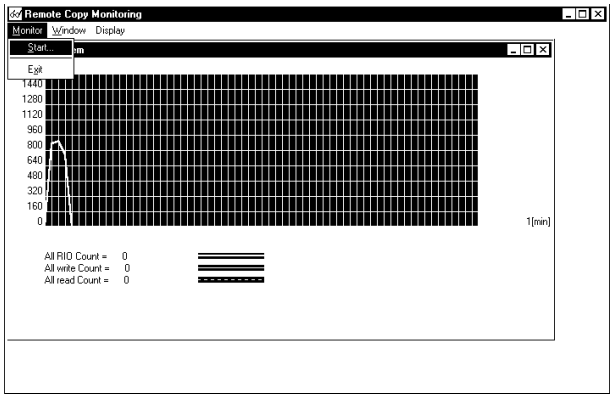
4. Selecting information desired to be acquired

Select one or more data items on the Select Monitoring Data screen, then press (CL) the [OK] button.



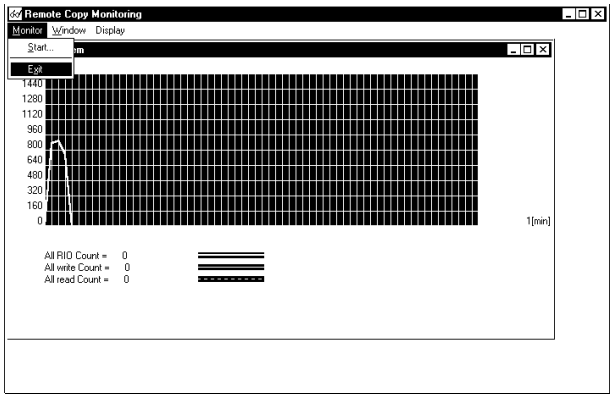
5. Displaying the operation information

The Operation Information Display window appears. To view operation information of other devices, select Monitor-Start from the menu and go to step 3. (Two or more (MAX. 15) screens can be displayed at a time.)



6. Terminating the operation information display

To terminate the operation information display, select Monitor-Exit to return to the HORC screen.



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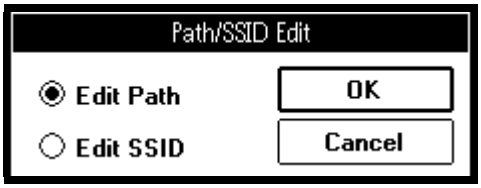
2.28.11 Adding the SSID(s) to the RCU

This operation adds the SSID(s) to the RCU already registered. The operation can be performed from both the MCU and the RCU.

1. Selecting an RCU
   Display the HORC screen and select (CL) an RCU from RCU List which is desired to be increased SSIDs. (Only one RCU can be selected here.)

2. Selecting a function
   Select (CL) the [Edit Path SSID...] button on the HORC screen.
   The Path/SSID Edit screen will appear.

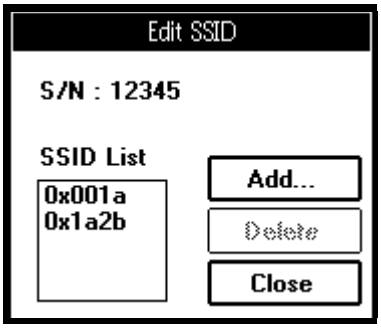
   Select (CL) the [Edit SSID] radio button then press (CL) the [OK] button on the screen.



3. Confirming the number of SSID(s)
   The Edit SSID screen will appear.

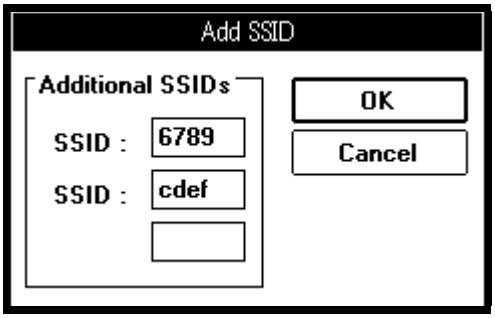
   Press (CL) [Add] button on the screen.
   (See the figure.)

   Note: If 4 SSIDs are registered on the RCU, you can not add a SSID further. ([Add...] button will be not active.)



4. Adding the SSID(s) to the RCU
   The Add SSID screen will appear.

   Input 4-digit hexadecimal SSID(s) number in SSID, then press (CL) [OK] button.



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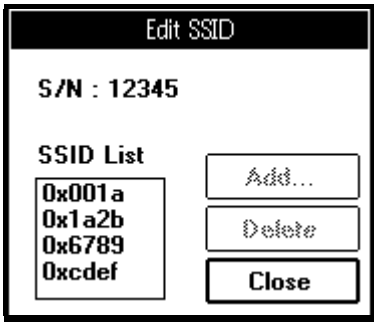
5. Verifying the SSIDs added

Make sure on the Edit SSID screen that the specified SSIDs have been added correctly.



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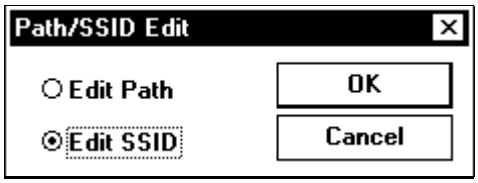
2.28.12 Reducing the SSID(s) from the RCU

This operation reduces the SSID(s) from the RCU already registered.

1. Selecting an RCU
   Display the HRC (HODM) screen and select (CL) an RCU from RCU List which is desired to be reduced SSIDs. (Only one RCU can be selected here.)

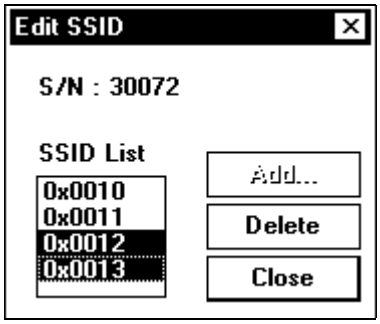
2. Selecting a function
   Select (CL) the [Edit Path SSID...] button on the HORC screen.
   The Path/SSID Edit screen will appear.

   Select (CL) the [Edit SSID] radio button then press (CL) the [OK] button on the screen.

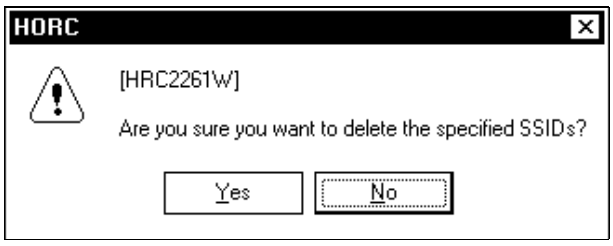


3. Selecting SSID(s) to be deleted
   The Edit SSID screen will appear.

   Select SSIDs desired to be deleted from the SSID List displayed on the Edit SSID screen and press (CL) [Delete] button (See the figure).



4. Confirmation message
   When the confirmation message appears, confirm the SSIDs to be deleted and press (CL) the [Yes] button.



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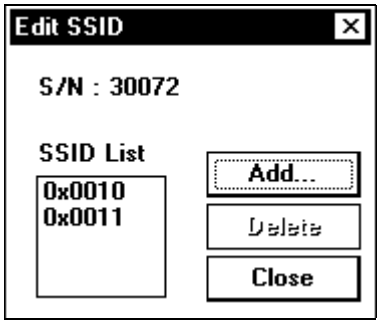
5. Verifying the SSIDs deleted

Make sure on the Edit SSID screen that the specified SSIDs have been deleted correctly.



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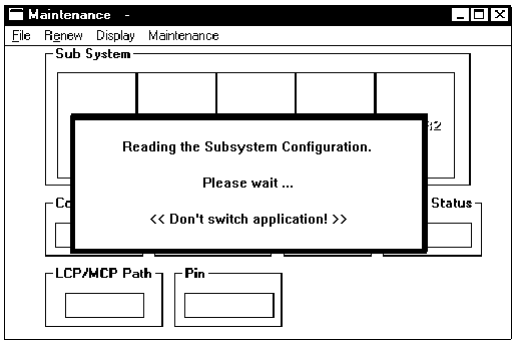
3 Activating and Terminating STATUS

3.1 Activating STATUS

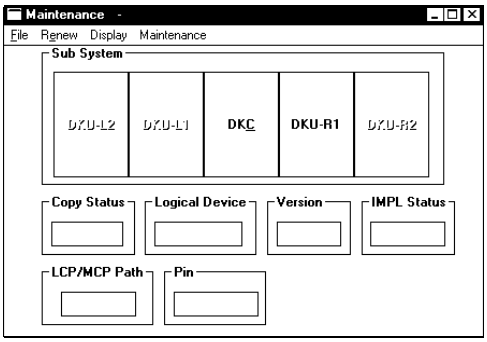
(1) Select (CL) the [Maintenance] in the 'SVP' window.

(2) The 'Maintenance' window will appear, on which the message "Reading the Subsystem Configuration. Please wait..." is displayed. Upon completion of reading the system configuration information, go to step (3). If a read error occurs, go to step (4) or (5).

* Please do not change an application's window until SVP-DKC communication finish.



(3) The main screen shown on the right will appear on the 'Maintenance' window, completing activation of STATUS.



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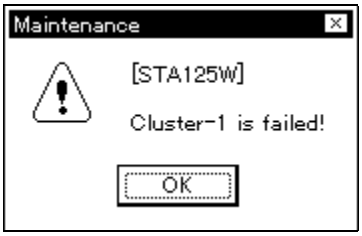
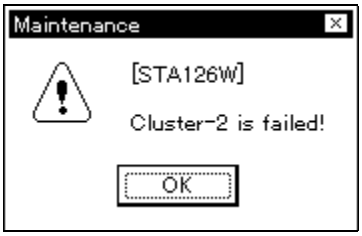
(4) If an error occurs, the nature of error is displayed.
"Cluster X is failed!"
X : 1 or 2
Select (CL) [OK].

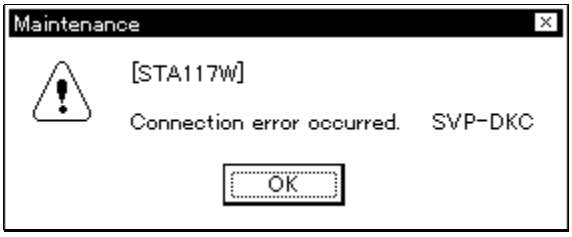


If status of power supplies is failure (refer to step SVP03-20), see TROUBLE SHOOTING SECTION (refer to step 3.2.7 (TRBL03-80)).

If status of power supplies is normal (refer to step SVP03-20), see SVP SECTION (refer to step 2.19 (SVP02-890)).

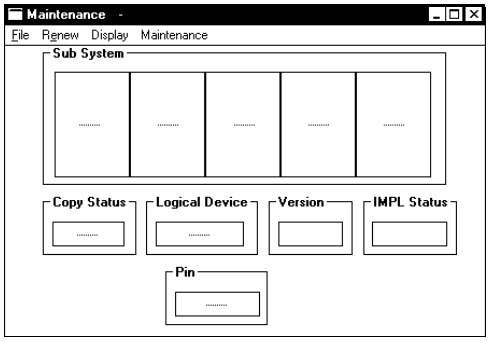


(5) If an error occurs, the nature of the error is displayed.
① "Connection error occurred. SVP-XXX" is displayed.
XXX : DKC or SSVP
② "Initializing SSVP (Phase X/16) Please Wait"
X : 1~16
③ "SSVP Dump is being performed (Phase X/15). Environment Status Can't be read."
X : 1~15
Select (CL) [OK].



(6) The similar screen as in step (3) will appear, but the buttons are indicated by "-----" to indicate an error. Terminate STATUS and remove the cause of the error. Then reactivate STATUS.

Note :When a communication error has occurred on either the SVP-DKC or the SVP-SSVP, the status that was taken through communication is displayed.
The example on the right is the screen displayed when a SVP-DKC and a SVP-SSVP communication error occurs.



* When a communication error has occurred on either SVP-DKC or SVP-SSVP, refer to the "5.3 Recovery Procedure for LAN Error (TRBL05-70)".

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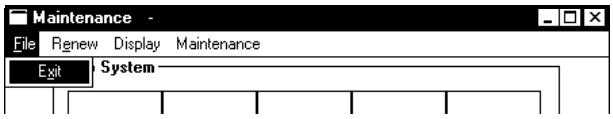
3.2 Terminating STATUS

(1) Close the ‘Maintenance’ window.
Select (CL) [File] - [Exit] in menu bar on ‘Maintenance’. (Screen on the right.)
or
Select (DC) Control Box at the left on the title bar.
or
Select (CL) Control Box - [Close].



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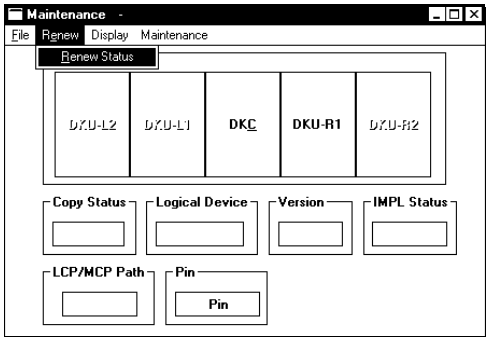
3.3 Updating the STATUS display

The STATUS display remains unchanged while the screen is displayed or being switched.
To display the latest status, follow the procedure below.

(1) Select (CL) [Renew] - [Renew Status] in the menu bar on the main screen. (Screen on the right)

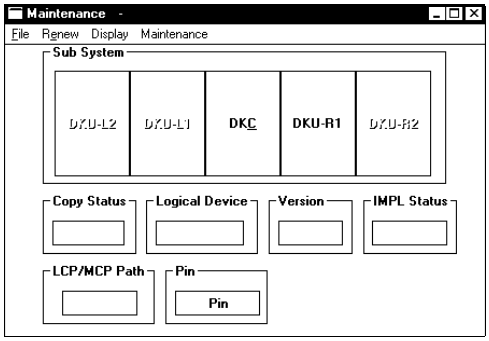
or

(2) Terminate STATUS and activate it again.



3.4 Main screen

After STATUS is activated, the buttons on the 'Maintenance' window indicate each status as follows.



DKC ..... Status of the DKC (Details are displayed on the lower layered screen.)
- Valid button : Normal
- Blinking button : Failure or under maintenance

DKU-R1,R2,L1,L2 ..... Status of the DKU (Details are displayed on the lower layered screen.)
- Valid button : Normal
- Blinking button : Failure or under maintenance or during a copy operation
- Invalid button : Non-mounted

Copy Status ..... Status of copy work
- Blinking "Copy" in the button : Copy work is in progress. (Details are displayed on the lower layered screen.)
- No display in the button : Copy work is not performed. (The lower layered screen is not provided.)

Logical Device .. Logical device information is displayed on the lower layered screen.

Version ..... Version information on the micro-program is displayed on the lower layered screen.

LCP/MCP Path . LCP/MCP Path information is displayed on the lower layered screen.

SCSI Path ..... SCSI Path definition is displayed.

Pin ..... Pinned Track is displayed.

IMPL Status ..... IMPL Sequence codes each MP are displayed.

The menus in the menu bar are explained below.

Renew ..... The configuration information is read. The status display is updated.(Select (CL) [Renew] - [Renew Status].)

File ..... The pull-down menu to terminate STATUS appears.
Selecting (CL) [Exit] terminates STATUS.

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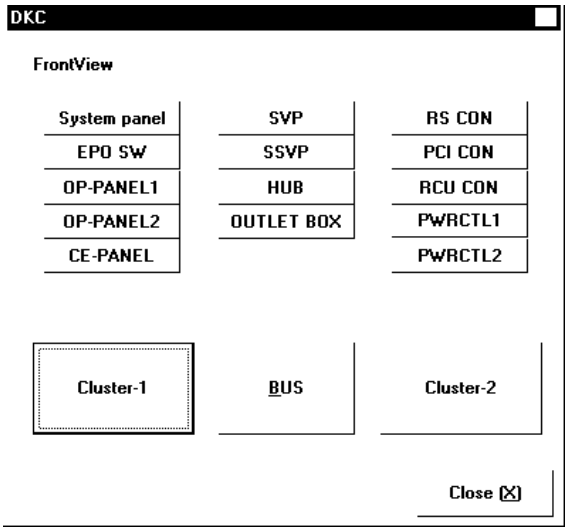
3.5 DKC

(1) Status of DKC
Select (CL) [DKC] on the main screen.
The 'DKC' window will appear.



PWRCTL 1 ---- Status of PWRCTL1 and
PWRCTL 2 PWRCTL2
Valid button : Normal
Blinking button : Failure

Cluster-1 ------- Status of Cluster-1 and Cluster-2 and BUS (Details are
Cluster-2 displayed on the lower layered screen.)
BUS Valid button : Normal
Blinking button : Failure or under maintenance
" ---- "button : No information due to SVP-DKC error

System panel -- Only parts names are displayed.
EPO SW
OP-PANEL 1
OP-PANEL 2
CE-PANEL
SVP
SSVP
HUB
OUTLET BOX
RS CON
PCI CON
RCU CON

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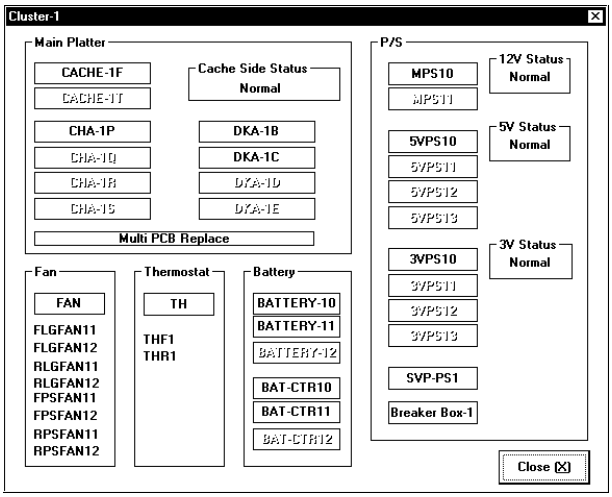
(2) Status of Cluster-1 and 2
Select (CL) [Cluster-1] or [Cluster-2] in the 'DKC' window.
The 'Cluster-1/2' window will appear.



3VPSn0 --- Status of the power supplies
5VPSn0 Valid button : Normal
3VPSn1 Blinking button : Failure
5VPSn1
3VPSn2
5VPSn2
3VPSn3
5VPSn3
MPSn0
MPSn1
SVP-PSn
Breaker Box-n--- Only Breaker Box names are displayed.
12V Status ------ Status of the 12 voltage
5V Status -------- Status of the 5 voltage
3V Status -------- Status of the 3 voltage
• Normal
• Warning (abnormal)
FLGFANn1 --- Status of the fans
FLGFANn2 Valid button : Normal
RLGFANn1 Blinking button : Failure
RLGFANn2
FPSFANn1
FPSFANn2
RPSFANn1
RPSFANn2
THFn ---------- Status of the temperature
THRn Valid button : Normal
Blinking button: Abnormal
BATTERY-n0--- Status of the expanded power supplies
BATTERY-n1 Valid button : Normal
BATTERY-n2 Blinking button: Abnormal
BAT-CTR-n0
BAT-CTR-n1
BAT-CTR-n2
Cache Side Status ---- Status of the Cache Side
• Normal
• Warning (abnormal)
CACHE-nx --- Status of Cache (Details are displayed on the lower layered screen.)
Valid button : Normal
Blinking button: Failure or under maintenance
Invalid button : Non-mounted

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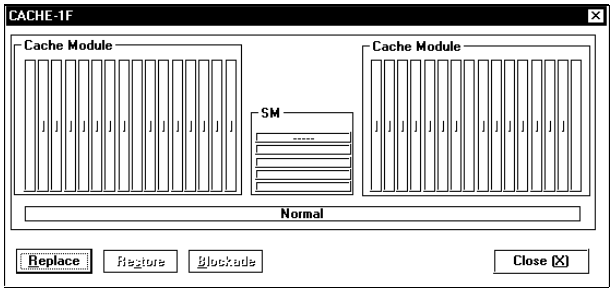
CHA-nx -------- Status of the CHA (Details are displayed on the lower layered screen.)
Valid button : Normal
Blinking button: Abnormal
Invalid button : Non-mounted
DKA-nx -------- Status of the DKA (Details are displayed on the lower layered screen.)
Valid button : Normal
Blinking button: Abnormal
Invalid button : Non-mounted

The number n is 1 for cluster 1 or 2 for cluster 2.

(3) Status of each PCB (Cache)
Select (CL) one of [Cache-nxx/nx] in the 'Cluster-1/2' window.

The window for the selected PCB will appear.
The same configuration is used for all PCBs.



Cache Module - Status of the cache memory module (Displayed for each module group)
Valid button : Normal
Blinking '*' in the button : Failure
'¦' displayed in the button : Non-mounted
SM ---------- Status of the shared memory module
Valid button : Normal
Blinking '*' in the button : Failure or under maintenance
'--' displayed in the button : Non-mounted
PCB Status ----- Status of this package
Valid button : Normal
Blinking button : Warning (abnormal)
: Blocked (blocked for maintenance)
: Failed (blocked due to a failure)
: Cache Access Error (PCB blocked and CMG normal)

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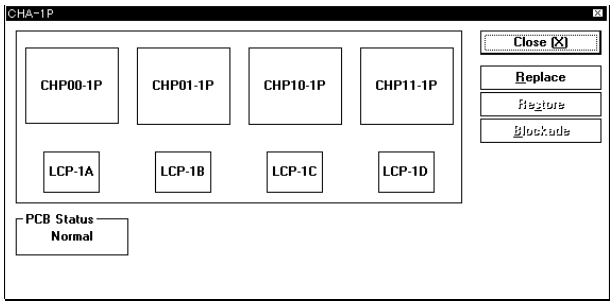
(4) Status of the CHA

Select (CL) one of [CHA-nx] in the 'Cluster-1/2' window. The 'CHA' window will appear. The CHA part location number is displayed in the title.



CHPX-XX Status of program CHP in the CHA
- Valid button : Normal
- Blinking button : Failure

LCPXX ---- Status of program LCP or MCP
MCPXX in the LCM
- Valid button : Normal
- Blinking button : Failure
- Invalid button : Non-mounted

PCB Status Status of the CHA package
- Normal
- Warning (abnormal)
- Blocked (blocked for maintenance)
- Failed (blocked due to a failure)

SCP XX --- Status of processor SCP
- Valid button : Normal
- Blinking button : Failed or Blocked (status displayed under SCP button)
- Invalid button : Non-mounted

FCP XX --- Status of processor FCP
- Valid button : Normal
- Blinking button : Failed or Blocked (status displayed under FCP button)
- Invalid button : Non-mounted

PERFORMANCE FIBRE ------ High performance type of FIBRE package.

FOP XX --- Status of processor FOP
- Valid button : Normal
- Blinking button : Failed or Blocked (status displayed under FOP button)
- Invalid button : Non-mounted

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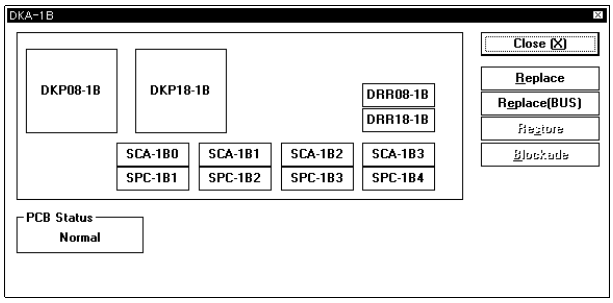
(5) Status of the DKA

Select (CL) one of [DKA-nx] in the 'Cluster-1/2' window. The 'DKA' window will appear.

DKPX-XX Status of programs DMP and DSP in the DKA

Valid button : Normal

Blinking button : Failure or under maintenance



SCA-XXX Status of the SCA (No. 0 ~ 3)

SPC-XXX - Status of the SPC (No. 1 ~ 4)

PCB Status Status of the DKA package

- Normal
- Warning (abnormal)
- Blocked (blocked for maintenance)
- Failed (blocked due to a failure)

DRR-XX -- Status of DRR

Valid button : Normal

Blinking button : Failure

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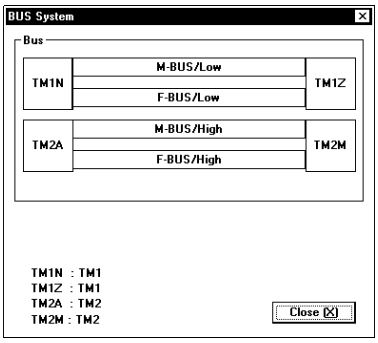
(6) Status of the BUS in the DKC
Select (CL) [BUS] in the 'DKC' window.
The status of each bus will be displayed.



F-BUS/Low --- Status of the F-BUS and M-BUS
F-BUS/High Valid button : Normal
M-BUS/Low Blinking button: Failure or under maintenance
M-BUS/High
TM1N ---------- Terminator (Only terminator names are
TM1Z displayed.)
TM2A
TM2M

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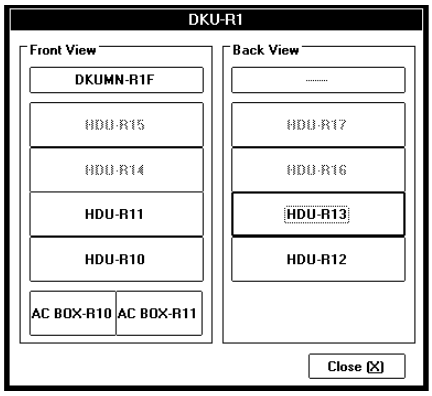
3.6 DKU

(1) Status of the DKU

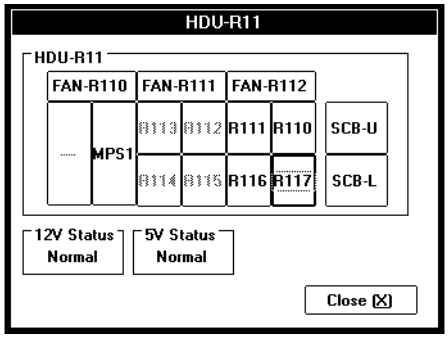
Select (CL) [DKU-R1] , [DKU-R2] , [DKU-L1] , or [DKU-L2] in the main screen.
The 'DKU' window will appear.
The DKU part location number is displayed in the title.



HDU-XX0 Status of the HDUs constituting the selected DKU
HDU-XX1 (Details are displayed on the lower layered screen.)
HDU-XX2 Valid button : Normal
HDU-XX3 Blinking button: Failure or under
HDU-XX4 maintenance or copy work in progress
HDU-XX5 Invalid button : Non-mounted
HDU-XX6
HDU-XX7
DKUMN-XXF - Status of DKU monitor
DKUMN-XXR Valid button : Normal
Blinking button : Failure
AC BOX-Rnn --- Only AC BOX names are displayed.
XX represents XX in DKU-XX: for example, R1 for DKU-R1 and L2 for DKU-L2.

(2) Status of the HDU

Select (CL) one of [HDU-XX0] to [HDU-XX7] in the 'DKU' window. The 'HDU' window will appear.



YYY0 -------- Status of the HDDs constituting the HDU
YYY1 (Details are displayed on the lower layer
YYY2 screen.)
YYY3 Valid button : Normal
YYY4 Blinking button : PDEV error, failure, or
YYY5 under maintenance
YYY6 Blocked port Copy work in progress
YYY7 Invalid button : Non-mounted
" ---- "button : No information due to SVP-DKC error
MPS0 -------- Status of the HDU power supplies
MPS1 Valid button : Normal
Blinking button : Failure
" ---- "button : No information due to SVP-SSVP error
FAN-YYY0 - Status of the fans in the HDU
FAN-YYY1 Valid button : Normal
FAN-YYY2 Blinking button : Failure
" ---- "button : No information due to SVP-SSVP error

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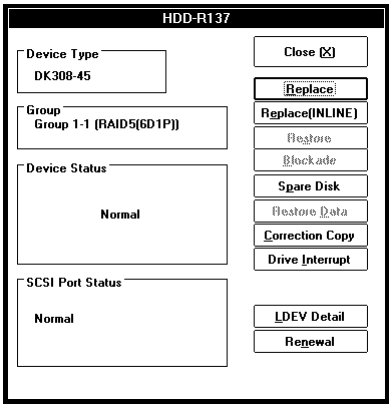
SCB-U-------- Only SCSI Buffer names are displayed.
SCB-L " ---- "button : No information due to SVP-SSVP error
12V Status -- Status of the 12 voltage
5V Status ---- Status of the 5 voltage
- Normal
- Warning (abnormal)

YYY represents YYY in HDU-YYY: when HDU-R12 is selected, for example, YYY is R12.

(3) Status of the HDD
Select (CL) one of [YYY0] to [YYY7] in the 'HDU' window.
The 'HDD' window will appear.
The HDD part location number is displayed in the title.



Device Type --- Model name of the HDD
Group ---------- Number of the parity group to which the HDD belongs
LDEV Detail --- The involved logical devices are listed.
Device Status -- The status of the HDD and the work name are displayed.
- Normal
- Correction Copy (xx%)
- Copy Back (xx%)
- Drive Copy (xx%)
- Dynamic Sparing (xx%)
- Blocked (blocked for maintenance)
- Failed (blocked due to failure)
- Warning (Either SCSI port is blocked.)
- Failed (Both SCSI ports are blocked.)
- Free (available spare disk.)
- Reserved (not available spare disk. The spare disk is reserved.)

During a copy operation, copy destination/copy source is displayed.
- to HDD-xx : Data is copied form this drive to HDD-xx.
- from HDD-xx : Data is copied from HDD-xx to this drive.

SCSI Port Status -- SCSI port status
- Normal
- Warning (Port 0 failed): port 0 is blocked.
- Warning (Port 1 failed): port 1 is blocked.
- Failed: Both ports are blocked.

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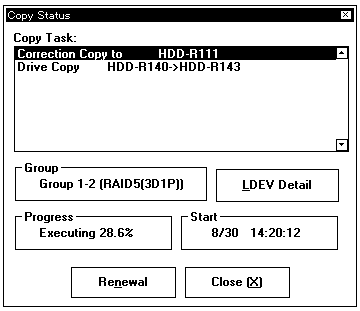
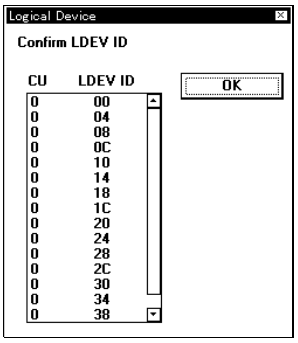
3.7 Copy status

(1) Select (CL) [Copy Status] in the main screen.
The 'Copy Status' window will appear.



Copy Task - The operations of the drive copy currently running are listed.
- Correction Copy to HDD-XXXX
- Dynamic Sparing HDD-XXXX->HDD-XXXX
- Copy Back HDD-XXXX->HDD-XXXX
- Drive Copy HDD-XXXX->HDD-XXXX

Group ------ Number of the parity group to which the target drive belongs.
Start -------- Date and time when the job started
Progress --- Degree of job progress (indicated in percent)

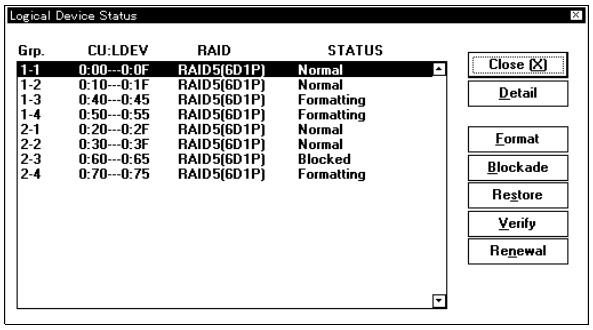


Select (CL) one job item from the list. And select (CL) [LDEV Detail] in the 'Copy Status' screen. The following information concerning the selected LDEV ID will be displayed:

CU ---------- CU ID
LDEV ID -- Logical Device ID

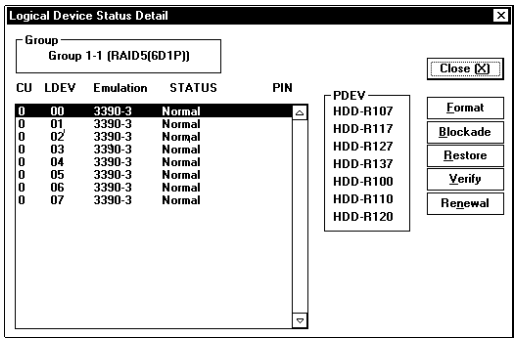
3.8 Logical device

(1) Select (CL) [Logical Device] in the main screen.
The 'Logical Device Status' window will appear.



Grp---------- Grp ID
CU:LDEV - List of the mounted logical devices
RAID ------- RAID Level
Status ------- Status of the logical device

Select (CL) a logical device from the list. And select (CL) [Detail] in the 'logical device status' screen. The following information concerning the selected logical device will be displayed:



Parity Group --- Parity group to which the Logical Device belongs
PDEV---------- Number of the HDD including the Logical Device
PIN---------- If an Ldev has PIN, SVP will indicate the PIN status as '*'.
- '*' : PIN occurred.
- ' ' : Normal (not occurred).

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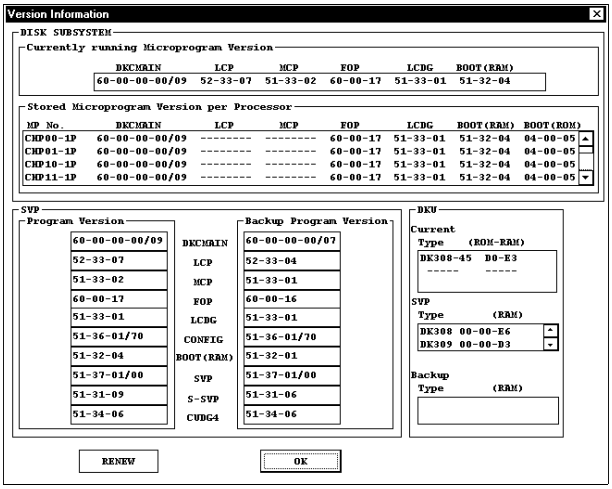
3.9 Micro-program version

Select (CL) [Version] from the main screen.
The message indicating that the version data of the micro-program currently running is being read is displayed, followed by the message indicating that the version data of the disk drive is read. Finally, the message indicating that the version data of the micro-program in the processor is being read is displayed.
Then, the 'Version Information' dialog box is displayed.

* Please do not change an application's window until SVP-DKC communication finish.



DISK SUBSYSTEM area : Displays the version of the currently running micro-program.
- Representative version
- Version of each processor

SVP area : Displays the version of the micro-program saved in the SVP.
- Latest version in the SVP
- Old version in the SVP

DKU area
- Drive version

In the version display areas, a hyphen "-" indicates that micro-program is not installed.
In the version display areas, a question mark "?" indicates that version data could not be obtained while the letter "x" indicates that the obtained data is invalid.

If the version of the PCB which has already been installed is displayed as "x", please exchange the micro-code corresponding to "x" by micro FC (refer to MICRO-FC SECTION 4.4 Hard Disk Download (MICRO-FC04-140)).

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To obtain new version data, select (CL) [RENEW]. The contents of the display will be updated accordingly.

To quit the version display, select (CL) [OK]. This will take you back to the main screen.

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[1] DISK SUBSYSTEM area

DISK SUBSYSTEM

Currently running Microprogram Version

DKCMAIN	LCP	MCP	FOP	LCDG	BOOT(RAM)
60-00-00-00/09	52-33-07	51-33-02	60-00-17	51-33-01	51-32-04

Stored Microprogram Version per Processor

MP No.	DKCMAIN	LCP	MCP	FOP	LCDG	BOOT(RAM)	BOOT(ROM)
CHP00-1P	60-00-00-00/09	--------	--------	60-00-17	51-33-01	51-32-04	04-00-05
CHP01-1P	60-00-00-00/09	--------	--------	60-00-17	51-33-01	51-32-04	04-00-05
CHP10-1P	60-00-00-00/09	--------	--------	60-00-17	51-33-01	51-32-04	04-00-05
CHP11-1P	60-00-00-00/09	--------	--------	60-00-17	51-33-01	51-32-04	04-00-05

(1) Representative version and version for each processor
The Currently running Micro-program Version area displays the representative version of micro-program currently running.
The Stored Micro-program Version per Processor area displays the version of the currently running micro-program for each processor.
A micro-program is divided into seven items: MAIN, LCP, MCP, FOP, LCDG, BOOT (RAM), BOOT (ROM). The version of MAIN is displayed in the form of VV-RR-NN-PP/nn. The other versions are displayed in the form of VV-RR-NN.

The representative version may be displayed in reverse video. This display indicates that there is a processor version that does not match the representative version. The processor displayed in reverse video in the Stored Micro-program Version per Processor area is the one that caused a mismatch. An asterisk "*" in front of a version number indicates the mismatching item in the mismatching processor.

DISK SUBSYSTEM

Currently running Microprogram Version

DKCMAIN	LCP	MCP	FOP	LCDG	BOOT(RAM)
60-00-00-00/09	52-33-07	51-33-02	60-00-17	51-33-01	51-32-04

Stored Microprogram Version per Processor

MP No.	DKCMAIN	LCP	MCP	FOP	LCDG	BOOT(RAM)	BOOT(ROM)
CHP00-1P	60-00-00-00/09	--------	--------	60-00-17	51-33-01	51-32-04	04-00-05
CHP01-1P	60-00-00-00/09	--------	--------	*xx-xx-xx	xx-xx-xx	51-32-04	04-00-05
CHP10-1P	60-00-00-00/09	--------	--------	60-00-17	51-33-01	51-32-04	04-00-05
CHP11-1P	60-00-00-00/09	--------	--------	*xx-xx-xx	xx-xx-xx	51-32-04	04-00-05

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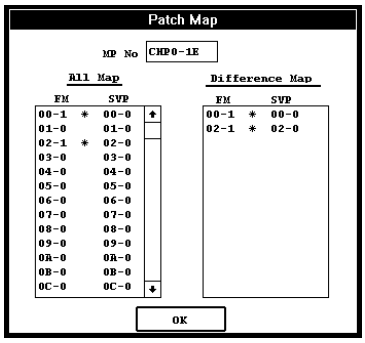
(2) Patch status display

Select the (DC) one line from the list in the Stored Micro-program Version per Processor area on the 'Version Information' dialog box.
'Patch Map' dialog box will be displayed, showing the patch status for the target processor.

MP No ---------- Processor ID
All Map ---------- List of all maps. All maps in the FM and SVP are displayed. When a match is not found between a map in the FM and the corresponding map in the SVP, an asterisk "*" is displayed between them.
Difference Map -- Only the maps which do not provide a match between the FM and SVP in All Map.



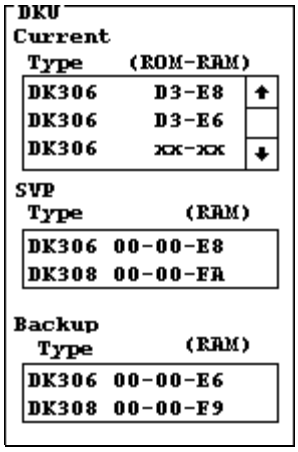
The example on the right shows that, in processor CHP0-1E, the contents for patch ID numbers 00 and 02 are contained in the flash memory (FM) but not in the SVP.

To quit the patch status map display, select (CL) [OK].

(3) Drive version

The DKU area on the 'Version Information' dialog box lists drive versions as ROM Version-RAM Version.

Type : Types of drives currently running (DKxxx).
Current : Version of micro-program currently running.
SVP : New version of micro-program stored in SVP hard disk. (00-00-RAM Version)
Backup : Old version of micro-program stored in SVP hard disk. (00-00-RAM Version)

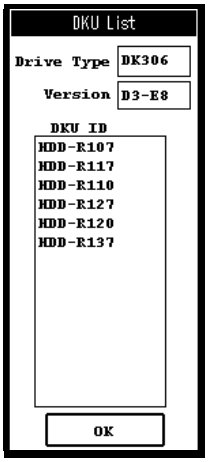


(4) Drive name display

Select (DC) one line from the list in the DKU area on the 'Version Information' dialog box. The 'DKU List' dialog box will be displayed, in which the drive identified by the version are listed.

Drive Type - Types of drives identified by the selected version.
Version ----- Selected version
DKU ID ---- List of IDs of the drives identified by the selected version.

To quit 'Drive List', select (CL) [OK].



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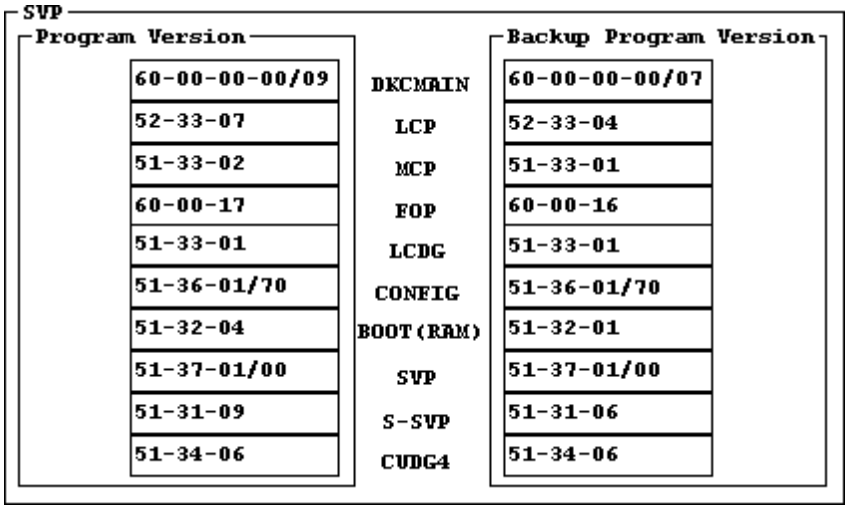
[2] SVP area



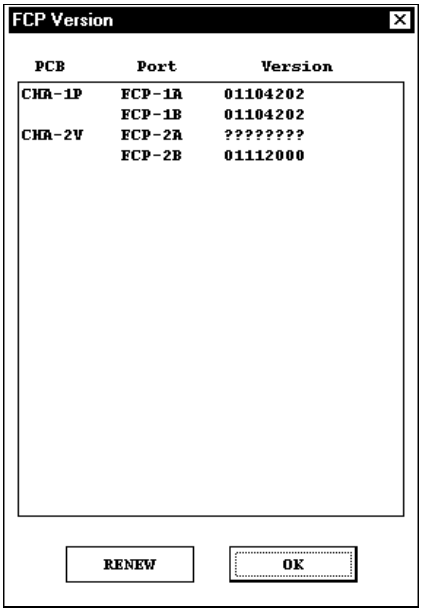
This area displays the versions of two generations (previous and most recent) of micro-programs saved on the SVP hard disk. Each micro-program is divided into ten items: MAIN, LCP, MCP, FOP, LCDG, CONFIG, BOOT (RAM), SVP, S-SVP, and CUDG4. The version of MAIN is displayed in the form of VV-RR-NN-PP/nn while that of SVP, CONFIG is displayed in the form of VV-RR-NN/nn. The other versions are displayed in the form of VV-RR-NN.

Program Version ---------- The latest version is displayed.
Backup Program Version ----- The old version is displayed.

[3] FCP Version

Select (CL) [FCP Version...] in the 'Version Information'.

To obtain new FCP version data, select (CL) [RENEW].
The contents of the display will be updated accordingly.
To quit the version display, select (CL) [OK].
This will take you back to the 'Version Information'.



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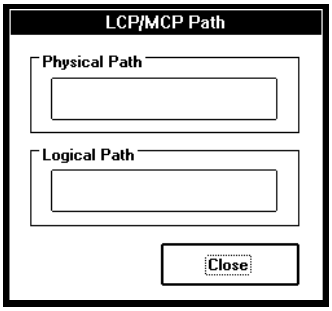
3.10 LCP/MCP Path

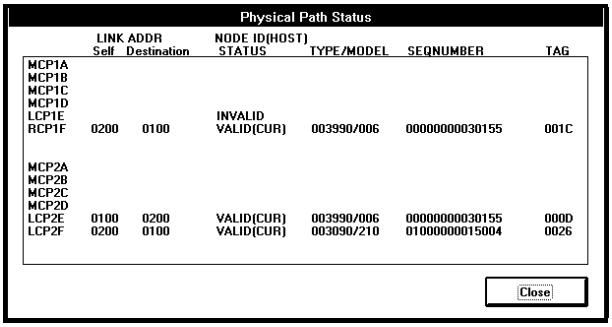
Select (CL) [LCP/MCP Path] from the main screen.
The message shown on the right is displayed while the SVP is reading path information from the DKC.

Upon completion of reading the path information, the LCP/MCP Path screen is displayed for selecting the physical or logical path.



* Please do not change window until SVP-DKC communication finish.

(1) Physical Path
Select (CL) [Physical Path] in the screen.
The 'Physical Path Status' window will appear.

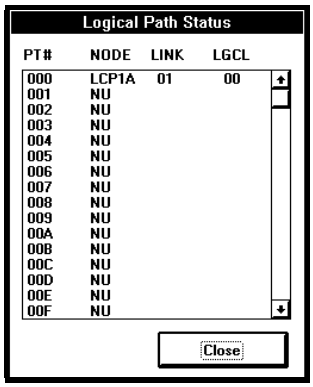


LCPxx/RCPxx/MCPxx -- LCP/RCP/MCP mount position
LINK ADDR
Self ---------- LCP/RCP/MCP link address
Destination --------- Connection destination (host) link address
NODE ID (HOST)
STATUS ---------- Node ID obtainment status
TYPE/MODEL --- Connection destination type/model name
SEQNUMBER ---- Connection destination production number
TAG ---------- Connection destination tag

To exit the display, press [Close].

---

(2) Logical Path
Select (CL) [Logical Path] in the screen.
The 'Logical Path Status' window will appear.



PT# ----------Path number
NODE -------LCPxx : LCP to which the logical path is allocated
RCPxx : RCP to which the logical path is allocated.
CLSW : Metal channel
NU : Unused logical path
LINK --------Link address of the connected host
"NA" is displayed when the metal channel is specified.
LGCL--------Logical address of the connected host
A blank is displayed when the metal channel is specified.

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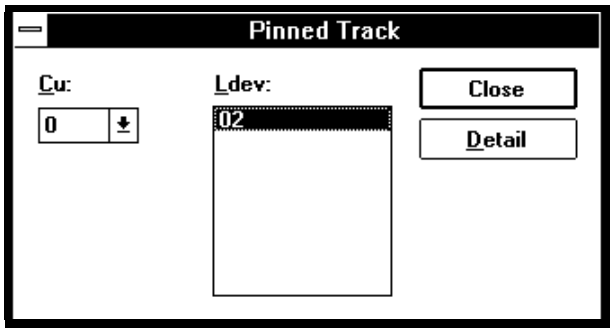
Since data can be displayed only in 16 rows within a screen, use the scroll bar to display data not included in the screen.
To exit the display, press (CL) [Close].

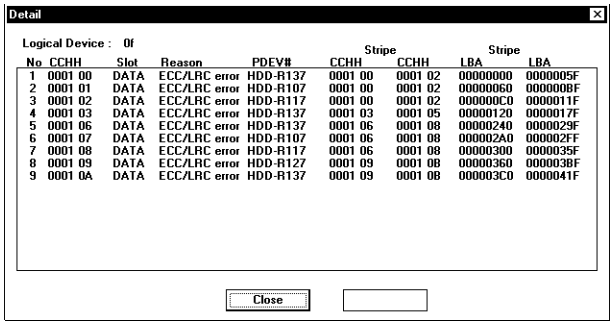
3.11 Pin

(1) Select (CL) [Pin] in the main screen.
The 'Pinnec Track' windows will appear.



CU ---------- CU ID
Ldev -------- Logical device number which PIN exists.

Select (CL) a Ldev from the list. And select (CL) [Detail] in the 'Pinned Track' screen. The following information concerning the selected Ldev will be displayed.



CCHH ------ Number of cylinder and head which PIN exist.
Slot---------- Kind of Track which PIN exists.
DATA : DATA Track
PRTY : Parity Track
Reason------ Cause of Pin.
ELC/LRC error : see TRBL04-20
WRITE error : see TRBL04-30
PDEV# ----- HDD number which Logical device has PIN.
Stripe ------- The first and the last CCHH of parity stripes.
The first and the last LBA of parity stripes.

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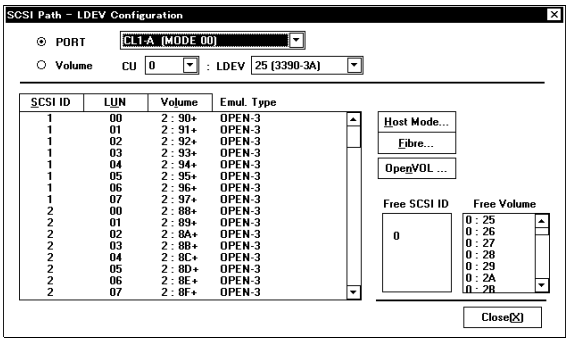
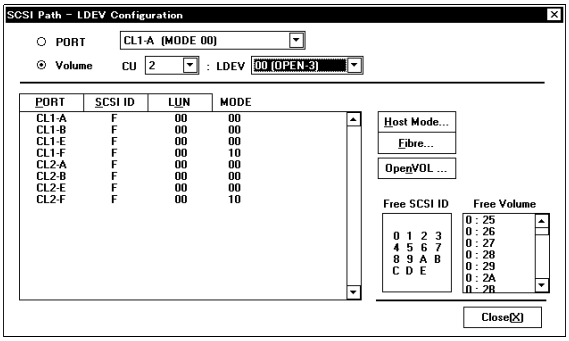
3.12 SCSI Path

(1) Status of SCSI Path

Select (CL) [SCSI Path] in the main screen.
The 'SCSI Path-LDEV Configuration' window will appear.

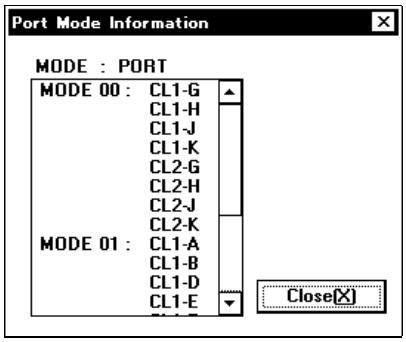




PORT list ---------- List of the ports installed CHSs and CHFs
CU:LDEV list -------- List of installed CU:LDEV IDs corresponding to OPEN-LDEV
PORT button --------- SCSI paths are sorted increasingly in port number.
SCSI ID button ------- SCSI paths are sorted increasingly in ID.
LUN button ---------- SCSI paths are sorted increasingly in LUN.
CU:LDEV button ---- SCSI paths are sorted increasingly CU:LDEV ID.
SCSI Path list--------- List of defined SCSI paths.
The string '[for Cmd. Dev.]' denotes 'Command Device'.
Free SCSI ID area --- Unused SCSI IDs
Free LDEV ID list --- Unused CU:LDEV IDs
Host Mode button --- 'Port Mode Information' window will appear.
Fibre button---------- 'Fibre Information' window will appear.
Open VOL button---- 'LU Expansion Define' window will appear.

(2) Status of Port Mode

Select (CL) [Host Mode...] in the 'SCSI Path-LDEV Configuration' window.
The 'Port Mode Information' window will appear.



MODE:PORT list---- Displays mode of each port

CAUTION

On the CHF, Host Mode must be set to "MODE 00".

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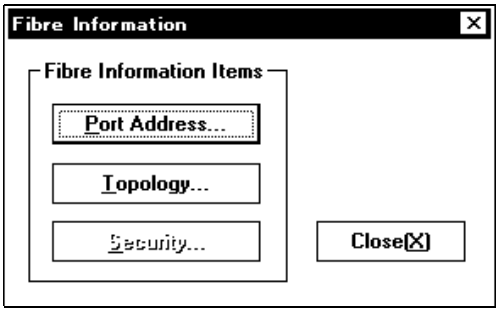
(3) Status of Fibre Port

Select (CL) [Fibre...] in the 'SCSI Path-LDEV Configuration' window.
The 'Fibre Information' window will appear.

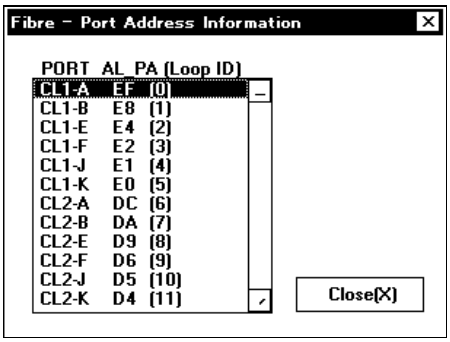
Port Address button - 'Fibre-Port Address Information' window will appear.
Topology button ----- 'Fibre-Topology Information' window will appear.



(3.1) Status of Port Address

Select (CL) [Port Address...] in the 'Fibre Information' window.
The 'Fibre-Port Address Information' window will appear.

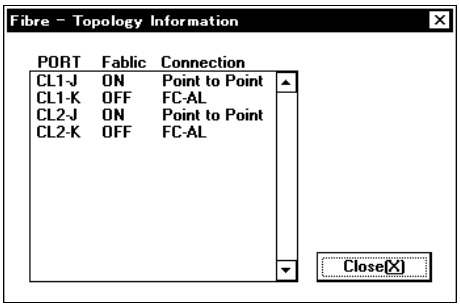
PORT Address list--- Displays address of each port



(3.2) Status of Topology

Select (CL) [Topology...] in the 'Fibre Information' window.
The 'Fibre-Topology Information' window will appear.

PORT Fablic Connection list
---------- Displays Fablic and connection type of each port.



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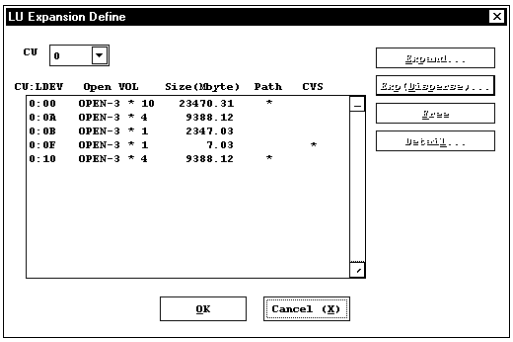
(4) Status of Open VOL

Select (CL) [Open VOL...] button in 'SCSI Path-LDEV Configuration' window.
'LU Expansion Define' window is displayed.



Detail of the list

CU:LDEV : The list is displayed line by line in CU (The selection can be done on CU list).

OPEN VOL : The number of LDEVs connected sequentially together which formalize LU Expansion (Open VOL).
ex.) The first line on the right figure indicates that 10 LDEVs whose emulation type is OPEN-3 are connected together sequentially.

Size (Mbyte) : The capacity of Open VOL

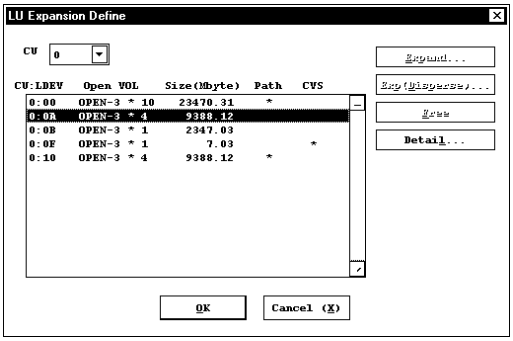
Path : The existence of SCSI path definition to the Open VOL
ex.) In the first line, '*' shows that CU:LDEV=0:00 has a SCSI path definition.

CVS : The existence of CVS definition to the Open VOL
ex.) In the fourth line '*' shows that CU:LDEV=0:0F has a CVS definition.

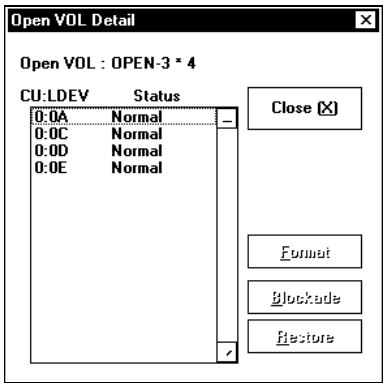
[Detail...] button : To display 'Open VOL Detail' window.

(4.1) Display detail information of Open VOL ('Open VOL Detail' window)

After the selection (CL) of LDEV at 'LU Expansion Define' window, select (CL) [Detail...] button.



'Open VOL Detail' window is displayed.



Detail of displayed information

CU:LDEV : CU:LDEV# of LDEV compose Open VOL

Status : Status of CU:LDEV

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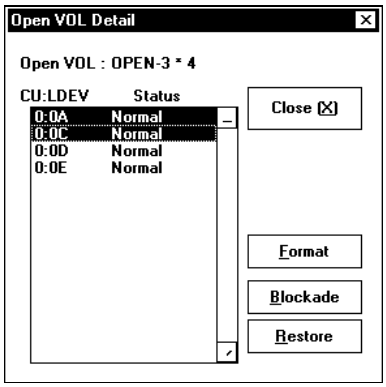
After selection (CL) of CU:LDEV from the list, maintenance logical device.

[Format] button : Format logical device
[Blockade] button : Block logical device
[Restore] button : Restore logical device



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3.13 Error or Failure Status Action

When an error status of, Warning, Failed, or other is displayed on the screen and action is required, locate the part in error and follow the instructions sccording to the action code (ACC). The ACC can be obtained by executing the SSB log or SIM log displayed function of the SVP.

Notice

1. In case that DKU INLINE is unsuccessful, neither SSB log nor SIM log may be created. When HDD status button is flashing, please check DIAG log additionally.
2. When you execute the transfer of dump, log or the other data, please confirm that SVP does not work. When SVP is working, please stop the process or wait for the end of the process. Otherwise SVP may be hang up.
   When you cannot stop the process of SVP but you must transfer data urgently, please use the other SVP or PC. For your information, in case that “SVP working status” is going on for very long time, please inform the Technical Support Center of it.

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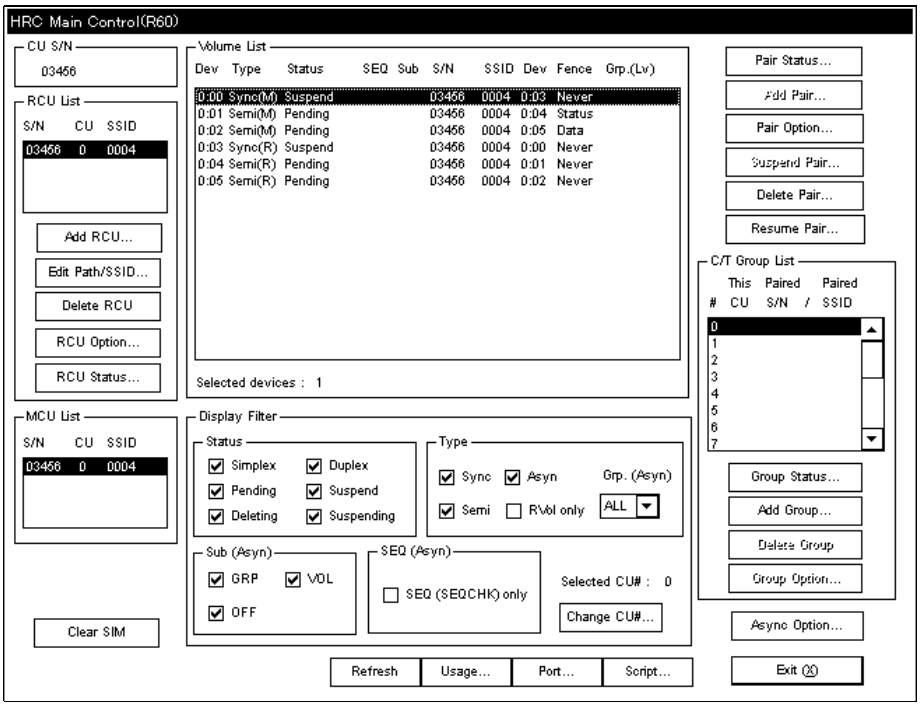
4 References for HRC&HODM Operation Screen

4.1 Main screen

4.1.1 HRC Main screen



RCU List ..... This List Box displays Controllers as RCU(Remote disk Control Unit).
"XXXXX XX XXXX"
Serial Number CU# SSID

MCU List ..... This List Box displays Controllers as MCU(Main disk Control Unit).
(Only volume pairing is established.)
"XXXXX XX XXXX"
Serial Number CU# SSID

Volume List ..... This List Box displays valid LDEV(Logical Device) and the pair status.
"X:XX XXXX(X) XXXXXXX XXX XXX XXXXX XXXX X:XX XXXX X(XXX)"
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① CU# : LDEV#..... CU address: LDEV address
② Copy Mode ..... "Sync" : Synchronous
"Semi" : Semi-Synchronous
"Asyn" : Asynchronous
"-" : SIMPLEX Volume
③ Volume Type ..... "M" : Main Volume,
"R" : Remote Volume
" - " : SIMPLEX Volume

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④ Pair status ..... Volume pair status
"Simplex" : Simplex
"Duplex" : Duplex
"Pending" : Pending
"Suspend" : Suspend
"Suspending" : Suspennding
"Deleting" : Deleting

⑤ SEQCHK..... If the volume pair is in SEQCHK status, "SEQ" is displayed.

⑥ Sub Status..... Suspend sub status.
GRP: The consistency time of the volume correspond to the C/T group's which the volume belongs to.
VOL: The consistency time of the volume is different from the C/T group's which the volume belongs to.
OFF: The volume pair is suspended by the MCU P/S OFF.

⑦ Serial Number ..... Serial Number of destination Controller.

⑧ SSID ..... SSID of destination controller.

⑨ CU# : LDEV#..... Pair CU address : LDEV address.

⑩ Fence Level ..... LDEV Fence Level

⑪ Grp.(Lv) ..... C/T group#(Error Level)

Display Filter.....Display filter of the Volume List.

• Status
"Simplex" ~ "Suspending" check box ...LDEVs whose status are selected by check box are displayed.
(Note : If "Suspend" check box is not selected, "GRP" ~ "VOL" check box are displayed ineffectively.)

• Type
"Sync" ~ "Asyn" check box ..LDEVs whose synchronous mode are selected by check box are displayed.
(Note : If "Asyn" check box is not selected, "Deleting", "Suspending", "GRP", "OFF", "VOL", "SEQ only" check box and "Grp.(Asyn)" combo box are displayed ineffectively.)
"Grp.(Asyn)" combo box .....LDEVs whose C/T group# is selected by combo box is displayed.
("ALL" displays all C/T groups.)

• Sub(Asyn)
"GRP" ~ "VOL" check box ..LDEVs whose sub status are selected by check box are displayed.

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• SEQ(Asyn)
"SEQ (SEQCHK) only" check box
.....Displays only SEQCHK LDEVs
"Simplex", "Sync", "Semi" check box are displayed ineffectively.
"RVol only" check box .....Displays only R-Vols
(Note: "Simplex" check box displayed ineffectively).

Change CU#.....Specifies CU address (CU#) to display the RCU List, the MCU List and the Volume List concerned with the CU.

Clear SIM.....It will clear SIMs of Remote Copy.

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Port Operation

Port.....Changes the port type between LCP and RCP.

When the MCU is connected to the RCU, the MCU side port type must be set to RCP.

Path Operation

Add RCU.....Establishes the path between the MCU and the RCU. When establishing the path, the MCU must register the object RCU first. This function registers the object RCU and establishes the path at a time. When the MCU registers the object RCU successfully, the RCU is added to the RCU list. (Up to 4 RCU units can be registered for one MCU.)

Edit Path/SSID ...Adds/reduces the number of paths or SSIDs to an RCU selected from the RCU list within a range of 1 to 4.

Delete RCU .....Deletes an RCU selected from the RCU list and the path(s) to the RCU at a time. Before executing this function, all the units paired with the RCU must be set to simplex status.

RCU Option .....Changes the option for connection to an RCU selected from the RCU list. The connection option can also be specified when the RCU is registered, but this function is used to change the option during operation.

RCU Status.....Displays the status of an RCU selected from the RCU list. This function can also display the status of each path to the RCU.

Pair Operation

(Note : All pair operations are disabled if the synchronous (Semi-synchronous) copy volume pair(s) and asynchronous copy volume pair(s) are selected at the same time.)

Pair Status .....Displays the status of a volume selected from the volume list. This function is disabled if two or more volumes are selected from the volume list.

Add Pair .....Creates the HRC pair(s) by making the simplex volume(s) selected from the volume list become the M-VOL(s). Before executing this function, the CU that includes the R-VOL(s) must be registered as the RCU(s). This function is disabled if the volume(s) selected include(s) the volume(s) in the status other than simplex.

Change Option ...Changes the pair option of the volume(s) selected from the volume list. The pair option can also be specified when the pair is created, but this function is used to change the option during the operation. This function is disabled if any volume(s) selected include(s) the simplex, suspending, deleting and remote volume(s).

Suspend Pair.....Suspends the pair(s) of the volume(s) selected from the volume list. This function is disabled if any volume(s) selected include(s) the simplex, suspend, suspending, and deleting volume(s).

Delete Pair.....Deletes the pair of the volume(s) selected from the volume list.

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Resume Pair .....Resume the pair of the volume(s) (in the suspend status) selected from the volume list. This function is enabled if the selected volume(s) is(are) suspended M-VOL(s).

HODM Pair Operation

Add Pair .....Instructs the simplex volume(s) selected from the volume list to migrate data to volume(s). Before executing this function, the CU that includes source volume(s) must be registered as the RCU. This function is disabled if the selected volume(s) include(s) the volume(s) in the status other than simplex.

Suspend Pair.....Suspends the pair(s) of the volume(s) (not in the simplex status) selected from the volume list. This function is disabled if any volume(s) selected include(s) the simplex volume(s).

Delete Pair.....Deletes the pair of the volume(s) (not in the simplex status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a simplex volume(s).

Resume Pair .....Resume the pair of the volume(s) (in the suspend status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a simplex volume(s).

Erase R-VOL.....Instructs the volume(s) (waiting for data erasure) selected from the volume list to erase R-VOL data.

C/T Group Operation

C/T Group List ...X XXX XXXXX / XXX ...
① ② ③ ④ ⑤ ⑥
① C/T group# (0 ~ F)
② Type of own CU.
MCU: Own CU is MCU for the paired CU.
RCU: Own CU is RCU for the paired CU.
M&R: Own CU and the paired CU are the same.
③ S/N of the paired CU.
If “Used” is displayed, the paired CU is not exist.
④ Slash.
⑤ SSID of the paired CU.
⑥ If “...” is displayed, own CU have two or more paired CU.

Group Status.....Displays the status of a C/T group selected from C/T group list.

Add Group.....Assigns the C/T group selected from C/T group list. This function is disabled if the specified if the specified C/T group has already assigned.

Delete Group .....Releases the C/T group selected from C/T group list. This function is enabled if the CU type of the specified C/T group is “MCU” (Displayed “MCU” on the C/T group list).

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Group Option .....Changes the option parameters of the C/T group selected from C/T group list. This function is disabled if the CU type of the specified C/T group is “RCU” (Displayed “RCU” on the C/T group list). Also, the specified C/T group is not assigned, too.

Async Option Operation

Async Option.....Changes the option parameters of the asynchronous function

Other Functions

Usage.....Displays HRC/HODM operation control information.

Refresh. .....Updates information displayed on the screen. Information displayed on the screen is kept as is until this function is executed.

Script .....Executes HRC Script.

Exit.....Exits the operation screen.

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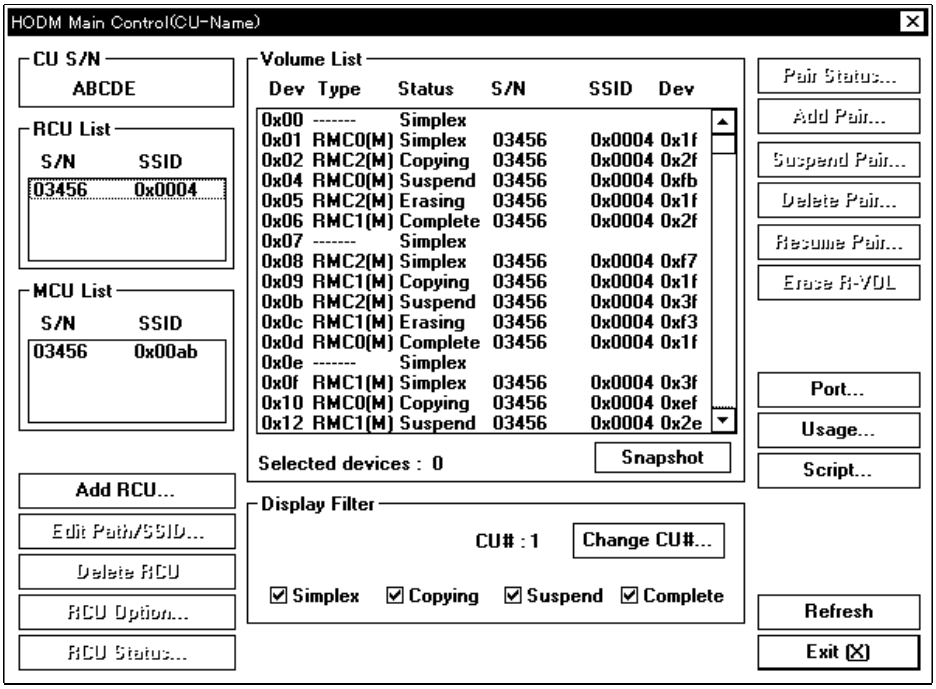
4.1.2 HODM Main screen



RCU List ..... This List Box displays Controllers as RCU(Remote disk Control Unit).
"XXXXX 0xXXXX"
Serial Number SSID

MCU List ..... This List Box displays Controllers as MCU(Main disk Control Unit).
(Only volume pairing is established.)
"XXXXX 0xXXXX"
Serial Number SSID

Volume List ..... This List Box displays valid LDEV(Logical Device) and the pair status.
"0xXX XXXX(X) XXXXXXX XXXXX 0xXXXX 0xXX X"
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① #LDEV..... LDEV address
② Copy Type ..... "RMC" : Remote Migration Copy(HODM)
"---" : SIMPLEX Volume
③ Copy Mode ..... "0" : While Migration Copy in progress (HODM)
"1" : Until Delete Pair/Erase operation (HODM)
"2" : Never duplicated(HODM)
"-" : SIMPLEX Volume
④ Volume Type ..... "M" : Main Volume,
"-" : SIMPLEX Volume

Snapshot..... Output HODM pairs status into a text file.

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⑤ Pair status..... Volume pair status
"Simplex" : Simplex
"Copying" : Copying
"Suspend" : Suspend
"Complete" : Simplex (Waiting for Erasure)
"Erasing" : Simplex (Erasing in progress)
⑥ Serial Number/SSID Serial Number and SSID of destination Controller.
⑦ #LDEV..... LDEV address on the destination Controller.

Display Filter..... Display filter of the Volume List.
"Simplex" ~ "Complete".....LDEVs that were selected by check box are displayed.

Change CU#..... Specifies CU address (CU#) to display the RCU List and the Volume List concerned with the CU.

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Port Operation

Port.....Changes the port type between LCP and RCP.

When the MCU is connected to the RCU, the MCU side port type must be set to RCP.

Path Operation

Add RCU.....Establishes the path between the MCU and the RCU. When establishing the path, the MCU must register the object RCU first. This function registers the object RCU and establishes the path at a time. When the MCU registers the object RCU successfully, the RCU is added to the RCU list. (Up to 4 RCU units can be registered for one MCU.)

Edit Path/SSID ...Adds/reduces the number of paths or SSIDs to an RCU selected from the RCU list within a range of 1 to 4.

Delete RCU .....Deletes an RCU selected from the RCU list and the path(s) to the RCU at a time. Before executing this function, all the units paired with the RCU must be set to simplex status.

RCU Option .....Changes the option for connection to an RCU selected from the RCU list. The connection option can also be specified when the RCU is registered, but this function is used to change the option during operation.

RCU Status.....Displays the status of an RCU selected from the RCU list. This function can also display the status of each path to the RCU.

Pair Operation

Pair Status .....Displays the status of a volume selected from the volume list. This function is disabled if two or more volumes are selected from the volume list.

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Add Pair .....Instructs the simplex volume(s) selected from the volume list to migrate data to volume(s). Before executing this function, the CU that includes source volume(s) must be registered as the RCU. This function is disabled if the selected volume(s) include(s) the volume(s) in the status other than simplex.

Suspend Pair.....Suspends the pair(s) of the volume(s) (not in the simplex status) selected from the volume list. This function is disabled if any volume(s) selected include(s) the simplex volume(s).

Delete Pair.....Deletes the pair of the volume(s) (not in the simplex status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a simplex volume(s).

Resume Pair .....Resume the pair of the volume(s) (in the suspend status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a simplex volume(s).

Erase R-VOL.....Instructs the volume(s) (waiting for data erasure) selected from the volume list to erase R-VOL data.

Other Functions

Usage.....Displays HODM operation control information.

Refresh. .....Updates information displayed on the screen. Information displayed on the screen is kept as is until this function is executed.

Script .....Executes HODM Script.

Exit.....Exits the operation screen.

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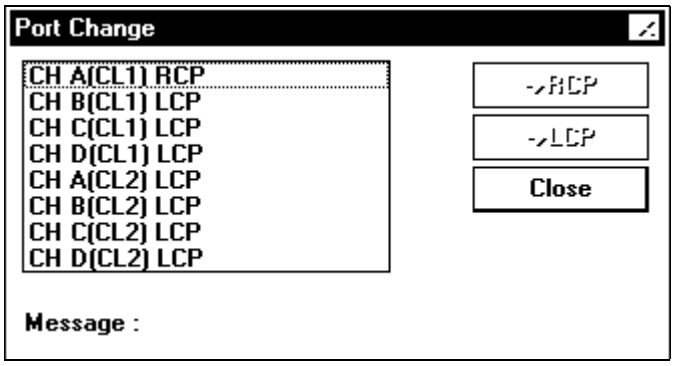
4.2 Port... screen



List ..... Displays the list of usable serial channels.
CH X[CL Y] XXX
① ② ③
① Channel ID (A to R)
② Cluster ID (1 or 2)
③ Channel type (LCP or RCP)

-> RCP ..... Changes the channel type selected from the list to the RCP.

-> LCP..... Changes the channel type selected from the list to the LCP.

Message..... Displays the progress of each changing process when the Changing function is started.
Checking port# CH X[CL Y] ...
Blocking port# CH X[CL Y] ...
Setting port# CH X[CL Y] ...
Restoring port# CH X[CL Y] ...

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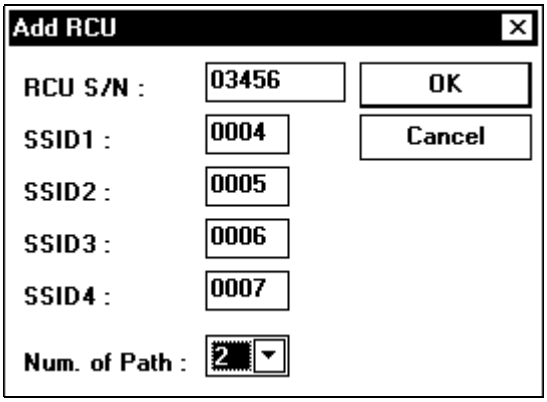
4.3 Add RCU... screen

• Specify RCU parameter.



RCU S/N.....Input the Serial number of RCU.
"XXXXX" .....5 characters. (Use only lower 5 figures in the RCU serial number. Ignore over 6'th figures)

SSID1 ~ 4.....Input the SSID of RCU. (Note)
"XXXX" .....4 hexadecimal digits number.

Num. Of Path .....Specifies the number of path between MCU & RCU.(1 ~ 4)

Option... .....Specified RCU option item. (Refer to RCU Option...)

Note: How to Set Up HRC/HODM between DKC210I and DKC310I

1. Difference in Setting SSIDs

   Both DKC210I and DKC310I can have different SSIDs for each 64 boundary of LDEV#.

   For DKC210I, only one SSID can be specified. Adding zero, one, two, and three to the specified value, DKC210I generates four consecutive SSIDs. These four consecutive SSIDs are automatically given to LDEVs x'00'-x'3F', x'40'-x'7F', x'80'-x'BF', and x'C0'-x'FF' respectively.

   It is possible for DKC310I to have independent SSIDs for each 64 boundary of LDEV#.

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2. RCU/R-VOL Setting When MCU is DKC210I and RCU is DKC310I

Since DKC210I can accept only one SSID per one RCU, each 64 LDEVs must be registered as a different RCU.

DKC210I expects that SSIDs read from R-VOLs have the same rule as itself because conventional DKC210I can not detect the difference between DKC210I and DKC310I. That is, DKC210I expects that zero, one, two, and three are implicitly added to the registered value for R-VOLs x‘00’-x‘3F’, x‘40’-x‘7F’, x‘80’-x‘BF’, and x‘C0’-x‘FF’ respectively.

Therefore, an operator should subtract one, two, and three from SSIDs set to DKC310I, and enter the result of this subtraction. Note that SSID is defined as 16 bits unsigned hexadecimal value. For example, two subtracted from x‘0201’ leaves x‘01FF’. The result of subtraction is called an “adjusted SSID”.

The table 4-1 shown below describes the summary. Boldfaced italic letters (***A*** to ***E***) denote the values specified by configuration setting. Numbers 1 to 4 in the RCU# column just means that each row should be treated as different RCU.

Table 4-1 RCU/R-VOL Settings to MCU (DKC210I)

Configuration of RCU (DKC310I)			RCU/R-VOL Settings to MCU (DKC210I)			
Serial #	SSID	LDEV #	RCU #	Serial #	SSID	R-VOL #
A	***B***	x‘00’ - x‘3F’	1	***A***	***B*** - *0*	x‘00’ - x‘3F’
A	***C***	x‘40’ - x‘7F’	2	***A***	***C*** - *1*	x‘40’ - x‘7F’
A	***D***	x‘80’ - x‘BF’	3	***A***	***D*** - *2*	x‘80’ - x‘BF’
A	***E***	x‘C0’ - x‘FF’	4	***A***	***E*** - *3*	x‘C0’ - x‘FF’

If the R-VOLs are behind several SSIDs, as many adjusted SSIDs must be registered by separate ADDRCU/ESTPATH operations. The same serial number must be specified. Path parameters (LCP port number and link destination address) may be the same or different.

For ADDPAIR/ESTPAIR, DELPAIR, SUSPEND, and RECOVER operations, the adjusted SSID that the R-VOL belongs to must be specified.

To remove all of the RCU registrations which have been specified to have different SSIDs, as many DELRCU/DELPATH operations are required.

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3. RCU/R-VOL Setting When MCU is DKC310I and RCU is DKC210I

DKC310I expects that SSID read from an R-VOL is always identical to the specified value. Therefore corresponding SSID must be explicitly specified including SSIDs automatically generated by DKC210I.

Since DKC310I can handle up to four SSIDs per an RCU, one RCU registration is enough to register all SSIDs of one DKC210I.

The table 4-2 shown below describes the summary. Boldfaced italic letters (A and B) denote the values specified by configuration setting. Number 1 in the RCU# column just means that up to four SSIDs can be set to the same RCU registration.

Table 4-2 RCU/R-VOL Settings to MCU (DKC310I)

Configuration of RCU (DKC210I)			RCU/R-VOL Settings to MCU (DKC310I)			
Serial #	SSID	LDEV #	RCU #	Serial #	SSID	R-VOL #
A	***B***	x‘00’ - x‘3F’	1	***A***	***B***	x‘00’ - x‘3F’
A	*(**B**+ 1)*	x‘40’ - x‘7F’	1	***A***	***B*** *+ 1*	x‘40’ - x‘7F’
A	*(**B**+ 2)*	x‘80’ - x‘BF’	1	***A***	***B*** *+2*	x‘80’ - x‘BF’
A	*(**B**+ 3)*	x‘C0’ - x‘FF’	1	***A***	***B*** *+3*	x‘C0’ - x‘FF’

ADDRCU panel has been modified so that it can accept up to four SSIDs at the time of the RCU registration. EDITSSID panel is also available. It is possible to add new SSID(s) to, or remove SSID(s) from, the RCU registration.

To register several SSIDs by using ESTPATH command, as many separate commands are required. The same serial number must be specified. Path parameters (LCP port number and link destination address) may be the same or different. If the same path parameters are specified, the specified SSID is added to SSIDs of the existing RCU registration. Otherwise, it is registered as a different RCU.

For ADDPAIR/ESTPAIR, DELPAIR, SUSPEND, and RECOVER operations, the actual SSID that the R-VOL belongs to must be specified.

DELRCU operation removes RCU registration. For just removing specified SSID(s) from the RCU registration, EDITSSID panel is available.

DELPATH command removes specified SSID from the RCU registration if more than one SSID have been registered. When the last SSID is removed by DELPATH, the RCU registration is also removed.

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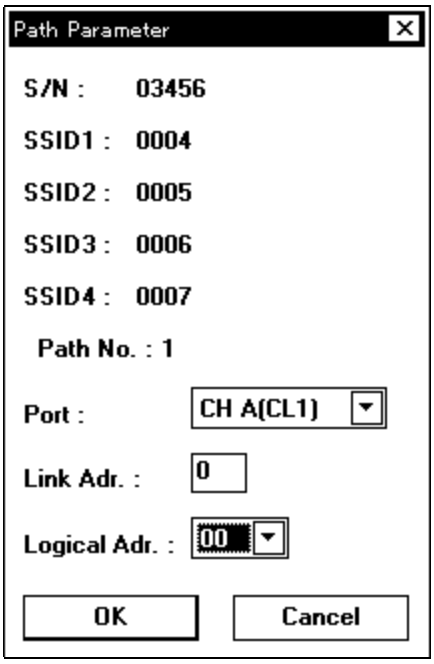
• Specify PATH parameter.
Input the RCU parameter, then input the path parameter for each specified path.



Port.....Specified port using as RCP in the Combo Box.

Link Adr.....Input the destination link address.
"XX" ..... 2 characters of hexadecimal number. ("00" through "fd")
If RCU is connected to MCU directly without ESCD, specified "00" at the [Link Adr.].
If RCU is connected to MCU with ESCD, specified destination link address at the [Link Adr.].

Logical Adr. .....Specified logical address of the destination DKC.
Please select a logical address which are defined as CU images (00 through 03) in the RCU.

(Notes) DKC210I : It has only #00 as CU image.
DKC80I-3 : When the RCU is MPSD, select "00". When the RCU is SPSD, select "00" or "01" according to the device position.
Other DKC : There are some DKCs that have four CU images (00 through 03).). In this case, please select corresponding logical address according to the device position.

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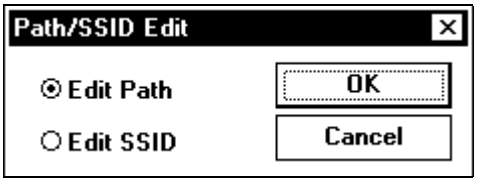
4.4 Edit Path/SSID

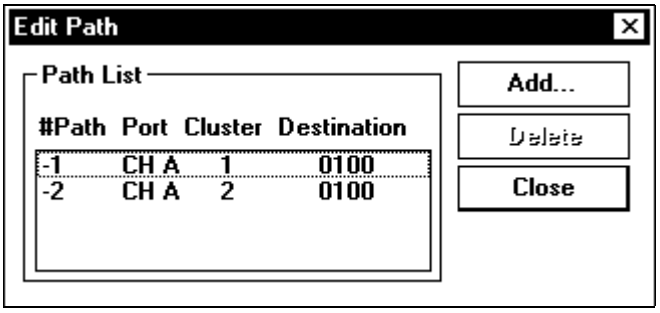
4.4.1 Path/SSID Edit... screen



Edit Path... Adding/reducing the number of paths.

Edit SSID . Adding/reducing the number of SSIDs.

4.4.2 Edit Path... screen



Path List ... Display current path's information.

"X CH X X XXXX"

① ② ③ ④

① #Path.....Status(+:Normal -:Abnormal) and Path No.(1 ~ 4)

② #Port .....Port of path creating.(CH A ~ CH R)

③ #Cluster .....Cluster. (1 ~ 2)

④ Destination.....Link address (2 hexadecimal numbers) + Logical address (2 hexadecimal numbers)

Add..... Adding new path. (Refer to Add.. RCU-Specified Path Parameter)

Delete ..... Deleting the path selected in the Path List.

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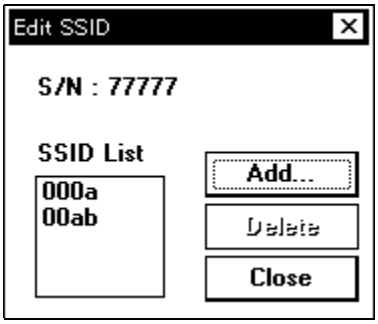
4.4.3 Edit SSID... screen

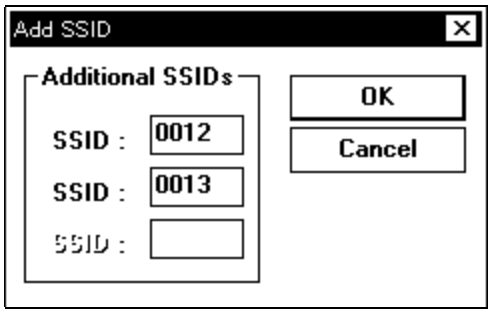


SSID List.. Display current SSIDs information.

Add..... Adding new SSIDs.

Delete ..... Deleting the SSIDs selected in the SSID List.

4.4.4 Add SSID... screen



Additional SSIDs ..... To add the SSIDs, input 4 hexadecimal digits numbers.

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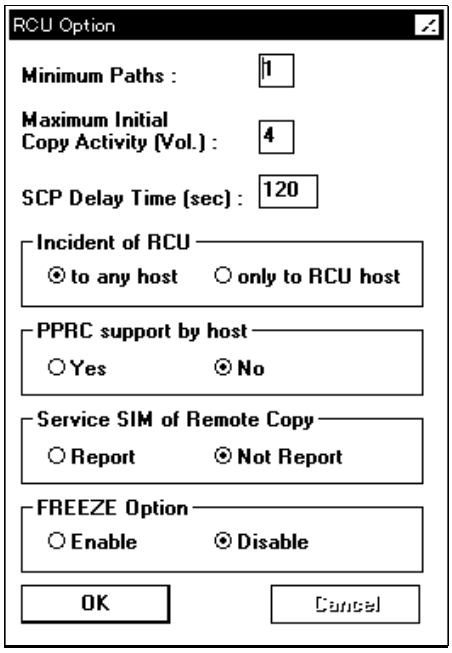
4.5 RCU Option... screen



Minimum Paths.....Specifies lowest number of paths needed for continuation of HRC (HODM).
Defined between 1 to 4.

Maximum Initial .....Specifies maximum number of Initial copy execution.
(First group of defined HRC volume pairs.)
Defined between 1 to 4.

SCP Delay Time [sec].....Specifies SCP delay time (Available for HRC only).
Defined between 0 to 600.

Incident of RCU.....Specifies method for handling Incident that occurs in RCU.
"to any host" .....Incident is reported to MCU host too.
"only to RCU host".....Incident is reported to only RCU host .

PPRC support by host.....Is PPRC(HRC) supported by RCU host .
"Yes" .....Supported.
"No".....Not supported.

Service SIM of Remote Copy..... Specifies method for handling SIM of Remote Copy.
"Report".....SIM is reported.
"Not Report".....SIM is not reported.

FREEZE Option.....Specifies freeze option (Available for HRC only).
"Enable".....Freeze option is enable.
"Disable" .....Freeze option is disable.

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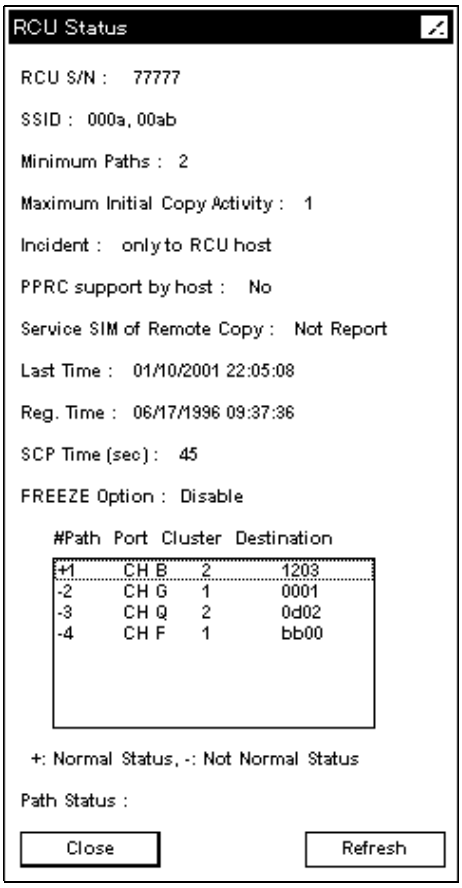
4.6 RCU Status... screen



RCU s#.....Display Serial number of the RCU.
"XXXXX" .....5 decimal digits.

SSID.....Display SSID of the RCU.
"XXXX" .....4 hexadecimal digits.

Minimum Paths.....Display lowest number of paths necessity for continuation of HRC (HODM).

Maximum Initial Copy Activity..... Display maximum number of initial copies.

Incident .....Display method for handling Incident that occurs in RCU.
"to any host" .....Incident is reported to MCU host too.
"only to RCU host".....Incident is reported to only RCU host.

PPRC support by host .....Display PPRC support information of HOST system.
"Yes" .....PPRC is supported by HOST.
"No".....PPRC isn't supported by HOST.

Service SIM of Remote Copy ..... Specifies method for handling SIM of Remote Copy.
"Report".....SIM is reported.
"Not Report".....SIM is not reported.

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Last Time .....Display last update time & date of the RCU.

Reg. Time.....Display registration time & date of the RCU.

SCP Time [sec].....Display SCP delay time (Available for HRC only).

FREEZE Option.....Display freeze option.
"Enable".....Freeze option is enable.
"Disable" .....Freeze option is disable.

Path Status.....Display status of path that selected in list.
If it isn't "Normal", do the recovery action according to TRBL06-190 "Recovery Action of Path Status Error".
"Nothing"..... No established.
"Normal" ..... The status of path is normal.
"Initialization Failed" ..... Error has occurred in the path initialization.
"Communication Time Out" Communication between MCU and RCU time out.
"Resource Shortage(MCU)". Resource at the MCU is short.
"Resource Shortage(RCU).. Resource at the RCU is short.
"Serial Number Mismatch" .. Specified serial number is mismatch.
"Invalid Port"..... Specified port is invalid.

Refresh .....Refresh displayed information.

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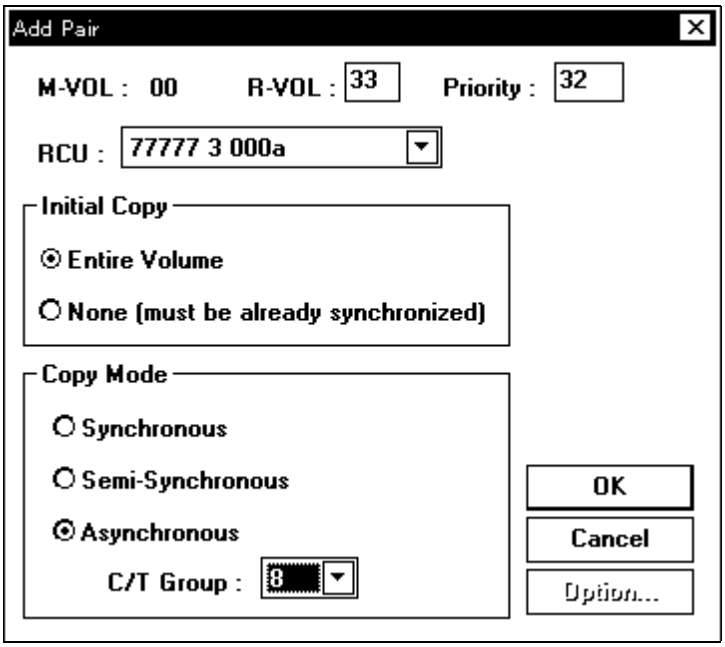
4.7 Add Pair... screen (HRC)



M-VOL .....Display volume(LDEV) that is MCU side.

R-VOL .....Specifies volume(LDEV) that is RCU side.
"XX" ..... 2 hexadecimal digits.

Priority .....Specifies priority of initial copy execution.

RCU .....Select RCU from the Combo Box.
The list of RCUs currently registered will appear.

Initial Copy .....Specifies initial copy type. (Valid only for the remote dual copy function.)
"Entire Volume" .....Specifies all cylinders.
"None" .....Nothing

Copy Mode.....Specifies copy mode. (Valid only for the remote dual copy function.)
"Synchronous" .....Specifies synchronous copy.
"Semi-Synchronous" .....Specifies semi-synchronous copy.
"Asynchronous".....Specifies asynchronous copy.

C/T Group... .....Select C/T group# from the combo box.
The list of C/T group currently assigned will appear, except the CU type of the C/T group is not RCU. (Displayed as "RCU" in the C/T group list of HRC Main screen.)
This combo box is displayed effectively if the "Asynchronous" is specified.

Option... .....Specifies pair option item. (Refer to Pair Option...)

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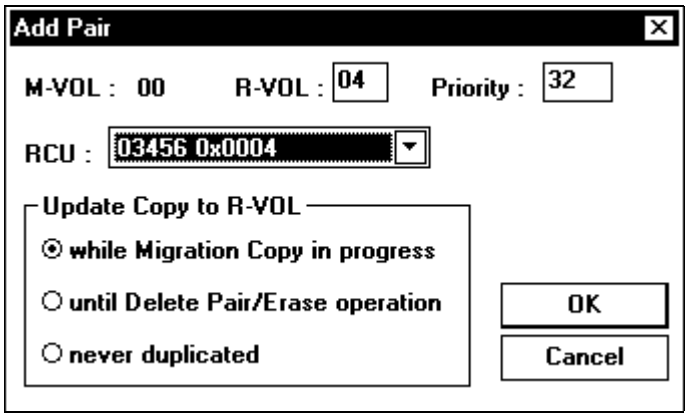
4.8 Add Pair... screen (HODM)



M-VOL .....Display volume(LDEV) that is MCU side.

R-VOL .....Specifies volume(LDEV) that is RCU side.
"XX" ..... 2 hexadecimal digits.

Priority .....Specifies priority of initial copy execution.

RCU .....Select RCU from the Combo Box.
The list of RCUs currently registered will appear.

Update Copy to R-VOL .....Specifies update copy mode to R-VOL.
"while Migration Copy in progress"
.....Enable while migration copy is progress.
"until Delete Pair/Erase operation"
.....Enable until Delete Pair/Erase R-VOL operation is executed.
"never duplicated"
.....Disable while migration copy is progress.

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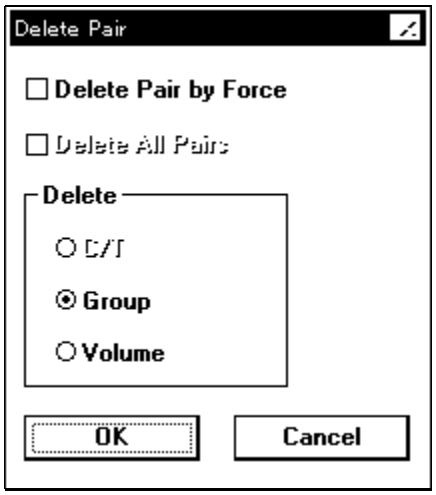
4.9 Delete Pair... screen



Delete Pair by Force.... Specified forcibly delete mode.
The pair status is deleted even when the communication with the CU is disabled.
(Note : Fixed at forcibly delete mode if the status of the specified volume(s) is(are) suspending or deleting state.)

Delete All Pairs..... To delete all pairs except HRC asynchronous pairs.

Delete ..... Select the kind of deletion. (Effective only asynchronous copy pair.)
- C/T ..... All volume(s) will be deleted which have the same C/T as the specified volume(s). (Displayed effectively if the specified volume(s) is(are) R-VOL(s).
- Group ..... All volume(s) will be deleted which are assigned to the same C/T group as the specified volume(s).
- Volume .. Only specified volume(s) will be deleted.

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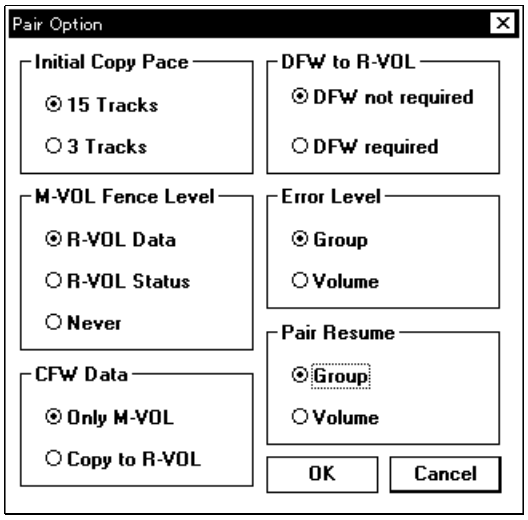
4.10 Pair Option... screen



Initial Copy Pace..... Specifies Initial copy pace. (Remote Dual Copy)(HRC option)
"15 Tracks" 15tracks
"3 Tracks" 3tracks

DFW to R-VOL ..... Is Remote Dual Copy continued when DFW blockade occurred. (HRC option)
"DFW not required".... When DFW block, Remote Dual Copy do not stop.
"DFW required"..... When DFW block, Remote Dual Copy stop.

CFW Data ..... Is the CFW data on the subject of Remote Dual Copy ? (HRC option)
Displayed ineffectively if the specified volume is asynchronous copy volume.
"Copy to R-VOL" ..... Yes
"Only to M-VOL" ..... No

M-VOL Fence Level... M-VOL fence level(HRC option)
"R-VOL Data"..... M-VOL fence when data is unmatched
"R-VOL Status" ..... M-VOL fence when status can not be changed.
"Never" ..... Never fence
(Note : Fixed "Never" if the specified volume is asynchronous copy volume)

Error Level ..... The suspension kind when asynchronous pairing is failed. (HRC Option)
Displayed effectively if the specified volume is asynchronous copy volume.
"Group" ..... All asynchronous copy volumes under the same C/T group as the specified volume(s) will be suspended.
"Volume" ..... Only specified volume(s) will be suspended.

Pair Resume ..... The resumption kind of suspended asynchronous copy volume. (HRC option)
Displayed effectively when asynchronous copy pair resuming.
"Group" ..... All asynchronous copy volumes under the same C/T group as the specified volume(s) will be resumed.
"Volume" ..... Only specified volume(s) will be resumed.

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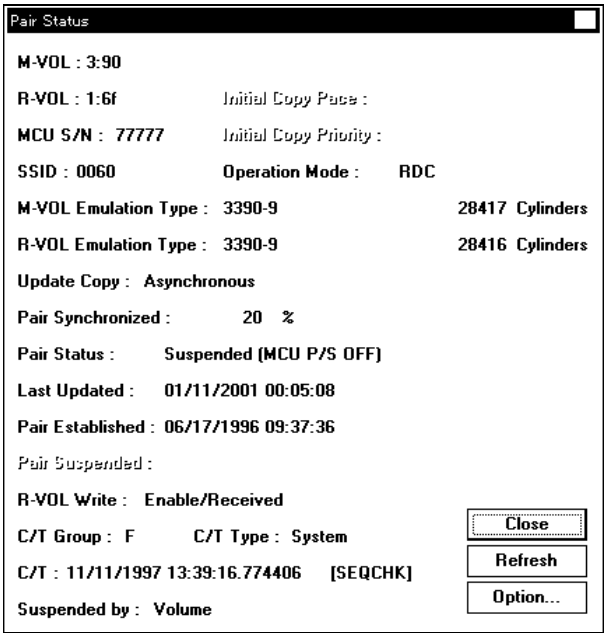
4.11 Pair Status... screen

4.11.1 Pair Status... screen (HRC)



M-VOL .....Displays CU# : LDEV#(MCU side).

R-VOL .....Displays CU# : LDEV#(RCU side).

RCU S/N.....Displays serial number of the RCU.

SSID.....Displays SSID of the RCU.

Initial Copy Pace.....Displays Initial copy pace.
"15 Tracks"..... 15tracks
"3 Tracks"..... 3tracks

Initial Copy Priority .....Displays priority of initial copy execution.

Operation Mode .....Displays pair creative mode.
"RDC" ..... Remote Dual Copy (HRC)

M-VOL Emulation Type.....Displays M-VOL device emulation type and number of cylinders.

R-VOL Emulation Type.....Displays R-VOL device emulation type and number of cylinders.

Update Copy .....Displays pair synchronous mode.

Pair Synchronized .....Displays progress of initial copy.
(Note: There is a possibility to be displayed as "Not Valid (Initial copy not complete)" when agreeing with undermentioned condition.
• The specified volume is R-VOL.
• The specified volume is asynchronous copy pair.
• The specified volume is in the suspended state.)

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Pair Status .....Displays pair status information.
"Simplex"
"Duplex Pending"
"Duplex"
"Suspended(M-VOL by Operator)"
"Suspended(R-VOL by Operator)"
"Suspended(by MCU)"
"Suspended(by RCU)"
"Suspended(Delete pair to RCU)"
"Suspended(R-VOL failure)"
"Suspended(MCU IMPL)"
"Suspended(Initial Copy Failed)"
"Suspended(by FREEZE)"
"Suspended(MCU P/S OFF)"
"Suspending"
"Deleting"

Last Updated .....Displays last update time of pair status.

Pair Established.....Displays registration time the volume pair.

Pair Suspended.....Displays suspension time of the volume pair.

R-VOL Write .....Displays R-VOL write permission status.
"Enable"..... R-VOL write permission is enabled.
"Enable/Received"..... R-VOL write command is received.
"Enable/Not Received".... R-VOL write command is not received.
"Disable" ..... R-VOL write permission is disabled.

C/T Group .....Displays the C/T group# ('0' ~ 'F') of the volume.
(Displayed effectively if the volume is asynchronous copy volume.)

C/T Type .....Displays the timer type of the volume.
(Displayed effectively if the volume is asynchronous copy volume.)
"System" ..... Use the timer of the HOST.
"Local"..... Use the timer of the SVP.
"None" ..... The correctness of the C/T is not guaranteed.

C/T .....Display the consistency time of the volume.
(Displayed effectively if the volume is asynchronous copy volume.)
(Note : If "Overflow" is displayed, the consistency time is after 2042. If "Underflow" is displayed, the consistency time is before 1972.)

[SEQCHK].....Displayed if the volume is in the "SEQCHK" status.

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Suspended by ..... Displays the C/T status of the volume.
(Displayed effectively if the volume is asynchronous copy R-VOL.)
"Group" ..... The consistency time of the volume correspond to the C/T group's which the volume belongs to.
"Volume"..... The consistency time of the volume is different from the C/T group's which the volume belongs to.

Option... ..... Displays pair option item. (Same to Pair Option...)

Refresh ..... Refresh displayed information.

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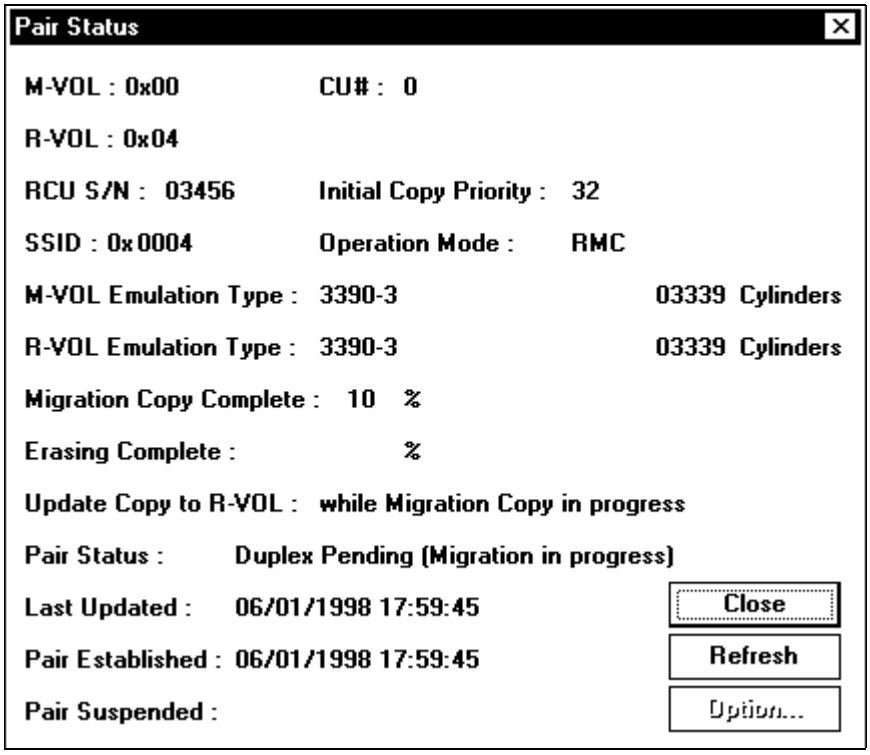
4.11.2 Pair Status... screen (HODM)



M-VOL .....Displays volume (LDEV) (MCU side).

R-VOL .....Displays volume (LDEV) (RCU side).

RCU S/N.....Displays serial number of the RCU.

SSID.....Displays SSID of the RCU.

CU#.....Displays current CU number.

Initial Copy Priority .....Displays priority of initial copy execution.

Operation Mode .....Displays pair creative mode.
"RMC"..... Migration Copy (HODM)

M-VOL Emulation Type.....Displays M-VOL device emulation type and number of cylinders.

R-VOL Emulation Type.....Displays R-VOL device emulation type and number of cylinders.

Migration Copy Complete ....Displays progress of migration copy.

Erasing Complete.....Displays progress of erasing R-VOL data.

Update Copy to R-VOL .....Displays update copy mode to R-VOL. (Remote Migration Copy)

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Pair Status .....Displays pair status information.
“Simplex”
“Suspended(by MCU)”
“Suspended(by RCU)”
“Suspended(R-VOL failure)”
“Suspended(MCU IMPL)”
“Simplex(Migration in progress)”
“Simplex(Migration Complete)”
“Simplex(Erasing in progress)”
“Simplex(Erasing Error)”
“Duplex Pending(Migration in progress)”
“Suspended(Migration Error, M-VOL)”
“Suspended(Migration Error, R-VOL)”

Last Updated .....Displays last update time of pair status.

Pair Established.....Displays registration time the volume pair.

Pair Suspended.....Displays suspension time of the volume pair.

Option... .....Displays pair option item. (Same to Pair Option...)

Refresh .....Refresh displayed information.

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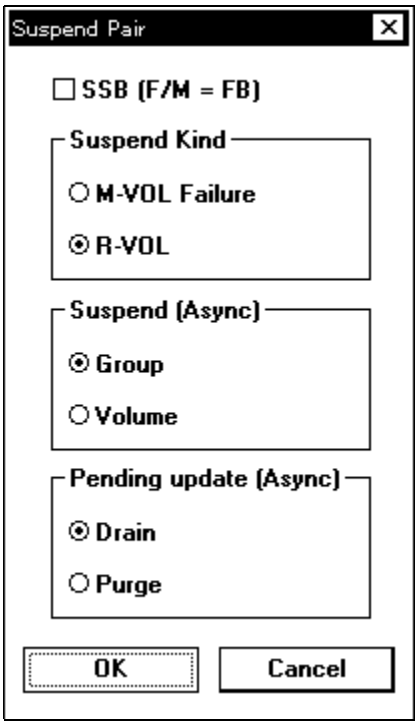
4.12 Suspend Pair... screen



SSB (F/M=FB)..... Specifies suspension reporting method.

Suspend Kind..... Specifies suspended type.
"M-VOL Failure" ..... M-VOL suspension reported as M-VOL failure
"R-VOL" ..... R-VOL suspension
(Note : Fixed "R-VOL" if asynchronous copy pair suspension.)

Suspend (Async) ..... Specifies suspension kind of asynchronous copy pair(s).
Displayed effectively when asynchronous copy pair(s) suspension.
"Group" ..... All asynchronous copy pairs which belong to the same C/T group as the specified volumes will be suspended.
"Volume"..... Only specified volume(s) will be suspended.

Pending update (Async)... Specifies releasing method of the Record Set.
Displayed effectively when asynchronous copy pair(s) suspension.
"Drain" ..... The pair volume(s) of the specified volume(s) will be updated with pending data in the Record Set.
"Purge" ..... The pair volume(s) of the specified volume(s) will be not updated.

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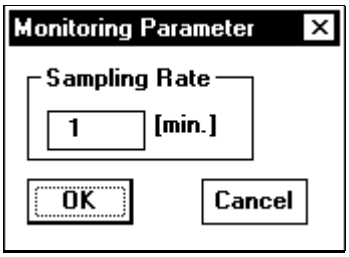
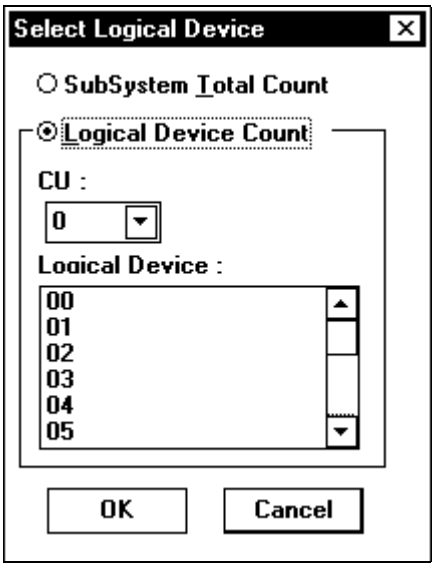
4.13 Usage... screen

Monitoring Parameter



Sampling Rate.... Sets the sampling rate of operation control information within a range of 1 to 546 in steps of a minute.

Select Logical Device



Logical Device: .. Displays the list of logical devices valid in the subsystem. Select the device from the list to display its operation information. To display the operation information of the whole subsystem, select "Sub System".

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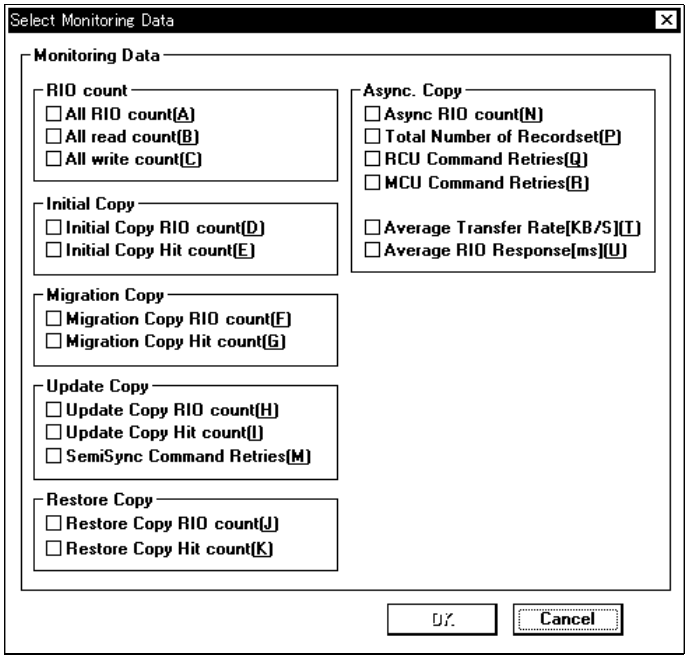
Select Monitoring Data

(1) Subsystem



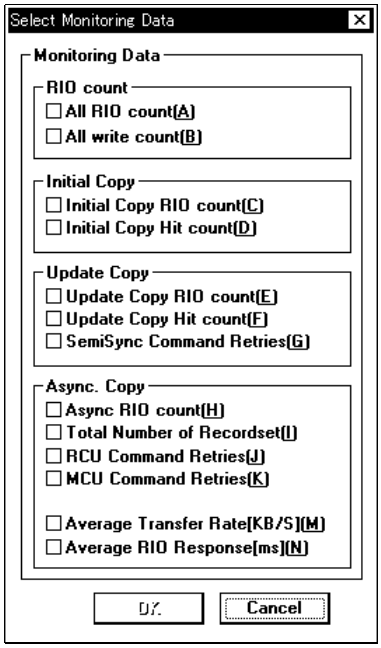
[CAUTION]

• Average Transfer Rate [KB/s]

• Average RIO Response [ms]

You can’t select above 2 items with other items.

(2) Logical Device for HRC



[CAUTION]

• Average Transfer Rate [KB/s]

• Average RIO Response [ms]

You can’t select above 2 items with other items.

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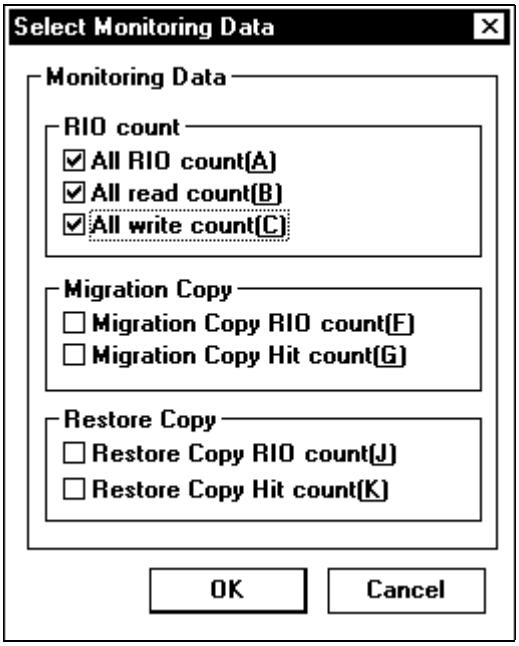
(3) Logical Device for HODM



RIO count.....Specifies the read/write count concerning the Remote Copy.

Initial Copy .....I/O count for the initial copy

Migration Copy..I/O count for migration copy

Update Copy .....I/O count for renewal copy

Restore Copy.....I/O count for recovering copy

Async. Copy.....I/O count for Asynchronous Remote Copy

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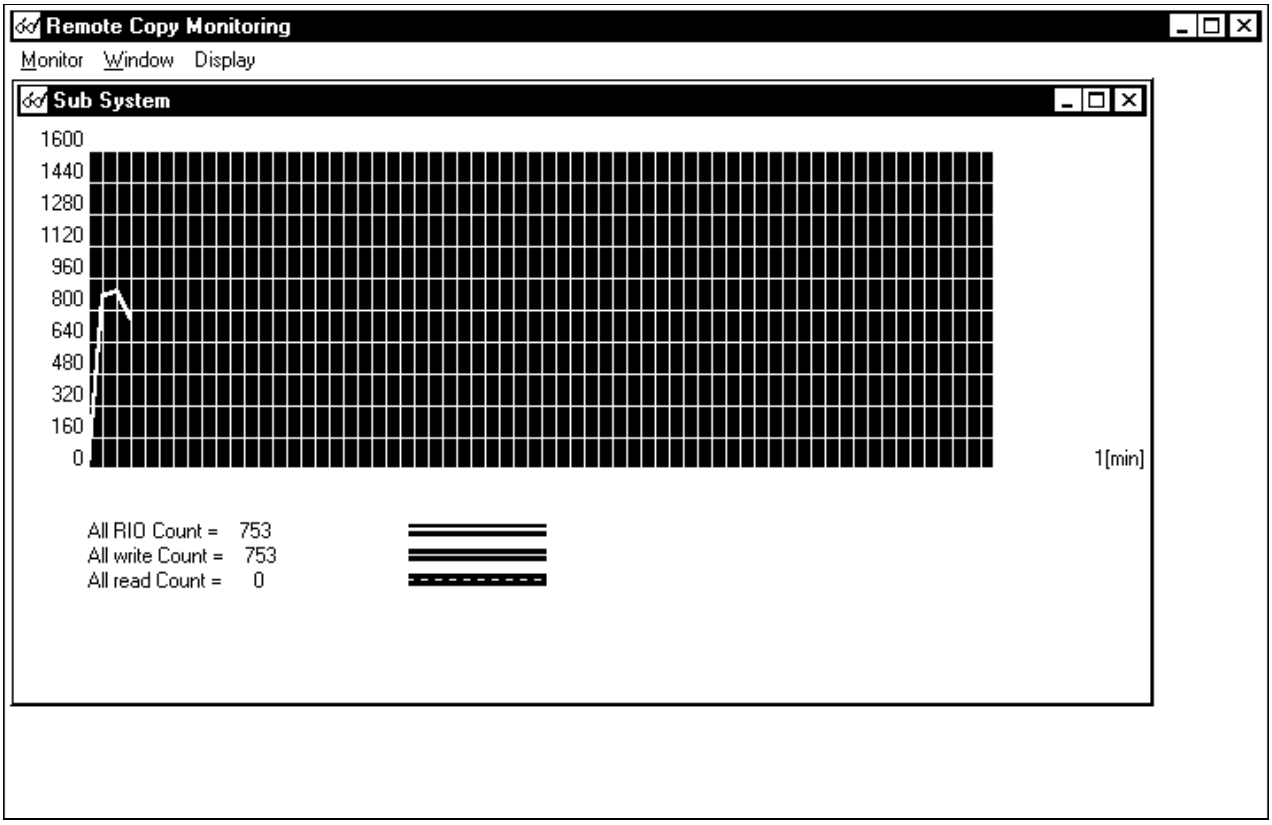
Remote Copy Monitoring Screen



Monitor Menu .... Start.....Displays another Remote Copy Monitoring screen.
EXit.....Closes the Remote Copy Monitoring screen.

Window Menu ... Cascade (C)....Displays Remote Copy Monitoring windows side by side.
Tile (T).....Displays lined-up Remote Copy Monitoring windows.
Icon (I) .....Lines up Remote Copy Monitoring window icons.
All close (A) ..Closes all the Remote Copy Monitoring windows.

Display Menu..... Line Model ....Displays or hides the explanation of lines.

Vertical Axis ..... Indicates the count number.

Horizontal axis... Indicates the time elapsed. A scale division on the horizontal axis indicates a sampling rate. The latest data is drawn to the right.

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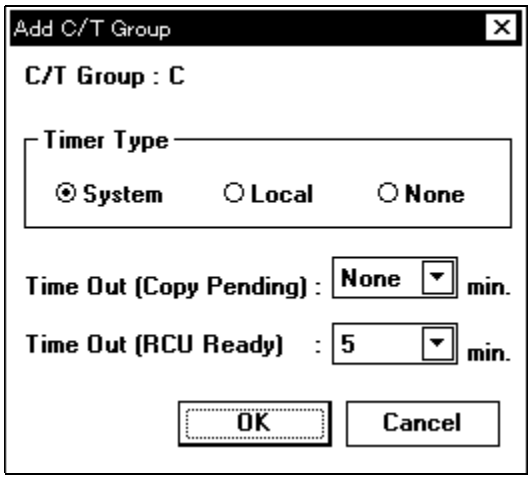
4.14 Add Group/Group Option... screen



C/T Group ..... Displays C/T group# selected from C/T group list.

Timer Type..... Select the timer type of the specified C/T group#.
"System" .....Use the timer of HOST.
"Local".....Use the timer of SVP.
"None" .....The correctness of the C/T is not guaranteed.

Time Out (Copy Pending)..... Specifies the maximum delay time of the update data.
(None, 3 ~ 15[min.])

Time Out (RCU Ready) ..... Specifies the maximum waiting time for the RCU gets ready.
(None, 1 ~ 10[min.])

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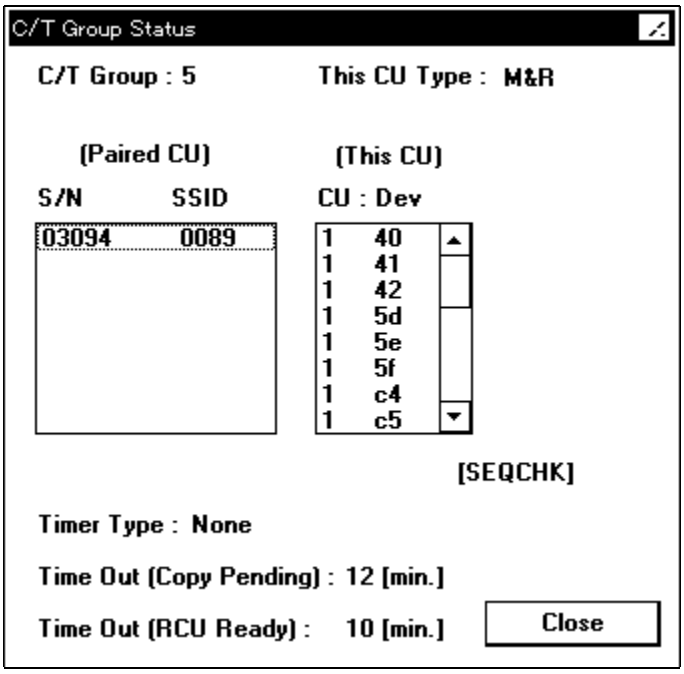
4.15 Group Status... screen



C/T Group ..... Displays C/T group# selected from C/T group list.

CU Type ..... Displays the CU type of the specified C/T group#.
"MCU" ..... MCU
"RCU" ..... RCU
"M&R" ..... MCU&RCU

S/N SSID List Box ..... Displays the serial numbers and SSIDs of RCUs which are registered in the specified C/T group#.

CU:Dev List Box ..... Displays the CU# and LDEV# which belongs to the specified C/T group#.

C/T ..... Displays the consistency time of the specified C/T group#.
(Note : If specified C/T group is in the SEQCHK state, "[SEQCHK]" is displayed.)
(Note : If "Overflow" is displayed, the consistency time is after 2042. If "Underflow" is displayed, the consistency time is before 1972.)

Timer Type ..... Displays the timer type of the specified C/T group#.

Time Out (Copy Pending) ..... Displays the maximum delay time of the specified C/T group#.

Time Out (RCU Ready) ..... Displays the maximum waiting time of the specified C/T group#.

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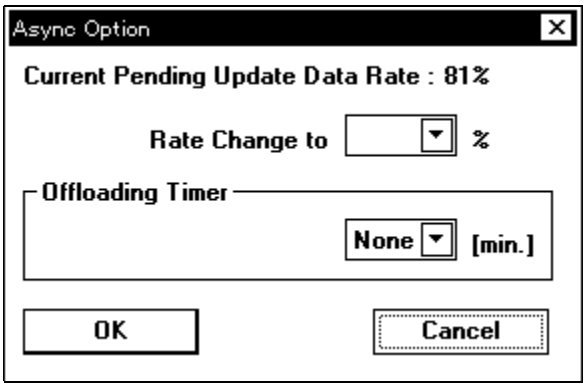
4.16 Async Option... screen



Current Pending Update Data Rate.....Displays current occupation rate of pending update data among the Record Set.

Rate Change to..... Specifies occupation rate of pending update data among the Record Set. (30 through 70)

Offloading Timer ..... Specifies monitoring time for the Record Set. (None, 1 through 20)

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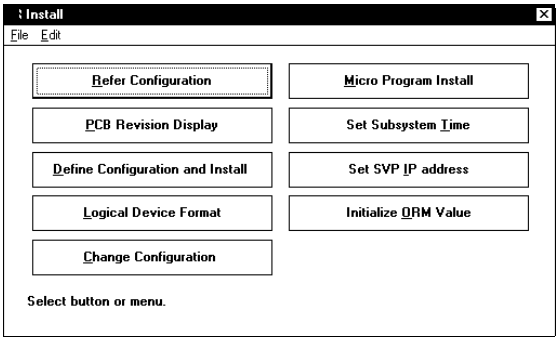
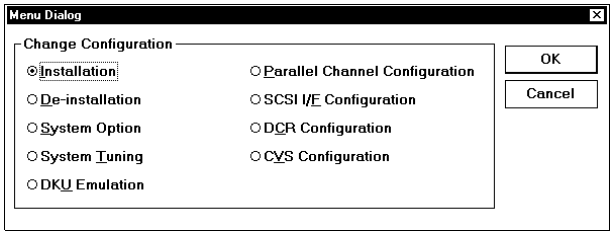
5 Option Install

(1) Select Install
Select (CL) [Install].

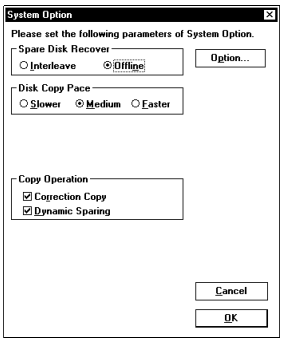
(2) Select Change Configuration
Select (CL) the [Change Configuration] menu in the 'Install Subsystem' window and select (CL) [OK].



(3) Select System Option
Select (CL) [System Option] menu in the 'Menu Dialog' window and select (CL) [OK].



(4) Select Option
Select (CL) [Option...] menu in the 'System Option' window.



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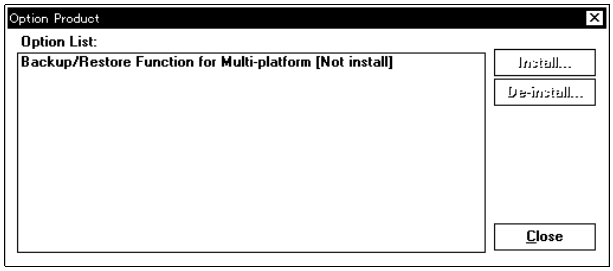
(5) Change Option

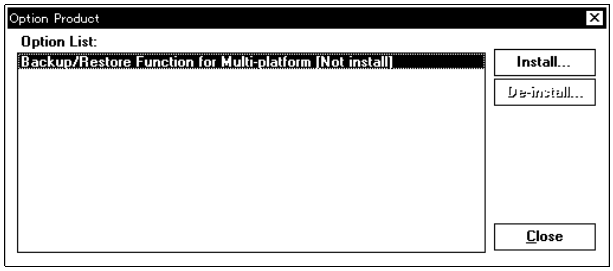
Option Install

Select (CL) option item you want to install from 'Option List' and select (CL) [Install...] button.

Option De-install

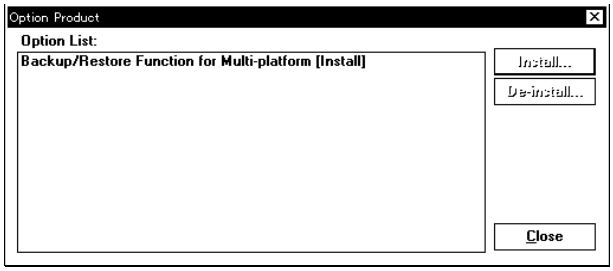
Select (CL) option item you want to de-install from the 'Option List' and select (CL) [De-install...] button





(6) Changing finish

Select (CL) [Close].



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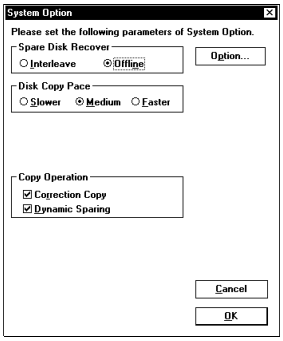
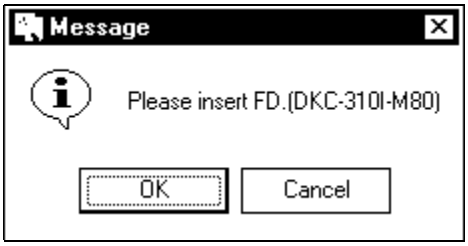
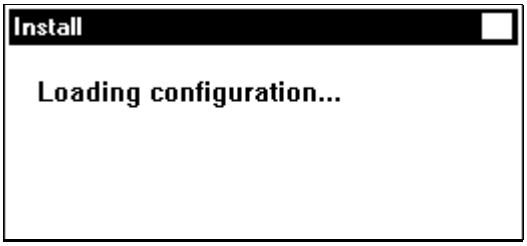
(7) Close System Option
Select (CL) [OK].



(8) Insert Special FD
Insert Special FD in accordance with following message.
And remove Special FD when 'remove' message is displayed.
If you want to change other item then go to (5).



(9) Configuration down loading
The down loading message is displayed.



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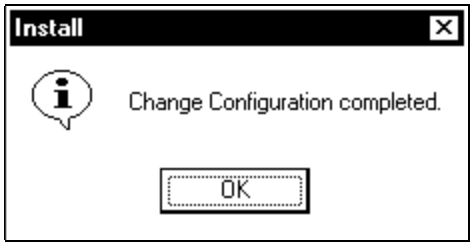
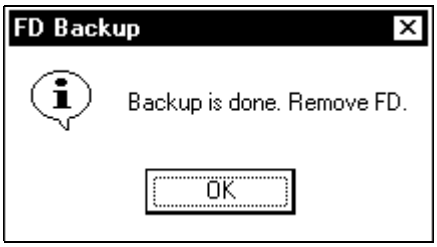
(10) Change system option is finished
The finished message is displayed. Select (CL) [OK].



(11) “Reading subsystem configuration data...” is displayed.
“Please insert config FD in FDD.” is displayed.
Insert the configuration FD into FDD, select (CL) [OK].

(12) When this procedure is completed, message “Back up is done. Remove FD.” is displayed.
Remove the FD, select (CL) [OK].



(13) Close ‘Install’ window

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6 Display of Disk Drive Model

SVP displays each drive model as the following table.

Disk drive model	SVP screen
DK309-180	DK309-18
DK3F1-60	DK3F1-06

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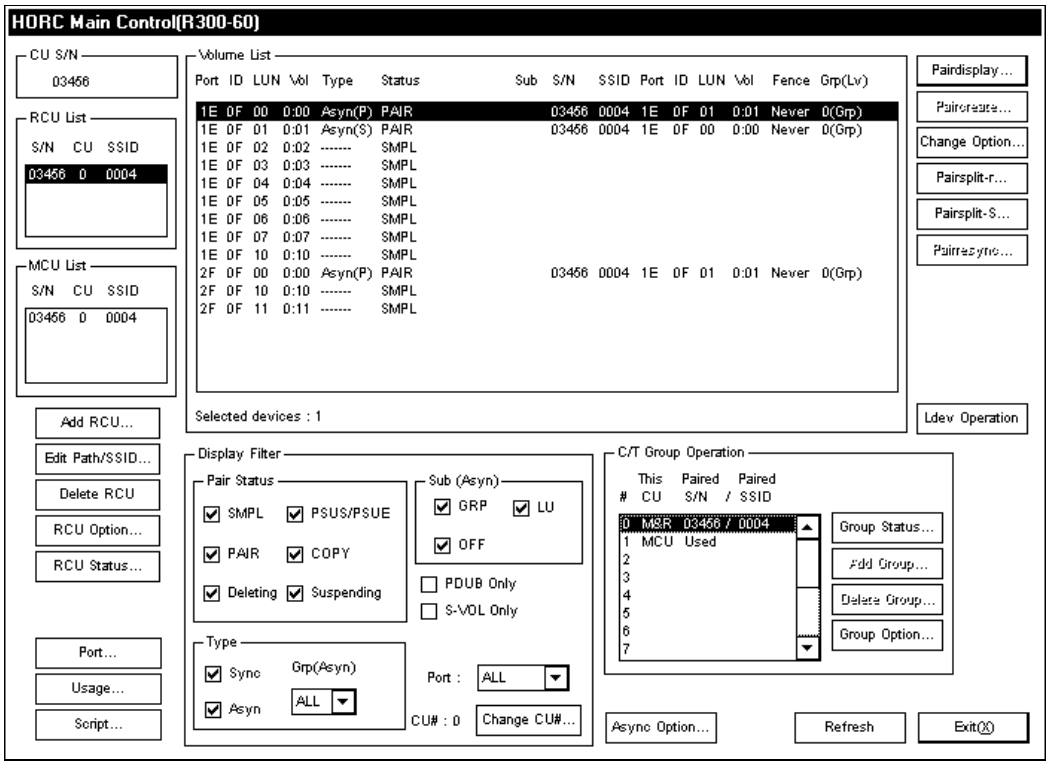
7 References for HORC Operation Screen (for OPEN VOL)

If SVP Micro-program version is not over “51-36-01”, refer to the “9 References for HORC Operation Screen (for LDEV) (SVP09-10)”.

7.1 HORC Main screen



RCU List ..... This List Box displays Controllers as RCU(Remote disk Control Unit).
“XXXXX X XXXX”
Serial Number CU# SSID

MCU List ..... This List Box displays Controllers as MCU(Main disk Control Unit).
(Only volume pairing is established.)
“XXXXX X XXXX”
Serial Number CU# SSID

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Volume List ..... This List Box displays valid OPEN VOL (open volume) and the Pairdisplay.

"XX XX XX X:XX XXX(X) XXXXXXX XXX XXXXX XXXX XX
① ② ③ ④ ⑤ ⑥ ⑦ ⑨ ⑩ ⑪ ⑫
XX XX X:XX X X(XXX)"
⑬ ⑭ ⑮ ⑯ ⑰

① #OPEN VOL:PORT ....PORT Number of OPEN VOL
② #OPEN VOL:ID .....SCSI ID Number of OPEN VOL
③ #OPEN VOL:LUN .....LUN Number of OPEN VOL
④ #CU:#LDEV .....CU address:LDEV top address of OPEN VOL
⑤ Copy Mode ..... "Sync" : Synchronous
"Asyn" : Asynchronous
" - " : SMPL Volume
⑥ Volume Type ..... "P" : Primary Volume
"S" : Secondary Volume
" - " : SMPL Volume
⑦ Status .....Volume Pairdisplay
"SMPL" : SMPL
"PAIR" : PAIR
"COPY" : COPY
"PSUS/PSUE" : Suspend
"Suspending" : Suspending
"Deleting" : Deleting
"PDUB" : PDUB
⑨ Sub Status .....Suspend sub status.
"GRP" : The consistency time of the volume is corresponding to the C/T group's.
"LU" : The consistency time of the volume is not corresponding to the C/T group's.
"OFF" : The volume is suspended by MCU P/S off.
⑩ Serial Number.....Serial Number of Destination Controller.
⑪ SSID .....SSID of destination Controller.
⑫ #OPEN VOL:PORT....PORT Number of OPEN VOL on the destination Controller.
⑬ #OPEN VOL:ID.....SCSI ID Number of OPEN VOL on the destination Controller.
⑭ #OPEN VOL:LUN.....LUN Number of OPEN VOL on the destination Controller.
⑮ #CU:#LDEV .....CU address on the destination Controller :LDEV top address of OPEN VOL on the destination Controller.
⑯ Fence Level .....OPEN VOL Fence Level
⑰ Grp. (Lv) .....C/T group#(Error Level)

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Display Filter..... Display filter of the Volume List.

• Pair Status

"SMPL" ~ "Deleting" check box

..... LDEVs whose status are selected by check box are displayed.

(Note: If "PSUS/PSUE" check box is not selected, "GRP" ~ "LU" check box are displayed ineffectively.)

• Type

"Sync" ~ "Asyn" check box

..... LDEVs whose synchronous mode are selected by check box are displayed.

(Note: If "Asyn" check box is not selected, "Deleting", "Suspending", "GRP", "OFF", "LU" check box and "Grp(Asyn)" combo box are displayed ineffectively.)

"Grp (Asyn)" combo box

..... LDEVs whose C/T group# is selected by combo box is displayed. ("ALL" displays all C/T groups.)

• Sub (Asyn)

"GRP" ~ "LU" check box

..... LDEVs whose sub status are selcted by check box are displayed.

"PDUB Only" check box

..... Only Warning OPEN VOLs are displayed.

"S-VOL Only" check box

..... Displays only S-VOL pairs.

"SMPL" check box are displayed ineffectively.

"Port" combo box..... Select the port number to be connected to the object form the combo-box in Port(s).

("ALL" displays all connected Port(s).)

Select the RCP port to be connected to the object RCU from the combo-box in Port.

Change CU#..... Specifies CU address (CU#) to display the RCU List, the MCU List and the Volume List concerned with the CU.

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Port Operation

Port.....Changes the port type between LCP and RCP.

When the MCU is connected to the RCU, the MCU side port type must be set to RCP.

Path Operation

Add RCU.....Establishes the path between the MCU and the RCU. When establishing the path, the MCU must register the object RCU first. This function registers the object RCU and establishes the path at a time. When the MCU registers the object RCU successfully, the RCU is added to the RCU list. (Up to 4 RCU units can be registered for one MCU.)

Edit Path/SSID ...Adds/reduces the number of paths or SSIDs to an RCU selected from the RCU list within a range of 1 to 4.

Delete RCU .....Deletes an RCU selected from the RCU list and the path(s) to the RCU at a time. Before executing this function, all the units paired with the RCU must be set to SMPL status.

RCU Option .....Changes the option for connection to an RCU selected from the RCU list. The connection option can also be specified when the RCU is registered, but this function is used to change the option during operation.

RCU Status.....Displays the status of an RCU selected from the RCU list. This function can also display the status of each path to the RCU.

Pair Operation

(Note: All pair operations are disabled if the synchronous copy pair(s) and asynchronous copy pair(s) are selected at the same time.)

Pairdisplay.....Displays the status of a volume selected from the volume list. This function is disabled if two or more volumes are selected from the volume list.

Paircreate.....Creates the HORC pair(s) by making the SMPL volume(s) selected from the volume list become the P-VOL(s). Before executing this function, the CU that includes the S-VOL(s) must be registered as the RCU(s). This function is disabled if the volume(s) selected include(s) the volume(s) in the status other than SMPL.

Change Option ...Changes the pair option of the volume(s) (not in the SMPL status) selected from the volume list. The pair option can also be specified when the pair is created, but this function is used to change the option during the operation. This function is disabled if any volume(s) selected include(s) the SMPL, suspending, deleting and Secondary Volume(s).

Pairsplit-r.....Suspends the pair(s) of the volume(s) selected from the volume list. This function is disabled if any volume(s) selected include(s) the SMPL, PSUS, PSUE suspending, and deleting volume(s).

Pairsplit-S.....Deletes the pair of the volume(s) selected from the volume list.

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Pairresync.....Resume the pair of the volume(s) (in the suspend status) selected from the volume list. This function is enabled if the selected volume(s) is(are) suspended P-VOL(s).

C/T Group Operation

C/T Group List...X XXX XXXXX / XXXX ...
① ② ③ ④ ⑤ ⑥

① C/T group# (0 ~ F)
② Type of own CU.
MCU : Own CU is MCU for the paired CU.
RCU : Own CU is RCU for the paired CU.
M&R : Own CU and the paired CU are the same.
③ S/N of the paired CU.
If "Used" is displayed, the paired CU is not exist.
④ Slash.
⑤ SSID of the paired CU.
⑥ If "..." is displayed, own CU have two or more paired CU.

Group Status.....Displays the status of a C/T group selected from C/T group list.

Add Group.....Assigns the C/T group selected from C/T group list. This function is disabled if the specified C/T group has already assigned.

Delete Group. .....Releases the C/T group selected from C/T group list. This function is enabled if the CU type of the specified C/T group is "MCU" (Displayed "MCU" on the C/T group list).

Group Option .....Changes the option parameters of the C/T group selected from C/T group list. This function is disabled if the CU type of the specified C/T group is "RCU" (Displayed "RCU" on the C/T group list). Also, the specified C/T group is not assigned, too.

Async Option Operation

Async Option.....Changes the option parameters of the asynchronous function.

Other Functions

Ldev Operation...Displays HORC Sub Main Screen of OPEN VOL selected from Volume List of HORC Main screen.

Usage.....Displays HORC operation control information.

Refresh. .....Updates information displayed on the screen. Information displayed on the screen is kept as is until this function is executed.

Exit.....Exits the operation screen.

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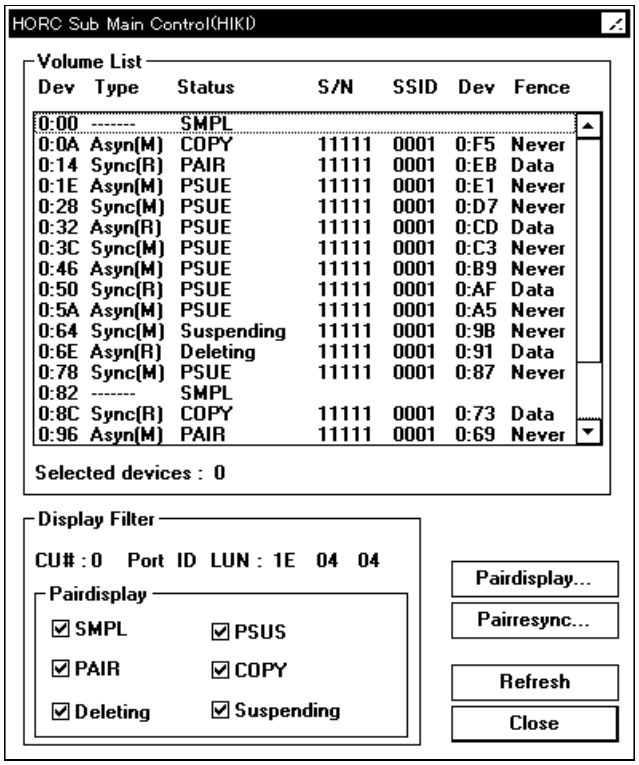
7.2 HORC Sub Main screen



Volume List ..... This list box displays valid LDEV of OPEN VOL and the Pairdisplay.
"X:XX XXXX(X) XXXXXXX XXXXX XXXX X:XX X"
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① #CU:#LDEV..... CU address:LDEV address
② Copy Type ..... Sync : Synchronous copy pair
Asyn : Asynchronous copy pair
"---" : SMPL Volume
③ Volume Type ..... "P" : Primary Volume
"S" : Secondary Volume
"-" : SMPL Volume
④ Pairdisplay ..... Volume Pairdisplay
"SMPL" : SMPL
"PAIR" : PAIR
"COPY" : COPY
"PSUS/PSUE" : Suspend
"Suspending" : Suspending
"Deleting" : Deleting
⑤ Serial Number of Destination Controller
⑥ SSID of Destination Controller
⑦ #CU:#LDEV..... CU address on the destination Controller
:LDEV address on the destination Controller
⑧ Fence Level..... LDEV Fence Level

Display Filter..... Display filter of the Volume List.

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Pair Operation

Pairdisplay.....Displays the status of a volume selected from the volume list. This function is disabled if two or more volumes are selected from the volume list.

HORC Pair Operation

Pairresync.....Resume the pair of the volume(s) (in the suspend status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a asynchronous copy pair(s).
If all the pair of the volume(s) (in the suspend status) are not resumed, PDUB is displayed at this OPEN VOL in the HORC Main screen.

Other Functions

Refresh .....Updates information displayed on the screen. Information displayed on the screen is kept as is until this function is executed.

Close.....Close the operation screen.

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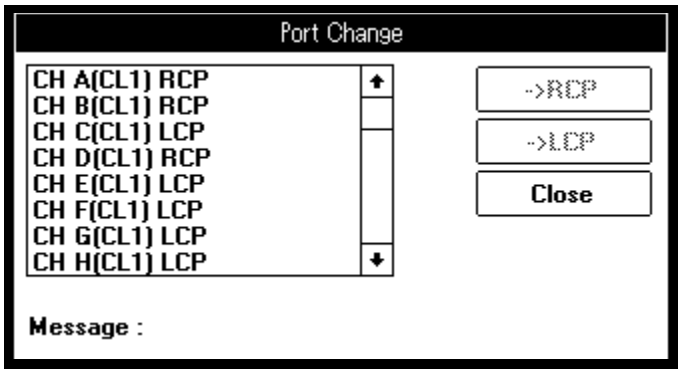
7.3 Port...screen



List ..... Displays the list of usable serial channels.

CH X[CL Y] XXX
① ② ③

① Channel ID (A to R)

② Cluster ID (1 or 2)

③ Channel type (LCP or RCP)

-> RCP ..... Changes the channel type selected from the list to the RCP.

-> LCP..... Changes the channel type selected from the list to the LCP.

Message..... Displays the progress of each changing process when the Changing function is started.
Checking port# CH X[CL Y] ...
Blocking port# CH X[CL Y] ...
Setting port# CH X[CL Y] ...
Restoring port# CH X[CL Y] ...

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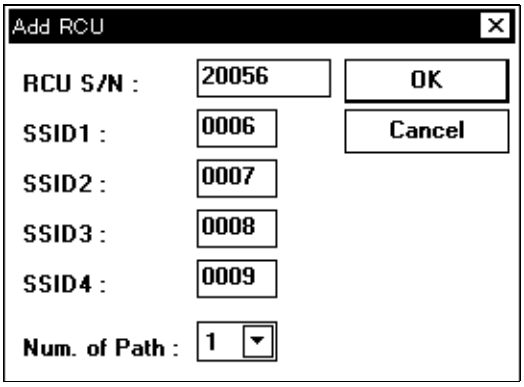
7.4 Add RCU... screen

• Specify RCU parameter.



RCU S/N.....Input the Serial number of RCU.
"XXXXX" .....5 characters.

SSID1 ~ 4.....Input the SSID of RCU. (Note)
"XXXX" .....4 hexadecimal digits number.

Num. Of Path .....Specifies the number of path between MCU & RCU.(1 ~ 4)

Option... .....Specified RCU option item. (Refer to RCU Option...)

Note: How to Set Up HORC of DKC310I.

1. Setting SSIDs
   DKC310I can have different SSIDs for each 64 boundary of LDEV#.

   It is possible for DKC310I to have independent SSIDs for each 64 boundary of LDEV#.

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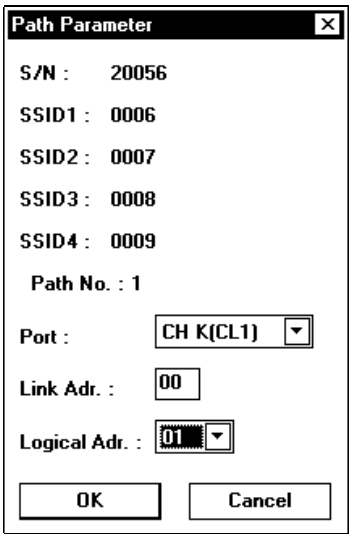
• Specify PATH parameter.
Input the RCU parameter, then input the path parameter for each specified path.



Port.....Specified port using as RCP in the Combo Box.

Link Adr. .....Input the destination link address.
"XX" ..... 2 characters of hexadecimal number. ("00" through "fd")
If RCU is connected to MCU directly without ESCD, specified "00" at the [Link Adr.].
If RCU is connected to MCU with ESCD, specified destination link address at the [Link Adr.].

Logical Adr. .....Specified logical address of the destination DKC.
Please select a logical address which is defined as CU images (00 through 03) in the RCU.

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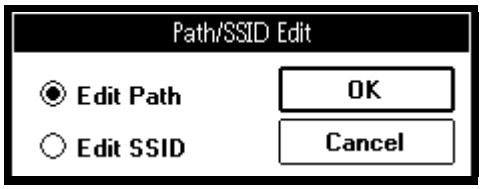
7.5 Edit Path/SSID

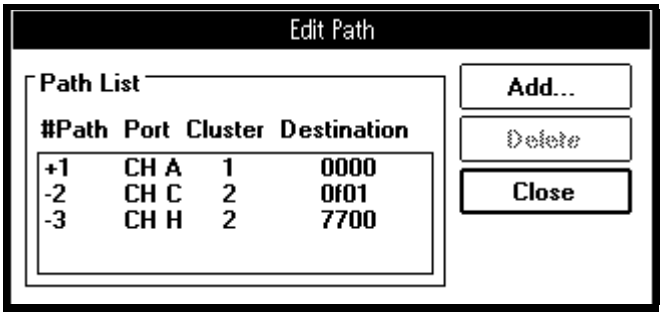
7.5.1 Path/SSID Edit... screen



Edit Path... Adding/reducing the number of paths.

Edit SSID . Adding/reducing the number of SSIDs.

7.5.2 Edit Path... screen



Path List ... Display current path's information.

"X CH X X XXXX"
① ② ③ ④

① #Path.....Status(+:Normal -:Abnormal) and Path No.(1 ~ 4)
② #Port .....Port of path creating.(CH A ~ CH R)
③ #Cluster .....Cluster. (1 ~ 2)
④ Destination.....Link address (2 hexadecimal numbers) + Logical address (2 hexadecimal numbers)

Add..... Adding new path.(Refer to Add.. RCU-Specified Path Parameter)

Delete ..... Deleting the path selected in the Path List.

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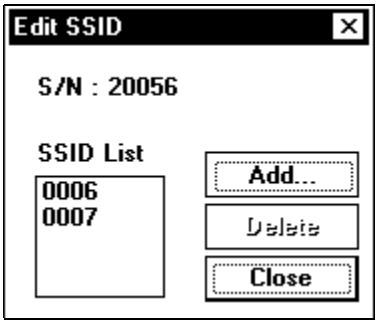
7.5.3 Edit SSID... screen

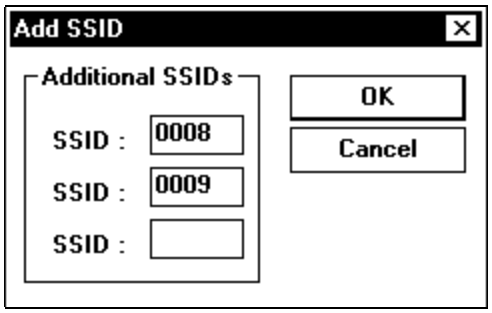


SSID List.. Display current SSIDs information.

Add..... Adding new SSIDs.

Delete ..... Deleting the SSIDs selected in the SSID List.

7.5.4 Add SSID... screen



Additional SSIDs ..... To add the SSIDs, input 4 hexadecimal digits numbers.

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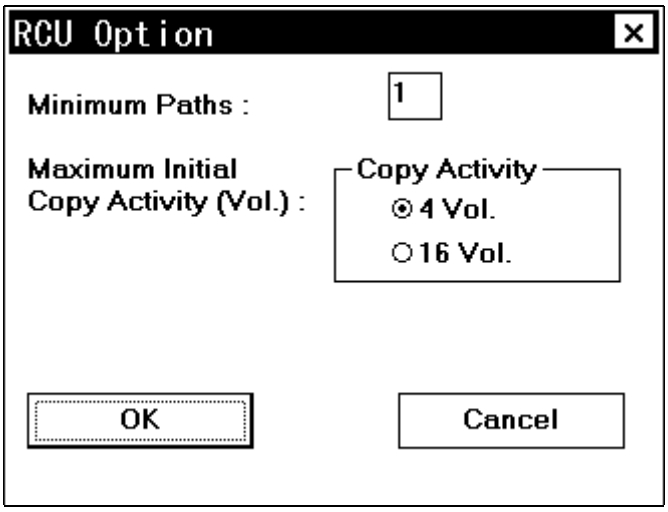
7.6 RCU Option... screen



Minimum Paths.....Specifies lowest number of paths needed for continuation of HORC. Defined between 1 to 4.

Maximum Initial Copy Activity (Vol.).....Specifies maximum number of Initial copy execution. (First group of defined HORC volume pairs.) Defined 4 or 16.

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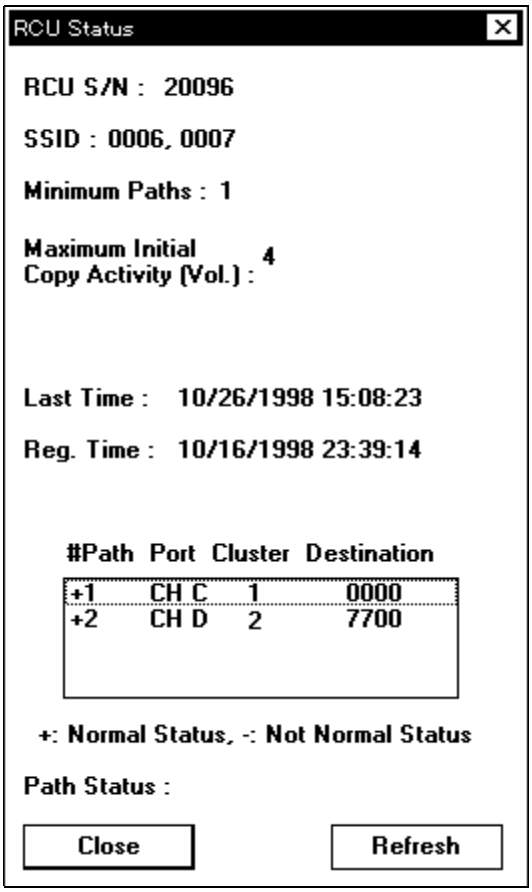
7.7 RCU Status... screen



RCU s#.....Display Serial number of the RCU.
"XXXXX" .....5 decimal digits.

SSID.....Display SSID of the RCU.
"XXXX" .....4 hexadecimal digits.

Minimum Paths.....Display lowest number of paths necessity for continuation of HORC.

Maximum Initial Copy Activity (Vol.).....Display maximum number of Initial copy execution.

Last Time .....Display last update time & date of the RCU.

Reg. Time.....Display registration time & date of the RCU.

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Path Status.....Display status of path that selected in list.
If it isn't "Normal", do the recovery action according to TRBL06-190 "Recovery Action of Path Status Error".
"Nothing".....No established.
"Normal" .....The status of path is normal.
"Initialization Failed" .....Error has occurred in the path initialization.
"Communication Time Out" Communication between MCU and RCU time out.
"Resource Shortage(MCU)" Resource at the MCU is short.
"Resource Shortage(RCU)" Resource at the RCU is short.
"Serial Number Mismatch" Specified serial number is mismatch.
"Invalid Port".....Specified port is invalid.

Refresh.....Refresh displayed information.

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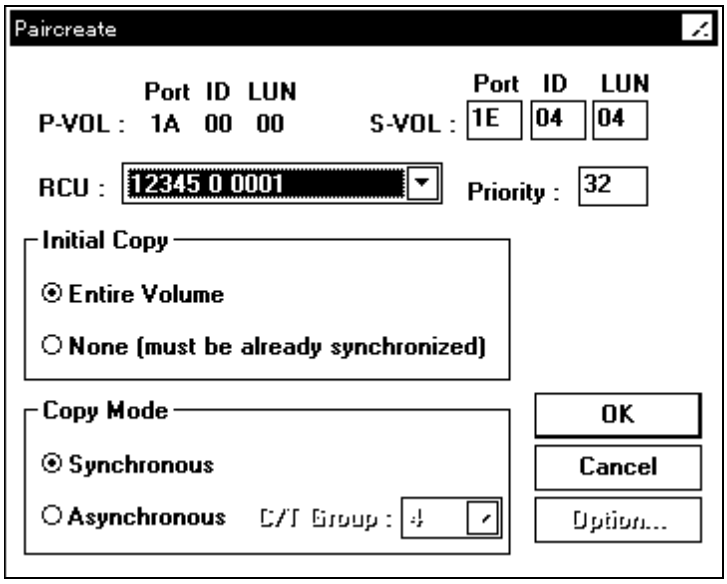
7.8 Paircreate... screen



P-VOL.....Display volume(OPEN VOL) that is MCU side.
PORT ..... Display PORT Number of OPEN VOL.
ID ..... Display SCSI ID Number of OPEN VOL.
LUN ..... Display LUN Number of OPEN VOL.

S-VOL.....Specifies volume(OPEN VOL) that is RCU side.
PORT ..... Specifies PORT Number of OPEN VOL that is RCU side.
ID ..... Specifies SCSI ID Number of OPEN VOL that is RCU side.
LUN ..... Specifies LUN Number of OPEN VOL that is RCU side.
"XX" ..... 2 hexadecimal digits.

Priority .....Specifies priority of initial copy execution.

RCU .....Select RCU from the Combo Box.
The list of RCUs currently registered will appear.

Initial Copy .....Specifies initial copy type. (Valid only for the remote dual copy function.)
"Entire Volume" .....Specifies all cylinders.
"None" .....Nothing

Copy Mode.....Specifies copy mode.
"Synchronous" .....Specifies synchronous copy.
"Asynchronous".....Specifies asynchronous copy.

C/T Group .....Select C/T group# from the combo box.
The list of C/T group currently assigned will appear, except the CU type of the C/T group is not RCU (Displayed as "RCU" in the C/T group list).
This combo box is displayed effectively if the "Asynchronous" is specified.

Option... .....Specifies pair option item. (Refer to Pair Option...)

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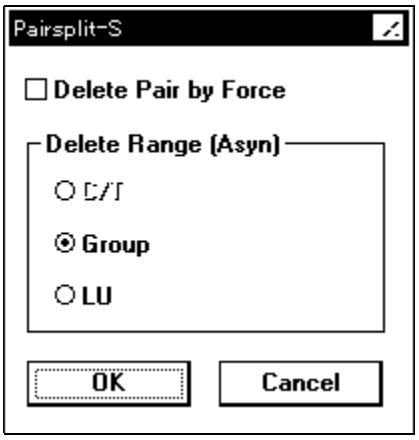
7.9 Pairsplit-S... screen



Delete Pair by Force.... Specified forcibly delete mode.
The Pairdisplay is deleted even when the communication with the CU is disabled. In the case of asynchronous copy pairs, “Delete Pair by Force” can be specified if the Delete Range is “Group”.

Delete Range(Asyn).....Select the kind of deletion. (Effective only asynchronous copy pair. Fixed “LU” if 2 or more volume are specified.)

- C/T..... All pair(s) will be deleted which have the same C/T as the specified pair. (Displayed effectively if the specified pair(s) is(are)) :
  - S-VOL
  - Neither “Suspending” status nor “Deleting” status
- Group... All pair(s) will be deleted which are assigned to the same C/T group as the specified pair.
- LU..... Only specified pair(s) will be deleted.

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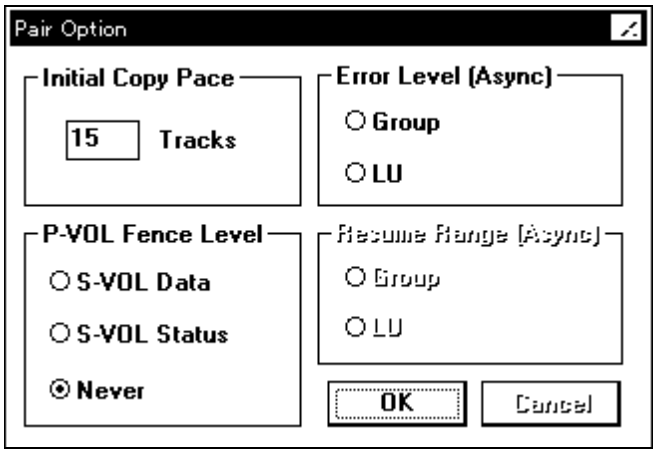
7.10 Pair Option... screen



Initial Copy Pace..... Specifies Initial copy pace.
"NN".....Decimal number within a range of 1 to 15.

P-VOL Fence Level ..... P-VOL fence level
"S-VOL Data" ..... P-VOL fence when data is unmatched
"S-VOL Status"..... P-VOL fence when status can not be changed.
"Never"..... Never fence
(Note: Fixed "Never" when asynchronous copy pairing)

Error Level (Async) ..... The suspension kind when asynchronous pairing is failed. Displayed effectively if the specified volume is asynchronous copy volume.
"Group" .....All asynchronous copy volumes under the same C/T group as the specified volume(s) will be suspended.
"LU" .....Only specified volume(s) will be suspended.

Resume Range (Async).... The resumption kind of suspended asynchronous copy volume. Displayed effectively when asynchronous copy pair resuming.
"Group" .....All asynchronous copy volumes under the same C/T group as the specified volume(s) will be resumed.
"LU" .....Only specified volume(s) will be resumed.

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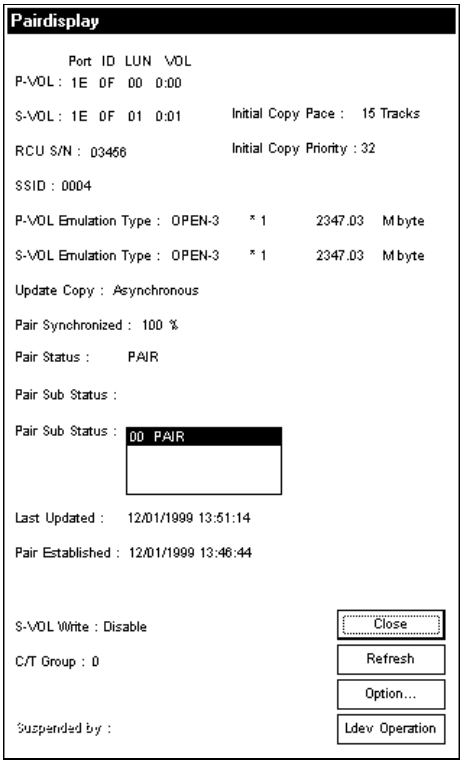
7.11 Pairdisplay... screen (of OPEN VOL)



P-VOL.....Displays volume(OPEN VOL) (MCU side).
PORT...Display PORT Number of OPEN VOL.
ID.....Display SCSI ID Number of OPEN VOL.
LUN.....Display LUN Number of OPEN VOL.
VOL.....Display LDEV top address of OPEN VOL.

S-VOL.....Displays volume(OPEN VOL) (RCU side).
PORT...Display PORT Number of OPEN VOL.
ID.....Display SCSI ID Number of OPEN VOL.
LUN.....Display LUN Number of OPEN VOL.
VOL.....Display LDEV top address of OPEN VOL.

RCU S/N.....Displays serial number of the RCU.

SSID.....Displays SSID of the RCU.

Initial Copy Pace.....Displays Initial copy pace. (Remote Dual Copy)
"NN".....Decimal number within a range of 1 to 15.

Initial Copy Priority .....Displays priority of initial copy execution.

Operation Mode .....Displays pair creative mode.
"RDC" .....Remote Dual Copy(HORC)

P-VOL Emulation Type.....Displays P-VOL device emulation type and volume size (OPEN VOL).

S-VOL Emulation Type.....Displays S-VOL device emulation type and volume size (OPEN VOL).

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Update Copy .....Displays pair synchronous mode.

Pair Synchronized .....Displays progress of initial copy.
(Note: There is a possibility to be displayed as “Not Valid(Initial copy not complete)” when agreeing with undermentioned condition.
• The specified volume is S-VOL.
• The specified volume is asynchronous copy pair.
• The specified volume is in the suspended state.)

Pair status .....Displays Pairdisplay information.
“SMPL”
“PDUB”
“COPY”
“PAIR”
“PSUS(P-VOL by Operator)”
“PSUS(S-VOL by Operator)”
“PSUS(by MCU)”
“PSUE(by RCU)”
“PSUS(Delete pair to RCU)”
“PSUE(S-VOL failure)”
“PSUE(MCU IMPL)”
“PSUE(Initial Copy Failed)”
“Suspending”
“Deleting”
“PSUE(MCU P/S OFF)”

Pair Sub Status .....Displays pair sub status information.
“Warning in SMPL”
“Warning in PSUE”
“Warning in PAIR”

Last Updated .....Displays last update time of Pairdisplay.

Pair Established.....Displays registration time the volume pair.

Pair Suspended.....Displays suspension time of the volume pair.

S-VOL write.....Display whether to enable S-VOL to read/write.

C/T Group .....Displays the C/T group# (‘0’ ~ ‘F’) of the volume.
(Displayed effectively if the volume is asynchronous copy volume.)

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Suspended by .....Displays the C/T status the volume.
(Displayed effectively when agreeing with undermentioned condition.)
• The volume is S-VOL.
"Group" ....The consistency time of the volume correspond to the C/T group's which the volume belongs to.
"LU" .....The consistency time of the volume is different from the C/T group's which the volume belongs to.

Option... .....Displays pair option item. (Same to Pair Option...)

Refresh .....Refresh displayed information.

Ldev Operation .....Displays HORC Sub Main screen of OPEN VOL, and resuming operation for LDEV can be performed.

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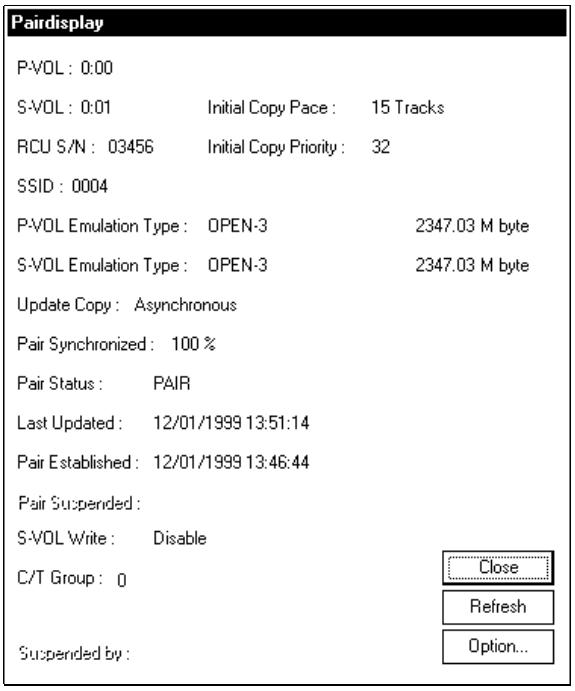
7.12 Pairdisplay... screen (of LDEV)



P-VOL.....Displays volume(LDEV) (MCU side).

S-VOL.....Displays volume(LDEV) (RCU side).

RCU S/N.....Displays serial number of the RCU.

SSID.....Displays SSID of the RCU.

Initial Copy Pace.....Displays Initial copy pace. (Remote Dual Copy)
"NN".....Decimal number within a range of 1 to 15.

Initial Copy Priority .....Displays priority of initial copy execution.

Operation Mode .....Displays pair creative mode.
"RDC" .....Remote Dual Copy(HORC)

P-VOL Emulation Type.....Displays P-VOL device emulation type and volume size.

S-VOL Emulation Type.....Displays S-VOL device emulation type and volume size.

Update Copy .....Displays pair synchronous mode.

Pair Synchronized .....Displays progress of initial copy(Remote Dual Copy).
(Note: There is a possibility to be displayed as "Not Valid(Initial copy not complete)" when agreeing with undermentioned condition.
• The specified volume is S-VOL.
• The specified volume is asynchronous copy pair.
• The specified volume is in the suspended state.)

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Pair status ..... Displays Pairdisplay information.
"SMPL"
"PDUB"
"COPY"
"PAIR"
"PSUS(P-VOL by Operator)"
"PSUS(S-VOL by Operator)"
"PSUS(by MCU)"
"PSUE(by RCU)"
"PSUS(Delete pair to RCU)"
"PSUE(S-VOL failure)"
"PSUE(MCU IMPL)"
"PSUE(Initial Copy Failed)"
"Suspending"
"Deleting"
"PSUE(MCU P/S OFF)"

Last Updated ..... Displays last update time of Pairdisplay.

Pair Established..... Displays registration time the volume pair.

Pair Suspended..... Displays suspension time of the volume pair.

S-VOL write..... Display whether to enable S-VOL to read/write.

C/T Group ..... Displays the C/T group# ('0' ~ 'F') of the volume.
(Displayed effectively if the volume is asynchronous copy volume.)

Suspended by ..... Displays the C/T status the volume.
(Displayed effectively when agreeing with undermentioned condition.)
• The volume is S-VOL.
"Group" .... The consistency time of the volume correspond to the C/T group's which the volume belongs to.
"LU" ..... The consistency time of the volume is different from the C/T group's which the volume belongs to.

Option... ..... Displays pair option item. (Same to Pair Option...)

Refresh ..... Refresh displayed information.

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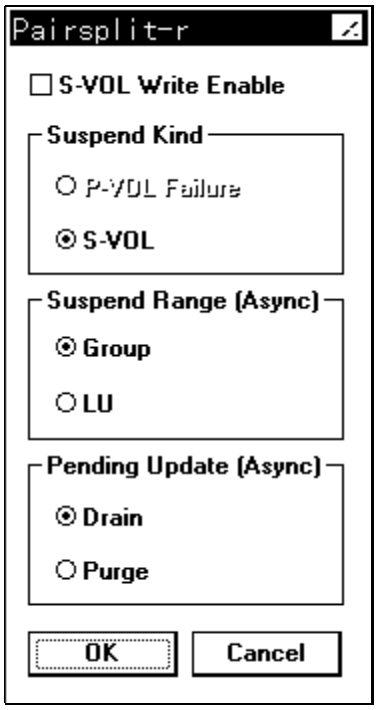
7.13 Pairsplit-r... screen



S-VOL Write Enable..... Specifies whether to enable S-VOL write.
If you want to use this parameter, select “S-VOL” in Suspend Kind parameter.

Suspend Kind..... Specifies suspended type.
“P-VOL Failure” .... P-VOL suspension reported as P-VOL failure.,
“S-VOL”..... S-VOL suspension
(Note: “P-VOL Failure” cannot be specified for asynchronous copy pair.)

Suspend Range (Async)... Specifies suspension kind of asynchronous copy pair(s).
Displayed effectively when asynchronous copy pair(s) suspension.
“Group” .....All asynchronous copy pair which belong to the same C/T group as the specified volumes will be suspended.
“LU” .....Only specified volume(s) will be suspended.
(Note: If 2 or more volume pairs are specified, fixed to “LU”.)

Pending update (Async)... Specifies releasing method of the Record Set.
Displayed effectively when asynchronous copy pair(s) suspension.
“Drain” .....The pair volume(s) of the specified volume(s) will be updated with pending data in the Record Set.
“Purge” .....The pair volume(s) of the specified volume(s) will be not updated.

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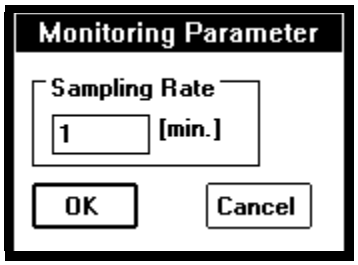
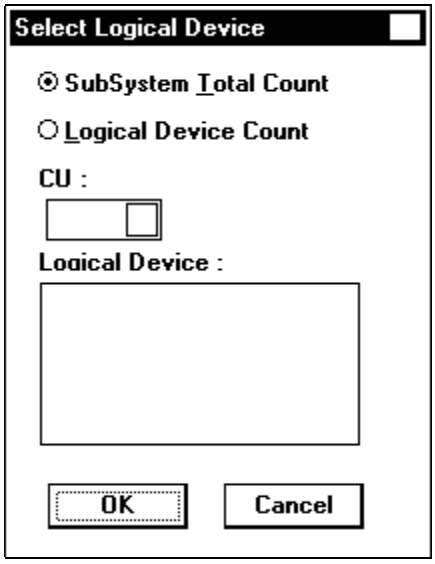
7.14 Usage... screen

Monitoring Parameter



Sampling Rate.... Sets the sampling rate of operation control information within a range of 1 to 546 in steps of a minute.

Select Logical Device



Logical Device:.. Displays the list of logical devices valid in the subsystem. Select the device from the list to display its operation information. To display the operation information of the whole subsystem, select "Sub System".

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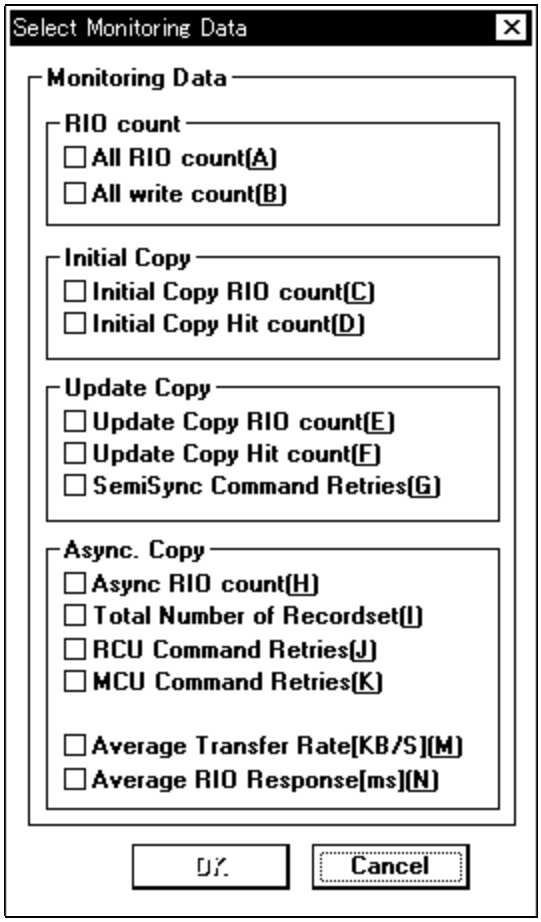
Select Monitoring Data



RIO count.....Specifies the read/write count concerning the HORC.

Initial Copy .....I/O count for the initial copy

Update Copy .....I/O count for renewal copy

Restore Copy.....Count for recovering copy

Async. Copy.....I/O count for Asynchronous Remote Copy

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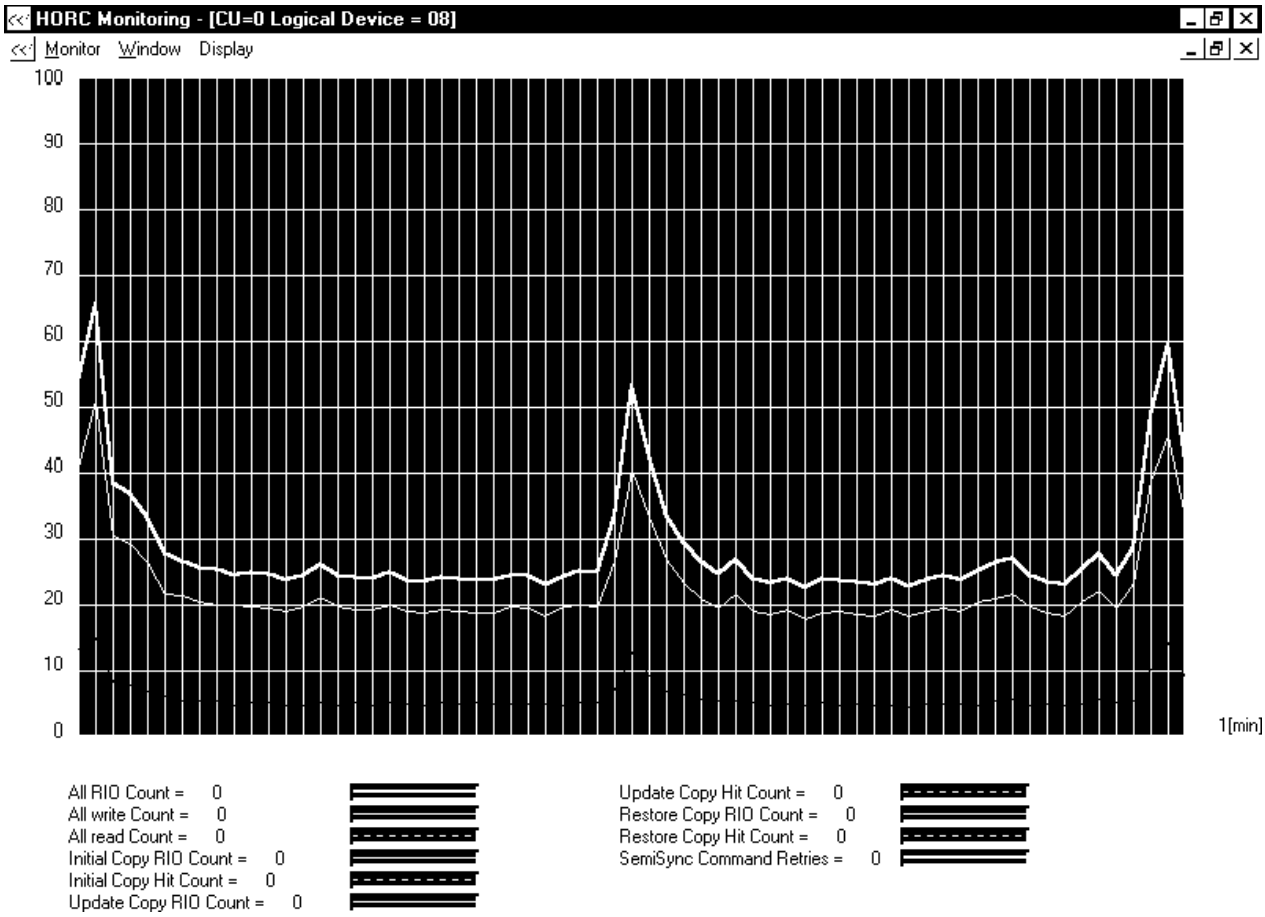
Remote Copy Monitoring Screen



Monitor Menu .... Start.....Displays another Remote Copy Monitoring screen.
EXit.....Closes the Remote Copy Monitoring screen.

Window Menu ... Cascade (C)....Displays Remote Copy Monitoring windows side by side.
Tile (T).....Displays lined-up Remote Copy Monitoring windows.
Icon (I) .....Lines up Remote Copy Monitoring window icons.
All close (A) ..Closes all the Remote Copy Monitoring windows.

Display Menu..... Line Model ....Displays or hides the explanation of lines.

Vertical Axis ..... Indicates the count number.

Horizontal axis... Indicates the time elapsed. A scale division on the horizontal axis indicates a sampling rate. The latest data is drawn to the right.

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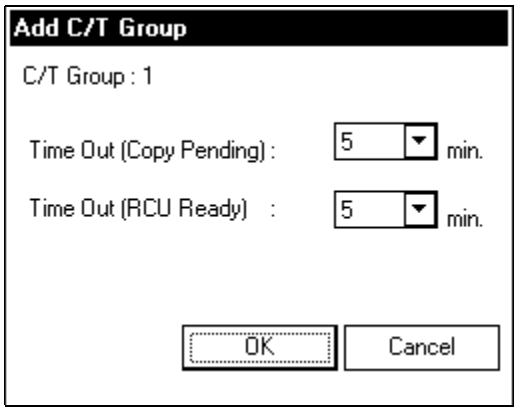
7.15 Add Group/Group Option... screen



C/T group.....Displays C/T group# selected from C/T group list.

Time Out (Copy Pending).....Specifies the maximum delay time of the update data.
(None, 1 ~ 15 [min.])

Time Out (RCU Ready).....Specifies the maximum waiting time for the RCU gets ready.
(None, 1 ~ 10 [min.])

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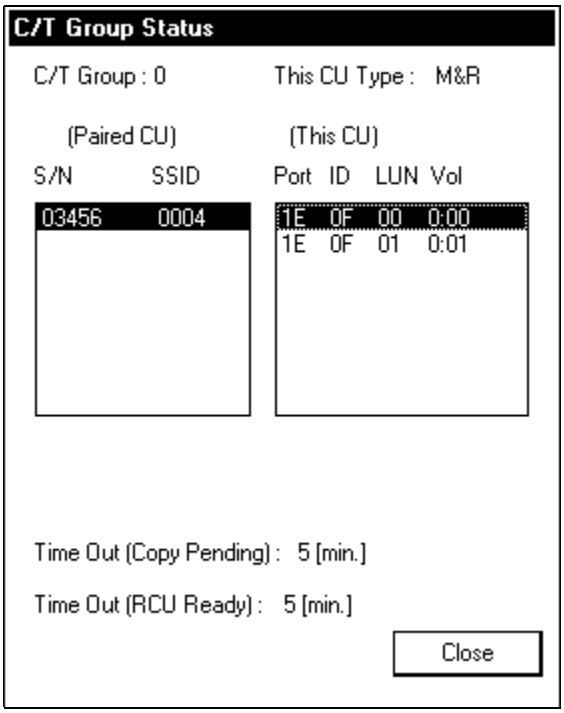
7.16 Group status... screen



C/T group.....Displays C/U group# selected from C/T group list.

CU Type.....Displays the CU type of the specified C/T group#.
"MCU"..... MCU
"RCU" ..... RCU
"M&R" ..... MCU&RCU

S/N SSID List Box.....Displays the serial numbers and SSIDs of RCUs which are registered in the specified C/T group#.

Port ID LUN Vol.....Displays the LUN#(Port, ID, LUN) and Vol# which belongs to the specified C/T group#

Time Out (Copy Pending).....Display the maximum delay time of the specified C/T group#.

Time Out (RCU Ready).....Display the maximum waiting time of the specified C/T group#.

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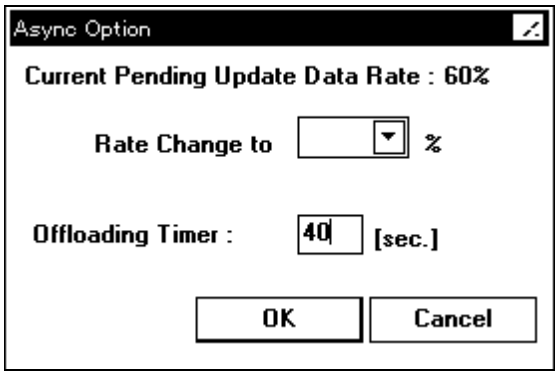
7.17 Async Option... screen



Current Pending Update Data Rate..... Displays current occupation rate of pending update data among the Record Set.

Rate Change to..... Specifies occupation rate of pending update data among the Record Set.(30 through 70)
(Note: If the C/T group(s) which is(are) assigned by HORC is(are) exist, the rate can not be changed.)
(Notice)
When using SVP version 51-44-XX, the rate can be turned within 40 through 70. When using 51-45-XX or later, it can be turned within 30 through 70.

Offloading Timer ..... Specifies monitoring time for the Record Set. (1 through 255)

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8 Details of the HMRCF Operation Screen

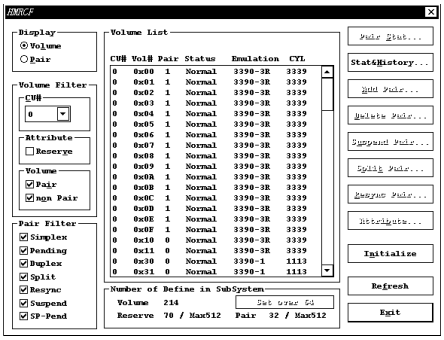
[0] Display HMRCF main screen

(1) Select the mode View or Modify.
View Mode: Only confirming the volume status is available.
Modify Mode: All operation and confirming the volume status are available.

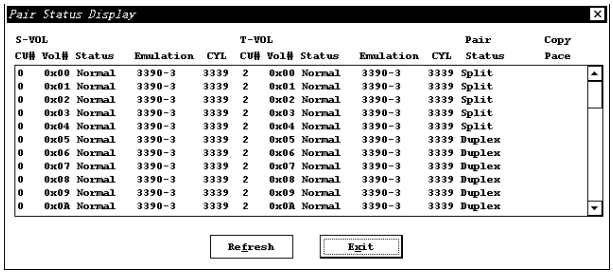
(2) Click the [HMRCF] button on the svp window.
After reading some configuration and HMRCF information.
The HMRCF main screen comes out.

[1] Procedure for confirming the volume status

(1) Select the volumes whose statuses you want to confirm, then click the [Pair Stat...] button.



(2) The statuses of the volumes you selected are displayed. To update the displayed information to the latest one, click the [Refresh] button. The screen can be closed by clicking the [Exit] button.



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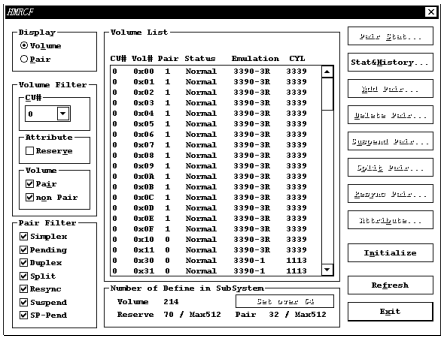
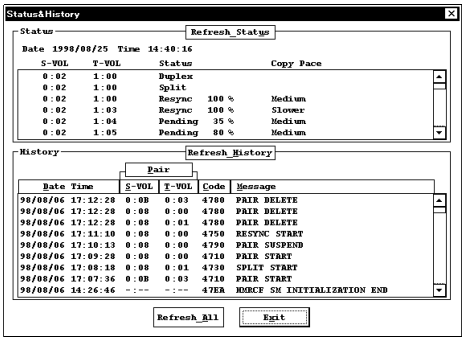
[2] Procedure for confirming Status & History

(1) Click the [Stat&History] button of HMRCF main screen.



(2) The status situation of the present pairs are displayed in the Status frame. To update the displayed information of the side of Status to the latest one, click the [Refresh_Status] button.
The one to have sorted a condition transfer history by the time series is displayed in the History frame. When sorting in the time series, click the [Date Time] button. When sorting in the number of S-VOL series, click the [S-VOL] button. When sorting in the number of T-VOL series, click the [T-VOL] button. When sorting in the Message Code series, click the [Code] button. When sorting in the Message series, click the [Message] button. When sorting in the Pair series, click the [Pair] button. When updating the history of the condition transfer of the pair, click the [Refresh_History] button.
When updating the all information, click the [Refresh_All] button. The screen can be closed by clicking the [Close] button.



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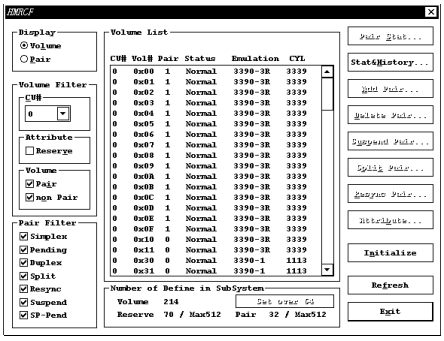
[3] Procedure for creating a volume pair

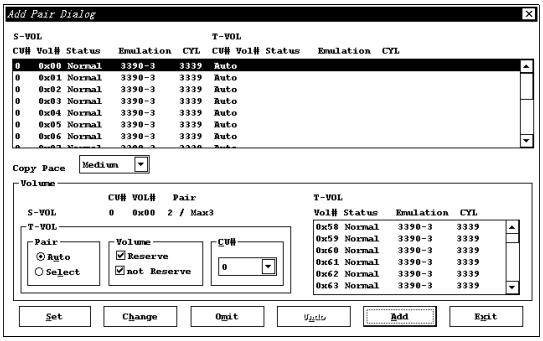
(1) Don't check the display attribute to "Reserve" on the HMRCF main screen, select a volume with which you want to create a volume pair, then click the [Add Pair...] button.



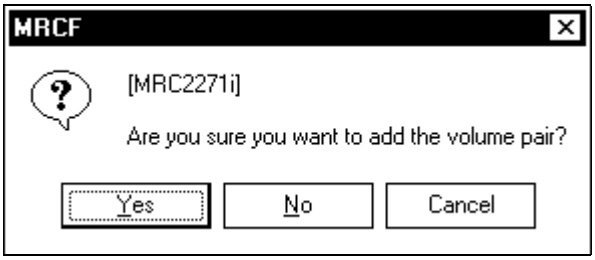
⚠ NOTICE

To create a volume pair, reserve volume must be defined. Refer to SVP08-80 and define reserve volume.

(2) A T-VOL is automatically selected for the S-VOL that you selected. When you add the T-VOL, select it on the screen, then click the [Set] button. To delete a pair from the Pair Volume list, select the pair you want to delete from the Pair Volume list and click the [Omit] button.
When you create a volume pair using the reserve volume displayed, click the [Add] button.
To stop the pairing, click the [Exit] button.



(3) A message box asking for confirmation whether to execute the pairing appears. To execute the pairing with the selected volumes, click the [Yes] button. To stop the pairing, click the [No] button. When you click the [Cancel] button, the screen for creating volume pairs returns.



(4) When indicating the making of a pair, a status display screen is displayed. It confirms that status of pair which referred to SVP08-10 and indicated making becomes duplex.

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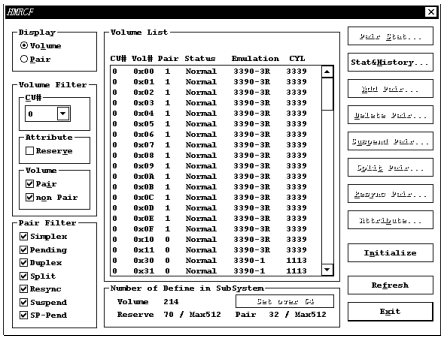
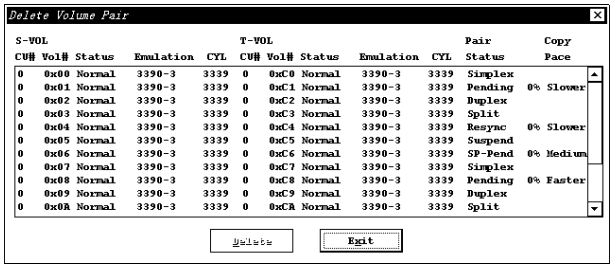
[4] Procedure for parting a volume pair

(1) Don't check the display attribute to "Reserve" on the HMRCF main screen, select a volume that you want to part the pair, then click the [Del Pair...] button.

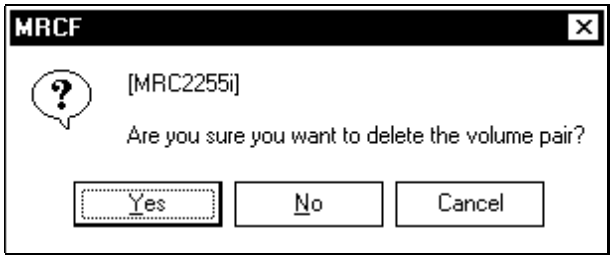


NOTICE
When the selected volume pair is not split status, the data of the T-VOL is not guarantied because there are differential data from the S-VOL.

(2) Select a volume pair that you want to part from the Pairs displayed and click the [Delete] button. To stop the parting, click the [Exit] button.



(3) A message box asking for confirmation whether to execute the parting appears. To actually part the selected volume pair, click [Yes] button. To stop the parting, click [No] button. When you click the [Cancel] button, the screen for parting volume pairs returns.



(4) When indicating the partition of the pair, it confirms that the pair which was specified by the HMRCF main screen is partitioned. When the pair status is displayed with Simplex, concerned pair is in the transition condition of the pair partition. Push [Refresh] button with the HMRCF main screen and confirm that concerned pair is partitioned.

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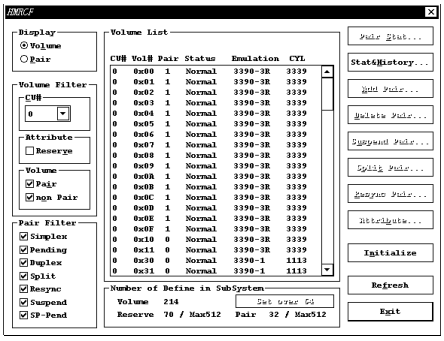
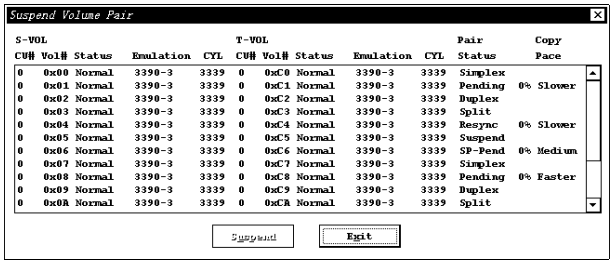
[5] Procedure for suspending a volume pair

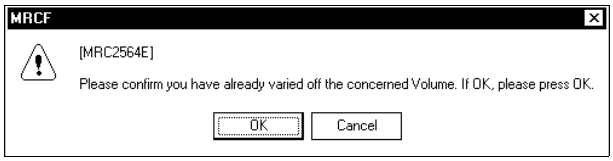
(1) Don't check the display attribute to "Reserve" on the HMRCF main screen, select a volume that you want to suspend, then click the [Suspend Pair...] button.



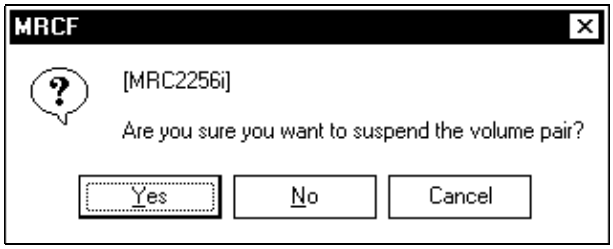
(2) Select a volume pair that you want to suspend from the pairs displayed and click the [Suspend] button. To stop the suspension, click the [Exit] button.



(3) The message to confirm that concerned Volume is an off line is displayed. It pushes [OK] button if confirming that concerned Volume is an off line. When you click the [Cancel] button, the screen for suspending volume pairs returns.



(4) A message box asking for confirmation whether to execute the suspension appears. To actually suspend the selected volume pair, click the [Yes] button. To stop the suspension, click the [No] button. When you click the [Cancel] button, the screen for suspending volume pairs returns.



(5) When indicating suspend of pair, status display screen is displayed. It confirms that status of pair which referred to SVP08-10 and indicated making becomes suspend.

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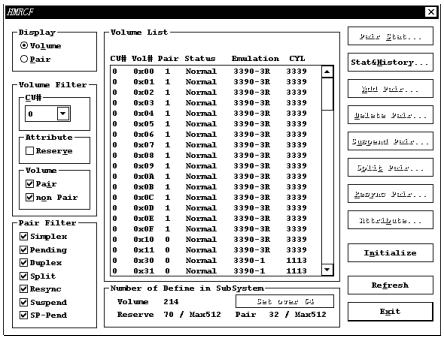
[6] Procedure for splitting a volume pair

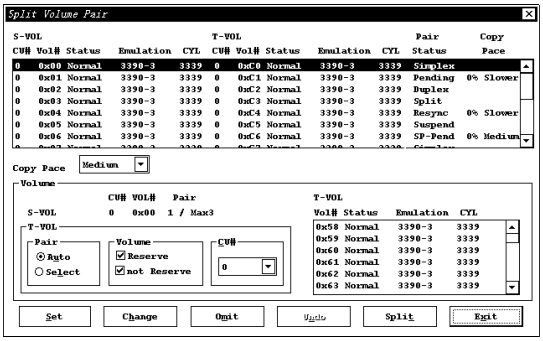
(1) Don't check the display attribute to "Reserve" on the HMRCF main screen, select a volume that you want to split, then click the [Split Pair...] button.



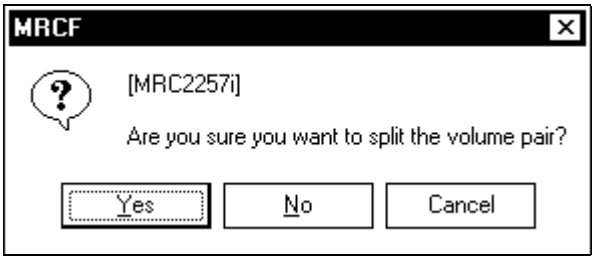
⚠ NOTICE

To splitting a volume pair newly, reserve volume must be defined. Refer to SVP08-80 and define reserve volume.

(2) A T-VOL is automatically selected for the S-VOL that you selected. When you add the T-VOL, select it on the screen, then click the [Set] button. To delete a pair from the Pair Volume list, select the pair you want to delete from the Pair Volume list and click the [Omit] button.
When you split a volume pair using the reserve volume displayed, click the [Split] button.
To stop the spliting, click the [Exit] button.



(3) A message box asking for confirmation whether to execute the splitting of the volume pair appears. To actually split the selected volume pair, click [Yes] button. To stop the splitting, click the [No] button. When you click the [Cancel] button, the screen for splitting volume pairs returns.



(4) When indicating split of pair, status display screen is displayed. It confirms that status of pair which referred to SVP08-10 and indicated making becomes split.

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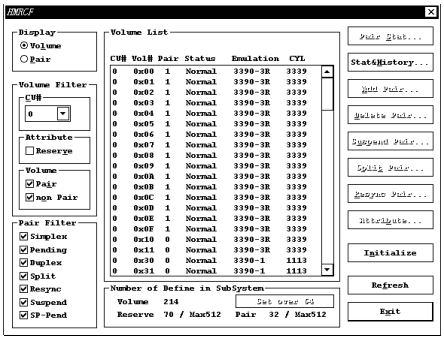
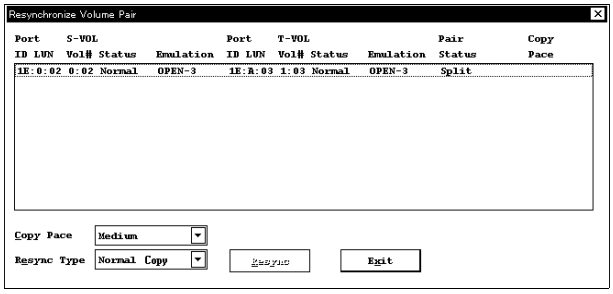
[7] Procedure for resynchronizing a volume pair

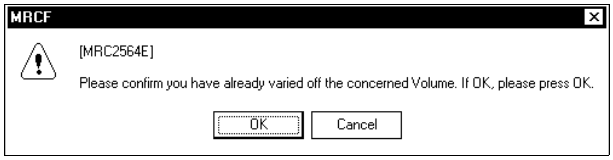
(1) Don't check the display attribute to "Reserve" on the HMRCF main screen, select a volume that you want to resynchronize, then click the [Resync Pair...] button.



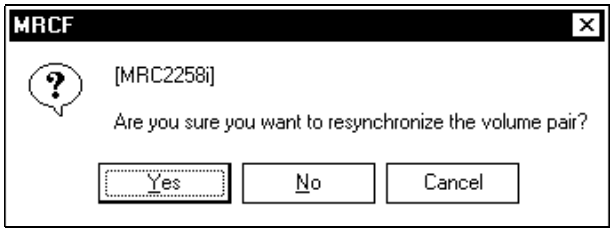
(2) Select a volume pair that you want to resynchronize from the pairs displayed and click the [Resync] button. To stop the resynchronization, click the [Exit] button.



(3) The message to confirm that concerned Volume is an off line is displayed. It pushes [OK] button if confirming that concerned Volume is an off line. When you click the [Cancel] button, the screen for resynchronizing volume pairs returns.



(4) A message box asking for confirmation whether to execute the resynchronization appears. To actually resynchronize the selected volume pair, click the [Yes] button. To stop the synchronization, click the [No] button. When you click the [Cancel] button, the screen for resynchronizing volume pairs returns.



(5) When indicating making in resynchronization of pair, status display screen is displayed. It confirms that status of pair which referred to SVP08-10 and indicated making becomes duplex.

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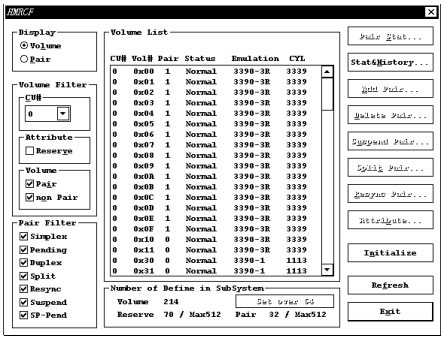
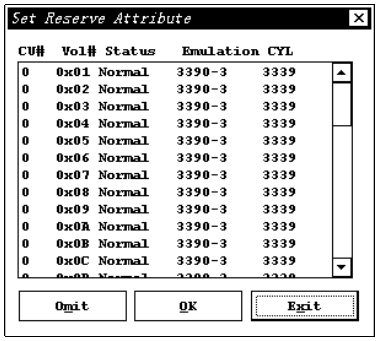
[8] Procedure for changing volume attribute

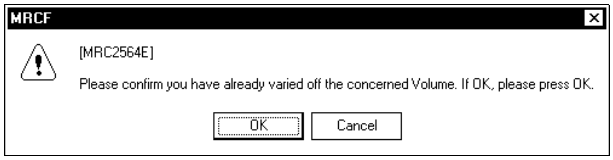
(1) Select the volumes whose attribute you want to change, then click the [Attribute...] button.



(2) When there are some volumes whose attributes you want to left unchanged, select the volumes and click the [Omit] button. To change the attributes of the selected volumes, click the [OK] button. To stop the attribute change, click the [Exit] button.



(3) When set the reserve attribute, the message to confirm that concerned Volume is an off line is displayed. It pushes [OK] button if confirming that concerned Volume is an off line. When you click the [Cancel] button, the screen for set volume attribute returns.



(4) When indicating the attribute change of the volume, it confirms that an attribute with the volume which was specified by the HMRCF main screen is changed.

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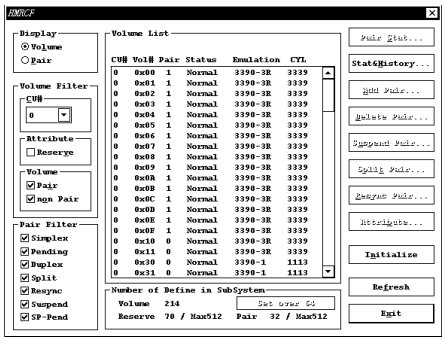
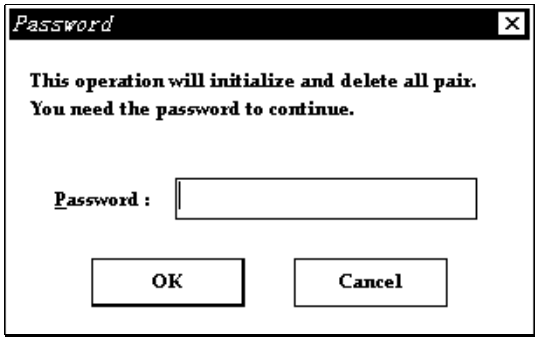
[9] Procedure for initializing a Volume pair

(1) On the HMRCF main screen, click the [Initialize] button.



⚠ NOTICE
All the pairs of HMRCF are deleted by this operation.

(2) "This operation will initialize and delete all pair. You need the password to continue." is displayed. Enter the password and select [OK] button.



⚠ NOTICE
This is a special (exceptional) operation and requires an input of a password. Ask the technical support center about the appropriateness of the operation and input the password after getting an approval of executing the operation.

(3) When indicating the compulsion initialization of the pair, it confirms that all pairs are initialized with the HMRCF main screen.

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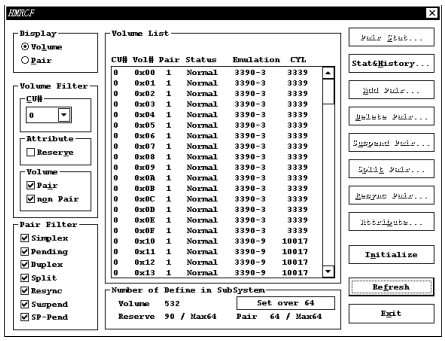
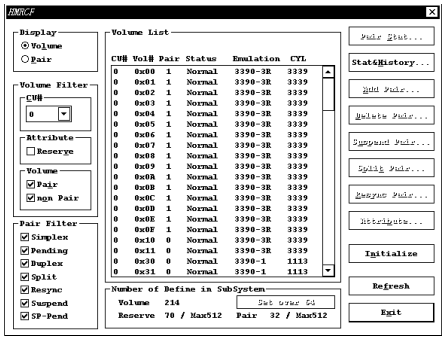
[10] Procedure of extending the number of maximum pair

(1) On the HMRCF main screen, when the [Set over 64] button is enable, the number of maximum pair can be extended from 64 to 512.
When the [Set over 64] button is disable, the following case is thought of.



- It has extended the number of maximum pair
  Confirm the HMRCF main screen number of maximum pair.
- During maximum pair number extension
  Press the [Refresh] button of the HMRCF main screen.
- The SM capacity lack
  Refer to INST05-230 and confirm SM capacity.
- The nonconformity of the DKCMAIN program version
  Refer to SVP03-130 and confirm DKCMAIN program version.

(2) Push the [Set over 64] button. Confirm that the HMRCF main screen number of maximum pair and the number of maximum Reserve are extended to 512. After maximum pair number extension, refer to MICRO-FC08-10 and acquire the backup of the configuration of the subsystem.



(3) When indicating maximum pair number extension, it confirms that the number of the maximum pairs is extended with the HMRCF main screen.

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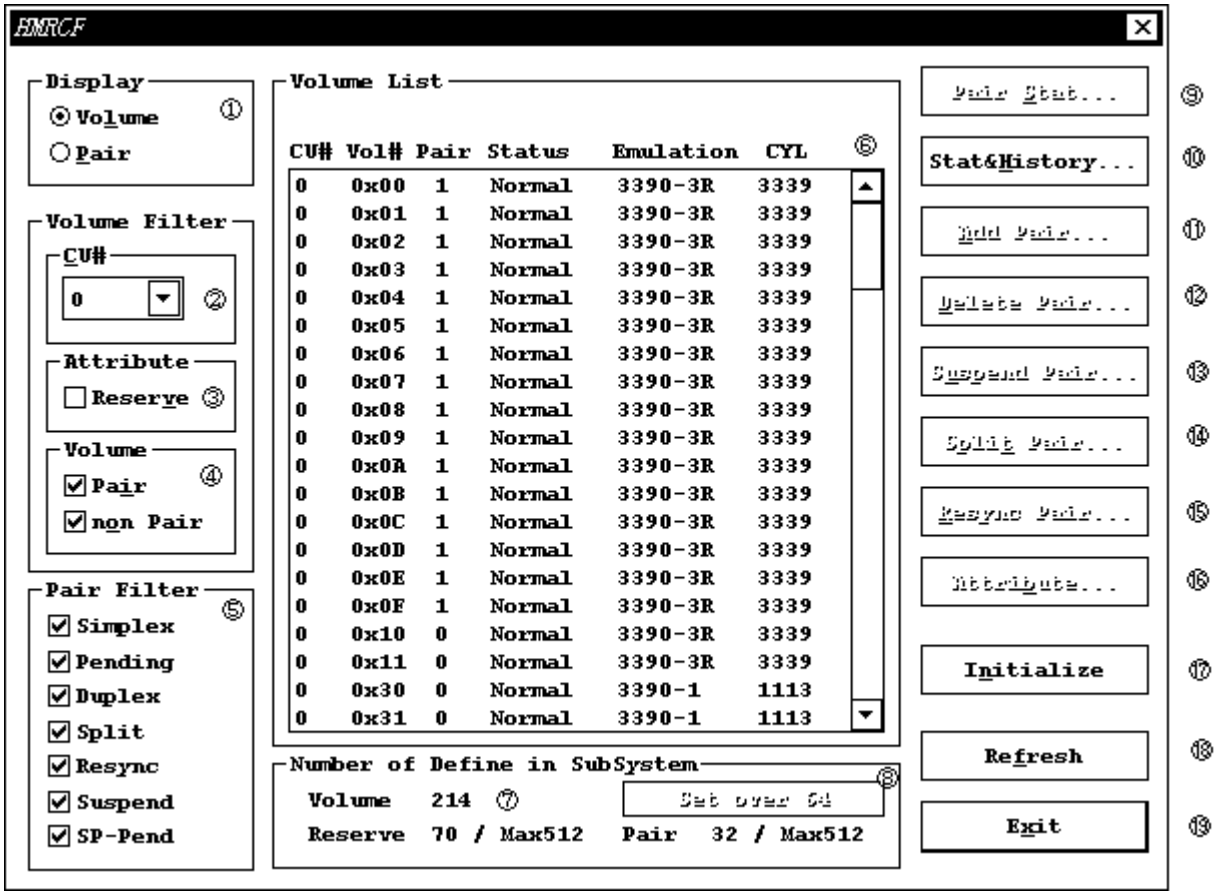
8.1 Details for Screen

HMRCF main screen



(1) : Specifies the classification to display.
Volume : Displays Volume
Pair : Displays Pair

(2) : Specifies the CU# to which volumes to be displayed belong.
However, this specification is not valid when “Pair” is selected in step (1).

(3) : Display Filter Attribute
When the check box is checked, volumes with “Reserve” attribute are displayed. When the check box is not checked, volumes with attributes other than “Reserve” are displayed.
However, this specification is not valid when “Pair” is selected in step (1).

(4) : Display Filter Volume
Pair : Volumes with paired are Display
non Pair : Volumes with not paired are Display
However, this specification is not valid when “Pair” is selected in step (1).

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(5) : Pair Filter
Simplex : Pair with Simplex are Display
Pending : Pair with Pending are Display
Duplex : Pair with Duplex are Display
Split : Pair with Split are Display
Resync : Pair with Resynchronization or Reverse Resynchronization are Display
Suspend : Pair with Suspend are Display
SP-Pend : Pair with SP-Pend are Display
However, this specification is not valid when “Volume” is selected in step (1).

(6) : Volume List box
“Volume” is selected in step (1).
CU# : Number of the CU to which the volume concerned belongs
Vol# : Number of the volume concerned
Pair : Number of pairs of the volume concerned
Status : Status of the volume concerned
Emulation : Emulation type of the volume concerned
CYL : Number of cylinders that contain the volume concerned
“Pair” is selected in step (1).
S-VOL Vol# : Number of CU:Volume of S-VOL
S-VOL Status : Status of S-VOL
T-VOL Vol# : Number of CU:Volume of T-VOL
T-VOL Status : Status of T-VOL
Pair Status : Status of the volume pair concerned

(7) : Displays information concerning the volumes.
Volume : Number of volumes defined in the whole subsystem
Reserve : Number of reserves defined in the whole subsystem
Pair : Number of volume pairs defined in the whole subsystem

(8) : Extending the number of maximum pair. (Including HMRCF/HOMRCF/HIHSM pairs)

(9) : Displays a name of the screen for displaying the statuses of the volumes selected in step (6).

(10) : Displays a name of the screen for displaying the statuses of the all pair and pair history.

(11) : Displays a name of the screen for specifying the pairing of the volume selected in step (6).

(12) : Displays a name of the screen for specifying the parting of the volume pair selected in step (6).

(13) : Displays a name of the screen for specifying the suspension of the volume selected in step (6).

(14) : Displays a name of the screen for specifying the splitting of the volume pair selected in step (6).

(15) : Displays a name of the screen for specifying the resynchronization of the volume pair selected in step (6).

(16) : Displays a name of the screen for specifying the attribute change of the volumes selected in step (6).

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(17) : Initialize the all pairs.
All HMRCF/HOMRCF/HIHSM pairs will be initialized and deleted by force. This operation needs password.

(18) : Updates the displayed information to the latest one.

(19) : Quits the HMRCF screen.

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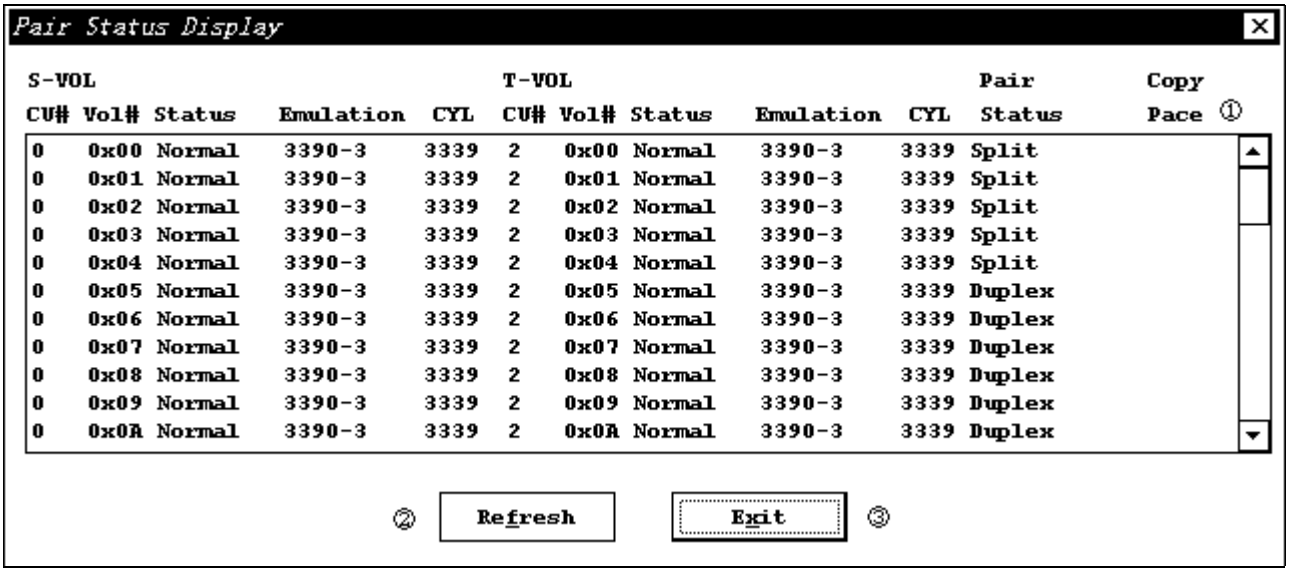
[2] Screen displaying pair status



(1) : Status information list box

S-VOL CU#	: Number of the CU to which the S-VOL belongs
S-VOL Vol#	: Number of the S-VOL
S-VOL Status	: Status of the S-VOL
S-VOL Emulation	: Emulation type of the S-VOL
S-VOL CYL	: Number of cylinders that contain the S-VOL
T-VOL CU#	: Number of the CU to which the T-VOL belongs
T-VOL Vol#	: Number of the T-VOL
T-VOL Status	: Status of the T-VOL
T-VOL Emulation	: Emulation type of the T-VOL
T-VOL CYL	: Number of cylinders that contain the T-VOL
Pair Status	: Status of the volume pair concerned
Copy Pace	: Copy pace of the volume pair

(2) : Updates the displayed information to the latest one.

(3) : Closes the screen.

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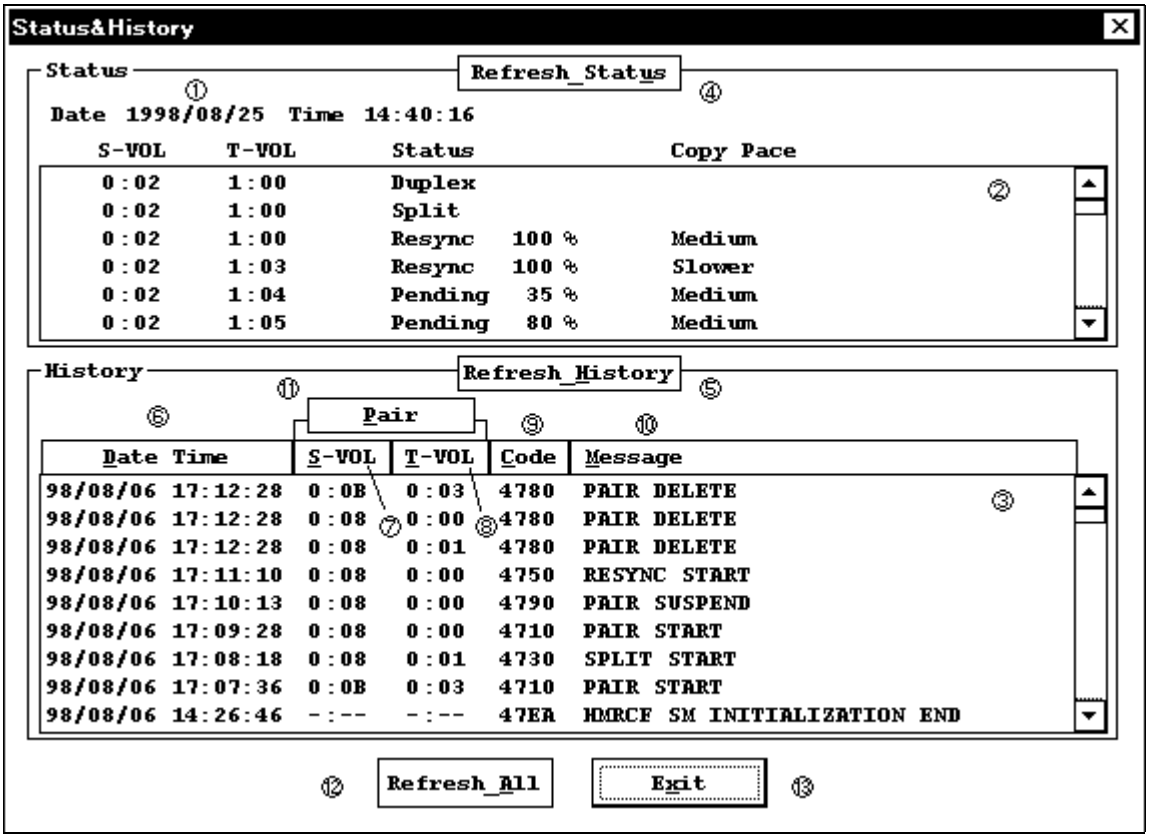
[3] Status & History Screen



(1) : It displays the time when the present pairs status was acquired.

(2) : The present pair status display list box
- S-VOL : Number of the CU of S-VOL (Left) Number of the Volume (Right)
- T-VOL : Number of the CU of T-VOL (Left) Number of the Volume (Right)
- Status : The present pairs of volume concerned.
- Copy Pace : Copy pace of the volume pair.

(3) : History of the condition transfer of the pairs display list box.
- Date Time : The time which history SIM occurred to.
- S-VOL : Number of the CU of S-VOL (Left) Number of the Volume (Right)
- T-VOL : Number of the CU of T-VOL (Left) Number of the Volume (Right)
- Code : Reference Code.
- Message : The message which corresponded to Reference Code.

(4) : Updates the status to the latest one.

(5) : Updates the history to the latest one.

(6) : It sorts with the key with time.

(7) : It sorts with the key with S-VOL.

(8) : It sorts with the key with T-VOL.

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(9) : It sorts with the key with code.

(10) : It sorts with the key with message.

(11) : It sorts with the key with pair.

(12) : Updates the displayed information to the latest one.

(13) : Quits the Screen.

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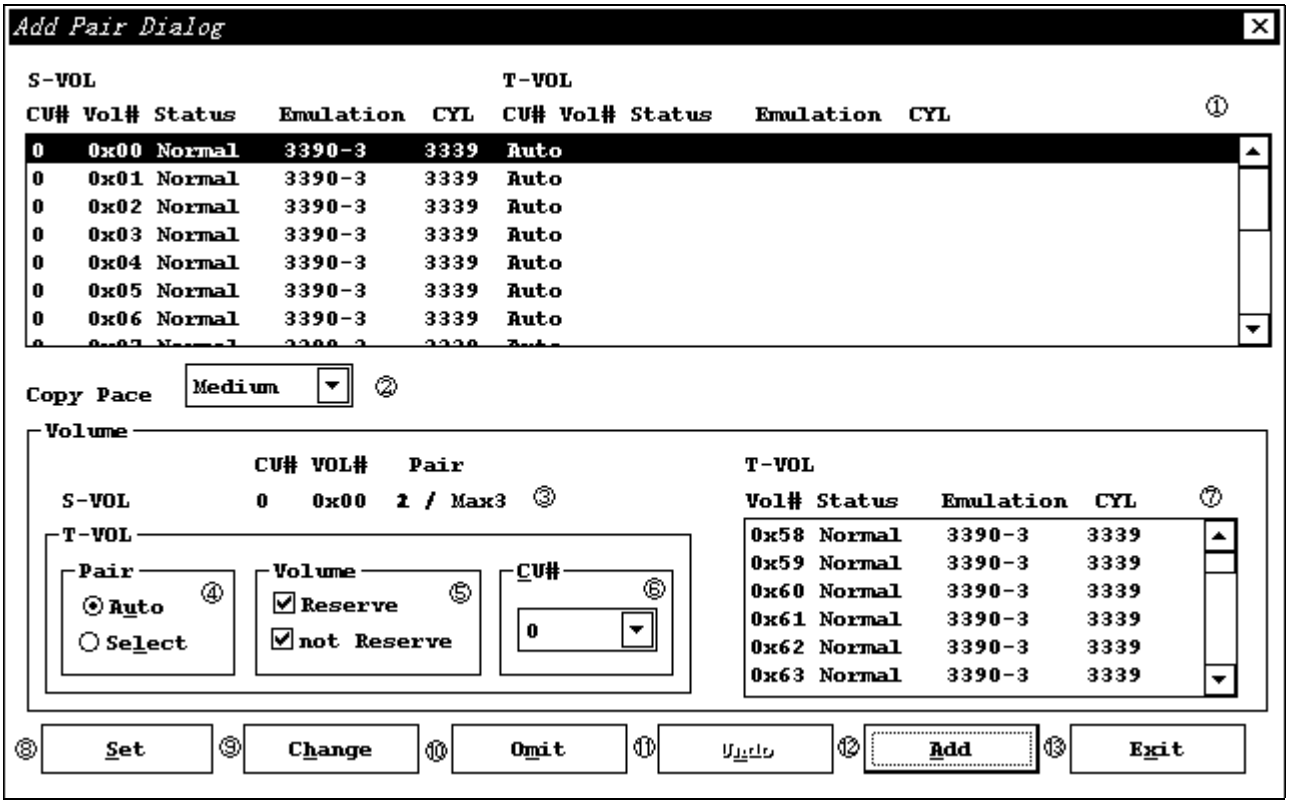
[4] Screen for specifying pairing



(1) : Volume information list box
- S-VOL CU# : Number of the CU to which the S-VOL belongs
- S-VOL Vol# : Number of the S-VOL
- S-VOL Status : Status of the S-VOL
- S-VOL Emulation : Emulation type of the S-VOL
- S-VOL CYL : Number of cylinders that contain the S-VOL
- T-VOL CU# : Number of the CU to which the T-VOL belongs
- T-VOL Vol# : Number of the T-VOL
- T-VOL Status : Status of the T-VOL
- T-VOL Emulation : Emulation type of the T-VOL
- T-VOL CYL : Number of cylinders that contain the T-VOL

When “AUTO” is specified for the T-VOL, the DKC automatically selects the T-VOL.

(2) : Specifies a copy pace.

(3) : S-VOL information
- CU# : Number of the CU to which the S-VOL belongs
- VOL# : Number of the S-VOL
- Pair : Number of pairs of the S-VOL

(4) : Specifies the method to select the T-VOL.
- Auto : Selects a T-VOL automatically.
- Select : Specifies a T-VOL for selection.

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(5) : Specifies T-VOL to display
Reserve : Display volume of the reserve attribute.
not Reserve : Display volume of the non-reserve attribute.
This control is available when the number of the maximum pairs is 512.

(6) : Specifies a CU# from which the T-VOL is selected.

(7) : Information of the T-VOL to be paired
Vol# : Number of the T-VOL
Status : Status of the T-VOL
Emulation : Emulation type of the T-VOL
CYL : Number of cylinders that contain the T-VOL

(8) : Adds the selected T-VOL as a volume to be paired.

(9) : Changes into T-VOL which chose T-VOL which is set at present.

(10) : Deletes the selected T-VOL from the volumes to be paired.

(11) : Returns 1 step of operation done by (8), (9) or (10).

(12) : Execute the pairing.

(13) : Stops the pairing.

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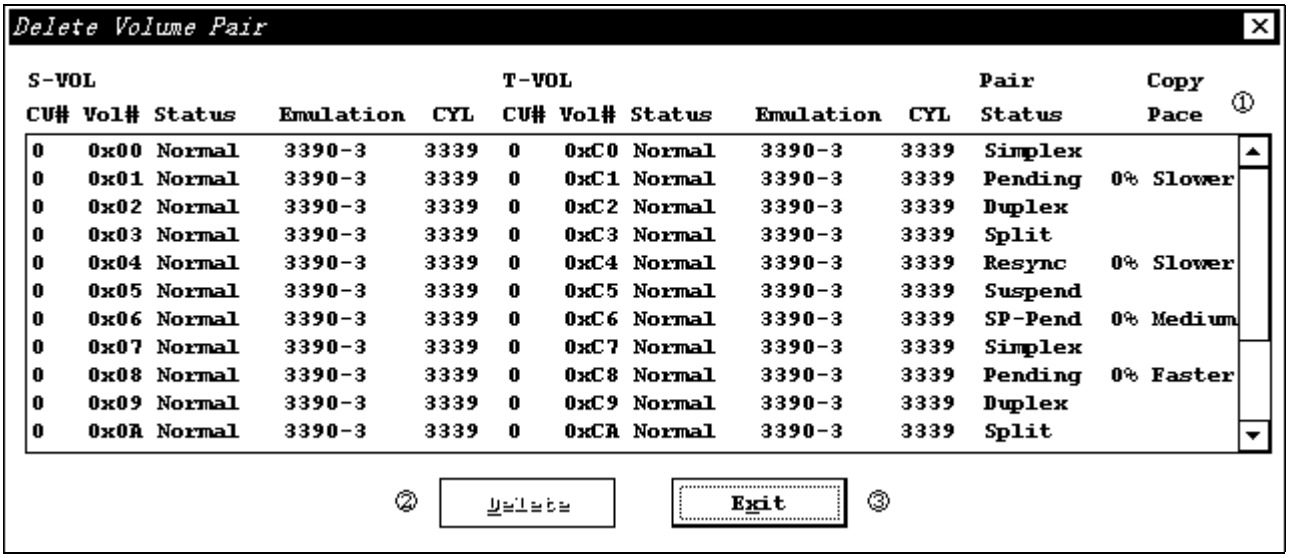
[5] Screen for specifying paring of volume pair



(1) : Volume pair information list box

S-VOL CU#	: Number of the CU to which the S-VOL belongs
S-VOL Vol#	: Number of the S-VOL
S-VOL Status	: Status of the S-VOL
S-VOL Emulation	: Emulation type of the S-VOL
S-VOL CYL	: Number of cylinders that contain the S-VOL
T-VOL CU#	: Number of the CU to which the T-VOL belongs
T-VOL Vol#	: Number of the T-VOL
T-VOL Status	: Status of the T-VOL
T-VOL Emulation	: Emulation type of the T-VOL
T-VOL CYL	: Number of cylinders that contains the T-VOL
Pair Status	: Status of the volume pair
Copy Pace	: Copy pace of the volume pair.

(2) : Executes an parting of the volume pair.

(3) : Stops parting of the volume pair.

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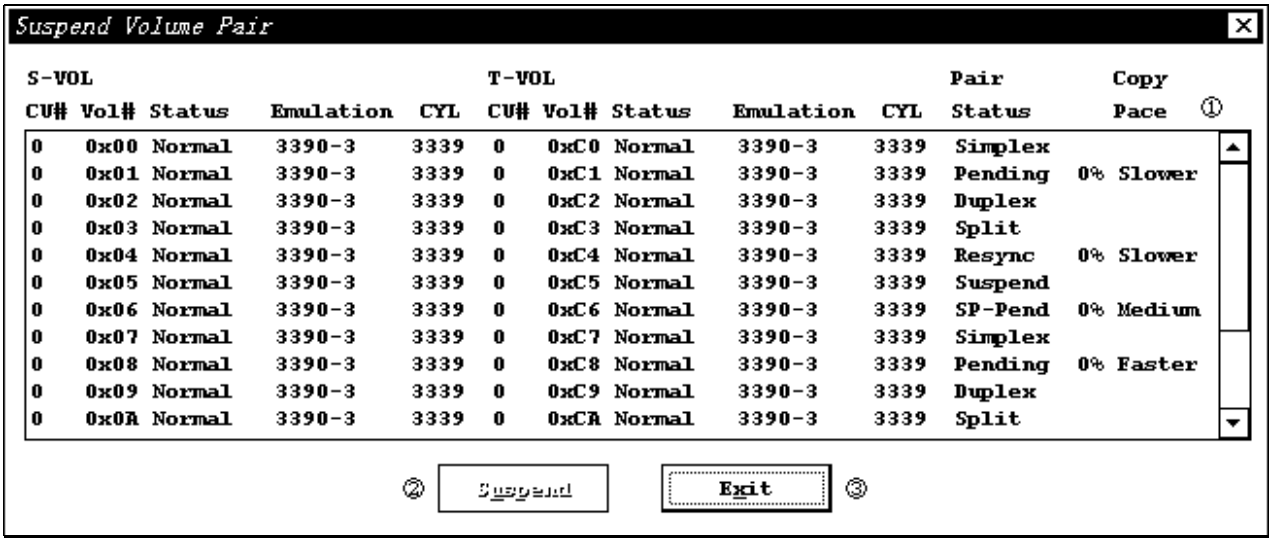
[6] Screen for specifying pair suspension



(1) : Volume pair information list box
- S-VOL CU# : Number of the CU to which the S-VOL belongs
- S-VOL Vol# : Number of the S-VOL
- S-VOL Status : Status of the S-VOL
- S-VOL Emulation : Emulation type of the S-VOL
- S-VOL CYL : Number of cylinders that contain the S-VOL
- T-VOL CU# : Number of the CU to which the T-VOL belongs
- T-VOL Vol# : Number of the T-VOL
- T-VOL Status : Status of the T-VOL
- T-VOL Emulation : Emulation type of the T-VOL
- T-VOL CYL : Number of cylinders that contain the T-VOL
- Pair Status : Status of the volume pair concerned
- Copy Pace : Copy pace of the volume pair.

(2) : Executes a suspension of the volume pair.

(3) : Stops a suspension of the volume pair.

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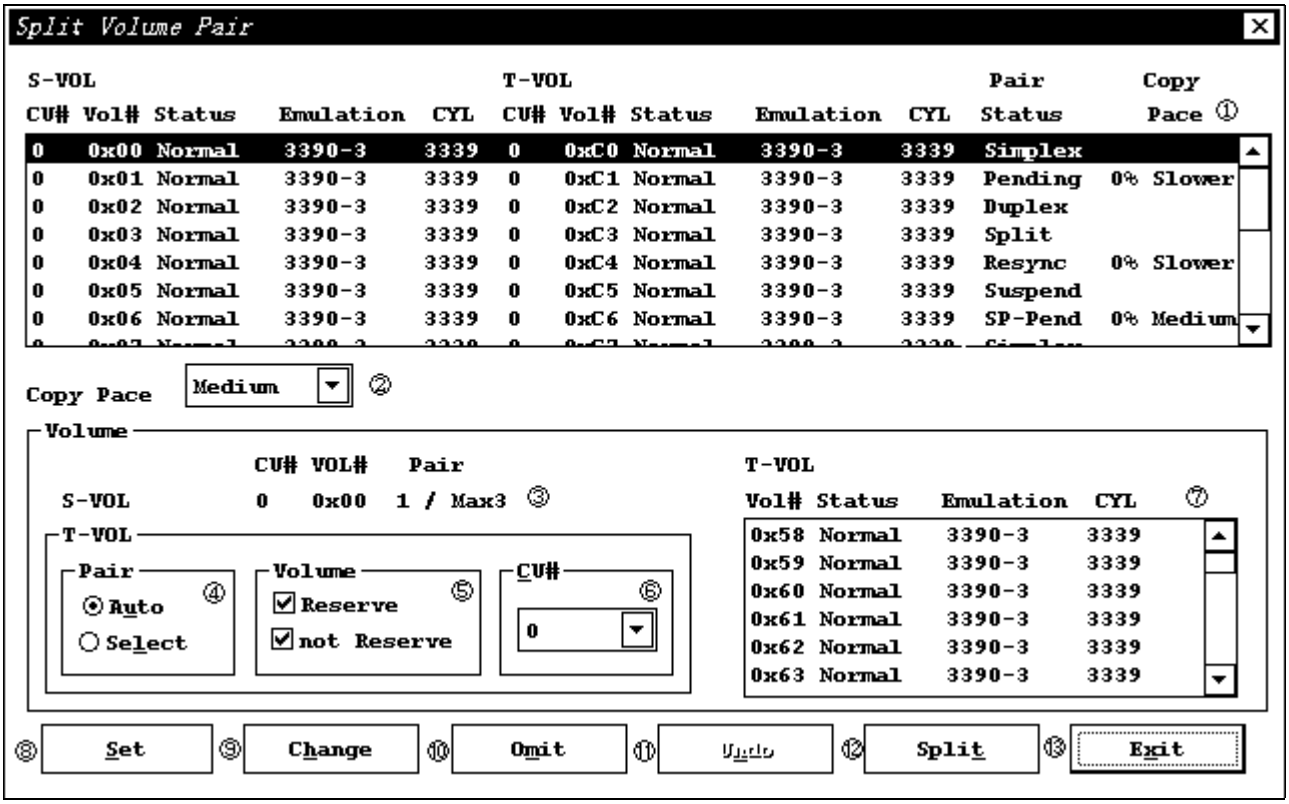
[7] Screen for specifying pair splitting



(1) : Volume pair information list box
- S-VOL CU# : Number of the CU to which the S-VOL belongs
- S-VOL Vol# : Number of the S-VOL
- S-VOL Status : Status of the S-VOL
- S-VOL Emulation : Emulation type of the S-VOL
- S-VOL CYL : Number of cylinders that contain the S-VOL
- T-VOL CU# : Number of the CU to which the T-VOL belongs
- T-VOL Vol# : Number of the T-VOL
- T-VOL Status : Status of the T-VOL
- T-VOL Emulation : Emulation type of the T-VOL
- T-VOL CYL : Number of cylinders that contain the T-VOL
- Pair Status : Status of the volume pair
- Copy Pace : Copy pace of the volume pair.

When “Auto” is specified for the T-VOL, the DKC automatically selects the T-VOL.

(2) : Specifies a copy pace.

(3) : S-VOL information
- CU# : Number of the CU to which the S-VOL belongs
- Vol# : Number of the S-VOL
- Pair : Number of volume pairs

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(4) : Specifies the method to select the T-VOL.
- Auto : Selects a T-VOL automatically.
- Select : Specifies a T-VOL for selection.

(5) : Specifies T-VOL to display
- Reserve : Display volume of the reserve attribute.
- not Reserve : Display volume of the non-reserve attribute.

This control is available when the number of the maximum pair is 512.

(6) : Specifies a CU# from which the T-VOL is selected.

(7) : Information of the T-VOL to be paired
- Vol# : Number of the T-VOL
- Status : Status of the T-VOL
- Emulation : Emulation type of the T-VOL
- CYL : Number of cylinders that contain the T-VOL

(8) : Adds a selected T-VOL as the one to be paired.

(9) : Changes into T-VOL which chose T-VOL which is set at present.

(10) : Deletes a selected T-VOL from the ones to be paired.

(11) : Returns 1 setp of operation done by (8), (9) or (10).

(12) : Execute a splitting of the volume pair.

(13) : Stops a splitting of the volume pair.

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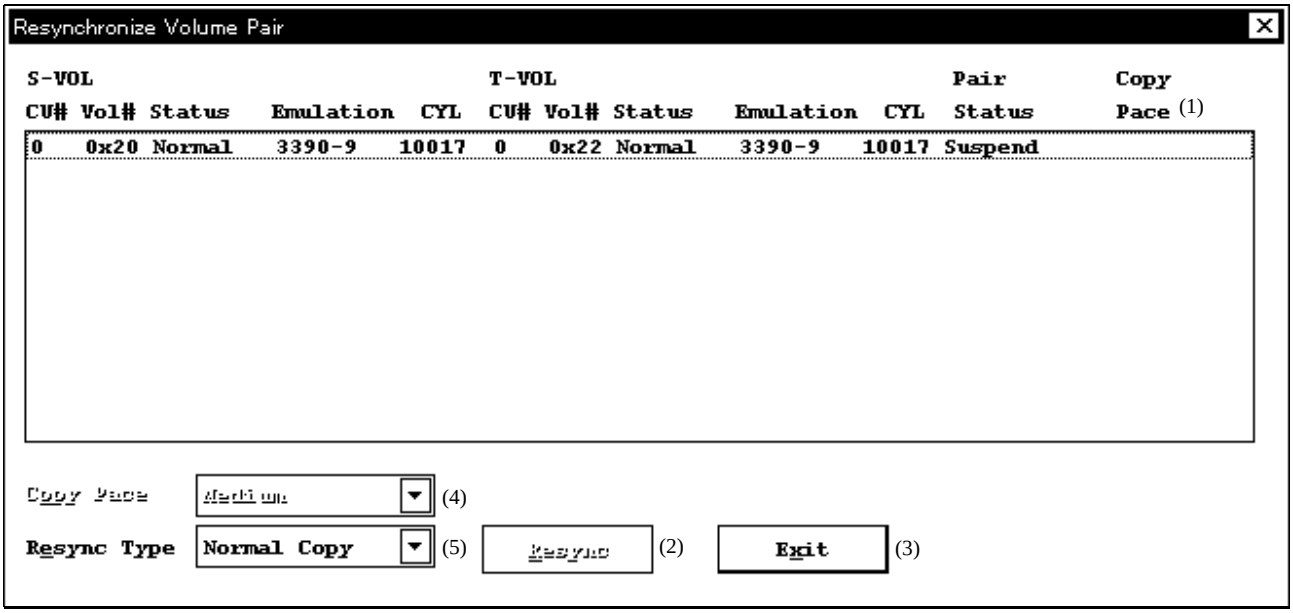
[8] Screen for specifying pair resynchronization



(1) : Volume pair information list box
- S-VOL CU# : Number of the CU to which the S-VOL belongs
- S-VOL Vol# : Number of the S-VOL
- S-VOL Status : Status of the S-VOL
- S-VOL Emulation : Emulation type of the S-VOL
- S-VOL CYL : Number of cylinders that contain the S-VOL
- T-VOL CU# : Number of the CU to which the T-VOL belongs
- T-VOL Vol# : Number of the T-VOL
- T-VOL Status : Status of the T-VOL
- T-VOL Emulation : Emulation type of the T-VOL
- T-VOL CYL : Number of cylinders that contain the T-VOL
- Pair Status : Status of the volume pair concerned
- Copy Pace : Copy pace of the volume pair.

(2) : Execute a resynchronization of the volume pair.

(3) : Stops a resynchronization of the volume pair.

(4) : Specifies a copy pace.

(5) : Resync Type
Specifies the resynchronization type used when the resynchronization is executed.
When executing the resynchronization, the resynchronization is applied to all the pairs.
- Normal Copy : Displays the Normal Resync
- Reverse Copy : Displays the Reverse Resync

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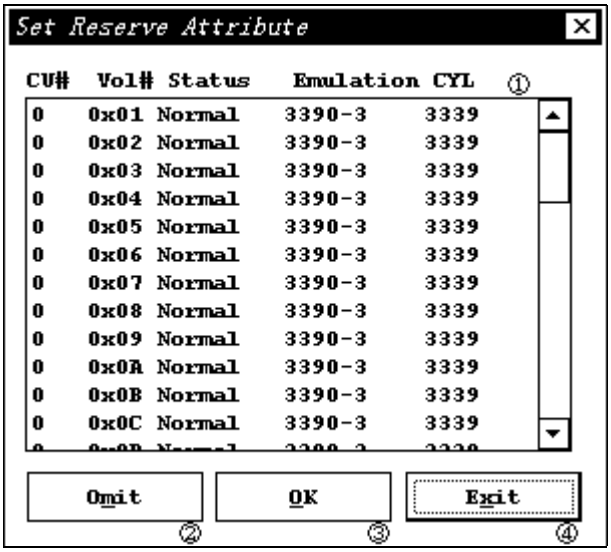
[9] Screen specifying volume attribute change



(1) : Volume information list box
- CU# : Number of the CU to which the volume belongs
- Vol# : Number of the volume
- Status : Status of the volume
- Emulation : Emulation type of the volume
- CYL : Number of cylinders that contain the volume

(2) : Removes the volume selected in step (1) from the ones whose attribute is to be changed.

(3) : Changes the attribute of the volume.

(4) : Stops changing the attribute of the volume.

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Message	Status
Reading configuration...	Update of configuration information
CU? Attribute Reading...	Reading of the attribute of all volumes belong to the CU?
Reading pair status...	Reading of the status of all volumes
Creating pair...	During pair making request
Deleting pair...	During pair deletion request
Suspending pair...	During pair suspend request
Splitting pair...	During pair split request
Resynchronizing pair...	During Pair Resynchronization request
Attribute Changing...	During volume attribute change request
Command Executing...	During maximum pair number extension request
Initializing pairs...	During pair forcing initialization request
Refreshing status...	Reading of the status of pairs volumes
Refreshing history...	Updating of condition transfer history
Sorting...	Sorting of condition transfer history

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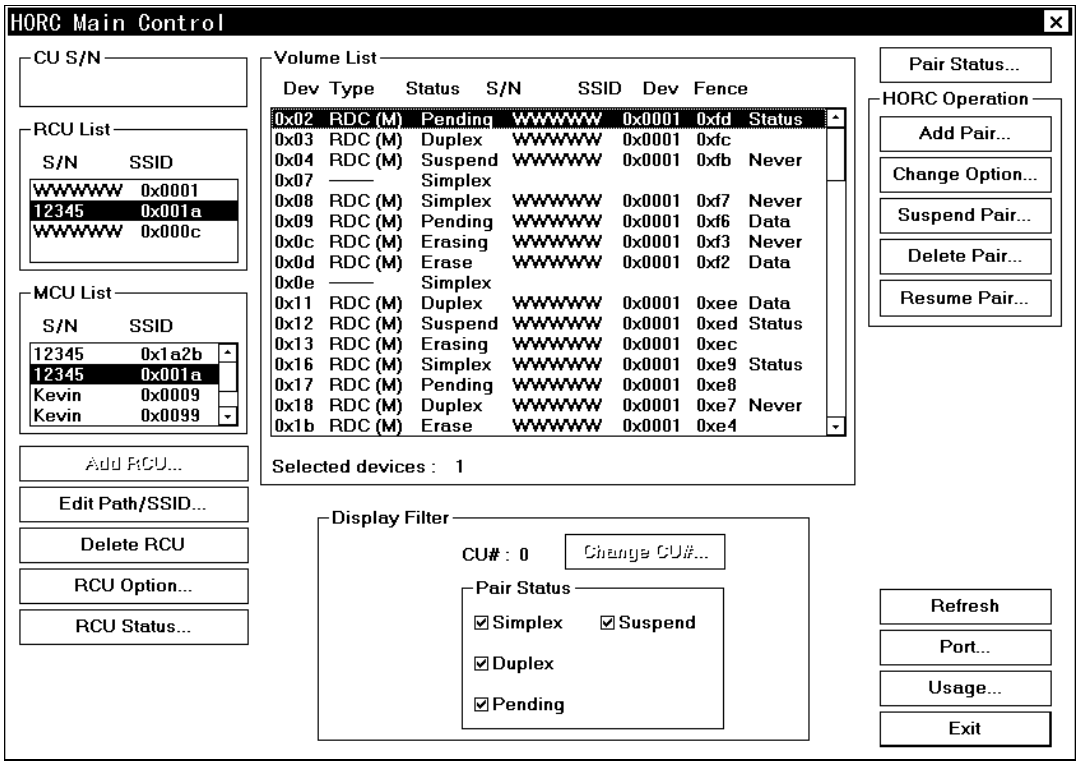
9 References for HORC Operation Screen (for LDEV)

If SVP Micro-program version is over “51-36-01”, refer to the “7 References for HORC Operation Screen (for OPEN VOL) (SVP07-10)”.

9.1 HORC Main screen



RCU List ..... This List Box displays Controllers as RCU(Remote disk Control Unit).
“XXXXX 0xXXXX”
Serial Number SSID

MCU List ..... This List Box displays Controllers as MCU(Main disk Control Unit).
(Only volume pairing is established.)
“XXXXX 0xXXXX”
Serial Number SSID

Volume List ..... This List Box displays valid LDEV(Logical Device) and the pair status.
“0xXX XXXX(X) XXXXXXX XXXXX 0xXXXX 0xXX X”
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① #LDEV..... LDEV address
② Copy Type ..... “RDC” : Remote Dual Copy(HORC)
“---” : SIMPLEX Volume
③ Copy Mode ..... “0” : Synchronous
“1” : Semi-Synchronous
“-” : SIMPLEX Volume

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④ Volume Type ..... "M" : Main Volume,
"R" : Remote Volume
" - " : SIMPLEX Volume

⑤ Pair status..... Volume pair status
"Simplex" : Simplex
"Duplex" : Duplex
"Pending" : Pending
"Suspend" : Suspend

⑥ Serial Number/SSID Serial Number and SSID of destination Controller.

⑦ #LDEV..... LDEV address on the destination Controller.

⑧ Fence Level..... LDEV Fence Level

Display Filter..... Display filter of the Volume List.
"Simplex" ~ "Suspend".... LDEVs that were selected by check box are displayed.

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Port Operation

Port.....Changes the port type between LCP and RCP.

When the MCU is connected to the RCU, the MCU side port type must be set to RCP.

Path Operation

Add RCU.....Establishes the path between the MCU and the RCU. When establishing the path, the MCU must register the object RCU first. This function registers the object RCU and establishes the path at a time. When the MCU registers the object RCU successfully, the RCU is added to the RCU list. (Up to 4 RCU units can be registered for one MCU.)

Edit Path/SSID ...Adds/reduces the number of paths or SSIDs to an RCU selected from the RCU list within a range of 1 to 4.

Delete RCU .....Deletes an RCU selected from the RCU list and the path(s) to the RCU at a time. Before executing this function, all the units paired with the RCU must be set to simplex status.

RCU Option .....Changes the option for connection to an RCU selected from the RCU list. The connection option can also be specified when the RCU is registered, but this function is used to change the option during operation.

RCU Status.....Displays the status of an RCU selected from the RCU list. This function can also display the status of each path to the RCU.

Pair Operation

Pair Status .....Displays the status of a volume selected from the volume list. This function is disabled if two or more volumes are selected from the volume list.

Add Pair .....Creates the HORC pair(s) by making the simplex volume(s) selected from the volume list become the M-VOL(s). Before executing this function, the CU that includes the R-VOL(s) must be registered as the RCU(s). This function is disabled if the volume(s) selected include(s) the volume(s) in the status other than simplex.

Change Option ...Changes the pair option of the volume(s) (not in the simplex status) selected from the volume list. The pair option can also be specified when the pair is created, but this function is used to change the option during the operation. This function is disabled if any volume(s) selected include(s) the simplex volume(s).

Suspend Pair.....Suspends the pair(s) of the volume(s) (not in the simplex status) selected from the volume list. This function is disabled if any volume(s) selected include(s) the simplex volume(s).

Delete Pair.....Deletes the pair of the volume(s) (not in the simplex status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a simplex volume(s).

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Resume Pair .....Resume the pair of the volume(s) (in the suspend status) selected from the volume list. This function is disabled if the volume(s) selected include(s) a simplex volume(s).

Other Functions

Usage.....Displays HORC operation control information.

Refresh. .....Updates information displayed on the screen. Information displayed on the screen is kept as is until this function is executed.

Exit.....Exits the operation screen.

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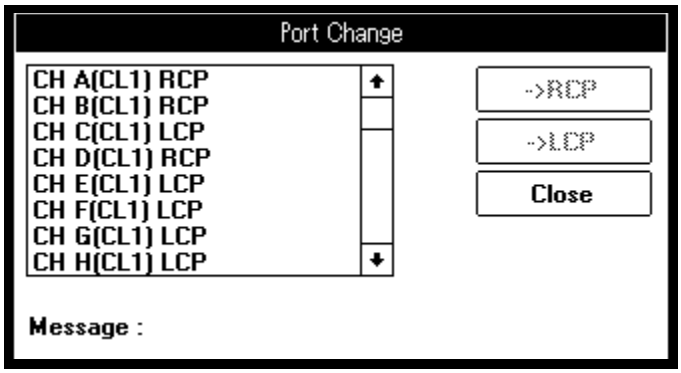
9.2 Port...screen



List ..... Displays the list of usable serial channels.

CH X[CL Y] XXX
① ② ③

① Channel ID (A to R)

② Cluster ID (1 or 2)

③ Channel type (LCP or RCP)

-> RCP ..... Changes the channel type selected from the list to the RCP.

-> LCP..... Changes the channel type selected from the list to the LCP.

Message..... Displays the progress of each changing process when the Changing function is started.
Checking port# CH X[CL Y] ...
Blocking port# CH X[CL Y] ...
Setting port# CH X[CL Y] ...
Restoring port# CH X[CL Y] ...

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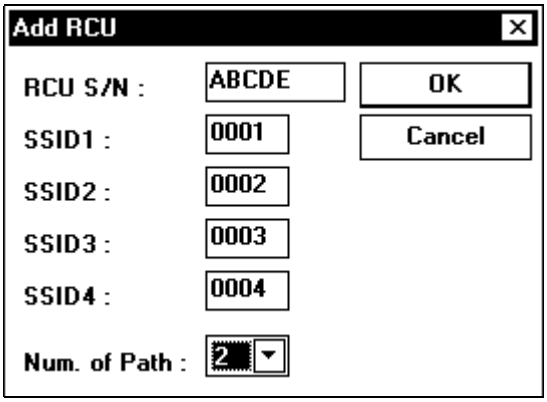
9.3 Add RCU... screen

• Specify RCU parameter.



RCU S/N.....Input the Serial number of RCU.
"XXXXX" .....5 characters.

SSID1 ~ 4.....Input the SSID of RCU. (Note)
"XXXX" .....4 hexadecimal digits number.

Num. Of Path .....Specifies the number of path between MCU & RCU.(1 ~ 4)

Option... .....Specified RCU option item. (Refer to RCU Option...)

Note: How to Set Up HORC of DKC310I.

1. Setting SSIDs
   DKC310I can have different SSIDs for each 64 boundary of LDEV#.

   It is possible for DKC310I to have independent SSIDs for each 64 boundary of LDEV#.

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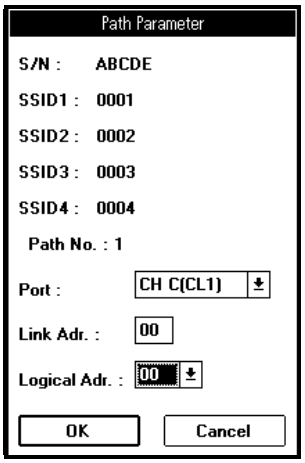
• Specify PATH parameter.
Input the RCU parameter, then input the path parameter for each specified path.



Port.....Specified port using as RCP in the Combo Box.

Link Adr. .....Input the destination link address.
"XX" ..... 2 characters of hexadecimal number. ("00" through "fd")
If RCU is connected to MCU directly without ESCD, specified "00" at the [Link Adr.].
If RCU is connected to MCU with ESCD, specified destination link address at the [Link Adr.].

Logical Adr. .....Specified logical address of the destination DKC.
Please select only 00 as a logical address.

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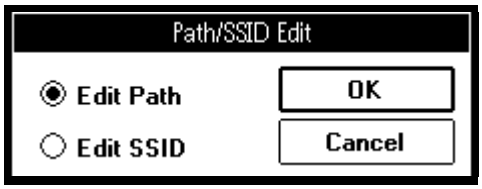
9.4 Edit Path/SSID

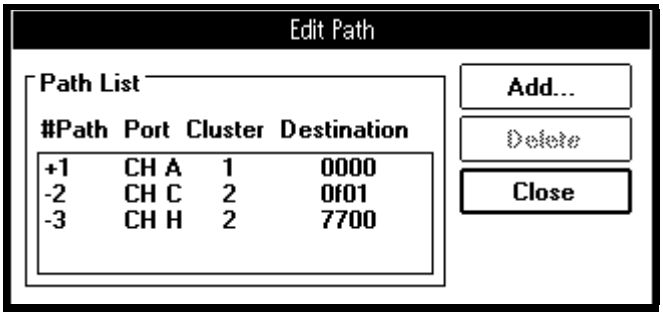
9.4.1 Path/SSID Edit... screen



Edit Path... Adding/reducing the number of paths.

Edit SSID . Adding/reducing the number of SSIDs.

9.4.2 Edit Path... screen



Path List ... Display current path's information.

"X CH X X XXXX"
① ② ③ ④

① #Path.....Status(+:Normal -:Abnormal) and Path No.(1 ~ 4)
② #Port .....Port of path creating.(CH A ~ CH R)
③ #Cluster .....Cluster. (1 ~ 2)
④ Destination.....Link address (2 hexadecimal numbers) + Logical address (2 hexadecimal numbers)

Add..... Adding new path.(Refer to Add.. RCU-Specified Path Parameter)

Delete ..... Deleting the path selected in the Path List.

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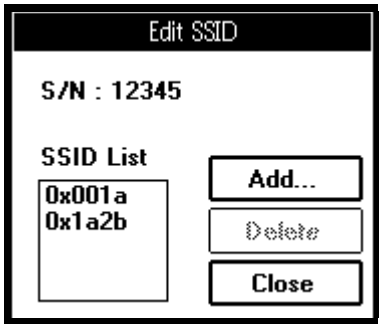
9.4.3 Edit SSID... screen

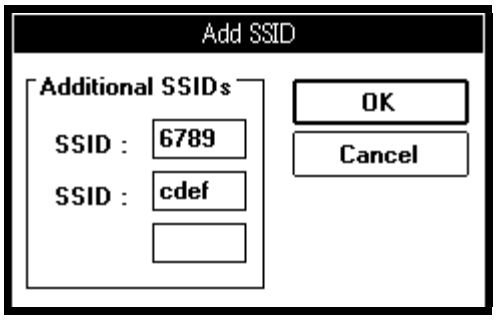


SSID List.. Display current SSIDs information.

Add..... Adding new SSIDs.

Delete ..... Deleting the SSIDs selected in the SSID List.

9.4.4 Add SSID... screen



Additional SSIDs ..... To add the SSIDs, input 4 hexadecimal digits numbers.

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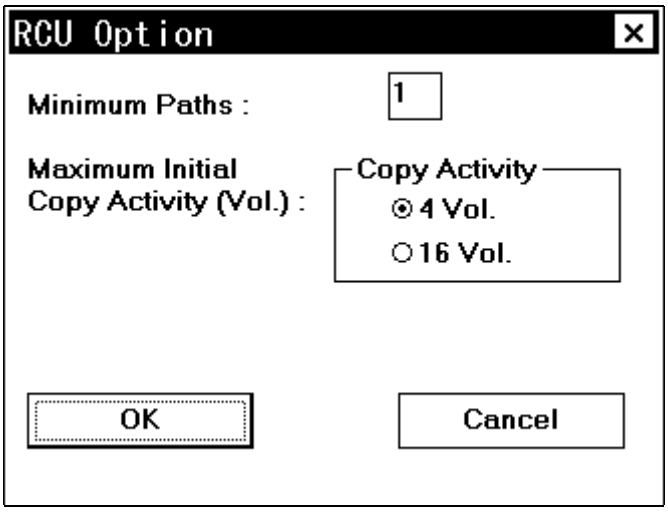
9.5 RCU Option... screen



Minimum Paths.....Specifies lowest number of paths needed for continuation of HORC. Defined between 1 to 4.

Maximum Initial .....Specifies maximum number of Initial copy execution. (First group of defined HORC volume pairs.) Defined 4 or 16.

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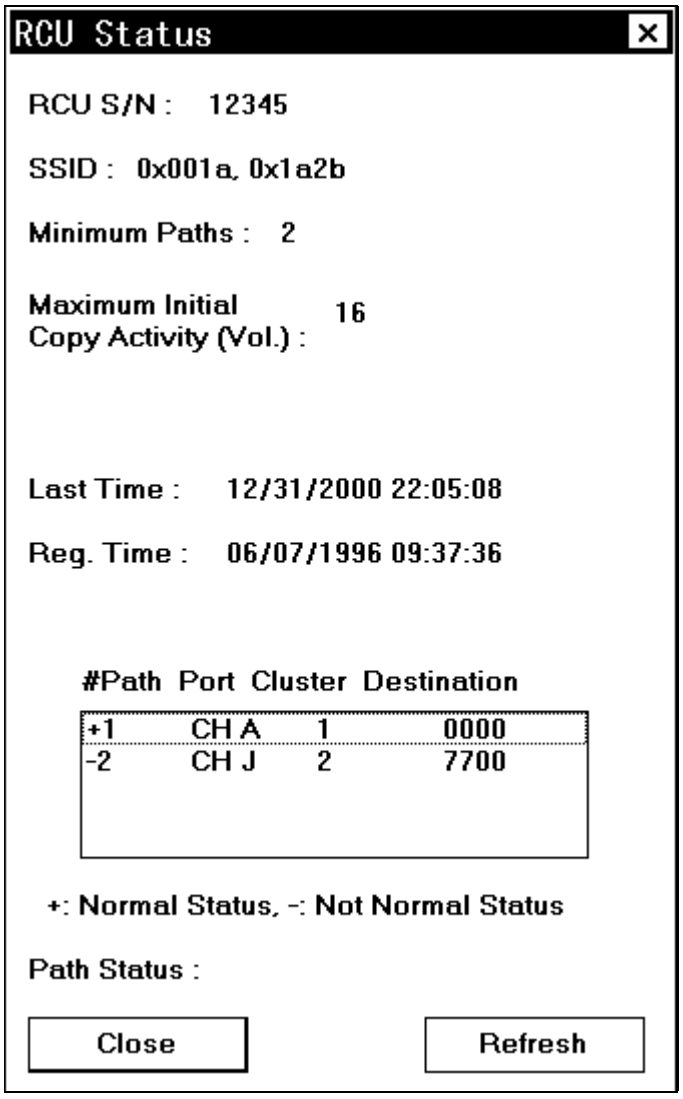
9.6 RCU Status... screen



RCU s#.....Display Serial number of the RCU.
"XXXXX" .....5 decimal digits.

SSID.....Display SSID of the RCU.
"XXXX" .....4 hexadecimal digits.

Minimum Paths.....Display lowest number of paths necessity for continuation of HORC.

Maximum Initial .....Display maximum number of Initial copy execution.

Last Time .....Display last update time & date of the RCU.

Reg. Time.....Display registration time & date of the RCU.

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Path Status.....Display status of path that selected in list.
If it isn't "Normal", do the recovery action according to TRBL06-190 "Recovery Action of Path Status Error".
"Nothing".....No established.
"Normal" .....The status of path is normal.
"Initialization Failed" .....Error has occurred in the path initialization.
"Communication Time Out" Communication between MCU and RCU time out.
"Resource Shortage(MCU)" Resource at the MCU is short.
"Resource Shortage(RCU)" Resource at the RCU is short.
"Serial Number Mismatch" Specified serial number is mismatch.
"Invalid Port".....Specified port is invalid.

Refresh.....Refresh displayed information.

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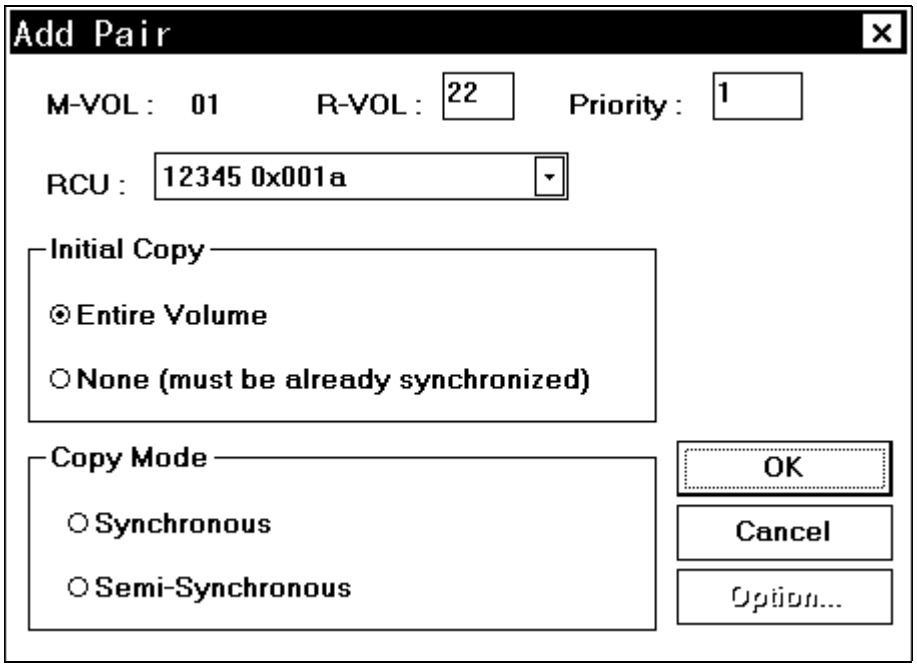
9.7 Add Pair... screen



M-VOL .....Display volume(LDEV) that is MCU side.

R-VOL .....Specifies volume(LDEV) that is RCU side.
"XX" ..... 2 hexadecimal digits.

Priority .....Specifies priority of initial copy execution.

RCU .....Select RCU from the Combo Box.
The list of RCUs currently registered will appear.

Initial Copy .....Specifies initial copy type. (Valid only for the remote dual copy function.)
"Entire Volume" .....Specifies all cylinders.
"None" .....Nothing

Option... .....Specifies pair option item. (Refer to Pair Option...)

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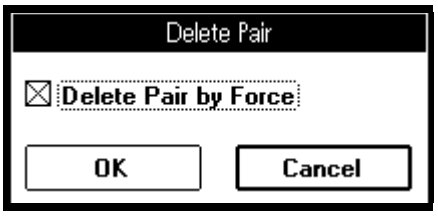
9.8 Delete Pair... screen



Delete Pair by Force.... Specified forcibly delete mode.
The pair status is deleted even when the communication with the CU is disabled.

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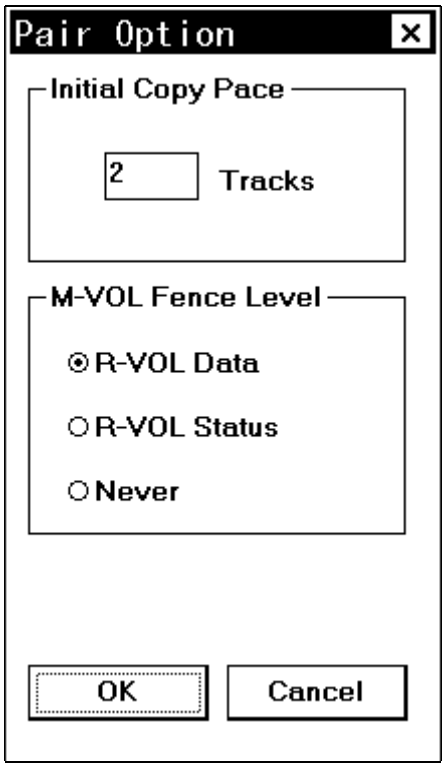
9.9 Pair Option... screen



Initial Copy Pace..... Specifies Initial copy pace. (Remote Dual Copy)(HORC option)
"NN"..... Decimal number within a range of 1 to 15.

M-VOL Fence Level..... M-VOL fence level(HORC option)
"R-VOL Data"..... M-VOL fence when data is unmatched
"R-VOL Status" ..... M-VOL fence when status can not be changed.
"Never"..... Never fence

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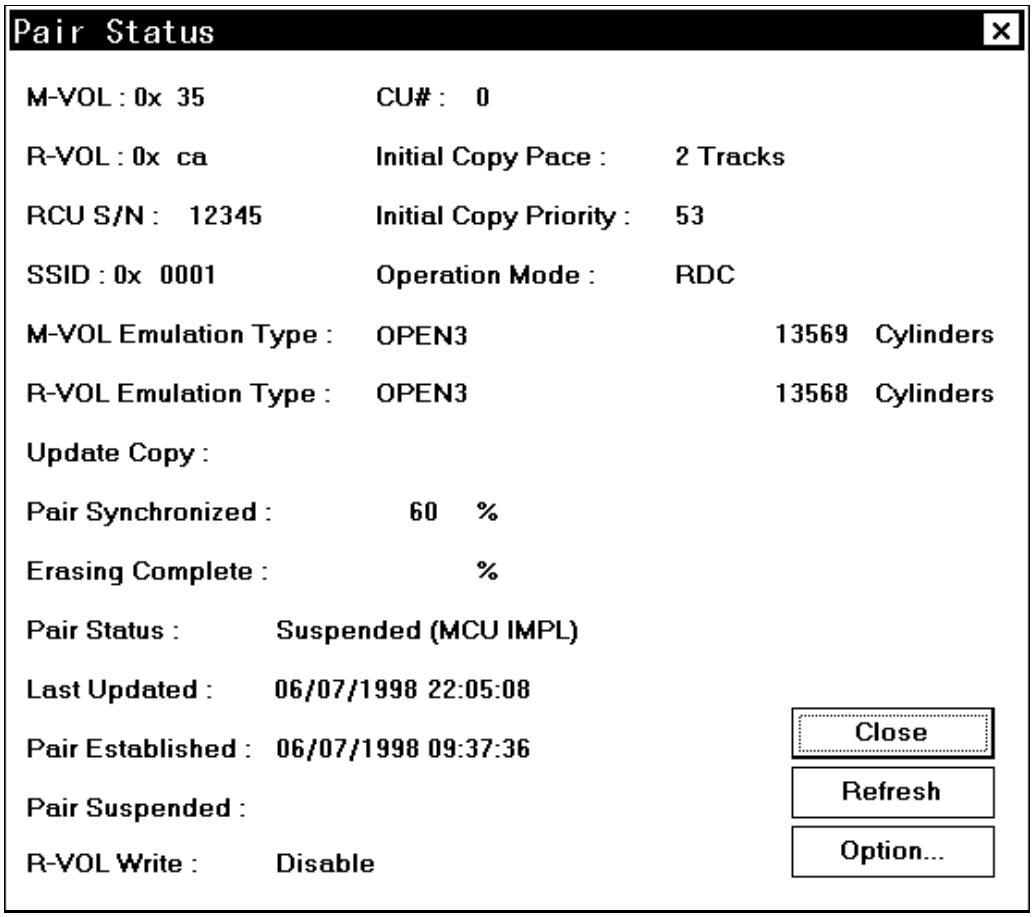
9.10 Pair Status... screen



M-VOL .....Displays volume(LDEV) (MCU side).

R-VOL .....Displays volume(LDEV) (RCU side).

RCU S/N.....Displays serial number of the RCU.

SSID.....Displays SSID of the RCU.

CU#.....Displays current CU number.

Initial Copy Pace.....Displays Initial copy pace. (Remote Dual Copy)
"NN" ..... Decimal number within a range of 1 to 15.

Initial Copy Priority .....Displays priority of initial copy execution.

Operation Mode .....Displays pair creative mode.
"RDC" ..... Remote Dual Copy(HORC)

M-VOL Emulation Type.....Displays M-VOL device emulation type and number of cylinders.

R-VOL Emulation Type.....Displays R-VOL device emulation type and number of cylinders.

Pair Synchronized .....Displays progress of initial copy(Remote Dual Copy).

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Pair Status	Displays pair status information. “Simplex" “Duplex Pending” “Duplex” “Suspended(M-VOL by Operator)” “Suspended(R-VOL by Operator)” “Suspended(by MCU)” “Suspended(by RCU)” “Suspended(Delete pair to RCU)” “Suspended(R-VOL failure)” “Suspended(MCU IMPL)” “Suspended(Initial Copy Failed)”
Last Updated	Displays last update time of pair status.
Pair Established	Displays registration time the volume pair.
Pair Suspended	Displays suspension time of the volume pair.
R-VOL write	Display whether to enable R-VOL to read/write.
Option...	Displays pair option item. (Same to Pair Option...)
Refresh	Refresh displayed information.

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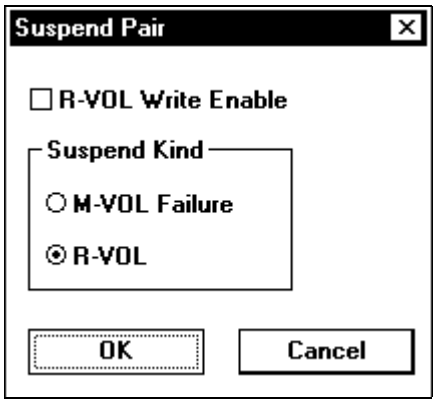
9.11 Suspend Pair... screen



R-VOL Write Enable .. Specifies whether to enable R-VOL read/write.
If you want to use this parameter, select “R-VOL” in Suspend Kind parameter.

Suspend Kind..... Specifies suspended type.
“M-VOL Failure”..... M-VOL suspension reported as M-VOL failure.,
“R-VOL”..... R-VOL suspension

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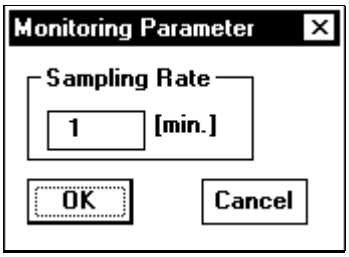
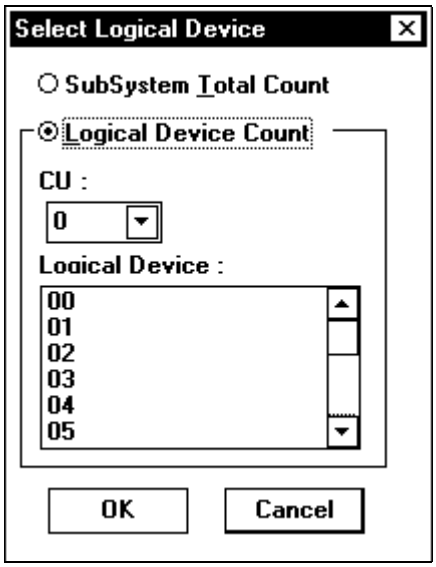
9.12 Usage... screen

Monitoring Parameter



Sampling Rate.... Sets the sampling rate of operation control information within a range of 1 to 546 in steps of a minute.

Select Logical Device



Logical Device: .. Displays the list of logical devices valid in the subsystem. Select the device from the list to display its operation information. To display the operation information of the whole subsystem, select "Sub System".

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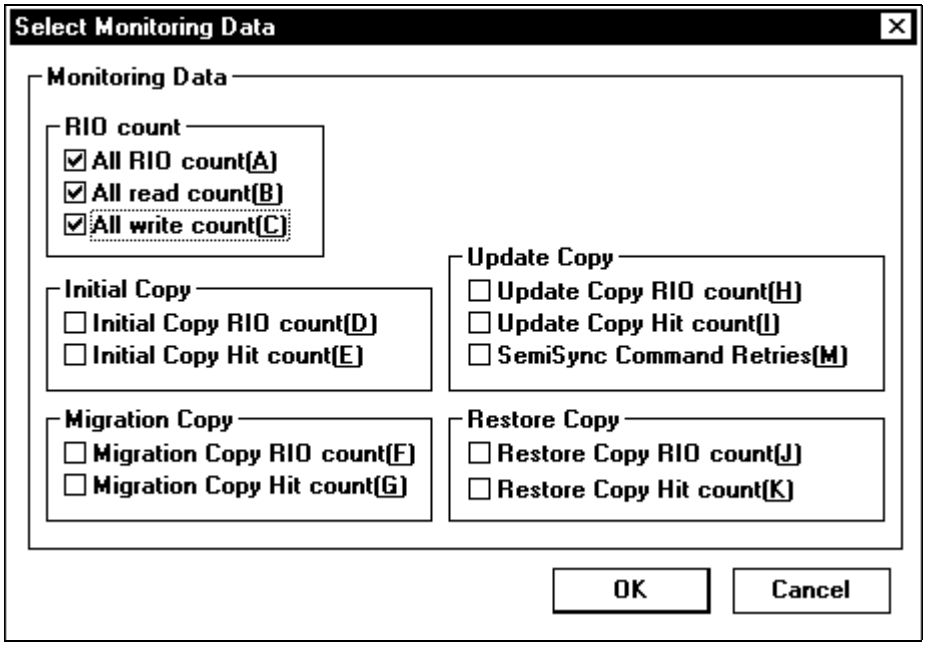
Select Monitoring Data
(1) Subsystem



RIO count.....Specifies the read/write count concerning the Remote Copy.

Initial Copy .....I/O count for the initial copy

Migration Copy..I/O count for migration copy

Update Copy .....I/O count for renewal copy

Restore Copy.....I/O count for recovering copy

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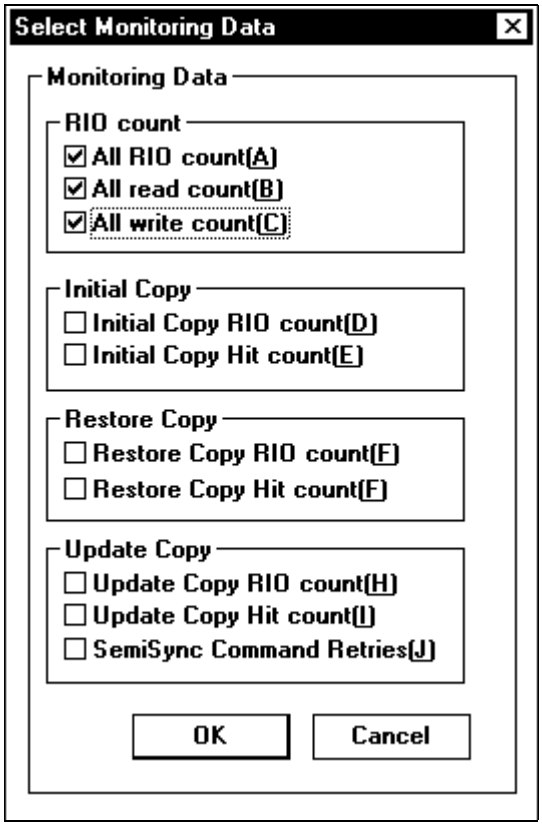
(2) Logical Device for HORC



RIO count.....Specifies the read/write count concerning the Remote Copy.

Initial Copy .....I/O count for the initial copy

Update Copy .....I/O count for renewal copy

Restore Copy.....I/O count for recovering copy

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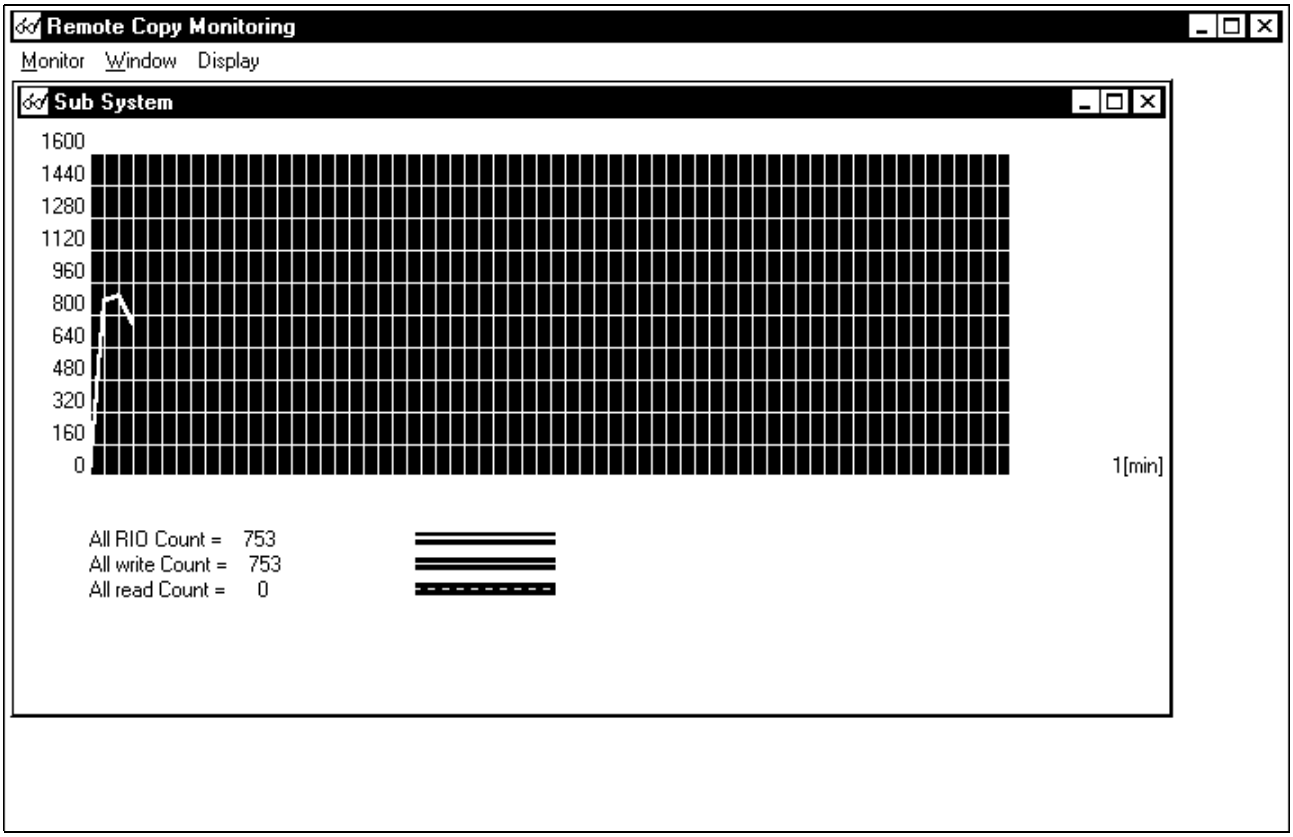
Remote Copy Monitoring Screen



Monitor Menu .... Start.....Displays another Remote Copy Monitoring screen.
EXit.....Closes the Remote Copy Monitoring screen.

Window Menu ... Cascade (C)....Displays Remote Copy Monitoring windows side by side.
Tile (T).....Displays lined-up Remote Copy Monitoring windows.
Icon (I) .....Lines up Remote Copy Monitoring window icons.
All close (A) ..Closes all the Remote Copy Monitoring windows.

Display Menu..... Line Model ....Displays or hides the explanation of lines.

Vertical Axis ..... Indicates the count number.

Horizontal axis... Indicates the time elapsed. A scale division on the horizontal axis indicates a sampling rate. The latest data is drawn to the right.

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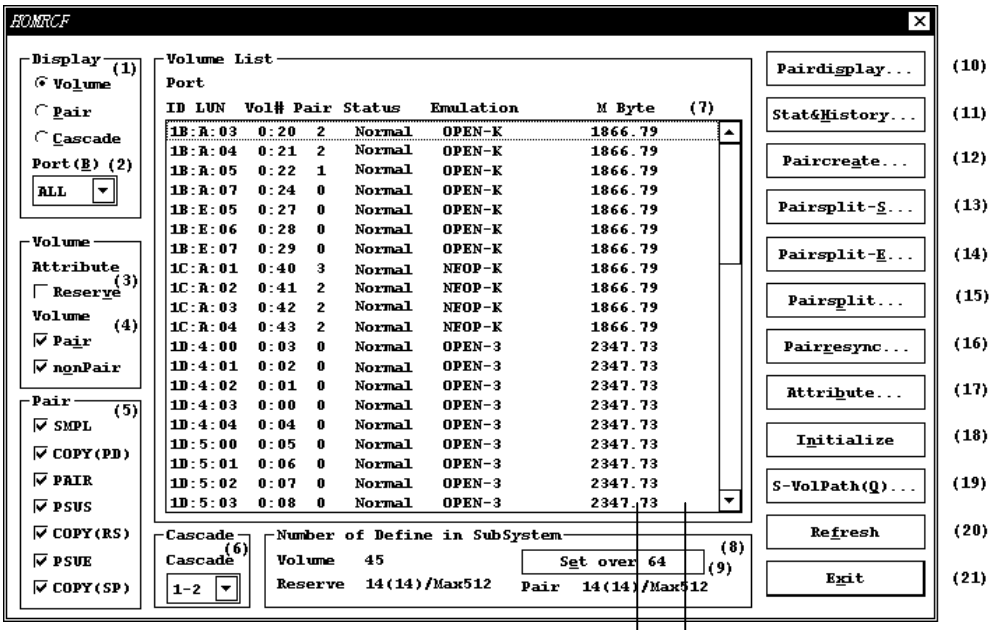
10 Details of the HOMRCF Operation Screen

10.1 Operation of HOMRCF

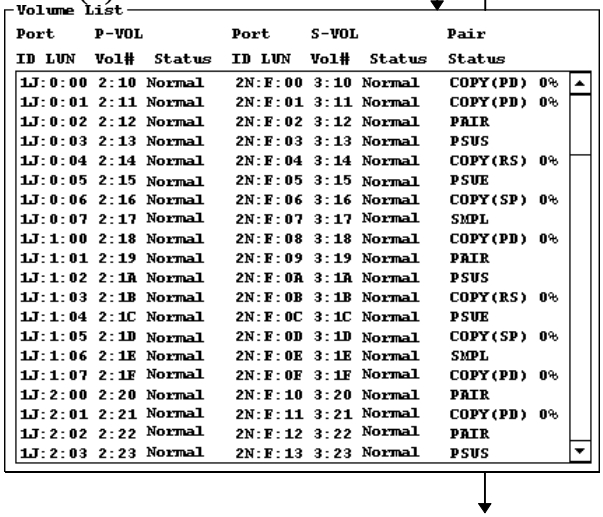
■ HOMRCF Main screen

HOMRCF has two modes of the volume display and the pair display and the cascade display. The volume display mode displays information for each of the volumes on the list. The pair display mode shows the list about pair's information that is making currently. The cascade display mode, it displays matching information in the form of cascade.

<The volume display>
Select [Volume] radio button on the (1)



<The pair display>
Select [Pair] radio button on the (1).



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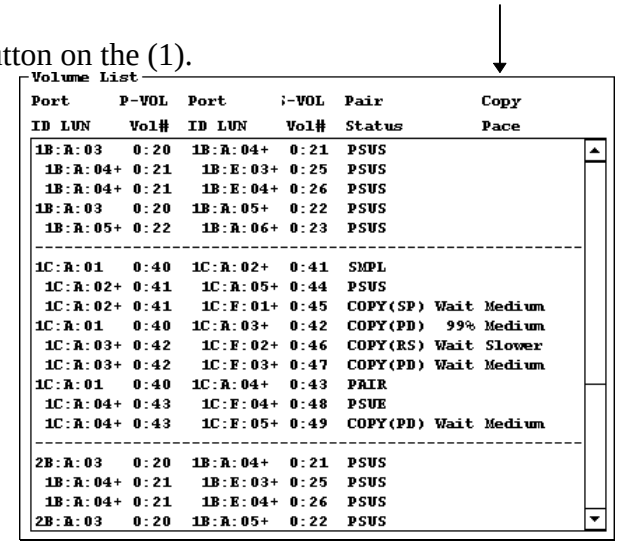
<The cascade display>
Select [Cascade] radio button on the (1).



(1) : Display
Specifies the classification to display.
Volume : Displays Volume
Pair : Displays Pair
Cascade : Displays Cascade

(2) : Specifies the Port number (Cluster and Channel number) to which volumes to be displayed belong.
When specifying 'ALL', it specifies all port.
When selecting Pair display in step (1), it specifies Port of P-VOL (Source Volume).
When selecting Cascade display in step (1), it specifies Port of Root Volume.

(3) : Display Filter Attribute
This specification is valid when [Volume] is selected in step (1).
Reserved volumes mean that they are reserved as target volumes when adding pairs are executed.
When the check box is checked, volumes with *Reserve* attribute are displayed.
When the check box is not checked, volumes with attributes other than *Reserve* are displayed.

(4) : Display Filter Volume
This specification is valid when [Volume] is selected in step (1).
Pair : Volumes with paired are Display
non Pair : Volumes with not paired are Display

(5) : Pair Filter
This specification is valid when [Pair] is selected in step (1).
SMPL : Pair with SMPL are Display
COPY(PD) : Pair with COPY(PD) are Display
PAIR : Pair with PAIR are Display
PSUS : Pair with PSUS are Display
COPY(RS) : Pair with Resynchronization or Reverse-Resynchronization are Display
PSUE : Pair with PSUE are Display
COPY(SP) : Pair with COPY(SP) are Display

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(6) : Cascade

This specification is valid when [Cascade] is selected in step (1).

1 : It displays only L1-Pair.

1-2 : It displays L1-Pair and L2-Pair.

(7) : Volume List box

When [Volume] is selected in step (1).

Port : Number of Port number (Cluster and Channel number) of the volume concerned

ID : Number of Target(SCSI) ID of the volume concerned

LUN : Number of LUN of the volume concerned

Vol# : Number of the volume concerned

Pair : Number of pairs of the volume concerned

Status : Status of the volume concerned

Emulation : Emulation type of the volume concerned

M Byte : Size of the volume concerned

When [Pair] is selected in step (1).

P-VOL Port : Port number (Cluster and Channel number) to which the P-VOL belongs

P-VOL ID : Target(SCSI) ID to which the P-VOL belongs

P-VOL LUN : LUN number to which the P-VOL belongs

P-VOL Vol# : Number of CU:Volume of P-VOL

P-VOL Status : Status of P-VOL

S-VOL Port : Port number (Cluster and Channel number) to which the S-VOL (Target Volume) belongs

S-VOL ID : Target(SCSI) ID to which the S-VOL belongs

S-VOL LUN : LUN number to which the S-VOL belongs

S-VOL Vol# : Number of CU:Volume of S-VOL

S-VOL Status : Status of S-VOL

Pairdisplay : Status of the volume pair concerned

When [+] is displayed after LUN, it shows that SCSI pass is defined in addition to being displayed too.

When [Cascade] is selected in step (1).

P-VOL Port : Port number (Cluster and Channel number) to which the P-VOL belongs

P-VOL ID : Target(SCSI) ID to which the P-VOL belongs

P-VOL LUN : LUN number to which the P-VOL belongs

P-VOL Vol# : Number of CU:Volume of P-VOL

S-VOL Port : Port number (Cluster and Channel number) to which the S-VOL (Target Volume) belongs

S-VOL ID : Target(SCSI) ID to which the S-VOL belongs

S-VOL LUN : LUN number to which the S-VOL belongs

S-VOL Vol# : Number of CU:Volume of S-VOL

Pairdisplay : Status of the volume pair concerned

Copy Status : Pace of the copy

When [+] is displayed after LUN, it shows that SCSI pass is defined in addition to being displayed too.

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(8) : Number of Define Subsystem
Displays information concerning the volumes.

Volume	: Number of volumes defined in the whole subsystem A summation with the number of reserved logical volumes which is defined at both of HMRCF/HOMRCF is shown in the brackets.
Reserve	: Number of reserves defined in the whole subsystem
Pair	: Number of volume pairs defined in the whole subsystem A summation with the number of pair of logical volumes which is defined at both of HMRCF/HOMRCF is shown in the brackets. Pair can be created to the extent that the value in the brackets is maximum value displayed on the right side.

(9) : Set Over 64
It extends the number of the maximum pairs to 512.
(Including HOMRCF/HMRCF/HIHSM pairs)

(10) : Pairdisplay ...
Displays a name of the screen for displaying the statuses of the volumes selected in step (7).

(11) : Stat & History ...
Displays a name of the screen for displaying the statuses of the all pair and pair history.

(12) : Paircreate ...
Displays a name of the screen for specifying the pairing of the volume selected in step (7).

(13) : Pairsplit-S ...
Displays a name of the screen for specifying the parting of the volume pair selected in step (7).

(14) : Pairsplit-E ...
Displays a name of the screen for specifying the suspension of the volume selected in step (7).

(15) : Pairsplit ...
Displays a name of the screen for specifying the splitting of the volume pair selected in step (7).

(16) : Pairresync ...
Displays a name of the screen for specifying the resynchronization of the volume pair selected in step (7).

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(17) : Attribute ...
Displays a name of the screen for specifying the attribute change of the volumes selected in step (7).

(18) : Initialize
It initializes all pairs. (HMRCF/HOMRCF/HIHSM pairs)

(19) : S-VOL Path ...
It displays the screen which refers to the SCSI pass which was defined by S-VOL of Pair which was chosen in (7).

(20) : Refresh
Updates the displayed information to the latest one.

(21) : Exit
Quits the HOMRCF screen.

If you choose the pair display or cascade display in step(1), you can choose the pairs of the status which are shown in the following Table 10-1.

Table 10-1 Enable buttons

Pairdisplay / Button	SMPL	COPY(PD)	PAIR	COPY(SP)	PSUS	COPY(RS)	COPY(RS-R)	PSUE
Pairsplit-E	x	OK	OK	OK	OK	OK	OK	x
Pairresync	x	x	x	x	OK	x	x	OK
Pairsplit-S	x	OK	OK	OK	OK	OK	OK	OK
Pairsplit	x	OK	OK	x	x	x	x	x

OK: Select the button x: Could not select the button

When you select several pairs by (1), buttons which your selected pairs can be operated will be available to be selected.
When select [cascade] in (1), the pair gets for the choice of the [Paircreate] button only when it is possible to add to be possible.

In the following Table 10-1-2, items of Volume Status in the (6) Volume List box are shown.

Table 10-1-2 Volume Status in the Volume List box

Item	Volume Status
Normal	The Volume is normal.
Blocked	The Volume is blocked.
Format	The Volume is formatting now.
Correct	The Volume is under correction access by HDD error.
Copying	The Volume is under correction copy by recovering HDD error.
Unknown	Status of the volume is unknown.

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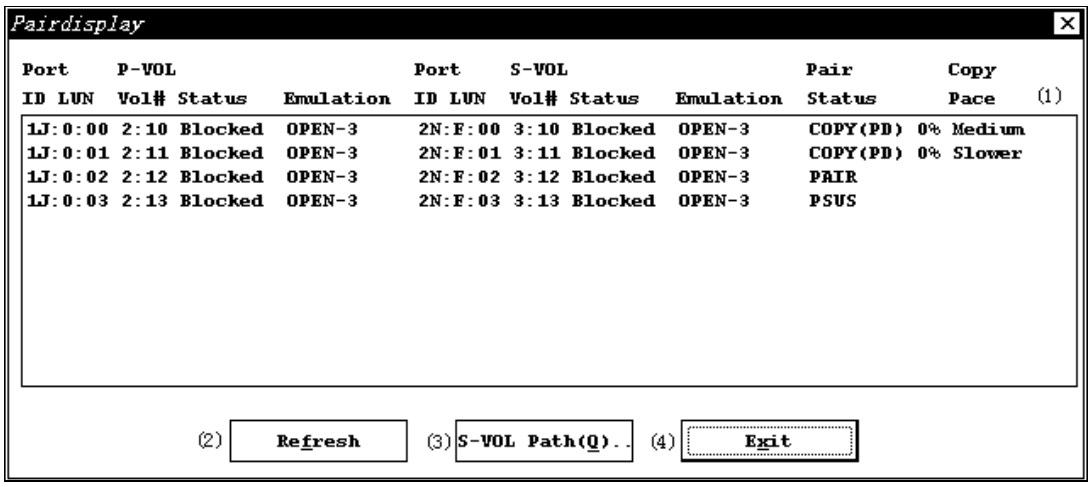
■ Pairdisplay Display Screen



(1) : Status information list box

P-VOL Port	:	Port number (Cluster and Channel number) to which the P-VOL belongs
P-VOL ID	:	Target(SCSI) ID to which the P-VOL belongs
P-VOL LUN	:	LUN number to which the P-VOL belongs
P-VOL Vol#	:	Volume number of the P-VOL
P-VOL Status	:	Status of the P-VOL
P-VOL Emulation	:	Emulation type of the P-VOL
S-VOL Port	:	Port number (Cluster and Channel number) to which the S-VOL belongs
S-VOL ID	:	Target(SCSI) ID to which the S-VOL belongs
S-VOL LUN	:	LUN number to which the S-VOL belongs
S-VOL Vol#	:	Volume number of the S-VOL
S-VOL Status	:	Status of the S-VOL
S-VOL Emulation	:	Emulation type of the S-VOL
Pairdisplay	:	Status of the volume pair concerned
Copy Pace	:	Mode of copy pace.

(2) : Refresh
Updates the displayed information to the latest one.

(3) : S-VOL Path ...
It displays the screen which refers to the SCSI pass which was defined by S-VOL.

(4) : Exit
Closes the screen.

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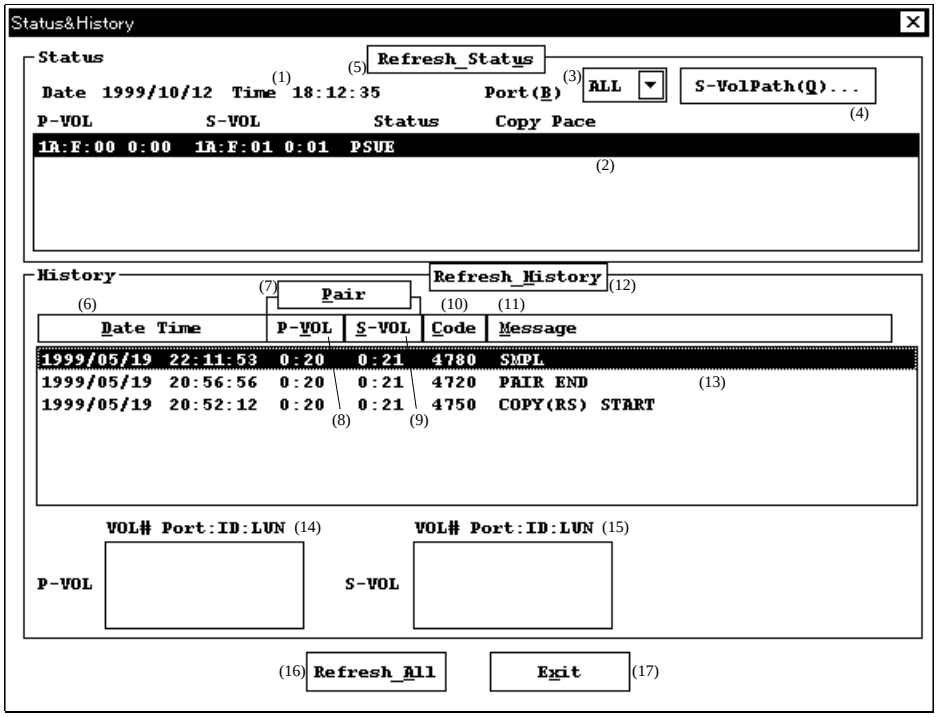
■ Status & History Screen



(1) : Date, Time
It displays the time when the Pairdisplay was acquired.

(2) : The present Pairdisplay at the (1) display list box
- P-VOL : The Port number (Cluster and Channel number), Target (SCSI) ID, LUN, the CU number:Volume number of P-VOL is shown.
- S-VOL : The Port number (Cluster and Channel number), Target (SCSI) ID, LUN, the CU number:Volume number of S-VOL is shown.
- Status : The present pairs of volume concerned.
- Copy Pace : Copy pace against the target pair.

(3) : Port (B)
It specifies Port number (Cluster and Channel number) of P-VOL of Pair to display.

(4) : S-VOL Path ...
It displays the screen which refers to the Port number (Cluster and Channel number), Target (SCSI) ID, LUN which was defined by S-VOL of chosen Pair.

(5) : Refresh_Status
Updates the displayed information to the latest one in the Pairdisplay list.

(6) : Date Time
It sorts with the key with Date/Time.

(7) : Pair
It sorts with the key with Pair.

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(8) : P-VOL
It sorts with the key with P-VOL.

(9) : S-VOL
It sorts with the key with S-VOL.

(10) : Code
It sorts with the key with Code. Codes and messages are shown as Table 10-2 List of Reference Codes and Messages.

(11) : Message
It sorts with the key with kind of Message.

(12) : Refresh_History
Updates the displayed information to the latest one in the History list.

(13) : History of the condition transfer of the pairs display list box.

Date Time	: The time which history SIM occurred to.
P-VOL	: CU number of P-VOL (Left) Number of the Volume (Right)
S-VOL	: CU number of S-VOL (Left) Number of the Volume (Right)
Code	: Reference Code.
Message	: The message which corresponded to Reference Code.

The following table is described about these Reference Codes and messages.

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Table 10-2 List of Reference Codes and Messages

Reference Code	Message	contents
4710 - 4713	PAIR START	Starting data copy by this pair.
4720 - 4723	PAIR END	End PAIR
4730 - 4733	PSUS START	Start PSUS
4740 - 4743	PSUS END	End PSUS
4750 - 4753	COPY(RS) START	Pair resynchonization was started
	COPY(RS-R) START	Pair reverse resynchonization was started
4760 - 4763	COPY(RS) END	Pair resynchonization was completed
	COPY(RS-R) END	Pair reverse resynchonization was completed
4780 - 4783	SMPL	End deleting the Pair
4790 - 4793	PSUE	Suspended the pair
4798	ALL COPY(SP) PSUE BY SM VOLATILE	PSUE all COPY(SP) Pairs by SM volatile.
47A0 - 47A3	COPY WARNING END	End copy warning. *1
47B0 - 47B3	COPY ABNORMAL END (SVOL BLOCKADE)	End copy abnormally (by blocking P-VOL). *1
47C0 - 47C3	COPY ABNORMAL END (TVOL BLOCKADE)	End copy abnormally (by blocking S-VOL). *1
47D0 - 47D3	COPY ABNORMAL END	End copy abnormally (by the other reason). *1
47E9	HOMRCF SM INITIALIZATION START	Start initializing a extensible table of HMRCF/HOMRCF
47EA	HOMRCF SM INITIALIZATION END	End initializing a extensible table of HMRCF/HOMRCF
47EB	HOMRCF SM INITIALIZATION FAILED	Failed initializing a extensible table of HMRCF/HOMRCF
FFFF	Reference Code unknown	Unknown reference code.

(14) : It displays the CU number, the volume number and the Port number (Cluster and Channel number), Target (SCSI) ID, LUN of chosen P-VOL.

(15) : It displays the CU number, the volume number and the Port number (Cluster and Channel number), Target (SCSI) ID, LUN of chosen S-VOL.

(16) : Refresh_All
Updates the displayed information to the latest one in both Pairdisplay list and History list.

(17) : Exit
Quits the Screen

*1 : When these messages occurs, please retry the same copies or operations against the volume. Even though the same messages are occurred again, please call your technical support center.

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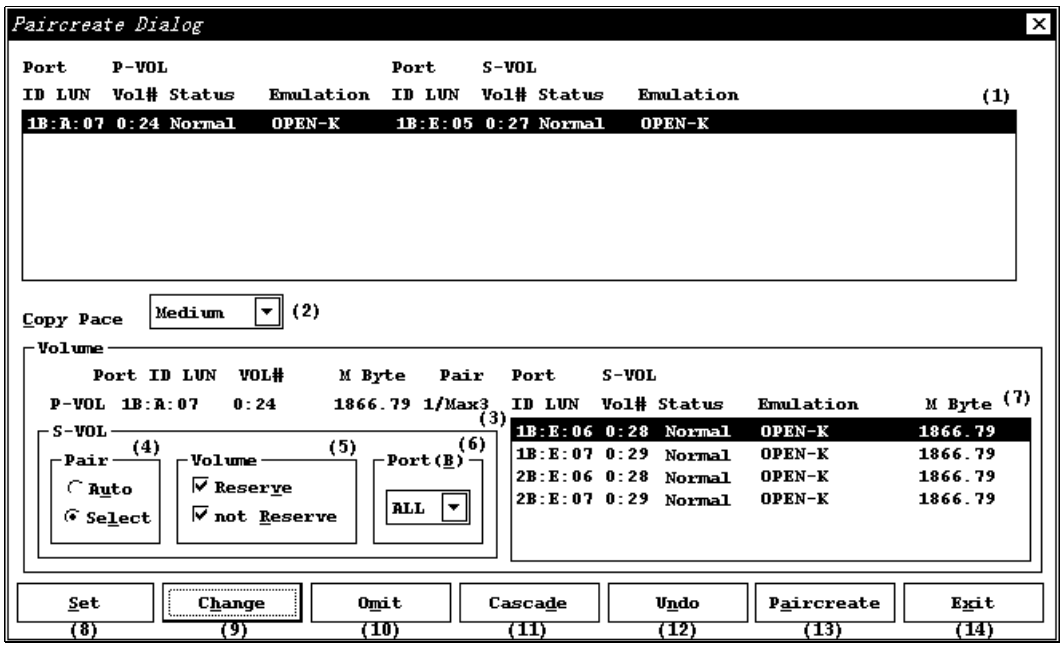
■ Paircreate Dialog Screen



(1) : Volume information list box

P-VOL Port	:	Port number (Cluster and Channel number) to which the P-VOL belongs
P-VOL ID	:	Target(SCSI) ID to which the P-VOL belongs
P-VOL LUN	:	LUN number to which the P-VOL belongs
P-VOL Vol#	:	Volume number of the P-VOL
P-VOL Status	:	Status of the P-VOL
P-VOL Emulation	:	Emulation type of the P-VOL
S-VOL Port	:	Port number (Cluster and Channel number) to which the S-VOL belongs
S-VOL ID	:	Target(SCSI) ID to which the S-VOL belongs
S-VOL LUN	:	LUN number to which the S-VOL belongs
S-VOL Vol#	:	Volume number of the S-VOL
S-VOL Status	:	Status of the S-VOL
S-VOL Emulation	:	Emulation type of the S-VOL

(Notice) When "AUTO" is specified for the S-VOL, the DKC automatically selects the S-VOL.

(2) : Copy Pace

Selecting Copy Pace

You can select one of the copy pace (Faster/Medium/Slower) mode. It will be applied to all adding pairs.

There are three paces and you can choose one of them.

Slower	: Copy pace is slower than medium pace.
Medium	: Copy pace is normal.
Faster	: Copy pace is faster than medium pace.

please be careful to select “Faster”, because this copy pace will be reflected to Host I/O Performance.

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(3) : P-VOL information

Port	: Port number (Cluster and Channel number) to which the P-VOL belongs
ID	: Target(SCSI) ID to which the P-VOL belongs
LUN	: LUN number to which the P-VOL belongs
Vol#	: Volume number of the P-VOL
M Byte	: Size of the P-VOL
Pair	: Number of pairs against the P-VOL

(4) : Specifies the method to select the S-VOL.

Auto	: Selects a S-VOL automatically.
Select	: Specifies a S-VOL for selection.

(5) : S-VOL Volumes

Reserve	: Displaying the reserved volumes (It means that those volumes' attribution are "Reserve") in the S-VOL list.
not Reserve	: Displaying volumes except reserved volumes in the S-VOL list.

(6) : Port

It specifies Port number (Cluster and Channel number) to display on the S-VOL display list box.

(7) : Information of the S-VOL to be paired

Port	: Port number (Cluster and Channel number) to which the S-VOL belongs
ID	: Target(SCSI) ID to which the S-VOL belongs
LUN	: LUN number to which the S-VOL belongs
Vol#	: Volume number of the S-VOL
Status	: Status of the S-VOL
Emulation	: Emulation type of the S-VOL
M Byte	: Size of the S-VOL

(8) : Set

Adds the selected S-VOL as a volume to be paired.

(9) : Change

Changes into S-VOL which chose S-VOL which is set at present.

(10) : Omit

Deletes the selected S-VOL from the volumes to be paired.

(11) : Cascade

It adds S-VOL of Pair which was chosen in (1) to the Pair display list box as P-VOL.
Changes into S-VOL which chose S-VOL which is set at present.
Only when all of the following conditions are met, the concerned button becomes possible to be selected.

- A L1-Pair is Pairsplit.
- A L1-Pair is selected.
- A S-VOL is selected by optional specification.
- It is possible to add a L2-Pair.

When there is L1-Pair excepted Pairsplit already and it adds only L2-Pair, the concerned button can not be chosen.

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(12) : Undo
Returns 1 step of operation done by (8), (9), (10) or (11).

(13) : Paircreate
Execute paring.

(14) : Exit
Stop the pairing and quits the screen.

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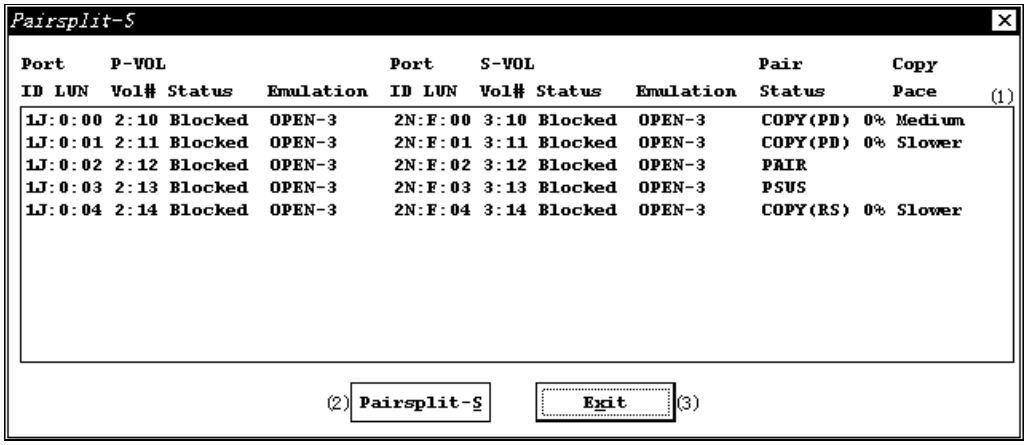
■ Delete Volume Pair Screen



(1) : Volume pair information list box

P-VOL Port	:	Port number (Cluster and Channel number) to which the P-VOL belongs
P-VOL ID	:	Target(SCSI) ID to which the P-VOL belongs
P-VOL LUN	:	LUN number to which the P-VOL belongs
P-VOL Vol#	:	Volume number of the P-VOL
P-VOL Status	:	Status of the P-VOL
P-VOL Emulation	:	Emulation type of the P-VOL
S-VOL Port	:	Port number (Cluster and Channel number) to which the S-VOL belongs
S-VOL ID	:	Target(SCSI) ID to which the S-VOL belongs
S-VOL LUN	:	LUN number to which the S-VOL belongs
S-VOL Vol#	:	Volume number of the S-VOL
S-VOL Status	:	Status of the S-VOL
S-VOL Emulation	:	Emulation type of the S-VOL
Pairdisplay	:	Status of the volume pair concerned
Copy Pace	:	Mode of copy pace (Faster/Medium/Slower).

(2) : Pairsplit-S
Executes an parting of the volume pair.

(3) : Exit
Stops parting of the volume pair and quits the screen.

When “SMPL” is in Pairdisplay, the pair is in a transition state to SMPL.
Please click [Refresh] button on HOMRCF Main Screen.

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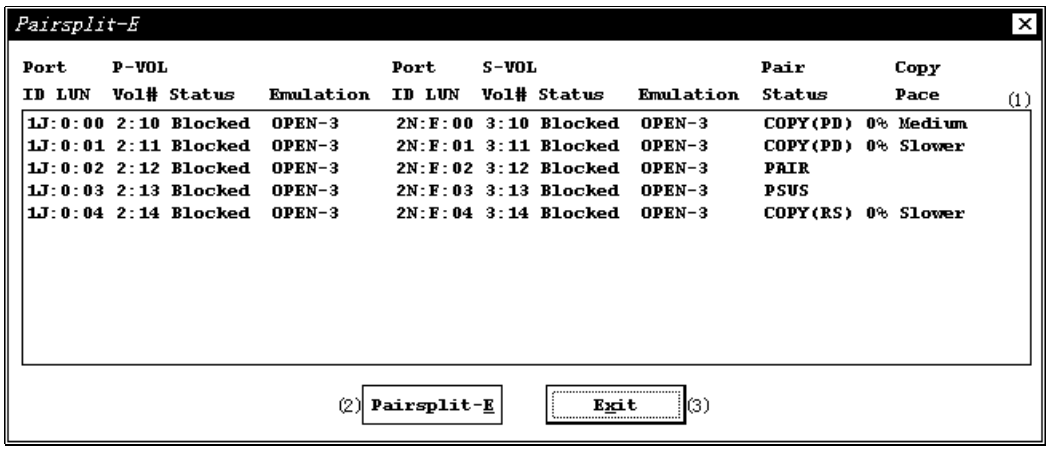
■ PSUE Volume Pair Screen



(1) : Volume pair information list box

P-VOL Port	:	Port number (Cluster and Channel number) to which the P-VOL belongs
P-VOL ID	:	Target(SCSI) ID to which the P-VOL belongs
P-VOL LUN	:	LUN number to which the P-VOL belongs
P-VOL Vol#	:	Volume number of the P-VOL
P-VOL Status	:	Status of the P-VOL
P-VOL Emulation	:	Emulation type of the P-VOL
S-VOL Port	:	Port number (Cluster and Channel number) to which the S-VOL belongs
S-VOL ID	:	Target(SCSI) ID to which the S-VOL belongs
S-VOL LUN	:	LUN number to which the S-VOL belongs
S-VOL Vol#	:	Volume number of the S-VOL
S-VOL Status	:	Status of the S-VOL
S-VOL Emulation	:	Emulation type of the S-VOL
Pairdisplay	:	Status of the volume pair concerned
Copy Pace	:	Mode of copy pace (Faster/Medium/Slower).

(2) : Pairsplit-E
Executes a suspension of the volume pair.

(3) : Exit
Stops a suspension of the volume pair.

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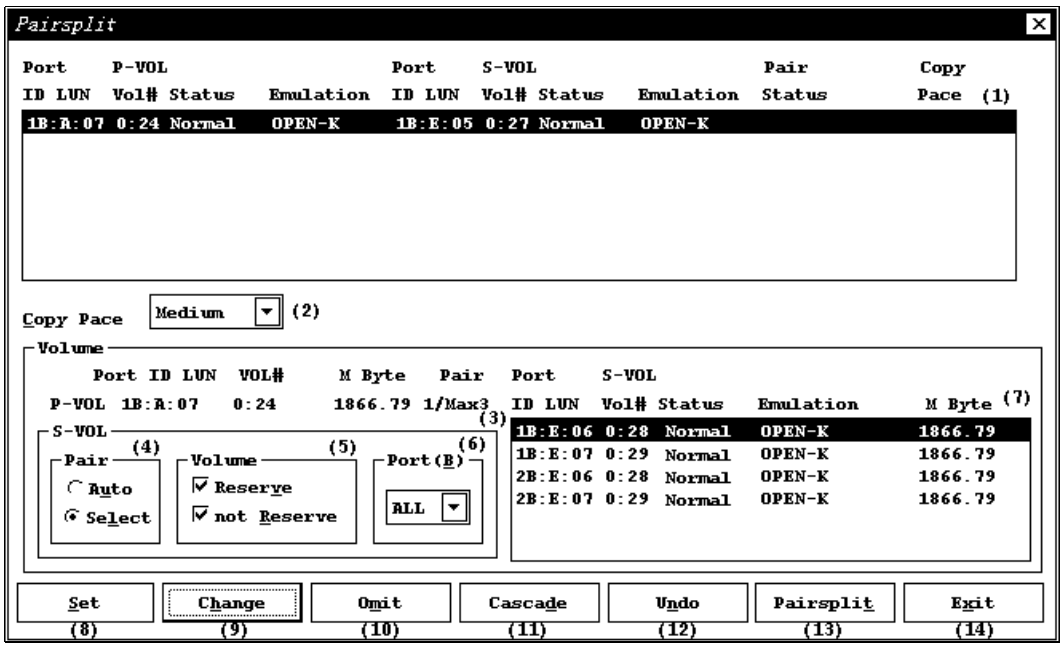
■ Screen for Pairsplit



(1) : Volume pair information list box

P-VOL Port	:	Port number (Cluster and Channel number) to which the P-VOL belongs
P-VOL ID	:	Target(SCSI) ID to which the P-VOL belongs
P-VOL LUN	:	LUN number to which the P-VOL belongs
P-VOL Vol#	:	Volume number of the P-VOL
P-VOL Status	:	Status of the P-VOL
P-VOL Emulation	:	Emulation type of the P-VOL
S-VOL Port	:	Port number (Cluster and Channel number) to which the S-VOL belongs
S-VOL ID	:	Target(SCSI) ID to which the S-VOL belongs
S-VOL LUN	:	LUN number to which the S-VOL belongs
S-VOL Vol#	:	Volume number of the S-VOL
S-VOL Status	:	Status of the S-VOL
S-VOL Emulation	:	Emulation type of the S-VOL
Pairdisplay	:	Status of the pair concerned.
Copy Pace	:	Displays a copy pace (Faster/Medium/Slower).

When "AUTO" is specified for the S-VOL, the DKC automatically selects the S-VOL.

(2) : Copy Pace

Selecting Copy Pace

You can select one of the copy pace mode. It will be applied to all adding pairs.

There are three paces and you can choose one of them.

Slower	: Copy pace is slower than medium pace.
Medium	: Copy pace is normal.
Faster	: Cop pace is faster than medium pace.

please be careful to select “Faster”, because this copy pace will be reflected to Host I/O Performance.

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(3) : P-VOL information

Port	: Port number (Cluster and Channel number) to which the P-VOL belongs
ID	: Target(SCSI) ID to which the P-VOL belongs
LUN	: LUN number to which the P-VOL belongs
Vol#	: Volume number of the P-VOL
M Byte	: Size of the P-VOL
Pair	: Number of pairs against the P-VOL

(4) : Specifies the method to select the S-VOL.

Auto	: Selects a S-VOL automatically.
Select	: Specifies a S-VOL for selection.

(5) : S-VOL Volumes

Reserve	: Displaying the reserved volumes (It means that those volumes' attribution are "Reserve") in the S-VOL list.
not Reserve	: Displaying volumes except reserved volumes in the S-VOL list.

(6) : Port

It specifies Port number (Cluster and Channel number) to display on the S-VOL display list box.

(7) : Information of the S-VOL to be paired

Port	: Port number to which the S-VOL belongs
ID	: ID number to which the S-VOL belongs
LUN	: LUN number to which the S-VOL belongs
Vol#	: Volume number of the S-VOL
Status	: Status of the S-VOL
Emulation	: Emulation type of the S-VOL
M Byte	: Size of the S-VOL

(8) : Set

Adds a selected S-VOL as the one to be PSUS.

(9) : Change

Changes into S-VOL which chose S-VOL which is set at present.

(10) : Omit

Deletes a selected S-VOL from the ones to be PSUS.

(11) : Cascade

It adds S-VOL of Pair which was chosen in (1) to the Pair display list box as P-VOL.
Changes into S-VOL which chose S-VOL which is set at present.
It chooses when making L1-Pair and L2-Pair at the same time.
Only when all of the following conditions are met, the concerned button becomes possible to be selected.

- A L1-Pair is selected.
- A S-VOL is selected by optional specification.
- It is possible to add a L2-Pair.

When there is L1-Pair already and it adds only L2-Pair, the concerned button can not be chosen.

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(12) : Undo
Returns 1 step of operation done by (8), (9), (10) or (11).

(13) : PSUS
Execute a splitting of the volume pair.

(14) : Exit
Stops a splitting of the volume pair.

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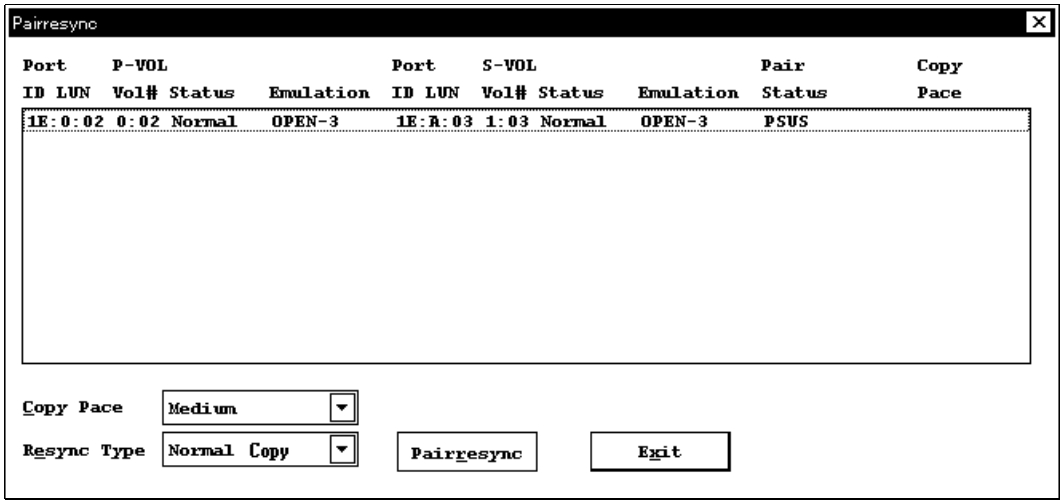
■ Re-synchronization Volume Pair Screen



(1) : Volume pair information list box

P-VOL Port	:	Port number (Cluster and Channel number) to which the P-VOL belongs
P-VOL ID	:	Target(SCSI) ID to which the P-VOL belongs
P-VOL LUN	:	LUN number to which the P-VOL belongs
P-VOL Vol#	:	Volume number of the P-VOL
P-VOL Status	:	Status of the P-VOL
P-VOL Emulation	:	Emulation type of the P-VOL
S-VOL Port	:	Port number (Cluster and Channel number) to which the S-VOL belongs
S-VOL ID	:	Target(SCSI) ID to which the S-VOL belongs
S-VOL LUN	:	LUN number to which the S-VOL belongs
S-VOL Vol#	:	Volume number of the S-VOL
S-VOL Status	:	Status of the S-VOL
S-VOL Emulation	:	Emulation type of the S-VOL
Pairdisplay	:	Status of the volume pair concerned
Copy Pace	:	Mode of copy pace (Faster/Medium/Slower).

(2) : Copy Pace

Selects one of the copy pace modes.
When executing re-synchronization, your selected mode will be applied to all pairs.
There are three paces and you \can choose one of them.

Slower	: Copy pace is slower than medium pace.
Medium	: Copy pace is normal.
Faster	: Cop pace is faster than medium pace.

please be careful to select “Faster”, because this copy pace will be reflected to Host I/O Performance.

(3) : COPY(RS)

Execute a re-synchronization of the volume pair.

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(4) : Exit
Stops a re-synchronization of the volume pair.

(5) : COPY(RS) Type
Specifies the re-synchronization type used when the re-synchronization is executed.
When executing the re-synchronization, the re-synchronization in (5) is applied to all the pairs.

Normal Copy	: Displays the Normal copy
Reverse Copy	: Displays the Reverse copy

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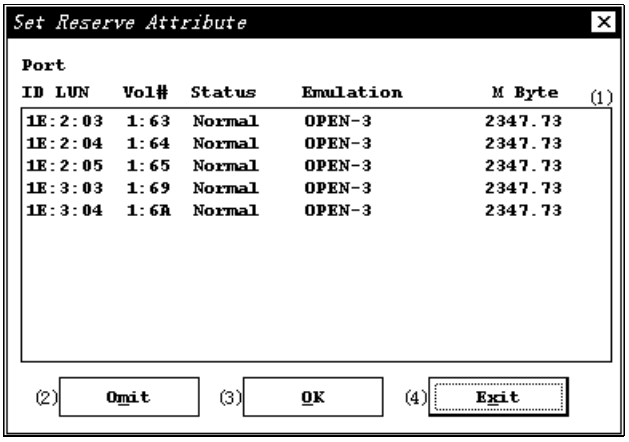
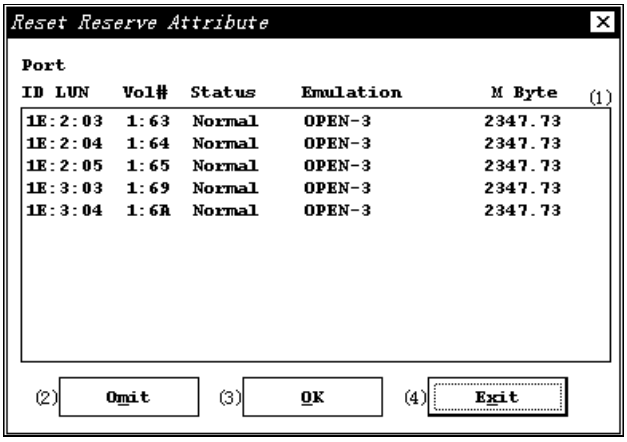
■ Screen specifying volume attribute change





(1) : Volume information list box

Port	:	Port number (Cluster and Channel number) to which the volume belongs.
ID	:	Target(SCSI) ID to which the volume belongs.
LUN	:	LUN number to which the volume belongs.
Vol#	:	Volume number of the volume belongs.
Status	:	Status of the volume belongs.
Emulation	:	Emulation type of the volume belongs.
M Byte	:	Size of the volume belongs.

(2) : Omit
Removes the volume selected in step (1) from the ones whose attribute is to be changed.

(3) : OK
Set/reset the “Reserve” attribute of the volume.

(4) : Exit
Stops setting /resetting the “Reserve” attribute of the volumes and quits the screen.

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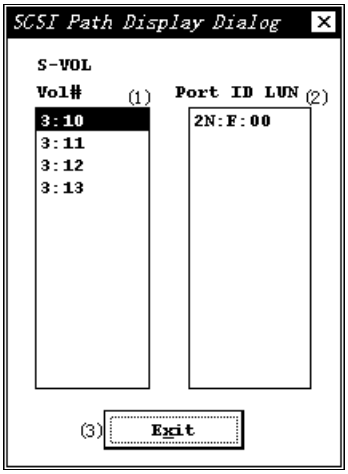
■ **S-VOL SCSI pass reference screen**



(1) : S-VOL display list box

Vol# : Volume number of the S-VOL

(2) : SCSI pass display list box

Port : Port number (Cluster and Channel number) to which the S-VOL belongs

ID : Target(SCSI) ID to which the S-VOL belongs

LUN : LUN number to which the S-VOL belongs

(3) : Exit

Closes the screen.

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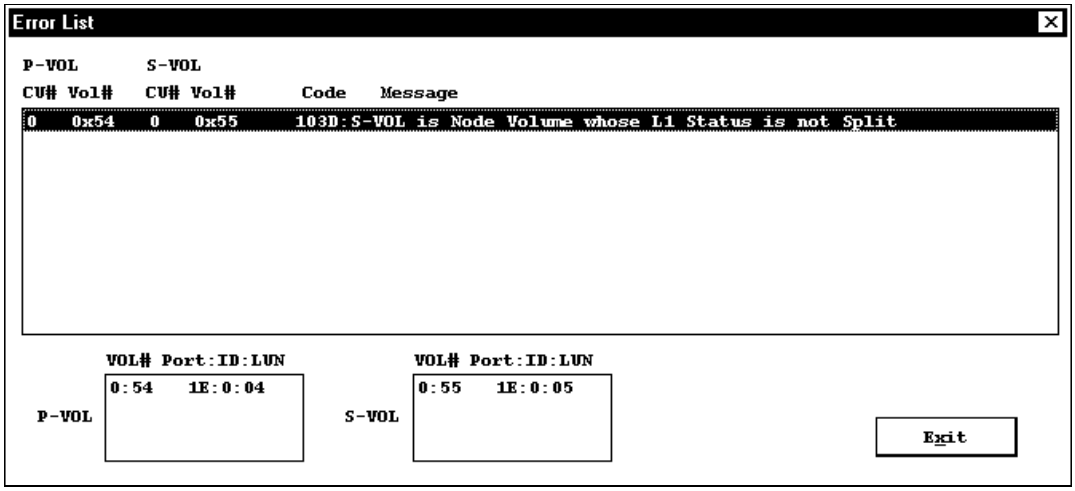
■ Error display screen



(1) : Information display list box

P-VOL CU#	: CU number of the P-VOL
P-VOL Vol#	: Volume number of the P-VOL
S-VOL CU#	: CU number of the S-VOL
S-VOL Vol#	: Volume number of the S-VOL
Code	: Error code is shown
Message	: Contents of the error code are shown

(2) : Exit

Closes the screen.

(3) : Path define of P-VOL

VOL#	: CU number : Displays the Volume number
Port	: Displays the Cluster and Channel number
ID	: Displays the Target (SCSI) ID
LUN	: Displays the discriminate number of Logical unit

(4) : Path define of S-VOL

VOL#	: CU number : Displays the Volume number
Port	: Displays the Cluster and Channel number
ID	: Displays the Target (SCSI) ID
LUN	: Displays the discriminate number of Logical unit

The list of the error code is shown after the next page.

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Error Code	contents	way of coping
0401	It detected a lock time over during internal process.	Reexecutes after about 5 seconds.
0402	The indication could not be received because it was not internally in the SMPL condition.	Reexecutes after about 5 seconds.
0801	HMRCF/HOMRCF can not use. because lock of PP.	Installs PP of HMRCF/HOMRCF.
0810	In the present condition, the command can not be received.	Confirms a matching condition and it confirms whether or not it is the command which can be allowed.
0811	This command is handled as NOP	Confirms a matching condition and it confirms whether or not it is the command is allowed.
0812	It is impossible to create a pair because a pass group is set with S-VOL.	vary offline from the host or cancel the pass of Remote Copy.
0813	Pairsplit command is required to the pair of the PSUS state.	Because it is already in the PSUS state, the Pairsplit command can not be required.
0814	Paircreate command is required to the pair of the PSUS state.	Because it is already in the PSUS state, the Paircreate command can not be required.
0815	Pairsplit command with Quiesce is required to S-VOL.	1. Request without Quiesce. 2. or Request to P-VOL.
0816	This command with PRIMA option is required to S-VOL	1. Request without PRIMA. 2. or Request to P-VOL.
0817	Impossible to set reserve volume because a pass group is set	Vary offline the volume which makes Reserve volume from the host or cancel the pair of Remote Copy.
0818	Pairsplit-E command to the COPY(RS) being impossible because a pass group is set	Vary offline S-VOL from the host or cancel the pair of Remote Copy.
081F	Command Reject. P-VOL is used from HOST or Remote Copy volume.	Disconnect from the host or cancel the Remote Copy path.
0830	The pair can not be created because the track format is different.	Confirms whether the emulation type of P-VOL and S-VOL is equal.
0831	The pair can not be created because the number of the slots is different.	Confirms whether the capacity of P-VOL and S-VOL is equal.
0834	The emulation type of specified P-VOL is not-supported by HOMRCF.	Confirms whether or not the emulation type of P-VOL is supported by HOMRCF.
0835	The emulation type of specified S-VOL is not-supported by HOMRCF.	Confirms whether or not the emulation type of S-VOL is supported by HOMRCF.
0836	The pair can not be created	Confirms whether the emulation type of P-VOL, S-VOL is equal.
0852	Command Reject. P-VOL and S-VOL are used from HOST or Remote Copy volume.	Disconnect from the host or cancel the Remote Copy path.
0C20	Detected the fault of the cache.	Make cache a normal condition.
0C21	Cache capacity unmatch.	Adjusts the capacity of the side A and the side B of cache.

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Error Code	contents	way of coping
0C30	Detected the fault of the SM.	Make SM a normal condition.
0C31	Capacity of SM is not enough.	Add the capacity of SM.
0C34	Failed in the initialization of SM.	Reexecute.
0C35	SM capacity unmatch.	Adjusts the capacity of the side A and the side B of SM.
0C36	SM that the capacity is 16 MB intermingles.	Uses SM that the capacity is 64 MB.
0C70	P-VOL isn't equipped.	Unequipped volume is not a processing object.
0C71	Impossible to use P-VOL.	Calls a maintenance member to make the condition of P-VOL normal.
0C72	P-VOL is formatting.	Waits until the format of P-VOL ends.
0C73	P-VOL is Command Device	Command Device is not an object of HOMRCF Pair.
0C80	S-VOL isn't equipped.	Unequipped volume is not a processing object.
0C81	Impossible to use S-VOL.	Calls a maintenance member to make the condition of S-VOL normal.
0C82	S-VOL is formatting.	Waits until the format of S-VOL ends.
0C83	S-VOL is Command Device	Command Device is not an object of HOMRCF Pair.
0C90	Logical volume which was specified as the Reserve volume isn't equipped.	Unequipped volume is not a processing object.
0C91	It is impossible to use logical volume which was specified as the Reserve volume.	Calls a maintenance member to make a condition with the volume which was specified in the Reserve volume normal.
0C92	Logical volume which was specified as the Reserve volume is formatting.	Waits until the format with the volume which was specified in the Reserve volume ends.
0C93	Reserve-Volume is Command Device	Command Device is not an object of HOMRCF Pair.
1009	Exceeded the multiple degree of HMRCF/HOMRCF.	Cancels some of pairs of the P-VOL.
1011	The logical volume which was specified as the Reserve volume is already set as the Reserve volume.	If you mistake changes the logical volume to specify as the Reserve volume.
1012	The logical volume number which was specified as the Reserve volume is used as P-VOL.	Changes the Volume number to specify as the Reserve volume.
1013	The logical volume number which was specified as the Reserve volume is used for HIHSM.	Changes the Volume number to specify as the Reserve volume.
1014	The logical volume which was specified as the Reserve volume is used for HIHSM.	Changes the Volume number to specify in the Reserve volume.
1015	Logical volume which was specified as the Reserve volume isn't set as the Reserve volume at reset reserve request.	Confirms a volume condition.

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Error Code	contents	way of coping
1016	Logical volume which can allocate suitably as S-VOL doesn't exist.	Cancels some of the Reserve volume which can allocate as S-VOL.
1017	It is impossible to set Reserve volume because it exceeded the number of the maximum allocations with Reserve volume	Cancels some of Reserve volume.
101E	There is not Reserve volume itself in the system.	Sets Reserve volume for AUTO operation.
1026	It is impossible to make a pair any more because the volume which was specified as P-VOL is root volume already.	It delete some of the pairs of Root Volume.
1027	It is impossible to make a pair any more because the volume which was specified as P-VOL is node volume already.	It delete some of the pairs of Node Volume.
1028	It is impossible to make a pair because the volume which was specified as P-VOL is Leaf Volume already.	It confirms a pair condition.
1029	It is pmpossible to make a pair because the volume which was specified as S-VOL is Leaf Volume already	It confirms a pair condition.
102E	P-VOL is used as Source Volume for HIHSM.	Confirms a matching conditon.
102F	P-VOL is used as Destination Volume for HIHSM.	Confirms a matching conditon.
1030	The specified P-VOL number doesn't exist.	Please refresh the screen.
1031	Specified P-VOL is set as the Reserve volume.	Confirms a matching condition.
1032	Specified P-VOL can not set a pair any more.	Cancels some of the pairs of the P-VOL.
1033	Specified P-VOL is not P-VOL at pair operation.	Confirms a matching condition.
1037	Specified P-VOL is used as S-VOL of HOMRCF.	Confirms a matching condition.
1038	Specified P-VOL is used as M-VOL of HODM.	Cancels the pair of HODM.
103A	COPY(RS) command is requested at the device of the SMPL condition.	Confirms a matching condition.
103B	It is impossible to make a pair because Volume which was specified as S-VOL is Root Volume already	It confirms a pair condition.
103C	It is impossible to make a pair because Volume which was specified as S-VOL is Node Volume already	It confirms a pair condition.
103D	It is impossible for L2 Pair to require a Pairsplit because L1 Pair is not in the PSUS condition.	After making L1 Pair a PSUS condition, it reexecutes.
103E	This request is rejected because of Remote Copy cooperation conditions.	Make the volume to SMPL state.

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Error Code	contents	way of coping
103F	Condition transfer's being impossible because of the Remote Copy cooperation conditions.	It makes the pair of Remote Copy M-VOL of which is S-VOL PSUE condition or SMPL condition.
1040	The specified S-VOL doesn't exist.	Please refresh the screen.
1042	S-VOL is used as Destination Volume for HIHSM.	Confirms a matching conditon.
1043	A specified S-VOL is used as S-VOL of HOMRCF.	Confirms a matching condition.
1044	Specified S-VOL is not S-VOL of HMRCF/HOMRCF.	Confirms a matching condition.
1046	Specified S-VOL is used as M-VOL of Remote Copy.	Cancels the pair of Remote Copy.
1047	Specified S-VOL is used as R-VOL of Remote Copy.	Cancels the pair of Remote Copy.
1048	Specified S-VOL is used as M-VOL of HODM.	Cancels the pair of HODM
104A	Specified S-VOL is used as P-VOL of HMRCF/HOMRCF.	Confirms a matching condition.
104B	S-VOL is used as Source Volume for HIHSM.	Confirms a matching conditon.
104C	Logical volume which was specified as Reserve is used as M-VOL of HODM.	Cancels the pair of HODM
104D	Logical volume which was specified as Reserve is used as R-VOL of HODM.	Cancels the pair of HODM
104E	Logical volume which was specified as Reserve is used as M-VOL of Remote Copy.	Cancels the pair of Remote Copy
104F	Logical volume which was specified as Reserve is used as R-VOL of Remote Copy.	Cancels the pair of Remote Copy
1050	Specified P-VOL & S-VOL are not the pair of HMRCF/HOMRCF.	Confirms a matching condition.
1051	The logical volume number of specified P-VOL and S-VOL is the same.	Reexecutes a screen behind Refresh.
1058	S-VOL is Node Volume whose L2 status is COPY(SP).	Confirms a matching conditon.
1084	Volume was used for Reserve volume of HIHSM.	Check the volume or Cancel the Reserve volume of HIHSM.
1085	P-VOL was used for Reserve volume of HIHSM.	Check the P-VOL or Cancel the Reserve volume of HIHSM.
1086	S-VOL was used for Reserve volume of HIHSM.	Check the S-VOL or Cancel the Reserve volume of HIHSM.
1087	P-VOL is used as Source Volume for HIHSM.	Confirms a matching conditon.
1095	Request could not be accepted because status of pair who shared with P-VOL was Reverse Copy.	Confirms a matching condition.

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Error Code	contents	way of coping
1096	Request could not be accepted because L1 Pairdisplay was Reverse Copy.	Confirms a matching condition.
1097	Request could not be accepted because L2 Pairdisplay was Reverse Copy.	Confirms a matching condition.
1098	Reverse Copy could not be accepted because Pairdisplay was not PSUS.	Confirms a matching condition.
1099	Reverse Copy to L2 pair could not be accepted because status of pair who shared with P-VOL was neither PSUS nor PSUE.	Confirms a matching condition.
109A	Reverse Copy could not be accepted because P-VOL was shared with HORC P-VOL whose status was not PSUE.	Confirms a matching condition.
109B	Reverse Copy could not be accepted because P-VOL was shared with HORC S-VOL whose status was not PSUE.	Confirms a matching condition.
109C	Reverse Copy could not be accepted because S-VOL was shared with HORC P-VOL.	Confirms a matching condition.

Notice : if a code that is not shown this table is appeared, please collect the DKC auto-dump and log. (See SVP02-530)

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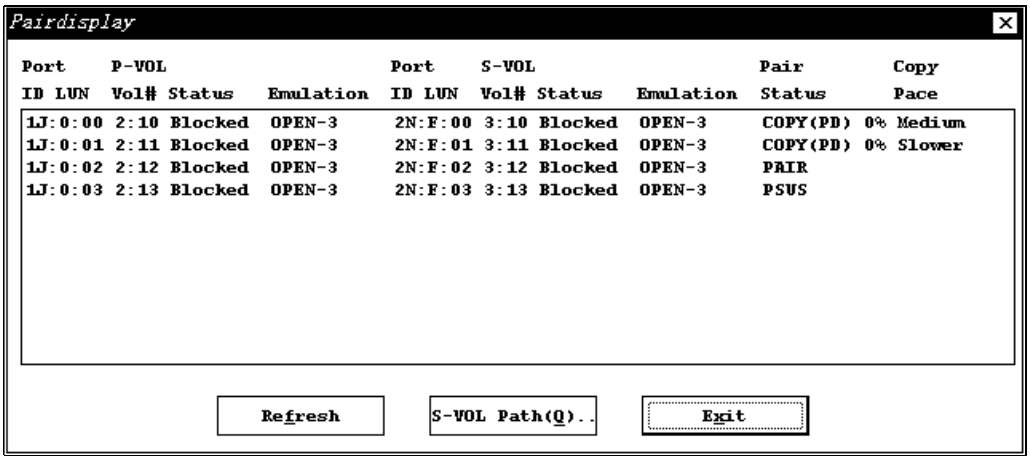
10.2 Procedure for confirming the volume status

■ Procedure for confirming the volume status

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

(2) Select the volume
Select the volumes whose statuses you want to confirm at HOMRCF main screen volume list, then click the [Pair Stat...] button. When you want to confirm sequential several volumes, please select them by pushing [Shift] key. When you want to select volumes at random (not sequentially), please use [Ctrl] key.

(3) Status display
The statuses of the volumes you selected are displayed. To update the displayed information to the latest one, click the [Refresh] button. The screen can be closed by clicking the [Exit] button.



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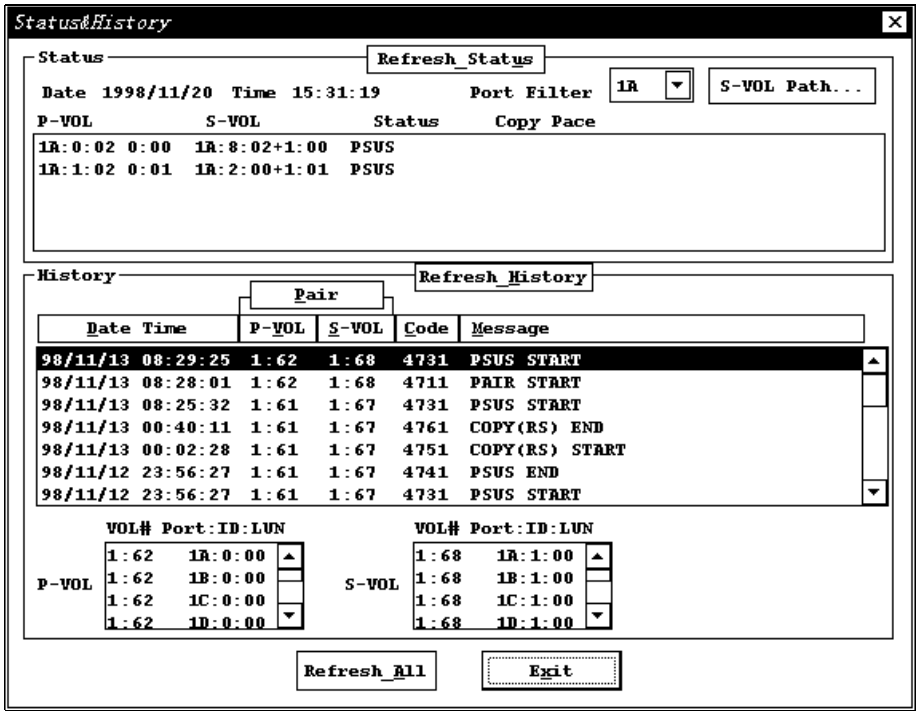
Procedure for confirming Status & History

■ Procedure for confirming Status & History

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

(2) Status & History
Click the [Stat&History] button of the HOMRCF main screen.

(3) Display the status and history
The status situation of the present pairs are displayed in the Status frame. To update the displayed information of the side of Status to the latest one, click the [Refresh_Status] button. The one to have sorted a condition transfer history by the time series is displayed in the History frame. When you want to sort by time, please select [Date Time] button. When you want to sort by the volume number of P-VOL, please select [P-VOL] button. When you want to sort by the volume number of S-VOL, please select [S-VOL] button. When you want to sort by the code, please select [Code] button.
When updating the history of the condition transfer of the pair, click the [Refresh_History] button. When updating the all information, click the [Refresh_All] button.
The screen can be closed by clicking the [Exit] button.



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Procedure for changing volume attribute

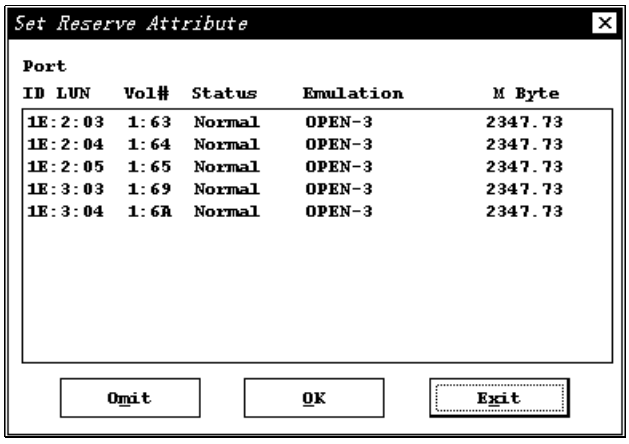
■ Procedure for changing volume attribute

In this section, we'd like to describe how to change the volume attribute as "Reserve" for S-VOLs.

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

(2) Select volumes
Select the volumes whose attribute you want to change, then click the [Attribute...] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key.

(3) Changing the volume attribute
When there are some volumes whose attributes you want to left unchanged, select the volumes and click the [Omit] button to delete them from the list. If you use [Shift] key, you can select sequential volumes. If [Ctrl] key, you can select volumes at random. To change the attributes of the selected volumes, click the[OK] button. To stop the attribute change, click the [Exit] button.



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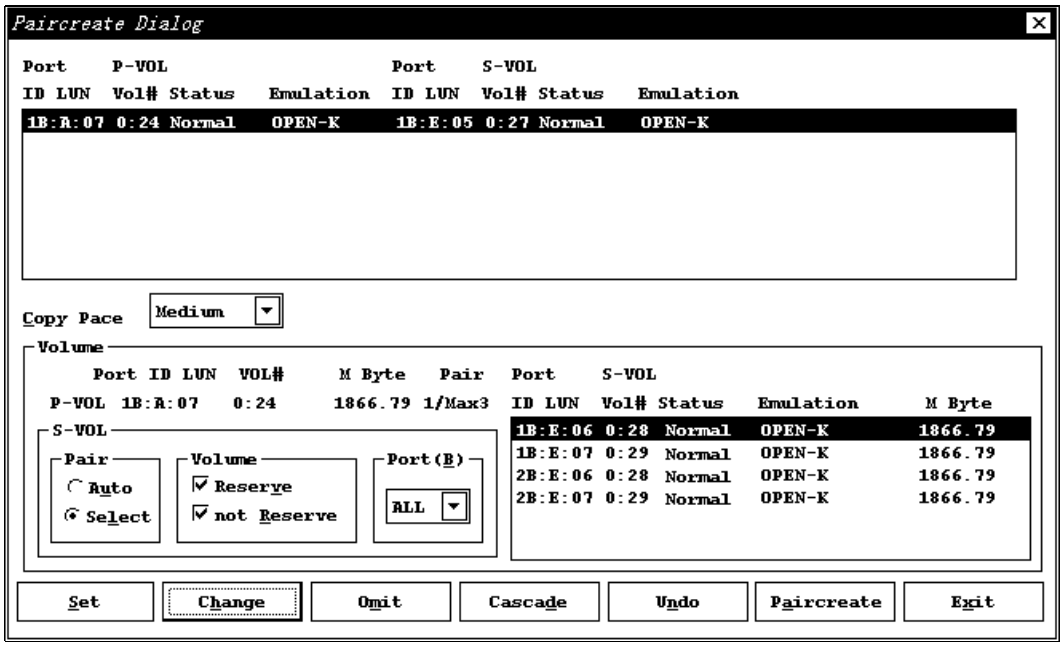
Procedure for creating/parting a volume pair

■ Procedure for creating a volume pair

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

(2) Select a Source Volume (P-VOL)
You can choose [Display] on the HOMRCF main screen as the volume display or the pair display. If you choose the volume display, don't check the display attribute to [Reserve] on the HOMRCF main screen. Select a volume with which you want to create a volume pair, then click the [Paircreate...] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key. If you select a mode to display by the pair unit, you could not select [Paircreate...].

(3) Edit pair & Execute
A S-VOL is automatically selected for the P-VOL that you selected.



Notice

Before you create pairs by selecting S-VOLs as "AUTO", you should define the volumes as "Reserved". Please refer to the procedure of changing the volume attribute.
In the Paircreate screen, it makes pair to all pair which are displayed in operation object volume list. If you do not want to use some volumes by pairs, please select them in the volume list and select [Omit] button to delete them from the list.

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<Select Target Volume (S-VOL)>

(A) By Manual

◆ In the case of which you want to select S-VOL by manually (not “AUTO”).
  (a) Select volumes as P-VOL.
  (b) Select [Select] in the Paircreate Dialog .
  (c) Select volumes from the S-VOL list. You can select any Port#.
  (d) Select [Change].

◆ In the case of which you want to add several pairs by manually.
  (a) Select a volume as P-VOL.
  (b) Select [Select] in the Paircreate Dialog .
  (c) Select volumes from the S-VOL list.
  (d) Select [Set].
  If you want to create more pairs, please repeat these operations.

(B) By automatic method

◆ In the case of which you select S-VOL by “AUTO”.
  (a) Select volumes as P-VOL.
  (b) Select [AUTO] in the [S-VOL Select]. (Default setting is [AUTO])
  (c) Select [Change].

◆ In the case of which you want to add several pairs by selecting one P-VOL with “AUTO”.
  (a) Select a volume as P-VOL.
  (b) Select [AUTO] in the [S-VOL Select].
  (c) Select [Set].
  If you want to create more pairs, please repeat these operations.

<Specification of the cascade>

Click [Cascade] button after choice in L1 Pair and S-VOL of L2 Pair.
Changes into S-VOL which chose S-VOL which is set at present.
Only when all of the following conditions are met, the concerned button becomes possible to be selected.

- A L1-Pair is Pairsplit.
- A L1-Pair is selected.
- A S-VOL is selected by optional specification.
- It is possible to add a L2-Pair.

When there is L1-Pair excepted Pairsplit already and it adds only L2-Pair, the concerned button can not be chosen.

<In case of selecting wrong pairs>

If you want to Pairsplits-S, please select those pairs and select [Omit].

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<Execute adding pairs>
If you want to Pairsplits-S, please select those pairs and select [Omit].
If you want to Paircreates against all pairs in the Pair Volume list, please select [Paircreate]. Remote Console will Paircreates and display the result. If you want to stop adding pairs, please select [Exit] button. The screen will be back to the HOMRCF main screen.

It is able to specify “Not Reserve”, “Reserve” when choosing S-VOL.

Copy pace is available these three mode [Slower] [Medium] [Faster].
[Faster] mode should be used in offline environment.

(4) Confirmation of Pairdisplay.
You can confirm Pairdisplay in HOMRCF Main Screen.
lease click “Refresh” button if necessary.

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■ Procedure for delete a volume pair

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

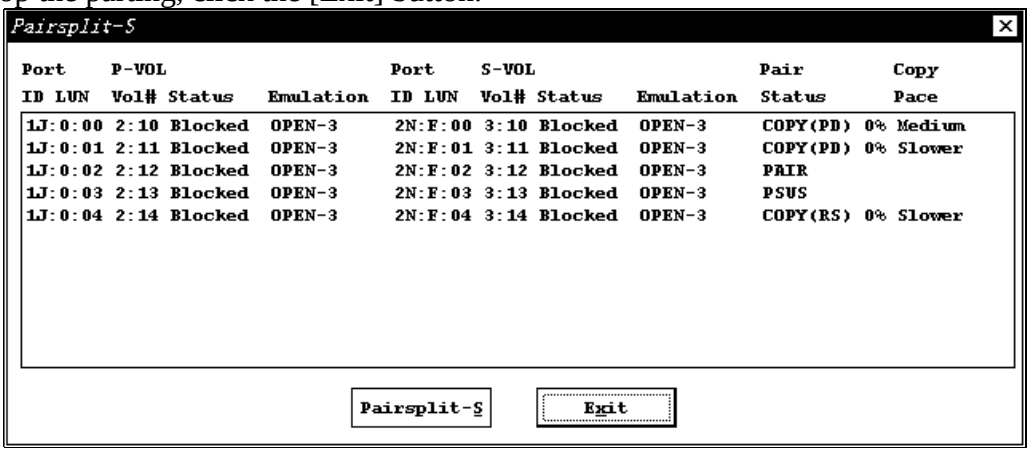
(2) Select volume/pair/Cascade
You can choose [Display] on the HOMRCF main screen as the volume display, the pair display or Cascade display.
If you choose the volume display, don't check the display attribute to [Reserve] on the HOMRCF main screen. Select a volume that you want to part the pair, then click the [Pairsplit-S...] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key. If you choose the pair display or Cascade, [Pairsplit-S...] button sometimes will not be available by the Pairdisplay.
You can choose the pairs of the status which are shown in the following Table 10-3.

Table 10-3 Status Allow Selection of [Pairsplit-S ...] Button

Pairdisplay / Button	SMPL	COPY(PD)	PAIR	COPY(SP)	PSUS	COPY(RS)	COPY(RS-R)	PSUE
Pairsplit-S	x	OK	OK	OK	OK	OK	OK	OK

OK: Select the button x: Could not select the button

(3) Execution of deleting pairs
Select a volume pair that you want to part from the Pairs displayed and click the [Pairsplit-S] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key.
To stop the parting, click the [Exit] button.



(4) confirmation of Pair
With the HOMRCF main screen, confirm the condition of the pair. According to the necessity, push and confirm [Refresh] button in the latest condition.
Also, click [Stat & History] button and confirm a table revelation condition in the Status & History screen.

⚠ Notice

If a pair in PAIR state is deleted, there may be difference between P-VOL and S-VOL.
Be sure to be PSUS state when a pair is deleted.

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Procedure for suspending/splitting/resynchronize a volume pair

■ Procedure for suspending a volume pair

When stopping the copy of Pair temporarily, and so on, it does.

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

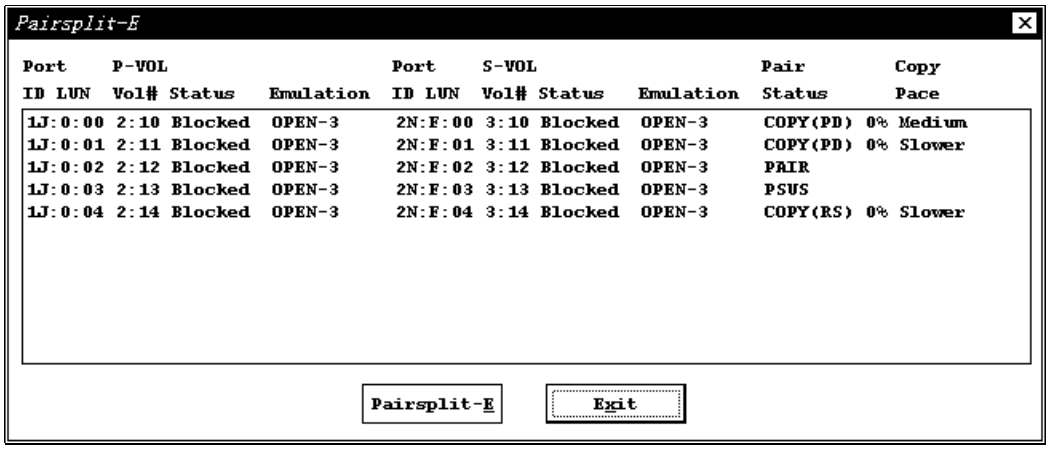
(2) Select volume/pair/Cascade
You can choose [Display] on the HOMRCF main screen as the volume display, the pair display or Cascade display.
If you choose the volume display, don't check the display attribute to [Reserve] on the HOMRCF main screen. Select a volume that you want to part the pair, then click the [Pairsplit-E...] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key. If you choose the pair display or Cascade display, [Pairsplit-E...] button sometimes will not be available by the Pairdisplay.
If you choose the pair display, you can choose the pairs of the status which are shown in the following Table 10-4.

Table 10-4 Statuses Allow Selection of [Pairsplit-E ...] Button

Pairdisplay / Button	SMPL	COPY(PD)	PAIR	COPY(SP)	PSUS	COPY(RS)	COPY(RS-R)	PSUE
Pairsplit-E	x	OK	OK	OK	OK	OK	OK	x

OK: Select the button x: Could not select the button

(3) Execution of suspending pairs
Select a volume pair that you want to PSUE from the pairs displayed and click the [Pairsplit-E] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key. It executes PSUE of Pair and it displays an execution result. To stop the suspension, click the [Exit] button. The screen will be back to the HOMRCF main screen.



(4) Confirmation of Pairdisplay.
You can confirm Pairdisplay in HOMRCF Main Screen.
lease click "Refresh" button if necessary.

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■ **Procedure for splitting a volume pair**

It does when wanting to use P-VOL and S-VOL separately after Pair forming.

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

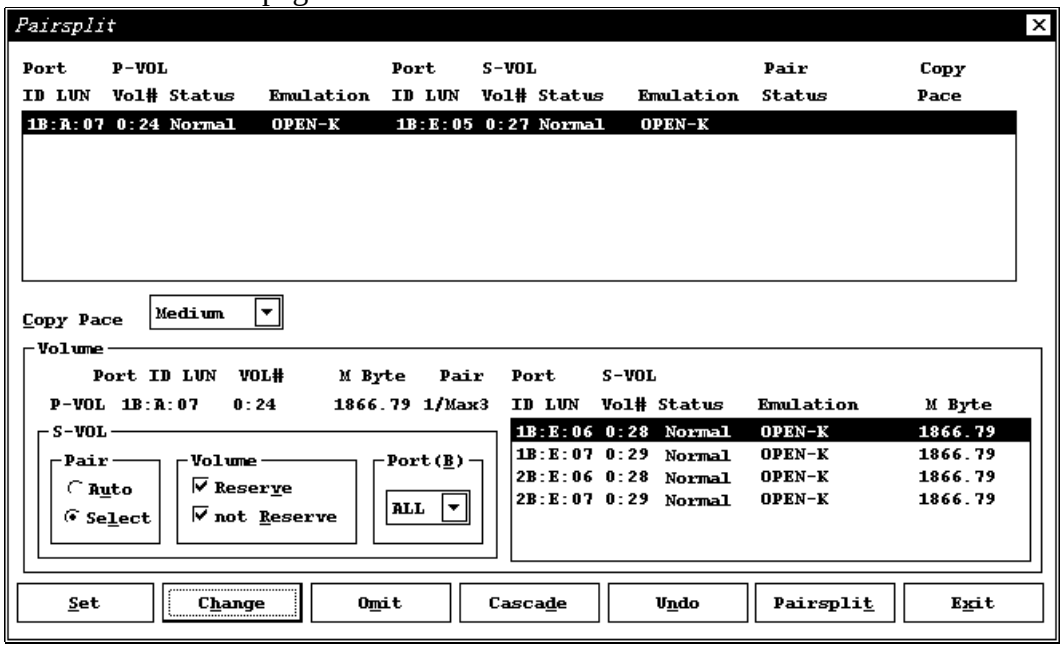
(2) Select volume/pair/Cascade
You can choose [Display] on the HOMRCF main screen as the volume display, the pair display or Cascade display.
If you choose the volume display, don't check the display attribute to [Reserve] on the HOMRCF main screen. Select a volume or cascade that you want to PSUS the pair, then click the [Pairsplit...] button.
If you choose the pair display or cascade display, you can choose the pairs of the status which are shown in the following Table 10-5.

Table 10-5 Statuses Allow Selection of [Pairsplit-S ...] Button

Pairdisplay / Button	SMPL	COPY(PD)	PAIR	COPY(SP)	PSUS	COPY(RS)	COPY(RS-R)	PSUE
Pairsplit	x	OK	OK	x	x	x	x	x

OK: Select the button x: Could not select the button

(3) Edit pair & Execute
If your selected P-VOL is not created as pair, S-VOL will be selected automatically. And S-VOL is displayed as "AUTO".
If your selected P-VOL is created as pair, created pairs will be displayed.
Procedure of changing the S-VOL which P-VOL does not have any pairs or other operations will be described in the next page.



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Notice

Before you Pairsplits whose status is SMPL by “AUTO”, you should define the volumes as “Reserved”. Please refer to the procedure of changing the volume attribute.
In the PSUS volume pair screen, it does PSUS to all pair which are displayed in operation object volume list. If you do not want to splits some pairs, please select them in the volume list and select [Omit] button to delete them from the list.

<Select Target Volume (S-VOL)>

(A) By Manual

◆ In the case of which you want to select S-VOL by manually (not “AUTO”).
  (a) Select volumes as P-VOL.
  (b) Select [Select] in the PSUS Volume Pair Screen.
  (c) Select volumes from the S-VOL list.
  (d) Select [Change].

◆ In the case of which you want to add several pairs by manually.
  (a) Select a volume as P-VOL.
  (b) Select [Select] in the PSUS Volume Pair Screen .
  (c) Select volumes from the S-VOL list.
  (d) Select [Set].
  If you want to create more pairs, please repeat these operations.

(B) By automatic method

◆ In the case of which you select S-VOL by “AUTO”.
  (a) Select volumes as P-VOL.
  (b) Select [AUTO] in the [S-VOL Select]. (default setting is [Auto])
  (c) Select [Change].

◆ In the case of which you want to add several pairs by selecting one P-VOL with “AUTO”.
  (a) Select a volume as P-VOL.
  (b) Select [AUTO] in the [S-VOL Select].
  (c) Select [Set].
  If you want to create more pairs, please repeat these operations.

Notice

Before you Pairsplits by selecting SMPL volumes is the automatic method, you should change those volumes as “Reserved”.

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<Specification of the cascade>
Click [Cascade] button after choice in L1 Pair and S-VOL of L2 Pair.
Changes into S-VOL which chose S-VOL which is set at present.
Only when all of the following conditions are met, the concerned button becomes possible to be selected.
- A L1-Pair is Pairsplit.
- A L1-Pair is selected.
- A S-VOL is selected by optional specification.
- It is possible to add a L2-Pair.

When there is L1-Pair excepted Pairsplit already and it adds only L2-Pair, the concerned button can not be chosen.

<In case of selecting wrong pairs>
If you want to Pairsplits-S, please select those pairs and select [Omit].

<Execute adding pairs>
If you want to Pairsplits-S, please select those pairs and select [Omit].
If you want to Pairsplits against all pairs in the Pair Volume list, please select [PSUS]. SVP will Pairsplits and display the result. If you want to stop splitting pairs, please select [Exit] button. The screen will be back to the HOMRCF main screen.

It is able to specify “Not Reserve”, “Reserve” when choosing S-VOL.

Copy pace is available these three mode [Slower] [Medium] [Faster].
[Faster] mode should be used in offline environment.

(4) Confirmation of Pairdisplay.
You can confirm Pairdisplay in HOMRCF Main Screen.
lease click “Refresh” button if necessary.

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■ **Procedure for resynchronizing a volume pair**

It makes once Pairsplit PAIR condition again. Or, it makes Pair of the PSUE condition PAIR condition.

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

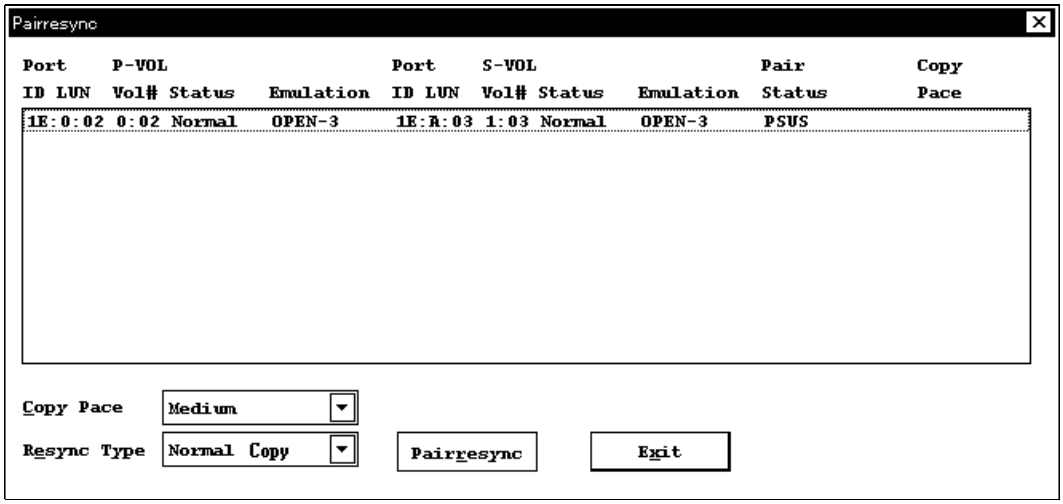
(2) Select volume or pair
You can choose [Display] on the HOMRCF main screen as the volume display, the pair display or Cascade display.
If you choose the volume display, don't check the display attribute to [Reserve] on the HOMRCF main screen. Select a volume that you want to part the pair, then click the [Pairresync...] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key. If you choose the pair display or Cascade display, you can choose the pairs of the status which are shown in the following Table 10-6.

Table 10-6 Statuses Allow Selection of [Pairresyncs ...] Button

Pairdisplay / Button	SMPL	COPY(PD)	PAIR	COPY(SP)	PSUS	COPY(RS)	COPY(RS-R)	PSUE
Pairresync	x	x	x	x	OK	x	x	OK

OK: Select the button x: Could not select the button

(3) Execution of resynchronizing pair
Select a volume pair that you want to re-synchronize from the pairs displayed and click the [COPY(RS)] button. If you want to select sequential volumes, please select volumes by pushing [Shift] key. If you want to select them at random, please use [Ctrl] key. It executes re-synchronize of pair and it displays an execution result. To stop the re-synchronization, click the [Exit] button. The screen will be back to the HOMRCF main screen.



(4) Confirmation of Pairdisplay.
You can confirm Pairdisplay in HOMRCF Main Screen.
lease click "Refresh" button if necessary.

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■ **Procedure for initializing a Volume pair**

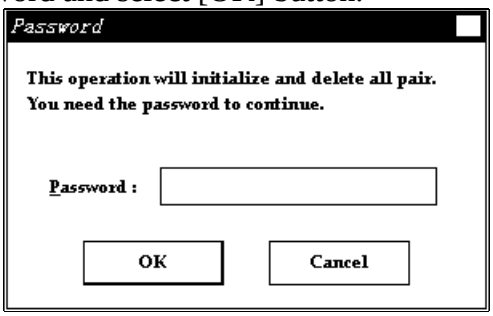
It initializes all Pair of HMRCF/HOMRCF.

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

(2) Initialization
In the HOMRCF main screen, it pushes [Initialize] button.

> **⚠ NOTICE**
> All Pair of HMRCF/HOMRCF are deleted by this operation.

(3) Inputs a password.
"This operation will initialize and delete all pair. You need the password to continue." is displayed. Enter the password and select [OK] button.



> **⚠ NOTICE**
> This is a special (exceptional) operation and requires an input of a password. Ask the technical support center about the appropriateness of the operation and input the password after getting an approval of executing the operation.

(4) Confirms an execution result
When indicating the compulsion initialization of Pair, it confirms that all Pair are deleted with the HOMRCF Main screen.

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■ **Procedure of extending the number of maximum pair**

It extends the HMRCF/HOMRCF number of maximum Pair to 512.

(1) Display of HOMRCF main screen
Click the [HOMRCF] button on SVP function screen, the HOMRCF main screen comes out.

(2) Confirmation of the thing about which it is possible to extend
On the HMRCF main screen, when the [Set over 64] button is enable, the number of maximum pair can be extended from 64 to 512.
When the [Set over 64] button is disable, the following case is thought of.
- It has extended the number of maximum pair
  Confirm the HOMRCF main screen number of maximum pair.
- During maximum pair number extension
  Press the [Refresh] button of the HOMRCF main screen.
- The SM capacity lack
  Refer to INST08-30 and confirm SM capacity.
- The nonconformity of the DKCMAIN program version
  Refer to SVP03-130 and confirm DKCMAIN program version.

(3) Extends
[Set over 64] It pushes a button. Confirm that the HOMRCF main screen number of maximum Pair and the number of maximum Reserve are extended to 512. After maximum Pair number extension, refer to M-FC08-10 and acquire the backup of the composition information.

(4) Confirms an execution result
When indicating maximum Pair number extension, confirm that the number of maximum Pair is extended with the HOMRCF Main screen.

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10.3 Notice about HOMRCF operation

■ **Restrictions on maintenance**

Dynamic Sparing/ Automatic collection copy : Even if a Dynamic Sparing or an automatic collection copy is performed in a PDEV concerning a pair, it does not affect a pairing status.

PDEV maintenance work : The maintenance of each PDEV does not affect a pair but when it affects a logical volume, it is restricted in the same way as the following LDEV maintenance work.

LDEV maintenance work : The LDEV maintenance work cannot be done when a pair exists.
(1) LDEV blockade : It is required to delete a pair and cancel the “Reserve” specification.
(2) LDEV formatting : Because an LDEV must be blocked, it is required to perform the above operation beforehand.

Cache maintenance work : In the case of cache maintenance under heavy I/O load, pair may be suspended.
So you should reduce I/O load before cache maintenance.

■ **When a failure occurs**

When a failure which prevents a copy among the logical volumes occurs, it places a pair in the “PSUE” status.

When an LDEV failure occurs : It places a pair in the “PSUE” status.
When a PDEV failure occurs : A pairing status is not changed owing to a collection access (single PDEV blockade).

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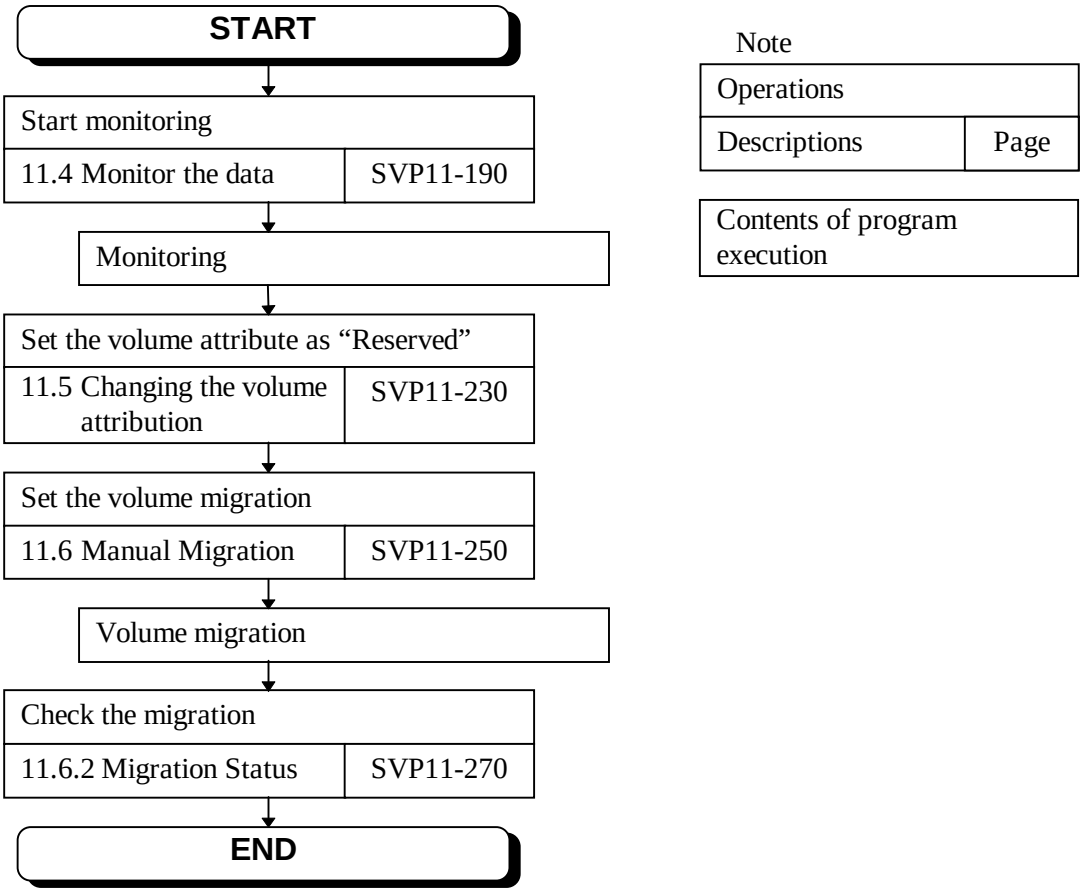
11 HIHSM

11.1 Flowchart of HIHSM operations

11.1.1 Basic Operations

HIHSM (Hitachi Internal Hierarchy Storage Management) is a function that plans and does the volumes migration by the monitoring data. There are two methods about the volume migrations, one is by hand (it is called manual operations) and the other is by automatic (automatic operations) of preset function.
In the case of the manual operations, the program immediately execute the volume migrations. In the case of the automatic operations, the program set the migration schedule and execute the migrations by the schedule.

(1) Manual Operations
We'd like to describe the flowchart of HIHSM's manual operations in the following diagram.



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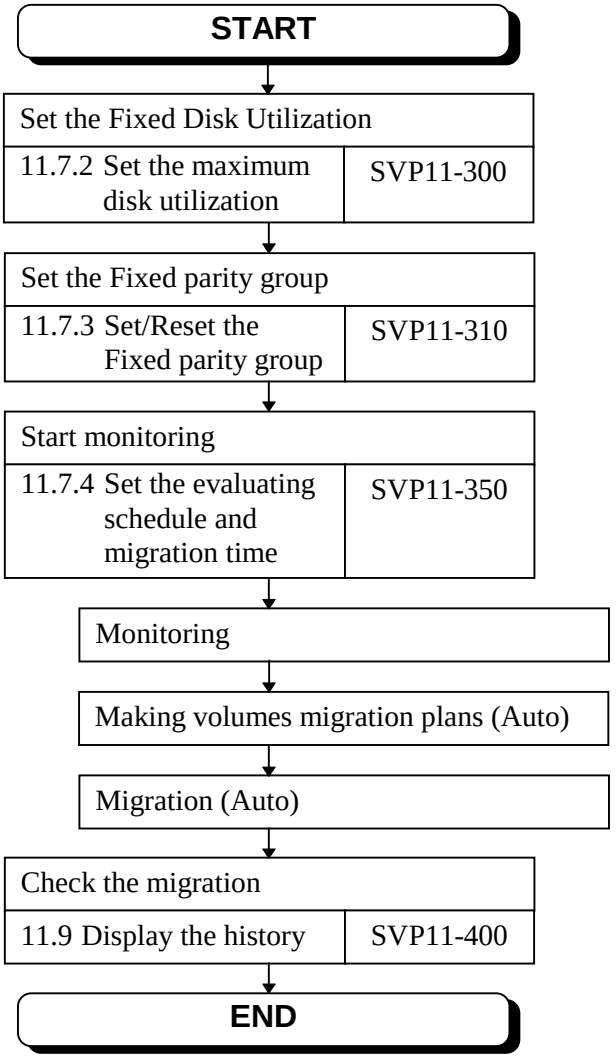
(2) Automatic Operations



Note

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Descriptions	Page
Contents of program execution	

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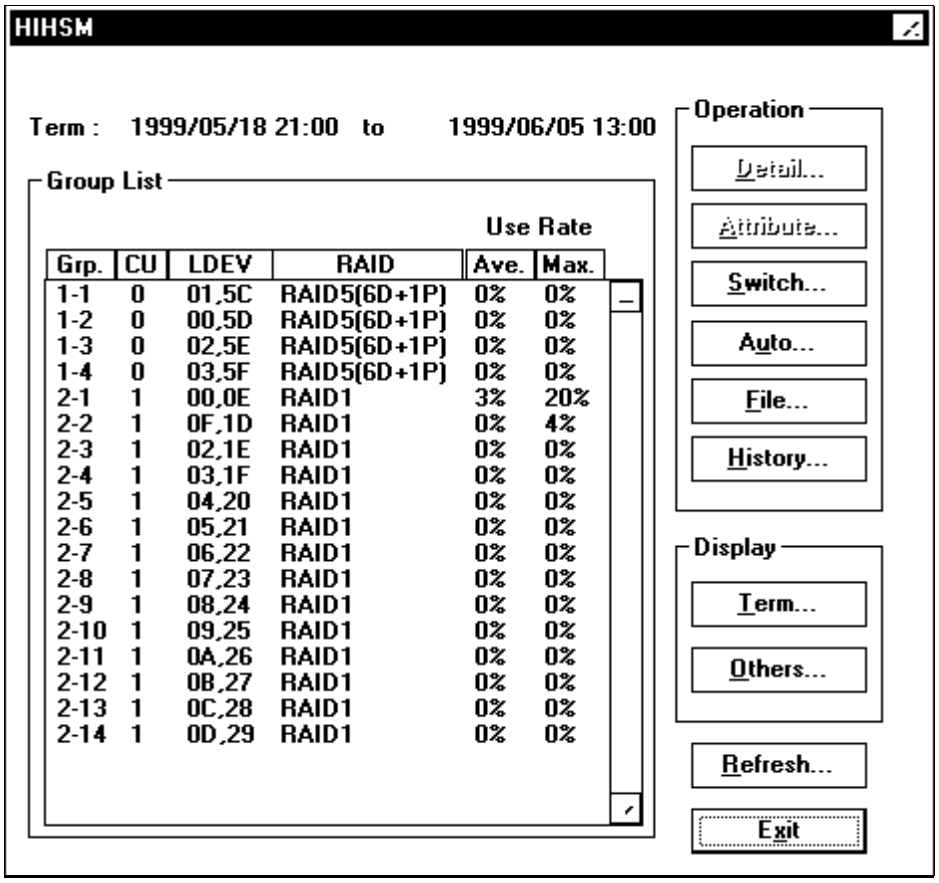
11.2 HIHSM Screens

11.2.1 Main Screen



This screen will be displayed after selecting [HIHSM] button in the function launcher.

(1) Term
Monitoring term which the program displays in this screen. Users can specify the term by selecting [Term].

(2) Group List
Displays the monitoring data by each parity group.

Grp.	Number of the parity group
CU	CU number
LDEV	Logical volume number
RAID	RAID type
Ave. (*1)	Average usage rate in the parity group during the term.
Max.	Maximum usage rate in the parity group during the term.

(*1) After volume migration, precision of the old data before migration will be low.

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(3) Operation buttons

[Detail...]	To operate volume migration by manual (manual operations). After selecting this button, the program will displays the Manual Migration Main screen.
[Attribute...]	To change the volume attribute. After selecting this button, the program will display the Change Attribute screen.
[Switch...]	To set or reset the execution of gathering monitoring data. After selecting this button, the program will display Data Gathering screen.
[Auto...]	To operate volume migration by automatic (Automatic operations). After selecting this button, the program will display Automatic Migration Main screen.
[File...]	To save the monitor data files. After selecting this button, the program will display File Operation screen.
[History...]	To display the operations history. After selecting this button, the program will display History screen.

(4) Display buttons

[Term...]	To set the data term to display. After selecting this button, the program will display Data Term screen.
[Others...]	To display the processor usage rate, bus usage rate, and DRR usage rate. After selecting this button, the program will display Usage screen.

(5) Other buttons

[Refresh...]	To refresh the display data to read the configuration data. After selecting this button, the program will display the last group list.
[Exit]	To exit the main screen.

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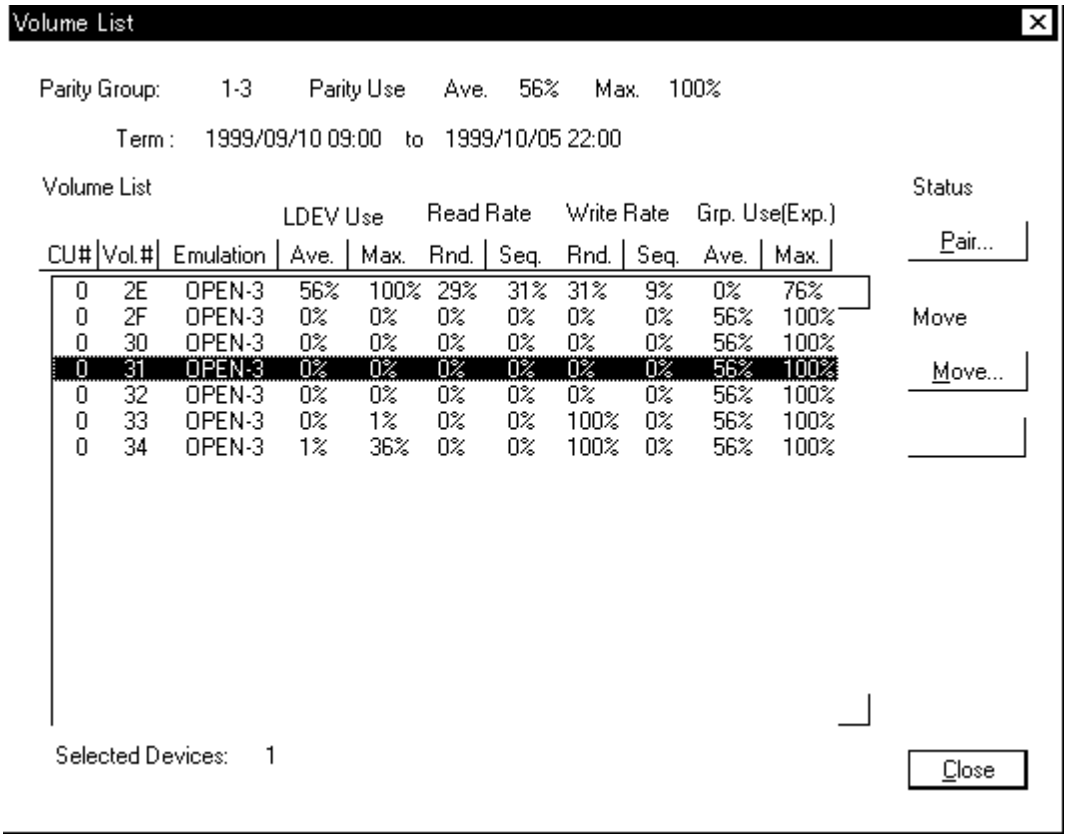
11.2.2 Manual Migration Main Screen

This screen is Manual Migration Main Screen to operate by manual operations.



This screen will be displayed after you select one of the parity group and push [Detail...] button in the main screen. The program will displays the information about your selected parity group.

(1) Information of the parity group

"Parity Group"	Number of the parity group.
"Parity Use"	Usage rate of the parity group.
"Ave."	Average rate of the usage in the parity group.
"Max."	Maximum rate of the usage in the parity group.

(2) Term

Sampling term which the monitoring data is displayed.

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(3) Volume List

In this list, the following information of the volumes in the parity group is displayed.

"CU#"	CU number.
"Vol#"	Logical volume number in the parity group.
"Emulation"	Emulation type of the volume.
"LDEV Use"	Usage rate of the volume.
"Ave."	Average rate of the volume usage.
"Max."	Maximum rate of the volume usage.
"Read Rate"	Read I/O rate.
"Rnd."	Read access rate in random mode.
"Seq."	Read access rate in Sequential Access Mode.
"Write Rate"	Write I/O rate.
"Rnd."	Write access rate in random mode.
"Seq."	Write access rate in Sequential Access Mode.
"Grp.Use(Exp.)	Usage rate of the parity group in the case of that the volume is not installed.
"Ave."	Average rate of the volume usage.
"Max."	Maximum rate of the volume usage

(4) Status button

[Pair...]	To display the status of the volume migration. After selecting this button, the program will display Pair Status screen.

(5) Move button

[Move...]	To migrate the volume. After selecting this button, the program will display Manual Migration Setting screen.
[Delete...]	To stop the volume migration. After selecting this button, the program will display Delete Pair Confirmation screen.

(6) Close button

[close]	To exit this screen. After selecting this button, the program will display Main screen.

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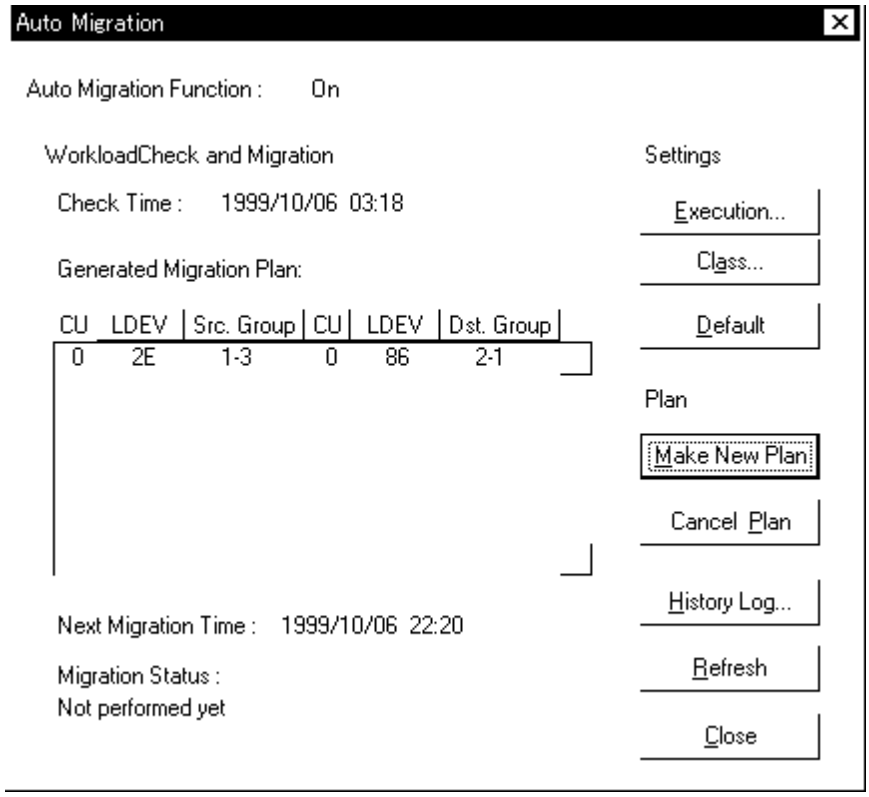
11.2.3 Automatic Migration Main Screen

This screen is Automatic Migration Main screen for automatic operations.



This screen will be displayed after selecting [Auto...] button in the main screen. And, this screen is to operate automatic migration.

(1) Function availability flag

"Auto Migration Function" To set the function to be available(ON) or not available(OFF). After selecting [Execution...] button, the program will display the Automatic Migration Setting screen so that you can set the flag in that screen.

(2) WorkloadCheck and Migration

The screen is displayed the setting status of automatic migration.

"Check Time" The next check time to determine the volume migration plan.

"Generated Migration Plan" Volume migration plan.

- "CU" CU number of the source volume.
- "LDEV" Logical volume number of the source volume.
- "CU" CU number of the target volume.
- "LDEV" Logical volume number of the target volume.
- "Src. Group" Parity group number which the source volume belongs to.
- "Dst. Group" Parity group number which the target volume belongs to.

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"Next Migration Time"	The time to execute volume migration.
"Migration Status"	The status whether the above migration plan is done. Not planed yet : No plan was made. Not peformed yet : Plan has been made but not be executed. Failed to make plan : Could not make a plan. Under migration : HIHSM is migration the volumes. Last migration has canceled (Please see log file) : HIHSM canceled the migration plan. Migration successfully ended. Plan has done : Plan has executed.

(3) Setting button

[Execution...]	To set the detail parameters for volume migration. After selecting this button, the program will display Automatic Migration Setting screen.
[Class...]	To display the class attribution in each parity group. There are three classes according to the installed drive type. After selecting this button, the program will display the Class List screen.
[Default]	To reset the detail parameters for volume migration as default value.

(4) Plan button

[Make New Plan]	To make new migration plan. After selecting this button, the program will make a new migration plan and display the plan in the "Generated Migration Plan" (The program will delete the remain plans). If "Migration Status" is "Under Migration", don't make plan.
[Cancel Plan]	To delete the migration plans in the "Generated Migration Plan".

(5) History button

[History Log...]	To display Automatic migration history screen.

(6) Refresh button

[Refresh]	To refresh the status to read configuration information.

(7) Close button

[Close]	To exit this screen. After selecting it, the program will display the main screen.

Notice: Generated migration plan will be executed at the setting time. Though you delete the plan by selecting [Cancel plan] during the planed migration, the program will not cancel that executing migration.
If you want to cancel those migrations, you should cancel the volume migrations one by one manually.

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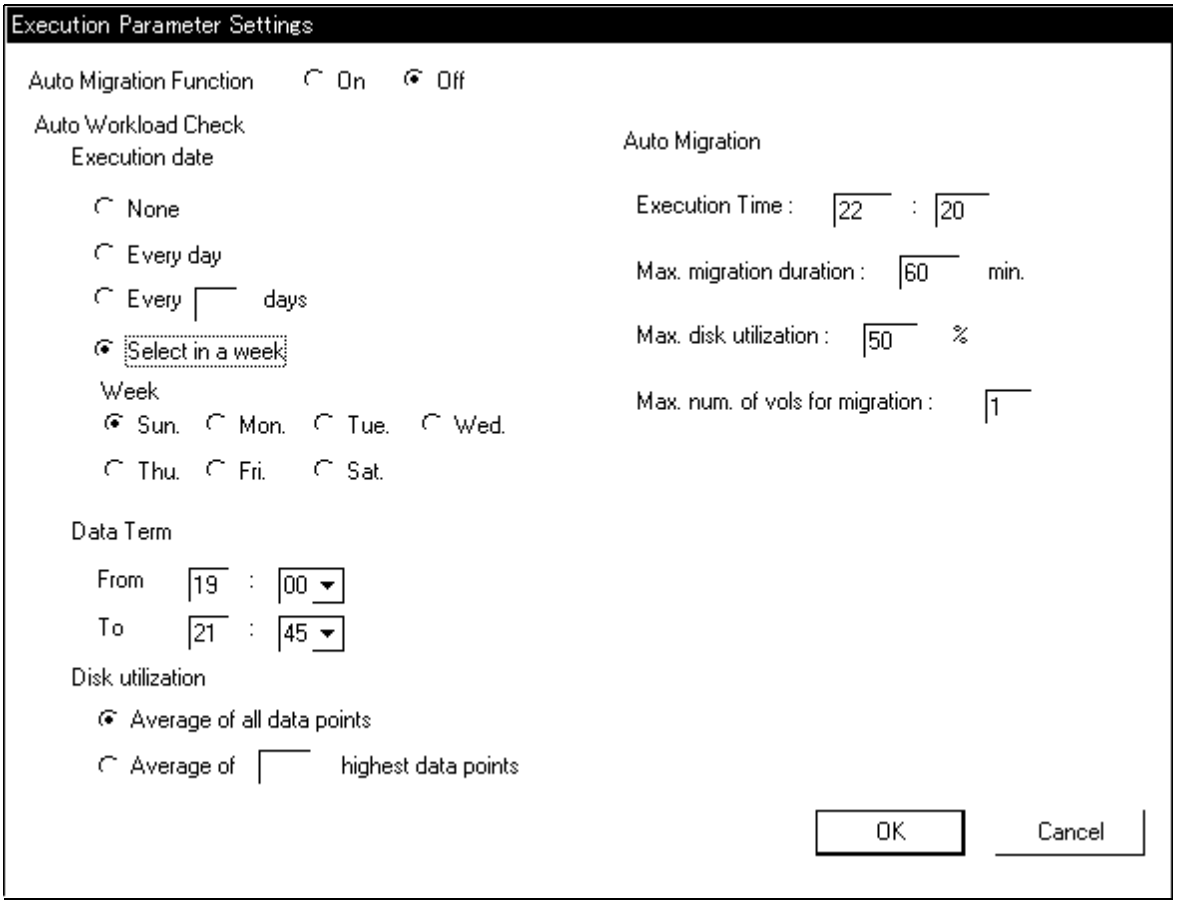
11.2.4 Automatic Migration Setting Screen



This screen is to set the automatic migration function (Preset function). After selecting [Execution...] button in the HIHSM main screen, this screen will be appeared.
Notice: You should set the monitoring switch to ON before using this function.

(1) Auto Migration Function
To set the automatic migration function to be available or not.
ON : Available to execute automatic migration.
OFF : Not available to execute automatic migration.

(2) Auto Workload Check
To set the monitoring term. The monitor data will be used whether the migration will be executed or not. The following three data you should set.
(a) Execution date
(b) Date Term
(c) Disk Utilization

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(a) Execution date

To set date to make a plan. The next "Data Term" is the monitoring term which the program uses to make a plan, and you can set the hours in this day.

None	: Not making a plan. If old plan is remain, the program will execute the migration using by the plan.
Every day	: Execute in every day.
Every [x]days	: Execute in every other x days. You should input x. (Value: 2 – 31days)
Select in a day of the week	: Execute in a day of the week. If you check it, please select a day of the week.

(b) Data Term

To set the hour of the day which monitoring data the program uses to make a plan. (*1)

From	Starting time of monitor data to make a plan. (Value: 0 – 23; 0, 15, 30, 45)
To	Ending time of monitor data to make a plan. (Value: 0 – 23; 0, 15, 30, 45)

(c) Disk Utilization

To set the determination point to make a plan. If the program determine to execute migration at that point, the program will make a plan.

Average of all data points	: To determine by using average usage rate against all sampling points.
Average of [x] higest data points	: To determine by using the average of the [x]th highest usage.

(3) Auto Migration

To set the migration schedule to execute migration.

Execution Time (*2)	: Starting time of migration. (Program executes at the same time in every day)
Max. migration duration	: Your available migration term. If the program could not finish migrating during this duration, the program will stop migrating. (Value: 10 – 120 min)
Max. disk utilization	: To set the maximum disk usage rate. If the usage is over the Maximum disk utilization during migration, the program will stop the migration. (Value: 10 – 100%)
Max. num of vols for migration	: To set the number of the migration volumes at the same migration term. (Value: 1 – 20 vols)

(*1) Automatic reboot or automatic data gathering should not be set in the following duration.
  (i) from the end of the target term to an hour.

(*2) (a) Automatic reboot or automatic data gathering should not be set in the following duration.
  (i) 15 minutes before starting making the plan (15 + Migration time)
  (ii) 30 minutes after starting making the plan
  (b) Time when the plan is made is not within the duration from 15 minutes before the target term (15 + Migration time) to one hour after the term.

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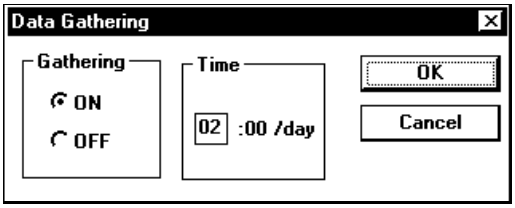
11.2.5 Data Gathering Screen

This screen will be displayed when you select [Switch...] button in the main screen. In this screen, you can set the start time of monitoring, the end time of monitoring, and time of gathering monitoring data.

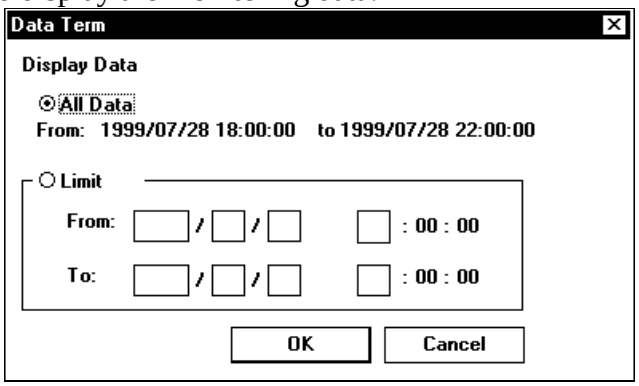


NOTICE

1. During data gathering, “Statistics Data Reading...” is displayed.
2. When maintenance is done during data gathering or data gathering starts during maintenance operation, maintenance is executed prior to data gathering. Then SVP stops data gathering temporarily but it will retry 15 minutes later. All the time “Statistics Data Reading...” remains displayed.

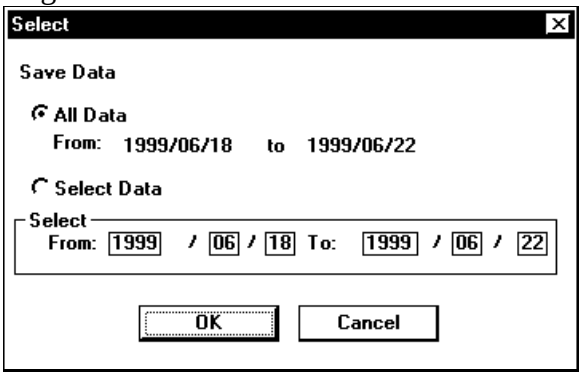
11.2.6 Data Term Screen

This screen will be displayed after selecting [Term...] button in the main screen.
You can set the term to display the monitoring data.



11.2.7 File Operation Screen

This screen will be displayed after selecting [File...] button in the main screen.
You can save the monitoring data into the FD.



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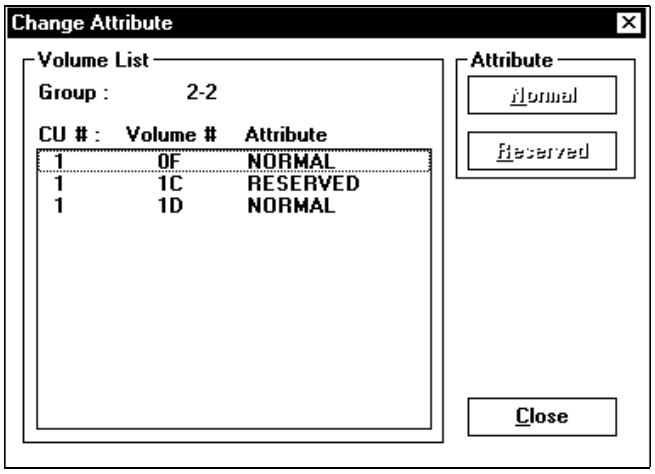
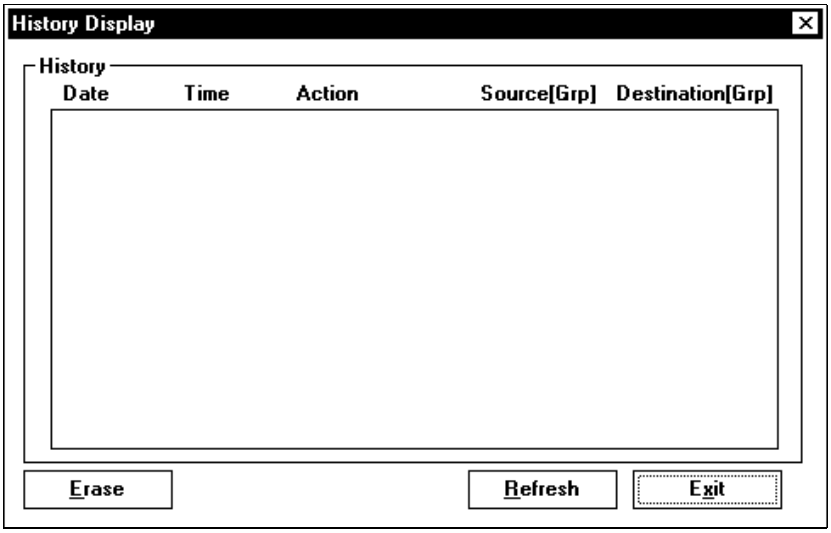
11.2.8 Change Attribute Screen

This screen will be displayed after selecting one of the parity group and pushing [Attribute...] button. You can change the volume attribution.



11.2.9 History Screen

This screen will be displayed after selecting [History...] button in the main screen. You can refer to the previous operations in this screen.



The following items are displayed in the Action.

Migration Start	: Started migrating volumes.
Migration Complete	: Migration was finished.
Migration Cancel	: Migration was canceled.
Migration Failed	: Migration was failed.
Migration Give Up	: Migration was gave up.

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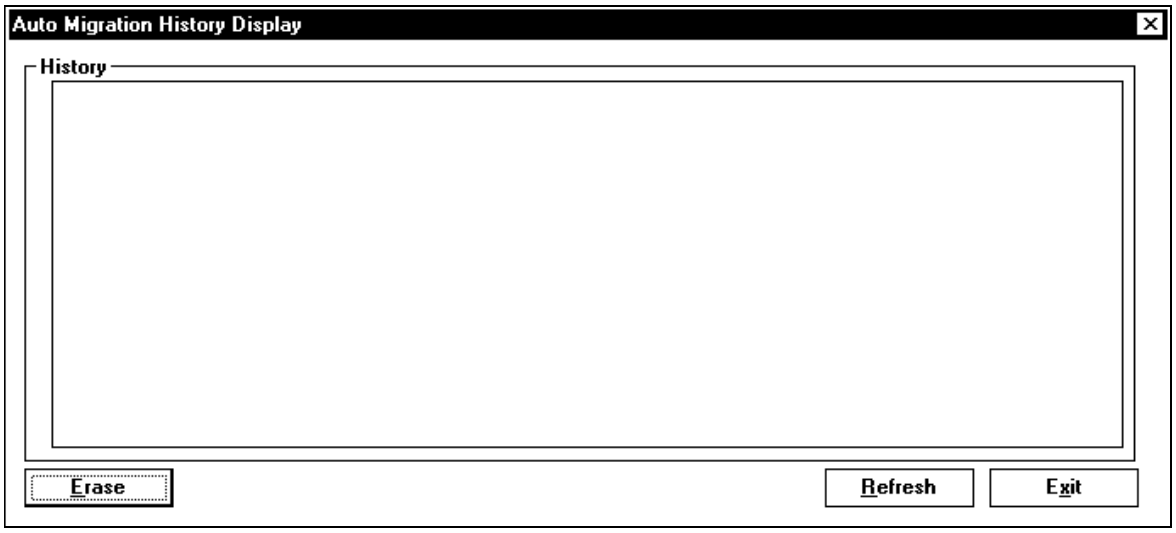
11.2.10 Automatic Migration History Screen

This screen is to display a history for automatic function and displayed by selecting [History Log...] button in the Automatic Migration Main Screen.



(1) Normal end of migration

"Migration Complete (CU:LDEV->CU:LDEV) Start:yyyy/mm/dd hh:min:sec -> End:yyyy/mm/dd hh:min:sec"
(a) (b) (c) (d)

(a) Original logical device (source volume)
(b) Target logical device (target volume)
(c) Copy start time
(d) Copy end time

(2) Cancel the migration (over the limit duration)

"Migration Canceled (CU:LDEV->CU:LDEV) Start:yyyy/mm/dd hh:min:sec -> End:yyyy/mm/dd hh:min:sec"
(a) (b) (c) (d)

(a) Original logical device (source volume)
(b) Target logical device (target volume)
(c) Copy start time
(d) Copy end time

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(3) Cancel the migration (other reason)

"Migration Canceled (CU:LDEV->CU:LDEV) yyyy/mm/dd hh:min:sec (XXXXXXXXXXXX)"
(a) (b) (c) (d)

(a) Original logical device (source volume)
(b) Target logical device (target volume)
(c) Canceled time
(d) Reason :

No Reserve Volume	: No reserved volume is set. Please make the other plan again.
Reserve Volume Emulation is different	: The reserved volume's emulation type is different.
Utilization Check	: The usage rate is over the limited rate. Or there is no monitoring data
Migration failed. Error Code:XXXX	: The indication of the migration was failed
Reserve Volume Size is different	: Reserve volume size is different.
Reserve Volume emulation is not supported	: The emulation type of reserved volume is not supported.
Utilization Check failed	: The check of the utilization rate finished abnormally.
Reserve Volume Check failed.	: The check of the reserved volume finished abnormally.

(4) Cancel the migration (Invalid Parity Group)

"Migration Canceled (CU:LDEV (X-X)->CU:LDEV (X-X)) yyyy/mm/dd hh:min:sec (Invalid Parity Group)"
(a) (b) (c) (d) (e)

(a) Original logical device (source volume)
(b) Parity group including the source volume.
(c) Target logical device (target volume)
(d) Parity group including the target volume.
(e) Canceled time.

(5) Deleted the migration plan (A migration plan was deleted because the previous plan had been deleted.)

"Migration Plan deleted (CU:LDEV->CU:LDEV) yyyy/mm/dd hh:min:sec (Pre-Plan is deleted)"
(a) (b) (c)

(a) Original logical device (source volume)
(b) Target logical device (target volume)
(c) Canceled time

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(6) Making plan

(i) Start making a plan

"yyyy/mm/dd hh:min : MakePlan function starts"
(a)

The program starts making a plan
(a) Start time

(ii) End making a plan

"yyyy/mm/dd hh:min : MakePlan function finishes"
(a)

The program ends making a plan
(a) End time

(iii) The number of made plans

"X plans are output"
(a)

The program outputs the x number of plans.
(a) The number of output plans

(iv) Contents of made plan

"PlanXXX: Src Hdev CU:LDEV in Grp X-X, Dst Hdev CU:LDEV in Grp X-X"
(a) (b) (c) (d) (e)

The program made the plan.
(a) Plan number
(b) Original volume (source volume)
(c) Parity group including the source volume
(d) Target volume
(e) Parity group including the source volume

(7) Failed making the plan

(i) Failed making the plan.

"yyyy/mm/dd hh:min : MakePlan is terminated by error: XXXXXXXXXX"
(a) (b)

The program failed to make plans.
(a) End time
(b) Failed reason (Refer to the following items)

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Cannot make a proper plan
[Message] Cannot make proper migration plan by this function
[Contents] The program could not make a proper migration plan.
[Action] Check the number of the reserved volumes and their locations.
Check the limit number of disk utilization and change if necessary.

Lack of data
[Message] Not enough HIHSM data in the workload check term
[Contents] The program did not have enough data to make the plan in the target term.
[Action] Check the monitored data and gather them again if necessary.
Check the workload check term.

Failed to get the information
[Message] Failed to get XXXXXXXXXX
(c)
[Contents] The program failed to get the information or data to make a plan.
(c) The kind of information or data.
[Action] In the case of information : Make the initial value again by selecting [Default].
In the case of data : Check the status of gathered data and get them again.

Failed to write the information.
[Message] Failed to write to XXXXXXXXXX
(c)
[Contents] The program failed to write the information to make a plan.
(c) The kind of information.

Invalid information / data
[Message] Invalid XXXXXXXXXX
(c)
[Contents] The program need the information to make the plan , but could not use it because the information was invalid.
(c) The kind of information / data
[Action] In the case of information : Make the initial value again by selecting [Default].
In the case of data : Check the status of gathered data and get them again.

Failed to allocate the memory
[Message] Memory allocation error
[Contents] The program failed to allocate the memory to make the plan.

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(8) Report the additional information

(i) history that the plan could not be made

"Cannot make plan: Class X Grp X-X"
(a) (b)

The plan of a certain group in the indicated class could not be made.
(a) Class
(b) Parity Group

(ii) Some samples were invalidated

"X samples are invalidated because of migration"
(a)

To reduce the influence of migration in the workload check term, the program made a plan without some samples.
(a) The number of invalidated samples

(iii) Add some volumes.

"new entries are added for following HDEVs: CU:LDEV, CU:LDEV, ..."
(a)

According to changing the volume configuration, the program added the information against those added volumes.
(a) Added volumes

(iv) Invalid data

"too many invalid data: invalidated all data"
The contents of data in the indicated group or volumes is invalid. The program made a plan without those data.

(9) Chech the migrating volumes.

(i) Failed to check the volume utilization.

"Utilization Check failed"
The program failed to check the volume utilization because it could not get the necessary data in this check. Please get the data again.

(ii) Failed to check the reserved volumes

"Reserve volume Check failed"
The program failed to check the volume attributions. The program could not get the necessary information.

Notice: Auto Migration History function determines to record whether the Auto Plan is executed or not.
If you want to see the actual migration history, please refer to Main History.

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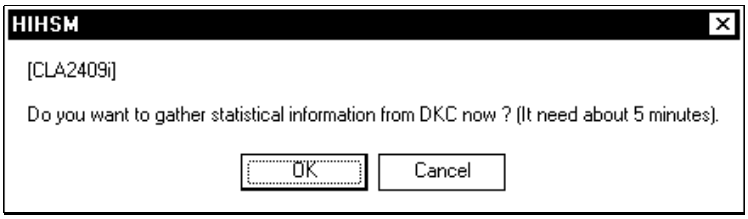
11.3 Start HIHSM

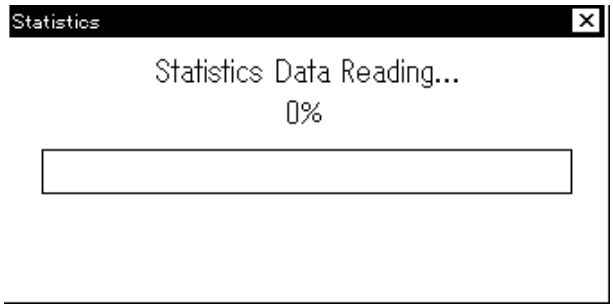
You can start "HIHSM" funtion to select "HIHSM" button in the Function Launcher screen. After selecting the button, the program will display a message about a monitoring data. If you have already started monitoring function, you can get those monitoring data. Please refer to "Monitor the data" for more detail description.

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.

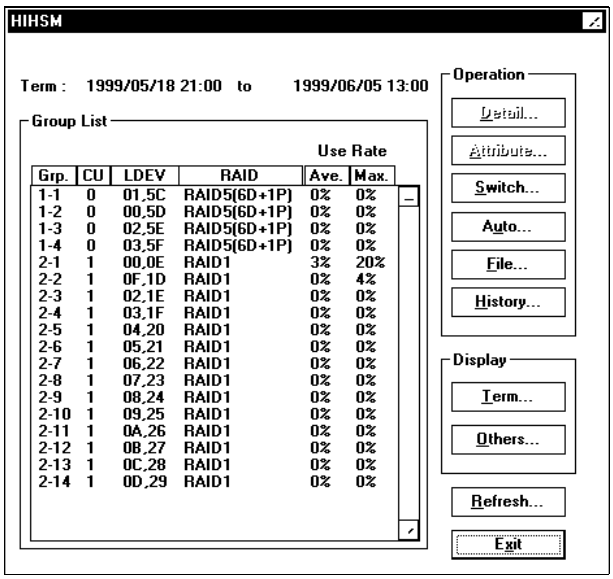
(2) Display a messa ge
The program will display the following message. If you have already started monitoring, please select [OK]. The program will start gathering the monitoring data. If you do not start, please select [Cancel]. You can go to the HIHSM's main screen.



(3) Gathering the d ata
The program is gathering the data. After finishing, the HIHSM's main screen will be displayed.



(4) Display HIHSM's main screen
The prgraom will display the main screen.



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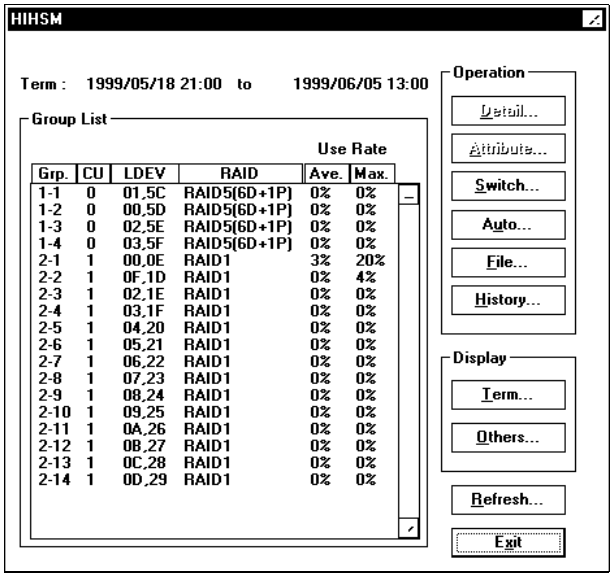
11.4 Monitor the data

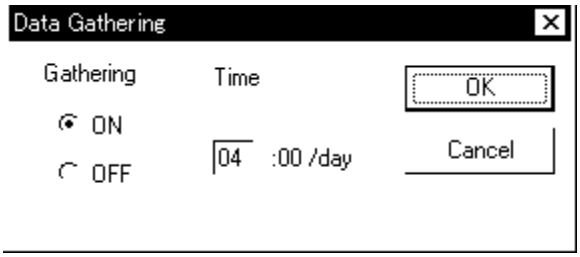
11.4.1 Start monitoring

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.

(2) Operation in the main screen
Select [Switch...] button in the main screen.



(3) Operation in the Data Gathering screen
Select [On] in the Data Gathering screen and input the time to gather the data. After, select [OK].



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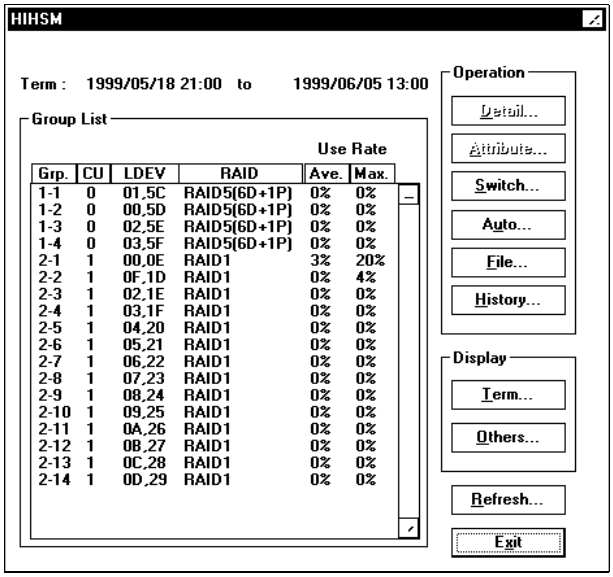
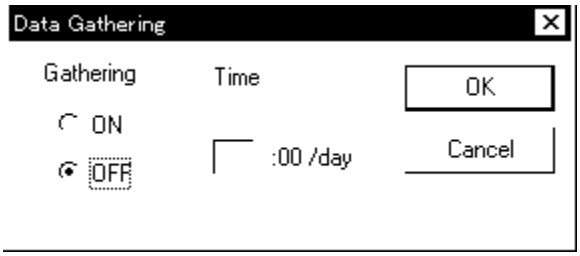
11.4.2 Stop monitoring

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.

(2) Operation in the main screen
Select [Switch...] button in the main screen.



(3) Operation in the Data Gathering screen
Select [Off:] in the Data Gathering screen and select [OK].



Notice: If you select [Off], the monitoring data which has not be read will be deleted. If you need these data, please exit this HIHSM function and restart again.

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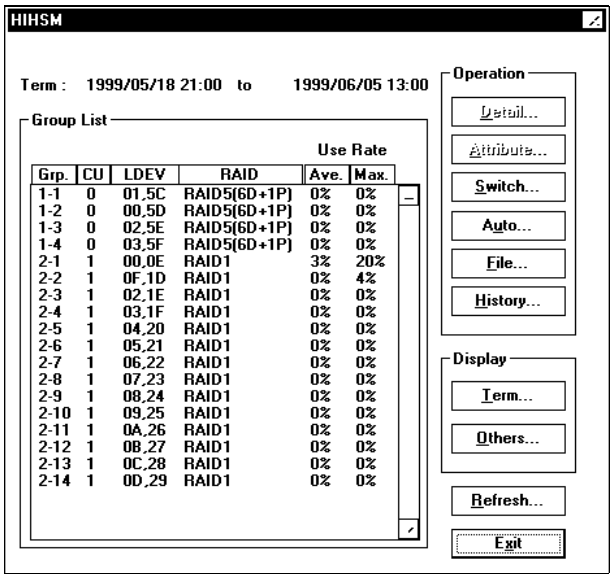
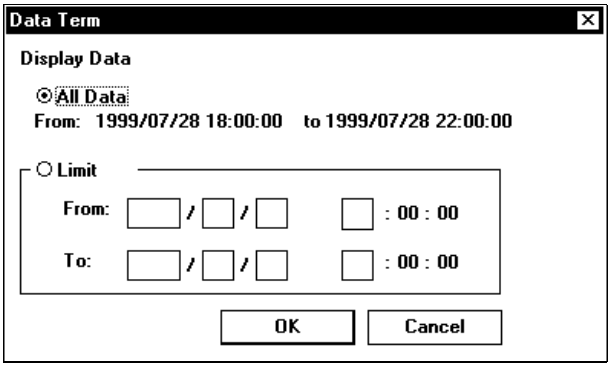
11.4.3 Set the term to display the monitoring data

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.

(2) Operation in the main screen
Select [Term...] button in the main screen.



(3) Set the term to display the monitoring data
Data Term Screen is displayed. You can do one of the following operations.
(a) If you want to display all monitoring data
Please select “All Data” and select [OK]. The program will display the all monitoring data.
(b) If you want to display some monitoring data
Please select “Limit” and input the term which is From data and To data.
After inputting the term, please select [OK].
The program will display your inputted term of monitoring data.



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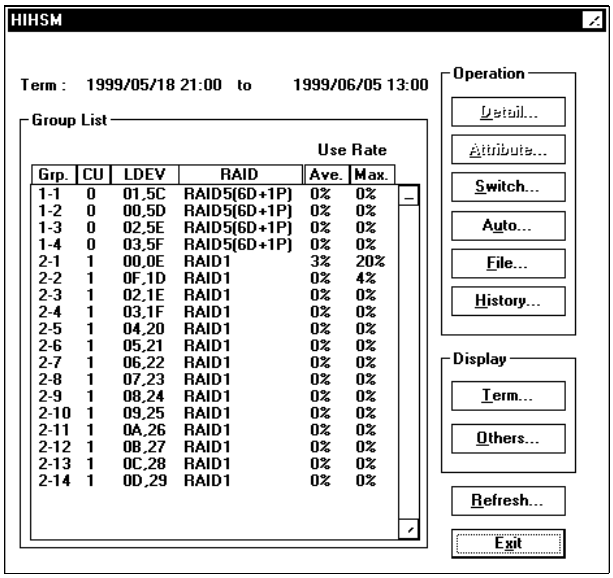
11.4.4 Save monitoring data to FD

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.

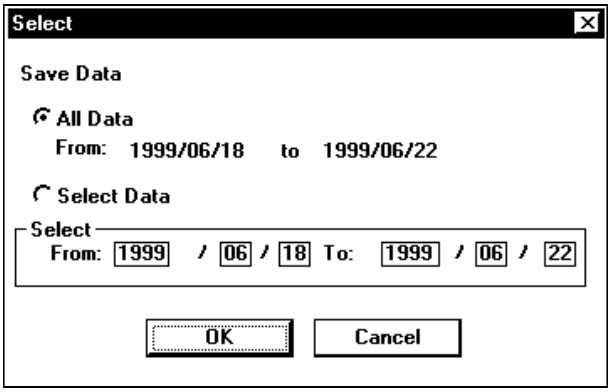
(2) Operation in the main screen
Select [Switch...] button in the main screen.



(3) Operation in the File Operation screen
File Operation Screen is displayed. You can select one of the operations.

(a) If you want to save all monitoring data
Please select “All Data” and select [OK]. The program will save the all monitoring data into the FD.

(b) If you want to save some of the all monitoring data
- Select “Select Data” and input “From” date and “To” date
- Select [OK]. The program will save your selected monitoring data into the FD.



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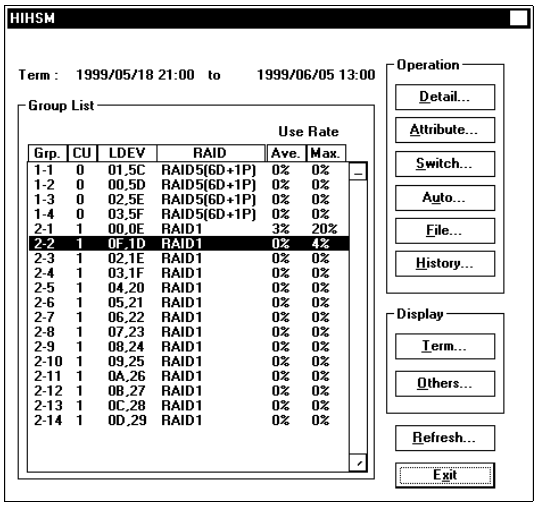
11.5 Changing the volume attribution

11.5.1 Changing the volume attribution to “Reserved”

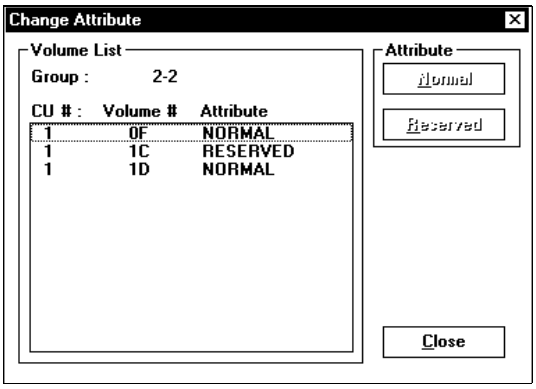
There are “Normal” and “Reserved” attributions. The normal volumes has the “Normal” attribution. Before executing the volume migration, you should decide the target volumes changing the volume attributions as “Reserved”.
In this section, the operation to change the attribute will be described.

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.

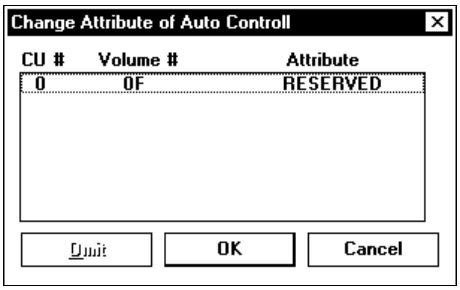
(2) Select parity group
Select one of the parity group in the Group List and push [Attribute...].



(3) Set the attribute as “Reserved”
Change Attribute screen is displayed.
Select the volume in the Volume List and push [Reserved] button.



(4) Confirm the attribution
The program displays the list of your setting attribution.
If you want to set, please the select [OK].
If you want to delete one of then, please select it in the list and select [Omit]. The program will delete it from the list.
If you want to cancel, please select [Cancel].



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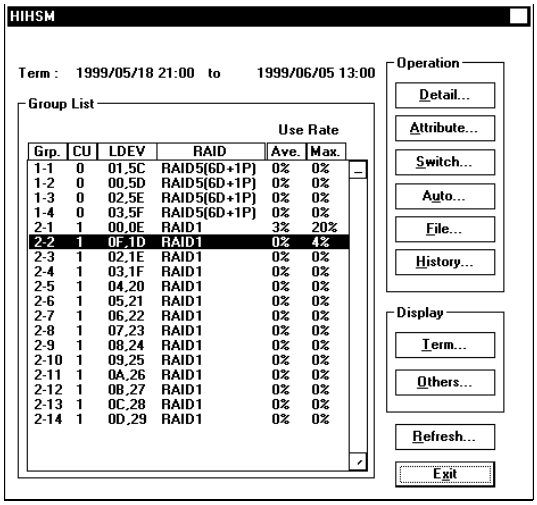
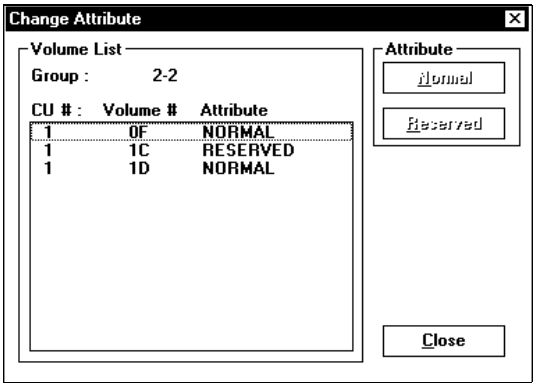
11.5.2 Changing the volume attribute to “Normal”

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.

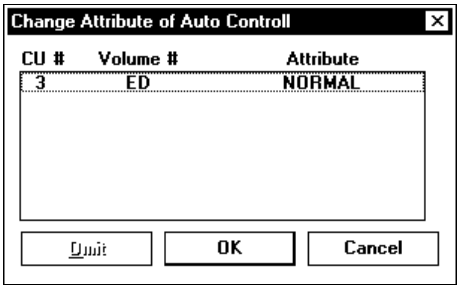


(2) Select parity group
Select one of the parity group in the main screen and push [Attribute...] button.

(3) Set the attribute
Change Attribute screen is displayed.
Select the volume in the Volume List and push [Normal] button.



(4) Confirm the attribution
The program displays the list of your setting attribution.
If you want to set, please the select [OK].
If you want to delete one of then, please select it in the list and select [Omit]. The program will delete it from the list.
If you want to cancel, please select [Cancel].



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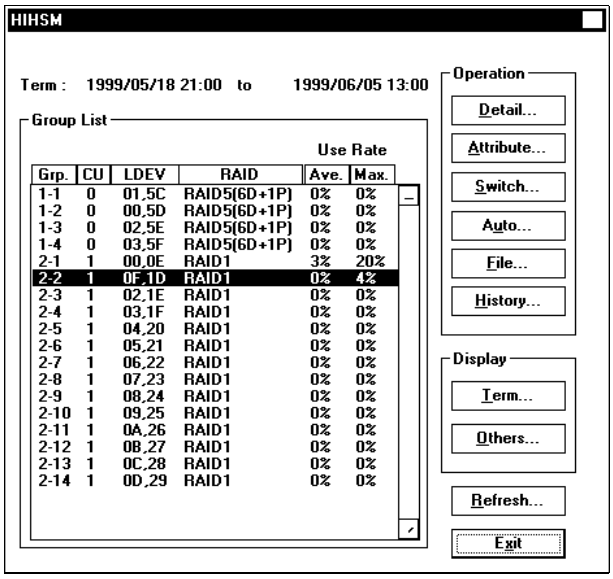
11.6 Manual Migration

If you want to refer the migrate LDEV number in the group after finishing the volume migration by SVP or Remote Console, you should refer to “Refer Configuration” in “Install” function to get the latest configuration information.

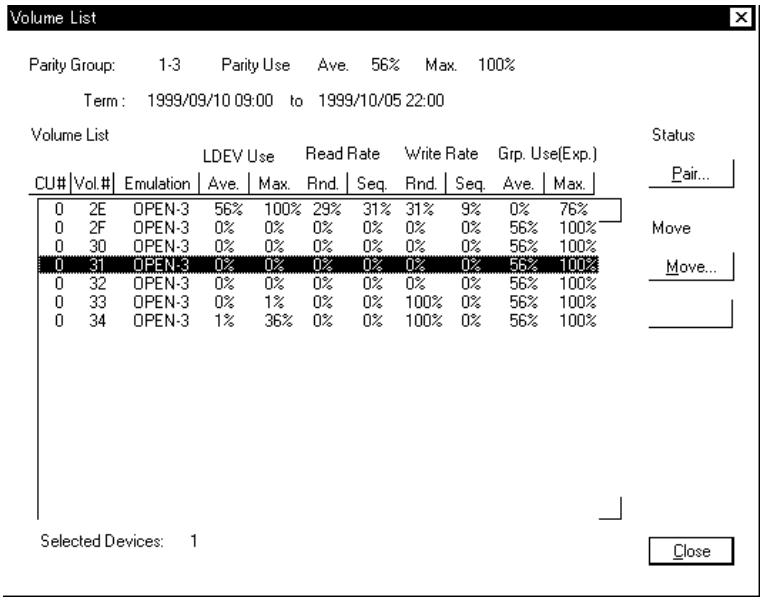
11.6.1 Manual Migration

(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.



(2) Operation in the main screen
Select one of the parity group which you want to migrate, and push [Detail...] button in the main screen.

(3) Select the volume
Manual Migration Main screen will be displayed.
Select a volume and push [Move...].



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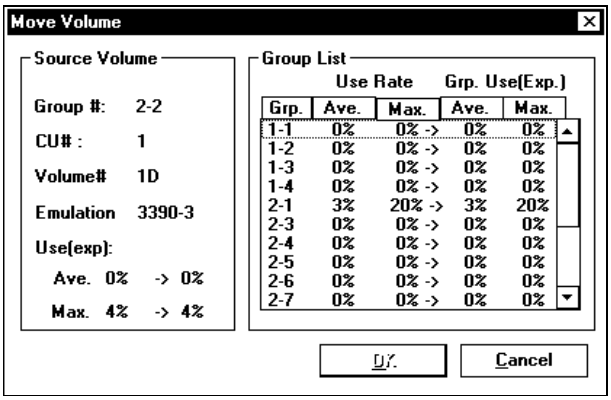
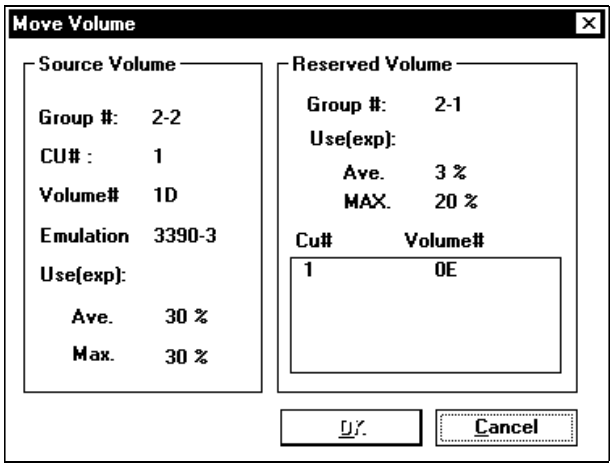
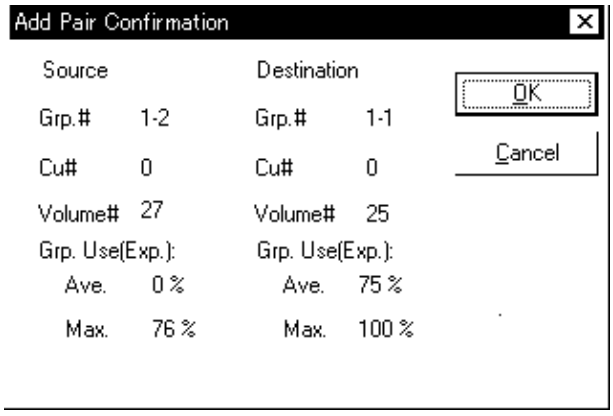
(4) Select the target parity group
Manual Migration Setting screen will be displayed. In this screen, the actual volume usage rate and the estimated volume usage after migration are displayed.
Please check the estimated rate.
Select the target parity group and push [OK].



(5) Select the target volume
The program displays the reserved volume list.
Select the target volume from the reserved volume list and push [OK].



(6) Confirm the migration
The program displays the source volume and the target volume with the usage rate.
Please confirm them and select [OK]. The program will start executing the migration. If you do not want to execute, select [Cancel].



(7) Check during the migration
If you want to check the migration status, please refer to “Migration Status” section.

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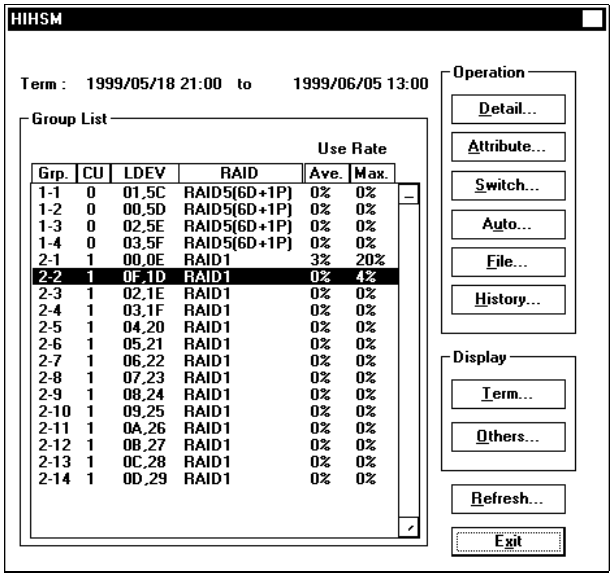
11.6.2 Migration Status

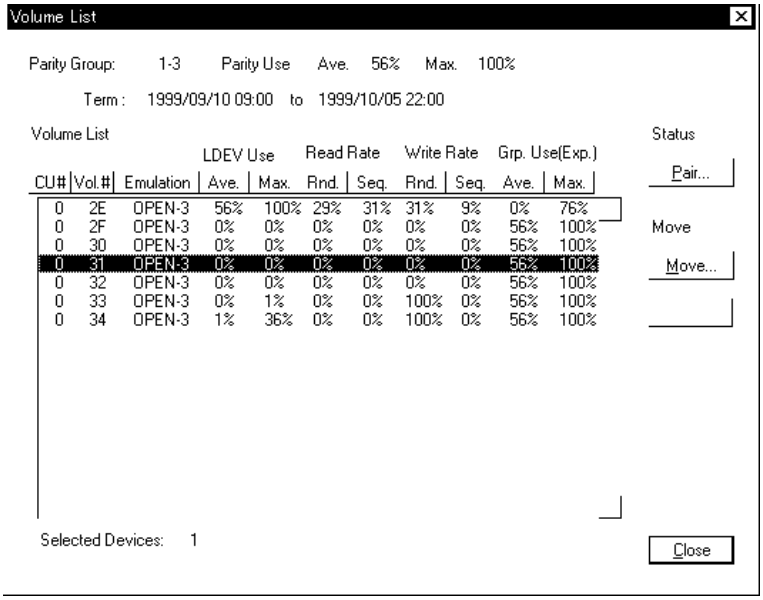
(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.



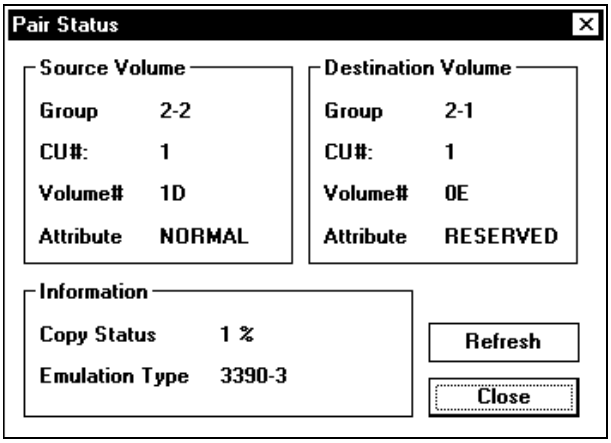
(2) Select parity group
Select one of the parity group which you want to refer to volume migration, and push [Detail...] button in the main screen.

(3) Select volume
Manual Migration Main screen is displayed.
Select one of the volume and push [Pair...] button.

Notice: Migration volumes are indicated as "*" in the left side.



(4) Check the status
The source and target volumes are displayed with the migration status. Please continue selecting [Refresh] to get the last status.



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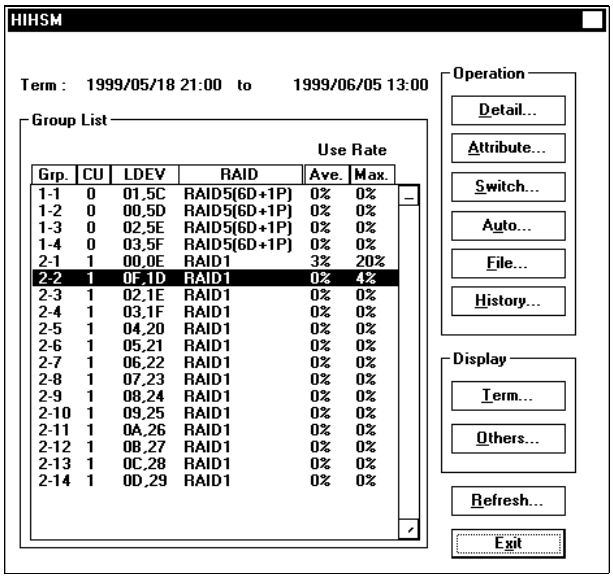
11.6.3 Stop migration

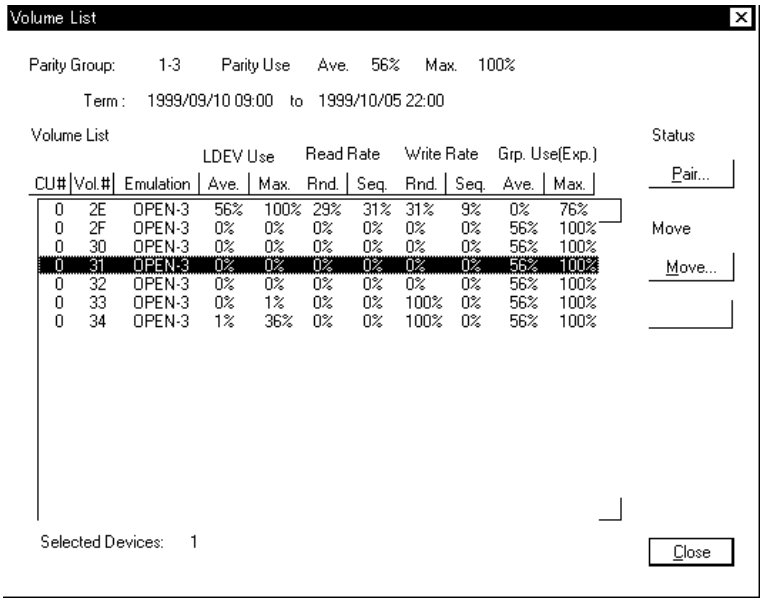
(1) Start HIHSM
Select [HIHSM] button in the Function Launcher screen.



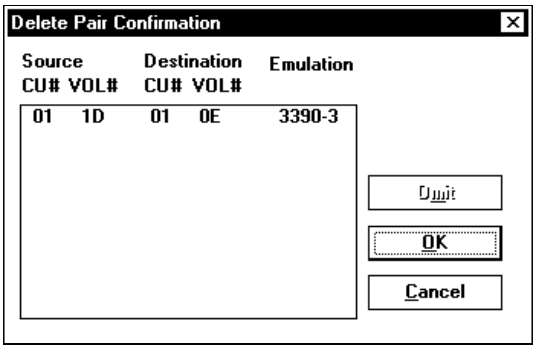
(2) Select parity group
Select one of the parity group which you want to refer to volume migration, and push [Detail...] button in the main screen.

(3) Select volume
Manual Migration Main screen is displayed.
Select one of the volume and push [Delete...] button.

Notice: Migration volumes are indicated as "*" in the left side.



(4) Confirmation
Your selected volumes which you want to stop the migration are displayed in the volume list.
Please confirm them.
If you want to stop the migration, please select [OK].
If you do not want, please select [Cancel].
If you want to remove the volumes from the volume list, please select the volumes and push [Omit]. The volume is deleted from the volume list ,which means that your omitted volume does not stop the migration. After selecting [OK], the program will stop the migration against the volumes in the list.



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11.7 Automatic Migration

In the case of this automatic migration, the program automatically selects the volumes to migrate by using the following maximum disk utilization value.
The idea of these threshold control are described in the "Preset function". Please refer to it more detailed description.

11.7.1 Classification according to each disk type

The program automatically classifies according to each disk type. The following table are described the detailed desk type classification.

(1) Desk type classification
The program determines a class by the disk type (disk performance).

Disk Type	Order
DK306	5
DK308	4
DK309	3
DK30A	2
DK3F1	1
DK3F2	0

low performance

high performance

(2) Relationship between the installed disk types and those classes
The program assigns the highest performance disk type as Class A, and the lower performance type as Class B,C,D,E,F. The program assigns maximum 6 classes according to the disk types. But these classes are depend on the installed disk types. The following tables are examples of these classified result.

Example 1

Installed type	Order	Assigned Class
DK3F2	0	Class A
DK30A	2	Class B
DK308	4	Class C

Example 2

Installed type	Order	Assigned Class
DK309	3	Class A
DK308	4	Class B

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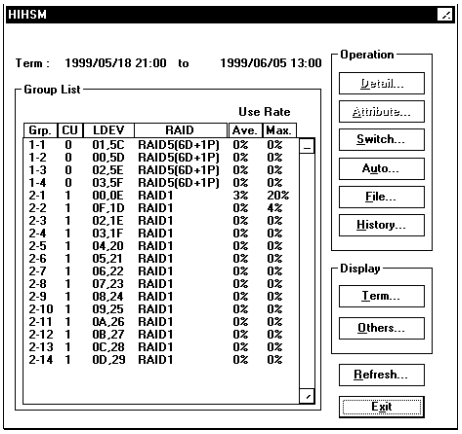
11.7.2 Set the maximum disk utilization

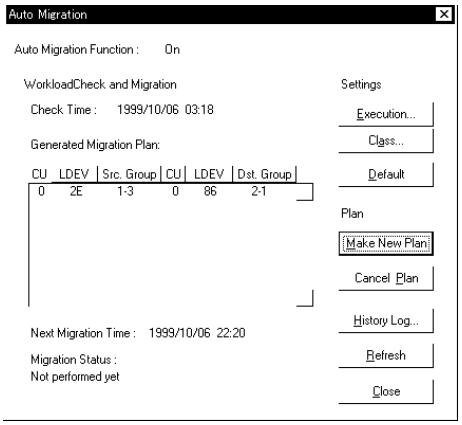
Set the maximum disk utilization for each class

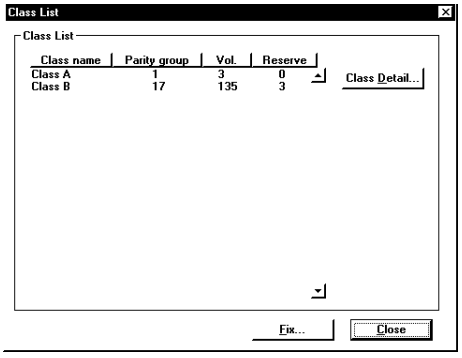
(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.



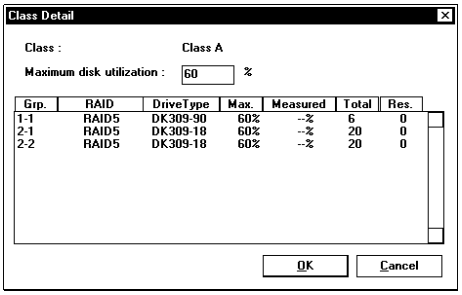
(2) Operation in the main screen
Select [Auto...] button in the main screen.

(3) Operation in Auto Migration scren
Select [Class...] button in the Auto Migration screen.
And select “Class Name”, push [Class Detail].





(4) Set the maximum disk utilization
In the Class Detail screen, input the value in the “Maximum disk utilization” field.
After inputting, select [OK].



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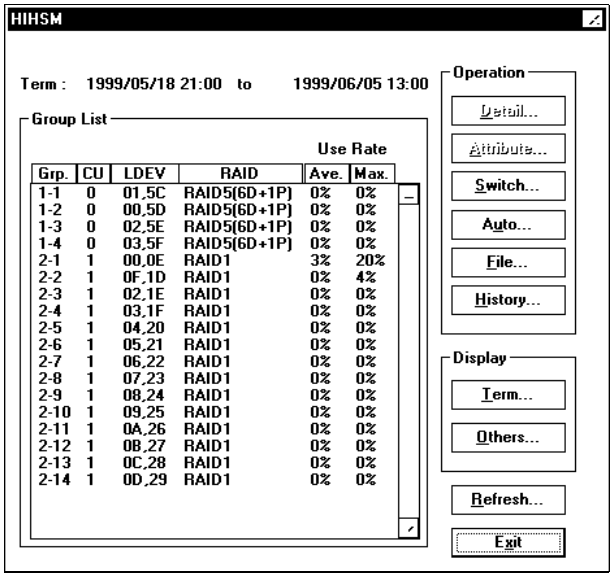
11.7.3 Set/Reset the Fixed parity group

Fixed parity group is the volume group that is not selected as the automatic volume migration. If you want to remove some parity group from the automatic volume migration, you should set them as the fixed parity group before executing automatic migration.

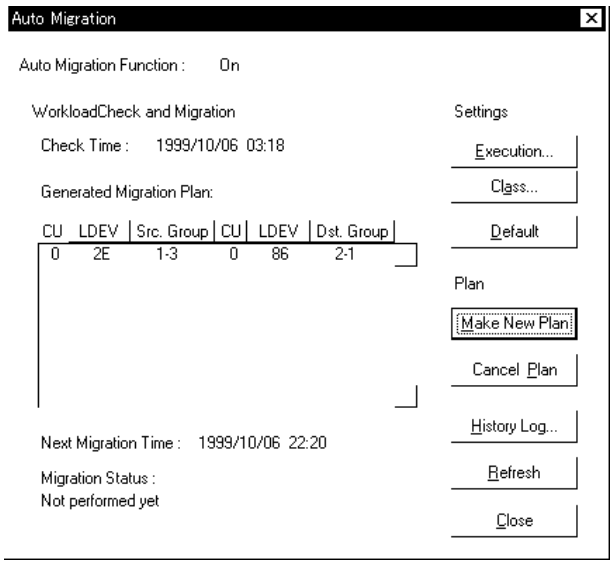
Set the fixed parity group.

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.



(2) Operation in the main screen
Select [Auto...] button in the main screen.

(3) Operation in the Automatic Migration Main screen
Automatic Migration Main screen is displayed.
Please select [Class...] button.



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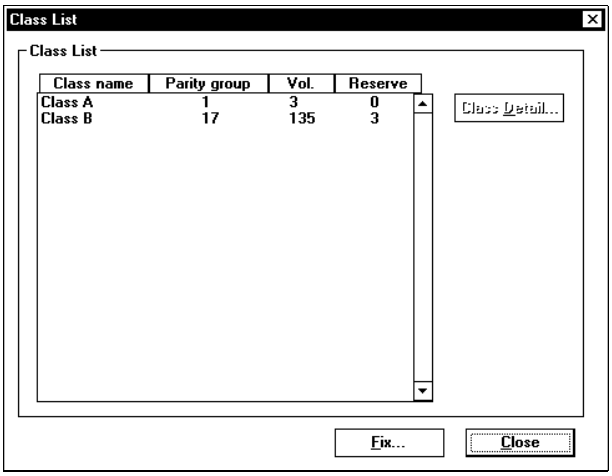
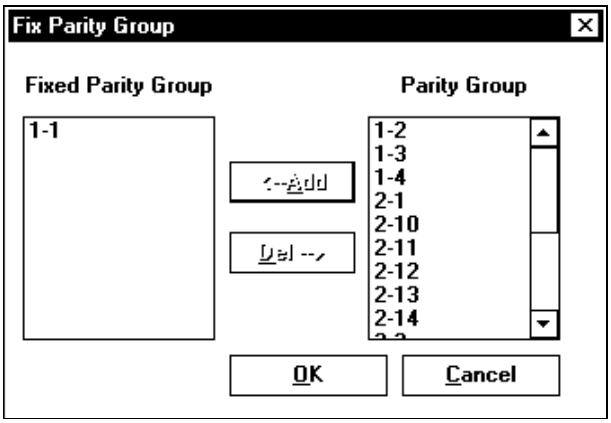
(4) Operation in the Class List screen
Select [Fix...] button in the Class List screen.



(5) Select Fixed parity group
Select the group which you want to fix from the Parity Group list and [<-Add] button. After selecting, the selected parity group will move to the Fixed Parity Group list.
If you want to reset the fixed parity group, please select the group from the Fixed Parity Group and push [Del->] button. After selecting, the selected parity group will move to Parity Group list.
If you want to set, please select [OK]. The program will set the group in the Fixed Parity Group list as the Fixed parity group.



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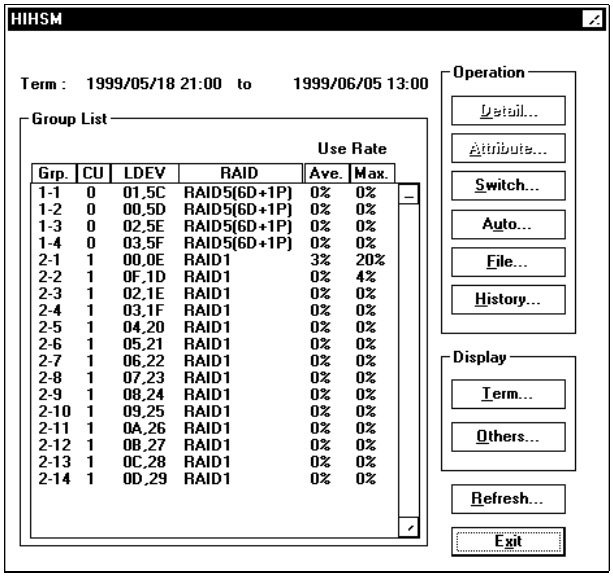
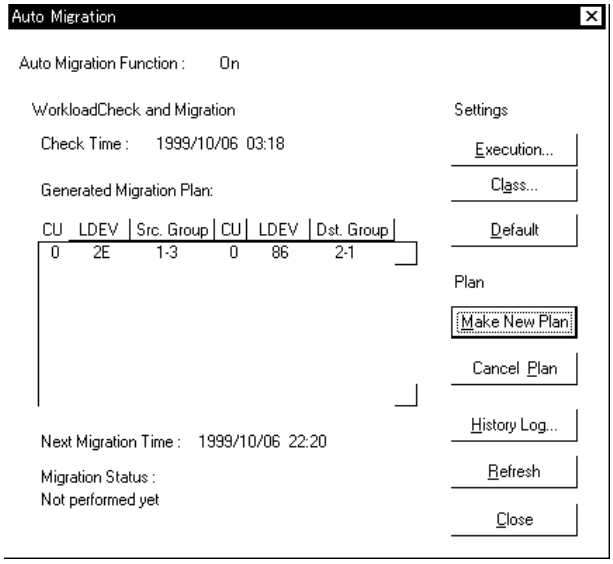
Reset the fixed parity group.

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.



(2) Operation in the main screen
Select [Auto...] button in the main screen.

(3) Operation in the Automatic Migration Main screen
Automatic Migration Main screen is displayed.
Please select [Class...] button.



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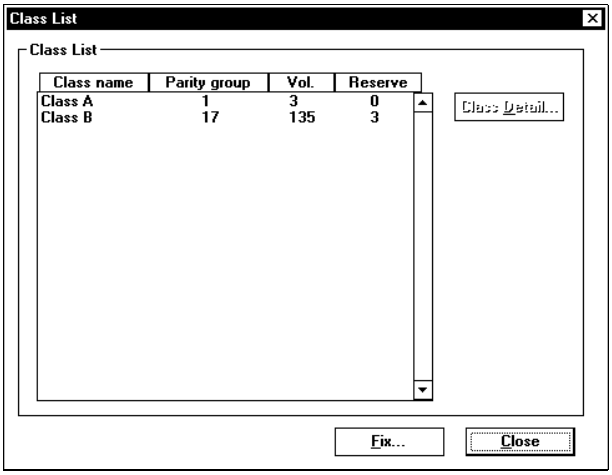
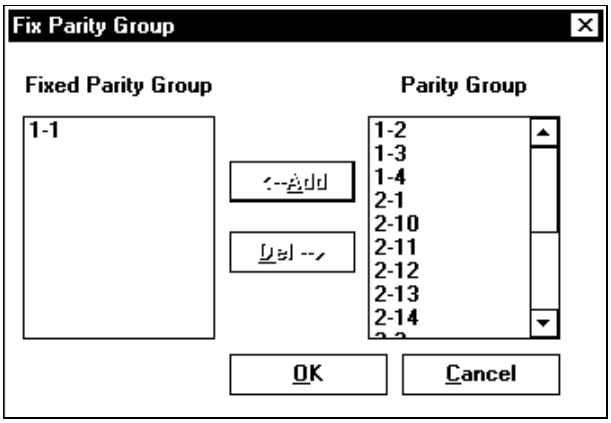
(4) Operation in the Class List screen
Select [Fix...] button in the Class List screen.



(5) Select the fixed parity group
Select the group which you want to reset the fixed parity group from the Fixed Parity Group list and [Del->] button. After selecting, the selected parity group will move to the Parity Group list.
If you want to set the parity group as Fixed, please select the group from the Parity Group and push [<-Add] button. After selecting, the selected parity group will move to Fixed Parity Group list.
If you want to set, please select [OK]. The program will set the group in the Parity Group list as the usual parity group.



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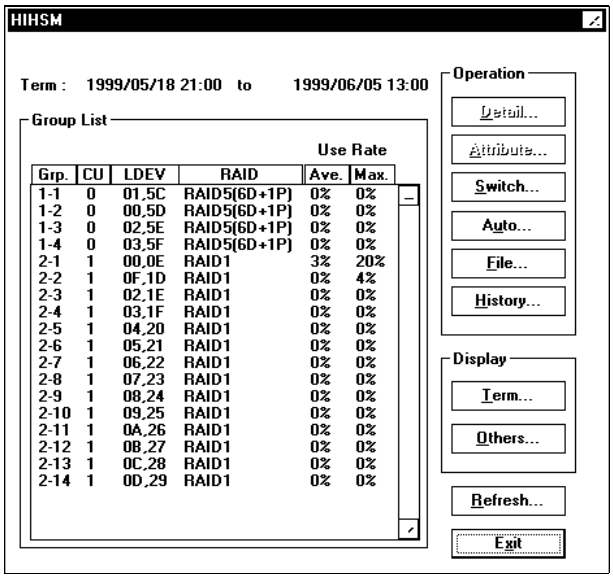
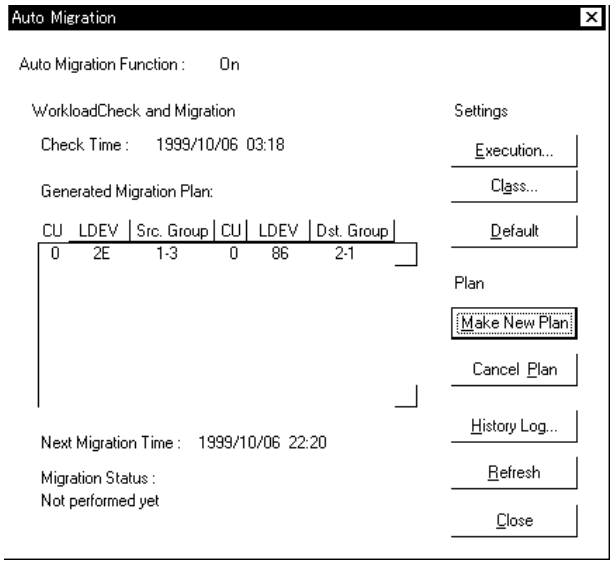
11.7.4 Set the evaluating schedule and migration time

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.



(2) Operation in the main screen
Select [Auto...]button in the main screen.

(3) Operation in the screen
Automatic Migration Main screen is displayed.
Please select [Execution...] button.



(4) Set the parameter
Automatic Migration Setting screen is displayed. This screen is to set the detail parameter about the automatic migration. At the next step it will be described how to set these parameter.

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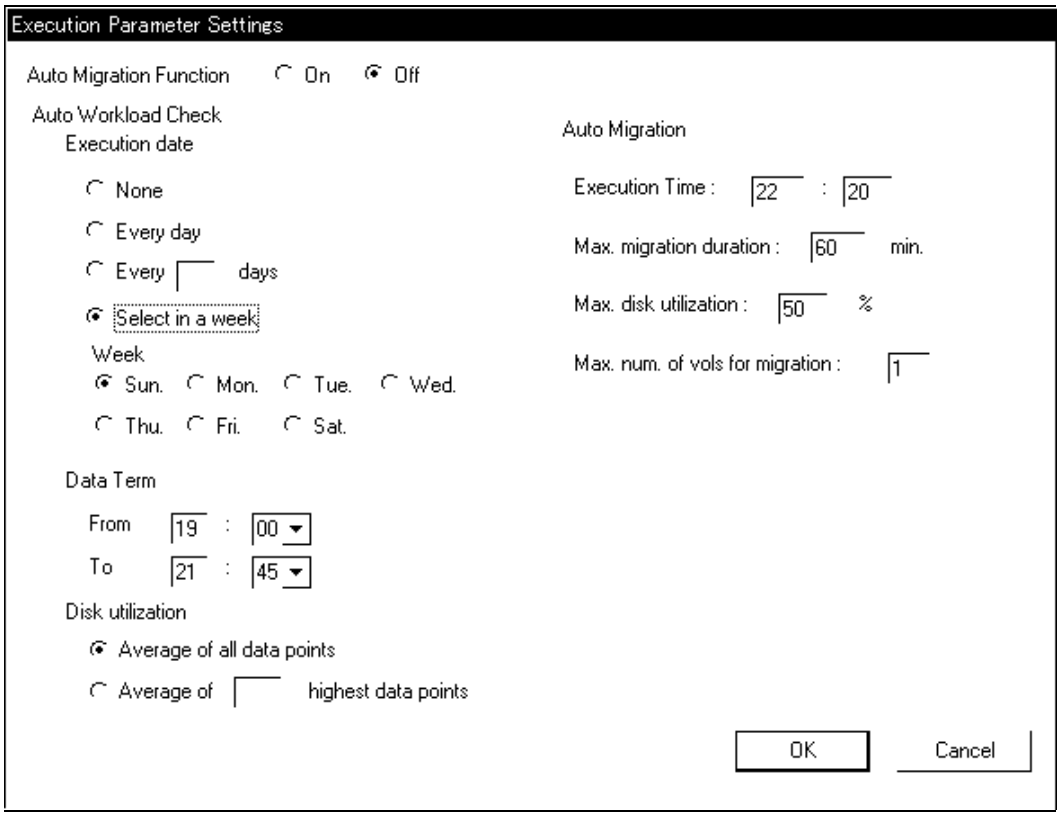
(5) Set the detail parameter

Set the check schecule migration timeto execute automatic migration function.

Notice: You should set the monitoring switch to “ON” before using this function.



(a) Set Auto Migration Function

Select "On" at the Auto Migration Function.

(b) Execution date

Set the date to make a plan. Please select one of the following three items, "Every Day", "Every x Day", "Select in a week", or "None".

(i) In the case of selecting "Every x Day"

Input the days. If you input "3" for example, the program will check every three days.

(ii) In the case of selecting "Select in a week"

Select one of the week.

(iii) In the case of selecting "None"

The program will not make a plan. But the program will execute the volume migration if the other old plans remain.

(c) Data Term

Input the term which monitoring data the program uses to make a plan.

From : Input the start time of monitor data to make a plan.

To : Input the end time of monitor data to make a plan.

In these term, the program will execute monitoring.

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(d) Disk Utilization

Select one of the following two kinds of determination points.

(i) Average of all data points

Program calculates average usage from all data points to determine the migration.

(ii) Average of [x] highest data points

Program calculates the average usage from the highest value to the x highest value. You should input the number [x].

(e) Auto Migration

Input the migration schedule.

(i) Execution Time : Input the start time (Program executes at that time in every day)

(ii) Max. migration duration : Input the minutes. This value is a duration that you permits to execute migration. For example, if you input "90", the available duration is 90 minutes and if the migration could not finish in this duration, the program will stop the migration. (Value: 10 – 120 min)

(iii) Max. disk utilization

The available disk utilization rate during the migration. Input the maximum available rate (%). For example, if you input "60" and the disk utilization is higher than 60 %, the migration will be stopped. (Value: 10 – 100%)

(iv) Max. num of vols for migration

To set the number of the migration volumes at the same time. (Value: 1 – 20 vols)

(6) Confirm the parameter

Confirm your inputted parameter again, and select [OK].

Notice: If SVP reboots during auto migration, HIHSM will display as "SVP Reboot" in the History screen but will not record the migration result. Please refer to the main history.
HIHSM remains the old plans before SVP rebooting in the Auto plan, and displays as "Under Migration" in the Status. Please cancel those "Under Migration" volumes.

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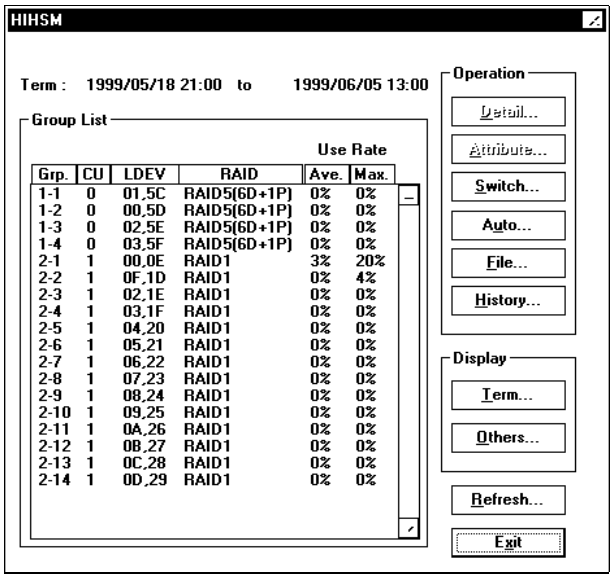
11.7.5 Make the migration plan

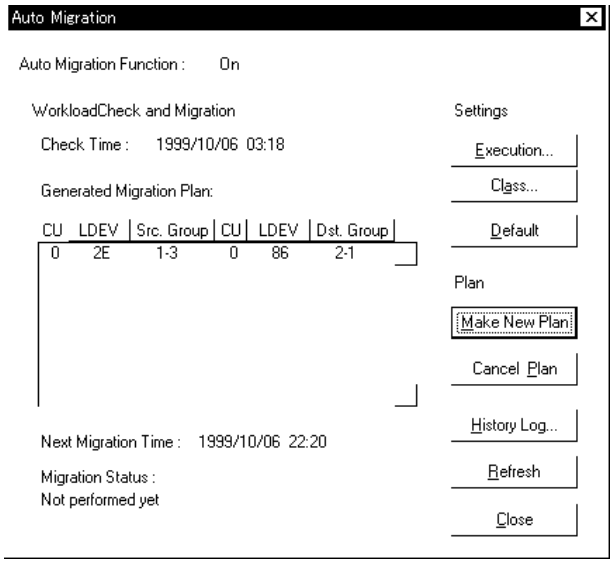
After monitoring the disk usage according to the evaluating schedule, the migration plan will be made.
HIHSM usually make these plan automatically. But you can make them by the following operations.

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.

(2) Operation in the main screen
Select [Auto...]button in the main screen.



(3) Make plan
Automatic Migration Main screen is displayed. To make the migration plan, please select [Make New Plan] button. The program will display new plans in the "Generated Migration Plan".
The program will execute the volume migration according to the generated migration plans at the time which are displayed in the "Next Migration Time".



Notice: HIHSM sometimes does not make a plan as the result of "Make New Plan". Please refer to "History".

(4) Review the plans
Please check the generated plan. If you cannot agree this plan, please select [Cancel Plan].

Notice: HIHSM will delete plans made after the specified migration plan according to the migration order. You can not delete one of these plans.

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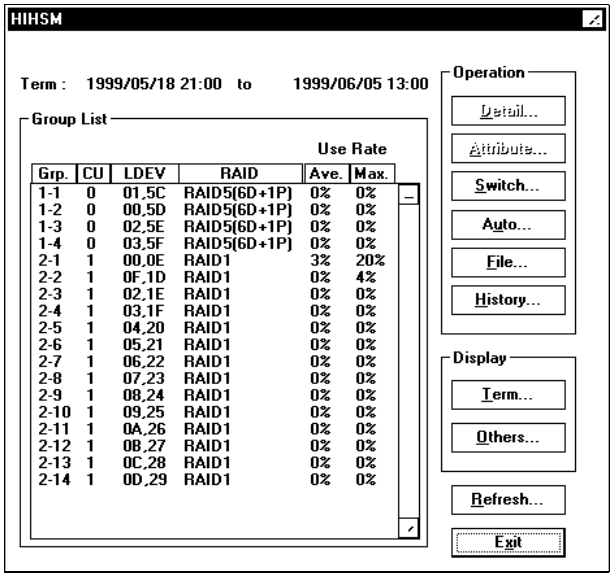
11.8 Display the volume usage rate

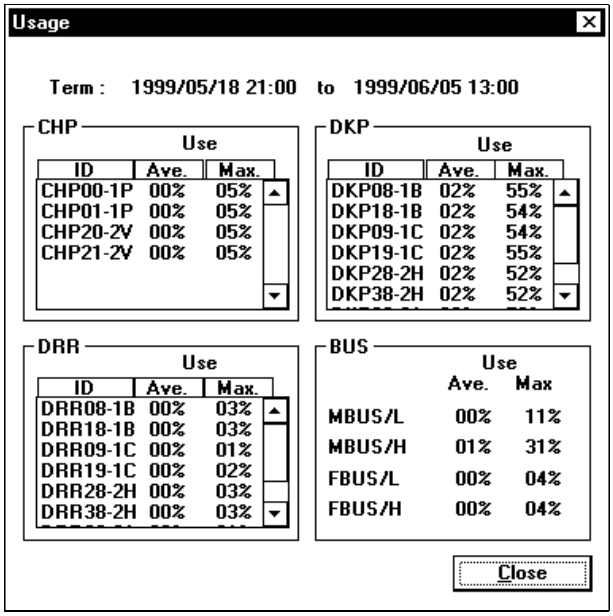
This screen is to display the physical volume usage rate.

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.

(2) Operation in the main screen.
Select [Other...] button in the main screen.



(3) Display the rate
The program will display the usage rate of each processor, BUS and DRR. After you check them, please select [Close] button to exit this screen.



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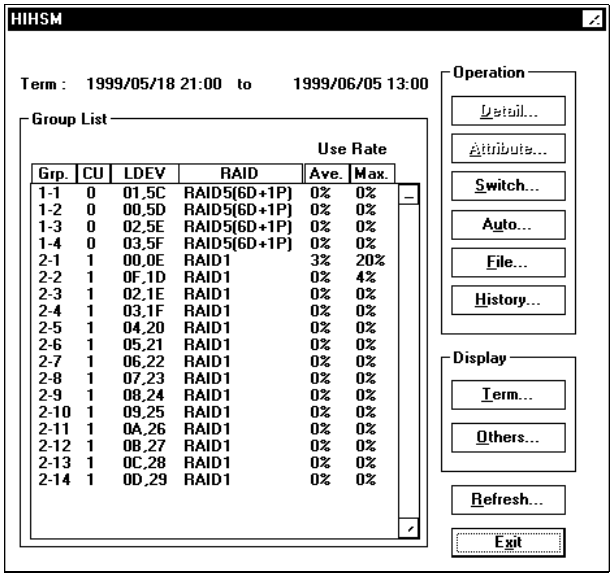
11.9 Display the history

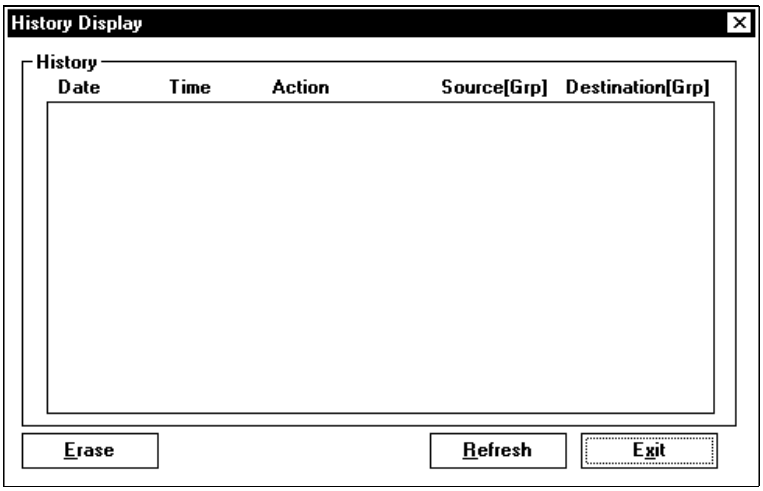
11.9.1 History Screen

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.

(2) Operation in the main screen.
Select [Auto...] button in the main screen.



(3) History
History Screen is displayed.
If you want to delete the history, please select [Erase] button.
After checking, please select [Exit] to close this screen.



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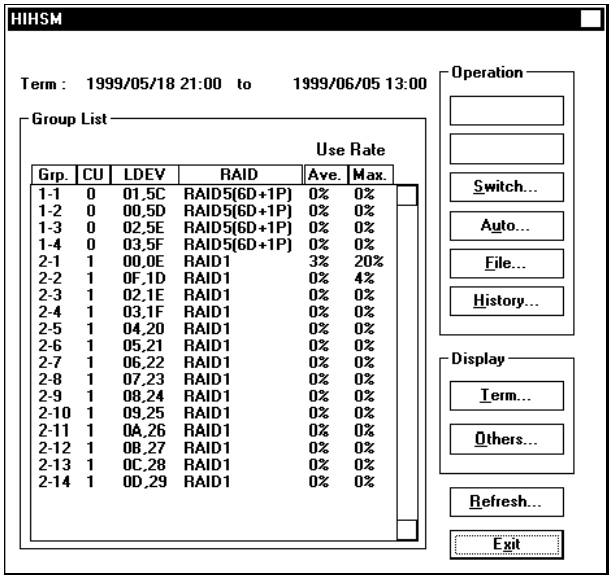
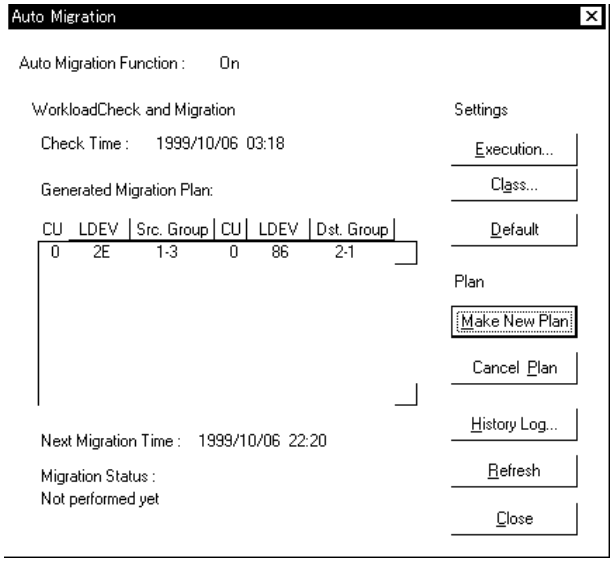
11.9.2 Display the history for automatic migration function

(1) Start HIHSM function
Select [HIHSM] button in the Function Launcher screen.

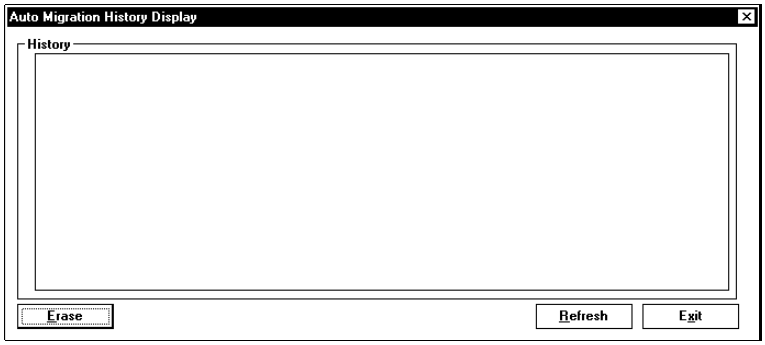
(2) Operation in the main screen
Select [Auto...] button in the main screen.



(3) Operation in the Automatic Migration Main screen
Select [History Log...] button.



(3) History
Automatic Migration History Screen is displayed.
If you want to delete the history, select [Erase] button.
After checking, select [Exit] to close this screen.
Sometimes an error code may be displayed.
Please refer to the next page which is described about those error.



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Error Code	Description	Action to cope with an error
0401	A locking time-out was detected during an internal processing. (A retry may result in a normal termination.)	Retry about five seconds later.
0801	The HIHSM could not be used.	Install the PP or the HIHSM.
0810	The issued command cannot accepted in this status. (The command was rejected.)	Check the pair status and confirm whether the command is allowed to be issued.
0811	The issued command is treated as an NOP.	The issued command is treated as an NOP.
0830	A pair cannot be created because the track format is different.	Check if the emulation types of the source and the target volume are the same.
0831	A pair cannot be created because a number of slots is different.	Check if the capacities of the source and the target volume are the same.
0834	The emulation type of the specified source volume is not supported by the HIHSM.	Check if the emulation type of the source volume is supported by the HIHSM
0835	The emulation type of the specified target volume is not supported by the HIHSM	Check if the emulation type of the target is supported by the HIHSM.
0836	The pair can not be created.	Confirms whether the emulation type of the source and the target volume are the same.
0C70	An the source volume is not installed.	Volumes not installed are not included in the object to be processed.
0C71	The source volume cannot be used.	Call the service personnel to make the source volume status normal.
0C72	The source volume is being formatted.	Wait until the formatting of the source volume is completes.
0C73	The source volume is command device.	The command device does not execute HIHSM function
0C80	The target volume is not installed.	Volumes not installed are not included in the object to be processed.
0C81	The target volume cannot be used.	Call the service personnel to make the target volume status normal.
0C82	The target volume is being formatted.	Wait until the formatting of the target volume completes.
0C83	The target volume is command device.	The command device does not execute HIHSM function.
0C90	The HDEV specified to be a Reserve volume is not installed.	Volumes not installed are not included in the object to be processed.
0C91	The HDEV specified to be a Reserve volume cannot be used.	Call the service personnel to make the volume specified to be a Reserve volume normal.
0C92	The HDEV specified to be a Reserve volume is being formatted.	Wait until the formatting of the volume specified to be a Reserve volume completes.
0C93	The HDEV specified to be a Reserve volume is command device.	The command device does not execute HIHSM function.

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Error Code	Description	Action to cope with an error
1009	The multiplicity of the HIHSM exceeded its limit.	Delete some of the pairs.
1011	The number of the HDEV specified to be a Reserve volume has already been used for a Reserve volume.	Change the HDEV number for specifying a Reserve volume.
1012	The number of the HDEV specified to be a Reserve volume has already been used for a primary HDEV of the HMRCF/HOMRCF.	Change the HDEV number for specifying a Reserve volume.
1013	The number of the HDEV specified to be a Reserve volume has already been used for a source volume of the hierarchical control.	Change the HDEV number for specifying a Reserve volume.
1014	The number of the HDEV specified to be a Reserve volume has already been used for a destination volume of the hierarchical control.	Change the HDEV number for specifying a Reserve volume.
1015	The HDEV specified to be a Reserve volume is not set as a Reserve volume.	Check the volume status.
1017	A Reserve volume cannot be set because the number of Reserve volumes allocated for them was exceeded.	Delete any of the Reserve volumes
102B	The specified volume as the “Reserved” has been set as the HMRCF/HOMRCF target volume.	Check the volume status.
102C	The specified source volume has been set as the HRC/HORC source volume.	Check the volume status.
102D	The specified target volume has been set as the HRC/HORC target volume.	Check the volume status.
102F	The specified source volume has been set as the HIHSM source volume.	Check the volume status.
1030	The specified source volume number does not exist.	Retry after refreshing the screen.
1031	The specified source volume has been set as a Reserve volume.	Check the pair status.
1034	The specified source volume has been set as other source volume.	Check the pair status.
1036	The specified source volume has been set as the HMRCF/HOMRCF source volume.	Delete the pair of the HMRCF/HOMRCF.
1037	The specified source volume has been set as a target volume of the HMRCF/HOMRCF.	Delete the pair of the HMRCF/HOMRCF.
1038	The specified source volume has been set as a M-VOL of the HODM.	Delete the pair of the HODM. (*1)
103B	It is impossible to make a pair because Volume which was specified as a target volume is Root Volume already	It confirms a pair condition.

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Error Code	Description	Action to cope with an error
103C	It is impossible to make a pair because Volume which was specified as a target volume is Node Volume already	It confirms a pair condition.
1040	The specified target volume does not exist.	Execute "Refresh" and do again.
1041	The specified target volume does not set as the Reserve volume.	Check the volume status.
1042	The specified target volume has been used as other HIHSM target volume.	Check the volume status.
1043	The specified target volume has been used as HMRCF/HOMRCF target volume.	Delete pair of HMRCF/HOMRCF
1046	The specified secondary HDEV is used as an M-VOL of the HORC.	Delete the HORC pair.
1047	The specified secondary HDEV is used as an R-VOL of the HORC.	Delete the HORC pair.
1048	The specified secondary HDEV is used as an M-VOL of the HODM.	Delete the HORC pair.
104A	The specified secondary HDEV is used as an source volume of the HMRCF / HOMRCF.	Delete the HMRCF/HOMRCF pair.
104B	The specified target volume has been used as other HIHSM source volume.	Check the volume status.
104C	The HDEV specified as a Reserve volume is being used as an M-VOL of the HODM.	Delete the HODM pair. (*1)
104E	The HDEV specified as a Reserve volume is being used as an M-VOL of the HRC/HORC.	Delete the HRC/HORC pair.
104F	The HDEV specified as a Reserve volume is being used as an R-VOL of the HRC/HORC.	Delete the HRC/HORC pair.
1051	The HDEV numbers of the specified source and the target volumes are the same.	Retry after refreshing the screen.
1085	The source volume was used for Reserve volume of HIHSM.	Check the source volume or Cancel the Reserve volume of HIHSM.
1088	The specified reserve volume has been set as DCR.	Reset the DCR.
1089	The specified source volume has been set as DCR	Reset the DCR
108A	The specified target volume has been set as DCR.	Reset the DCR
108B	The specified reserve volume has been constructed as LUSE.	Reset the LUSE.
108C	The specified reserve volume has been set as HMRCF/HOMRCF reserved volume.	Check the pair status.

(*1) These error codes are displayed only when HODM function is installed.

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PARTS CATALOG SECTION

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1 HOW TO USE PARTS CATALOG

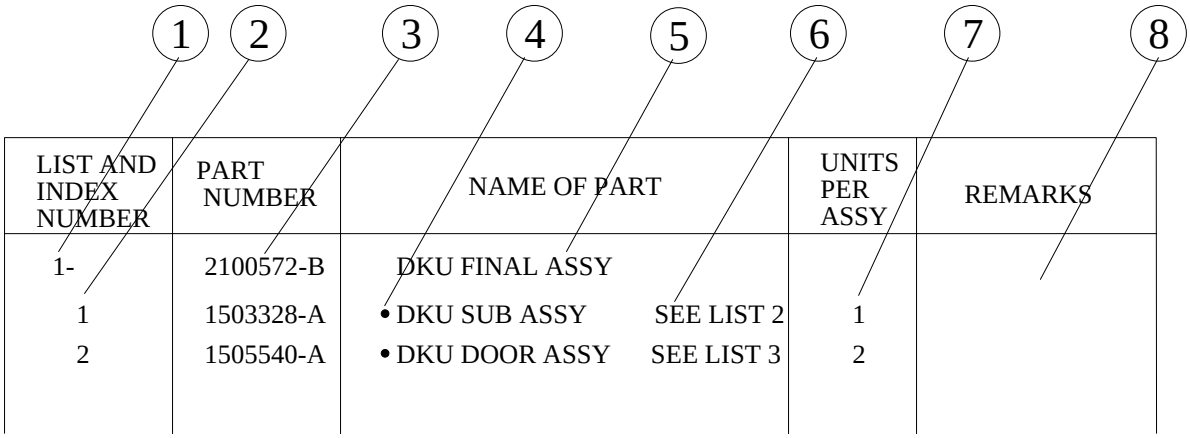
1. Parts list
   Table 1-1 shows the reference page of each part.

Table 1-1 Reference page of each part

No.	Part Name	Pages
1	DKU	PARTS02-10 through 02-130
2	DKC	PARTS03-10 through 03-100
3	PCBs and Memory Modules	PARTS04-10 through 04-60
4	Cable Assemblies	PARTS05-10 through 05-140
5	Spare Parts	PARTS06-10 through 06-40

2. Tool list
   This list shows tools necessary to exchange a part or to troubleshoot DKC310I and DKU305I.

3. How to refer to parts list



① : Indicates the list number of the assembly.
② : Indicates the item number given in the figure.
③ : Indicates the part number.
④ : Non-dot mark indicates a main assembly in a parts list.
One-dot mark indicates a part included in a main assembly.
Two-dot mark indicates a part included in a one-dot marked part.
⑤ : Indicates the unit type.
⑥ : Indicates the detailed list number if any.
⑦ : Indicates a quantity per main assembly.
⑧ : If 'SP' is written, it indicates a spare part.

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2 PARTS LIST OF DKU305I

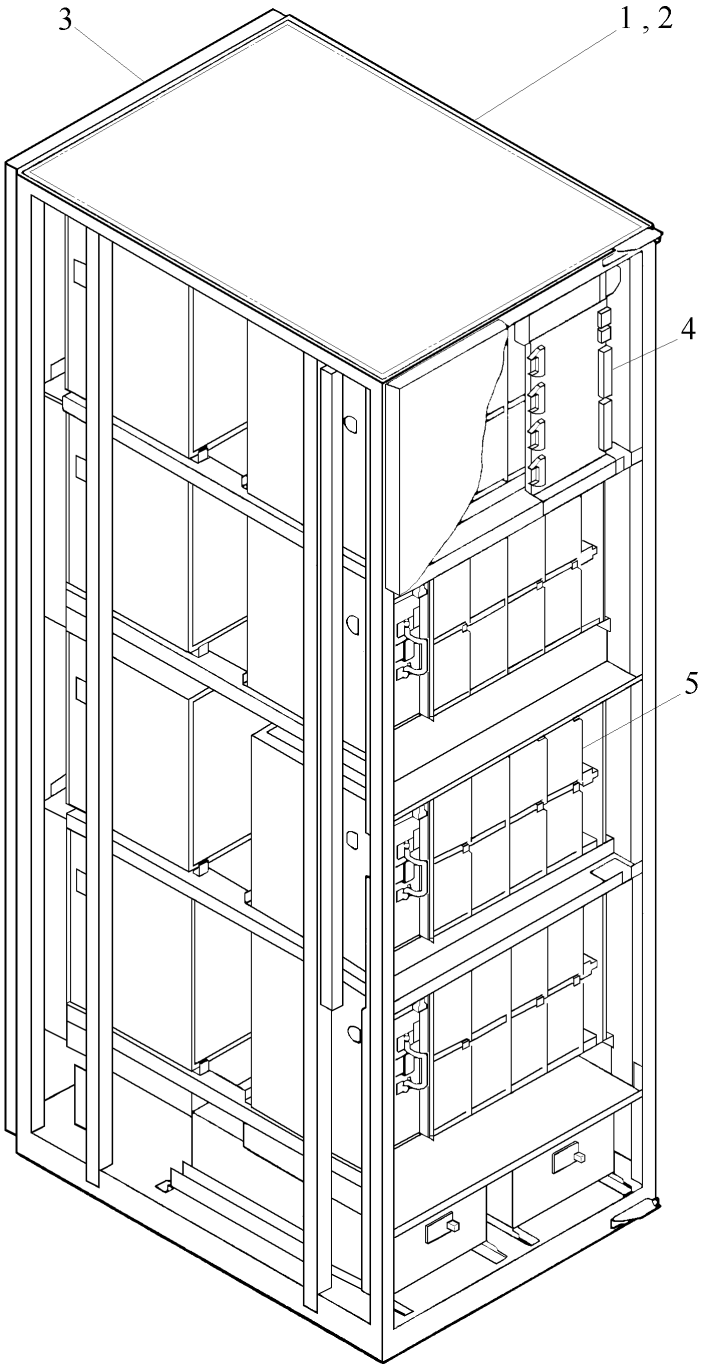

Fig. 2-1 DKU ASSY

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PARTS LIST 1-1 (Parts listed below are shown in Fig. 2-1)

LIST NUMBER	NAME OF PART	PAGE
1	DKU 305 FINAL ASSY	PARTS02-30, 02-40
2	DKU SUB ASSY	PARTS02-50, 02-60, 02-70
3	DKU DOOR ASSY	PARTS02-80, 02-90
4	DKU MONITOR ASSY	PARTS02-100, 02-110
5	HDU-6F1(60) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-901(90) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-1801(180) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-9F1(90) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-15F1(150) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-3601(360) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-18J1SC(180) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130
	HDU-47J1SC(470) for RAID5, RAID1 NOTE 1	PARTS02-120, 02-130

NOTE 1 : see PARTS LIST 1-3.

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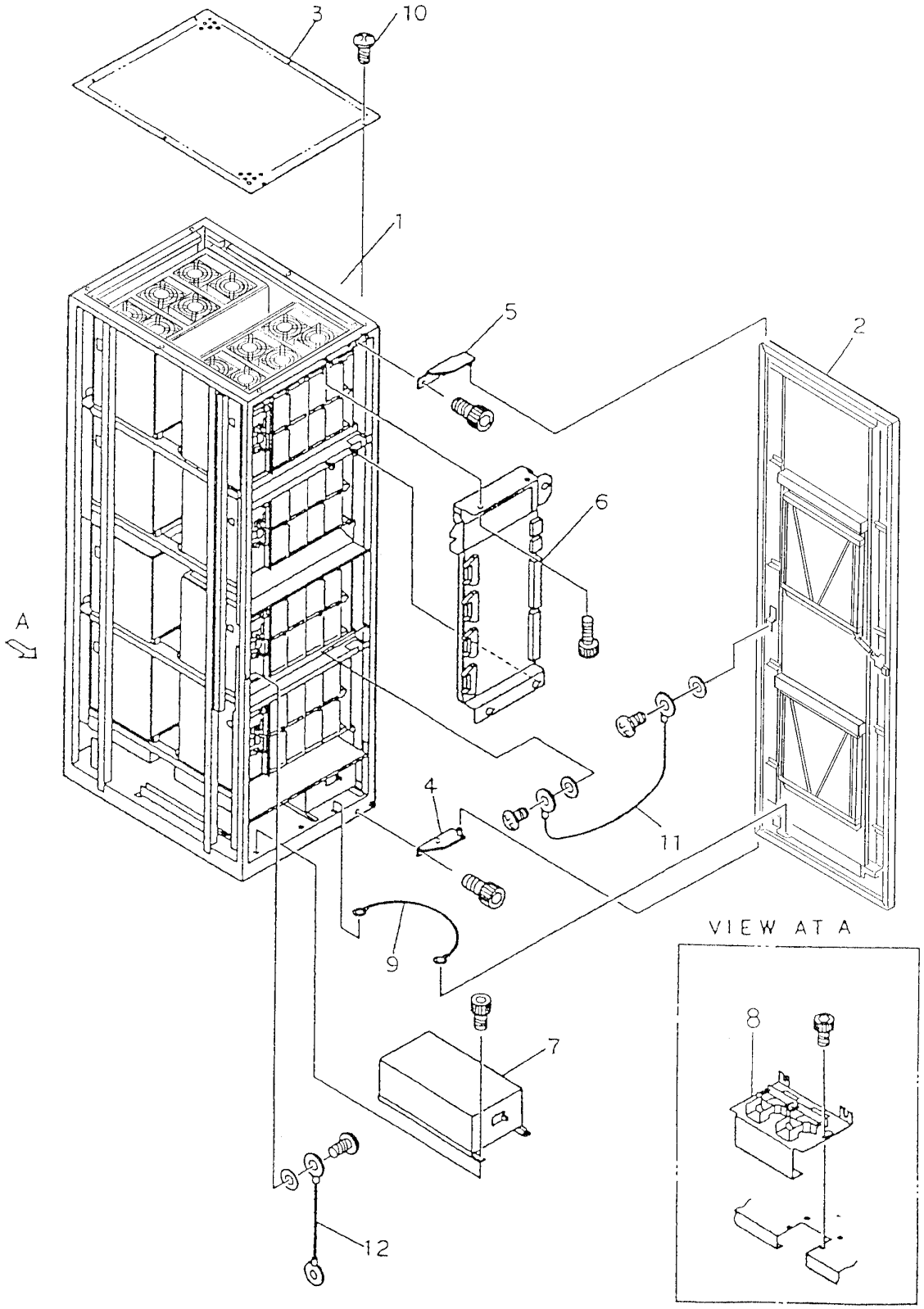

Fig. 2-2 DKU305 FINAL ASSY

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PARTS LIST 1-2 (Parts listed below are shown in Fig. 2-2)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
1-	2100572-B	DKU305 FINAL ASSY		
1	1503328-A	• DKU SUB ASSY See PARTS LIST 1-3.	1	
2	1505540-A	• DKU DOOR ASSY See PARTS LIST 1-4.	2	
3	3239218-1	• TOP COVER	1	
4	5460630-A	• HINGE ASM-L	2	
5	5460631-A	• HINGE ASM-U	2	
6	3239331-A	• DKU MONITOR ASSY See PARTS LIST 1-5.	2	
7	5487058-A	• AC BOX	2	S.P
8	3239268-B,C	• STR ASSY	1	NOTE 1
9	3210567-1	• WIRE ROPE	2	
	3210567-101	• WIRE ROPE	2	ALTERNATE
10	3183101-1	• BLACK SCREW	6	
11	3183008-B	• EARTH WIRE	2	
	3243620-B	• EARTH WIRE	2	ALTERNATE
12	5473095-A	• FG CABLE	1	

NOTE 1 : P/N-B :IU
P/N-C :IE

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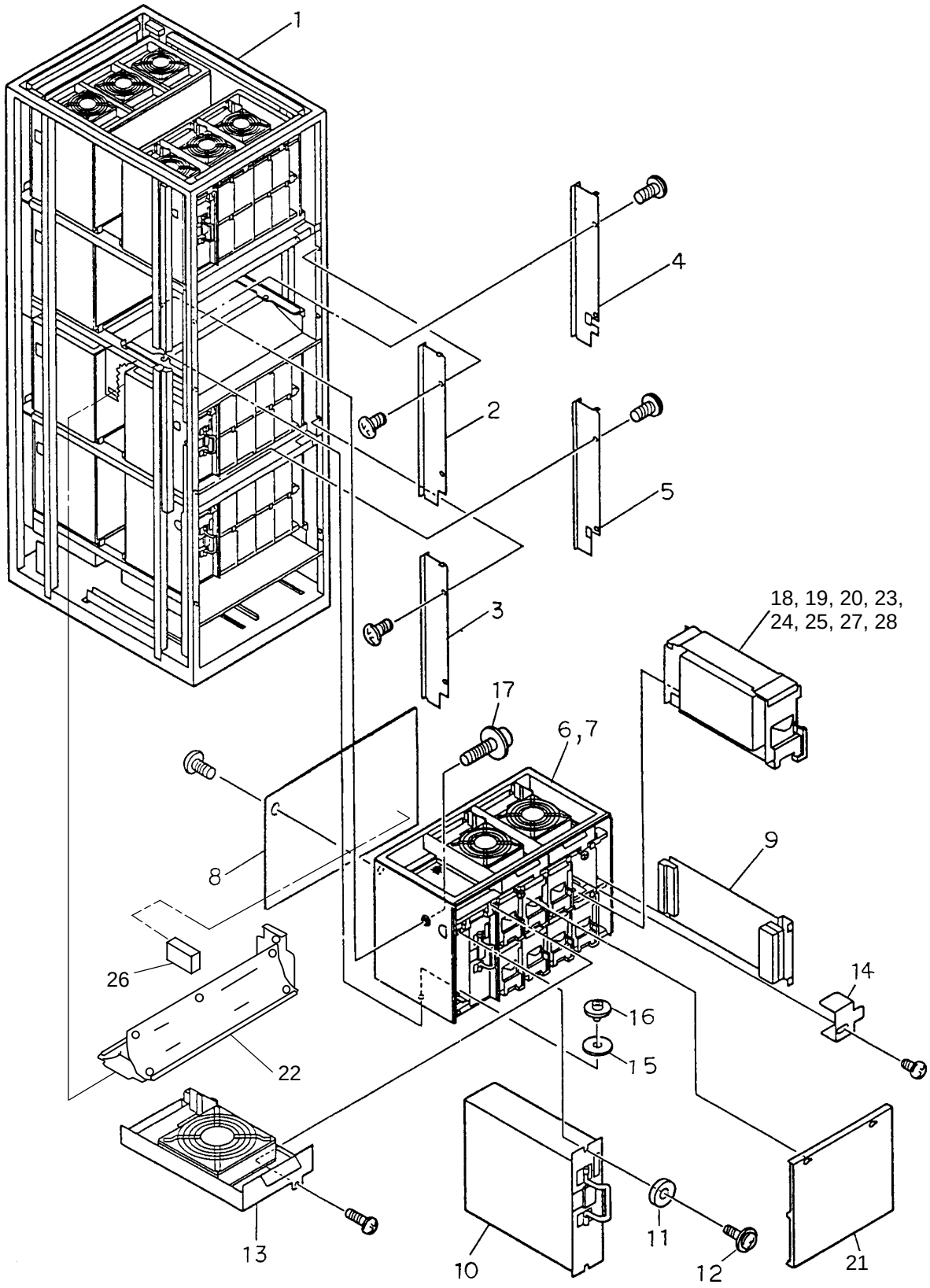

Fig. 2-3 DKU SUB ASSY

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PARTS LIST 1-3 (Parts listed below are shown in Fig. 2-3)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
2-	1503328-A	DKU SUB ASSY		
1	3239259-A	• FRAME ASSY	1	
2	3239260-A	• PLATE ASSY(U-R)	2	
3	3239261-A	• PLATE ASSY(L-R)	2	
4	3239262-A	• PLATE ASSY(U-L)	2	
5	3239263-A	• PLATE ASSY(L-L)	2	
6	1505536-A	• B4 ASSY	1	
7	1505534-A	•• HDD BOX ASSY	NOTE.1	
8	5497469-A	•• HDD BACK BOARD(LP481-A)	NOTE.1	S.P
9	5497468-A	•• SCSI BFR PCB(SH087-A)	NOTE.2	S.P
10	5497470-A	•• MULTI POWER SUPPLY (HS400-08C-S/HS400-08C-W)	NOTE.2	S.P
	5497470-B	MULTI POWER SUPPLY(HS400-08C-R)	NOTE.2	S.P
	5497470-C	MULTI POWER SUPPLY(TSG-370HS)	NOTE.2	S.P
11	5487148-1	•• BUSH(SWPS)	NOTE.3	
12	3183100-310	•• SCREW	NOTE.3	
13	5497471-A	•• HDD FAN ASSY	NOTE.4	S.P
14	5487238-1	•• STOPPER(SCSI-PK)	NOTE.1	
15	5476890-1	• WASHER(HDU)	16	
16	5473003-2	• BOLT(LL-WASHER)	16	
17	5473003-3	• BOLT(LL-WASHER)	16	
18	5497472-A	• HDU-6F1(60) See PARTS LIST 1-6.	NOTE.5	S.P

NOTE.1 : DKU305I-14 : 4
DKU305I-14+DKU-F305I-B4 : 8

NOTE.2 : DKU305I-14 : 8
DKU305I-14+DKU-F305I-B4 : 16

NOTE.3 : DKU305I-14 : 16
DKU305I-14+DKU-F305I-B4 : 32

NOTE.4 : DKU305I-14 : 12
DKU305I-14+DKU-F305I-B4 : 24

NOTE.5 : DKU-F305I-6F4 : 4
DKU-F305I-6F1 : 1

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PARTS LIST 1-3 (Parts listed below are shown in Fig. 2-3)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
19	5491618-A	• HDU-901(90) See PARTS LIST 1-6.	NOTE.6	S.P
20	5497473-A	• HDU-1801(180) See PARTS LIST 1-6.	NOTE.7	S.P
21	3252630-1	COVER(HDD BOX)	NOTE.1	
22	3250915-A	CENTER PLATE ASSY	1	
23	5502138-A	• HDU-9F1(90) See PARTS LIST 1-6.	NOTE.8	S.P
24	5502085-A	• HDU-15F1(150) See PARTS LIST 1-6.	NOTE.9	S.P
25	5502084-A	• HDU-3601(360) See PARTS LIST 1-6.	NOTE.10	S.P
26	5502320-A	SCSI ID JUMPER PLUG	NOTE.1	S.P
27	5502372-A	• HDU-18J1SC(180) See PARTS LIST 1-6.	NOTE.11	S.P
28	5502373-A	• HDU-47J1SC(470) See PARTS LIST 1-6.	NOTE.12	S.P

NOTE.1 : DKU305I-14 : 4
DKU305I-14+DKU-F305I-B4 : 8

NOTE.6 : DKU-F305I-907 : 7
DKU-F305I-904 : 4
DKU-F305I-901 : 1

NOTE.7 : DKU-F305I-1804 : 4
DKU-F305I-1801 : 1

NOTE.8 : DKU-F305I-9F4 : 4
DKU-F305I-9F1 : 1

NOTE.9 : DKU-F305I-15F4 : 4
DKU-F305I-15F1 : 1

NOTE.10 : DKU-F305I-3604 : 4
DKU-F305I-3601 : 1

NOTE.11 : DKU-F305I-18J4 : 4
DKU-F305I-18J1 : 1

NOTE.12 : DKU-F305I-47J4 : 4
DKU-F305I-47J1 : 1

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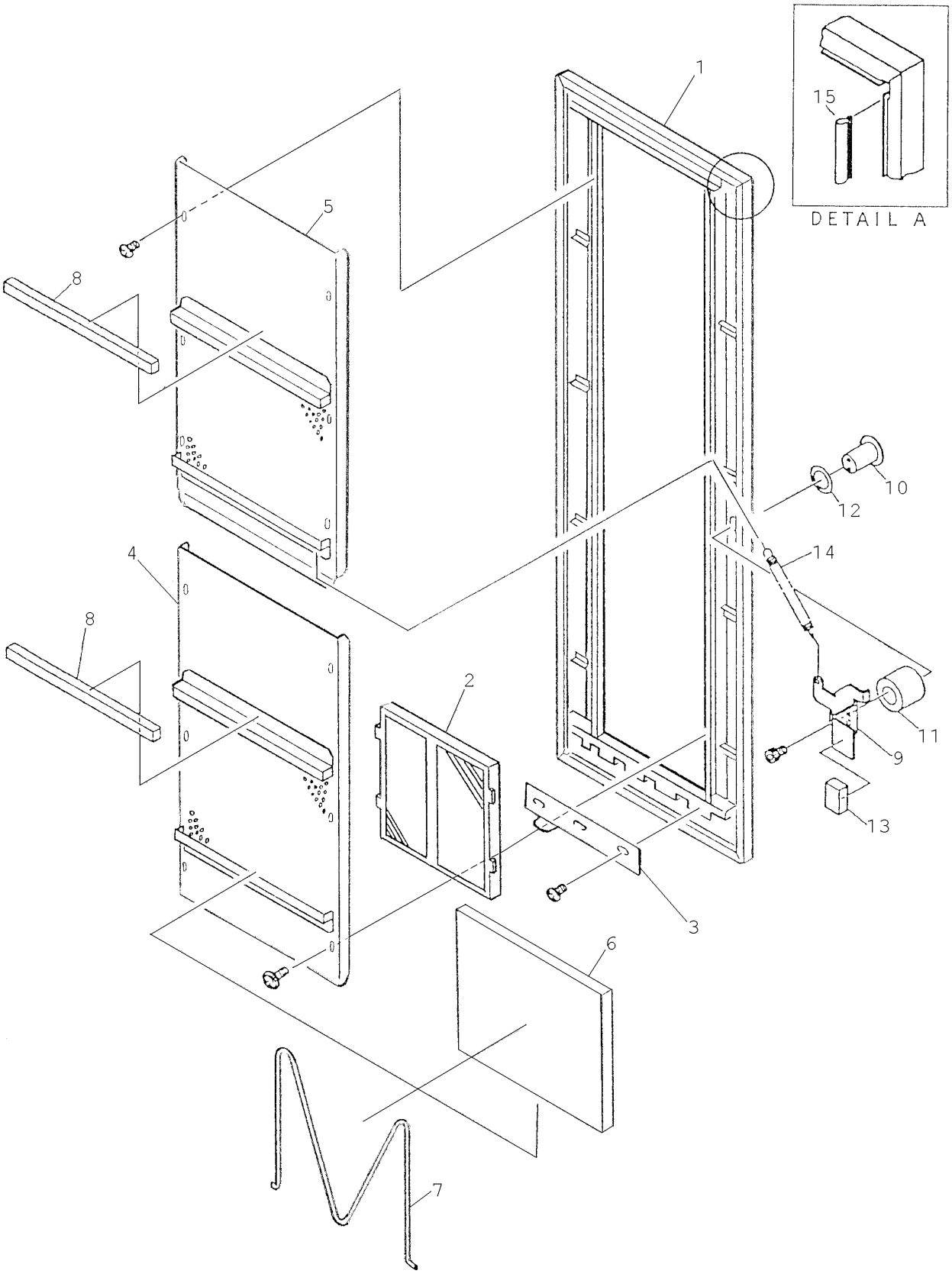

Fig. 2-4 DKU DOOR ASSY

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PARTS LIST 1-4 (Parts listed below are shown in Fig. 2-4)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
3-	1505540-A	DKU DOOR ASSY		
1	1505539-B	• DOOR ASM(DKU)	1	
2	2102064-1	• LOUVER	5	
3	3252741-1	• ANGLE(DOOR)	1	
4	2102103-A	• BRACKET(FILTER)-L	1	
5	2102104-A	• BRACKET(FILTER)-U	1	
6	3236791-5	• FILTER(DKC210)	2	
7	3252669-1	STOPPER(FILTER)	2	
8	3239345-5	• PACKING(DOOR)	2	
9	3239342-1	• LATCH(DOOR)	1	
10	5478840-2	• SLEEVE(DOOR)	1	
11	5481966-1	• SPACER(DOOR)	1	
12	5478842-1	• INSULATOR(DOOR)	1	
13	5478843-2	• CUSHION(DOOR)	1	
14	MT144	• SPRING(T)	1	
15	5444307-1	• PACKING	1	

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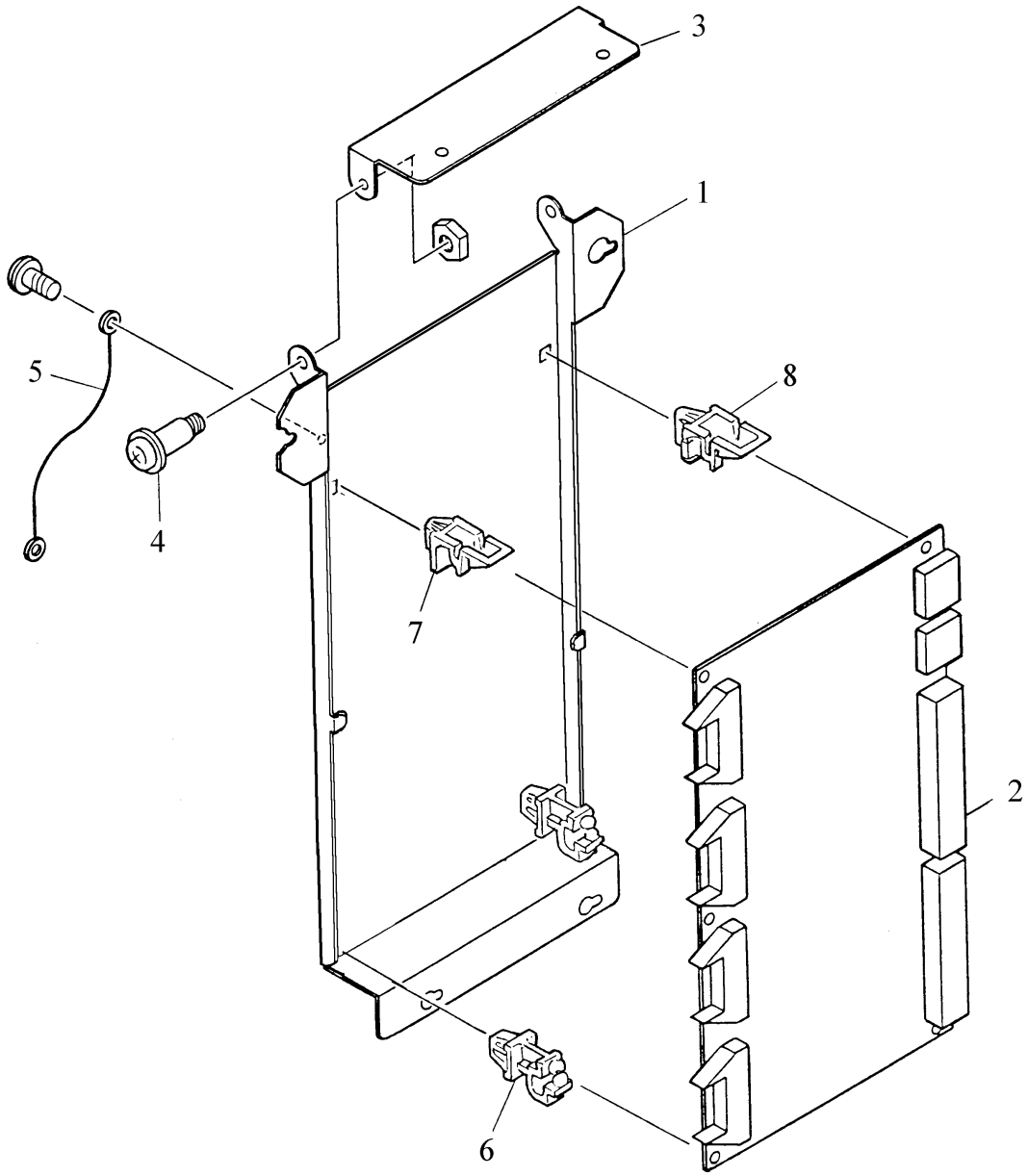

Fig. 2-5 DKU MONITOR ASSY

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PARTS LIST 1-5(Parts listed below are shown in Fig. 2-5)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
4-	3239331-A	DKU MONITOR ASSY		
1	3239329-1	• DKU MONI BRACKET	1	
2	5487055-A	• DKU MN PCB(SZ601-A)	1	S.P
3	3239330-1	• DKU MONI HINGE	1	
4	5481843-1	• SCREW(DKU-MONI)	2	
5	5473095-A	• FG CABLE	1	
6	3243585-1	• PIERCE HOLD	2	
7	3243586-1	• CARD EDGE SPACER	1	
8	3243587-1	• FG EDGE SPACER	1	

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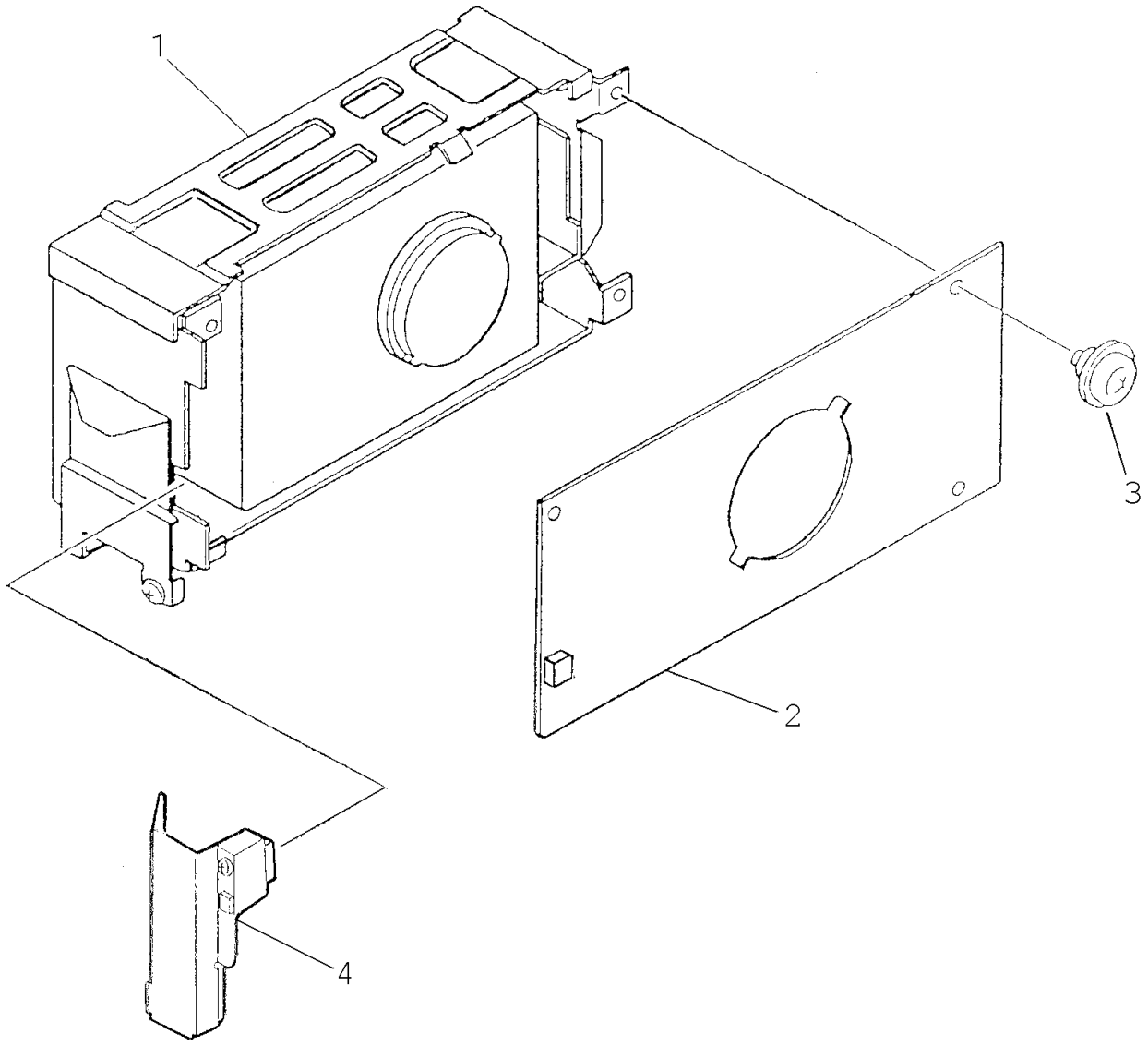

Fig. 2-6 CANISTER ASSY

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PARTS LIST 1-6(Parts listed below are shown in Fig. 2-6)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
5-	5497472-A	HDU-6F1(60)		S.P for RAID 5, RAID 1
	5491618-A	HDU-901(90)		S.P for RAID 5, RAID 1
	5497473-A	HDU-1801(180)		S.P for RAID 5, RAID 1
	5502138-A	HDU-9F1(90)		S.P for RAID 5, RAID 1
	5502085-A	HDU-15F1(150)		S.P for RAID 5, RAID 1
	5502084-A	HDU-3601(360)		S.P for RAID 5, RAID 1
	5502372-A	HDU-18J1SC(180)		S.P for RAID 5, RAID 1
	5502373-A	HDU-47J1SC(470)		S.P for RAID 5, RAID 1
1	2101635-A	• HDA(6F1)	1	
	2101621-B	• HDA(901)	1	
	2101621-A	• HDA(1801)	1	
	2101758-B	• HDA(9F1)	1	
	2101758-A	• HDA(15F1)	1	
	2101756-A	• HDA(3601)	1	
2	1504312-A	• HDD MAIN PCB(SH112-A)	1	
	1504281-B	• HDD MAIN PCB(SH094-B)	1	
	1504281-A	• HDD MAIN PCB(SH094-A)	1	
	2101707-B	• HDD MAIN PCB(SH169-B)	1	
	2101707-A	• HDD MAIN PCB(SH169-A)	1	
	2101730-A	• HDD MAIN PCB(SH172-A)	1	
3	5491848-A	• SCREW(HDD-PK)	3	
4	2102163-1	• CONNECTOR(WITH-SPRING)	1	

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3 PARTS LIST OF DKC310I

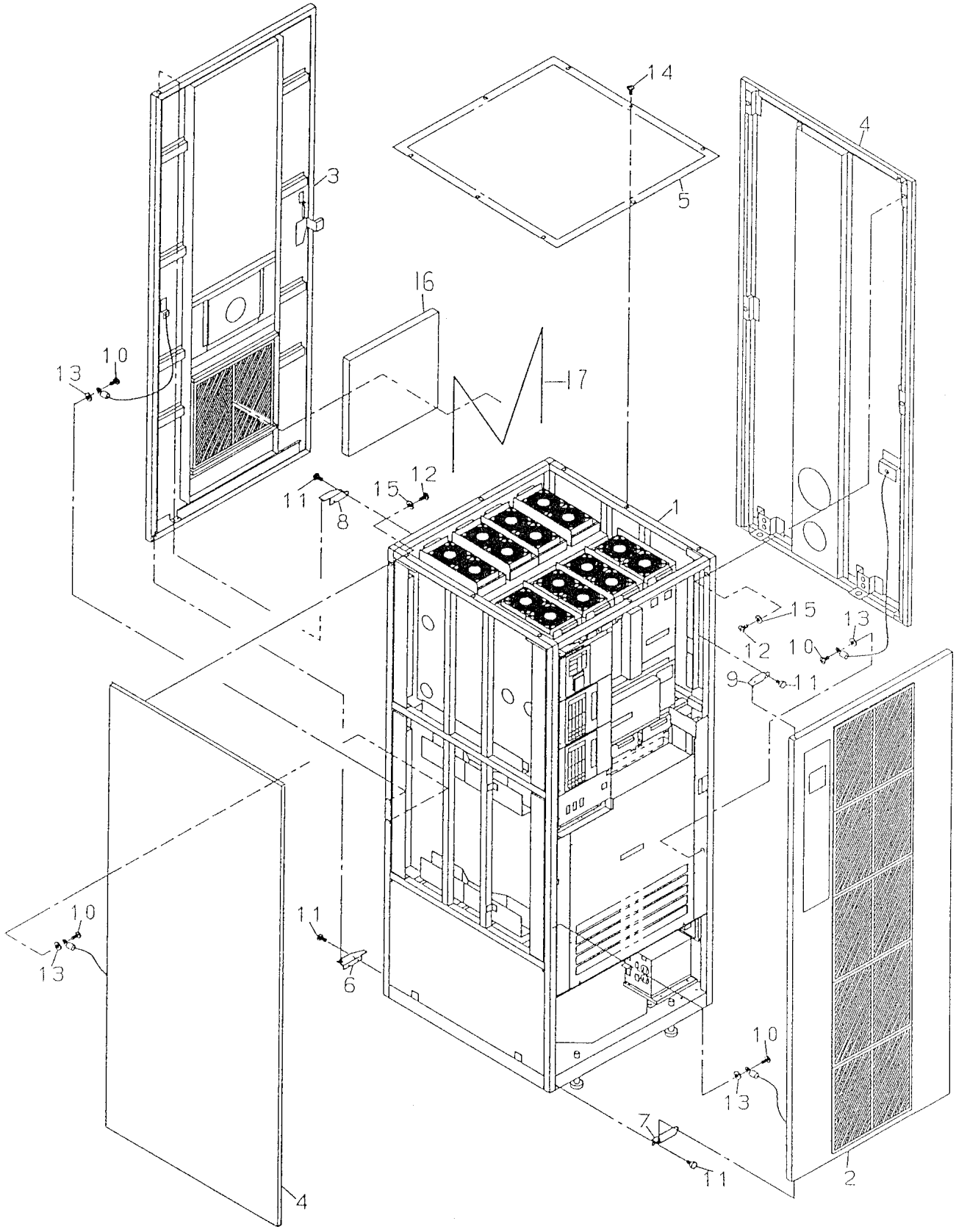

Fig. 3-1 DKC ASSY

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PARTS LIST 2-1 (Parts listed below are shown in Fig. 3-1)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
6-	1505517-A	DKC ASSY	—	
1	1505448-A	• MAIN ASSY	1	
2	1505521-A	• FRONT DOOR ASSY	1	
3	1505522-A	• REAR DOOR ASSY	1	
4	3236770-C	• SIDE COVER ASSY	2	
5	3236746-1	• TOP COVER	1	
6	5460630-A	• HINGE ASM(L)	1	
7	5460930-B	• HINGE ASM(L)	1	
8	5460631-A	• HINGE ASM(U)	1	
9	5460631-B	• HINGE ASM(U)	1	
10	SB408	• BINDING SCREW M4×8	4	
11	BS510	• HEXAGON SOCKET BOLT M5×10	8	
12	SB536	• BINDING SCREW M5×36	8	
13	WT004	• LOCK WASHER M4	4	
14	3183101-1	• HWA BIND SCREW	8	
15	2051001-532	• LL WASHER	8	
16	3236791-5	• FILTER(DKC210)	2	
17	3252669-1	• STOPPER(FILTER)	2	

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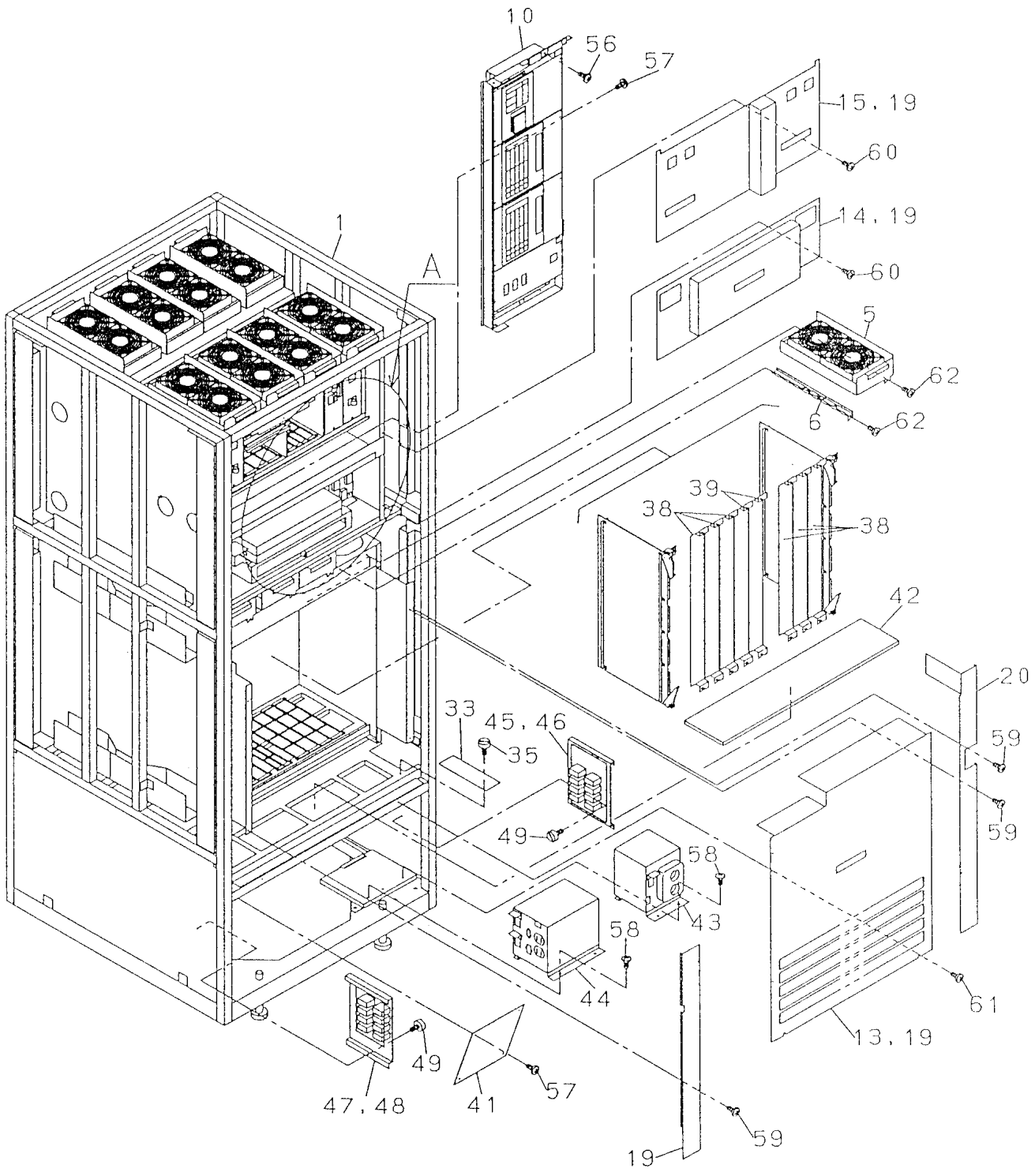

Fig. 3-2 MAIN ASSY(1/3) (Front side)

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PARTS LIST 2-2 (Parts listed below are shown in Fig. 3-2, 3-3, 3-3A, 3-3B and 3-4)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
7-	1505448-A	MAIN ASSY	—	
1	1505447-A	• SUB MAIN ASSY	1	
2	5500003-A	• 5V POWER SUPPLY(HS05065C-S/ TAH-325HSA/HS05065C-W)	2	S.P
3	5500003-B	• 3V POWER SUPPLY(HS03075C-S/ TAH-264HSA/HS03075C-W)	2	S.P
4	5479654-C	• MULTI POWER SUPPLY(HS300-04C-V) (HS300-04C-R)	2	S.P
	5491916-2	• MULTI POWER SUPPLY(TSG-370HS-C)		
	EC5000367-A	• MULTI POWER SUPPLY(HS400-08GR)		
5	5509215-A	• FAN ASSY	16	S.P
6	3247490-A	• THERMOSTAT ASSY	4	S.P
7	5497350-A	• BREAKER BOX ASSY	2	S.P
8	5497288-1	• BRACKET(BREAKER-L)	1	
9	5497289-1	• BRACKET(BREAKER-R)	1	
10	1505532-A	• OP ASSY	1	See LIST 8
11				
12				
13	3252681-1	• L/G COVER(F)	1	
14	2102019-A	• COVER(BREAKER) ASM	1	
15	3250833-1	• PL COVER(SH)	1	
16	3250903-1	• L/G COVER	1	
17	3250910-1	• P/S COVER	1	
18	5493656-1	• TOTTE	7	
19	3252683-1	• COVER(FRAME)4	1	
20	3250905-2	• COVER(FRAME)2	1	
21				

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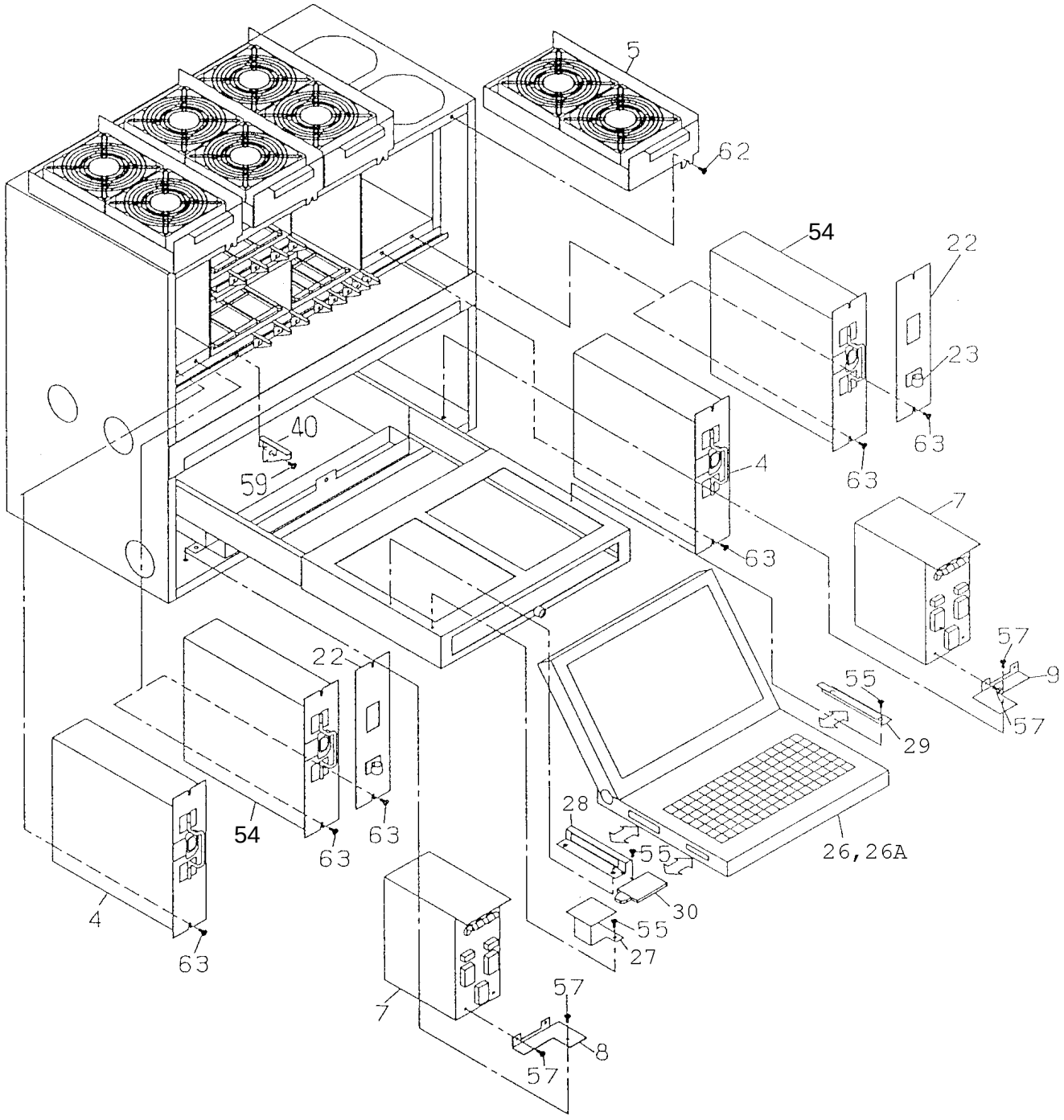

Fig. 3-3 MAIN ASSY(2/3) (Detail of A, A case that the ARMADA SVP is installed)

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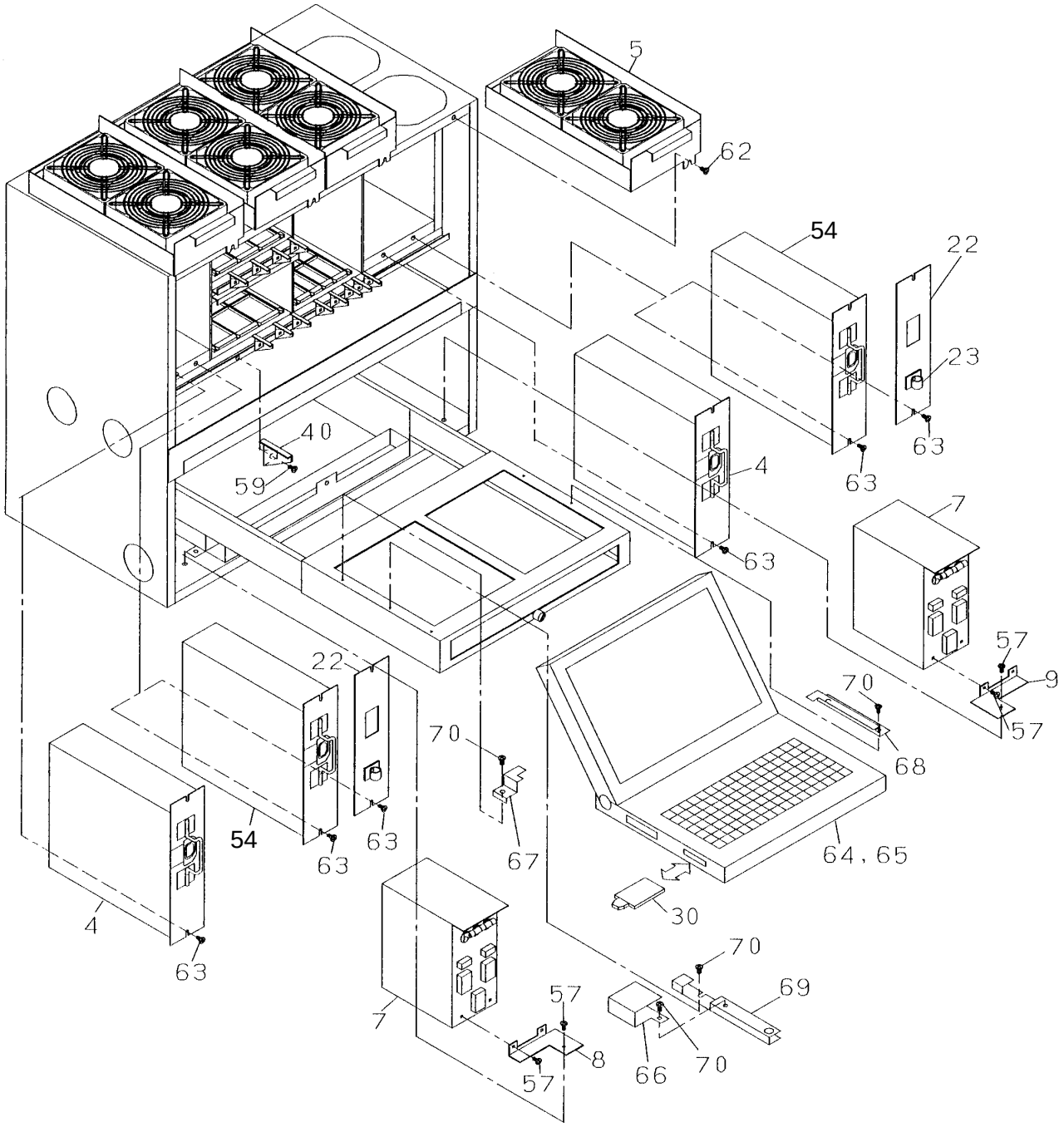

Fig. 3-3A MAIN ASSY(2/3) (Detail of A, A case that the FLORA230 SVP is installed)

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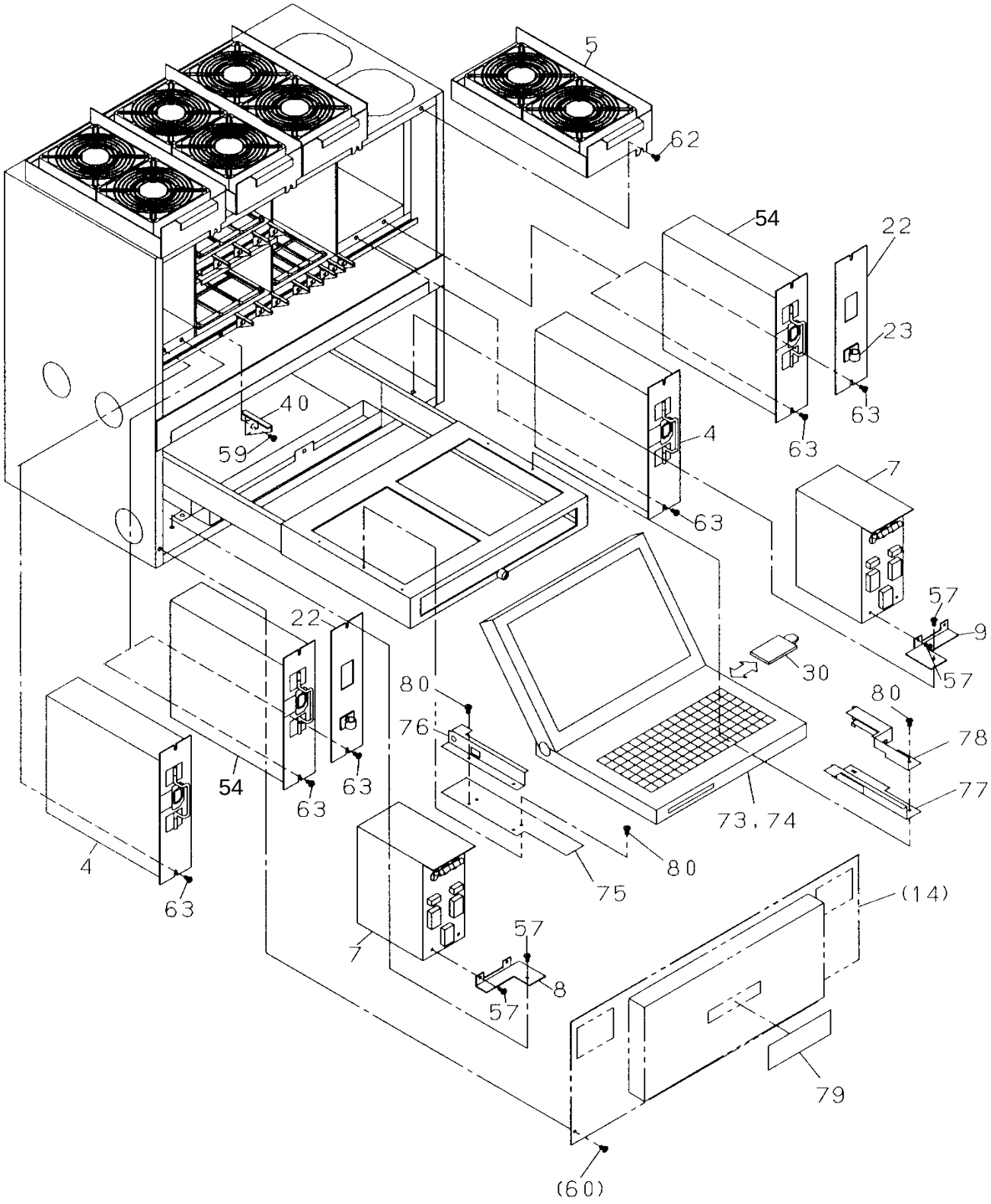

Fig. 3-3B MAIN ASSY(2/3) (Detail of A, A case that the FLORA270V SVP is installed)

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PARTS LIST 2-3 (Parts listed below are shown in Fig. 3-2, 3-3, 3-3A, 3-3B and 3-4)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
22	5480251-1	• DUMMY PLATE(PS)	14	
23	3183059-3	• LOCKING CLAMP(CABLE)	14	
24	5500030-1	• PLATE(PS-U)	1	
25	5500031-1	• PLATE(PS-L)	1	
26	5497440-1	• SVP(ARMADA)	1	S.P
27	5500189-1	• PROTECTOR(LAN)	1	
28	5500190-1	• STOPPER (PC)	1	
29	5500190-2	• STOPPER (PC)	1	
30	5486353-1	• LAN CARD (PS-CE2-10BT)	1	S.P
	5486353-2	• LAN CARD (PS-CE3-10BT)		
31	3236759-A	• BATTERY ASSY	4	S.P
32	2098612-A	• SZ592-A P/K ASSY	1	S.P
33	5480304-1	• COVER(PCI/RCU)	2	
34	5480215-2	• COVER(PCI/RCU)	1	
35	5480385-1	• LOCK SCREW	3	
36				
37	3252608-A	• DUMMY PLATE(DKA) ASSY	6	
38	3252609-A	• DUMMY PLATE(CHA) ASSY	6	
39	3252610-A	• DUMMY PLATE(CA) ASSY	2	
40	5500302-1	• STOPPER(SH-PK)	12	
41	5500112-1	• DUMMY PLATE	10	
42	3236791-1	• FILTER(DKC210)	2	

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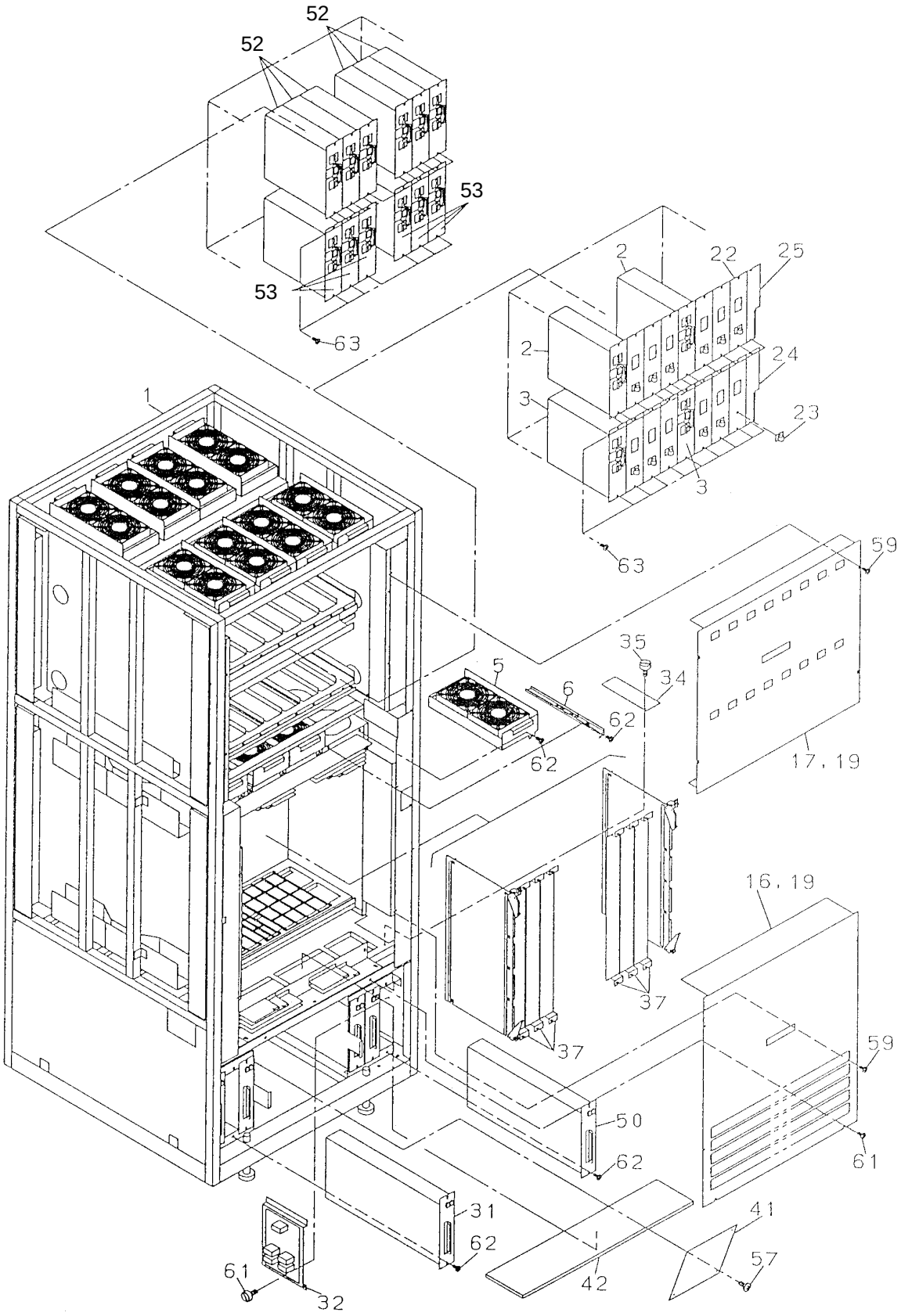

Fig. 3-4 MAIN ASSY(3/3) (Rear Side)

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PARTS LIST 2-4 (Parts listed below are shown in Fig. 3-2, 3-3, 3-3A, 3-3B and 3-4)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
43	5497351-B	• OUTLET BOX(IE-Type)	1	NOTE.1
44	5497351-A	• OUTLET BOX(IU-Type)	1	NOTE.2
45	3236713-A	• PCI/RCU CON ASSY	1	
46	2098689-A	• • SZ624-A P/K ASSY	1	S.P, NOTE.3
47	3236713-B	• PCI/RCU CON ASSY	1	
48	2098691-A	• • SZ625-A P/K ASSY	1	S.P, NOTE.4
49	5480385-2	• LOCK SCREW	2	
50	3236759-A	• BATTERY ASSY	2	S.P, NOTE.5
51				
52	5500003-A	• 5V POWER SUPPLY(HS05065C-S/ TAH-325HSA/HS05065C-W)	6	S.P, NOTE.6
53	5500003-B	• 3V POWER SUPPLY(HS03075C-S/ TAH-264HSA/HS03075C-W)	6	S.P, NOTE.6
54	5479654-C	• MULTI POWER SUPPLY(HS300-04C-V) (HS300-04C-R)	2	S.P, NOTE.7
	5491916-2	• MULTI POWER SUPPLY(TSG-370HS-C)		
	EC5000367-A	• MULTI POWER SUPPLY(HS400-08GR)		
55	3217069-306	• SCREW(TORQUES)	5	
56	SB406	• BINDING SCREW M4×6.3	1	
57	SB408	• BINDING SCREW M4×8	50	
58	BS408	• HEXAGON SOCKET BOLT M4×8	2	
59	5480283-1	• SCREW(STOPPER)	28	
60	5480283-2	• SCREW(STOPPER)	8	
61	5480283-4	• SCREW(STOPPER)	6	
62	5480283-6	• SCREW(STOPPER)	32	
63	5480283-7	• SCREW(STOPPER)	32	

NOTE. 1. Special tool
2. Special tool
3. DKC-F310I-18
4. DKC-F310I-19
5. DKC-F310I-20 (The same parts as list number 7-31.)
6. DKC-F310I-80/81/82 (The same parts as list number 7-2 or 3.)
7. DKC-F310I-81 (The same parts as list number 7-4.)

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PARTS LIST 2-4A (Parts listed below are shown in Fig. 3-3A and 3-3B)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
64	5500595-B	• SVP(FLORA230)	1	S.P
65	5500677-A	• • SVP	1	
66	5500550-1	• • PROTECTOR(LAN)	1	
67	5500547-1	• • STOPPER(PC-L)	1	
68	5500548-1	• • STOPPER(PC-R)	1	
69	5500549-1	• • PROTECTOR BASE(PC)	1	
70	3217069-306	• • SCREW(TORQUES)	6	
71				
72				
73	5500595-C	• SVP(FLORA270V)	1	S.P
74	5503238-A	• • SVP	1	
75	5503097-1	• • BASE PLATE(270V)	1	
76	5503099-1	• • STOPPER(270V/L)	1	
77	5503098-1	• • STOPPER(270V/R)	1	
78	3253993-1	• • PROTECTOR(270V/LAN)	1	
79	5503100-1	• • DUMMY LABEL	1	
80	3217069-306	• • SCREW(TORQUES)	6	
81				

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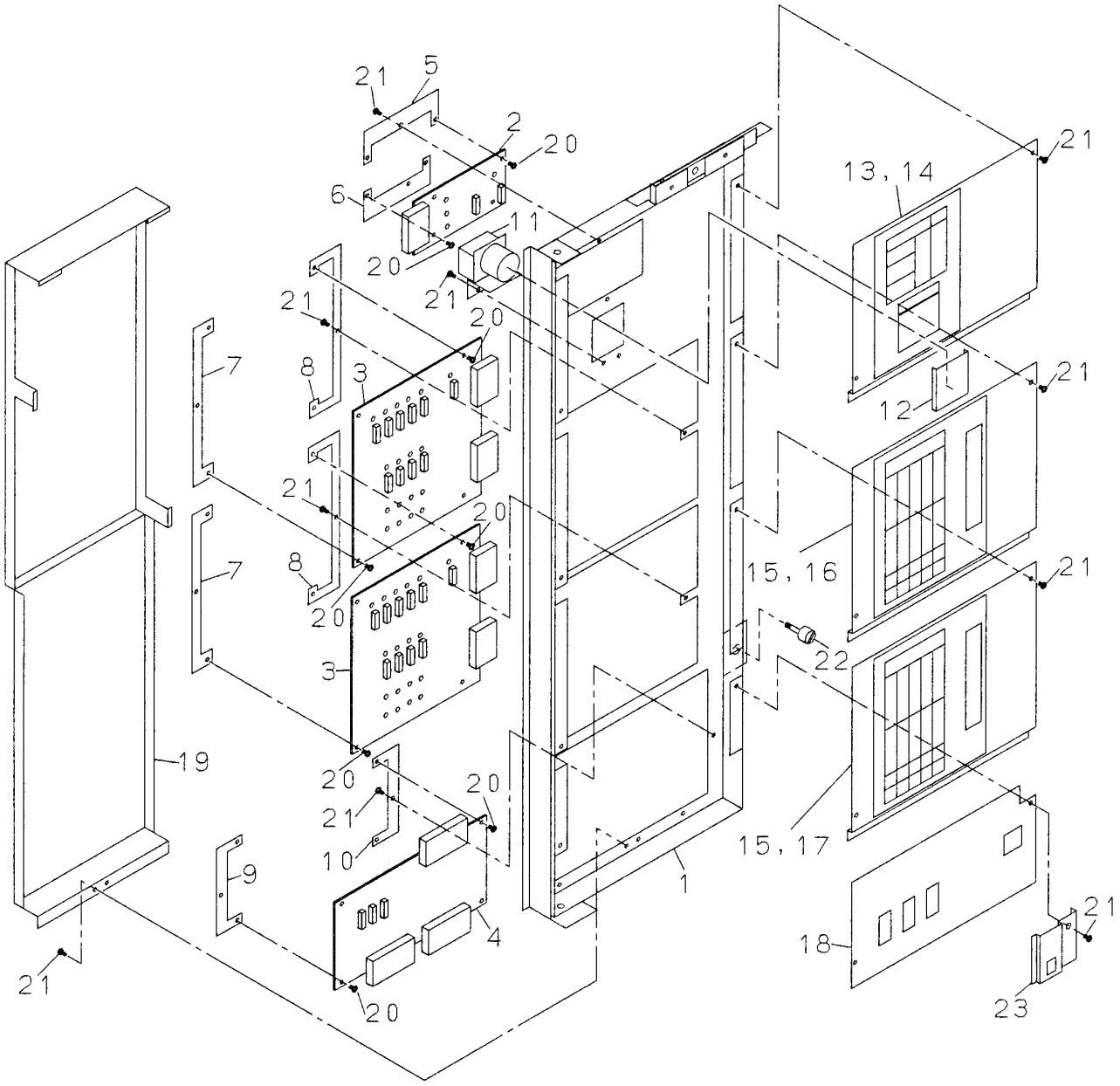

Fig. 3-5 OP ASSY

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PARTS LIST 2-5 (Parts listed below are shown in Fig. 3-5)

LIST AND INDEX NUMBER	PART NUMBER	NAME OF PART	UNITS PER ASSY	REMARKS
8-	1505532-A	OP ASSY	—	
1	2102084-1	• BOX(OP)	1	
2	2098610-A	• SZ569-A P/K ASSY	1	S.P
3	1504196-A	• SH089-A P/K ASSY	2	S.P
4	1503458-A	• SZ591-A P/K ASSY	1	S.P
5	5480310-1	• PLATE(PK 1)	1	
6	5480311-1	• PLATE(PK 2)	1	
7	5500080-1	• PLATE(PK 10)	2	
8	5500079-1	• PLATE(PK 9)	2	
9	5480314-1	• PLATE(PK 5)	1	
10	5480314-2	• PLATE(PK 5)	1	
11	3240104-A	• EPO ASSY	1	S.P
12	5471981-1	• KNOB	1	
13	3252615-1	• OP PANEL-4	1	
14	1505529-1	• SHEET(OP-4)	1	
15	3252616-1	• OP PANEL-5	2	
16	1505530-1	• SHEET(OP-5)	1	
17	1505530-2	• SHEET(OP-5)	1	
18	3252614-1	• OP PANEL-6	1	
19	2102081-1	• COVER(OP)	1	
20	SB306	• BINDING SCREW M3×6.3	16	
21	5480283-1	• SCREW(STOPPER)	18	
22	5480344-1	• LOCK SCREW	1	
23	5500460-1	• SWITCH COVER	1	

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4 PARTS LIST OF PCB AND MEMORY MODULE

4.1 PCB LOCATION

FRONT LOGIC BOX PCB LOCATION

| CL1 | CL1 | | |

REAR LOGIC BOX PCB LOCATION

CL2	CL2									CL1										CL2
M	L		K		J		H		G	F	E		D		C		B			A
WP1002|A	WP1002|A	WP1002|B/WP1322|B	WP1002|A	WP1002|B/WP1322|B	WP1002|A	WP1002|B/WP1322|B	WP1002|A	WP1002|B/WP1322|B	WP108|A/WP1188|A	WP108|A/WP1188|A	WP1002|A	WP1002|B/WP1322|B	WP1002|A	WP1002|B/WP1322|B	WP1002|A	WP1002|B/WP1322|B	WP1002|A	WP1002|B/WP1322|B	WP1002|B
	*C	*F	*B	*E	*A	*D					*C	*F	*B	*E	*A	*D				
TM-2M	DKA-2L		DKA-2K		DKA-2J		DKA-2H		CACHE-2G	CACHE-1F	DKA-1E		DKA-1D		DKA-1C		DKA-1B			TM-2A

Add.3 Add.2 Add.1 Basic Basic Basic Add.3 Add.2 Add.1 Basic

*A: DKC-F310I-50×1 set
*B: DKC-F310I-50×2 sets
*C: DKC-F310I-50×3 sets
*D: DKC-F310I-50E×1 set
*E: DKC-F310I-50E×2 sets
*F: DKC-F310I-50E×3 sets

Fig. 4.1-2 Rear Logic Box PCB

FRONT PS BOX PS and PCB LOCATION

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS10	MPS11	SVPPS1	BATCTR10	BATCTR11	BATCTR12	PWRCTR1	SSVP	HUB	PWRCTR2	MPS20	MPS21
Multi PS	Multi PS	SH1111|A	SH093|A	SH093|A	SH093|A *B	SH092|A	SH090|A/SH091|A	SH088|A	SH092|A	Multi PS	Multi PS
		SH1111|A	SH093|A	SH093|A	SH093|A *B						
		SVPPS2	BATCTR20	BATCTR21	BATCTR22						
	*A	KL	JL	HL	GL						*A

*A: DKC-F310I-81
*B: DKC-F310I-20

Fig. 4.1-3 Front PS Box

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4.2 SHARED MEMORY MODULE LOCATION

1. Standard Cache Memory PCB

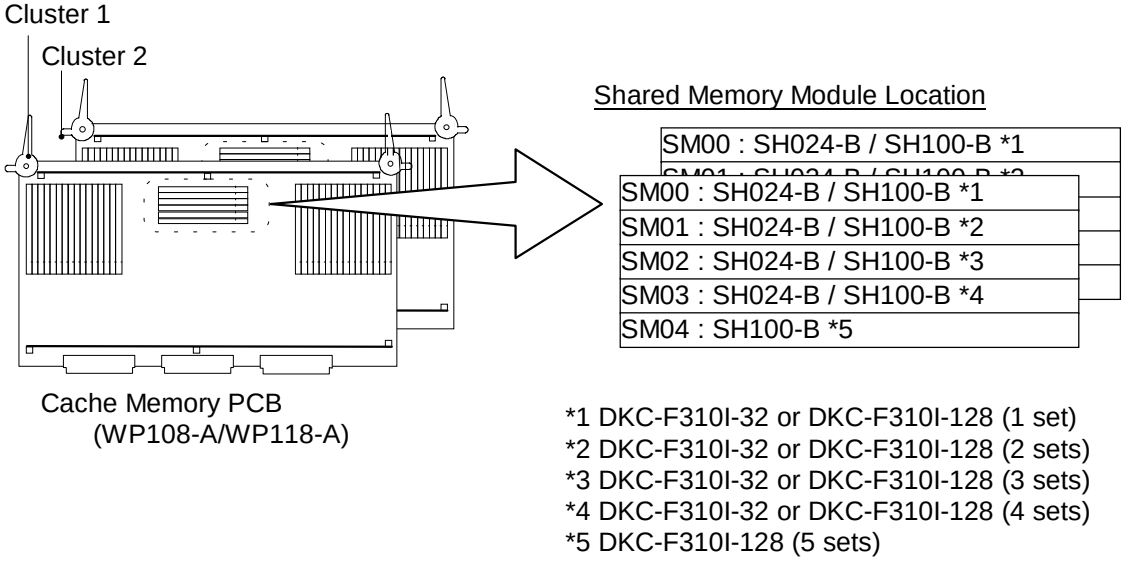

Fig. 4.2-1 Shared Memory Module Location

Note : Shared Memory Module specifications
For mixture mounting of SH024-B and SH100-B, satisfy the condition of the following table in Shared Memory.

Location	DKC-F310I-32/128	DKC-F310I-128
SM00	SH024-B (1 set) *a	SH100-B (1 set) *b
SM01	SH024-B (2 sets) *a	SH100-B (2 sets) *b
SM02	SH024-B (3 sets) *a	SH100-B (3 sets) *b
SM03	SH024-B (4 sets) *a	SH100-B (4 sets) *b
SM04	SH100-B (1 set) *b	un-mountable
Capacity	32 to 256 MB	128 to 512 MB

*a: DKC-F310I-32
*b: DKC-F310I-128

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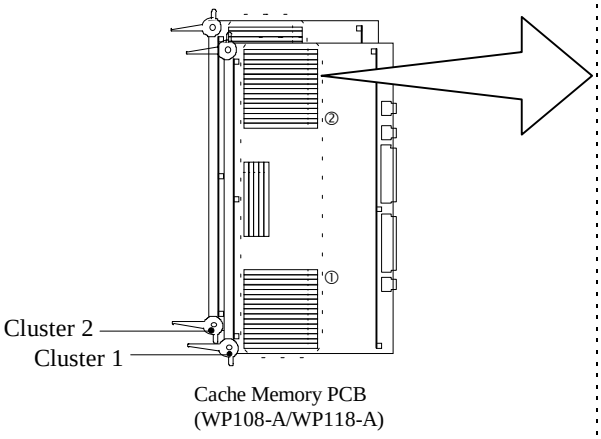
4.3 CACHE MEMORY MODULE LOCATION

1. Standard Cache Memory PCB



Cache Memory PCB
(WP108-A/WP118-A)

Cache Memory Module Location

②			
CM03	:	SH024-A/SH100-A	*1
CM13	:	SH024-A/SH100-A	*2
CM23	:	SH024-A/SH100-A	*3
CM33	:	SH024-A/SH100-A	*4
CM43	:	SH024-A/SH100-A	*5
CM53	:	SH024-A/SH100-A	*6
CM63	:	SH024-A/SH100-A	*7
CM73	:	SH024-A/SH100-A	*8
CM01	:	SH024-A/SH100-A	*1
CM11	:	SH024-A/SH100-A	*2
CM21	:	SH024-A/SH100-A	*3
CM31	:	SH024-A/SH100-A	*4
CM41	:	SH024-A/SH100-A	*5
CM51	:	SH024-A/SH100-A	*6
CM61	:	SH024-A/SH100-A	*7
CM71	:	SH024-A/SH100-A	*8
①			
CM70	:	SH024-A/SH100-A	*8
CM60	:	SH024-A/SH100-A	*7
CM50	:	SH024-A/SH100-A	*6
CM40	:	SH024-A/SH100-A	*5
CM30	:	SH024-A/SH100-A	*4
CM20	:	SH024-A/SH100-A	*3
CM10	:	SH024-A/SH100-A	*2
CM00	:	SH024-A/SH100-A	*1
CM72	:	SH024-A/SH100-A	*8
CM62	:	SH024-A/SH100-A	*7
CM52	:	SH024-A/SH100-A	*6
CM42	:	SH024-A/SH100-A	*5
CM32	:	SH024-A/SH100-A	*4
CM22	:	SH024-A/SH100-A	*3
CM12	:	SH024-A/SH100-A	*2
CM02	:	SH024-A/SH100-A	*1

*1 DKC-F310I-256 / DKC-F310I-1024 (1 set)
*2 DKC-F310I-256 / DKC-F310I-1024 (2 sets)
*3 DKC-F310I-256 / DKC-F310I-1024 (3 sets)
*4 DKC-F310I-256 / DKC-F310I-1024 (4 sets)
*5 DKC-F310I-256 / DKC-F310I-1024 (5 sets)
*6 DKC-F310I-256 / DKC-F310I-1024 (6 sets)
*7 DKC-F310I-256 / DKC-F310I-1024 (7 sets)
*8 DKC-F310I-256 / DKC-F310I-1024 (8 sets)

Fig. 4.3-1 Cache Memory Module Location

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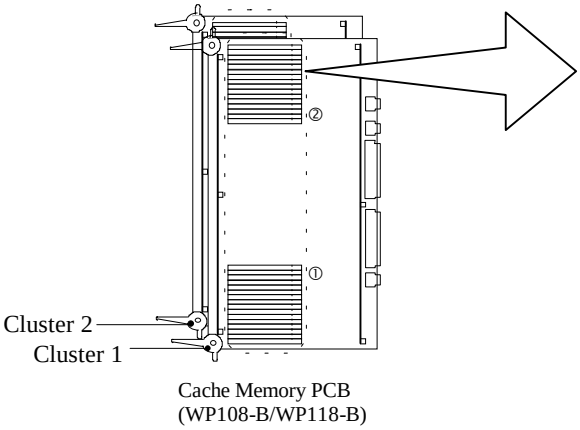
2. Cache Memory PCB Constituting DKC-F310I-20



Cache Memory PCB
(WP108-B/WP118-B)

Cache Memory Module Location

②			
CM03	:	SH024-A/SH100-A	*9
CM13	:	SH024-A/SH100-A	*A
CM23	:	SH024-A/SH100-A	*B
CM33	:	SH024-A/SH100-A	*C
CM43	:	SH024-A/SH100-A	*D
CM53	:	SH024-A/SH100-A	*E
CM63	:	SH024-A/SH100-A	*F
CM73	:	SH024-A/SH100-A	*G
CM01	:	SH024-A/SH100-A	*9
CM11	:	SH024-A/SH100-A	*A
CM21	:	SH024-A/SH100-A	*B
CM31	:	SH024-A/SH100-A	*C
CM41	:	SH024-A/SH100-A	*D
CM51	:	SH024-A/SH100-A	*E
CM61	:	SH024-A/SH100-A	*F
CM71	:	SH024-A/SH100-A	*G
①			
CM70	:	SH024-A/SH100-A	*G
CM60	:	SH024-A/SH100-A	*F
CM50	:	SH024-A/SH100-A	*E
CM40	:	SH024-A/SH100-A	*D
CM30	:	SH024-A/SH100-A	*C
CM20	:	SH024-A/SH100-A	*B
CM10	:	SH024-A/SH100-A	*A
CM00	:	SH024-A/SH100-A	*9
CM72	:	SH024-A/SH100-A	*G
CM62	:	SH024-A/SH100-A	*F
CM52	:	SH024-A/SH100-A	*E
CM42	:	SH024-A/SH100-A	*D
CM32	:	SH024-A/SH100-A	*C
CM22	:	SH024-A/SH100-A	*B
CM12	:	SH024-A/SH100-A	*A
CM02	:	SH024-A/SH100-A	*9

*9 DKC-F310I-256 / DKC-F310I-1024 (9 sets)
*A DKC-F310I-256 / DKC-F310I-1024 (10 sets)
*B DKC-F310I-256 / DKC-F310I-1024 (11 sets)
*C DKC-F310I-256 / DKC-F310I-1024 (12 sets)
*D DKC-F310I-256 / DKC-F310I-1024 (13 sets)
*E DKC-F310I-256 / DKC-F310I-1024 (14 sets)
*F DKC-F310I-256 / DKC-F310I-1024 (15 sets)
*G DKC-F310I-256 / DKC-F310I-1024 (16 sets)

Fig. 4.3-2 Cache Memory Module Location

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4.4 PARTS LIST

PARTS LIST 3 (Parts listed below are shown in Fig. 4.1-1 through 4.3-2.)

ITEM NO.	PART NUMBER	PART NAME	QUANTITY PER DKC	REMARKS
10-1	3252509-B	Serial 2-port CHA ASSY (WP207-B/WP217-B×1 & SH086-A/SH149-A×2)	2-8	SP
2	3252509-A	Serial 4-port CHA ASSY (WP207-A/WP217-A×1 & SH086-A/SH149-A×4)	2-8	SP
3	3252510-A	Parallel 4CH CHA ASSY (WP209-A×1 & SH086-B/SH149-B×2)	2-4	SP
4	3252505-A	SCSI 4-port CHA ASSY (WP204-A/WP214-A×1 & SH086-C/SH149-C×4)	2-8	SP
5	3252506-A	Fibre 2-port CHA ASSY (Optical) (WP206-A×1 & SH113-A×2 & SH086-D/SH149-D×2)	2-8	SP
6	3252506-C	Fibre 2-port CHA ASSY (Optical) (WP206-B×1 & SH160-A×2 & SH086-D/SH149-D×2)	2-8	SP
7	3254519-A	Fibre 2-port CHA ASSY (Short Wavelength) (WP256-A×1 & SH164-A×1)	2-8	SP
8	3254519-B	Fibre 2-port CHA ASSY (Long Wavelength) (WP256-B×1 & SH164-A×1)	2-8	SP
9	1505479-B	WP102-B P/K ASSY(Support of HMRCF)	2-8	SP
	1505871-B	WP132-B P/K ASSY(Support of HMRCF)		
10	1505479-A	WP102-A P/K ASSY	2-8	SP
11	1505482-A	WP108-A P/K ASSY	2	SP
	1505847-A	WP118-A P/K ASSY		
12	1505482-B	WP108-B P/K ASSY	2	SP
	1505847-B	WP118-B P/K ASSY		
13	1505496-A	WP100-A P/K ASSY	1	SP
14	1505496-B	WP100-B P/K ASSY	1	SP
15	1505497-A	WP105-A P/K ASSY	1	SP
16	1505497-B	WP105-B P/K ASSY	1	SP
17	1505404-A	SH024-A P/K ASSY	8-128	SP
18	1501164-A	SH100-A P/K ASSY	8-128	SP
19	1505404-B	SH024-B P/K ASSY	2-8	SP
20	1501164-B	SH100-B P/K ASSY	2-8	SP
21	1504192-A	SH093-A P/K ASSY	4-6	SP
22	1505504-A	SH111-A P/K ASSY	2	SP
23	1504193-A	SH092-A P/K ASSY	2	SP
24	3250958-A	SH090-A & SH091-A	1	SP
25	1504195-A	SH088-A P/K ASSY	1	SP

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5 INTERNAL CABLING AND CABLE ASSEMBLY PARTS LIST

5.1 INTERNAL CABLING

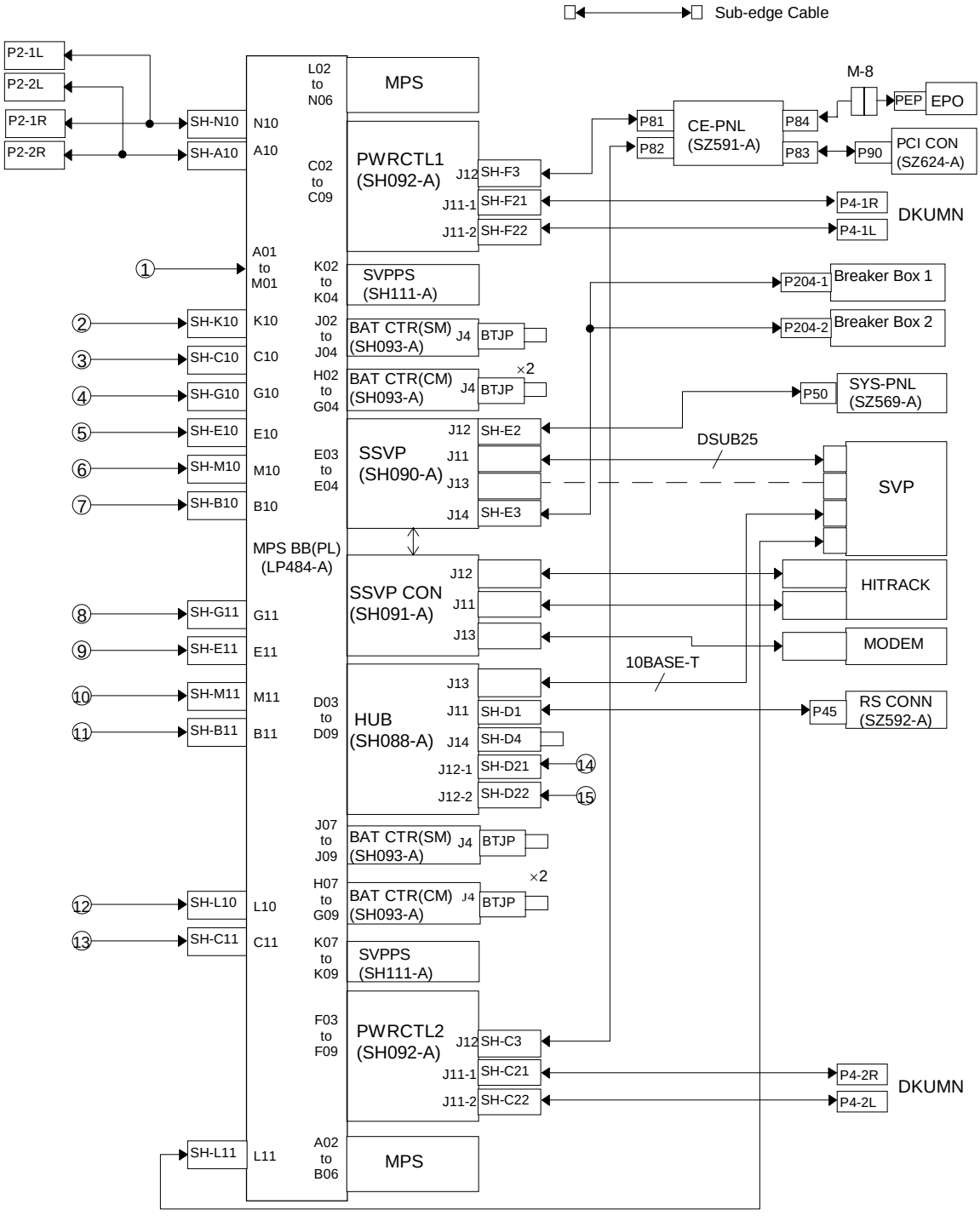

Fig. 5.1-1 Subsystem Internal Cabling Diagram ① (1/2)

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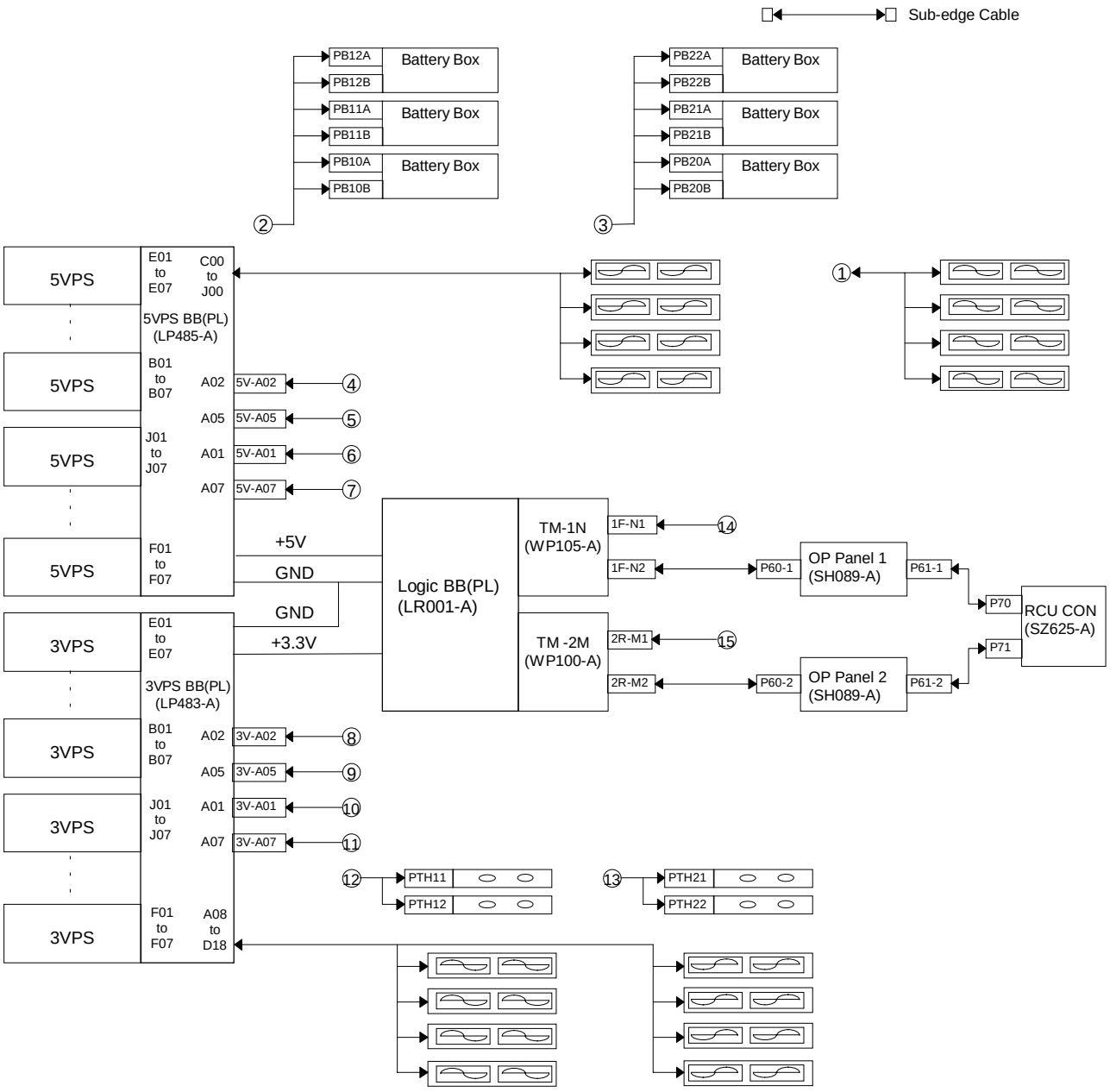

Fig. 5.1-2 Subsystem Internal Cabling Diagram ① (2/2)

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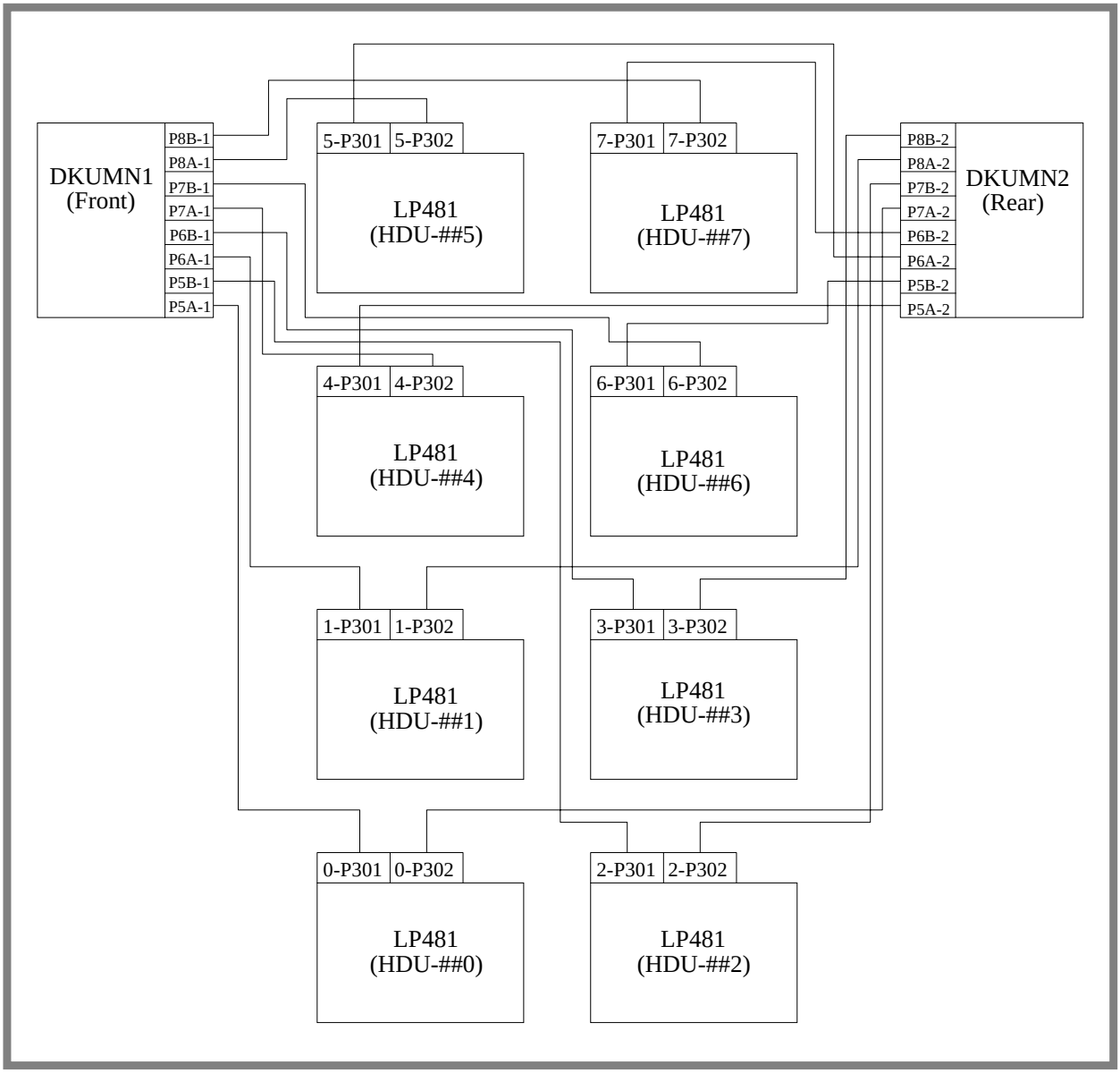
DKU



(Note) ## : DKU Location (R1, R2, L1, L2)

Fig. 5.1-3 Subsystem Internal Cabling Diagram ②

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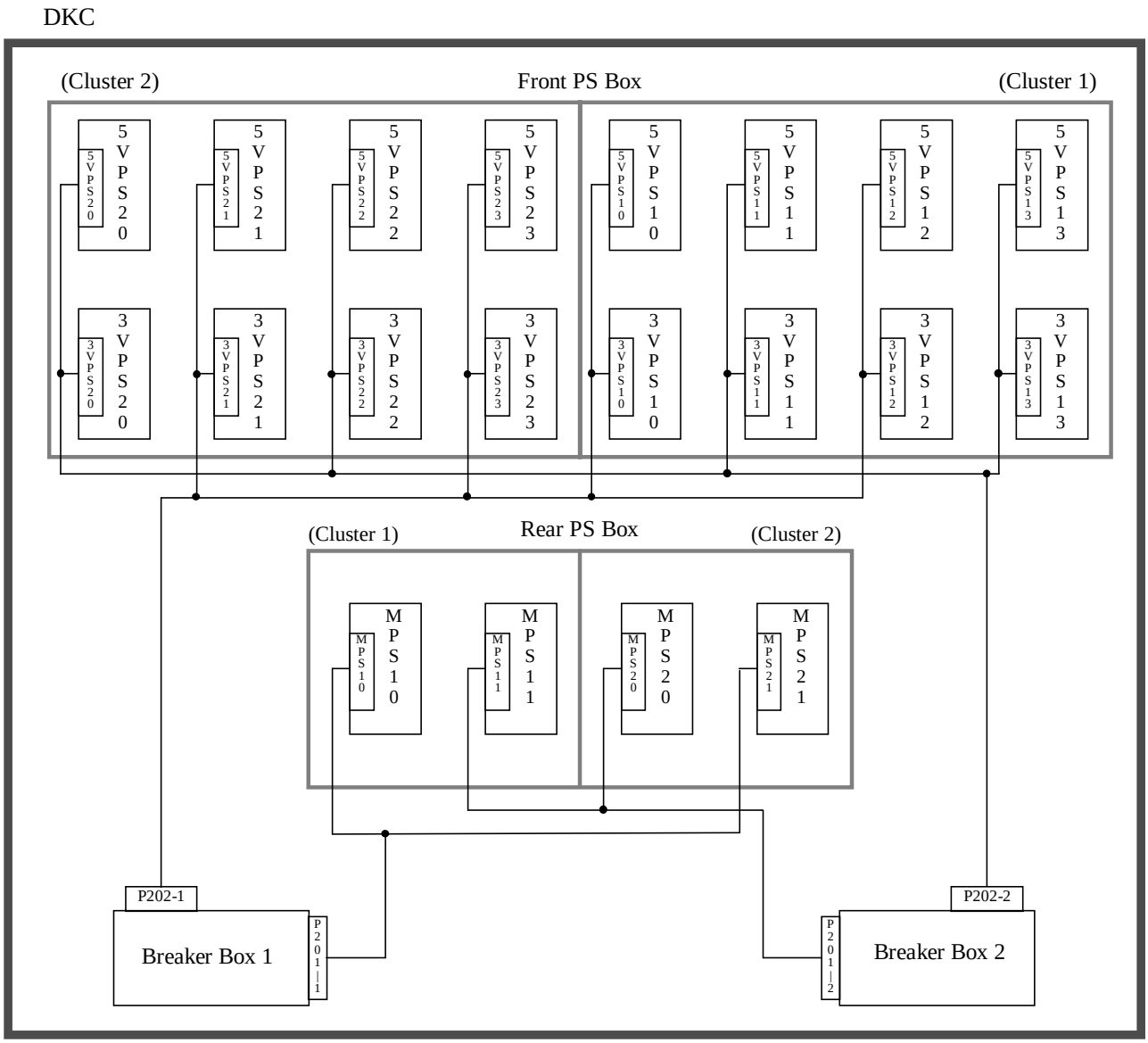

Fig. 5.1-4 Subsystem Internal Cabling Diagram ③

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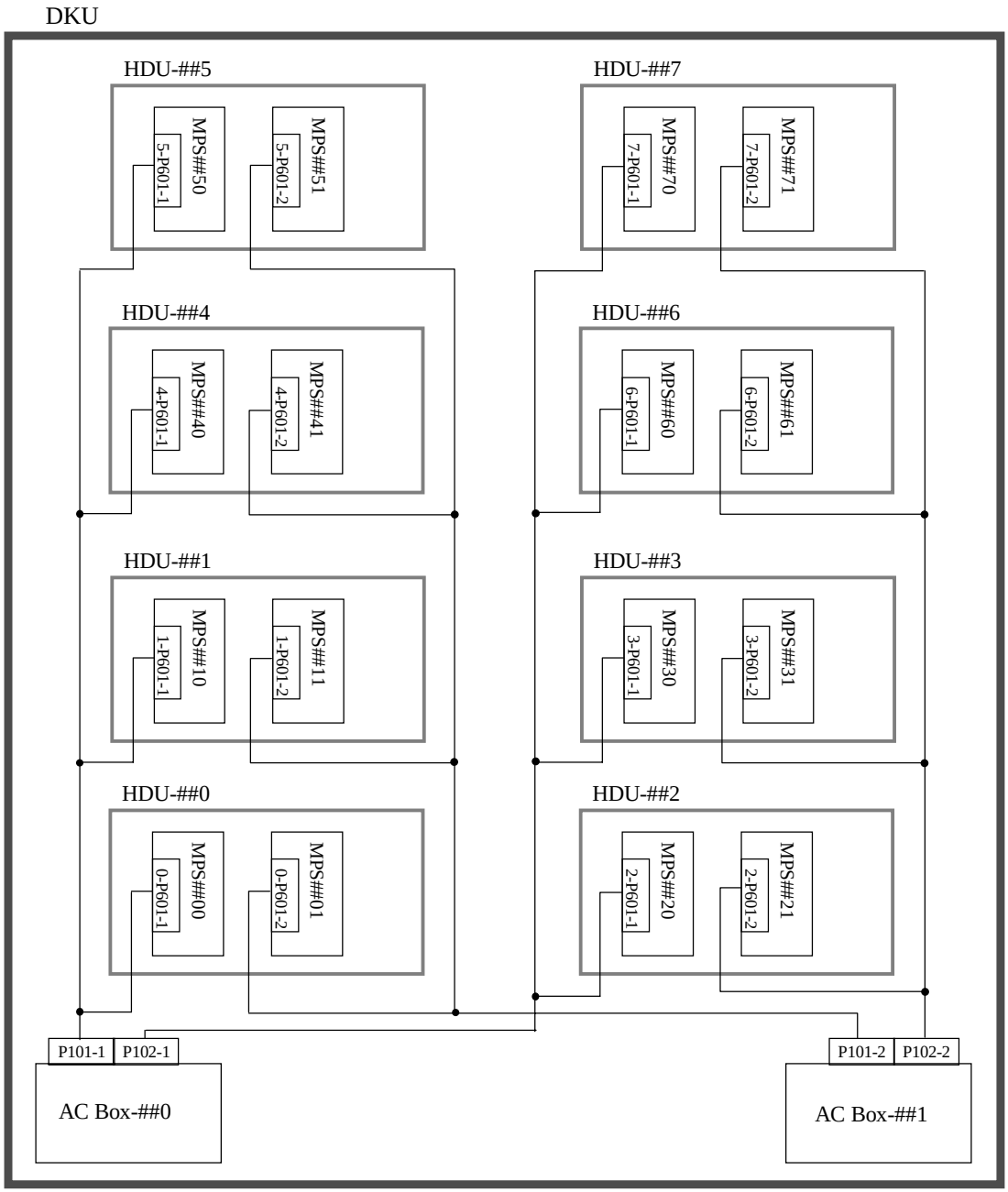

(Note) ## : DKU Location (R1, R2, L1, L2)

Fig. 5.1-5 Subsystem Internal Cabling Diagram ④

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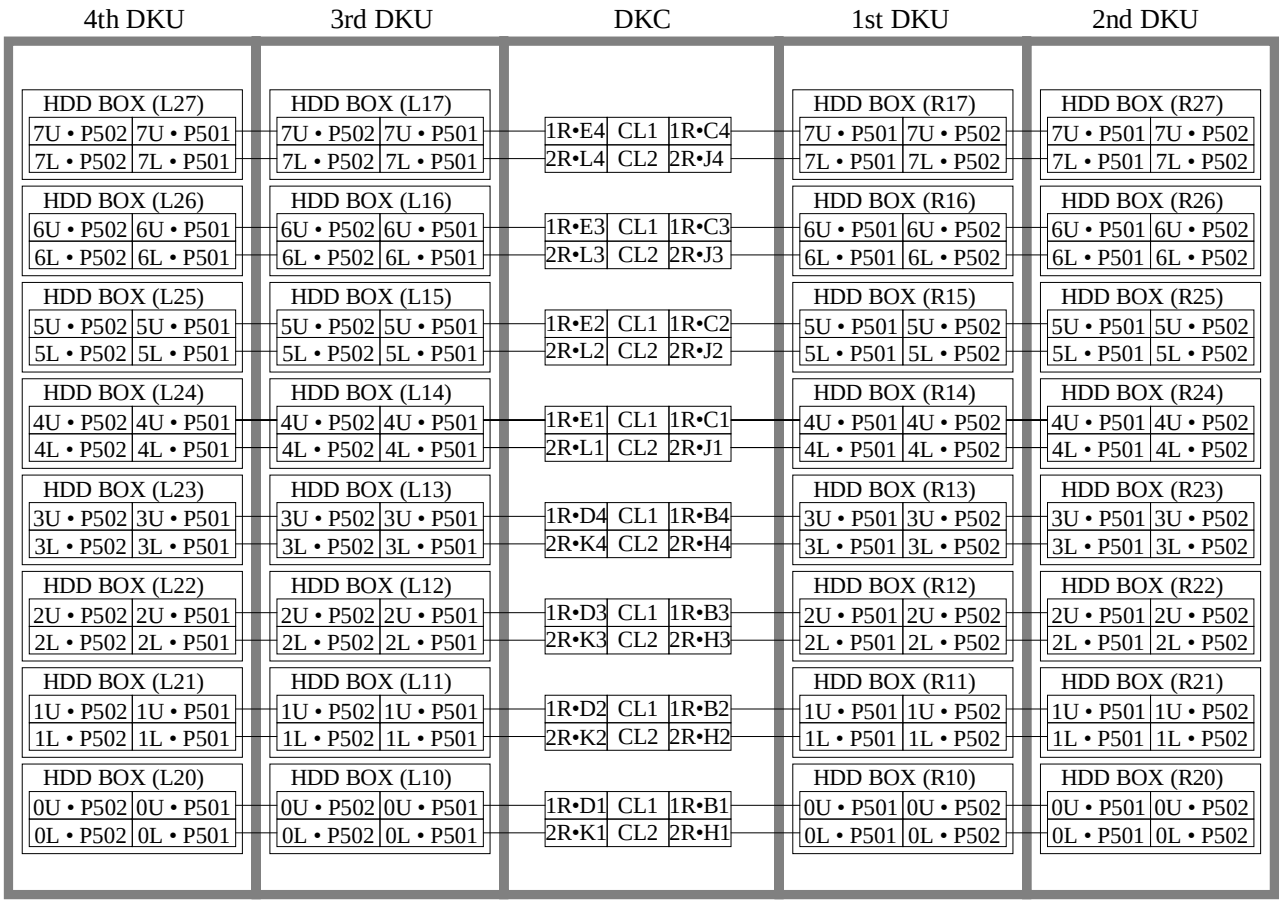

Fig. 5.1-6 Subsystem Internal Cabling Diagram ⑤

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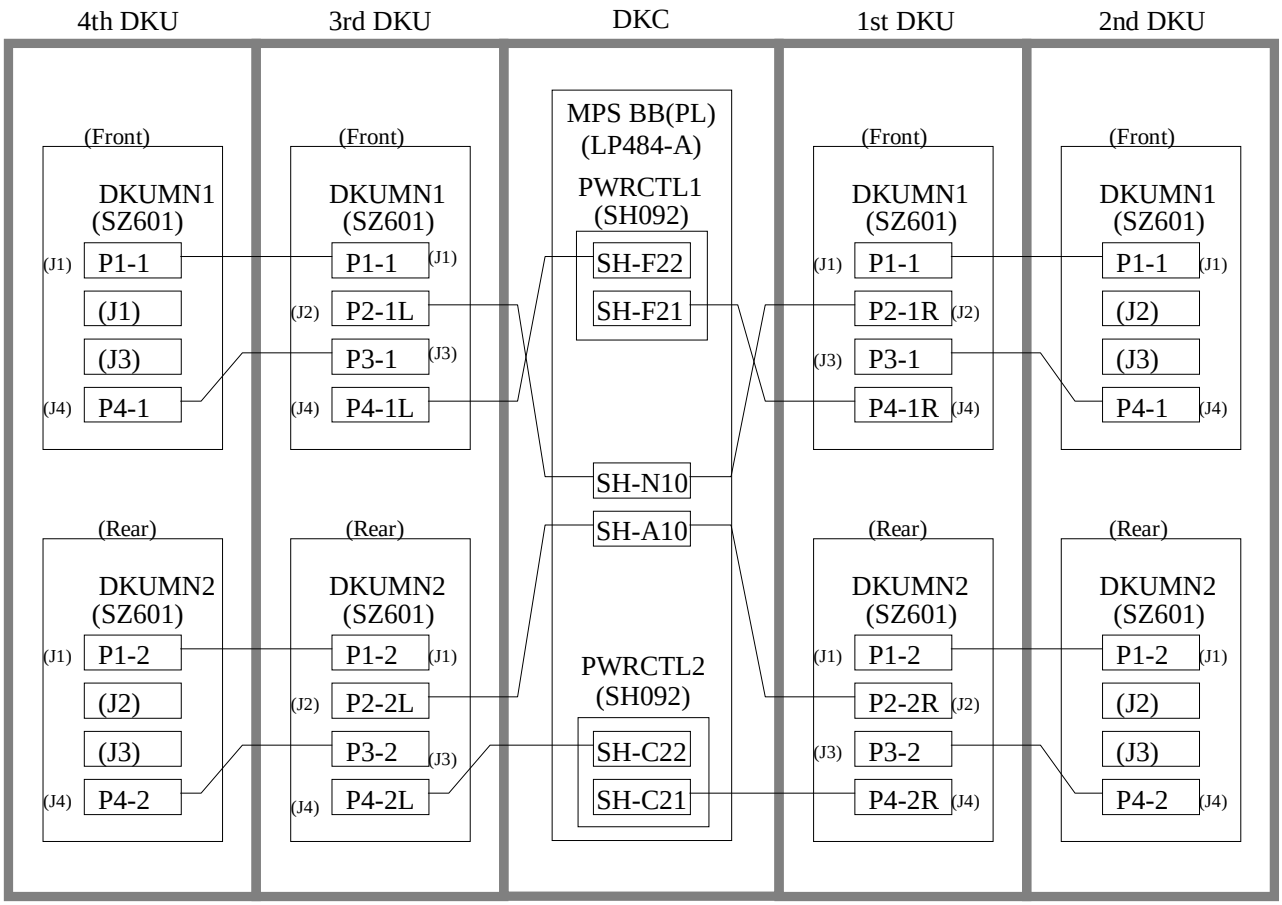

Fig. 5.1-7 Subsystem Internal Cabling Diagram ⑥

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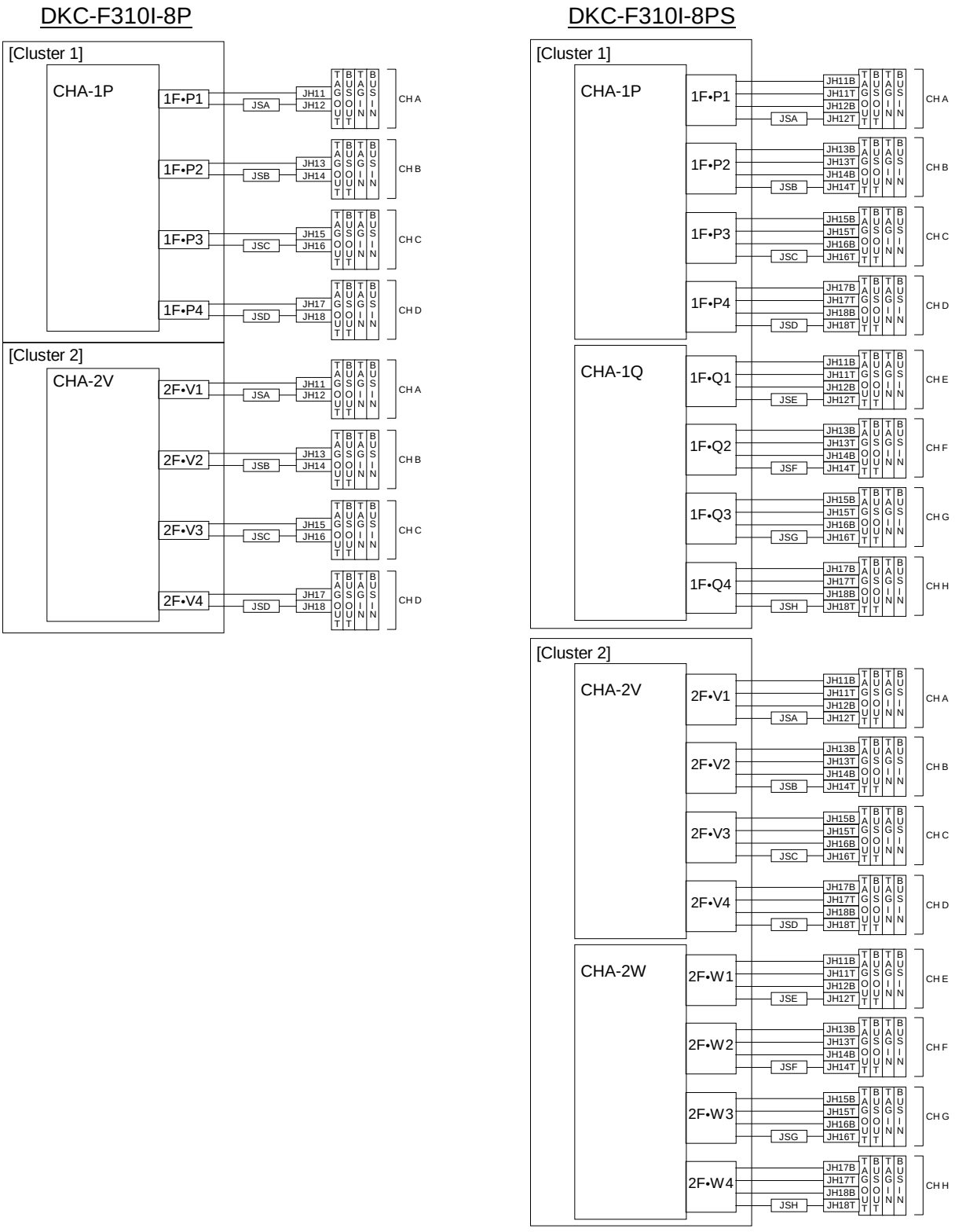

Fig. 5.1-8 Subsystem Internal Cabling Diagram ⑦

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DKC-F310I-8C

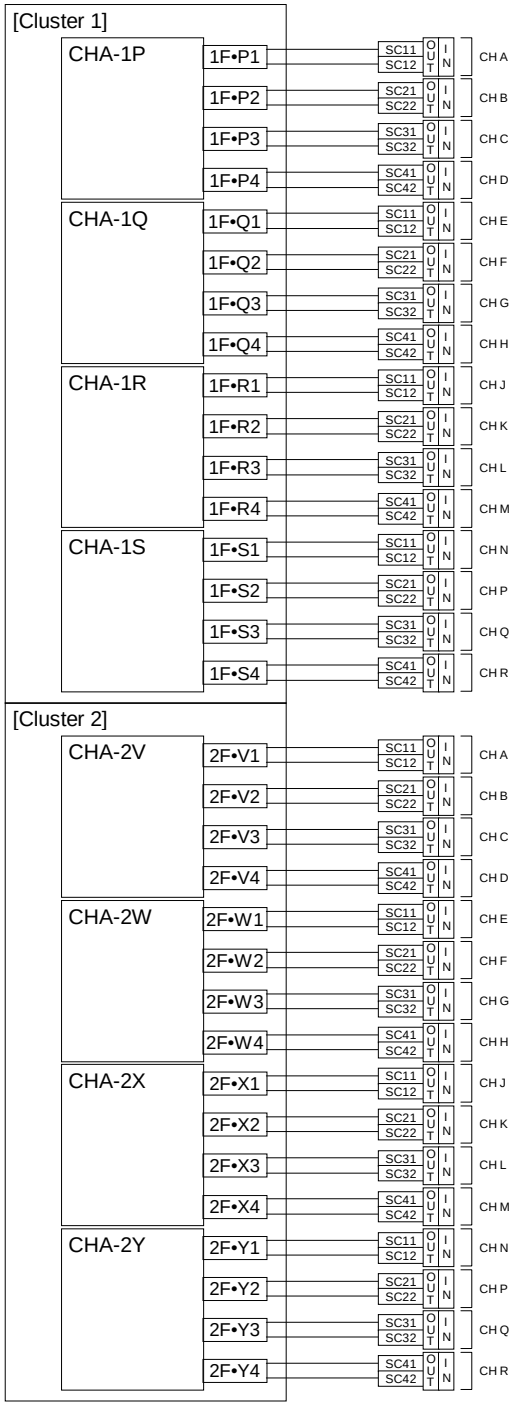

Fig. 5.1-9 Subsystem Internal Cabling Diagram ⑧

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5.2 CABLE ASSEMBLY PARTS LIST

List and Index No.	Connector No.		Part No.	Part Name
	Source	Destination		
11-1	SH-E2 (SSVP)	P50 (System Panel)	3250513-A	CABLE ASSY (20FA-ST)
2	SH-F3 (PWRCTL1)	P81 (CE-Panel)	3250514-A	CABLE ASSY (26FA-ST)
	SH-C3 (PWRCTL2)	P82 (CE-Panel)	3250514-B	CABLE ASSY (26FA-ST)
	SH-G10 (MPS PL)	5V-A02 (5V PS PL)	3250514-C	CABLE ASSY (26FA-ST)
	SH-E10 (MPS PL)	5V-A05 (5V PS PL)	3250514-D	CABLE ASSY (26FA-ST)
	SH-G11 (MPS PL)	3V-A02 (3V PS PL)	3250514-E	CABLE ASSY (26FA-ST)
	SH-E11 (MPS PL)	3V-A05 (3V PS PL)	3250514-F	CABLE ASSY (26FA-ST)
3	P70 (RCU CONN)	P61-1 (OP Panel 1)	3250515-A	CABLE ASSY (34FA-ST)
	P71 (RCU CONN)	P61-2 (OP Panel 2)	3250515-B	CABLE ASSY (34FA-ST)
	P83 (CE Panel)	P90 (PCI CONN)	3250515-C	CABLE ASSY (34FA-ST)
4	2R-M2 (LG-TM1)	P60-2 (OP Panel 2)	3250516-A	CABLE ASSY (50FA-ST)
	1F-N2 (LG-TM2)	P60-1 (OP Panel 1)	3250516-B	CABLE ASSY (50FA-ST)
5	SH-D22 (HUB)	2R-M1 (LG-TM)	3250517-A	CABLE ASSY (26FA-TW)
	SH-D21 (HUB)	1F-N1 (LG-TM)	3250517-B	CABLE ASSY (26FA-TW)
6	SH-D1 (HUB)	P45 (RS-CON)	3250518-A	CABLE ASSY (MRP-50)
7	SH-F21 (PWRCTL1)	P4-1R (DKUMN1)	3250519-A	CABLE ASSY (MRP-100)
	SH-F22 (PWRCTL1)	P4-1L (DKUMN1)	3250519-B	CABLE ASSY (MRP-100)
	SH-C21 (PWRCTL2)	P4-2R (DKUMN2)	3250519-C	CABLE ASSY (MRP-100)
	SH-C22 (PWRCTL2)	P4-2L (DKUMN2)	3250519-D	CABLE ASSY (MRP-100)
8	P84 (CE Panel)	PEP (EPO)	3250520-A	CABLE ASSY (EPO)
9	SH-N10 (MPS PL)	P2-1L (DKUMN1)	3250521-A	CABLE ASSY (SH-PL)
		P2-1R (DKUMN1)		
	SH-A10 (MPS PL)	P2-2L (DKUMN2)	3250521-B	CABLE ASSY (SH-PL)
		P2-2R (DKUMN2)		
10	P200-1 (BREAKER1)	P103-1 (AC-BOX1)	3250522-A	CABLE ASSY (BREAKER BOX)
	P200-2 (BREAKER2)	P103-2 (AC-BOX2)	3250522-B	CABLE ASSY (BREAKER BOX)
11	SH-E3 (SSVP)	P204-1 (BREAKER1)	3250523-A	CABLE ASSY (SSVP/BREAKER)
		P204-2 (BREAKER2)		
12	SH-L10 (MPS PL)	PTH11 (THORM11)	3250524-A	CABLE ASSY (TH)
		PTH12 (THORM12)		
	SH-C10 (MPS PL)	PTH21 (THORM21)	3250524-B	CABLE ASSY (TH)
		PTH22 (THORM22)		

(To be continued)

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(Continued from the preceding page)

List and Index No.	Connector No.		Part No.	Part Name
	Source	Destination		
13	SH-K10 (MPS PL)	PB10A (Battery Box)	3250525-A	CABLE ASSY (BATTERY)
		PB10B (Battery Box)		
		PB11A (Battery Box)		
		PB11B (Battery Box)		
		PB12A (Battery Box)		
		PB12B (Battery Box)		
	SH-C10 (MPS PL)	PB20A (Battery Box)	3250525-B	CABLE ASSY (BATTERY)
		PB20B (Battery Box)		
		PB21A (Battery Box)		
		PB21B (Battery Box)		
		PB22A (Battery Box)		
		PB22B (Battery Box)		
14	SH-M11 (MPS PL)	3V-A01 (3V PS PL)	3250526-A	CABLE ASSY (SH-PL)
	SH-B11 (MPS PL)	3V-A07 (3V PS PL)	3250526-B	CABLE ASSY (SH-PL)
	SH-M10 (MPS PL)	5V-A01 (5V PS PL)	3250526-C	CABLE ASSY (SH-PL)
	SH-B10 (MPS PL)	5V-A07 (5V PS PL)	3250526-D	CABLE ASSY (SH-PL)
15	1R-B1 (DKA)	0U-P501 (SCSI BFR)	3250527-A	CABLE ASSY (SCSI)
	1R-B2 (DKA)	1U-P501 (SCSI BFR)	3250527-B	CABLE ASSY (SCSI)
	1R-B3 (DKA)	2U-P501 (SCSI BFR)	3250527-C	CABLE ASSY (SCSI)
	1R-B4 (DKA)	3U-P501 (SCSI BFR)	3250527-D	CABLE ASSY (SCSI)
	2R-H1 (DKA)	0L-P501 (SCSI BFR)	3250527-E	CABLE ASSY (SCSI)
	2R-H2 (DKA)	1L-P501 (SCSI BFR)	3250527-F	CABLE ASSY (SCSI)
	2R-H3 (DKA)	2L-P501 (SCSI BFR)	3250527-G	CABLE ASSY (SCSI)
	2R-H4 (DKA)	3L-P501 (SCSI BFR)	3250527-H	CABLE ASSY (SCSI)
	1R-C1 (DKA)	4U-P501 (SCSI BFR)	3250527-J	CABLE ASSY (SCSI)
	1R-C2 (DKA)	5U-P501 (SCSI BFR)	3250527-K	CABLE ASSY (SCSI)
	1R-C3 (DKA)	6U-P501 (SCSI BFR)	3250527-L	CABLE ASSY (SCSI)
	1R-C4 (DKA)	7U-P501 (SCSI BFR)	3250527-M	CABLE ASSY (SCSI)
	2R-J1 (DKA)	4L-P501 (SCSI BFR)	3250527-N	CABLE ASSY (SCSI)
	2R-J2 (DKA)	5L-P501 (SCSI BFR)	3250527-P	CABLE ASSY (SCSI)
	2R-J3 (DKA)	6L-P501 (SCSI BFR)	3250527-Q	CABLE ASSY (SCSI)
	2R-J4 (DKA)	7L-P501 (SCSI BFR)	3250527-R	CABLE ASSY (SCSI)
16	SH-D4 (HUB)		3250529-A	CABLE ASSY (8P JUMPER)
17	BTJP (BATT CTR)		3250530-A	JUMPER (BATTERY)
18	SD (LG-P/I)		3250531-A	JUMPER (MINI PV)
19	—(SSVP)	—(SVP)	5485510-2	CABLE (RS-232C)
20	—(HUB)	—(SVP)	5485506-3	LAN CABLE

(To be continued)

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(Continued from the preceding page)

List and Index No.	Connector No.		Part No.	Part Name
	Source	Destination		
21	P202-1 (BREAKER1)	3VPS10 (SWPS)	3250542-A	CABLE ASSY (BRANCH)
		3VPS12 (SWPS)		
		3VPS21 (SWPS)		
		3VPS23 (SWPS)		
		5VPS10 (SWPS)		
		5VPS12 (SWPS)		
		5VPS21 (SWPS)		
		5VPS23 (SWPS)		
	P202-2 (BREAKER2)	3VPS11 (SWPS)	3250542-B	CABLE ASSY (BRANCH)
		3VPS13 (SWPS)		
		3VPS20 (SWPS)		
		3VPS22 (SWPS)		
		5VPS11 (SWPS)		
		5VPS13 (SWPS)		
		5VPS20 (SWPS)		
		5VPS22 (SWPS)		
22	P201-1 (BREAKER1)	MPS10 (SWPS)	3250543-A	CABLE ASSY (STRAIGHT)
		MPS21 (SWPS)		
	P201-2 (BREAKER2)	MPS11 (SWPS)	3250543-B	CABLE ASSY (STRAIGHT)
		MPS20 (SWPS)		
23	SH-L11 (MPS PL)	—(SVP)	3250945-A	CABLE ASSY (SVP ARMADA)
			3253518-A	CABLE ASSY (SVP FLORA230)
			3253518-B	CABLE ASSY (SVP FLORA270V)
24	AI (PWRCTL)		5500576-A	JUMPER (PWRCTL)
25	P101-1 (AC Box)	0-P601-1 (MPS)	3239255-A	CABLE ASSY (DKU-AC)
		1-P601-1 (MPS)		
		4-P601-1 (MPS)		
		5-P601-1 (MPS)		
	P101-2 (AC Box)	0-P601-2 (MPS)	3239255-B	CABLE ASSY (DKU-AC)
		1-P601-2 (MPS)		
		4-P601-2 (MPS)		
		5-P601-2 (MPS)		
	P102-1 (AC Box)	2-P601-1 (MPS)	3239255-C	CABLE ASSY (DKU-AC)
		3-P601-1 (MPS)		
		6-P601-1 (MPS)		
		7-P601-1 (MPS)		
	P102-2 (AC Box)	2-P601-2 (MPS)	3239255-D	CABLE ASSY (DKU-AC)
		3-P601-2 (MPS)		
		6-P601-2 (MPS)		
		7-P601-2 (MPS)		

(To be continued)

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(Continued from the preceding page)

List and Index No.	Connector No.		Part No.	Part Name
	Source	Destination		
26	P5A-1 (DKUMN)	0-P301 (HDD PL)	3239257-A	CABLE ASSY (DKUMN)
	P6A-1 (DKUMN)	1-P301 (HDD PL)	3239257-B	CABLE ASSY (DKUMN)
	P5B-1 (DKUMN)	2-P301 (HDD PL)	3239257-C	CABLE ASSY (DKUMN)
	P6B-1 (DKUMN)	3-P301 (HDD PL)	3239257-D	CABLE ASSY (DKUMN)
	P7A-1 (DKUMN)	4-P302 (HDD PL)	3239257-E	CABLE ASSY (DKUMN)
	P8A-1 (DKUMN)	5-P302 (HDD PL)	3239257-F	CABLE ASSY (DKUMN)
	P7B-1 (DKUMN)	6-P302 (HDD PL)	3239257-G	CABLE ASSY (DKUMN)
	P8B-1 (DKUMN)	7-P302 (HDD PL)	3239257-H	CABLE ASSY (DKUMN)
	P7A-2 (DKUMN)	0-P302 (HDD PL)	3239257-J	CABLE ASSY (DKUMN)
	P8A-2 (DKUMN)	1-P302 (HDD PL)	3239257-K	CABLE ASSY (DKUMN)
	P7B-2 (DKUMN)	2-P302 (HDD PL)	3239257-L	CABLE ASSY (DKUMN)
	P8B-2 (DKUMN)	3-P302 (HDD PL)	3239257-M	CABLE ASSY (DKUMN)
	P5A-2 (DKUMN)	4-P301 (HDD PL)	3239257-N	CABLE ASSY (DKUMN)
	P6A-2 (DKUMN)	5-P301 (HDD PL)	3239257-P	CABLE ASSY (DKUMN)
	P5B-2 (DKUMN)	6-P301 (HDD PL)	3239257-Q	CABLE ASSY (DKUMN)
	P6B-2 (DKUMN)	7-P301 (HDD PL)	3239257-R	CABLE ASSY (DKUMN)
27	1R-D1 (DKA)	0U-P501 (SCSI BFR)	5500004-A	DEV I/F Cable (1)
	2R-K1 (DKA)	0L-P501 (SCSI BFR)	5500004-B	DEV I/F Cable (1)
	1R-D2 (DKA)	1U-P501 (SCSI BFR)	5500004-C	DEV I/F Cable (1)
	2R-K2 (DKA)	1L-P501 (SCSI BFR)	5500004-D	DEV I/F Cable (1)
	1R-D3 (DKA)	2U-P501 (SCSI BFR)	5500004-E	DEV I/F Cable (1)
	2R-K3 (DKA)	2L-P501 (SCSI BFR)	5500004-F	DEV I/F Cable (1)
	1R-D4 (DKA)	3U-P501 (SCSI BFR)	5500004-G	DEV I/F Cable (1)
	2R-K4 (DKA)	3L-P501 (SCSI BFR)	5500004-H	DEV I/F Cable (1)
	1R-E1 (DKA)	4U-P501 (SCSI BFR)	5500004-J	DEV I/F Cable (1)
	2R-L1 (DKA)	4L-P501 (SCSI BFR)	5500004-K	DEV I/F Cable (1)
	1R-E2 (DKA)	5U-P501 (SCSI BFR)	5500004-L	DEV I/F Cable (1)
	2R-L2 (DKA)	5L-P501 (SCSI BFR)	5500004-M	DEV I/F Cable (1)
	1R-E3 (DKA)	6U-P501 (SCSI BFR)	5500004-N	DEV I/F Cable (1)
	2R-L3 (DKA)	6L-P501 (SCSI BFR)	5500004-P	DEV I/F Cable (1)
	1R-E4 (DKA)	7U-P501 (SCSI BFR)	5500004-Q	DEV I/F Cable (1)
	2R-L4 (DKA)	7L-P501 (SCSI BFR)	5500004-R	DEV I/F Cable (1)
28	0U-P502 (SCSI BFR)	0U-P501 (SCSI BFR)	5487067-A	DEV I/F Cable (2)
	0L-P502 (SCSI BFR)	0L-P501 (SCSI BFR)	5487067-B	DEV I/F Cable (2)
	1U-P502 (SCSI BFR)	1U-P501 (SCSI BFR)	5487067-C	DEV I/F Cable (2)
	1L-P502 (SCSI BFR)	1L-P501 (SCSI BFR)	5487067-D	DEV I/F Cable (2)
	2U-P502 (SCSI BFR)	2U-P501 (SCSI BFR)	5487067-E	DEV I/F Cable (2)
	2L-P502 (SCSI BFR)	2L-P501 (SCSI BFR)	5487067-F	DEV I/F Cable (2)
	3U-P502 (SCSI BFR)	3U-P501 (SCSI BFR)	5487067-G	DEV I/F Cable (2)
	3L-P502 (SCSI BFR)	3L-P501 (SCSI BFR)	5487067-H	DEV I/F Cable (2)
	4U-P502 (SCSI BFR)	4U-P501 (SCSI BFR)	5487067-J	DEV I/F Cable (2)
	4L-P502 (SCSI BFR)	4L-P501 (SCSI BFR)	5487067-K	DEV I/F Cable (2)

(To be continued)

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(Continued from the preceding page)

List and Index No.	Connector No.		Part No.	Part Name
	Source	Destination		
28	5U-P502 (SCSI BFR)	5U-P501 (SCSI BFR)	5487067-L	DEV I/F Cable (2)
	5L-P502 (SCSI BFR)	5L-P501 (SCSI BFR)	5487067-M	DEV I/F Cable (2)
	6U-P502 (SCSI BFR)	6U-P501 (SCSI BFR)	5487067-N	DEV I/F Cable (2)
	6L-P502 (SCSI BFR)	6L-P501 (SCSI BFR)	5487067-P	DEV I/F Cable (2)
	7U-P502 (SCSI BFR)	7U-P501 (SCSI BFR)	5487067-Q	DEV I/F Cable (2)
	7L-P502 (SCSI BFR)	7L-P501 (SCSI BFR)	5487067-R	DEV I/F Cable (2)
29	P1-1 (DKUMN1)	P1-1 (DKUMN1)	3239256-A	MONI Cable (2)
	P1-2 (DKUMN2)	P1-2 (DKUMN2)	3239256-B	MONI Cable (2)
	P3-1 (DKUMN1)	P4-1 (DKUMN1)	2098190-A	MONI Cable (1)
	P3-2 (DKUMN2)	P4-2 (DKUMN2)	2098190-B	MONI Cable (1)
30	B4 (HDD PL)		3250199-A	SCSI ID JUMPER

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6 SPARE PARTS LIST

The following table shows the Spare parts of DKC310I.

No.	Part Name		Part Number	Corresponding List and Index Number
1	Serial 2-port CHA ASSY	WP207-B/WP217-B×1 & SH086-A/SH149-A×2	3252509-B	10-1
2	Serial 4-port CHA ASSY	WP207-A/WP217-A×1 & SH086-A/SH149-A×4	3252509-A	10-2
3	Parallel 4CH CHA ASSY	WP209-A×1 & SH086-B/SH149-B×2	3252510-A	10-3
4	SCSI 4-port CHA ASSY	WP204-A/WP214-A×1 & SH086-C/SH149-C×4	3252505-A	10-4
5	Fibre 2-port CHA ASSY (Optical)	WP206-A×1 & SH113-A×2 & SH086-D/SH149-D×2	3252506-A	10-5
6	Fibre 2-port CHA ASSY (Optical)	WP206-B×1 & SH160-A×2 &SH086-D/SH149-D×2	3252506-C	10-6
7	Fibre 2-port CHA ASSY (Short Wavelength)	WP256-A×1 & SH164-A×1	3254519-A	10-7
8	Fibre 2-port CHA ASSY (Long Wavelength)	WP256-B×1 & SH164-A×1	3254519-B	10-8
9	DKA (Support of HMRCF)	WP102-B P/K ASSY	1505479-B	10-9
		WP132-B P/K ASSY	1505871-B	
10	DKA	WP102-A P/K ASSY	1505479-A	10-10
11	CACHE	WP108-A P/K ASSY	1505482-A	10-11
		WP118-A P/K ASSY	1505847-A	
		WP108-B P/K ASSY	1505482-B	10-12
		WP118-B P/K ASSY	1505847-B	
12	TM2	WP100-A P/K ASSY	1505496-A	10-13
		WP100-B P/K ASSY	1505496-B	10-14
13	TM1	WP105-A P/K ASSY	1505497-A	10-15
		WP105-B P/K ASSY	1505497-B	10-16
14	5V PS PL	LP485-A B/P ASSY	1504189-A	—
15	3V PS PL	LP483-A B/P ASSY	1504190-A	—
16	MPS PL	LP484-A B/P ASSY	1504191-A	—
17	L/G PL	LR001-A B/P ASSY	5497443-1	—
18	CM-SIMM (Cache Memory Module)	SH024-A P/K ASSY	1505404-A	10-17
		SH100-A P/K ASSY	1501164-A	10-18
19	SM-SIMM (Shared Memory Module)	SH024-B P/K ASSY	1505404-B	10-19
		SH100-B P/K ASSY	1501164-B	10-20
20	BREAKER BOX ASSY		5497350-A	7-7
21	5V POWER SUPPLY	HS05065C-S	5500003-A	7-2,52
		TAH-325HSA		
		HS05065C-W		
22	3V POWER SUPPLY	HS03075C-S	5500003-B	7-3,53
		TAH-264HSA		
		HS03075C-W		

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No.	Part Name		Part Number	Corresponding List and Index Number
23	MULTI POWER SUPPLY	HS300-04C-V	5479654-C	7-4,54
		HS300-04C-R		
		TSG-370HS-C	5491916-2	
		HS400-08GR	EC5000367-A	
24	SVP	ARMADA (COMPAQ)	5497440-1	7-26
		FLORA230 (HITACHI)	5500595-B	7-64,11-23
		FLORA270V (HITACHI)	5500595-C	7-73,11-23
25	THERMOSTAT ASSY (ALM(TH-L) ASSY)		3247490-A	7-6
26	BATTERY ASSY		3236759-A	7-31,50
27	FAN ASSY		5509215-A	7-5
28	EPO ASSY		3240104-A	8-11
29	BATT CTR	SH093-A P/K ASSY	1504192-A	10-21
30	SVP PS	SH111-A P/K ASSY	1505504-A	10-22
31	PWRCTL	SH092-A P/K ASSY	1504193-A	10-23
32	SSVP ASSY	SH090-A & SH091-A	3250958-A	10-24
33	HUB	SH088-A P/K ASSY	1504195-A	10-25
34	CE PNL	SZ591-A P/K ASSY	1503458-A	8-4
35	SYSTEM PNL	SZ569-A P/K ASSY	2098610-A	8-2
36	OP PNL	SH089-A P/K ASSY	1504196-A	8-3
37	PCI CON	SZ624-A P/K ASSY	2098689-A	7-46
38	RCU CON	SZ625-A P/K ASSY	2098691-A	7-48
39	RS CON	SZ592-A P/K ASSY	2098612-A	7-32
40	LAN CARD	PS-CE2-10BT	5486353-1	7-30
		PS-CE3-10BT	5486353-2	
41	DEV I/F Cable (Label: 1R•B1-0U•P501)		3250527-A	11-15
42	DEV I/F Cable (Label: 1R•B2-1U•P501)		3250527-B	11-15
43	DEV I/F Cable (Label: 1R•B3-2U•P501)		3250527-C	11-15
44	DEV I/F Cable (Label: 1R•B4-3U•P501)		3250527-D	11-15
45	DEV I/F Cable (Label: 2R•H1-0L•P501)		3250527-E	11-15
46	DEV I/F Cable (Label: 2R•H2-1L•P501)		3250527-F	11-15
47	DEV I/F Cable (Label: 2R•H3-2L•P501)		3250527-G	11-15
48	DEV I/F Cable (Label: 2R•H4-3L•P501)		3250527-H	11-15
49	DEV I/F Cable (Label: 1R•C1-4U•P501)		3250527-J	11-15
50	DEV I/F Cable (Label: 1R•C2-5U•P501)		3250527-K	11-15
51	DEV I/F Cable (Label: 1R•C3-6U•P501)		3250527-L	11-15
52	DEV I/F Cable (Label: 1R•C4-7U•P501)		3250527-M	11-15
53	DEV I/F Cable (Label: 2R•J1-4L•P501)		3250527-N	11-15
54	DEV I/F Cable (Label: 2R•J2-5L•P501)		3250527-P	11-15
55	DEV I/F Cable (Label: 2R•J3-6L•P501)		3250527-Q	11-15
56	DEV I/F Cable (Label: 2R•J4-7L•P501)		3250527-R	11-15
57	I/F Connector Panel (for CL1)		2102035-A	—
58	I/F Connector Panel (for CL2)		2102035-B	—

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The following table shows the Spare parts of DKU305I.

No.	Part Name		Part Number	Corresponding List and Index Number
1	AC BOX		5487058-A	1-7
2	MULTI POWER SUPPLY	HS400-08C-S	5497470-A	2-10
		HS400-08C-W		
		HS400-08C-R	5497470-B	
		TSG370HS	5497470-C	
3	DKU MN	SZ601-A P/K ASSY	5487055-A	4-2
4	SCSI BFR	SH087-A P/K ASSY	5497468-A	2-9
5	HDD PL	LP481-A B/P ASSY	5497469-A	2-8
6	HDD FAN ASSY		5497471-A	2-13
7	HDU-6F1(60)	DK3F1-60	5497472-A	2-18,5-
8	HDU-901(90)	DK308/309-90	5491618-A	2-19,5-
9	HDU-1801(180)	DK309/30A-180	5497473-A	2-20,5-
10	HDU-9F1(90)	DK3F2-90	5502138-A	2-23,5-
11	HDU-15F1(150)	DK3F2-150	5502085-A	2-24,5-
12	HDU-3601(360)	DK30A-360	5502084-A	2-25,5-
13	HDU-18J1SC(180)	DKR2B-J18SC	5502372-A	2-27,5-
14	HDU-47J1SC(470)	DKR1B-J47SC	5502373-A	2-27,5-
15	DEV I/F Cable (1)	(Label: 1R•D1-0U•P501)	5500004-A	11-27
16	DEV I/F Cable (1)	(Label: 2R•K1-0L•P501)	5500004-B	11-27
17	DEV I/F Cable (1)	(Label: 1R•D2-1U•P501)	5500004-C	11-27
18	DEV I/F Cable (1)	(Label: 2R•K2-1L•P501)	5500004-D	11-27
19	DEV I/F Cable (1)	(Label: 1R•D3-2U•P501)	5500004-E	11-27
20	DEV I/F Cable (1)	(Label: 2R•K3-2L•P501)	5500004-F	11-27
21	DEV I/F Cable (1)	(Label: 1R•D4-3U•P501)	5500004-G	11-27
22	DEV I/F Cable (1)	(Label: 2R•K4-3L•P501)	5500004-H	11-27
23	DEV I/F Cable (1)	(Label: 1R•E1-4U•P501)	5500004-J	11-27
24	DEV I/F Cable (1)	(Label: 2R•L1-4L•P501)	5500004-K	11-27
25	DEV I/F Cable (1)	(Label: 1R•E2-5U•P501)	5500004-L	11-27
26	DEV I/F Cable (1)	(Label: 2R•L2-5L•P501)	5500004-M	11-27
27	DEV I/F Cable (1)	(Label: 1R•E3-6U•P501)	5500004-N	11-27
28	DEV I/F Cable (1)	(Label: 2R•L3-6L•P501)	5500004-P	11-27
29	DEV I/F Cable (1)	(Label: 1R•E4-7U•P501)	5500004-Q	11-27
30	DEV I/F Cable (1)	(Label: 2R•L4-7L•P501)	5500004-R	11-27
31	DEV I/F Cable (2)	(Label: 0U•P502-0U•P501)	5487067-A	11-28
32	DEV I/F Cable (2)	(Label: 0L•P502-0L•P501)	5487067-B	11-28
33	DEV I/F Cable (2)	(Label: 1U•P502-1U•P501)	5487067-C	11-28
34	DEV I/F Cable (2)	(Label: 1L•P502-1L•P501)	5487067-D	11-28
35	DEV I/F Cable (2)	(Label: 2U•P502-2U•P501)	5487067-E	11-28
36	DEV I/F Cable (2)	(Label: 2L•P502-2L•P501)	5487067-F	11-28
37	DEV I/F Cable (2)	(Label: 3U•P502-3U•P501)	5487067-G	11-28

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No.	Part Name	Part Number	Corresponding List and Index Number
38	DEV I/F Cable (2) (Label: 3L•P502-3L•P501)	5487067-H	11-28
39	DEV I/F Cable (2) (Label: 4U•P502-4U•P501)	5487067-J	11-28
40	DEV I/F Cable (2) (Label: 4L•P502-4L•P501)	5487067-K	11-28
41	DEV I/F Cable (2) (Label: 5U•P502-5U•P501)	5487067-L	11-28
42	DEV I/F Cable (2) (Label: 5L•P502-5L•P501)	5487067-M	11-28
43	DEV I/F Cable (2) (Label: 6U•P502-6U•P501)	5487067-N	11-28
44	DEV I/F Cable (2) (Label: 6L•P502-6L•P501)	5487067-P	11-28
45	DEV I/F Cable (2) (Label: 7U•P502-7U•P501)	5487067-Q	11-28
46	DEV I/F Cable (2) (Label: 7L•P502-7L•P501)	5487067-R	11-28
47	SCSI ID JUMPER PLUG	5502320-A	2-26

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7 TOOL LIST

The following table shows the maintenance tools:

TOOL MANE	SPECIFICATION	REMARKS
Monkey wrench	100mm	Used for installation, maintenance, trouble-shooting, and parts change.
Monkey wrench	300mm	
Hexagon wrench key set	1.27, 1.4, 1.58, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0mm	
Box driver set	4.0, 5.5, 6.0, 7.0, 8.0, 10.0mm	
Stubby driver set (PHILIPS TYPE)	No. 2 x 38	
Stubby driver set (PHILIPS TYPE)		
Screw driver set (STRAIGHT TYPE)		
Insulated cutting pliers	175mm	
Insulated radio pliers	150mm	
Insulated cutting nipper	150mm	
Pincette	125mm	
Soldering iron	25W	Used for field change.
Soldering iron	100W	
Wrapping tool		
Oscilloscope	200MHz	Used for inspection.
Digital voltmeter	AC, DC, OHM	

The following table shows the special tools:

TOOL MANE	PART NO.	REMARKS
Fiber wraparound connector	5430106-1	For diagnostics for serial channel interface
Torques driver	5480359-1	For replacement of SVP
Simm puller	5480389-A	For removing memory module (SM / CM)
Power Supply check cable	3243301-A	For check of DC voltage
Screw driver with insulated blade	5480302-1	For removing screw
Outlet Box (IE Type)	5497351-B	For convenience
Outlet Box (IU Type)	5497351-A	For convenience
Hitrack Bracket	5503467-A	For Hitrack converter mount

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THEORY OF OPERATION SECTION

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1. RAID Architecture Overview

The objectives of the RAID technology are the low cost, high reliability, and high I/O performance of disk storage devices. To achieve these objectives, this subsystem supports levels 1, and 5 of RAID technologies (in this section, part of level 3 RAID technology is explained to make the outline of RAID5 more understandable). The features of the levels of RAID technologies are described below.

1.1 RAID0 and RAID1

RAID0 uses small-scale disk storage devices instead of conventional expensive large-scale disk storage devices for cost reduction. To increase the reliability of RAID0 devices, all disk devices are duplexed in RAID1.
Strictly speaking, RAID0 and RAID1 subsystems are not disk array systems; their performance is the same as conventional disk subsystems. Controlling these subsystems are rather simple and many RAID0 and RAID1 subsystems have been put into market by several vendors.

1.2 RAID3

In RAID3, a stream of data to be transferred is split and distributed into two or more disk devices (1 parity group) on a byte or bit basis (striping). This enables two or more disk devices to run simultaneously and increase the speed of data transfer between the DKC and disk drives. In addition, since parity data for the parity group is created and stored on a separate disk device (parity disk), data can easily be recovered even if a device in a parity group gets inoperative or causes a read error. This enhances the reliability of the disk storage subsystem.
Since RAID3 lacks the parallel I/O capability and it entails a long latency time because of the need to drive two or more drives at a time, it exhibits little performance in applications that process small-volume data repeatedly (transaction processing) though it shows a real advantage when running applications that process large-volume data in a single run (e.g., scientific computations).

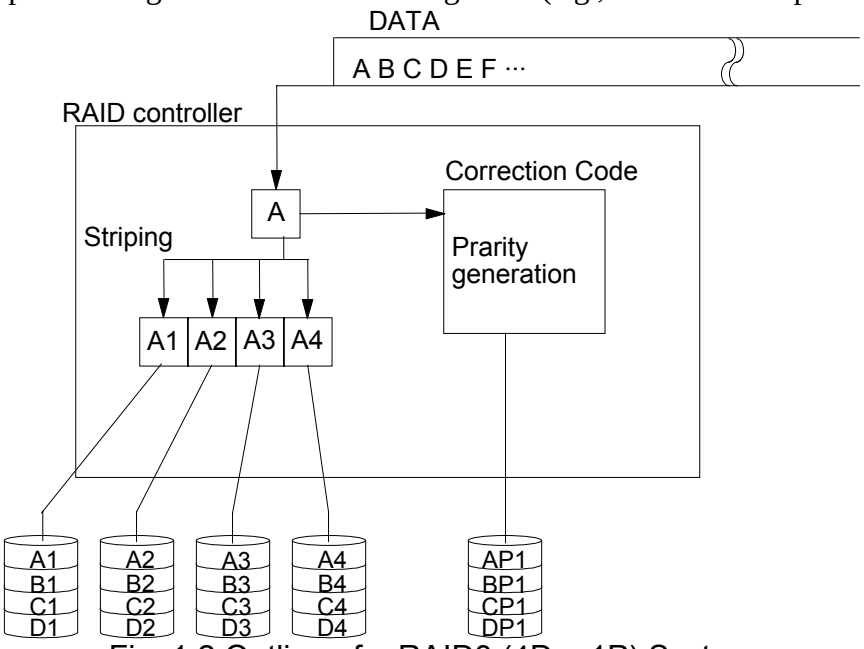

Fig. 1.2 Outline of a RAID3 (4D + 1P) System

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1.3 RAID5

Small-sized records are intensively read and written randomly in transaction processing. This type of processing generates many I/O requests for transferring small amounts of data. In such a situation, greater importance is placed on increased I/O performance (parallel I/O processing) than on increase in the rate of transferring large-volume data. RAID5 has been introduced to be suitable for this type of transaction processing.

In RAID5, the striping size is set to that of blocks which are transferred in a small-scale I/O processing mode and which are distributed in two or more disk devices (1 parity group). This entails the RAID controller to access each disk device only for one stripe equivalence of data and allows it to perform I/O operations on other disks in parallel, increasing the I/O performance substantially; though its data transfer rate remains the same as that of conventional subsystems in small-scale I/O applications. In large-scale (sequential) I/O applications, it permits the blocks in the same parity group to be processed in parallel as does RAID3, resulting in an increase in data transfer rate. In addition, like RAID3, RAID5 uses a parity disk for improved reliability. In individual writes to single-blocks (small-scale writes), however, this parity scheme raises various problems for the following reasons:

- The parity disk entails rewrites of new parity data.
- It is necessary to read the old parity data and old (before-update data) to generate new parity data.

Consequently, RAID5 entails extra reads from the data and parity disks in small-size write operations (this is called “write penalty”). If the parity data were fixed at a single disk device, the parity disk would be occupied during a single write that is executed to update the parity data, thus making it impossible to perform parallel I/O processing. To alleviate this problem, RAID5 adopts a system of distributing parity data on several disks in the group. This will not solve the write penalty problem completely.

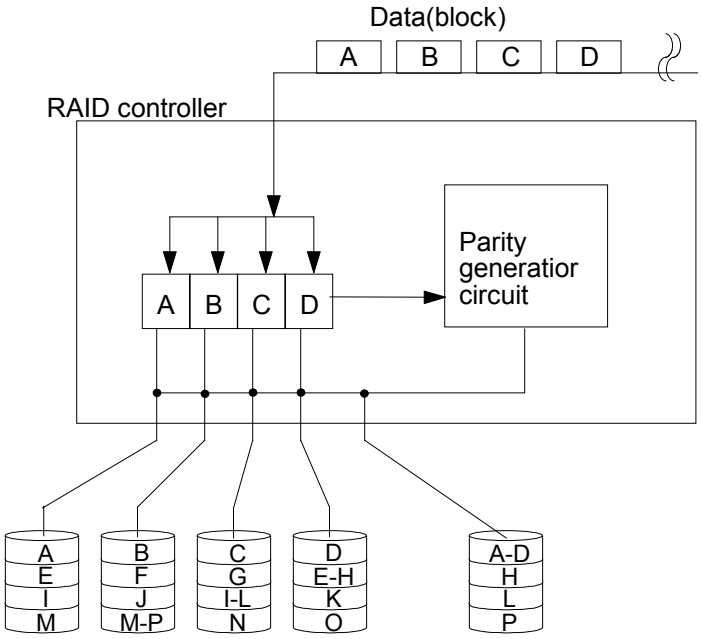

Fig. 1.3 Outline of RAID5 (4D + 1P)

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1.4 Application of the RAID technologies DKC310 and DKU305

RAID5 will not show its stuff during transaction processing if a single I/O operation spans over two or more disk devices (when the stripe size is too small). Consequently, adequate consideration should be given to the stripe size.

In this subsystem, the stripe size is 58 KB which is equivalent to one track of the 3390-3 so that the 3390-3 can be emulated. This is because it is anticipated that a single transaction will not span over two or more tracks when the 3390-3 is emulated. This subsystem also uses cache memory to preclude write penalties from occurring wherever possible. The cache memory can pool the data to be written onto the disk drives and prefetch old data.

- On write penalty

A parity group of a this subsystem (level 5) system consists of seven disk devices (6D + 1P) or four disk devices (3D+1P). Since the parity data is made up of parity data for six data disks (6D+1P) or three data disks (3D+1P) in the group, once a 1 stripe equivalence of partial write occurs in the group during transaction processing, it becomes necessary to regenerate the corresponding parity data in that group.

Since parity data is calculated using the formula shown below, “data established before update,” “parity established before update,” and “data established after update” are required to generate parity. The extra processing required to read this “data before update” is referred to as a write penalty.

“New parity data”
= (“Data before update” EOR “Data after update”) EOR “Parity before update”

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2. Specifications

2.1 DKC310I Specifications

Specifications are shown in the following table.

DKC310I Specifications

Item		Specifications
Data transfer rate (MB/s)		3.0/4.5/6.0/9.0/10/17/20/40/100 Note
Nonstop maintenance	Disk drive	✓
	Control package	✓
	Microcode	✓
	Power supply, fan	✓
	Battery	✓
	Maintenance package	✓
	Duplex bus	✓
	Spare disk support	✓

Note: 6.0MB/s and 9MB/s data transfer can be applied on the Channel Interface when attached to Hitachi CPU.
10MB/s and 17MB/s data transfer can be applied on the Serial Channel Interface.
20MB/s data transfer can be applied on the Fast/Wide SCSI Channel Interface.
40MB/s data transfer can be applied on the Ultra/Wide SCSI Channel Interface.
100MB/s data transfer can be applied on the Fibre Channel Interface.

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2.2 DKU305I Specifications

Specifications are shown in the following table.

DKU305I Specifications

Item		DK308/309-90	DK309/30A-180	DK3F1-60
Seek time (ms) (Read/Write)	MIN.	2.0/2.0	2.0/2.0 (0.6/0.8) *1	0.6/0.8
	AVE.	11.5/12.5	11.5/12.5	6.0/7.0
	MAX	24.0/26.0	24.0/26.0	14.0/16.0
Data transfer rate (MB/s)		7.6 - 10.7	10.0 - 15.3 (12.8 - 22.1) *1	13.8 - 16.2
Average latency time (ms)		4.8	4.8	2.5
Number of physical cyl./HDA (User area only)		5,434	6,823	3,684
Number of physical track/physical cyl.		28	29	29
Number of physical disks/HDA (User area only)		15	15	15
Number of physical track/HDA (User area only)		152,152	197,867	106,836
Number of actuator/HDA		1	1	1
Number of HDA/Drive unit		maximum 64	maximum 64	maximum 64

*1: DK30A-180

Item		DK3F2-90	DK3F2-150	DK30A-360
Seek time (ms) (Read/Write)	MIN.	0.6/0.8	0.6/0.8	0.6/0.8
	AVE.	5.5/6.5	5.5/6.5	11.5/12.5
	MAX	12.0/13.0	12.0/13.0	24.0/26.0
Data transfer rate (MB/s)		18.6 - 27.5	18.6 - 27.5	12.8 - 22.1
Average latency time (ms)		2.5	2.5	4.8
Number of physical cyl./HDA (User area only)		5,721	5,721	9,993
Number of physical track/physical cyl.		18	29	29
Number of physical disks/HDA (User area only)		9	15	15
Number of physical track/HDA (User area only)		102,978	165,909	289,797
Number of actuator/HDA		1	1	1
Number of HDA/Drive unit		maximum 64	maximum 64	maximum 64

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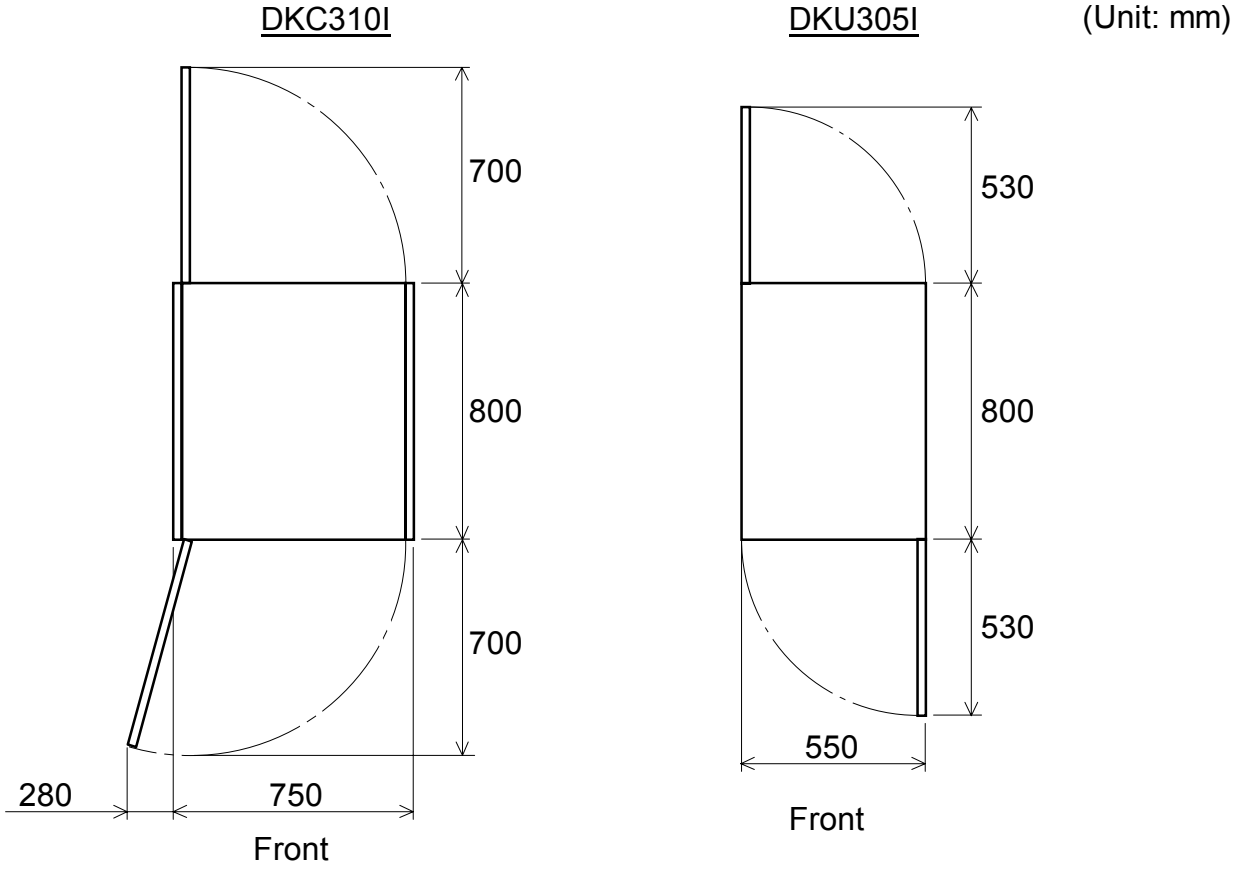
2.3 Physical Specifications

DKC310I/DKU305I physical specifications are shown in the following figures and table.



Item		DKC310I		DKU305I
Dimension (mm)	Width	750 *1	750 *1	550
	Depth	800	800	800
	Height	1,790	1,790	1,790
Weight (kg)		427 *2	463 *3	430 *4
Heat Output (kW)		1.65 *2	2.57 *3	2.46 *4
Power Consumption (kVA)		1.76 *2	2.75 *3	2.64 *4
Air Flow (m^3/min.)		24 *2	24 *3	6 *4

*1: This includes the thickness of side covers (16mm × 2).
*2: These values are used when DKC310I has 4GB Cache Memory, two Serial 8-port Adapter and DKC Redundant Power Supply.
*3: These values are used when DKC310I has full options.
*4: These values are used when DKU305I has full options.

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2.4 Equipment Layout

The layout diagrams of the DKC310 and DKU305 components are shown below. For details on the individual components, see the Location Sections.

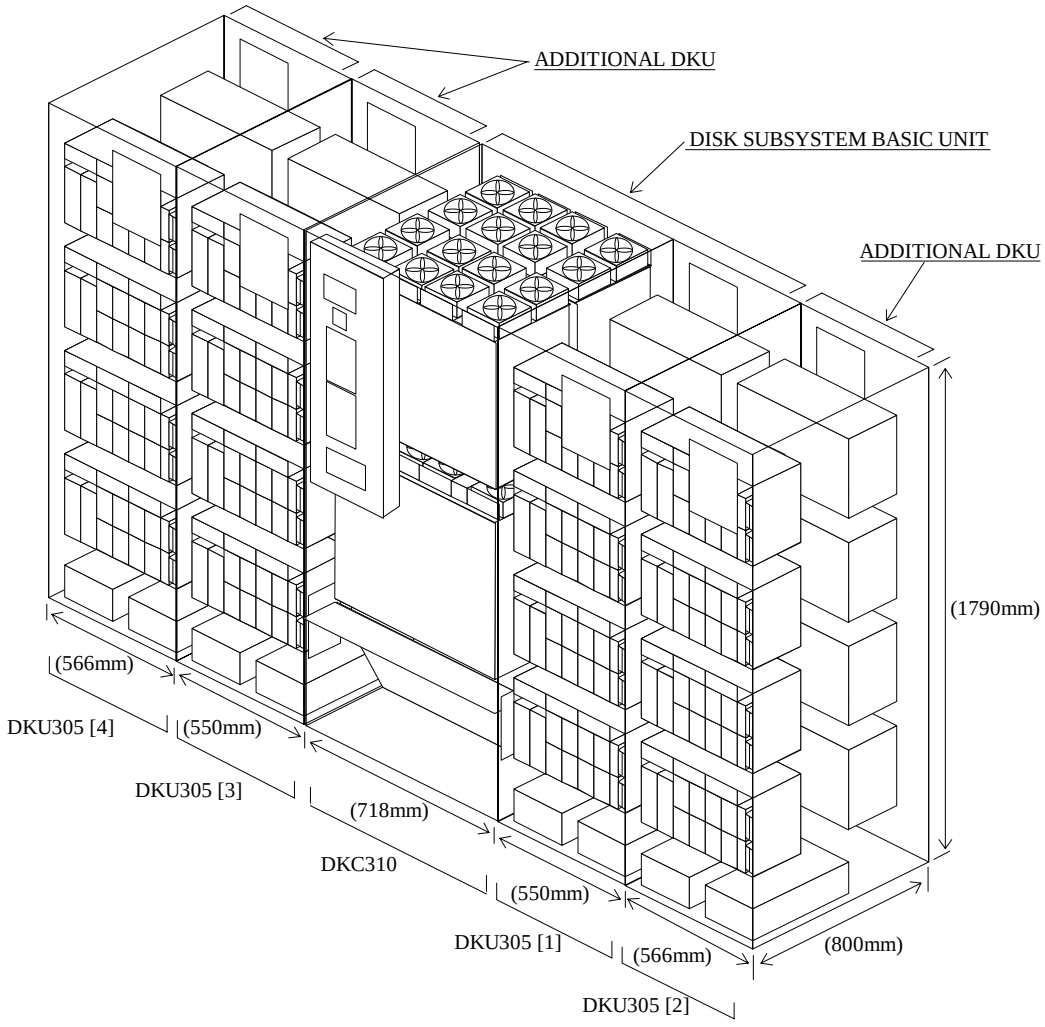

Fig.2.4 Over View of DKC310 and DKU305

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3. Internal Operation

3.1 Hardware Block Diagram

The controller of this unit consists of channel adapters for channel processing, disk adapters for disk unit processing, and a cache card having a non-volatile memory. The controller can control and transfer data to the cache and a shared memory from each adapter via a high-speed I/O bus and multi-I/O bus. Furthermore, the controller connects to small disk drives to form disk arrays.

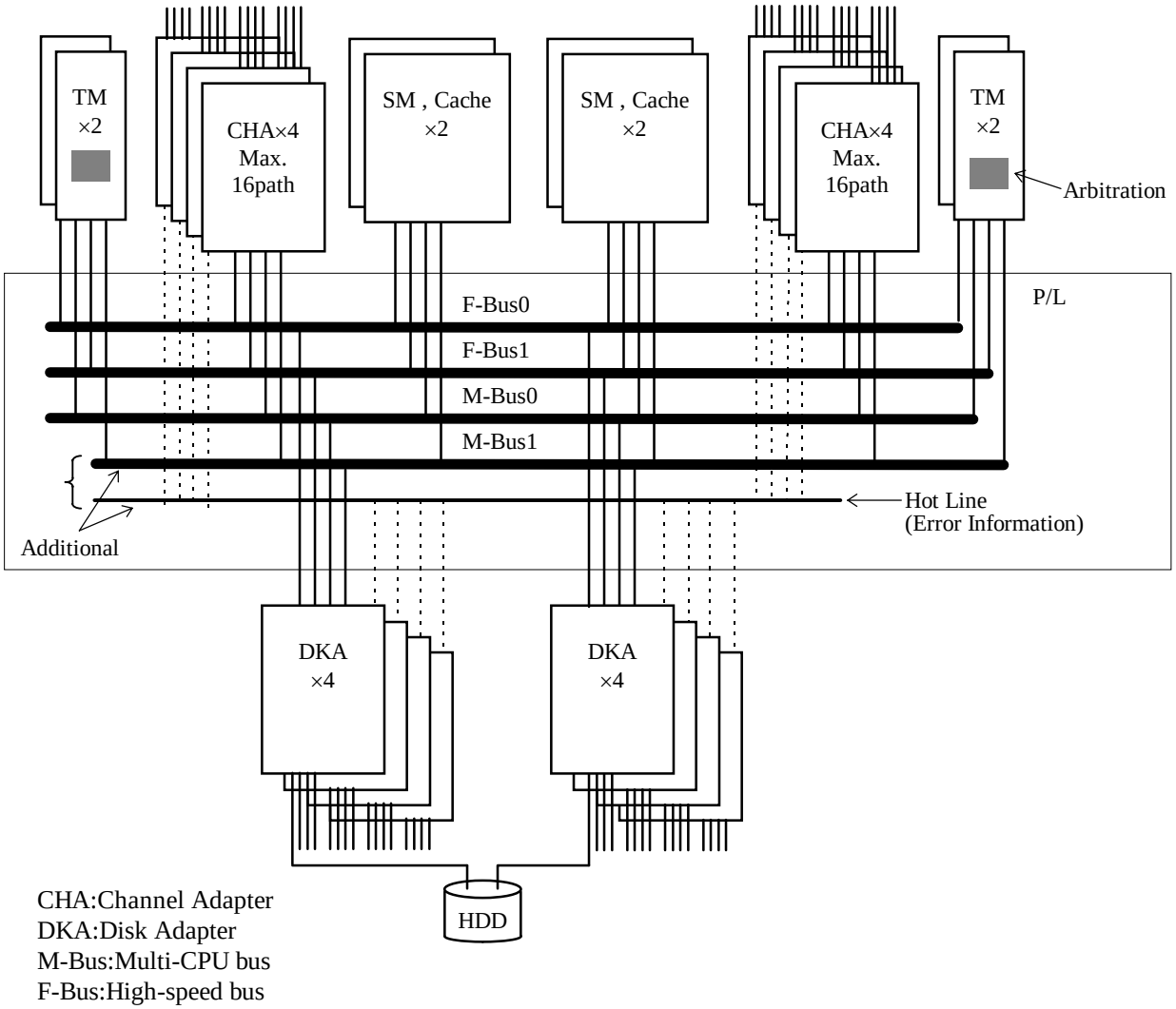

Fig. 3.1 Internal Hardware Configuration

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3.2 Software Organization

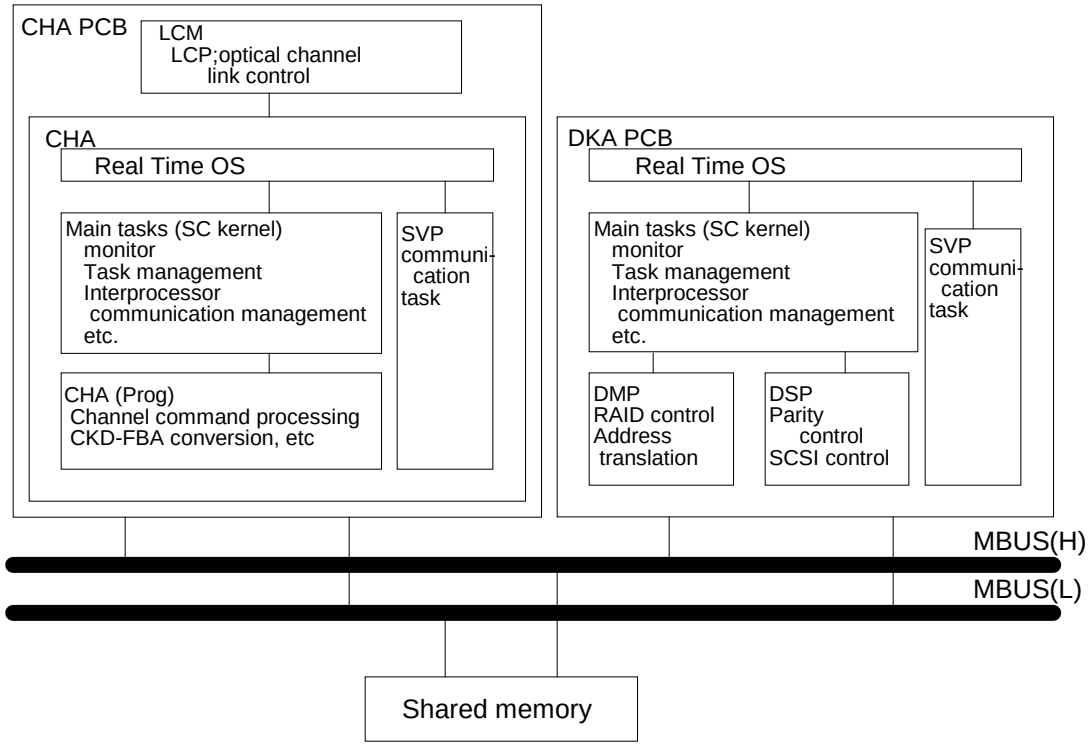

Fig. 3.2 Software Organization

Real Time OS:

A basic OS for controlling the RISC processor. Its primary tasks are to control and switch between the main tasks and SVP communication tasks.

Main tasks:

Made up of DKC control tasks (CHA Prog, DMP, DSP) and the SC kernel tasks that supervise the DKC control tasks. They switch the control tasks by making use of the SC kernel's task switching facility.

SVP communication task:

Controls the communication with the SVP.

LCP (Link Control Program):

Controls the optical channel links. LCP is identical to that which is used in the DKC90. LCP is located in the LCM.

CHA (Prog):

Is a channel command control layer that processes channel commands and controls cache and data transfer operations. It is located in the CHA. CHA Prog is recognized by the logical volume number and logical block number.

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DMP (Disk Master Program):

Is a RAID control layer and provides cache control, logical-to-physical address translation, and RAID control functions. DMP is located in the DKA. DMP is recognized by the logical volume number and logical block number.

DSP (Disk Slave Program):

Is a SCSI drive control layer and provides SCSI control, drive data transfer control, and parity control functions. It is located in the DKA. DSP is recognized by the physical volume number and LBA number.

- On Interprocessor (interprogram) communication

Interprocessor communications are initiated from the MBUS via the shared memory. They are performed by MBUS (L) and MBUS (H). If one MBUS is blocked, interprocessor communications are carried out via the other MBUS. Programs running on the same processor (DMP and DSP) perform interprogram communications through program interrupts.

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3.3 Data Formats

(1) Data Conversion Overview
Since the disk subsystem uses SCSI drives, data in the CKD format are converted to the FBA format on an interface before being written on the drives. The data format is shown in Fig. 3.3.1.

CKD-to-FBA conversion is carried out by the CHA. Data is stored in cache (in the DKC) in the FBA format. Consequently, the drive need not be aware of the data format when transferring to and receiving data from cache.

Each field of the CKD-format record is left-justified and the data is controlled in units of 528-byte subblocks (because data is transferred in 16-byte units). Each field is provided with data integrity code (LRC). An address integrity code (LA: logical address) is appended to the end of each subblock. A count area (C area) is always placed at the beginning of the subblock.

Four subblocks make up a single block. The first subblock of a block is provided with T information (record position information).

If a record proves not to fit in a subblock during CKD-to-FBA conversion, a field is split into the next subblock when it is recorded. If a record does not fill a subblock, the subblock is padded with 00s, from the end of the last field to the LA.

On a physical drive, data is recorded data fields in 520-byte units (physical data format). The format of the LA in the subblock in cache is shown in Fig. 3.3.1. The last 8 bytes of the LA area are padding data which is insignificant (the reason for this is because data is transferred to cache in 16 byte units). When data is transferred to a drive from cache, the last 8 bytes of each LA area are discarded and 520 bytes are transferred.

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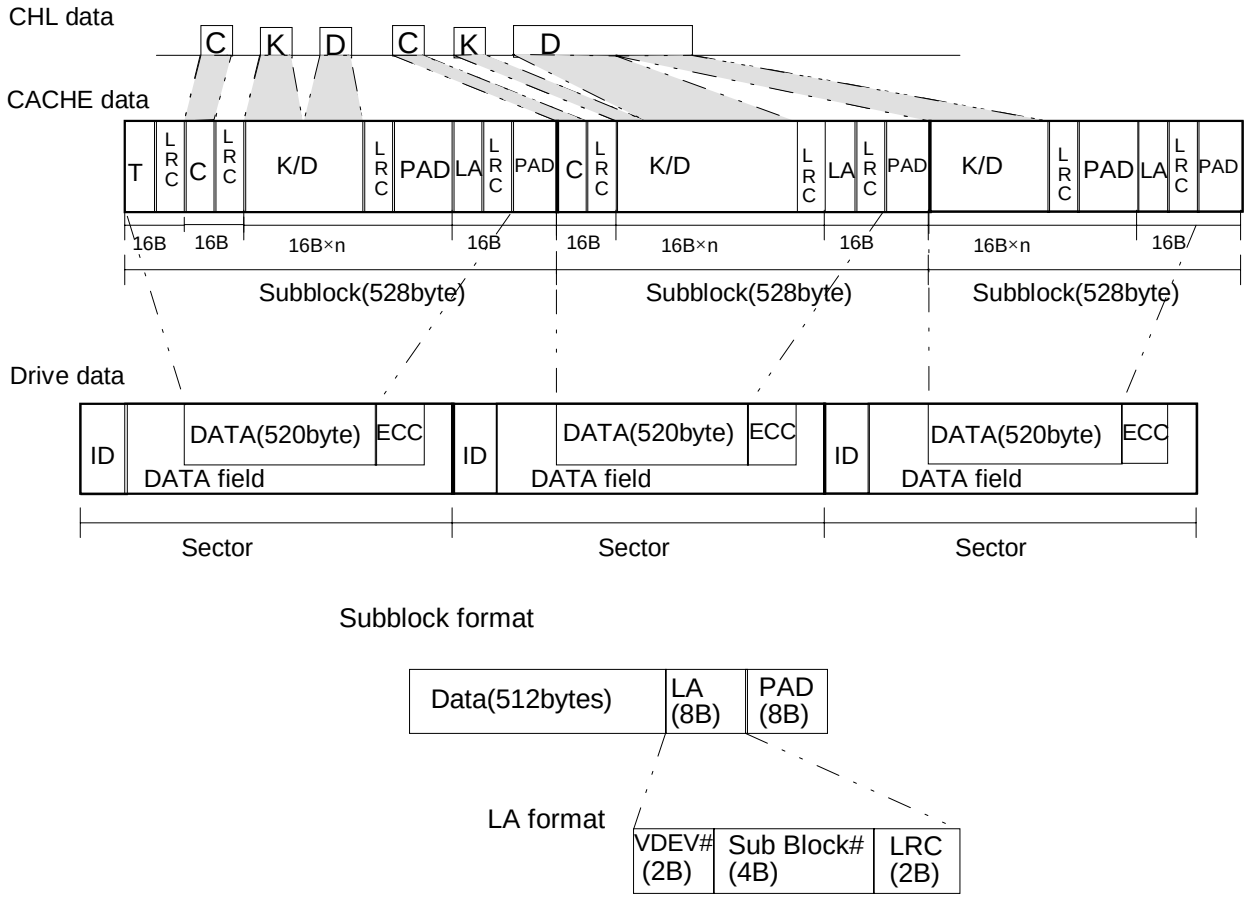

Subblock format

Fig. 3.3.1 Data Format

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(2) Block format

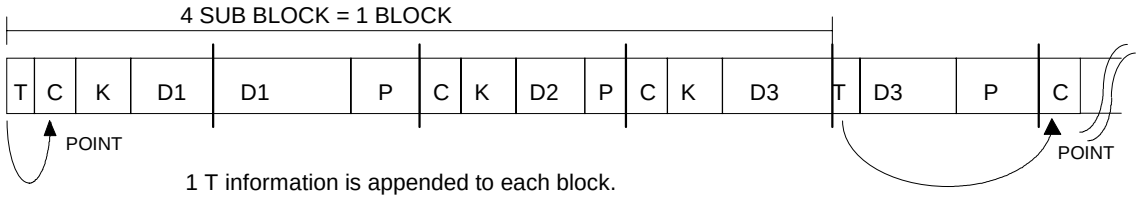

Fig. 3.3.2 Block Format

The RAID system records T information for each block of 4 subblocks as positional information that is used during record search. This unit of data is called a block.

1 block = 4 subblocks = 2 KB

The T information is 16 bytes long. However, only two bytes have meaning and the remaining 14 byte positions are padded with 0s. The reason for this is the same as that for the LA area. Unlike the LA, the insignificant bytes are also stored on the drive as are.

As seen from Fig. 3.3.2, the T information points to the closest count area in its block in the form of an SN (segment number). The drive computes the block number from the sector number with the SET SECT and searches the T information for the target block. From the T information, the drive computes the location of the closest count area and starts processing the block at the count area. This means that the information plays the role of the AM of the conventional disk storage.

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(3) Data integrity provided

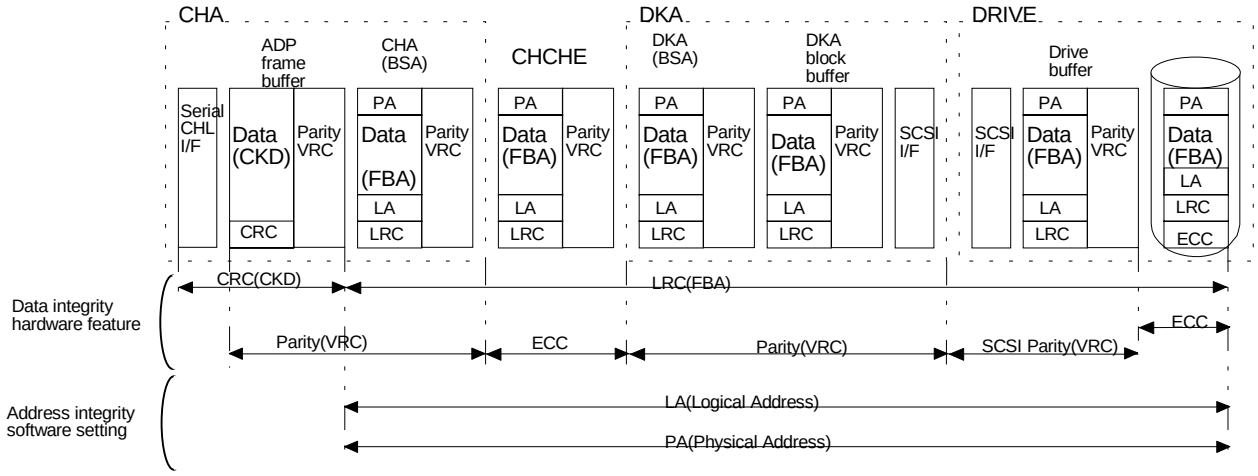

Fig. 3.3.3 Outline of Data Integrity

In the DKC310 and DKU305 system, a data integrity code is appended to the data being transferred at each component as shown in Fig. 3.3.3. Since data is striped onto two or more disk devices and the address integrity code is also appended. The data integrity codes are appended by hardware and the address integrity codes by software.

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3.4 Cache Management

Since the DKC requires no through operation, its cache system is implemented by two memory areas called cache A and cache B so that write data can be duplexed. To prevent data loss due to power failures, cache is made non-volatile by being fully battery-backed (48 hours). This dispenses with the need for the conventional NVS.

The minimum unit of cache is the 16 KB segment. Cache is destaged in segment units. Emulation Disk type at three or four segments make up one slot. The read and write slots are always controlled in pair. Cache data is enqueued and dequeued usually in slot units. In real practice, the segments of the same slot are not always stored in a contiguous area in cache, but are stored in discreet areas. These segments are controlled suing CACHE-SLCB and CACHE-SGCB so that the segments belonging to the same slot are seemingly stored in a contiguous area in cache.

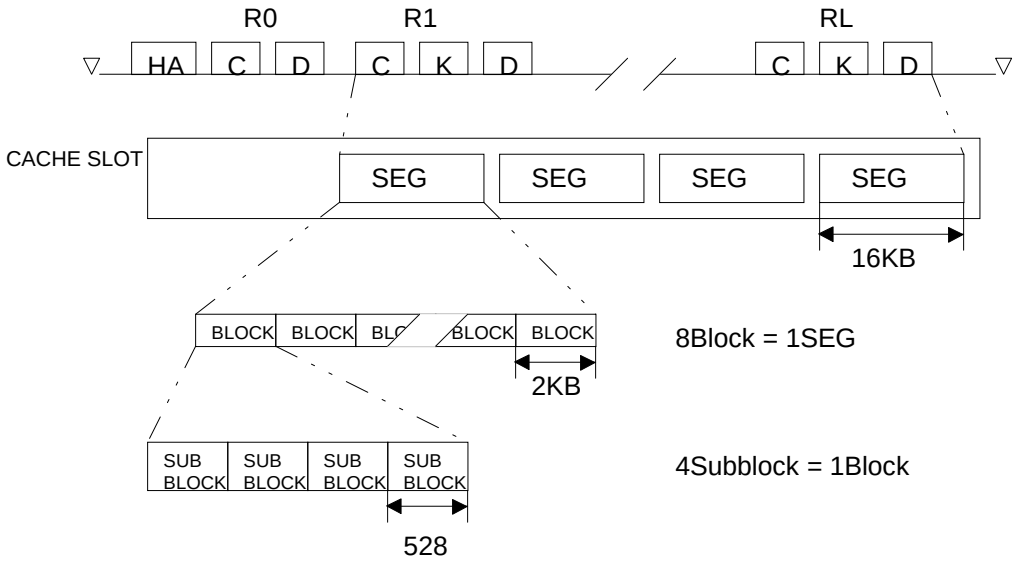

Fig. 3.4 Cache Data Structure

For increased directory search efficiency, a single virtual device (VDEV) is divided into 16-slot groups which are controlled using VDEV-GRPP and CACHE-GRPT.

1 cache segment = 8 blocks = 32 subblocks = 16 KB
1 slot = 1 stripe = 4 segments = 64 KB

The directories VDEV-GRPP, CACHE-GRPT, CACHE-SLCB, and CACHE-SGCB are used to identify the cache hit and miss conditions. These control tables are stored in the shared memory.

In addition to cache hit and miss control, the shared memory is used to classify and control the data in cache according to its attributes. Queues are something like boxes that are used to classify data according to its attributes.

Basically, queues are controlled in slot units (some queues are controlled in segment units). Like SLCB-SGCB, queues are controlled using a queue control table so that queue data of the seemingly same attribute can be controlled as a single data group. These control tables are briefly described below.

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(1) Cache control tables (directories)

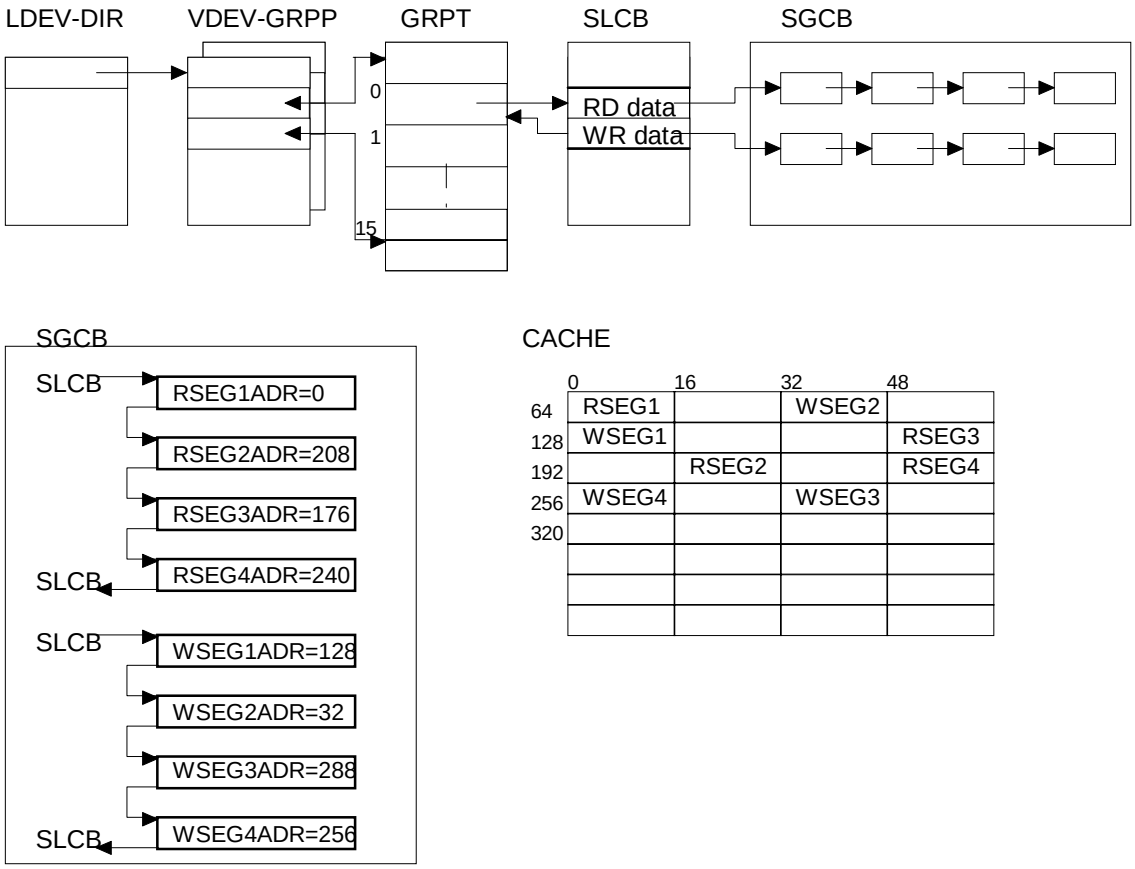

Fig. 3.4.1 Cache Control Tables

LDEV-DIR (Logical DEV-directory):

Contains the shared memory addresses of VDEV-GRPPs for an LDEV. LDEV-DIR is located in the local memory in the CHA.

VDEV-GRPP (Virtual DEV-group Pointer):

Contains the shared memory addresses of the GRPTs associated with the group numbers in the VDEV.

GRPT (Group Table):

A table that contains the shared memory address of the SLCBs for 16 slots in the group. Slots are grouped to facilitate slot search and to reduce the space for the directory area.

SLCB (Slot Control Block):

Contains the shared memory addresses of the starting and ending SGCBs in the slot. One or more SGCBs are chained. The SLCB also stores slot status and points to the queue that is connected to the slot. The state transitions of clean and dirty queues occur in slot units. The processing tasks reserve and release cache areas in this unit.

SGCB (Segment Control Block):

Contains the control information about a cache segment. It contains the cache address of the segment. It is used to control the staged subblock bit map, dirty subblock bitmap, and other information. The state transitions of only free queues occur in segment units.

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(2) Cache control table access method (hit/miss identification procedure)

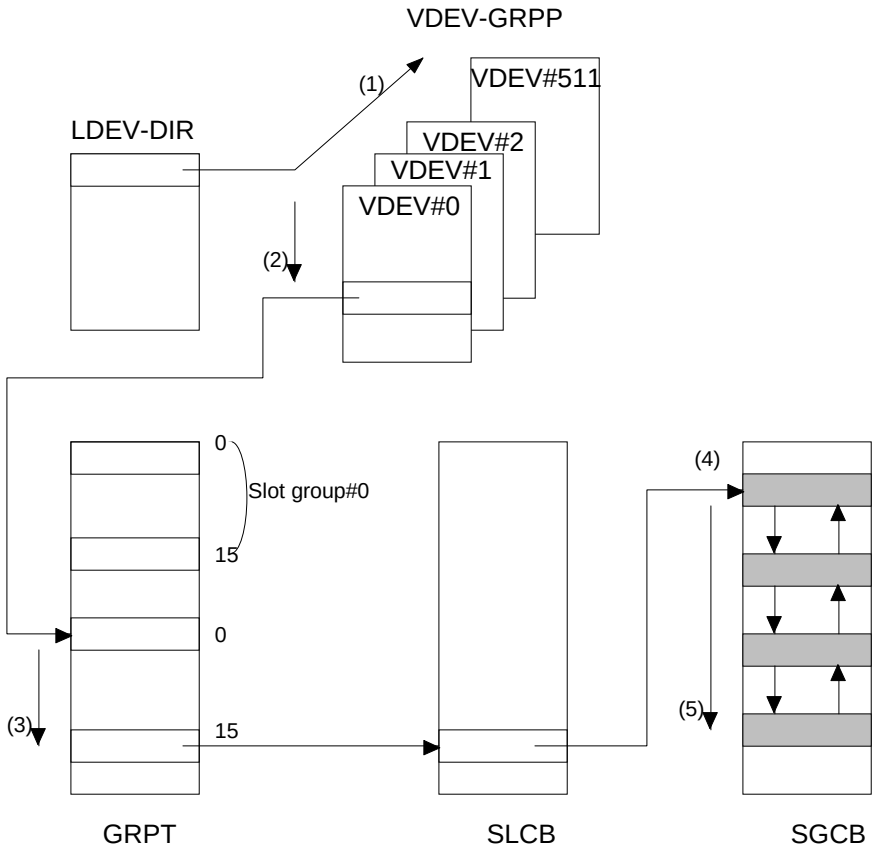

Fig. 3.4.2 Outline of Cache Control Table Access

1. The current VDEV-GRPP is referenced through the LDEV-DIR to determine the hit/miss condition of the VDEV-groups.
2. If a VDEV-group hits, CACHE-GRPT is referenced to determine the hit/miss condition of the slots.
3. If a slot hits, CACHE-SLCB is referenced to determine the hit/miss condition of the segments.
4. If a segment hits, CACHE-SGCB is referenced to access the data in cache.

If a search miss occurs during the searches from 1. through 4., the target data causes a cache miss.

Definition of VDEV number
Since the host processor recognizes addresses only by LDEV, it is unaware of the device address of the parity device. Accordingly, the RAID system is provided with a VDEV address which identifies the parity device associated with an LDEV. Since VDEVs are used to control data devices and parity devices systematically, their address can be computed using the following formulas:
Data VDEV number = LDEV number
Parity VDEV number = 1024 + LDEV number

From the above formulas, the VDEV number ranges from 0 to 2047.

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(3) Queue structures

The DKC310 and DKU305 uses 10 types of queues to control data in cache segments according to its attributes. These queues are explained below.

- CACHE-GRPT free queue

This queue is used to control segments that are currently not used by CACHE-GRPT (free segments) on an FIFO (First In First Out) basis. When a new table is added to CACHE-GRPT, the segment that is located by the head pointer of the queue is used.

- CACHE-SLCB free queue

This queue is used to control segments that are currently not used by CACHE-SLCB (free segments) on an FIFO basis. When a new slot is added to CACHE-SLCB, the segment that is located by the head pointer of the queue is used.

- CACHE-SGCB free queue

This queue is used to control segments that are currently not used by CACHE-SGCB (free segments) on an FIFO basis. When a new segment is added to CACHE-SGCB, the segment that is located by the head pointer of the queue is used.

- Clean queue

This queue is used to control the segments that are reflected on the drive on an LRU basis.

- Bind queue

This queue is defined when the bind mode is specified and used to control the segments of the bind attribute on an LRU basis.

- Error queue

This queue controls the segments that are no longer reflected on the drive due to some error (pinned data) on an LRU basis.

- Parity in-creation queue

This queue controls the slots (segments) that are creating parity on an LRU basis.

- DFW queue (host dirty queue)

This queue controls the segments that are not reflected on the drive in the DFW mode on an LRU basis.

- CFW queue (host dirty queue)

This queue controls the segments that are not reflected on the drive in the CFW mode on an LRU basis.

- PDEV queue (physical dirty queue)

This queue controls the data (segments) that are not reflected on the drive and that occur after parity is generated. Data is destaged from this queue onto the physical DEV. There are 32 PDEV queues per physical DEV.

The control table for these queues is located in the shared memory and points to the head and tail segments of the queues.

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(4) Queue state transitions
Figure 3.4.4 shows the state transitions of the queues used in. A brief description of the queue state transitions follows.

- State transition from a free queue
When a read miss occurs, the pertinent segment is staged and enqueued to a clean queue. When a write miss occurs, the pertinent segment is temporarily staged and enqueued to a host dirty queue.

- State transition from a clean queue
When a write hit occurs, the segment is enqueued to a host dirty queue. Transition from clean to free queues is performed on an LRU basis.

- State transition from a host dirty queue
The host dirty queue contains data that reflects no parity. When parity generation is started, a state transition occurs to the parity in-creation queue.

- State transition from the parity in-creation queue
The parity in-creation queue contains parity in-creation data. When parity generation is completed, a transition to a physical dirty queue occurs.

- State transition from a physical dirty queue
When a write hit occurs in the data segment that is enqueued in a physical dirty queue, the segment is enqueued into the host dirty queue again. When destaging of the data segment is completed, the segment is enqueued into a queue (destaging of data segments occur asynchronously on an LRU basis).

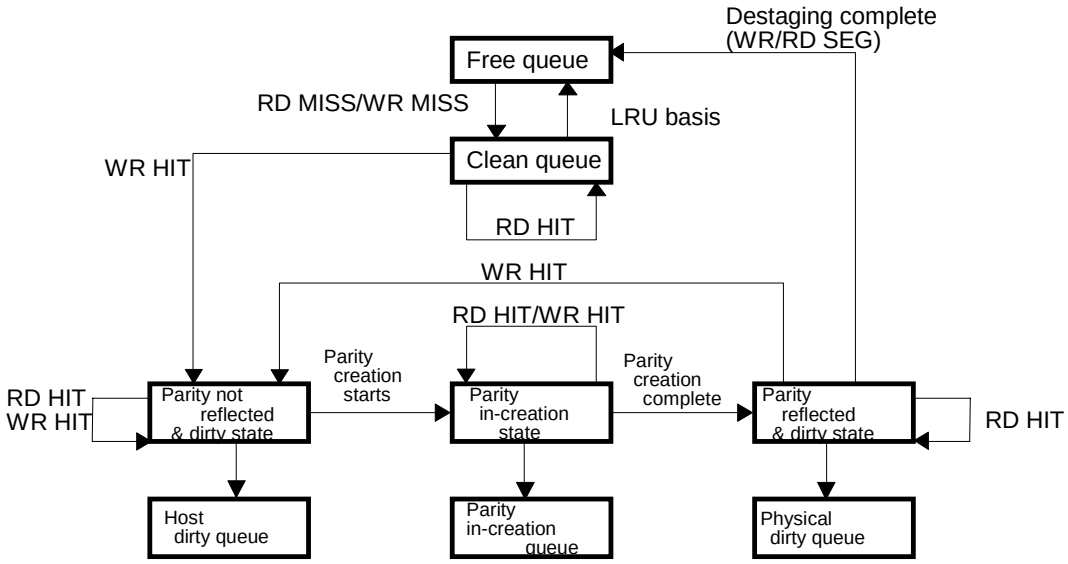

Fig. 3.4.4 Queue Segment State Transition Diagram

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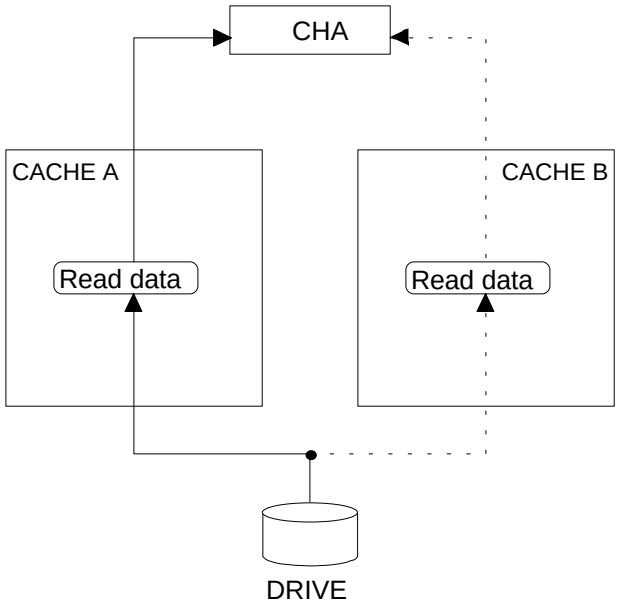
(5) Cache usage in the read mode



The cache area to be used for destaging read data is determined depending on whether the result of evaluating the following expression is odd or even:

(CYL# x 15 + HD#) / 16

The read data is destaged into area A if the result is even and into area B if the result is odd.

Fig. 3.4.5 Cache Usage in the Read Mode

Read data is not duplexed and its destaging cache area is determined by the formula shown in Fig. 3.4.5. Staging is performed not only on the segments containing the pertinent block but also on the subsequent segments up to the end of track (for increased hit ratio). Consequently, one track equivalence of data is prefetched starting at the target block. This formula is introduced so that the cache activity ratios for areas A and B are even. The staged cache area is called the cache area and the other area NVS area.

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(6) Cache usage in the write mode

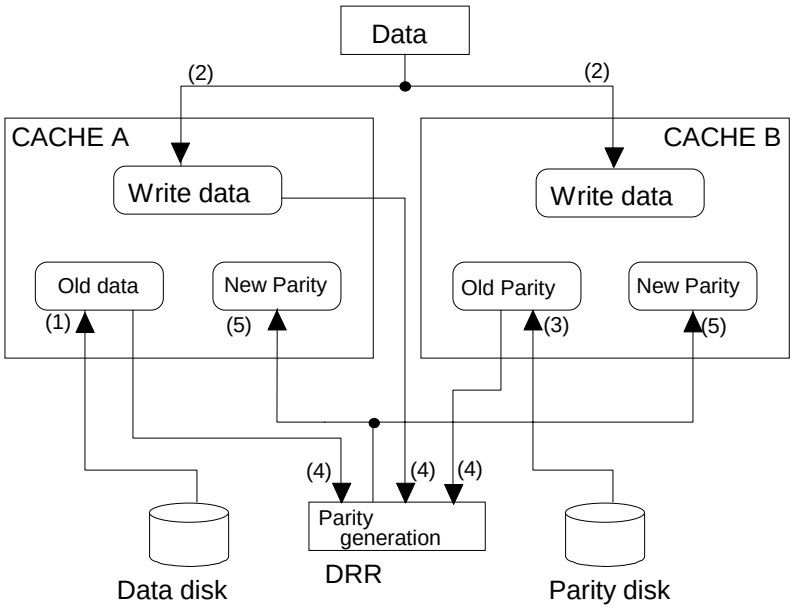

Fig. 3.4.6 Cache Usage in the Write Mode

This system handles write data (new data) and read data (old data) in separate segments as shown in Fig. 3.4.6 (not overwritten as in the conventional systems), whereby compensating for the write penalty.

(1) If the write data in question causes a cache miss, the data from the block containing the target record up to the end of the track is staged into a read data slot.
(2) In parallel with step (1), the write data is transferred when the block in question is established in the read data slot.
(3) The parity data for the block in question is checked for a hit or miss condition and, if a cache miss condition is detected, the old parity is staged into a read parity slot.
(4) When all data necessary for generating new parity is established, it is transferred to the DRR circuit in the DKA.
(5) When the new parity is completed, the DRR transfers it into the write parity slots for cache A and cache B (the new parity is handled in the same manner as the write data).

The reason for writing the write data into both cache areas is that data will be lost if a cache error occurs when it is not yet written on the disk.

Although two cache areas are used as explained above, the read data (including parity) is staged into either cache A or cache B simply by duplexing only the write data (including parity) (in the same manner as in the read mode).

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(7) Pseudo Through
The DKC80/90 systems write data directly onto disk storage in the form of cache through, without performing a DFW, when a cache error occurs. In this system, cache must always be passed, which fact disables the through operation. Consequently, the write data is duplexed, and a pseudo through operation is performed; that is, when one cache subsystem goes down, the end of processing status is not reported until the data write in the other cache subsystem is completed. This process is called pseudo through.

The control information necessary for controlling cache is stored in the shared memory.

(8) Shared memory

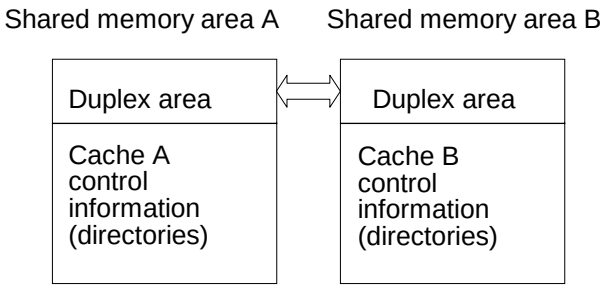

Fig. 3.4.7 Outline of Shared Memory

This system has two areas of cache memory, shown in Fig. 3.4.7, as it has two areas of cache memory. One part of its internal data is fully duplexed (this serves as the role of the conventional ECM). The other part of the shared memory area contains the control information about the corresponding cache area (shared memory area A for cache A and shared memory area B for cache B). If an error occurs on one side of shared memory (A or B), the corresponding cache area becomes inoperative (equivalent to a cache error).

Like cache, shared memory is made non-volatile (approximately 96 hours) to prevent data loss in case of power failures.

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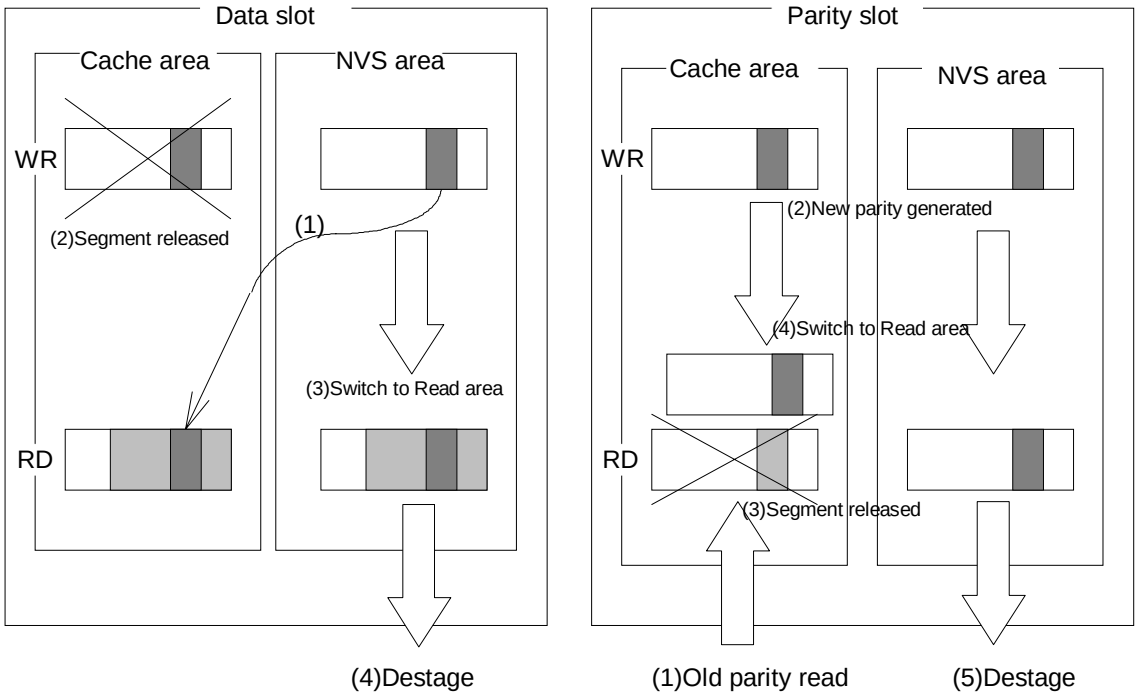
3.5 Destaging Operations

(1) Cache management in the destage mode (RAID5)
Destaging onto a drive is deferred until parity generation is completed. Data and parity slot transitions in the destage mode occur as shown in Fig. 3.5.1



① The write data is copied from the NVS area into the read area.
② The write segment in the cache area is released.
③ Simultaneously, the segment in the NVS area is switched from write to read segment.
④ Destaging.
⑤ The read segment in the NVS area is released.

① Parity generation correction read (old parity) occurs.
② New parity is generated.
③ The old parity in the read segment is released.
④ The segments in the cache and NVS areas are switched from write to read segment.
⑤ Destaging.
⑥ The read segment in the NVS area is released.

Fig. 3.5.1 Cache Operation in the Destage Mode

Write data is stored in write segments before parity is generated but stored in read segments after parity is generated. When drive data is stored, therefore, the data from the read segment is transferred.

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(2) Cache management in the destage mode (RAID1)
Data slot read segment is copied to parity slot then destage to primary/secondary drive synchronously.

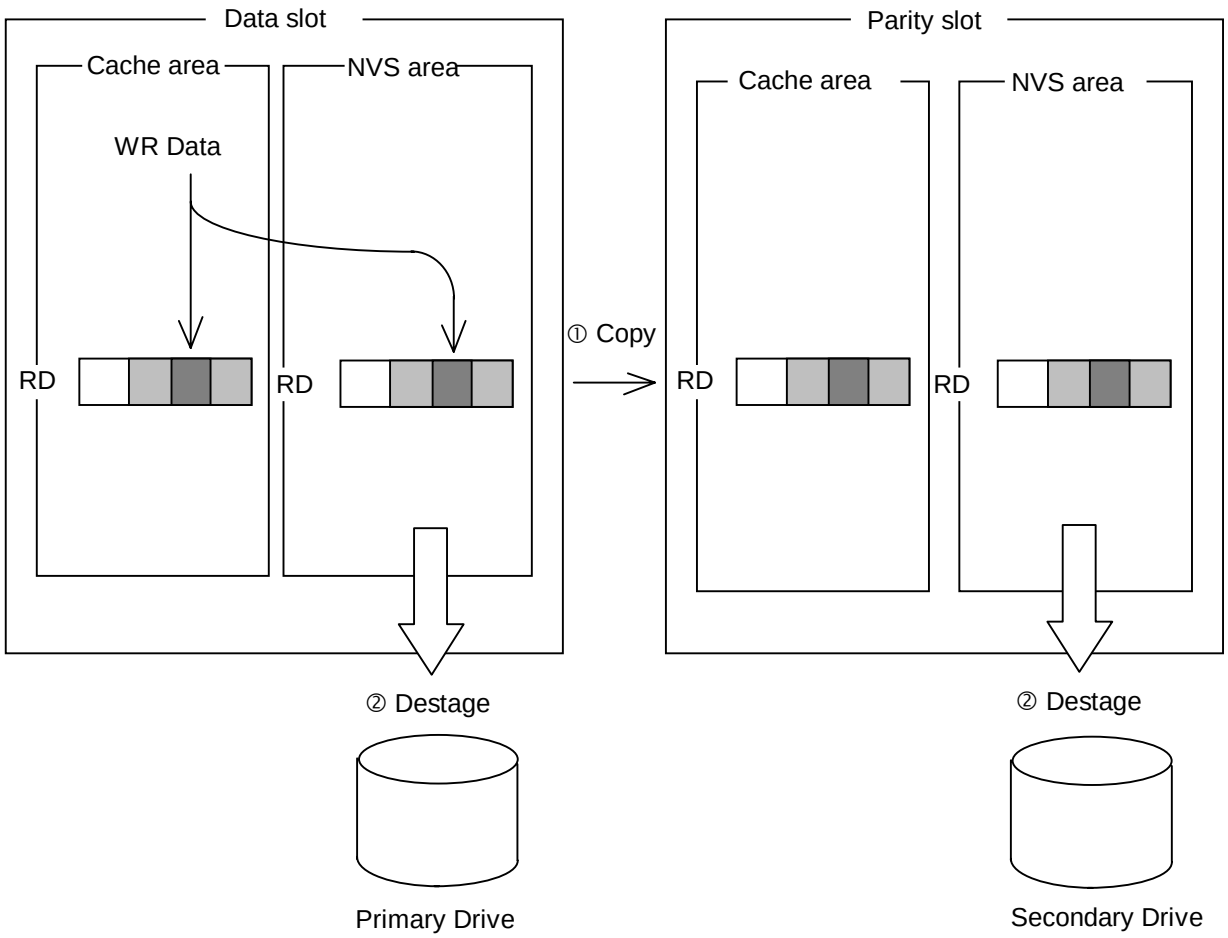

Fig. 3.5.2 RAID1 synchronous destage

① Copy the data slot read segment to the parity slot.
② Destage.
③ The data read segment in the NVS area of the data slot and the parity slot are released.

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Data slot is destage to primary/secondary drive.

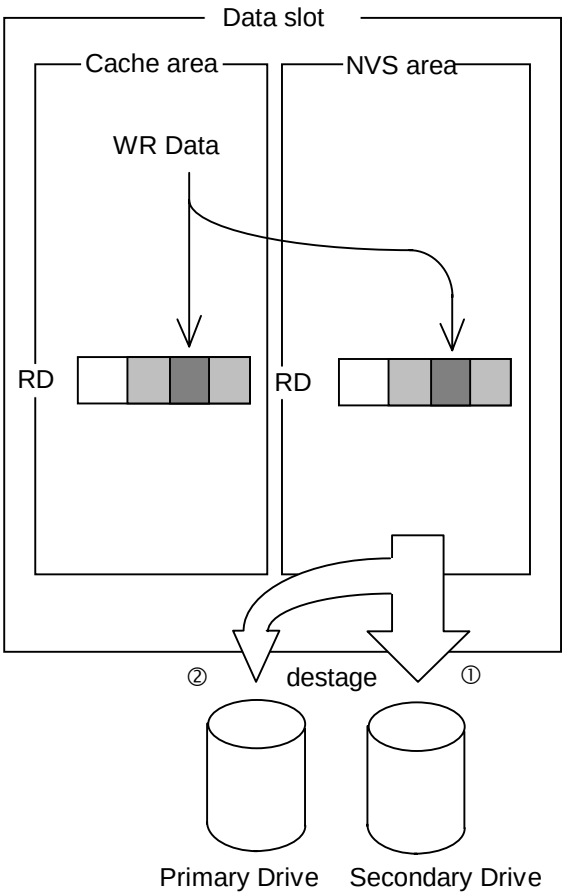

Fig. 3.5.3 RAID1 asynchronous destage

① Destage to secondary drive.
② Destage to primary drive.
③ The data read segment in the NVS area is released.

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(3) Blocked data write

The purpose of blocked data write is to reduce the number of accesses to the drive during destaging, whereby increasing the subsystem performance. There are three modes of blocked data write: single-stripe blocking, multiple-stripe blocking, and drive blocking. These modes are briefly explained below.

- Single-stripe blocking

Two or more dirty segments in a stripe are combined into a single dirty data block. Contiguous dirty blocks are placed in a single area. If an unloaded block exists between dirty blocks, the system destages the dirty blocks separately at the unloaded block. If a clean block exists between dirty blocks, the system destages the blocks including the clean block.

- Multiple-stripe blocking

The sequence of stripes in a parity group are blocked to reduce the number of write penalties. This mode is useful for sequential data transfer.

- Drive blocking

In the drive blocking mode, blocks to be destaged are written in a block with a single drive command if they are contiguous when viewed from a physical drive to shorten the drive's latency time.

The single- and multiple-stripe blocking modes are also called in-cache blocking modes. The DMP determines which mode to use. The drive blocking mode is identified by the DSP.

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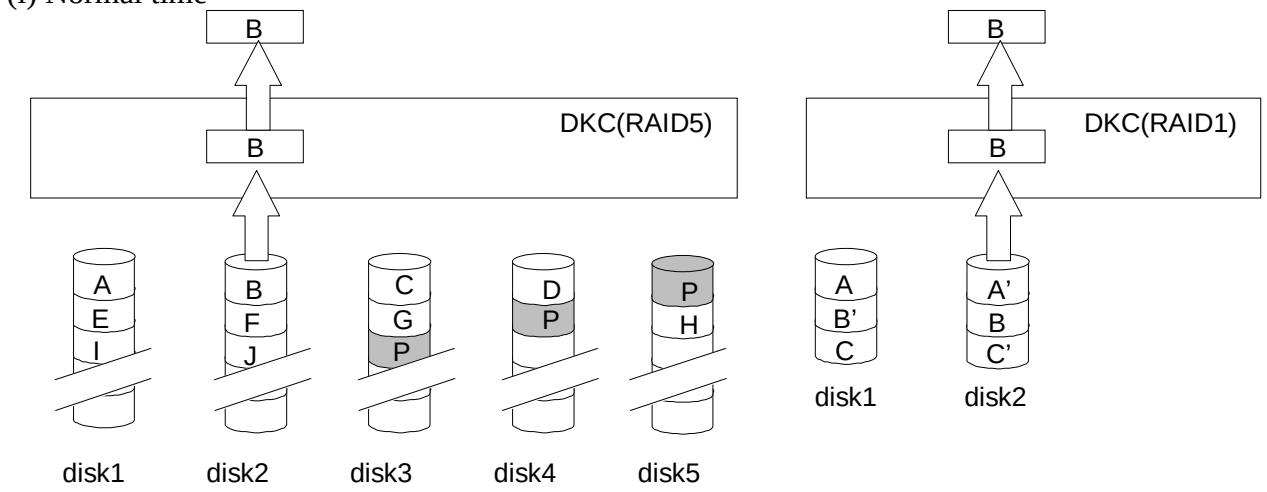
3.6 Operations Performed when Drive Errors Occur

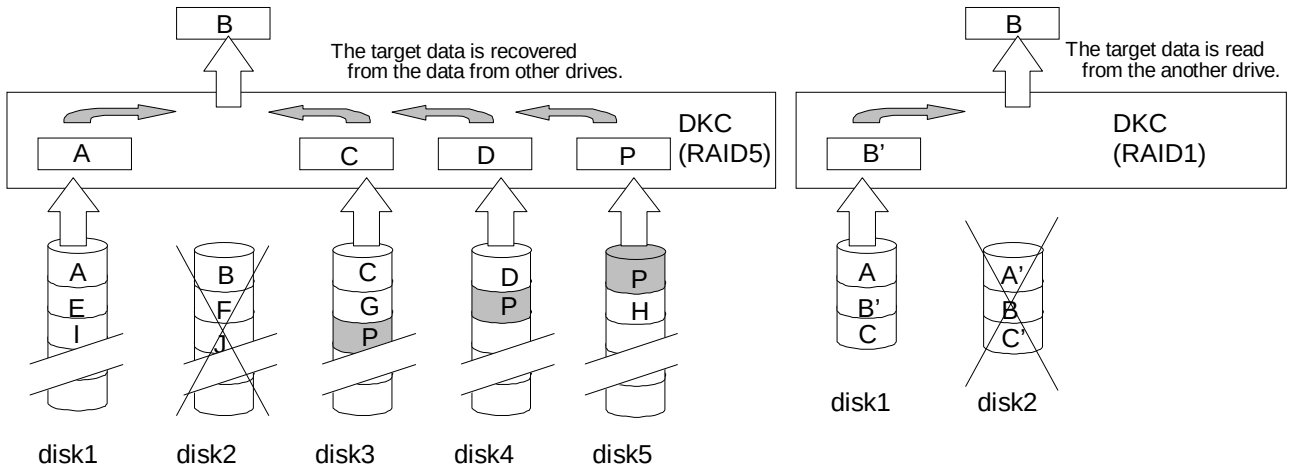
(1) I/O operations performed when drive errors occur
This system can recover target data using parity data and data stored on normal disk storage even when it cannot read data due to errors occurring on physical drives. This feature ensures non-disruptive processing of applications in case of drive errors. This system can also continue processing for the same reason in case errors occur on physical drives while processing write requests.

Figure 3.6.1 shows the outline of data read processing in case a drive error occurs.

Request for reading data B
(i) Normal time



(ii) When a disk error occurs



A,B,C • • • ; Data (A=A', B=B', C=C')
P ; Parity data

Fig. 3.6.1 Outline of Data Read Processing

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(2) Data integrity feature and drive errors
This system uses spare disk drives and reconfigures any drives that are blocked due to errors or drives whose error count exceeds a specified limit value using spare disks.

Since this processing is executed on the host in the background, this system can continue to accept I/O requests. The data saved on spare disks are copied into the original location after the error drives are replaced with new ones.

1. Dynamic sparing
This system keeps track of the number of errors that occurred, for each drive, when it executes normal read or write processing. If the number of errors occurring on a certain drive exceeds a predetermined value, this system considers that the drive is likely to cause unrecoverable errors and automatically copies data from that drive to a spare disk. This function is called dynamic sparing.In RAID1 method, this system is same as RAID5 dynamic sparing.

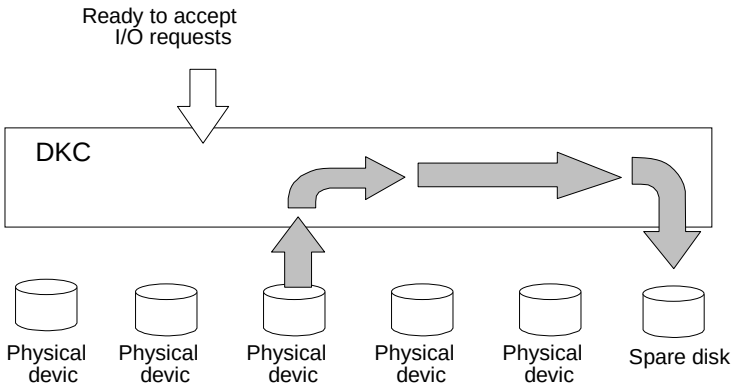

Fig. 3.6.2 Outline of the Dynamic Sparing Function

2. Correction copy
When this system cannot read or write data from or to a drive due to an error occurring on that drive, it regenerates the original data for that drive using data from the other drives and the parity data, and copies it onto a spare disk. In RAID1 method, this system copies data from the another drive to a spare disk.

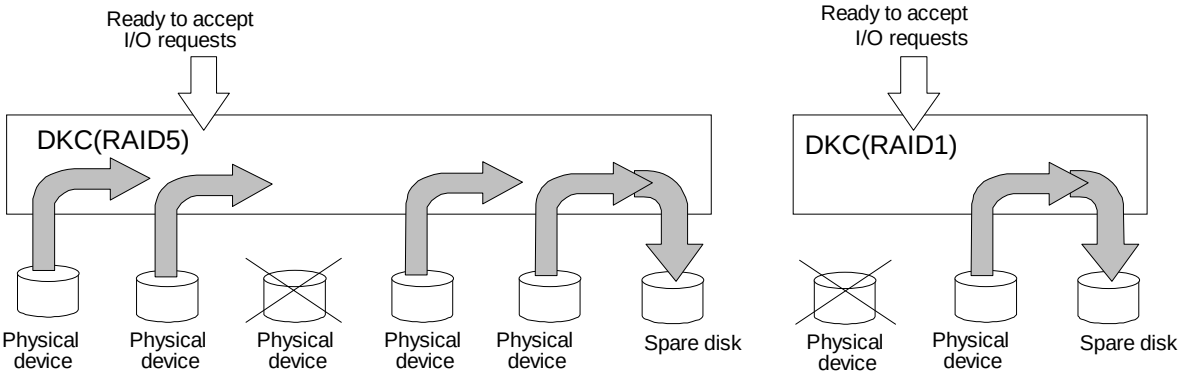

Fig. 3.6.3 Outline of the Correction Copy Function

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3.7 Inter Mix of Drives and Emulation types

3.7.1 Drives to be Connected

The models of disk units which are connectable with the RAID300 disk subsystem and the specifications of each disk unit are shown in Table 3.7.1.

Table 3.7.1 Disk Drive Specifications

		Disk drive model						
		DK308/309-90	DK309-180 *1 DK30A-180 *2	DK30A-360	DK3F1-60	DK3F2-90	DK3F2-150	DKR1B-J47
Formatted capacity (User Area)		9.23 GB	17.93 GB	36.92 GB	6.15 GB	9.23 GB	14.94 GB	47.19 GB
Sector length		520 bytes	520 bytes	520 bytes	520 bytes	520 bytes	520 bytes	520 bytes
Maximum transfer rate		16.0 MB/s	16.0 MB/s	20.0 MB/s	16.0 MB/s	20.0 MB/s	20.0 MB/s	20.0 MB/s
Data transfer rate (drive transfer rate)		7.6 to 10.7 MB/s	10.0 to 15.3 MB/s	12.8 to 22.1 MB/s	13.8 to 16.2 MB/s	18.6 to 27.5 MB/s	18.6 to 27.5 MB/s	30.2 to 45.6 MB/s
Seek time (ms)	MIN.	2.0/2.0	2.0/2.0 *1 0.6/0.8 *2	0.6/0.8	0.6/0.8	0.6/0.8	0.6/0.8	0.5/0.7
(Read/Write)	AVE.	11.5/12.5	11.5/12.5	11.5/12.5	6.0/7.0	5.5/6.5	5.5/6.5	5.7/6.5
	MAX	24.0/26.0	24.0/26.0	24.0/26.0	14.0/16.0	12.0/13.0	12.0/13.0	12.0/13.0
Revolution speed		6300 rpm	6300 rpm	6300 rpm	12030 rpm	12030 rpm	12030 rpm	10025 rpm
Mean latency time		4.8 ms	4.8 ms	4.8 ms	2.5 ms	2.5 ms	2.5 ms	3.0 ms

The RAID300 disk subsystem can connect up to 240 disk drives mentioned above, though the number of connectable disk drives varies with the emulation types and the RAID configuration. These will be explained in detail in Section 3.7.2.

SVP displays each drive model as the following table.

Disk drive model	SVP screen
DK309-180	DK309-18
DK30A-180	DK30A-18
DK3F1-60	DK3F1-06
DK30A-360	DK30A-36
DK3F2-150	DK3F2-15
DK3F2-90	DK3F2-09

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3.7.2 Emulation Device Type

(1) The emulation types of disk controller and disk units of the RAID300 are shown in Tables 3.7.2.1 to 3.7.2.4.

Table 3.7.2.1 List of RAID300 Emulation Types (for RAID5)

Item		Emulation contents						
Emulation Type	DKC	3990-3						
	DKU	3390-9	3390-3/3R	3390-2	3390-1	3380-K	3380-E	3380-J
Storage capacity (GB/volume)		8.51	2.84	1.89	0.95	1.89	1.26	0.63
Parity group (unit of addition)	DK308-90 DK309-90	6D + 1P (6 Vol)	6D + 1P (16 Vol)	6D + 1P (24 Vol)	6D + 1P (24 Vol)	6D + 1P (24 Vol)	6D + 1P (24 Vol)	6D + 1P (32 Vol)
	DK309-180 DK30A-180	3D + 1P (6 Vol)	3D + 1P (16/18 Vol)	—	—	3D + 1P (16/18/24/ 27Vol)	—	—
	DK3F1-60	—	3D + 1P (6 Vol)	3D + 1P (8 Vol)	3D + 1P (16 Vol)	3D + 1P (8 Vol)	—	—
	DK3F2-90	—	3D + 1P (9 Vol)	3D + 1P (12 Vol)	3D + 1P (18 Vol)	3D + 1P (12/14 Vol)	—	—
	DK3F2-150	3D + 1P (5 Vol)	3D + 1P (15 Vol)	3D + 1P (22 Vol)	3D + 1P (32 Vol)	3D + 1P (22 Vol)	3D + 1P (32 Vol)	3D + 1P (32 Vol)
	DK30A-360	3D + 1P (12 Vol)	3D + 1P (32/36 Vol)	—	—	3D + 1P (32/36/48/ 56 Vol)	—	—
	DKR1B-J47	3D + 1P (15 Vol)	3D + 1P (32/47 Vol)	3D + 1P (64 Vol)	—	3D + 1P (64 Vol)	—	—
Maximum number of parity groups	DK308-90 DK309-90	32	32	32	32	32	32	32
	DK309-180 DK30A-180	57	57	—	—	57	—	—
	DK3F1-60	—	58	58	58	58	—	—
	DK3F2-90	—	58	58	56	58	—	—
	DK3F2-150	58	58	46	32	46	32	32
	DK30A-360	58	32	—	—	32	—	—
	DKR1B-J47	58	21	16	—	16	—	—
Maximum number of volumes	DK308-90 DK309-90	192	512	768	768	768	1024	1024
	DK309-180 DK30A-180	384	1024	—	—	1024	—	—
	DK3F1-60	—	348	464	928	464	—	—
	DK3F2-90	—	522	696	1008	812	—	—
	DK3F2-150	290	870	1012	1024	1012	1024	1024
	DK30A-360	696	1024	—	—	1024	—	—
	DKR1B-J47	870	987	1024	—	1024	—	—
Subsystem capacity (user area)	DK308-90 DK309-90	51 GB to 1634 GB	45 GB to 1454 GB	45 GB to 1452 GB	23 GB to 729 GB	45 GB to 1452 GB	30 GB to 967 GB	20 GB to 645 GB
	DK309-180 DK30A-180	51 GB to 2961 GB	45 GB to 2908 GB	—	—	30 GB to 1935 GB	—	—
	DK3F1-60	—	17 GB to 988 GB	15 GB to 876 GB	15 GB to 881 GB	15 GB to 876 GB	—	—
	DK3F2-90	—	25 GB to 1482 GB	22 GB to 1315 GB	17 GB to 957 GB	22 GB to 1534 GB	—	—
	DK3F2-150	42 GB to 2468 GB	42 GB to 2470 GB	42 GB to 1912 GB	30 GB to 972 GB	42 GB to 1912 GB	40 GB to 1290 GB	20 GB to 645 GB
	DK30A-360	102 GB to 5923 GB	90 GB to 2908 GB	—	—	60 GB to 1935 GB	—	—
	DKR1B-J47	125 GB to 7266 GB	131 GB to 2742 GB	119 GB to 1898 GB	—	117 GB to 1873 GB	—	—

Note : The emulation type 3390-3 and 3390-3R cannot be intermixed in the subsystem.

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Table 3.7.2.2 List of RAID300 Emulation Types (for RAID5)

Item		Emulation contents						
Emulation Type	DKC / DKU	3990-6/6E						
		3390-9	3390-3/3R	3390-2	3390-1	3380-K	3380-E	3380-J
Storage capacity (GB/volume)		8.51	2.84	1.89	0.95	1.89	1.26	0.63
Parity group (unit of addition)	DK308-90 DK309-90	6D + 1P (6 Vol)	6D + 1P (16 Vol)	6D + 1P (24 Vol)	6D + 1P (24 Vol)	—	—	—
	DK309-180 DK30A-180	3D + 1P (6 Vol)	3D + 1P (16/18Vol)	—	—	—	—	—
	DK3F1-60	—	3D + 1P (6 Vol)	3D + 1P (8 Vol)	3D + 1P (16 Vol)	—	—	—
	DK3F2-90	—	3D + 1P (9 Vol)	3D + 1P (12 Vol)	3D + 1P (18 Vol)	—	—	—
	DK3F2-150	3D + 1P (5 Vol)	3D + 1P (15 Vol)	3D + 1P (22 Vol)	3D + 1P (32 Vol)	—	—	—
	DK30A-360	3D + 1P (12 Vol)	3D + 1P (32/36Vol)	—	—	—	—	—
	DKR1B-J47	3D + 1P (15 Vol)	3D + 1P (32/47Vol)	3D + 1P (64 Vol)	—	—	—	—
Maximum number of parity groups	DK308-90 DK309-90	32	32	32	32	—	—	—
	DK309-180 DK30A-180	57	57	—	—	—	—	—
	DK3F1-60	—	58	58	58	—	—	—
	DK3F2-90	—	58	58	56	—	—	—
	DK3F2-150	58	58	46	32	—	—	—
	DK30A-360	58	32	—	—	—	—	—
	DKR1B-J47	58	21	16	—	—	—	—
Maximum number of volumes	DK308-90 DK309-90	192	512	768	768	—	—	—
	DK309-180 DK30A-180	384	1024	—	—	—	—	—
	DK3F1-60	—	348	464	928	—	—	—
	DK3F2-90	—	522	696	1008	—	—	—
	DK3F2-150	290	870	1012	1024	—	—	—
	DK30A-360	696	1024	—	—	—	—	—
	DKR1B-J47	870	987	1024	—	—	—	—
Subsystem capacity (user area)	DK308-90 DK309-90	51 GB to 1634 GB	45 GB to 1454 GB	45 GB to 1452 GB	23 GB to 729 GB	—	—	—
	DK309-180 DK30A-180	51 GB to 2961 GB	45 GB to 2908 GB	—	—	—	—	—
	DK3F1-60	—	17 GB to 988 GB	15 GB to 876 GB	15 GB to 881 GB	—	—	—
	DK3F2-90	—	25 GB to 1482 GB	22 GB to 1315 GB	17 GB to 957 GB	—	—	—
	DK3F2-150	42 GB to 2468 GB	42 GB to 2470 GB	42 GB to 1912 GB	30 GB to 972 GB	—	—	—
	DK30A-360	102 GB to 5923 GB	90 GB to 2908 GB	—	—	—	—	—
	DKR1B-J47	125 GB to 7266 GB	131 GB to 2742 GB	119 GB to 1898 GB	—	—	—	—

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Table 3.7.2.3 List of RAID300 Emulation Types (for RAID1)

Item		Emulation contents							
Emulation Type	DKC	3990-3							
	DKU	3390-9	3390-6 *	3390-3/3R	3390-2	3390-1	3380-K	3380-E	3380-J
Storage capacity (GB/volume)		8.51	5.70	2.84	1.89	0.95	1.89	1.26	0.63
Parity group (unit of addition)	DK308-90 DK309-90	2D + 2D (2 Vol)	—	2D + 2D (6 Vol)	2D + 2D (8 Vol)	2D + 2D (16 Vol)	2D + 2D (8 Vol)	2D + 2D (12 Vol)	2D + 2D (16 Vol)
	DK309-180 DK30A-180	2D + 2D (4 Vol)	—	2D + 2D (12 Vol)	2D + 2D (16 Vol)	2D + 2D (16 Vol)	2D + 2D (16/18Vol)	2D + 2D (16 Vol)	2D + 2D (16 Vol)
	DK3F1-60	—	2D + 2D (2 Vol)	2D + 2D (4 Vol)	2D + 2D (6 Vol)	2D + 2D (12 Vol)	2D + 2D (6 Vol)	2D + 2D (8 Vol)	2D + 2D (16 Vol)
	DK3F2-90	2D + 2D (2 Vol)	—	2D + 2D (6 Vol)	2D + 2D (8 Vol)	2D + 2D (16 Vol)	2D + 2D (8 Vol)	2D + 2D (12 Vol)	2D + 2D (16 Vol)
	DK3F2-150	2D + 2D (2 Vol)	—	2D + 2D (10 Vol)	2D + 2D (14 Vol)	2D + 2D (28 Vol)	2D + 2D (14 Vol)	2D + 2D (22 Vol)	2D + 2D (44 Vol)
	DK30A-360	2D + 2D (8 Vol)	—	2D + 2D (24 Vol)	—	—	2D + 2D (36 Vol)	—	—
	DKR1B-J47	2D + 2D (10 Vol)	—	2D + 2D (30 Vol)	2D + 2D (46 Vol)	—	2D + 2D (48 Vol)	—	—
Maximum number of parity groups	DK308-90 DK309-90	116	—	116					
	DK309-180 DK30A-180		—						
	DK3F1-60	—	116						
	DK3F2-90	116	—						
	DK3F2-150		—			72		92	46
	DK30A-360		—	84	—	—	56	—	—
	DKR1B-J47		—	68	44	—	42	—	—
Maximum number of volumes	DK308-90 DK309-90	116	—	348	464	928	464	696	928
	DK309-180 DK30A-180	232	—	696	928	928	928	928	928
	DK3F1-60	—	116	232	348	696	348	464	928
	DK3F2-90	116	—	348	464	928	464	696	928
	DK3F2-150	116	—	580	812	1008	812	1012	1012
	DK30A-360	464	—	1008	—	—	1008	—	—
	DKR1B-J47	580	—	1020	1012	—	1008	—	—
Subsystem capacity	DK308-90 DK309-90	17 GB to 987 GB	—	17 GB to 988 GB	15 GB to 878 GB	15 GB to 878 GB	15 GB to 877 GB	15 GB to 877 GB	10 GB to 585 GB
	DK309-180 DK30A-180	34GB to 1974 GB	—	34 GB to 1976 GB	30 GB to 1753 GB	30 GB to 881 GB	30 GB to 1753 GB	30 GB to 1169 GB	20 GB to 584 GB
	DK3F1-60	—	11 GB to 661 GB	11 GB to 658 GB	11 GB to 658 GB	11 GB to 658 GB	11 GB to 658 GB	10 GB to 585 GB	10 GB to 585 GB
	DK3F2-90	17 GB to 987 GB	—	17 GB to 988 GB	15 GB to 878 GB	15 GB to 878 GB	15 GB to 877 GB	15 GB to 877 GB	10 GB to 585 GB
	DK3F2-150	17 GB to 987 GB	—	28 GB to 1647 GB	26 GB to 1534 GB	26 GB to 958 GB	26 GB to 1534 GB	28 GB to 1275 GB	28 GB to 637 GB
	DK30A-360	68 GB to 3948 GB	—	68 GB to 2862 GB	—	—	68 GB to 1905 GB	—	—
	DKR1B-J47	84 GB to 4844 GB	—	83 GB to 2833 GB	85 GB to 1876 GB	—	88 GB to 1844 GB	—	—

(note *) The 3390-6 emulation type is available for the specific customer (RPQ). Therefore, do not define this emulation type, even though SVP shows this emulation on the volume (LDEV) installation menu.

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Table 3.7.2.4 List of RAID300 Emulation Types (for RAID1)

Item		Emulation contents							
Emulation Type	DKC / DKU	3990-6/6E							
		3390-9	3390-6 *	3390-3/3R	3390-2	3390-1	3380-K	3380-E	3380-J
Storage capacity (GB/volume)		8.51	5.70	2.84	1.89	0.95	1.89	1.26	0.63
Parity group (unit of addition)	DK308-90 DK309-90	2D + 2D (2 Vol)	—	2D + 2D (6 Vol)	2D + 2D (8 Vol)	2D + 2D (16 Vol)	—	—	—
	DK309-180 DK30A-180	2D + 2D (4 Vol)	—	2D + 2D (12 Vol)	2D + 2D (16 Vol)	2D + 2D (16 Vol)	—	—	—
	DK3F1-60	—	2D + 2D (2 Vol)	2D + 2D (4 Vol)	2D + 2D (6 Vol)	2D + 2D (12 Vol)	—	—	—
	DK3F2-90	2D + 2D (2 Vol)	—	2D + 2D (6 Vol)	2D + 2D (8 Vol)	2D + 2D (16 Vol)	—	—	—
	DK3F2-150	2D + 2D (2 Vol)	—	2D + 2D (10 Vol)	2D + 2D (14 Vol)	2D + 2D (28 Vol)	—	—	—
	DK30A-360	2D + 2D (8 Vol)	—	2D + 2D (24 Vol)	—	—	—	—	—
	DKR1B-J47	2D + 2D (10 Vol)	—	2D + 2D (30 Vol)	2D + 2D (46 Vol)	—	—	—	—
Maximum number of parity groups	DK308-90 DK309-90	116	—	116			—		
	DK309-180 DK30A-180		—						
	DK3F1-60	—	116						
	DK3F2-90	116	—						
	DK3F2-150		—			68			
	DK30A-360		—	84	—	—			
	DKR1B-J47		—	68	44	—			
Maximum number of volumes	DK308-90 DK309-90	116	—	348	464	928	—	—	—
	DK309-180 DK30A-180	232	—	696	928	928	—	—	—
	DK3F1-60	—	116	232	348	696	—	—	—
	DK3F2-90	116	—	348	464	928	—	—	—
	DK3F2-150	116	—	580	812	1008	—	—	—
	DK30A-360	464	—	1008	—	—	—	—	—
	DKR1B-J47	580	—	1020	1012	—	—	—	—
Subsystem capacity	DK308-90 DK309-90	17 GB to 987 GB	—	17 GB to 988 GB	15 GB to 878 GB	15 GB to 878 GB	—	—	—
	DK309-180 DK30A-180	34 GB to 1974 GB	—	34 GB to 1976 GB	30 GB to 1753 GB	30 GB to 881 GB	—	—	—
	DK3F1-60	—	11 GB to 661 GB	11 GB to 658 GB	11 GB to 658 GB	11 GB to 658 GB	—	—	—
	DK3F2-90	17 GB to 987 GB	—	17 GB to 988 GB	15 GB to 878 GB	15 GB to 878 GB	—	—	—
	DK3F2-150	17 GB to 987 GB	—	28 GB to 1647 GB	26 GB to 1534 GB	26 GB to 958 GB	—	—	—
	DK30A-360	68 GB to 3948 GB	—	68 GB to 2862 GB	—	—	—	—	—
	DKR1B-J47	84 GB to 4844 GB	—	83 GB to 2833 GB	85 GB to 1876 GB	—	—	—	—

(note *) The 3390-6 emulation type is available for the specific customer (RPQ). Therefore, do not define this emulation type, even though SVP shows this emulation on the volume (LDEV) installation menu.

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(2) Specifications for coexistence of elements

Table 3.7.2.5 shows permitted coexistence of RAID levels, HDD types, and emulation types respectively.

Table 3.7.2.5 Specifications for Coexistence of Elements in Raid 300

Item	Specification	Remarks
Coexistence of RAID levels	• RAID1/5 can exist in DKC.	
Coexistence of numbers of PDEVs composing ECC group (coexistence of configurations 6D+1P, 3D+1P and 1D+1D)	• The numbers of PDEVs inside an ECC group are 7 PDEVs (6D+1P) and 4 PDEVs (3D+1P) and they are applicable only to RAID5. • The numbers of PDEVs inside an ECC group are 2 PDEVs (1D+1D) and they are applicable only to RAID1. • DK308/9-90 support a configuration of 6D+1P (RAID5)/1D+1D (RAID1). • DK309-180, DK30A-360 supports a configuration of 3D+1P (RAID5)/1D+1D (RAID1). • DK3F1-60, DK3F2-150, DK3F2-90 supports a configuration of 3D+1P (RAID5)/1D+1D (RAID1). • Configurations 6D+1P, 3D+1P and 1D+1D can not coexist within units of same DKA pair.	
Coexistence of HDD types	• HDD types can coexist in each ECC group. • The specification for selecting the spare HDD can be common in the subsystem if there exists a spare HDD having the same capacity as that of the data HDD, though the HDD types coexist.	
Coexistence of emulation types	• Emulation types can coexist in each ECC group. • LDEV ID addressing must be of the same emulation type (3380-K/E/J, 3390-9/3/2/1, or 3390-3R) for every 32-address boundary.	An emulation of the same system should be set for every 32 addressings due to generation restriction by the host.

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3.8 1024 logical addresses

The host connection interface specification are outlined in Tables 3.8.1 and 3.8.2.

Table 3.8.1 List of Allowable Maximum Values of Host Connection Interface Items on the DKC Side

	Metal channel	ESCON channel
Maximum number of CUs	1	4
Maximum number of SSIDs	4	16
Maximum number of LDEVs	256	1024

Table 3.8.2 Allowable Range of Host Connection Interface Items on DKC Side

		Metal channel	ESCON channel
CU address		0	0 to 3
SSID	3990-3 3990-6 3990-6E	0004 to FFFD	
Number of logical volumes		1 to 256	1 to 1024

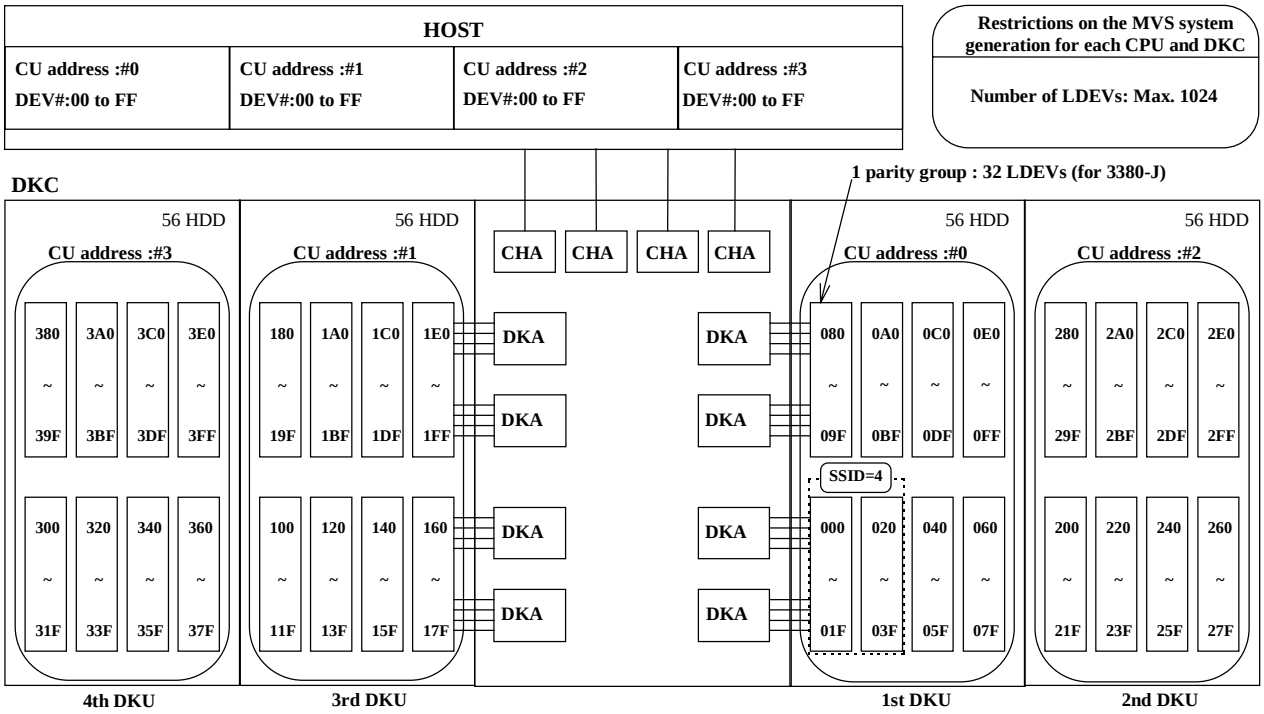

Fig. 3.8.1 Configuration Example of 1024 LDEVs Using 4 CUs

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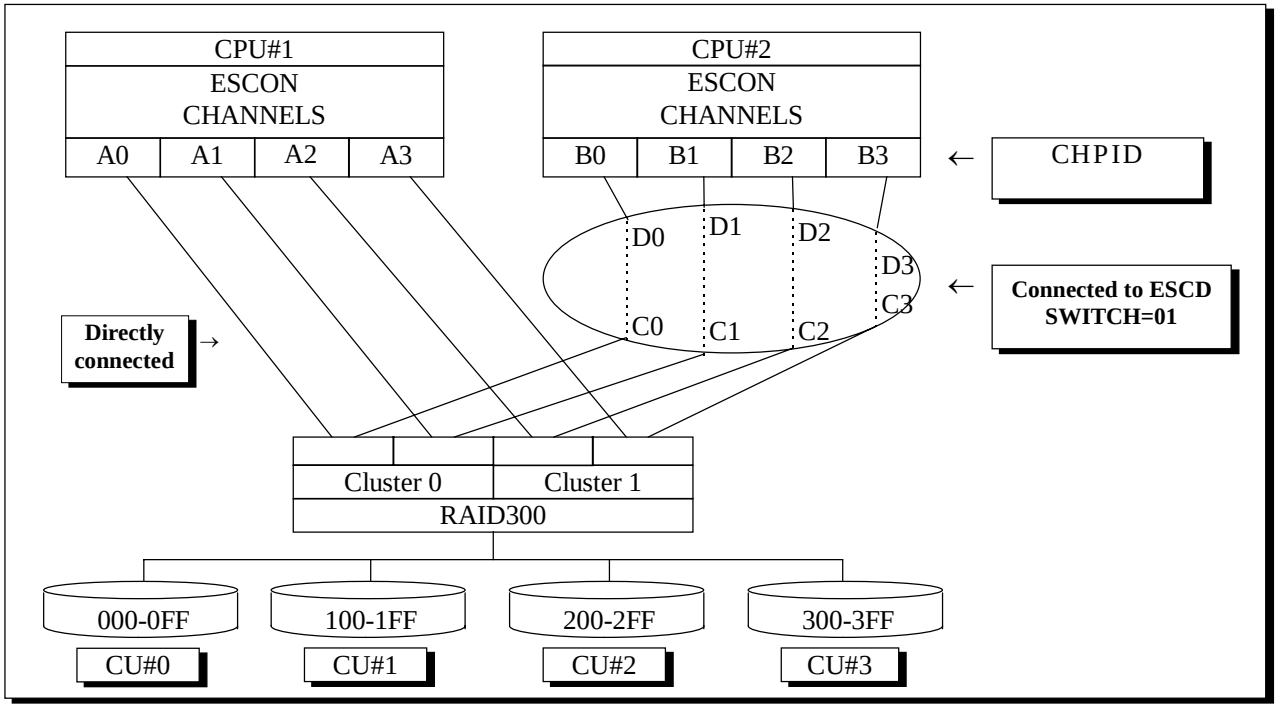

Fig. 3.8.2 Connection Example of CPUs and DKCs in Configuration with 1024 LDEVs Using 4 CUs

CPU#1

```
CHPID     PATH=A0,TYPE=CNC,PARTITION=(LPA1,REC)
CHPID     PATH=A1,TYPE=CNC,PARTITION=(LPA1,REC)
CHPID     PATH=A2,TYPE=CNC,PARTITION=(LPA1,REC)
CHPID     PATH=A3,TYPE=CNC,PARTITION=(LPA1,REC)
CNTLUNIT  CUNUMBR=100,PATH=(A0,A1,A2,A3),UNIT=3990,UNITADD=((00,256)),CUADD=0
CNTLUNIT  CUNUMBR=101,PATH=(A0,A1,A2,A3),UNIT=3990,UNITADD=((00,256)),CUADD=1
CNTLUNIT  CUNUMBR=102,PATH=(A0,A1,A2,A3),UNIT=3990,UNITADD=((00,256)),CUADD=2
CNTLUNIT  CUNUMBR=103,PATH=(A0,A1,A2,A3),UNIT=3990,UNITADD=((00,256)),CUADD=3
IODEVICE  ADDRESS=(000,256),CUNUMBR=100,UNIT=3390
IODEVICE  ADDRESS=(100,256),CUNUMBR=101,UNIT=3390
IODEVICE  ADDRESS=(200,256),CUNUMBR=102,UNIT=3390
IODEVICE  ADDRESS=(300,256),CUNUMBR=103,UNIT=3390
```

Example when CPU is directly connected to DKCs
Configuration with up to 1024 LDEVs is possible

CPU#2

```
CHPID     PATH=B0,TYPE=CNC,PARTITION=(LPA1,REC),SWITCH=01
CHPID     PATH=B1,TYPE=CNC,PARTITION=(LPA1,REC),SWITCH=01
CHPID     PATH=B2,TYPE=CNC,PARTITION=(LPA1,REC),SWITCH=01
CHPID     PATH=B3,TYPE=CNC,PARTITION=(LPA1,REC),SWITCH=01
CNTLUNIT  CUNUMBR=200,PATH=(B0,B1,B2,B3),LINK=(C0,C1,C2,C3),UNIT=3990,UNITADD=((00,256)),CUADD=0
CNTLUNIT  CUNUMBR=201,PATH=(B0,B1,B2,B3),LINK=(C0,C1,C2,C3),UNIT=3990,UNITADD=((00,256)),CUADD=1
CNTLUNIT  CUNUMBR=202,PATH=(B0,B1,B2,B3),LINK=(C0,C1,C2,C3),UNIT=3990,UNITADD=((00,256)),CUADD=2
CNTLUNIT  CUNUMBR=203,PATH=(B0,B1,B2,B3),LINK=(C0,C1,C2,C3),UNIT=3990,UNITADD=((00,255)),CUADD=3
IODEVICE  ADDRESS=(000,256),CUNUMBR=200,UNIT=3390
IODEVICE  ADDRESS=(100,256),CUNUMBR=201,UNIT=3390
IODEVICE  ADDRESS=(200,256),CUNUMBR=202,UNIT=3390
IODEVICE  ADDRESS=(300,255),CUNUMBR=203,UNIT=3390
CNTLUNIT  CUNUMBR=A00,PATH=(B0,B1,B2,B3),LINK=(FE,FE,FE,FE),UNIT=SWCH,UNITADD=((00,1))
IODEVICE  ADDRESS=(F00,1),CUNUMBR=A00,UNIT=SWCH
```

Example when CPU and DKCs are connected to ESCDs
Configuration with up to 1023 LDEVs is possible

Fig. 3.8.3 System Generation Example in Configuration with 1024 LDEVs in MVS

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3.9 32 concurrent data transfers / 512 logical path

The number of logical paths per physical path in the RAID300 is up to 16 in the case of LCP and 1 in the case of MCP. As a result, the maximum number of logical paths is 512.
The specifications for number of logical paths are summarized in Table 3.9.1.

Table 3.9.1 Specifications for Number of Logical Paths

ESCON channel	Per port	16 paths
	Per channel processor	32 paths
	Per channel adapter	64 paths
Metal channel	Per port	1 path
	Per channel processor	4 paths
	Per channel adapter	4 paths
Number of logical paths per DKC		Number of mounted LCPs × *16 + Number of mounted MCPs × 1

With respect to the logical path number of each logical path,

"LCP (MCP) number × 16"

is set as the first LPN (logical path number) of each LCP (MCP) and the logical path numbers are controlled in units of 16 paths. When the MCPs are connected, only one LPN can be established per MCP. Tables 3.9.2 and 3.9.3 show the logical path number in each LCP and MCP and the connectable CHP number.

Table 3.9.2 Logical Path Control Number Corresponding to LCP/MCP and Connectable CHP Number (Cluster 1)

	LCP/MCP ID															
	1A	1B	1C	1D	1E	1F	1G	1H	1J	1K	1L	1M	1N	1P	1Q	1R
LCP/MCP number	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
LPN number (LCP)	00 | 0F	10 | 1F	20 | 2F	30 | 3F	40 | 4F	50 | 5F	60 | 6F	70 | 7F	80 | 8F	90 | 9F	A0 | AF	B0 | BF	C0 | CF	D0 | DF	E0 | EF	F0 | FF
LPN number (MCP)	00	10	20	30	40	50	60	70	Not Installable							
CHP number (LCP)	0/1		10/11		2/3		12/13		4/5		14/15		6/7		16/17	
CHP number (MCP)	0/1				2/3				Not Installable							
Package number	0				1				2				3			

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Table 3.9.3 Logical Path Control Number Corresponding to LCP/MCP and Connectable CHP Number (Cluster 2)

	LCP/MCP ID															
	2A	2B	2C	2D	2E	2F	2G	2H	2J	2K	2L	2M	2N	2P	2Q	2R
LCP/MCP number	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
LPN number (LCP)	100 | 10F	110 | 11F	120 | 12F	130 | 13F	140 | 14F	150 | 15F	160 | 16F	170 | 17F	180 | 18F	190 | 19F	1A0 | 1AF	1B0 | 1BF	1C0 | 1CF	1D0 | 1DF	1E0 | 1EF	1F0 | 1FF
LPN number (MCP)	100	110	120	130	140	150	160	170	Not Installable							
CHP number (LCP)	20/21		30/31		22/23		32/33		24/25		34/35		26/27		36/37	
CHP number (MCP)	20/30				22/32				Not Installable							
Package number	4				5				6				7			

A sequence has been provided for the data transfer between the channels and the DKC so as to recognize the physical port number on the DKC side by the channel interface ID, and it makes LCP1A to LCP1H of the cluster 1 of the LCP port correspond to 08 to 0F (00 to 07 in commands), and LCP2A to LCP2H of the cluster 2 correspond to 18 to 1H (17 to 1F in commands).
In the RAID300, to realize 32 concurrent data transfers, the number of connectable physical paths is set to 32, however, there are only 16 patterns of channel interface IDs as shown above (because the IBM systems have only 16 physical interfaces connectable to channels).
Therefore, it is necessary to make the channel interface IDs of 16 patterns correspond to the 32 physical paths.
In the RAID300, one channel interface ID is made correspond to two physical paths; for examples, LCP1A and 1B is made correspond to the channel interface ID 08 (0), and LCP1C and 1D to 09 (10). The correspondences above are made using *8 packages in total by treating 2 IDs by one package.
Tables 3.9.4 and 3.9.5 show correspondence between the physical paths of the LCP and MCP and the channel interface IDs.

Table 3.9.4 Correspondence between Physical Paths of LCP/MCP and Channel Interface IDs (Cluster 1)

Channel interface ID (used in commands)	08 (00)	09 (01)	0A (02)	0B (03)	0C (04)	0D (05)	0E (06)	0F (07)
LCP/MCP ID	1A • 1B	1C • 1D	1E • 1F	1G • 1H	1J • 1K	1L • 1M	1N • 1P	1Q • 1R

Table 3.9.5 Correspondence between Physical Paths of LCP/MCP and Channel Interface IDs (Cluster 2)

Channel interface ID (used in commands)	18 (10)	19 (11)	1A (12)	1B (13)	1C (14)	1D (15)	1E (16)	1F (17)
LCP/MCP ID	2A • 2B	2C • 2D	2E • 2F	2G • 2H	2J • 2K	2L • 2M	2N • 2P	2Q • 2R

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3.11 High-Speed LDEV Formatting

3.11.1 Outlines

In RAID300, the LDEV formatting time is automatically shortened by providing the PDEV with the LDEV formatting function and by making the PDEVs perform the formatting concurrently.

Item No.	Item	RAID300
1	SVP operation	The operation is performed by selecting functions from the Maintenance menu.
2	Display of execution status	Display of the execution progress in the SVP message box (%)
3	Execution result	Normal/abnormal LDEV: Same indications as the conventional ones are displayed. Normal/abnormal PDEV: STATUS is displayed.
4	Recovery action when a failure occurs	Same as the conventional one. However, a retry is to be executed in units of ECC. (Because the LDEV-FMT is terminated abnormally in units of ECC when a failure occurs in the HDD.)
5	Operation of the SVP which is a high-speed LDEV-FMT object	When an LDEV-FMT of more than one ECC is instructed, the high-speed processing is performed.
6	HDD which is an object of the high-speed LDEV-FMT	HDD-DK309 and DK3F1 supporting the high-speed LDEV formatting
7	PS/OFF or powering off	The LDEV formatting is suspended. No automatic restart is executed.
8	SVP PC powering off during execution of an LDEV-FMT	After the SVP is rebooted, the indication before the PC powering off is displayed in succession.

3.11.2 Estimation of LDEV Formatting Time

Number of LDEVs	Conventional method (using measured value)	New method
1	11 minutes and 29 seconds	11 minutes and 29 seconds (Since the formatting is executed using the conventional method, the time is not changed.)
8	32 minutes and 16 seconds	14 minutes and 31 seconds
32	1 hour and 45 minutes	58 minutes and 04 seconds
1024	8 hours or longer.	1 hour and 12 minutes and 57 seconds

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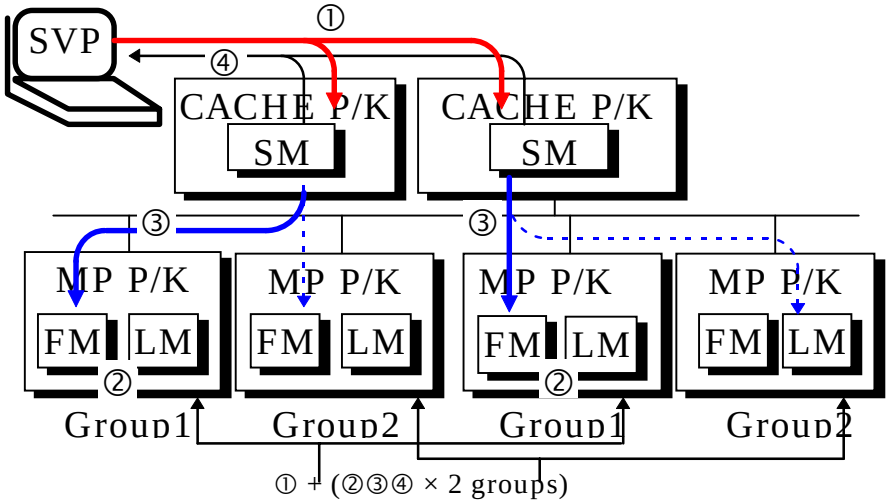
3.12 High-Speed Online Replacement of Microprogram

The microprograms are stored in the shared memory and transferred in a batch. Thus the number of times of the transfer from the SVP to the DKC via the LAN is reduced and the online microprogram replacement is speeded up by recovering two or more processors at the same time.

3.12.1 Outline

A microprogram storage area is reserved in the shared memory. The microprogram by which each processor operates is stored in it, and data is written into the flash memory from the shared memory by rebooting the processor. The reason for executing the writing during reboot processing is that it is intended to unify the microprogram writing processings executed in the PCB replacement and cold replacement (not supported at present). In addition, when the microprograms are stored in the shared memory, processors can execute the microprogram writing processings at the same time and the processing time can be shorted substantially.



Two or more processors execute the processings at the same time.

[Processing sequence]

① The SVP transfers the microprograms (DKCMAIN, RAMBOOT, LCP/LCDG, and MCP) to the shared memory.
② The SVP executes a reboot instruction for each processor of the first group.
③ In the reboot processing, the microprograms are transferred from the shared memory to the flash memory and the writing processing is executed.
④ The SVP monitors the status of the processors executing the reboot processing and writing processing to the flash memory and waits until the status changes to normal finally.
⑤ The SVP executes the processings of steps ② to ④ repeatedly for each group.

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3.12.2 Processing Time

The estimated time of microprogram replacement is shown below. The time below is required for the process for the programs DKCMAIN, RAMBOOT, LCP, and MCP. The SVP and DKU are processed in the conventional processing sequences and the time required for the sequences are not included in the processing time.

Processing time required for microprogram replacement	
RAID300 method (Estimated time for 4 groups)	RAID200 method (sequential)
24 min. / 48 processors	**240 min./ 48 processors**

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3.13 HRC & HODM

3.13.1 HRC/HODM Components

There are three modes of the update copy, a synchronous copy, semi synchronous copy and asynchronous copy.
Description of the asynchronous is described in chapter 3.17 HRC Asynchronous.

(1) HRC Components

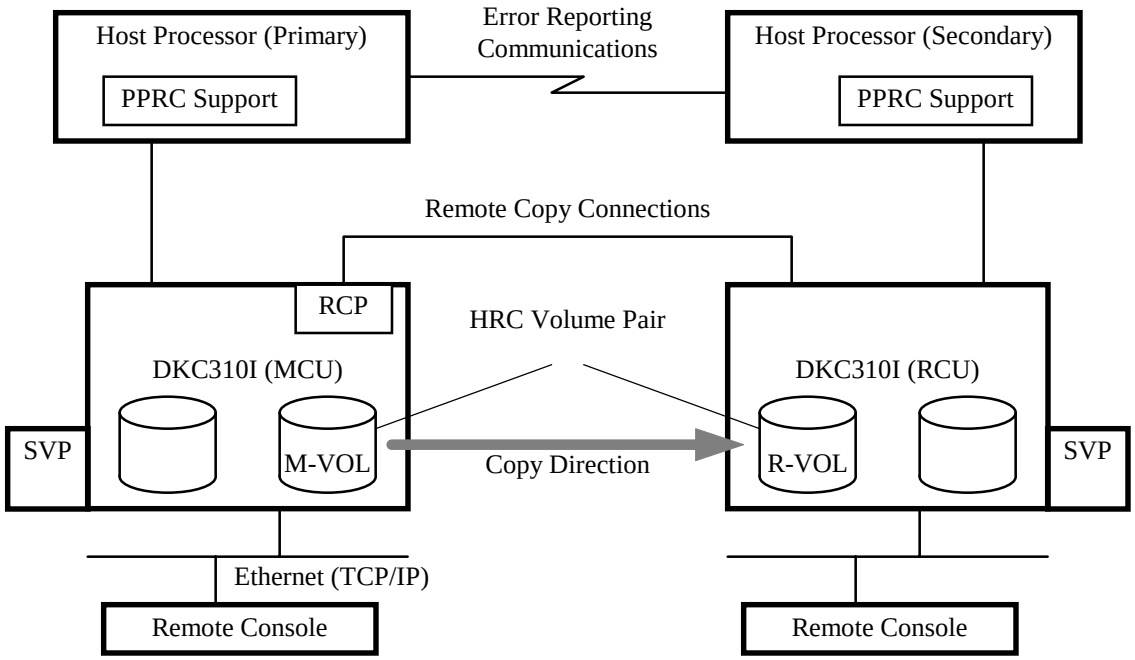

Fig. 3.13.1-1 HRC Components

(a) HRC Volume Pair

An **HRC volume pair** consists of two logical volumes, an M-VOL and an R-VOL, in different DKC310I subsystems.

An **M-VOL** (main volume) is a primary volume. It can be read or written by I/O operations from host processors.

An **R-VOL** (remote volume) is a secondary or a mirrored volume. Under control of the DKC310I subsystems, contents of an M-VOL and updates from host processors are copied to an R-VOL. Read or write I/O operations from host processors to R-VOLs are rejected.

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Note ; R-VOL Read Only function

HRC has R-VOL Read Only function to accept read commands to R-VOL of suspended pairs of HRC.

R-VOL Read Only function becomes effective with SVP system option setting for RCU of HRC.

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With this function, RCU accepts all RD commands including CTL/SNS commands and WR command to cylinder zero, head zero, record three of R-VOL. (It is necessary to change VOLSER of the volume.)

The RCU rejects some PPRC commands such as ADDPAIR to the R-VOL nevertheless the status of the R-VOL looks 'Simplex'. They must be controlled by system administration.

With this function, RCU displays the status of the R-VOL as 'Simplex' instead of 'Suspended'. It is necessary to accept I/O to R-VOL.

MCU copies cylinder zero of the pair at RESYNC copy unconditionally, besides the ordinary RESYNC copy.

The M-VOLs of the HRC volume pairs and the R-VOLs of other HRC volume pairs can be intermixed in one DKC310I subsystem.

(b) MCU and RCU

An **MCU** (main disk control unit) and an **RCU** (remote disk control unit) are disk control units in the DKC310I subsystems to which the M-VOLs and the R-VOLs are connected respectively.

An MCU controls I/O operations from host processors to the M-VOLs and copy activities between the M-VOLs and the R-VOLs. An MCU also provides functions to manage HRC status and configuration.

An RCU executes write operations directed by the MCU. The manner to execute write operations is almost same as that of I/O operations from host processors. An RCU also provides a part of functions to manage HRC status and configuration.

Note that an MCU/RCU is defined on each HRC volume pair basis. One disk control unit can operate as an MCU to control the M-VOLs and an RCU to control the R-VOLs.

(c) Remote Copy Connections

An MCU and an RCU must be connected with serial interface (ESCON) cables. Only multi mode ESCON cables whose length is up to 3km can be connected to the DKC310I subsystems. In order to locate the DKC310I subsystems more than 3km apart, IBM 9032/9033 ESCON directors or 9036 ESCON repeaters are required.

At least two independent remote copy connections should be established between an MCU and an RCU.

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(d) RCP

An **RCP** (remote control port) is a serial interface port to which an RCU is connected. Any serial interface port of the DKC310I subsystems can be configured as an RCP.

When an MCU communicates with an RCU through ESCON interface protocol, the RCP plays the role of a host processor channel. The RCP supports ESCON dynamic connection. A serial interface port of the RCU to which the MCU is connected can be connected to host processor channels by using dynamic switching capability provided by ESCON directors.

However an RCP can not communicate with host processor channel. Channel interface paths must be connected to other serial interface ports.

(e) SVP and Remote Console

An **SVP** provides functions to set up , modify and display HRC/HODM configuration and status.

A **remote console** is a personal computer compatible with the PC/AT. It should be connected to DKC310I subsystems with an Ethernet network (TCP/IP) . A remote console provides same managing HRC/HODM functions as an SVP. Several DKC310I subsystems can be connected with one Ethernet network.

For remote console, Hitachi provides only two software components, an HRC/HODM application program and dynamic link library. Both of them require Microsoft Windows operating system. A personal computer, Ethernet materials and other software products are not provided by Hitachi.

(f) Error Reporting Communications

Error reporting communication is a communication means between host processors. An MCU generates the sense information when it fails in keeping synchronization of HRC volume pair. The sense information causes the corresponding message to be displayed on the host processor console. For the reference during disaster recovery at the secondary (recovery) site, this console message should be transferred to the secondary site through the error reporting communication.

The error reporting communications may be configured by using channel-to-channel communications, Netview technology or other interconnect technologies, depending on installation. Hitachi does not provide any product for error reporting communications.

(g) PPRC Support

HRC provides a host processor interface compatible with IBM PPRC. TSO commands, DSF commands and disaster recovery PTFs provided for PPRC can be used for HRC.

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(2) HODM Components

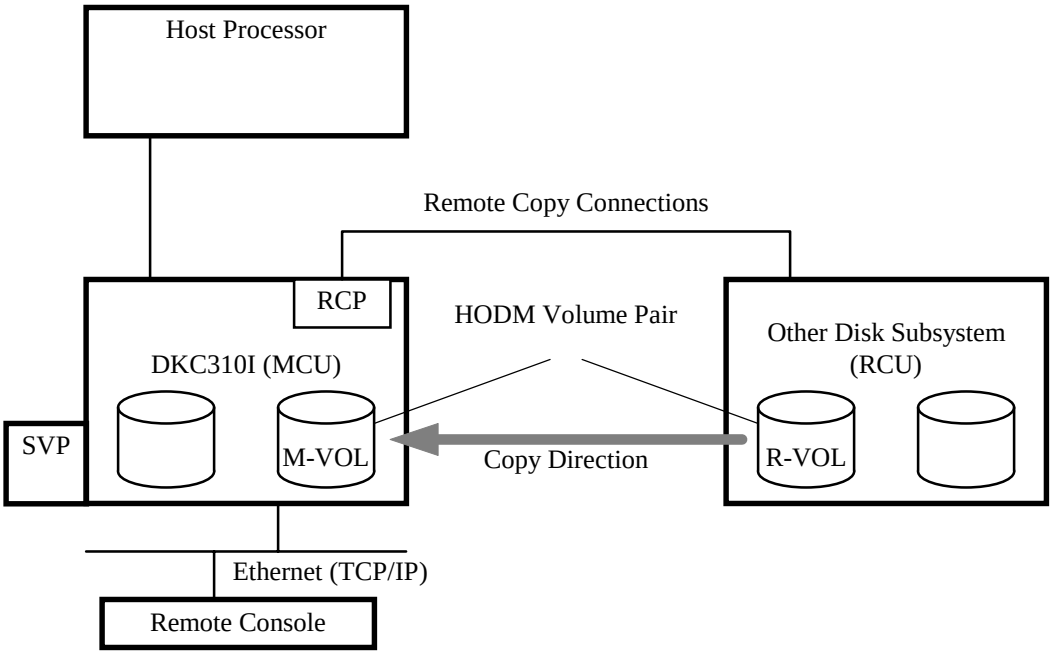

Fig. 3.13.1-2 HODM Components

(a) HODM Volume Pair

An **HODM volume pair** consists of one logical volume in a DKC310I subsystem and another disk volume in another disk subsystem, called an **M-VOL** (main volume) and an **R-VOL** (remote volume) respectively. But you can not establish HODM volume pair on condition that R-VOL is Dual Copy volume.

HODM copies the data written in the R-VOL into the M-VOL. Responding to read I/O operations from host processors to the M-VOL, HODM transfers the data read from the R-VOL if the requested data has not yet copied.

R-VOL should be protected from being updated during HODM. An operating environment must ensure this requirement because HODM does not protect it.

(b) MCU and RCU

An **MCU** (main disk control unit) is the disk control unit of a DKC310I subsystem. An **RCU** is the disk control unit of another disk subsystem in the HODM configuration.

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(c) Remote Copy Connections

An MCU and an RCU must be connected with serial interface (ESCON) cables. Only multi mode ESCON cables whose length is up to 1km can be connected to the DKC310I subsystems. Although IBM 9032/9033 ESCON directors and 9036 ESCON repeaters are supported, the longer distance is not recommended because of performance reasons.

At least two independent remote copy connections should be established between an MCU and an RCU.

(d) RCP

An **RCP** (remote control port) is a serial interface port to which an RCU is connected. Any port of DKC310I subsystems can be configured as an RCP.
When an MCU communicates with an RCU through an ESCON interface protocol, an RCP plays the role of a host processor channel. An RCP supports ESCON dynamic connection. A serial interface port of an RCU to which an MCU is connected can be connected to host processor channels by using dynamic switching capability provided by ESCON directors.

However an RCP can not communicate with a host processor channel. Channel interface paths must be connected to other serial interface ports.

(e) SVP and Remote Console

An **SVP** provides functions to set up , modify and display HRC/HODM configuration and status.

A **remote console** is a personal computer compatible with a PC/AT. It should be connected to the DKC310I subsystems with an Ethernet network (TCP/IP). A remote console provides same managing HRC/HODM functions as an SVP. Several DKC310I subsystems can be connected with one Ethernet network.

For a remote console, Hitachi provides only two software components, an HRC/HODM application program and dynamic link library. Both of them require Microsoft Windows operating system. A personal computer, Ethernet materials and other software products are not provided by Hitachi.

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3.13.2 HRC/HODM Theory of Operations

(1) HRC Copy Activities

HRC executes two kind of copy activities, **initial copy** and **update copy**.

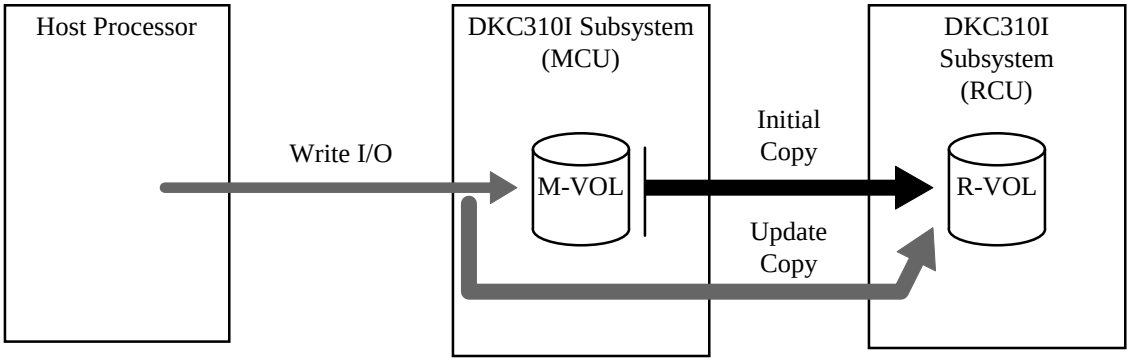

Fig. 3.13.2-1 HRC Copy Activities

(a) Initial Copy

Responding to an Establish HRC Volume Pair operation from an SVP/remote console or an ESTPAIR PPRC command, HRC begins initial copy. Data field of record zero and following records on all tracks, except for alternate and CE tracks, are copied from M-VOL to R-VOL. The initial copy operation is performed in ascending order of cylinder numbers.

"No copy" can be specified as a parameter to the initial copy. When "no copy" is specified, HRC will complete an Establish HRC Volume Pair operation without copying any data. An operator or a system administrator should be responsible for ensuring that data on the M-VOL and the R-VOL is already identical.

"Only out-of-sync cylinders" can also be specified as a parameter to the initial copy. This parameter is used to recover (re-establish) HRC volume pair from suspended condition. After suspending HRC volume pair, the MCU maintains a cylinder basis bit map which indicates the cylinders updated by I/O operations from the host processors. When this parameter is specified, HRC will copy only cylinders indicated by the bit map.

(b) Controlling Initial Copy

Number of tracks copied by one initial copy activity can be specified by an SVP/remote console or an ESTPAIR PPRC command.

Number of volume pairs for which the initial copy are concurrently executed and priority of each volume pair can be specified from an SVP/remote console.

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(c) Update Copy

Responding to the write I/O operations from the host processors, HRC copies the records updated by the write I/O operation to the R-VOL.

The update copy is a **synchronous remote copy**. An MCU starts the update copy after responding only channel-end status to the host processor channel, and sends device-end status after completing the update copy. The MCU will start the update copy when it receives:

- the last write command in the current domain specified by preceding locate record command;
- a write command for which track switch to the next track is required;
- each write command without being preceded by locate record command.

If many consecutive records are updated by single CCW chain which does not use locate record command, the third condition above may cause the significant impact on performance.

(d) Update Copy for Cache Fast Write Data

Cache fast write (CFW) data does not always have to be copied because CFW is used for temporary files, such as sort work data sets. These temporary files are not always necessary for disaster recovery.

In order to reduce update copy activities, HRC supports a parameter which specifies whether CFW data should be copied or not.

(e) Special Write Command for Initial Copy and Update Copy

In order to reduce overhead by the copy activities, HRC uses a special write command which is allowed only for copy activities between the DKC310I subsystems. The single write command transfers control parameters and an FBA formatted data which includes consecutive updated records in a track. It reduces interlocks on ESCON interface protocol and overhead required for converting FBA-to-CKD format and CKD-to-FBA format.

(2) HRC Read I/O Operations

Responding to read I/O operations, an MCU transfers the requested records form an M-VOL to a host processor. Even if reading records from the M-VOL is failed, the R-VOL is not automatically read for recovery. The redundancy of the M-VOL itself provided by RAID5 or RAID1 technique would recover the failure.

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(3) HODM Copy Activities

HODM performs three kind of copy operations, **migration copy**, **restore copy** and **update copy**.

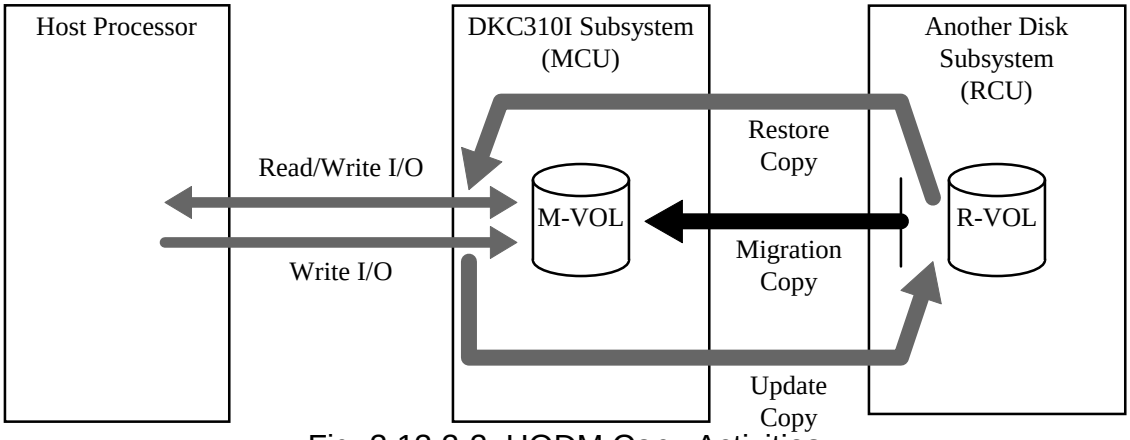

Fig. 3.13.2-2 HODM Copy Activities

(a) Migration Copy Operation

Responding to establishing HODM volume pair operation from SVP/Remote Console, HODM begins the migration copy. Data field of record zero and following records on all tracks, excluding alternate and CE tracks, are copied from R-VOL to M-VOL. The migration copy is performed in ascending order of cylinder numbers.

(b) Controlling Migration Copy

Number of volume pairs for which the migration copy operations are concurrently performed and priority of each volume pair can be specified from SVP/Remote Console.

(c) Restore Copy

When MCU receives read/write I/O operations from host processors and the requested data is not yet copied by the migration copy, HODM executes the restore copy. The restore copy copies the cylinder in which the requested records are stored. After completing the restore copy, MCU reads the requested records from the M-VOL for read I/O operation or executes the update copy for the write I/O operation.

While executing the restore copy, host processor channel is disconnected from the MCU with a command retry procedure.

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(d) Update Copy

Responding to the write I/O operations while the migration copy is in progress, HODM copies the records updated by the write I/O operations to the R-VOL. The purpose of the update duplication is to keep consistency of data on the R-VOL during data migration.

Update Copy mode can be selected by SVP Add Pair operation. (refer to THEORY03-550, SVP04-160)

"while Migration Copy in progress" (default):
Update Copy to R-VOL is enabled until the migration of the each device is complete.

"until Delete Pair/Erase operation":
Update Copy to R-VOL is enabled until Delete Pair or Erase operation, even if the migration for the volume is completed. This function is to avoid data lost, if HODM is failed and the situation is under the necessity of recovering by means of return the system to the RCU. But, this function effects heavier load to MCU and should cause performance degradation.

"never duplicated":
Update Copy to R-VOL is not enabled.

(4) HRC Volume Pair Status

All volumes in a DKC310I subsystem are in one of the states shown in Table 3.13.2-1.

Status of the M-VOLs or the R-VOLs are kept by the MCU and the RCU respectively. The MCU is responsible to keep status of the R-VOLs identical to status of the M-VOLs. However, in the case of communication failure between the MCU and the RCU, they could be different.

From an SVP/remote console or by using an appropriate command for IBM PPRC, status of M-VOLs or status of R-VOLs can be obtained from the MCU or the RCU respectively.

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Table 3.13.2-1 HRC Volume Status

Status	Description
Simplex	This volume does not belong to HRC volume pair. When the initial copy is started by an Add Pair operation, the volume is changed to “pending duplex” state.
Pending Duplex	The initial copy is in progress. Data on HRC volume pair is not fully identical. When completing the initial copy, the volume will be changed to “duplex” state.
Duplex	Volumes in HRC volume pair are synchronized. All updates from the host processors to the M-VOL are duplicated to the R-VOL.
Suspended	Volumes in HRC volume pair are not synchronized. When the MCU can not keep synchronization between HRC volume pair due to, for example, failure on the update copy, the MCU will put the M-VOL and the R-VOL in this state. When the MCU or the RCU accepts an Suspend operation from an SVP/remote console, the M-VOL and the R-VOL will be put in this state. When the RCU accepts the Delete Pair operation from the SVP/remote console, the MCU will detect the operation and put the M-VOL in this state.

For “suspended” volumes, cause of suspension is defined as shown in Table 3.13.2-2. The cause of suspension is displayed in the form of “Suspended (cause of suspension)” on an SVP/remote console.

Table 3.13.2-2 HRC Volume Status - Sub-status of Suspended Volume

Cause of Suspension	Description
M-VOL by Operator	The Suspend operation with “M-VOL failure” option was issued to the M-VOL. This cause of suspension is defined only for the M-VOLs.
R-VOL by Operator	The Suspend operation with “R-VOL” option was issued to the M-VOL or the R-VOL. This cause of suspension is defined for both the M-VOLs and the R-VOLs.
by MCU	The RCU received a request to suspend the R-VOL from an MCU. This cause of suspension is defined for only the R-VOLs.
by RCU	The MCU detected an error condition of the RCU which caused HRC volume pair to be suspended. This cause of suspension is defined only for the M-VOLs.
Delete Pair to RCU	The MCU detected that the R-VOL had been changed to “simplex” state by the Delete Pair operation. This cause of suspension is defined only for the M-VOLs.
R-VOL Failure	The MCU detected an error condition on the communication between the RCU or I/O error on the update copy. This cause of suspension is defined only for the M-VOLs. The cause of suspension of the R-VOLs are usually set to “by MCU” in this situation.
MCU IMPL	The MCU could not find valid control information in its non-volatile memory during its IMPL procedure. This situation may occur after the power supply failure.
Initial Copy Failed	The volume pair was suspended before completing the initial copy. Even if no write I/O has been issued after being suspended, the data in the R-VOL is not completely identical to the M-VOL.

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(5) HODM Volume Pair Status

The M-VOLs of HODM volume pair are in one of the states shown in Table 3.13.2-3. From an SVP/remote console connected to the MCU, status of the M-VOLs can be obtained.

Table 3.13.2-3 HODM Volume Status

Status	Sub-status	Description
Simplex	(with no substatus)	This volume does not belong to HODM volume pair. When the initial copy is started by an Add Pair operation, the volume is set to "pending duplex" state.
	Migration Complete	All data on the R-VOL has been successfully copied to the M-VOL. When the Delete Pair operation is directed, the volume will return to pure "simplex " state. When the R-VOL Erase operation is directed, the volume will be put into "erasing in progress" state.
	Erasing in Progress	All data on the R-VOL has been successfully copied to M-VOL, and data on the R-VOL are being erased. When all tracks are successfully erased, the volume will return to pure "simplex" state. When an MCU is powered off, the volume will be put into "migration complete" state after the MCU is re-IMPLed. To complete erasing, the R-VOL Erase operation must be operated again.
	Erasing Error	Erasing process failed.
Pending Duplex	Migration in Progress	Data on the R-VOL is being copied to the M-VOL. During in this state, updates to the M-VOL from the host processors are duplicated to the R-VOL.
Suspended	Migration Error, M-VOL	The migration copy failed due to an error condition at the MCU or the M-VOL. Although the migration copy has been terminated, the MCU tries to execute the update copy and the restore copy to respond to the I/O operations from the host processors. In order to restart the migration copy, the Delete Pair operation followed by another Add Pair operation is required after removing the error condition from the MCU/M-VOL.
	Migration Error, R-VOL	The migration copy failed due to an error condition at the RCU or the R-VOL. Although the migration copy has been terminated, the MCU tries to execute the update copy and the restore copy to respond to the I/O operations from the host processors. In order to restart the migration copy, the Delete Pair operation followed by another Add Pair operation is required after removing the error condition from the RCU/R-VOL.
	R-VOL by Operator	The Suspend operation with "R-VOL" option was issued to the M-VOL.
	MCU IMPL	The MCU could not find valid control information in its non-volatile memory during its IMPL procedure. This situation may occur after the power supply failure.

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3.13.3 HRC/HODM Control Operations

This section describes HRC/HODM control operations from an SVP or a remote console.

(1) Add RCU Operation

An Add RCU operation makes an MCU register the specified disk control unit as an RCU and establish the logical paths to the RCU. This operation also provides a function to modify the HRC/HODM options which will be applied to all HRC/HODM volume pairs in this subsystem. Refer to “SVP SECTION 4.3 Add RCU... Screen” for GUI image of this operation.

To register the RCU, the following parameters are required:

RCU S#	Serial number of the RCU.
SSID	SSID (subsystem identifier) of the RCU.
Num. of Path	Number of logical paths which should be established to the RCU on the remote copy connections.

Path parameters to specify one logical path are shown below. Up to four sets of the path parameters, as many as the “Num. of Paths” parameter specifies, must be specified. The description of path parameters is similar to the channel path definitions in IOCDS (I/O configuration dataset). In the IOCDS, a logical path is described with a sub-channel number, a link destination address and a logical address of the control unit image. A “Port” parameter, instead of the sub-channel number, is used to specify the serial interface port in the DKC310I subsystem.

Port	The serial interface port of the DKC310I subsystem where the logical path begins from. Before this operation, the serial interface port must be set to the RCP mode.
Link Adr	The link destination address. Similar to the logical path definitions in the IOCDS, this is the destination port address on the ESCD which is set to provide the dynamic connection capability. If the remote copy connection does not include the dynamic connection, x’00’ must be specified.
Logical Adr	The logical control unit address of the control unit image. If the RCU is configured as an SPSD (single path storage director), either x’00’ or x’01” must be specified. Otherwise, x’00’ must be specified.

Fig. 3.13.3-1 shows an example for the RCU and the path parameters.

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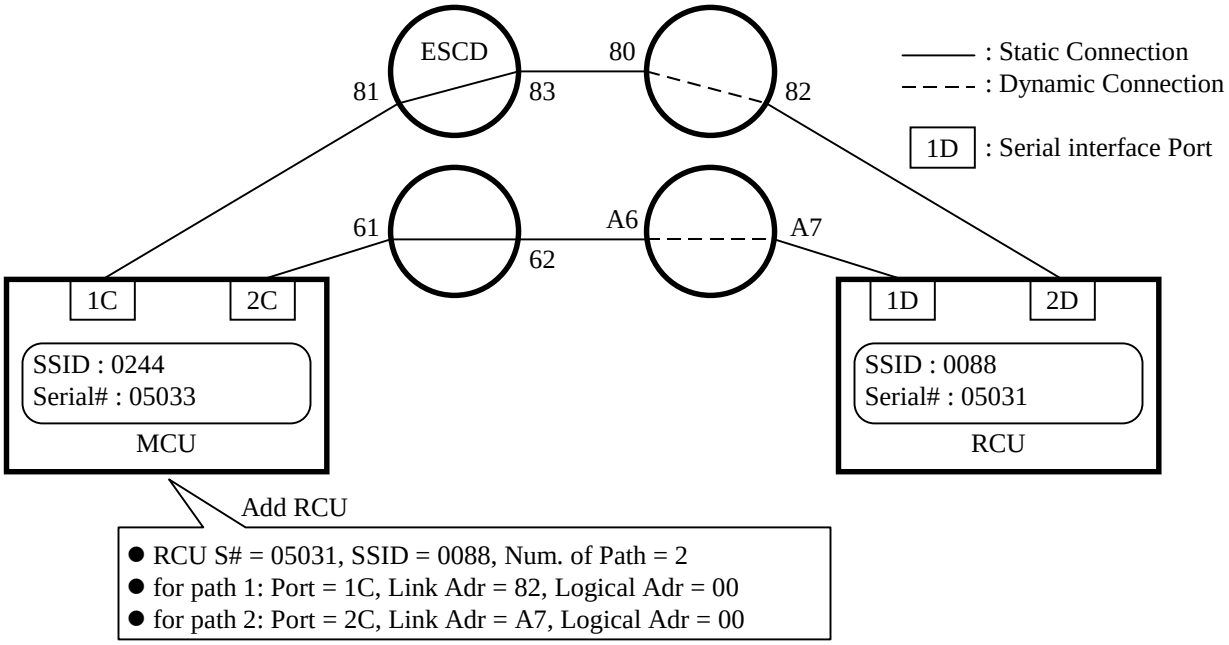

Fig. 3.13.3-1 Add RCU Operation Parameters Example

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The following parameters modify the HRC/HODM options which will be applied to all HRC/HODM volume pairs in this subsystem. Refer to “SVP SECTION 4.5 RCU Option... Screen” for GUI image to set these parameters.

Minimum Paths	When the MCU blocks the logical path due to communication failure, if the number of remaining paths becomes less than the number specified by this parameter, the MCU will suspend all of the HRC/HODM volume pairs. The default value is set to “1”. If the installation requirements prefers the subsystem I/O performance to the continuation of HRC/HODM, value between “2” and the number of the established logical paths can be specified.
Maximum Initial Copy Activities	It specifies how many HRC initial copy and HODM migration copy can be simultaneously executed by the MCU. If more HRC/HODM volume pairs are specified by an Add Pair operation, the MCU will execute the initial copy or the migration copy for as many volumes as specified by this parameter. The initial copy or the migration copy for other volumes is delayed until one of the initial copy or the migration copy is completed. This parameter can control the performance impact caused by the initial copy activity or the migration copy activity. Note: Default value of this parameter is “4”.
Incident of RCU	This parameter specifies whether the link incident record generated by the RCU is to be sent or not to the host processor connected to the MCU.
PPRC supported by HOST	If “Yes” is specified, the MCU will generate the sense information which is compatible with IBM PPRC when the HRC volume pair is suspended, but DEV_SIM of HRC/HODM will not be reported to the HOST except “DF40” and “DF48” DEV_SIM. If “No” is specified, the MCU will generate only service information messages. Even if the SSB (F/M=FB) is specified by the Suspend Pair Operation, the x’FB’ sense information will not be reported to the HOST.
Service SIM of HRC&HODM	If “Report” is specified, the HRC/HODM Service SIM will be reported to the HOST. If “Yes” is specified in PPRC supported by HOST option, DEV_SIM of HRC will not be reported to the HOST except “DF40” and “DF48” DEV_SIM. If “Not Report” is specified, the HRC/HODM Service SIM reporting will be suppressed. Refer to “SIM Reference Codes Detected by the Processor for HRC/HODM/HORC” in SIM-RC SECTION.

Note that these parameters will be applied to ALL RCUs registered to the MCU. If different parameters are specified, the last parameter will be applied.

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(2) Edit Path Operation

An Edit Path operation makes the MCU add/delete the logical path to/from the registered RCU.

To add a logical path, the same path parameters as an Add RCU operation are required. The added logical path will be automatically used to execute the copy activities.

When deleting a logical path, pay attention to the number of remaining logical paths. If it becomes less than the number specified by “Minimum Paths”, HRC/HODM volume pair could be suspended.

(3) RCU Option Operation

An RCU Option operation modifies the HRC/HODM options described in “3.13.3(1) Add RCU operation”.

(4) Delete RCU Operation

A Delete RCU operation makes the MCU delete the specified RCU from RCU registration. All logical paths to the specified RCU will be removed.

If some volumes connected to the specified RCU are active R-VOLs, this operation will be rejected. All R-VOLs must be deleted by a Delete Pair operation before a Delete RCU operation.

(5) RCU Status Operation

An RCU Status operation makes the MCU display the status of RCU registration. It also provides the current status, time of registration and time of changing status for each logical path.

The current status of each logical path is defined as follows:

Normal	This logical path has been successfully established and can be used for the HRC/HODM copy activities.
Initialization Failed	The link initialization procedure between the RCU is failed. It occurred due to Missing physical path connection between MCU and RCU, or connecting MCU with HOST as RCU.
Resource Shortage (RCU)	Establish Logical Path link control function has been rejected by the RCU. All logical path resources in the RCU might be used for other connections.
Serial Number Mismatch	The serial number of the control unit which is connected to this logical path does not match to the serial number specified by “RCU S#” parameter.
Invalid Port	The serial interface port specified by “Port” parameter is not in the RCP mode.

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(6) Add Pair Operation

An Add Pair operation makes the MCU establish a new HRC/HODM volume pair. It also provides function to modify the HRC/HODM options which will be applied to the selected HRC/HODM volume pair. Up to 256 HRC/HODM volume pairs can be established in one DKC310I subsystem.

To establish HRC/HODM volume pair, following parameters are required:

RCU	The disk control unit which controls the R-VOL of this HRC/HODM volume pair. It must be selected from RCUs which have already been registered by Add RCU operations.
R-VOL	Device number of the R-VOL.
Priority	Priority (scheduling order) of the initial copy or the migration copy for this volume pair. When the initial copy or the migration copy for one volume pair has been terminated, the MCU selects and start the initial copy or the migration copy for another volume pair which has the lowest value of this parameter. For the Add Pair operations, the value "1" through "256" can be specified. For establishing HRC volume pair by TSO command or DSF command for PPRC, "0" is implicitly applied to. "0" is the highest priority, "256" is the lowest, and default value for the Add Pair operation is "32". For the volume pairs to which the priority have been specified, the MCU prioritizes the volume pairs in the arrival order of the Add Pair operations or TSO/DSF commands. If the MCU are performing the initial copy or the migration copy for the number of volume pairs, as much as the value of "maximum initial copy activities", and accepts further Add Pair operation, the MCU does not start other initial copy or the migration copy until one of the copy being performed will be completed.
Operation Mode	It specifies what kind of remote copy capability should be applied to this volume pair. "Remote Dual Copy" and "Migration Copy" means HRC and HODM respectively. "Erase after Migration" will make the MCU start erasing the R-VOL of this HODM volume pair. Note: "Erase after Migration" is not supported at the first version of HRC/HODM.
Initial Copy	It specifies what kind of initial copy activity should be executed for this HRC volume pair. The kind of the initial copy can be selected out of: - "Entire Volume" specifies that all cylinders excluding the alternate cylinder and the CE cylinders should be copied. - "Only Out-of-Sync Cylinders" specifies that only cylinders which have been updated during this HRC volume pair is in "suspended" state - "None" specifies that the initial copy does not need to be executed. The synchronization between volume pair must have been ensured by the operator.

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HRC/HODM option parameters which will be applied to this HRC/HODM volume pair are as follows:

Initial Copy Pace	It specifies how many tracks should be copied at once by the initial copy. “15 Tracks” or “3 Tracks” can be specified. When “15 Tracks” is selected, elapsed time to complete the initial copy becomes shorter, however, the subsystem I/O performance during the initial copy could become worse. This parameter is valid only for HRC volume pair. Note: The default value of this parameter is “15”.
DFW to R-VOL	It specifies whether the DFW capability of the R-VOL is required or not. If “DFW required” is specified, the HRC volume pair will be suspended when the RCU can not execute the DFW due to, for example, cache failure. If the installation requirements prefers the continuation of HRC to the subsystem I/O performance, “DFW not required” is recommended. This parameter is valid only for HRC volume pair.
CFW Data	It specifies whether the records updated by CFW should be copied to the R-VOL or not. “Only M-VOL”, which means that CFW updates are not copied, is recommended because CFW data is not always necessary for disaster recovery.
When M-VOL Fails	It specifies whether the migration copy should be continued or stopped when the MCU detected unusual conditions, such as the correction copy or the dynamic sparing, of the M-VOL. This parameter is valid only for HODM volume pair. Note: This option is not effective. The migration copy will be continued regardless of correction access, correction copy and dynamic sparing.
M-VOL Fence Level	It specifies by what conditions the M-VOL will be fenced (the MCU will reject the write I/O operations to the M-VOL). - “R-VOL Data”: The M-VOL will be fenced when the MCU can not successfully execute the update copy. - “R-VOL Status”: The M-VOL will be fenced when the MCU can not put the R-VOL into “suspended” state. If status of the R-VOL is successfully changed to “suspended”, the subsequent write I/O operations to the M-VOL will be permitted. - “Never”: The M-VOL will never be fenced. The subsequent write I/O operations after the HRC volume pair has been suspended will be permitted. This parameter is valid only for HRC volume pairs.
Update Copy to R-VOL	Specifies update copy mode to R-VOL. - “while Migration Copy in progress”: Enable while migration copy is progress. - “until Delete Pair/Erase operation”: Enable until Delete Pair/Erase R-VOL operation is executed. - “never duplicated”: Disable while migration copy is progress.

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Note : The Add Pair operation to establish the HODM volume pair will be rejected if the specified M-VOL is in “simplex” state and belongs to any path group. Before the Add Pair operation, the M-VOL must be varied offline from all attached host processors.
Add Pair operation will be failed if the specified volume is in “correction access” or “correction copy” state. The error message is described in SVPMSG section 4.

The HRC volume pair and the HODM volume pair can not concurrently exist under the same controller (MCU-RCU). Without DEL RCU operation, the HODM (HRC) volume pair can not establish in the controller that had the HRC (HODM) volume pair before.

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(7) Delete Pair Operation

A Delete Pair operation makes the specified HRC/HODM volume pair being terminated. It can be operated on either the MCU or the RCU.

- When operated on the MCU, both the M-VOL and the R-VOL will be put into the "simplex" state.
- When operated on the RCU, only the R-VOL will be put into the "simplex" state. The M-VOL will be suspended when the MCU detects this operation. To complete deleting this volume pair, the MCU requires another Delete Pair operation.

When the MCU accepts this operation and it can not communicate with the RCU, this operation will be rejected. "Delete Pair by Force" option can make the MCU complete this operation, even if it can not communicate with the RCU.

The Delete Pair operation to the HODM volume pair without "Force" option is rejected if the M-VOL is not in "simplex (migration complete)" status and the M-VOL belongs to any path group. The Delete Pair operation to the HODM volume pair with "Force" option will be accepted regardless of status and path group of the M-VOL.

For the purpose of the recovery operation simply, "Delete All Pairs" option is provided in the delete pair operation. This option is need to use "Delete Pair by Force" option together, and specifies that the all volume pairs in the same RCU(CU Image) should be deleted. In the case of the delete operation at the RCU, specifies that the all volume pairs in the same serial number of the MCU and the same CU image of the MCU should be deleted.

(8) Suspend Pair Operation

A Suspend Pair operation makes the MCU or the RCU suspend the specified HRC/HODM volume pair.
This operation also cancel erasing operation of an HODM volume pair. The specified volume will be put into "migration complete" state. To complete erasing, the R-VOL Erase operation must be operated again.

The option parameter of this operation are as follows:

SSB (F/M=FB)	The MCU and the RCU will generate sense information to notify the suspension of this volume pair to the attached host processors. This option is valid only for HRC volume pairs.
M-VOL Failure	The subsequent write I/O operations to the M-VOL will be rejected regardless of the fence level parameter. This option can be selected only when operating on the MCU. This option is valid for only HRC volume pairs.
R-VOL	For HRC volume pairs, the subsequent write I/O operations to the M-VOL will be permitted or rejected, depending on the fence level parameter. This option can be accepted by the MCU and the RCU. For HODM volume pairs, only the migration copy is suspended. It does not affect on I/O operations from host processors.

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(9) Pair Option Operation

A Pair Option operation modifies the HRC/HODM option parameters which has been applied to the selected HRC/HODM volume pair. Refer to “3.13.3(6) Add Pair Operation” for the option parameters.

(10) Pair Status Operation

A Pair Status operation makes the MCU or the RCU display the result of the Add Pair operation or the Pair Status operation to the specified HRC/HODM volume pair, along with the following information:

Initial Copy Complete	When this HRC/HODM volume pair is in “pending duplex” state, it indicates how many cylinders have been successfully copied by the initial copy or the migration copy. When this HRC/HODM volume pair is in “suspended” state, it indicates how many cylinders are currently identical between this HRC/HODM volume pair. This information is provided only by the MCU.
Erase Complete	It indicates how many cylinders of the R-VOL have been successfully erased. This information is provided only by the MCU.
Pair Status	It indicates the status of the M-VOL or the R-VOL. Definition of the volume states is described in “3.13.2(4) HRC Volume Pair Status” and “3.13.2(5) HODM Volume Pair Status”.
Last Update	It indicate the time stamp when the volume pair status has been updated. Note that the time stamp value is obtained from an internal clock in the DKC210I subsystem.
Pair Established	It indicates the time stamp when the volume pair has been established by an Add Pair operation. Note that the time stamp value is obtained from an internal clock in the DKC310I subsystem.

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(11) Resume Pair Operation

A Resume Pair operation restart the suspended HRC/HODM volume pair. It also provides function to modify the HRC/HODM options which will be applied to the selected HRC/HODM volume pair.

As the initial copy parameters to the HRC volume pairs, only the “Only Out-of-Sync Cylinders” parameter can be specified.

“Out-of-Sync Cylinders” are recorded in the form of cylinder-bit-map allocated in SM (shared memory) of the DKC310I. If the MCU is powered off and the cylinder-bit-map is not retained due to the battery being discharged, the MCU resumes the initial copy as follows:

(a) For the HRC volume pair in “pending duplex” state, the initial copy is automatically resumed. The all cylinders of this volume will be copied.
(b) For the HRC volume pair in “suspended” state, the all cylinders of this volume will be copied responding to the Resume Pair operation.

(12) R-VOL Erase Operation

An R-VOL Erase operation makes the MCU start erasing the R-VOL. The migration copy from the R-VOL must have been successfully completed for this operation.

This operation can also restart an erasing operation of the R-VOL which is in “erasing error” or “migration complete” state. When restarting the R-VOL erasing, the MCU will erase the R-VOL from the cylinder 0.

(13) Port Operation

All serial interface ports in the DKC310I subsystem are initially set to the LCP mode, to which the host processor channels can be connected. At least two serial interface ports, one port from each storage cluster, must be set to the RCP mode for remote copy connections.

A Port operation makes the DKC310I subsystem change the operating mode of the specified serial interface port(s).

Before changing the operating mode from the LCP mode to the RCP mode, all channel paths to the specified port must be removed using host processor console or ESCD commands.

Before changing the operating mode from the RCP mode to the LCP mode, all RCUs which are connected through the specified port must be deleted by an Delete RCU operation.

Note: The Define Configuration & Installation operation also provide the function to set the operating mode of each serial interface mode.

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3.13.4 Managing HRC Environment

(1) Setting Up HRC Volume Pairs

(a) Sequence of Operations

Sequence of operations to establish the HRC volume pairs are shown below.

Table 3.13.4-1 Operations to Set Up HRC Volume Pairs

Step		Operation	
		SVP*	Others
1	Set appropriate serial interface ports to the RCP mode.	Port	
2	Establish logical paths between the DKC310I HRC subsystems	Add RCU	Before this step, remote copy connections must be established between DKC310I subsystems.
3	Ensure that the R-VOLs are offline from host processors		If necessary, perform the following system command. <In case of MVS system> • VARY OFFLINE <In case of VM system> • VARY OFFLINE from guest OS • VARY PATH OFFLINE from VM
4	Establish HRC volume pairs.	Add Pair	

* : Operations form the SVP/remote console attached to the MCU.

Several volume pairs can be specified within one Add Pair Operation. After completing an Add Pair operation, another Add Pair operation can be executed to establish another HRC volume pairs.

Be sure to vary the R-VOLs offline from the attached host processors before executing the Add Pair operation. The RCU will reject the write I/O operations to the R-VOLs once the Add RCU operation has been accepted.

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(b) Considering HRC Parameters

Setting of the “fence level” parameter to the Add Pair operation and the “PPRC supported by host” and “Service SIM of HRC/HODM” option to the Add RCU operation depends on your disaster recovery planning. Refer to “3.13.5(1) Preparing for Disaster Recovery” for these parameters.

Setting of the “CFW data” and “DFW to R-VOL” parameters to the Add Pair operation and the “minimum paths” parameter to the Add RCU operation depends on your performance requirement to the DKC310I subsystem at the primary site. Refer to “3.13.3(6) Add Pair operation” and “3.13.3(1) Add RCU operation” for these parameters.

Setting of the “maximum initial copy activities” parameter to the Add RCU operation and the “priority” and the “initial copy pace” parameters can control performance effect from the initial copy activities. Refer to “3.13.4(1)(c) Controlling Initial Copy Activities” for more detailed description.

Refer to “3.13.3(1) Add RCU operation and “3.13.3(6) Add Pair operation” for other parameters.

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(c) Controlling Initial Copy Activities

To control performance effect from the initial copy activities, the “maximum initial copy activities” parameter and the “priority” and the “copy pace” parameters can be specified:

- The “maximum initial copy activities” parameter controls the number of volumes for which the initial copy are concurrently executed;
- The “priority” parameter specifies the executing order of the migration copy on volume pair basis;
- The “copy pace” parameter specifies how many tracks should be copied by each initial copy activity.

Refer to the following example for the “maximum initial copy activities” and the “priority” parameters.

Example
Conditions:
- The Add Pair operation specifies that devices 00~05 should be M-VOLs.
- “Maximum initial copy activities” is set to “4” (this is the default value).
- “Priority” parameters for devices 00~05 are set to “3”, ”5”, ”5”, “1”, “4”, and “2” respectively.

Under the above conditions, the MCU will performs the initial copy:
- for devices 00, 03, 04 and 05 immediately.
- for device 01 when one of the initial copy has been terminated.
- for device 02 when the initial copy for the second device has been terminated.

(2) Suspending and Resuming the HRC Volume Pairs

This section describes the operations to suspend or resume the HRC volume pair, which are necessary for the following sections in this chapter.

The Suspend Pair operation with the “R-VOL” option parameters can suspend the specified HRC volume pairs while the M-VOLs are still accessed from the attached host processors. The “SSB” option should not be selected to prevent the sense information from being generated.

To resume the suspended HRC volumes pairs, the Resume Pair operation must be executed.

Refer to “3.13.3(8) Suspend Pair Operation” and “3.13.3(6) Add Pair Operation” for more detailed description.

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(3) Managing Power On/Off of HRC Components

(a) Cutting Power to HRC component

Cutting power to the RCU or the ESCDs on the remote copy connections, or other equivalent events which make the MCU unable to communicate with the RCU should be controlled in order not to affect the remote copy activities. If the MCU detects these events when it intends to communicate with the RCU, it would suspend all HRC volume pairs.

To avoid this problem, the applications on the primary host processors must be terminated or all HRC volume pairs must be suspended or terminated, before performing these events.

Refer to “3.13.4(2) Suspending and Resuming the HRC Volume Pairs” for the operations to suspend and resume the HRC volume pairs.

(b) Power Control Interface at the Secondary Site

In the secondary site, It is not recommended to use the power control interface which remotely cuts the power to the RCU or the ESCD on the remote copy connections in order to avoid the situation described in “3.13.4(3)(a) Cutting Power to HRC components”.

(c) Power-on-sequence

The RCU and the ESCDs on the remote copy connections must become operable before the MCU accepts to first write I/O operation to the M-VOLs.

After the power-on-reset sequence of the MCU, It communicates with the RCU in order to confirm the status of the R-VOLs. If it is not possible, the MCU retries the confirmation until it is successfully completed or the MCU accepts the first write I/O operations to the M-VOLs.

If the MCU accepts the first write I/O operation before completing the confirmation, the MCU will suspend the HRC volume pair. This situation is critical because the status of the R-VOL can not be changed, that is, remains “duplex” state.

(4)Executing ICKDSF to HRC Volume Pairs

The updates by the channel programs which specify “diagnostic authorization” or “device support authorization” are not reflected to the R-VOL. ICKDSF commands which issue the write I/O operations to the M-VOL must be controlled. The HRC volume pairs must be suspended or terminated before performing ICKDSF commands.

Refer to “3.13.4(2) Suspending and Resuming the HRC Volume Pairs” for the operations to suspend and resume the HRC volume pairs.

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3.13.5 HRC Error Recovery

(1) Preparing for Disaster Recovery

(a) Considering Fence Level Parameter

Table 3.13.5-1 shows how the fence level parameter of the Add Pair operation has an effect on the write I/O operations to the M-VOL after the HRC volume pair has been suspended. You should select one of the fence level considering the "degree of the currency" of the R-VOL required by your disaster recovery planning. The SVP or remote console, which is connected to either the MCU or the RCU, can display the fence level parameter which has been set to the HRC volume pairs.

Table 3.13.5-1 Effect of the Fence Level Parameter

Failure		Subsequent write I/O operations to the M-VOL will be ...		
		"Data"	"Status"	"Never"
1)	The update copy has failed,	rejected*	-	-
2)	(1) & however the status of the R-VOL could have been successfully changed to "suspended" state.	rejected*	accepted	accepted
3)	(1) & furthermore the status of the R-VOL could not have been changed to "suspended" state.	rejected*	rejected*	accepted

*) Sense bytes includes "command reject" and x'0F' of format/message.

Note: "Data" and "Status" has an effect when an HRC volume pair of "duplex" state is suspended. For HRC volume pairs which are in "pending duplex" state, subsequent write I/O operations will not be rejected regardless of Fence Level parameter.

1) Fence Level = "Data"

The data of the R-VOL is always identical to the M-VOL if once the HRC volume pair has been successfully synchronized. You can reduce the time to analyze whether the R-VOL is current or not in your disaster recovery procedures.

However, this parameter will make the M-VOL not accessible from your applications whenever the HRC copy activity has failed. Therefore you should specify this parameter to the most critical volumes for your disaster recovery planning.

Most of the database system supports duplexing the critical files, for example log files of DB2, for its file recovering capability. It is recommended to locate the duplexed files on the volumes in the physically separated DKC310I subsystems, and establish HRC volume pairs for each volumes by using physically separated remote copy connections.

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Note 1: If the failure has occurred before completing the initial copy, the R-VOL can not be used for disaster recovery because the data of the R-VOL is not fully consistent yet. You can became aware of this situation with referring status of the R-VOL in your disaster recovery procedures. Refer to "3.13.5(2)(b) Analyzing the Currency of R-VOLs" for more detailed description.

Note 2: Only the difference between the HRC volume pair must be the last update from the host processor. HRC is a synchronous remote copy. The MCU reports a "unit check" if it detects the failure on the write I/O operation including the update copy to the R-VOL. Therefore, the operating system and the application program does not regard the last (failed) I/O operation as successfully completed.

This parameter is functionally equivalent to "CRIT=YES" parameter for IBM PPRC

2) Fence Level = Never

The subsequent write I/O operations to the M-VOL will be accepted even if the HRC volume pair has been suspended. Therefore the contents of the R-VOL can become "older" (behind the currency of corresponding M-VOL) if the application program continue updating the M-VOL. Furthermore, the status of the R-VOL which will be obtained from the RCU can not be in a "suspended" state.

To use this parameter, your disaster recovery planning must satisfy the following requirements:

- The currency of the R-VOL should be decided by referring the error message which might have been transferred through the error reporting communications or analyzing the R-VOL itself with other files which are confirmed to be current.
- The data of the R-VOL should be recovered by using other files which are ensured to be current.

This parameter is functionally equivalent to "CRIT=NO" parameter for IBM PPRC

3) Fence Level = Status

The level of this parameter is between "Data" and "Never". Only when the status of the R-VOL can be ensured, the subsequent write I/O operations to the M-VOL will be permitted. Therefore the disaster recovery procedure of deciding the currency of the R-VOL can be reduced.

(b) Transferring the Sense Information through Error Reporting Communications

When the HRC volume pair is suspended, the MCU generates the sense information which notifies the host processor of the failure. This will help in deciding the currency of the R-VOLs in the disaster recovery procedures by transferring the sense information, or the system console message caused by the sense information, with the system time stamp information.

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The sense information can be selected out of:

- x'FB' of format/message. The sense information is compatible with IBM PPRC and result on a corresponding system console message, for example IEA491E of MVS, if the operating system supports it.
- service information message whose reference code means that the HRC volume pair has been suspended.

Note: The first version of HRC is not completely certified under the operating system which does not support IBM PPRC. Therefore the x'FB' sense information must be selected.

The error reporting communications are essential if you use the fence level of "Status" or "Never".

(c) File Recovery Procedures Depending on Installations

HRC is a synchronous remote copy. All updates to the M-VOLs are copied to their R-VOLs before completing each channel program of the write I/O operations. When the HRC volume pairs have been suspended or the MCU has become inoperable due to a disaster, therefore, many data "in progress" could remain in the R-VOLs. That is, some data set might be still opened, or some transactions might not be committed yet. All breakdown cases should be previously considered.

Therefore, even if you have selected the fence level of "Data" for all HRC volume pairs, you should establish the file or volume recovery procedures. The situation which should be assumed is similar to that where the volumes have became not accessible due to the disk controller failure in non-remote copied environment.

If you use the fence level of "Status" or "Never", the suspended R-VOLs could become "ancient" compared to other volumes. This situation might cause a data inconsistency problem among several volumes.
You should prepare, in your disaster recovery, for recovering some files or some volumes which have become "ancient" by using:

- files for file recovery, for example DB2 log files, which have been confirmed to be current. To ensure the currency of these files, it is recommended to use the fence level of "Data" for these critical volumes.
- the sense information with the system time stamp which have been transferred through the error reporting communications.
- full consistent file or volume backups, if the sense information and the system time stamp can not be used.

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(d) CSUSPEND/QUIESCE for IBM PPRC

PPRC recommends to customers to establish their disaster recovery planning where the CSUSPEND/QUIESCE TSO command is programmed to be issued responding to the IEA491E system console messages. This procedure intentionally suspend the remaining volume pairs when some volume pairs have been suspended due to a disaster.

The CSUSPEND/QUIESCE TSO command will be supported as the enhancement to HRC.

(e) All SIM of the HRC clear option

For the purpose of the restrain to report the HRC SIM which should be generated at the disaster and the recovery operations during the OS IPL, “Clear SIM” button is provided on HRC Main Control Screen at the SVP and the RMC. This function is able to use for the disaster recovery operation, and specifies that the all Remote Copy SIM in the subsystem should be deleted.

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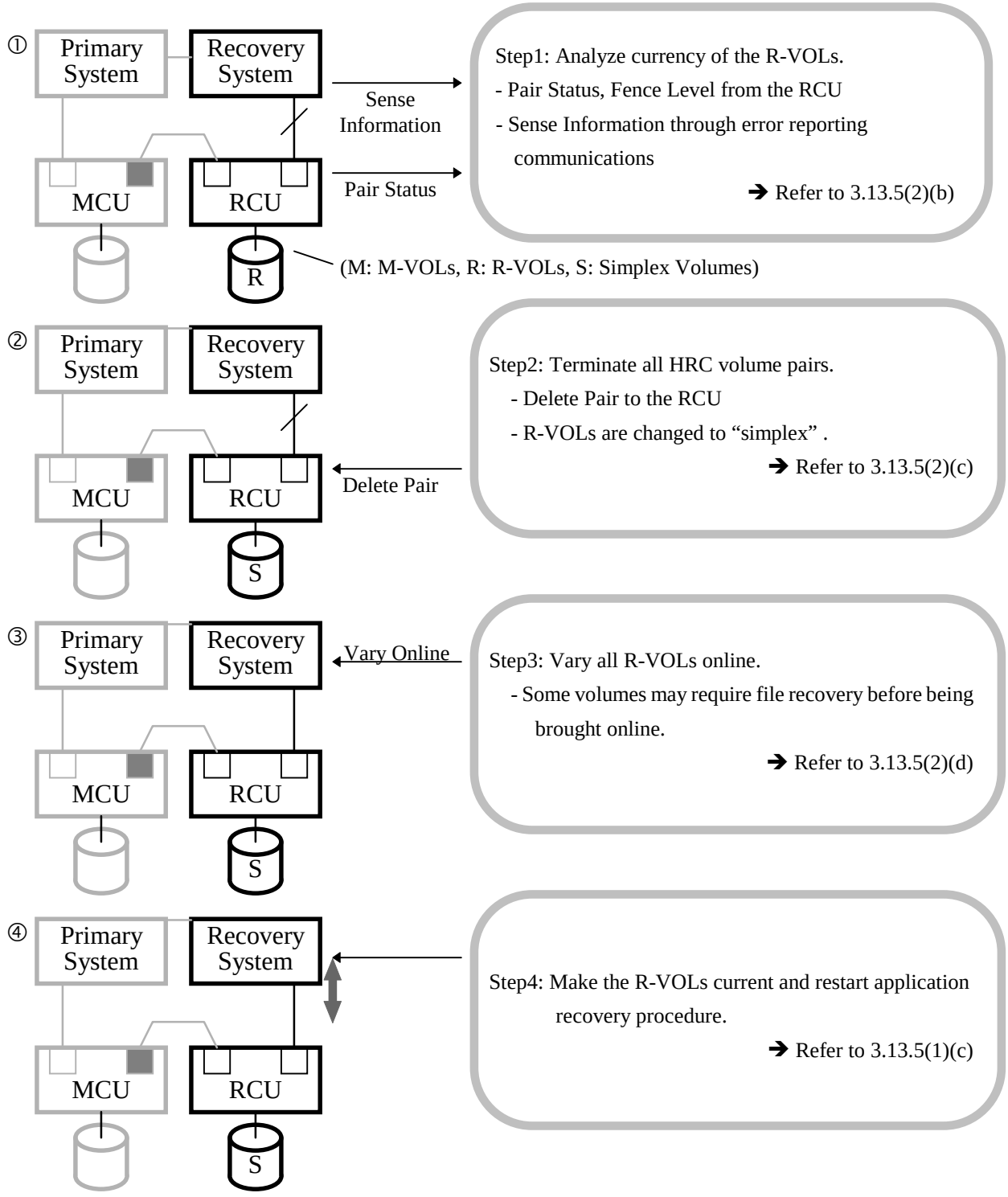
(2) Disaster Recovery Procedures - Switching to the Recovery System

(a) Summary

⓪ Primary system and MCU becomes inoperable due to disaster.



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(b) Analyzing the Currency of R-VOLs (Step 1)

1) Analyzing Status of the R-VOLs and Fence Level Parameter

Table 3.13.5-2 Currency of the R-VOLs

	Fence Level for this HRC volume pair		
Status of R-VOL	Data	Status	Never
Simplex	To be confirmed	To be confirmed	To be confirmed
Pending Duplex	Inconsistent	Inconsistent	Inconsistent
Duplex	Current	Current	To be analyzed
Suspended (Initial Copy Failed)	Inconsistent	Inconsistent	Inconsistent
Suspended (by other reason)	Current	Suspected	Suspected

Table 3.13.5-2 shows how to analyze the currency of the R-VOLs referring the status of the R-VOLs and the fence level parameter which have been specified when establishing the HRC volume pairs. The status of the R-VOLs must be obtained from the RCU in your disaster recovery procedures. The fence level parameter must be previously field since it cannot be obtained From RCU.

Meaning of the results or further actions shown in each column of table 3.13.5-2 are as follows:

To be confirmed This volume does not belong to any HRC volume pair. If you have certainly established the HRC volume pair for this volume and you have never deleted it, you should regard this volume as inconsistent.

Inconsistent The data on this volume is inconsistent because not all cylinders have successfully been copied to this volume yet. You can not use this volume for the applications unless this volume is initialized (or successfully copied from the M-VOL at later time).

Current The data on this volume is completely synchronized with the corresponding M-VOL.

To be analyzed The currency on this volume can not determined. To determine the currency, further analysis described in (2) of this section should be performed.

Suspected The data on this volume must be “older”, behind the currency of corresponding M-VOL. You should restore the consistency of this volume at least, and the currency of this volume if required. The system time information which might have been transferred through the error reporting communications or time of suspension obtained from the Pair Status operation will help you decide the last time when this volume was current.

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2) Further Analysis by Referring to Other Information

The M-VOLs, to which the fence level parameter has been set to “Never”, will accepts the subsequent write I/O operations regardless of the result of communication to change the R-VOL into the “suspended” state. Therefore, the status of the R-VOL should be analyzed by referring to the following information:

- The sense information through the error reporting communications. If the sense information which denote the suspension of this volume is found, you can return to table 3.13.5-2 with assumption of the “suspended” state.
- The status of the M-VOL obtained from the MCU, if possible. You should return to table 3.13.5-2 with assumption of the same status as the M-VOL and fence level of “Status”.
- The other related files, for example DB2 log files, which have been confirmed to be current.

(c) Terminating HRC Volume Pairs (Step 2)

The “Delete Pair” operation to the RCU terminates the specified HRC volume pairs. These R-VOLs will be changed to “simplex” state. Specified “Delete Pair by Force” option and “Delete All Pairs” option the all volume pairs in the same serial number of the MCU and the same CU image of the MCU should be deleted. Refer to “3.13.3(7) Delete Pair Operation”.

(d) Vary all R-VOLs online (Step 3)

In the case of the OS IPL, execute the “Clear SIM” operation at the SVP or the RMC before OS IPL. Refer to “2.23.19 Clear reported SIM” Operation.

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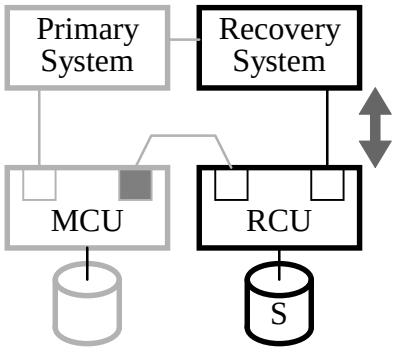
(3) Disaster Recovery Procedures - Returning to the Primary Site

(a) Summary

⓪



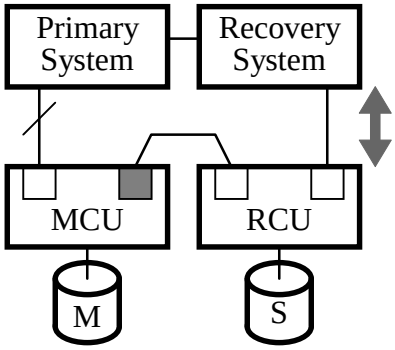
Applications are working at the recovery system.

①

Step1: Make the components in the primary system operable.

Repair Actions

Repair Actions



②

Step2: Terminate the HRC settings remaining in the MCU.

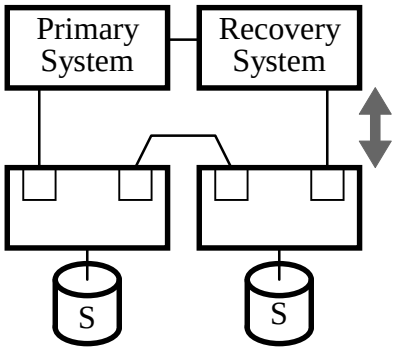
(1) Delete Pair: Delete all HRC volume pairs.

(2) Delete RCU

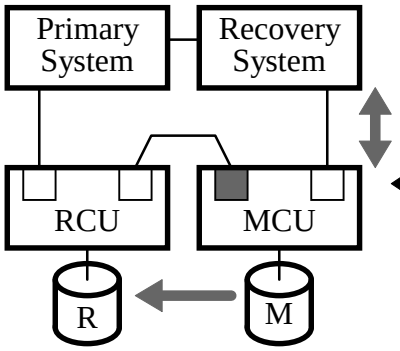
(3) Port: Change from RCP to LCP mode.

➔ Refer to 3.13.5(3)(b)

Delete Pair
Delete RCU
Port



③



Port
Add RCU
Add Pair

Step3: Establish HRC with the reverse direction

(1) Port: Change from LCP to RCP mode.

(2) Add RCU

(3) Add Pair

➔ Refer to 3.13.5(3)(c)

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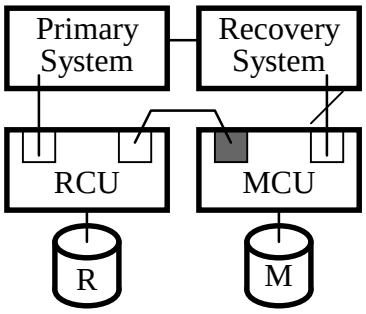
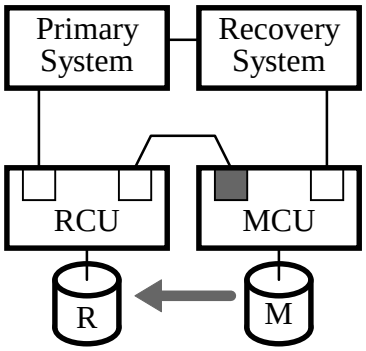
④



Vary Offline

Step4: Halt related applications and vary all M-VOLs offline from the recovery system.

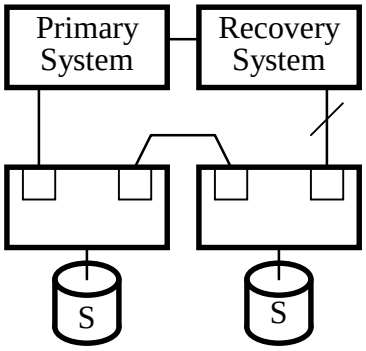
⑤



Pair Status

Step5: Confirm all HRC volume pairs become "duplex" state.

⑥



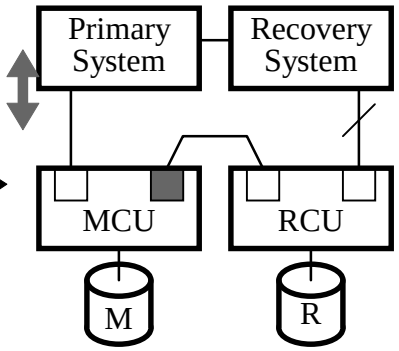
Delete Pair
Delete RCU
Port

Step6: Terminate all HRC settings.
(1) Delete Pair: Delete all HRC volume pairs.
(2) Delete RCU
(3) Port: Change from RCP to LCP mode.
➔ Refer to 3.13.5(3)(d)

⑦

Step7: Establish HRC pair with the original direction and start applications.
(1) Port: Change from LCP to RCP mode.
(2) Add RCU
(3) Add Pair
➔ Refer to 3.13.5(3)(e)

Port
Add RCU
Add Pair



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(b) Terminating the HRC Settings Remaining in the MCU (Step2)

After the DKC310I subsystem becomes operable, the remaining registration of the HRC volume pairs and the RCU should be deleted by performing the Delete Pair operation and Delete RCU operation respectively.

To complete the Delete Pair operation, the “delete pair unconditionally” option is required because the original R-VOLs do not belong presently to any HRC volume pairs. The MCU will change the specified M-VOLs into “simplex” state without checking the current status of the corresponding R-VOLs.

Specified “Delete Pair by Force” option and “Delete All Pairs” option the all volume pairs in the same RCU should be deleted.

Note that the status of M-VOLs may be “Suspended (Delete Pair to RCU)” because of Delete Pair operation issued to the RCU in step 2 of “3.13.5(2) Disaster Recovery Procedures - Switching to the Recovery System”. It is normal condition in this situation.

Before performing the Delete RCU operation, all HRC volume pairs must be deleted.

If you want to use same remote copy connections for step 3, the serial interface ports which have been set to the RCP mode should be changed to the LCP mode by the Port operation.

(c) Establish HRC with the Reverse Direction (Step3)

The HRC volume pair should be established with the reverse direction to synchronize the original M-VOLs with the original R-VOLs. The procedures for this step are same as those described in “3.13.4(1) Setting Up HRC Volume Pairs”. Note that the DKC310I subsystems in the original primary site and the recovery site are treated as the RCUs/R-VOLs and the MCUs/M-VOLs respectively.

Do not select “only out-of-sync cylinders” or “none” parameter to the Add Pair operations. The volumes in the original primary site are now behind the volumes in the recovery site. Furthermore the updates to the volumes in the recovery site have not been accumulated in cylinder bit map.

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(d) Terminate Applications and HRC Settings at the Recovery Site (Step 4~6)

HRC settings with the reverse direction must be deleted after halting the applications in the recovery site (step 4) and confirming that all HRC volume pairs are in “duplex” state (step 5).

Specified “Delete Pair by Force” option and “Delete All Pairs” option the all volume pairs in the same RCU should be deleted.

If you want to use same remote copy connections for step 7, the serial interface ports which have been set to the RCP mode should be changed to the LCP mode by the Port operation.

(e) Establish HRC Pair with the Original Direction and Start Applications (Step 7)

The HRC volume pair should be established with the original direction to synchronize the original M-VOLs with the original R-VOLs. The procedures for this step are same as those described in “3.13.4(1) Setting Up HRC Volume Pairs”.

Do not select “only out-of-sync cylinders” or “none” parameter to the Add Pair operations. The volumes in the original primary site are now behind the volumes in the recovery site. Furthermore the updates to the volumes in the recovery site have not been accumulated in cylinder bit map.

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3.13.6 Data Migration Procedure by HODM

(1) Data Migration Scenario

There are two possible data migration scenarios, **volumes by volumes** data migration and **subsystem to subsystem** data migration.

(a) Volumes by Volumes Data Migration

As shown in Fig. 3.13.6-1, only selected volumes are migrated by HODM at once. Other volumes in the existing disk subsystem should be accessed through the existing channel paths. After completing the migration copy for the selected volumes, another selected volumes can start being migrated.

The typical migration procedures are as follows:

① Define the volumes in DKC310I subsystem for the different volumes from the existing volumes in the I/O generations.
② Establish the remote copy connections between the existing disk subsystem and DKC310I subsystem
③ Connect the DKC310I subsystem to the host processor with different channel paths. Leave all volumes in the DKC310I subsystem offline from the host processors.
④ Vary offline the selected volume in the existing subsystem, for example A80~A83.
⑤ Start HODM for the selected volumes, for example device 00~03.
⑥ Vary online the corresponding volumes in DKC310I subsystem, for example C00~C03.
⑦ After completing HODM for device 00~03, continue procedures ④ to ⑥ for another volume group, for example A84~A87 and C04~C07.

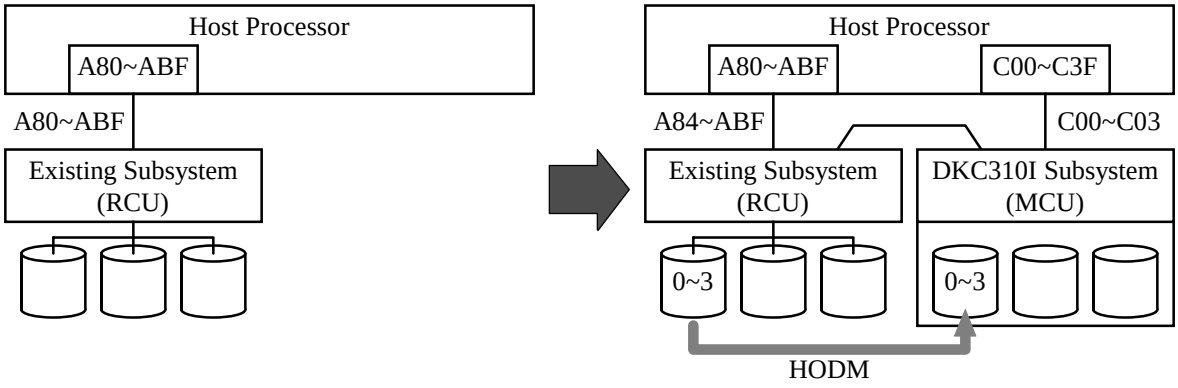

Fig. 3.13.6-1 Volumes by Volumes Data Migration

In this scenario, the I/O generations for the volumes in the DKC310I subsystem and the repeated operations for each volume group must be permitted. The performance degradation, instead, may be lower than the subsystem to subsystem migration scenario. Additionally, if the data migration failed, the existing volumes, A80~A83 for example, could return to be accessible in the short recovery time.

To perform this scenario, the restrictions described in (note) should be especially considered.

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(note)

HODM can migrate data between volumes of which device address are different. However HODM does not translate their device addresses for the I/O operations from the host processors.

Fig. 3.13.6-2 shows an example where device 05 are being migrated to device 00 by HODM and device 05 in the DKC310I subsystem does not belong to any HODM volume pair. Responding to read I/O operations directed to device 00, the DKC310I subsystem provides the data which have been stored in device 05 in another disk subsystem. It also provides the data from device 05 in the DKC310I subsystem for I/O operations directed to device 05.

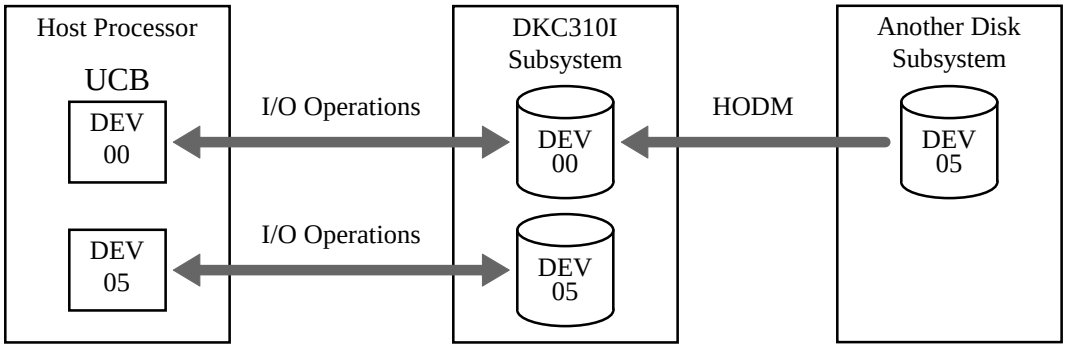

Fig. 3.13.6-2 HODM between Deferent Device Addresses

Customers' JCLs, catalogues and application programs should be modified if they depend on device address and HODM between different device addresses must be configured.

(b) Subsystem to Subsystem Data Migration

As shown in Fig. 3.13.6-3, all volumes in the existing disk subsystem are migrated at once.

The typical migration procedures are as follows:

① Vary offline all volume in the existing disk subsystem, A80~ABF for example.
② Disconnect the existing disk subsystem from the host processor.
③ Establish the remote copy connections between the existing disk subsystem and DKC310I subsystem.
④ Connect the DKC310I subsystem to the host processor with the same channel paths.
⑤ Start HODM for the all volumes, for example device 00~3F.
⑥ Vary online all volumes in DKC310I subsystem, for example A80~ABF.

In this scenario, the additional I/O generation may not be needed, except for restrictions described in (note). And the operating procedures are simple. However the performance during HODM could become worse than volume by volume data migration. And the error recovery procedures would be relatively complex.

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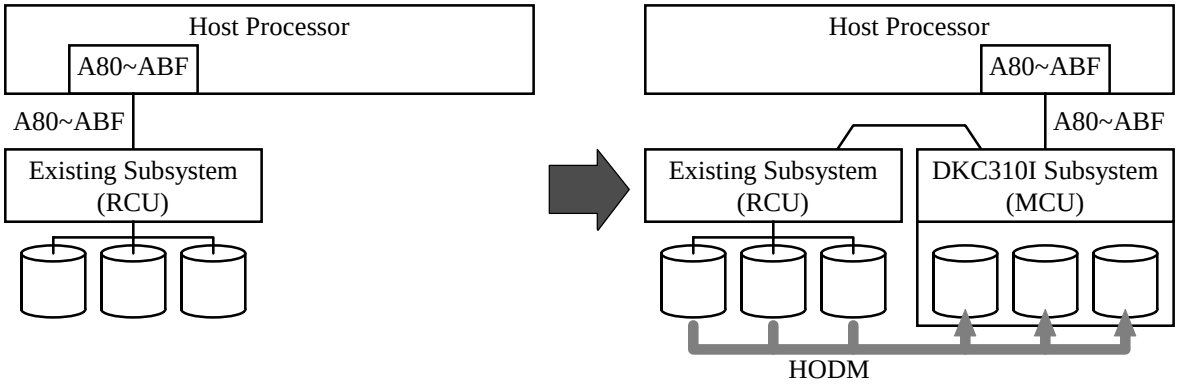

Fig. 3.13.6-3 Subsystem to Subsystem Data Migration

(note)

HODM does not emulate the device/control unit characteristics of the R-VOL/RCU. Responding to I/O operations from host processors, the DKC310I subsystems always provides device model, device serial number, control unit model, control unit serial number, subsystem ID and other device/control unit characteristics of the M-VOL/MCU itself.

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(2) Ordinary HODM Procedures

(a) Sequence of Operations

Ordinary sequence of operations is shown below.

Table 3.13.6-1 HODM Sequence of Operations

Procedure		Operation	
		SVP*	Others
1	Set appropriate serial interface port to the RCP mode.	Port	
2	Establish logical paths to the existing disk subsystem.	Add RCU	Before this procedure, DKC310I subsystem and the existing disk subsystem must be physically connected.
3	Ensure that the M-VOLs and the R-VOLs are offline from host processors		If necessary, perform the following system command. <In case of MVS system> • VARY OFFLINE <In case of VM system> • VARY OFFLINE from guest OS • VARY PATH OFFLINE from VM
4	Establish HODM volume pairs.	Add Pair	
5	Bring the M-VOLs online.		VARY ONLINE system command, If necessary.
6	Start the customer's application.		
7	Confirm that the migration copy has been successfully completed.	Pair Status	
8	Start erasing the R-VOLs, if required.	R-VOL Erase	
9	Confirm that the erasing the R-VOLs has been successfully completed. Status of the HODM volume pair will be changed to "simplex" state when the R-VOL erasing is completed.	Pair Status	
10	Remove logical paths to the existing disk subsystem.	Delete RCU	The existing disk subsystem can be physically removed after this procedure.

* : Operated from the SVP/remote console

For the volumes by volumes data migration scenario, procedure #3 to #9 should be performed for only the selected volumes.

For the subsystem to subsystem data migration scenario, procedure #3 to #9 should be performed for all volumes in the existing disk subsystem.

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(b) Device Online/Offline from Host Processors

Be sure to keep the following sequence of procedures to ensure data consistency of the HODM volume pair:

- The R-VOLs must be varied offline *before* the Add Pair operation. If the R-VOLs are still online and write I/Os are issued to R-VOLs, the updated data may not copied to the M-VOLs.
- The corresponding M-VOLs must be brought online *after* the Add Pair operation has successfully completed. For the I/O operations to the M-VOLs before starting the migration copy, the old data on the M-VOLs may be read or the updated data may be overlaid by the migration copy.

To check the second requirement described above, the Add Pair operation is be rejected if the specified M-VOL belongs to any path group.

(c) Confirming HODM Volume Status

By the Pair Status operation, the MCU can display the status of the specified volume pair.

- If the migration copy has been successfully started, the status of the M-VOL will turn to "Pending Duplex" state.
- If the migration copy has been successfully completed, the status of the M-VOL will turn to "simplex (migration complete)" state.
- If the erasing the R-VOL has been successfully started, the status of the M-VOL will turn to "simplex (erasing in progress)" state.
- If the erasing the R-VOL has been successfully terminated, the status of the M-VOL will turn to "simplex" state (without sub-status).

Refer to "3.13.2(5) HODM Volume Status" for more detailed description.

(d) Controlling Migration Copy Activities

Concerning to the I/O performance during HODM, following factors must be considered:

- Copy activities use the subsystem performance resources
- The restore copy and the update copy make I/O response time of the M-VOL longer

Note: Refer to "3.13.2(3) HODM Copy Activities" for the "restore copy" and the "update copy".

To control these factors, the "maximum initial copy activities" parameter and "priority" parameter can be specified. The first parameter controls the number of volumes for which the migration copy are concurrently executed. The second parameter specifies the executing order of the migration copy on volume pair basis.

Refer to the following example and "3.13.3(1) Add RCU Operation" and "3.13.3(6) Add Pair Operation" for detailed description about these parameters.

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Example
Conditions:
- The Add Pair operation specifies HODM to M-VOLs 00~05.
- "Maximum initial copy activities" is set to "4" (this is the default value).
- "Priority" parameters for devices 00~05 are set to "3", "5", "5", "1", "4", and "2" respectively.

Under the above conditions, the MCU will performs the migration copy:
- for devices 00, 03, 04 and 05 immediately.
- for device 01 when one of the migration copy has been terminated.
- for device 02 when the migration copy for the second device has been terminated.

To the R-VOL erasing operations, "maximum initial copy activities" and "priority" parameters are not applied.

(3) Canceling and Restarting HODM

1) Canceling HODM

The Suspend Pair operation and the Delete Pair operation can terminate the migration copy the R-VOL erasing for the specified volume. The deference between "suspend" and "delete" is:

- When the HODM volume pair is suspended, before the migration copy being complete the MCU still executes the restore copy and/or the update copy responding to I/O operations to the M-VOL.
- When the HODM volume pair is deleted, the MCU reads/write the data only on the M-VOL (even through it is not fully identical to the R-VOL)

Therefore, if you want to "delete" the HODM volume pair *before* completing the migration copy;
- The I/O operations to the M-VOL *must be previously quiesced*, for example, by VARY OFFLINE command.
- The M-VOL will *never be reused* by the applications until another migration copy to the M-VOL will successfully complete or the M-VOL will be completely initialized.

To check the first requirement described above, the Delete Pair operation without "unconditional" option is rejected if the M-VOL is not in "simplex (migration complete)" status and the M-VOL belongs to any path group.

Note: The Delete Pair operation with "unconditional" option will be accepted regardless of status and path group of the M-VOL.

HODM keeps the data consistency on R-VOL until the migration copy will complete. So the R-VOL can be used to resume the quiesced applications.

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2) Restarting HODM

All of the updates to the M-VOL are copied to the R-VOL while the HODM volume pair is in "pending" or "suspended" status. Therefor, the Resume Pair operation can resume the migration copy for the "suspended" HODM volume pair. Only cylinders which have not copied yet will be copied by the resumed migration copy. In this case, the M-VOL need not to be varied offline from host processors before restarting HODM.

Note that the updates to the M-VOL are not copied to R-VOL once the migration copy is completed or canceled by the Delete Pair operation. Therefore *never* restart HODM for the volumes if;

- the migration copy have been successfully completed or canceled by the Delete Pair operation and;
- some updates have been issued to the M-VOL after completion of the migration copy or deleting the HODM volume pair.

You should confirm the volume status at the time of deleting the HODM volume pair to prevent this problem from occurring.

The R-VOL Erase operation can restart the R-VOL erasing which has been terminated due to the Suspend Pair operation, MCU being powered off or erasing failure.

(4) HODM Error Recovery Procedures

(a) Actions of MCU for Unrecoverable Failures

When the MCU detects an error conditions on copy activity, it retries the failed copy activity. If the failure can not be recovered in the specific time of retries, the MCU executes the following actions:

- Turns the status of the M-VOL to "suspended" state.
- Stops the migration copy for this volume pair.
- Generates the service information message (SIM) which indicates that the HODM volume pair has been suspended. This SIM will be reported to the host processor when the next I/O operation will issue to the M-VOL.
- Generates the internal sense information. The SVP of the MCU will store the sense information into SSB LOG file. The sense information may include the 32 bytes of sense data which have been reported from the RCU.
- Reports unit-check to the host processor channel if the failure have been occurred on the restore copy or the update copy activity. The sense data to the host processor indicates an "equipment check".

The MCU will still try to execute the restore copy and the update copy when the subsequent I/O operations require to do them. If the restore copy and the update copy can be successfully completed, the I/O operations will continue. If the restore copy or the update copy encounters the failure, an equipment check will be reported again.

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(b) Error Recovery Procedures

Error recovery procedures are shown bellow:

① Quiesce customer's applications to access the failed volumes.
② Delete the failed HODM volume pair by the Delete Pair operation
③ Decide the failed portion by referring the sense information generated by the MCU.
④ Recover the failed portion according to the related sense information
⑤ Restart HODM volume pair
⑥ Resume the quiesced applications

Basically, the procedure ④ is similar to that which is currently performed for non-HODM disk subsystem except that the failed portion may be included in the existing disk subsystem. If the 32 bytes of sense data from the existing disk subsystem has been logged in the MCU, analyzing the sense data should be analyzed at procedure ③.

Be sure that procedure ⑤ will be performed only for the volumes for which the migration copy have been is progress. Refer to "3.13.6(3) Canceling and Restarting HODM" for restarting procedure and its cautions.

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3.13.7 Guard Concept for Maintenance Operation in HRC/HODM

(1) In this maintenance manual.....
SVP requires Password input for each setting operation. In each paragraph of this maintenance manual, we does not describe the password operation. If SVP requires to input password, please call TSC what the password is.

(2) Basic concept for password.
HRC / HODM applications which are installed in the SVP have guard process especially if the operator selects a button to execute HRC/HODM setting (Edit path, Add Pair, Delete Pair..). SVP requires the password input. These operations must be concerned with the direct access to customer data. So it is very dangerous operation for the system so that SVP needs guard operation.

(3) summary table
We arranged these concept as the following table.

#	Button (Function)	Operation which needs a password input
1	Add RCU	Y
2	Edit Path	Y
3	Delete RCU	Y
4	RCU Option	Y
5	RCU Status	N
6	Add Pair	Y
7	Delete Pair	Y
8	Pair Option	Y
9	Pair Status	N
10	Suspend Pair	Y
11	R-Vol Erase	Y
12	User	— (*1)
13	Usage	N
14	Connect	— (*1)
15	Port	* (*2)
16	Renew	N
17	Exit	N
	Explanatory notes	Y : It's necessary to input password. The all password are fixed N : Not necessary to input password * : It's necessary to input password when the operator uses some setting function. — : It is not supported(Displayed as gray color),

(*1) "User" and "Connect" functions are supported in the remote console application only. In the SVP, these button is displayed as gray to guard.
(*2) SVP does not require the password input at the first button selection. If the user selects port changing function (LCP-RCP), SVP requires the password input.

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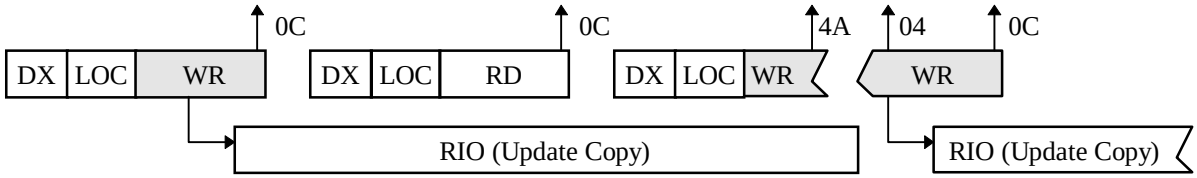
3.13.8 Outline & Specification of SemiSynchronous HRC

On the HRC Update copy operation accompanied HOST I/O, former operation which the Remote I/O is executed during CHL END & DEV END split to the HOST is called Synchronous Copy Mode. (Sync Copy). HRC supports new operation called SemiSynchronous Copy Mode. (SemiSync Copy)

(1) Write operation of SemiSynchronous HRC

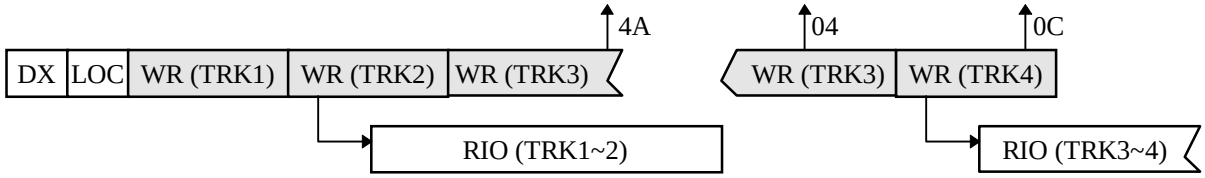
(a) Basic Operation of SemiSync Copy

- At final Write command in the Locate Domain, MCU reports DSB=0C (CHL END & DEV END) instead of DSB=08 (CHL END), then MCU issues Remote I/O.
- MCU accepts and performs subsequent I/O except WRT command, even if the preceding Remote I/O is still proceeding and has not completed yet. (In case of Read I/O to the same Track, MCU waits until the Slot is free. ; Slot Busy.)
- When MCU accepts the WRT I/O to the Device, if the preceding Remote I/O has not completed yet, the Write I/O waits by CMD Retry until the Remote I/O will be complete.



(b) Exception

Even if the HRC pair is specified SemiSync Copy mode, microprogram behave the I/O as Sync Copy mode in case that MCU issues Remote I/O during DSB=4A Retry.



(c) The order of Update Copy Schedule

Remote I/O of SemiSync Update Copy is arbitrary performed according to MCU internal algorithm. That is, Update Copy to R-VOL is issued by independent timing of the order of Write I/O to each devices.

(d) The opportunity of reporting SSB detected by Remote I/O operation

If Remote I/O of SemiSync Update Copy detects and creates some error SSB, MCU reports the SSB as asynchronous SSB at the first connection to the HOST. (At the timing of Req-Con and CHL initiate I/O.)

1) In case that MCU reports the Unit CHK at the Req-Con, the SSB which is created in Remote I/O attributed to preceding Write I/O may be reports during new CCW CHN.

2) CCHH in the SSB shows the CYL/HD# on which Update Copy is executing, it is not relating to the CYL/HD# executing HOST command.

Note; All of SSB created by Remote I/O are EQC, therefore above 1), 2) do not affect the OS Recovery procedure.

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(2) Sync/SemiSync mode setting and display

(a) Definition

- The mode permit above Update Copy operation is defined as SemiSync mode. The mode restricts only Sync Update Copy is defined as Sync mode. (prior HRC)
- The both mode is defined as attribute of HRC pair, it is possible to set to each HRC pair independently.
- It allows to intermixing the Sync and SemiSync mode pair in one of MCU/RCU relation.

(b) Setting of the mode (Sync/SemiSync) ; Refer to “SVP SECTION 4.7 Add Pair... screen”.

1) Add Pair operation
   Add Pair parameter ;
   M-VOL(LDEV#), R-VOL(LDEV#), priority, RCU(Serial#, SSID), Initial Copy ={Entire Volume/None}, Update Copy={Synchronous Mode/Semi-Synchronous Mode}
   Note; The default is Sync. mode.
2) Mode Change
   It is only allowed in case of Resume Pair. If operator would like to change the mode, it is necessary to suspend the pair.
3) PPRC command
   In case of ESTPAIR from host, Sync. mode is set on as default.

(c) Display of the Pair Status

1) SVP Display
   Refer to “SVP SECTION 4.1.1 HRC Main screen”. On HRC & HODM Main Control Screen, the mode is displayed at column “Type”, “RDC0[x]” means Sync mode, and “RDC1[x]” means SemiSync mode.
2) PPRC command
   Display of CQUERY is same as current specification. Sync/SemiSync is not displayed.

(d) Others

1) In case of SemiSync, other parameter and pair option (Initial Copy, Initial Copy Pace, M-VOL Fence Level, CFW Data, DFW to R-VOL) are possible to set independently, and they function as same as Sync Mode.
2) DELPAIR and SUSPEND from both of SVP and PPRC command are treated as same as current specification.

(e) Usage

The count of command retry due to waiting SemiSync Update Copy completion is newly added to Usage screen.

(3) HRC SIM

MCU distinguishes to report the Reference Code of HRC Pair SIM from Sync and SemiSync.

REF CODE= D4xx ; Sync Mode
REF CODE= DCxx ; SemiSync Mode

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(4) Application

(a) Pair Status

SemiSync Copy operation is available only Duplex Avail status. That is, even if SemiSync mode is specified at Add Pair operation, Update Copy is performed as synchronous during Pending Duplex.

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3.14 HMRCF & HOMRCF

3.14.1 HMRCF

3.14.1.1 Overview

(1) Main object
1) Reduce Backup time.
2) Easy testing with the data which applications are actually using before system upgrade.

(2) Function Outline
1) Making a duplicated volume.
2) There is no conflict on volume, because the duplicated volume is on another physical storage.
3) Three destination volumes can be with one master volume.
Those three pairs can split independently each other.
4) HMRCF (Hitachi Multiple RAID Coupling Feature) can be controlled by PPRC Command interface.

Table 3.14.1.1 Outline of HMRCF

No.	Items	Specification
1	Coupling object	One logical volume (LDEV)
2	Support emulation type of LDEV	3390-1/2/3/3R/9, 3380-J/G/K, NF80-K
3	Requirement for create a pair	(1) Pair LDEVs have to be a same track format and same capacity. (2) Pair LDEVs have to exist in a same subsystem. (3) It is not possible to share a destination volume at same time.
4	Support of CVS(Customized Volume Size)	Supported
5	Combination of RAID level between master volume and destination volume	RAID1←→RAID1 RAID5(3D+1P)←→RAID5(3D+1P) RAID5(6D+1P)←→RAID5(6D+1P) RAID5(3D+1P)←→RAID5(6D+1P) RAID5(3D+1P)←→RAID1 RAID5(6D+1P)←→RAID1
6	Data protection	There is a parity protection for both master volume and destination volume.
7	RESYNC pattern	From Master Volume data to destination volume
8	Time for transition from Duplex to Split.	3 min./VOL(3390-3) without IO (Depend on the number of pairs and the load of DKC)
9	When the destination volume can be accessed from HOST.	The destination volume can be accessed at only Split status.

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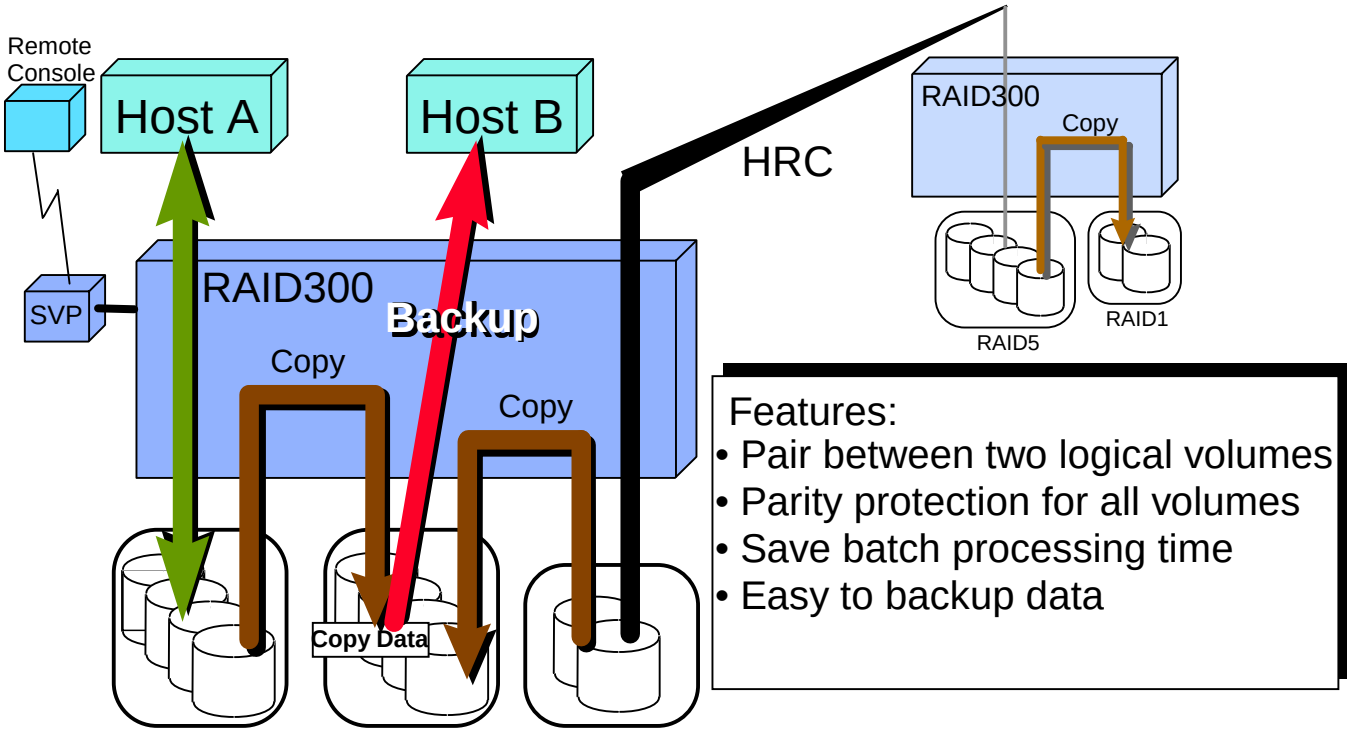
10	Cooperation with HRC/XRC	HMRCF : Supported The master volume of HMRCF can be a M-VOL or R-VOL of HRC.
11	Cooperation with HODM	It is not supported.

⚠ CAUTION

Copy process is done asynchronously with HOST i/o according to differential bit map.
Differential bit map is recorded on shared memory. So if shared memory is lost by offline micro exchange or volatile PSon etc., DKC lost differential bit map.
In these cases DKC treat as whole volume area has differential data, so copy process will take longer time than usual. And if the pair is SPLIT-PEND status, the pair become SUSPEND status because lost of differential bit map.



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3.14.1.2 Construction of HMRCF

- HMRCF can be controlled from SVP, Remote Console and HOST.
- DKA with LA exchange have to be exist in the subsystem.

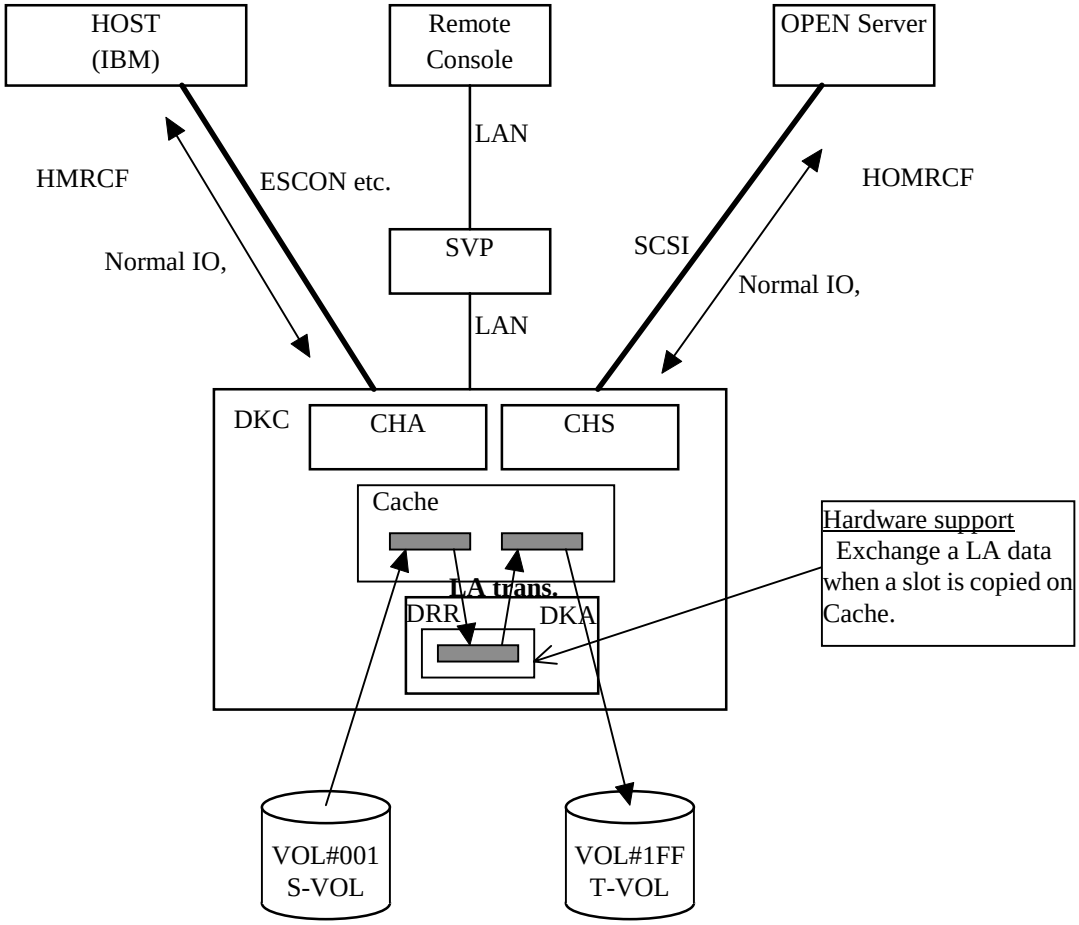

Fig. 3.14.1.2 Construction of HMRCF

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3.14.1.3 Status transition

Table 3.14.1.3 Status of HMRCF

No.	Status	Definition
1	Simplex	There is no pair with the volume.
2	Pending	At this status, there is a job to copy the data from the master volume to the destination volume.
3	Duplex	The copy from master to destination is finished. The destination volume can not be accessed from HOST.
4	Split Pending	At this status, there is a job to copy the differential data from the master volume.
5	Split	The pair is splited. The destination volume can be accessed from HOST. At this status, the position of write data from the HOST is recorded on a bitmap to reduce the copy time on RESYNC.
6	Resync	There is a job to copy the differential data from master to destination.
7	Suspend	(1) There is an error with the pair. (2) After a running copy job was stopped by operation of SVP, the pair status is “suspend”.

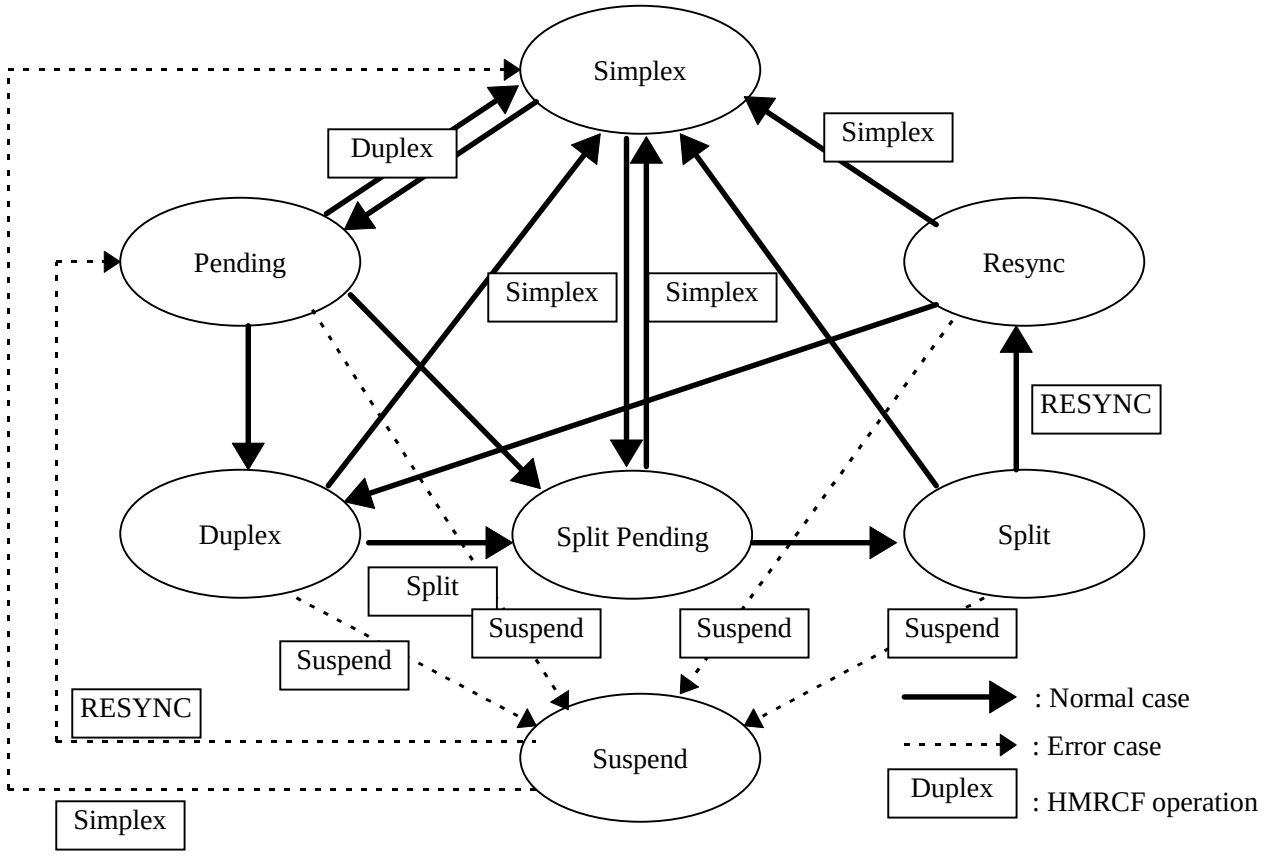

Fig. 3.14.1.3 Status transition map

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3.14.1.4 Interface

(1) Outline

HMRCF support a command set to control HMRCF functions.
This command set is a common interface in a subsystem. So the command from different HOST is translated to HMRCF command at each command process.

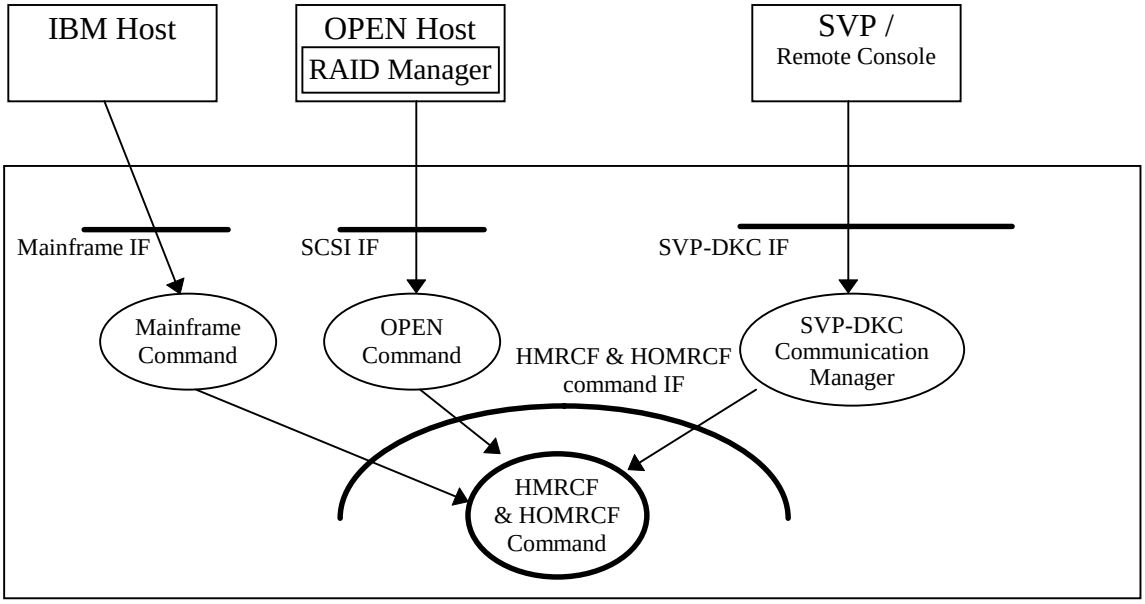

Fig. 3.14.1.4 Outline of HMRCF IF

(2) HMRCF operation

Table 3.14.1.4 HMRCF operation

No.	Command	Operation
1	Duplex	Create a pair and start initial copy
2	Split	Split the pair
3	RESYNC	Resume the pair and start differential copy
4	Simple	Delete the pair
5	Suspend	Suspend the pair action
6	Status Check	Requirement for status information
7	Reserve	Marking and Unmarking the volume for a candidate of destination volume

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3.14.1.5 Reverse-RESYNC

(1) Reverse-RESYNC Function

The Reverse-RESYNC function is an extension of the RESYNC function of the MRCF.

When a pair in the Split status is requested to perform the Reverse-RESYNC, the differential data between the target volume and the source volume is copied to the source volume from the target volume.

When a pair in the Suspend status is requested to perform the Reverse-RESYNC, the whole data of the target volume is copied to the source volume.

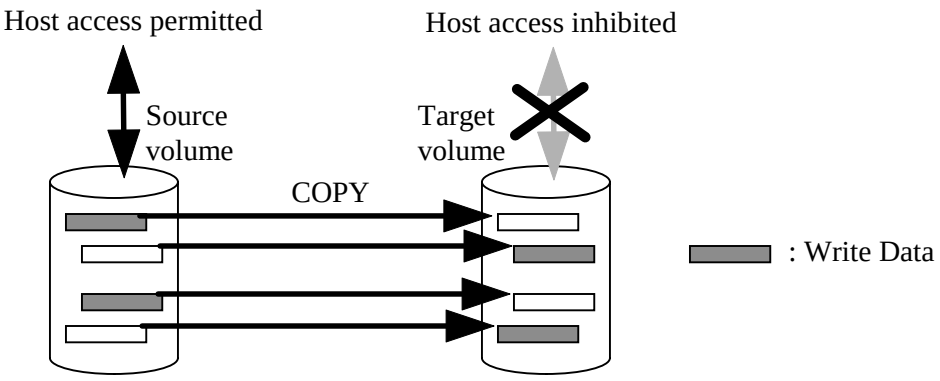

Fig. 3.14.1.5-1 Normal RESYNC Process

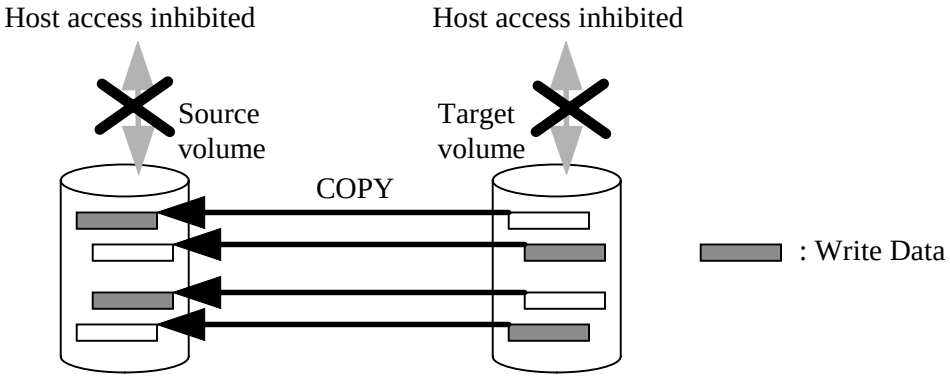

Fig. 3.14.1.5-2 Reverse RESYNC Process

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(2) Specifications

No.	Item	Description
1	RESYNC copy pattern	• The data of the target volume is copied to the source volume. • The copy pattern can be selected by specifying a unit of operation. Specified operation unit : SVP/RMC: In units of pair operation at a time
2	Copy range	• In the case of the Reverse-Copy in the Split status, range for merging writing into the regular and target volumes • In the case of the Reverse-Copy in the Suspend status, whole volume
3	Copy format	• Same format as that of a copy in the Duplex status
4	Applicable LDEV type	• 3390-1, 2, 3, 3R, and 9, 3380-J, G, and K, and CVSs of them
5	Host access during copying	• Source volume: Reading and writing disabled • Target volume: Reading and writing disabled
6	Specification method	• SVP/RMC: Add a specification for the RESYNC pattern onto the Pair Resync screen.
7	Conditions of command reception	• The pair concerned is in the Split or Suspend status. • Another pair sharing the source volume is in the Suspend or Split status. → If this condition is not satisfied, the CMD RJT takes place. • When the Reverse-Resync is being executed by another pair which is sharing the source volume, it is impossible to change the pair status of the pair concerned. (However, the pair deletion and pair suspension requests are excluded.) • The source volume of the pair concerned has no pair of the HRC or in the Suspend status. (See Item No.13 in this table.)
8	Status display during copying	• SVP/remote console Pair status display: RESYNC-R (RESYNC is currently displayed.) The display of the attribute, source or target, is not changed.
9	Condition after the copying terminates normally	• The pair concerned enters the Duplex status. • The conditions of the host access after the status transition are shown below. Source volume: Reading and writing enabled Target volume: Reading and writing disabled

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10	Effects on another pair	In another pair sharing the source volume, the part actually copied becomes the difference after execution of this function. Example: Pair of the other target volumes in the 1:3 configuration
11	Operation when the copying terminates abnormally	(1) The pair concerned enters the Suspend status. (2) The source volume of the pair concerned is enabled to read and write. → Data is not assured. The target volume of the pair concerned is disabled to read nor write in the case of the main frame volume and disabled to write in the case of the open volume. (3) The status of a pair sharing the source volume is not changed.
12	Operation when a suspension request is received during copying	Same as above
13	Relation to the HRC	• In the case where “M-volume of the HRC” = “Source volume of the MRCF” → The Reserve-Resync cannot be executed. (Command Reject) • In the case where “R-volume of the HRC” = “Source volume of the MRCF” → The Reserve-Resync cannot be executed. (Command Reject) • In the case where “Target volume of the MRCF” = “M-VOL of the HRC” → The Reserve-Resync cannot be executed. (Command Reject) • A pair of the HRC cannot be created with the volume of the MRCF executing the Reserve-Resync. (Command Reject)

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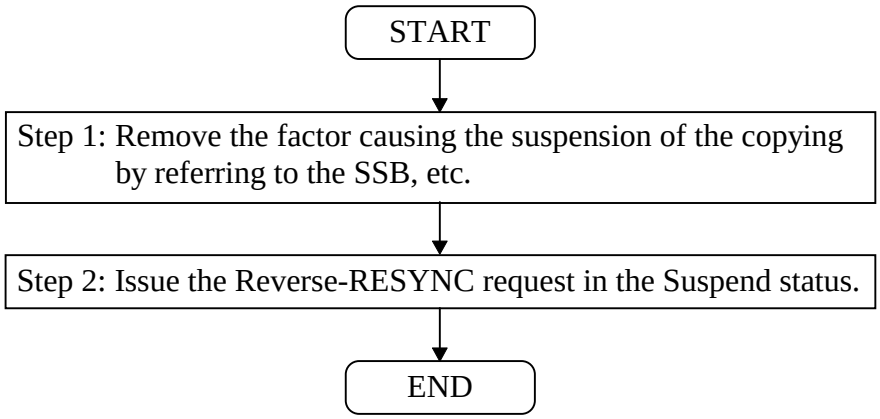
(3) Action to be taken when the pair is suspended during the Reverse-RESYNC
The recovery procedure to be used when the pair executing the Reverse-RESYNC is suspended owing to some problem or it explicitly placed the Suspend status by a command from the SVP/remote console is explained below.

(a) Case 1: A case where the Suspend status can be recovered without deleting the pair concerned
This is equivalent to a case where the pair encounter an event that copying cannot be continued owing to a detection of pinned data or a staging time- out.
Or, it is equivalent to a case where the pair explicitly placed in the Suspend status by a command.
<<Recovery procedure>>



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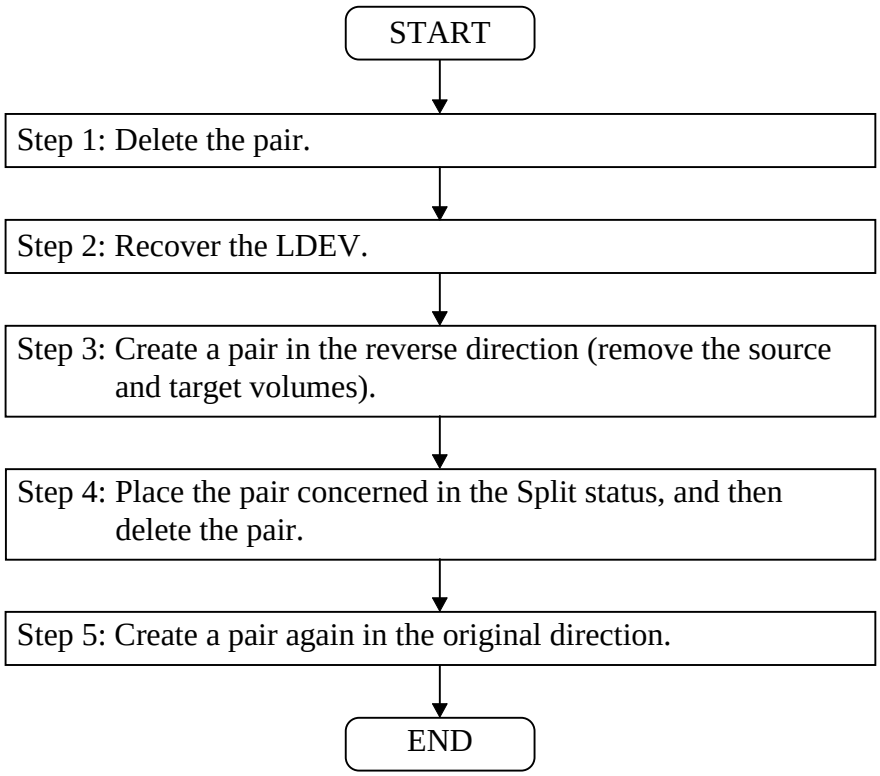
(b) Case 2: A case where the Suspend status cannot be recovered unless the pair concerned is deleted

This is equivalent to a case that the LDEV is blocked.
To recover the blockade of the LDEV, an LDEV formatting or LDEV recovery is required. Both of them cannot be executed in the state that the MRCF pair is created. (A guard works against it.) Therefore, delete the pair once, recover the LDEV, and then create the pair once again.
However, care should be taken because, in the pending state, the data of the source volume is copied to the target volume if simply create the pair again. Recover the blockade following the procedure below.

The following procedure is applicable just to a restoration of the source volume using the target volume. A procedure for directly restoring the source volume when the target volume is blocked is not included.

• Case 2-1: A case where the source volume is blocked
<<Recovery procedure>>



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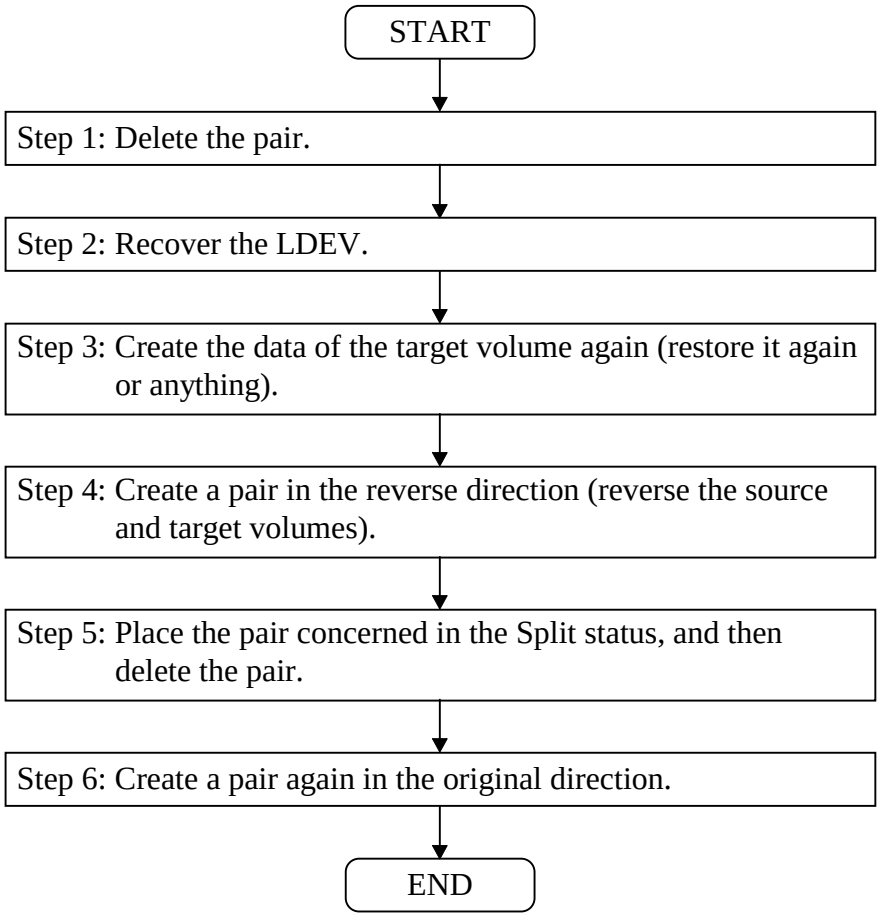
• Case 2-2: A case where the target volume is blocked

A recovery procedure for restoring data of the target volume is added because the copy source of the Reverse-RESYNC cannot be accessed.

<<Recovery procedure>>



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3.14.2 HOMRCF

3.14.2.1 Overview

(1) Main object
1) Reduce Backup time.
2) Easy testing with the data which applications are actually using before system upgrade.

(2) Function Outline
1) Making a duplicated volume.
2) There is no conflict on volume, because the duplicated volume is on another physical storage.
3) Three S-VOL can be with one P-VOL.
Those three pairs can split independently each other.
4) HOMRCF (Hitachi Open Multiple RAID Coupling Feature) can be controlled from RAID Manager.

Table 3.14.2.1 Outline of HOMRCF

No.	Items	Specification
1	Coupling object	One logical volume (LDEV)
2	Support emulation type of LDEV	OPEN-3/8/9/K and LUSE, NFOP-K
3	Requirement for create a pair	(1) Pair LDEVs have to be a same track format and same capacity. (2) Pair LDEVs have to exist in a same subsystem. (3) It is not possible to share a S-VOL at same time.
4	Support of CV(Customized Volume Size)	Supported
5	Combination of RAID level between master volume and destination volume	RAID1←→RAID1 RAID5(3D+1P)←→RAID5(3D+1P) RAID5(6D+1P)←→RAID5(6D+1P) RAID5(3D+1P)←→RAID5(6D+1P) RAID5(3D+1P)←→RAID1 RAID5(6D+1P)←→RAID1
6	Data protection	There is a parity protection for both P-VOL and S-VOL.
7	RESYNC pattern	From P-VOL data to S-VOL
8	Time for transition from Duplex to Split.	3 min./VOL(OPEN-3) without IO (Depend on the number of pairs and the load of DKC)
9	When the destination volume can be accessed from HOST.	The S-VOL can be accessed at only PSUS status.

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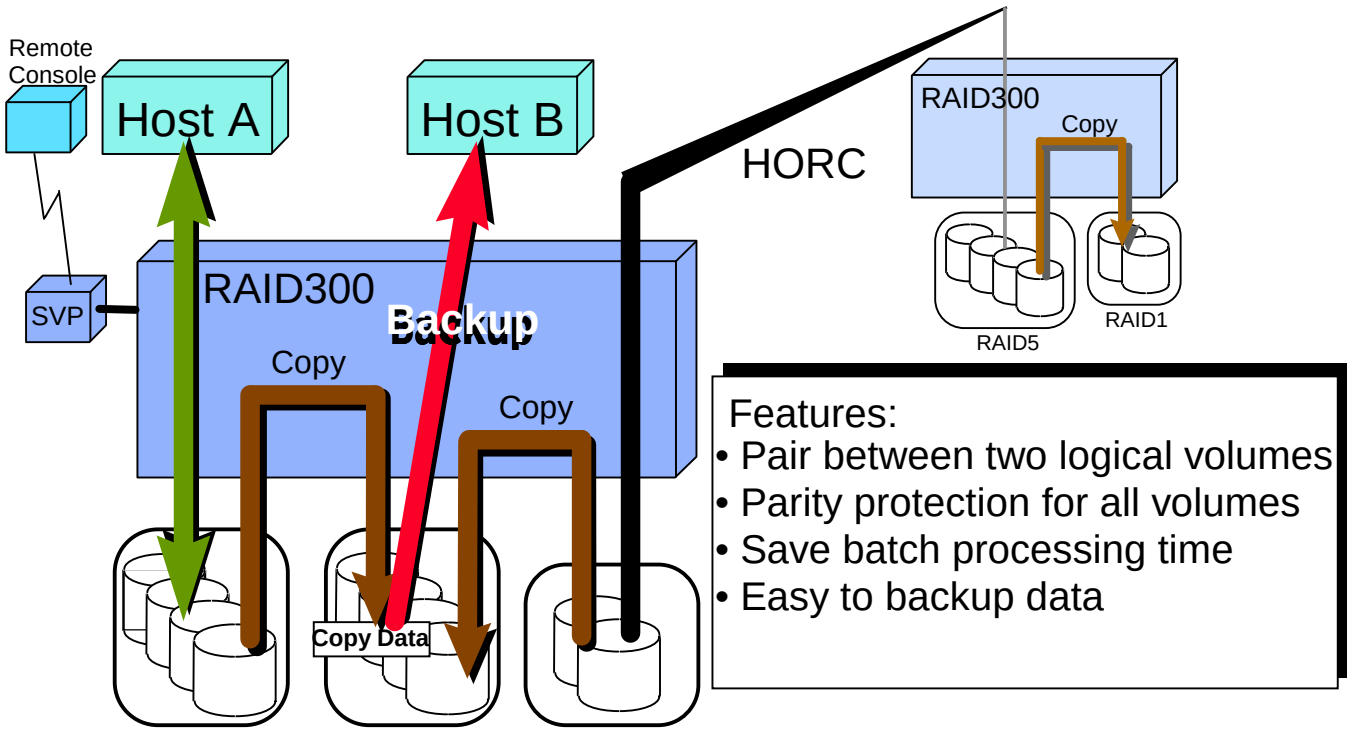
10	Cooperation with HORC	Supported The P-VOL of HOMRCF can be a P-VOL or S-VOL of HORC.
	Cooperation with HORC	Supported • The P-VOL or S-VOL of HORC can be a primary volume of HOMRCF. • The S-VOL of HOMRCF can be a P-VOL of HORC.
	Cooperation with HMBR	Supported • A P-VOL of HOMRCF can access from HOST like a usual volume. • A S-VOL of HOMRCF can not access from HOST if the pair is not PSUS status. In PSUS status, a S-VOL of HOMRCF can access from HOST like a usual volume.

⚠ CAUTION

Copy process is done asynchronously with HOST i/o according to differential bit map.
Differential bit map is recorded on shared memory. So if shared memory is lost by offline micro exchange or volatile PSon etc., DKC lost differential bit map.
In these cases DKC treat as whole volume area has differential data, so copy process will take longer time than usual. And if the pair is COPY(SP) status, the pair become PSUE status because lost of differential bit map.



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3.14.2.2 Construction of HOMRCF

- HOMRCF can be controlled from SVP, Remote Console and RAID Manager.
- DKA with LA exchange have to be exist in the subsystem.

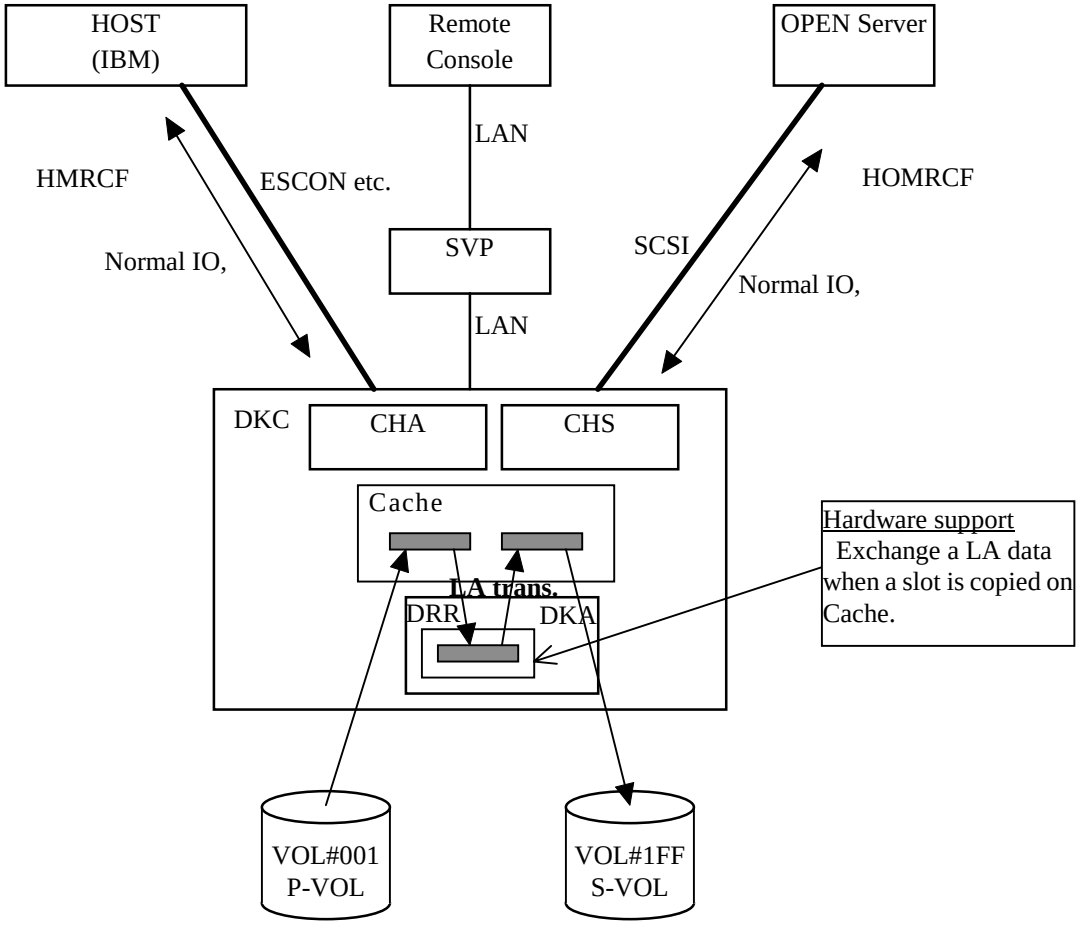

Fig. 3.14.2.2 Construction of HOMRCF

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3.14.2.3 Status transition

Table 3.14.3 Status of HOMRCF

No.	Status	Definition
1	SMPL	There is no pair with the volume.
2	COPY(PD)	At this status, there is a job to copy the data from the master volume to the destination volume.
3	PAIR	The copy from master to destination is finished. The destination volume can not be accessed from HOST.
4	COPY(SP)	At this status, there is a job to copy the differential data from the master volume.
5	PSUS	The pair is splited. The destination volume can be accessed from HOST. At this status, the position of write data from the HOST is recorded on a bitmap to reduce the copy time on RESYNC.
6	COPY(RS)	There is a job to copy the differential data from master to destination.
7	PSUE	(1) There is an error with the pair. (2) After a running copy job was stopped by operation of SVP, the pair status is “suspend”.

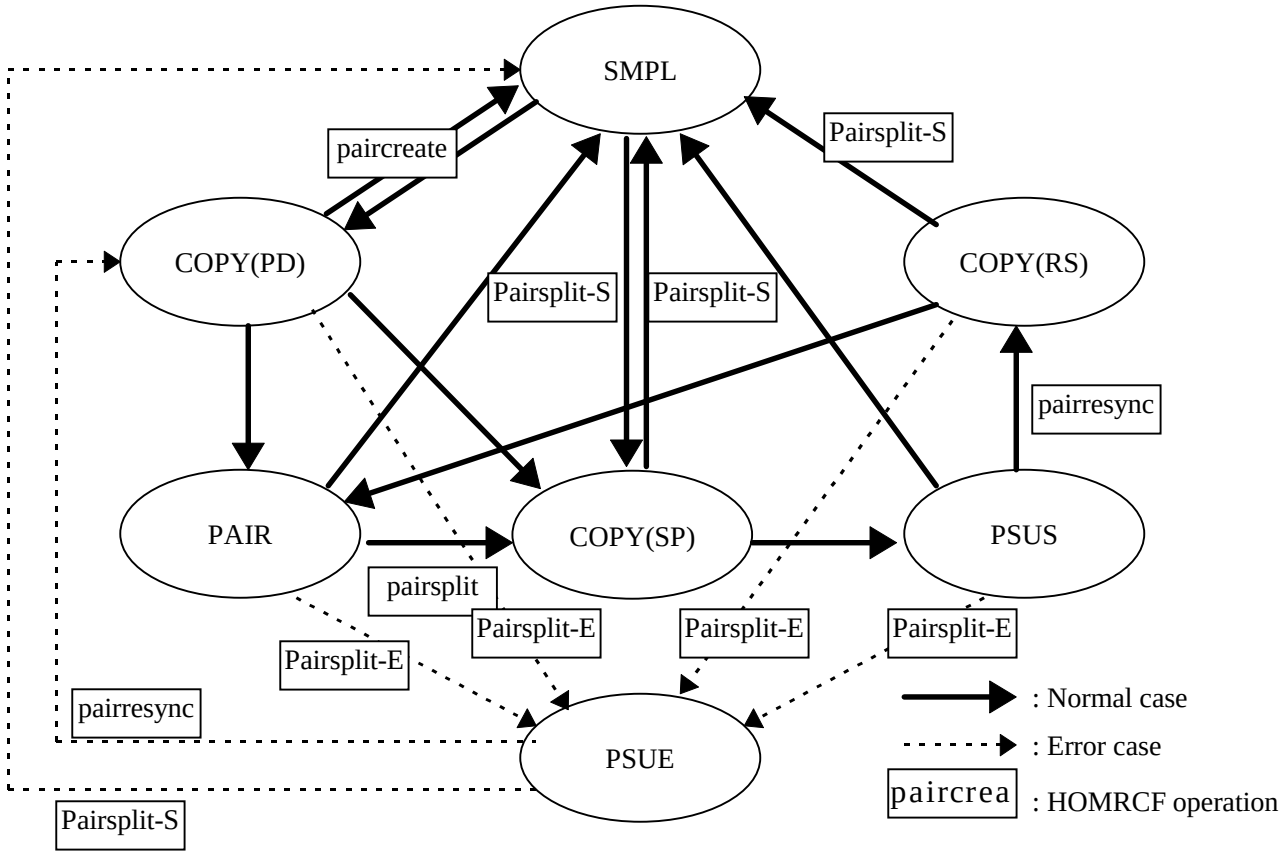

Fig. 3.14.2.3 Status transition map

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Blank Sheet

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3.14.2.4 Interface

(1) Outline

HOMRCF support a command set to control HOMRCF functions.
This command set is a common interface in a subsystem. So the command from different HOST is translated to HOMRCF command at each command process.

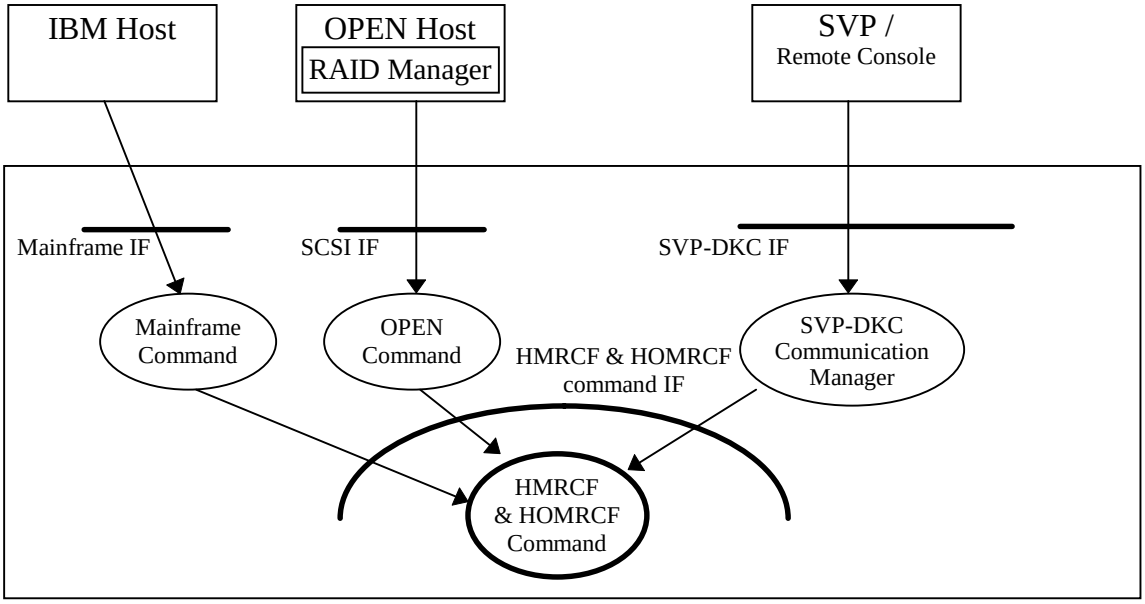

Fig. 3.14.2.4 Outline of HOMRCF IF

Notice
It is necessary to define Command Device before using RAID Manager on OPEN HOST.
(See INST05-599A)
Please do not define Command Device on heavy loaded path.

(2) HOMRCF operation

Table 3.14.2.4 HOMRCF operation

No.	Command	Operation
1	paircreate	Create a pair and start initial copy
2	pairsplit	Split the pair
3	pairresync	Resume the pair and start differential copy
4	pairsplit -S	Delete the pair
5	pairsplit -E	Suspend the pair action
6	pairdisplay	Requirement for status information
7	Reserve	Marking and Unmarking the volume for a candidate of destination volume

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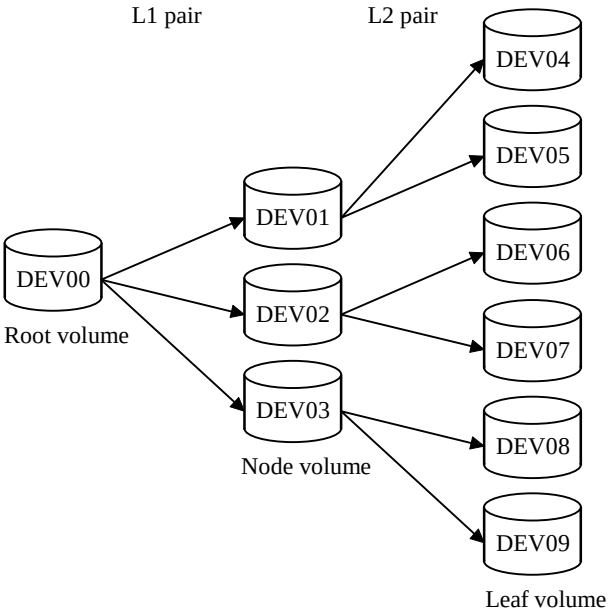
3.14.2.5 Cascade function

It is possible to make a pair with a existed Target volume as a new S-VOL by using Cascade function. See below figure.
This function is available for HOMRCF only.



No.	Content	Specification	Note
1	Pair structure	A S-VOL of L1 pair (=Node volume) can be a P-VOL of L2 pair.	
2	Number of copies	Root : Node = 1 : 3 Node : Leaf = 1 : 2 Root : (Node + Leaf) = 1 : 9	
3	Create pair condition	L2 pair have to be created after L1 pair.	The reverse is not true.
4	Split pair condition	L2 pair is able to execute pairsplit request only when the L1 pair is already PSUS status.	
5	Resync pair condition	• No conditions.	
6	Delete pair condition	• No conditions. • When L1 pair is deleted, then L2 pair become L1 pair.	
7	Combination with HORC	Possible But Node volume and Leaf volume are treated as a S-VOL.	

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- Name of volume type
  The P-VOL of first pair : Root Volume
  The S-VOL of first pair : Node Volume
  The P-VOL of 2nd pair : Node Volume
  The S-VOL of 2nd pair : Leaf Volume
- Name of pair
  - The first pair (A pair of root volume is P-VOL) : L1 pair
  - The second pair (A pair of node volume is P-VOL) : L2 pair
- Name of pair chain
  - a chain of L1 pair and L2 pair with a node volume: stream

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3.14.2.6 Reverse-RESYNC

(1) Reverse-RESYNC Function
The Reverse-RESYNC function is an extension of the RESYNC function of the HOMRCF.

When a pair in the Split status is requested to perform the Reverse-RESYNC, the differential data between the target volume and the source volume is copied to the source volume from the target volume.
When a pair in the Suspend status is requested to perform the Reverse-RESYNC, the whole data of the target volume is copied to the source volume.

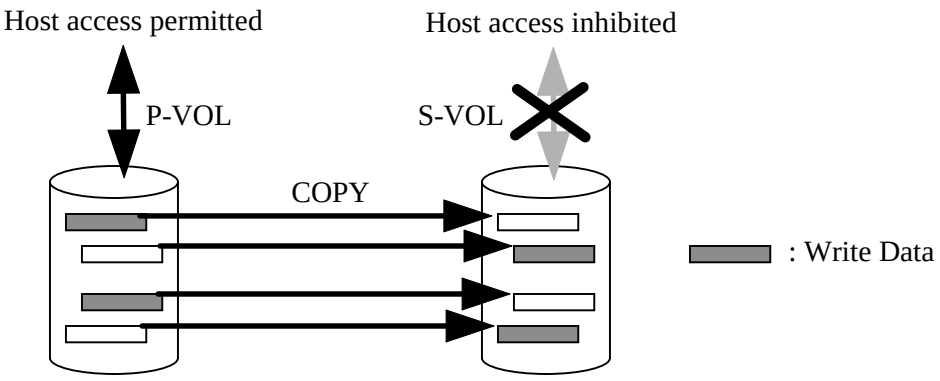

Fig. 3.14.2.6-1 Normal RESYNC Process

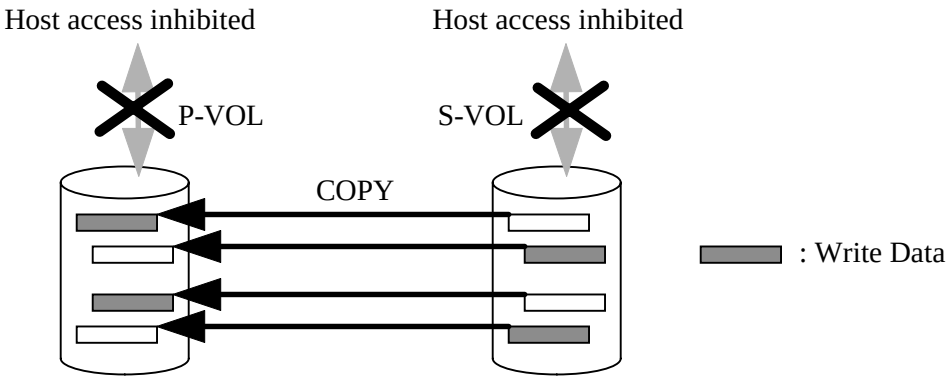

Fig. 3.14.2.6-2 Reverse RESYNC Process

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(2) Specifications

No.	Item	Description
1	RESYNC copy pattern	• The data of the S-VOL is copied to the P-VOL. • The copy pattern can be selected by specifying a unit of operation. Specified operation unit : SVP/RMC: In units of pair operation at a time RAID manager: In units of command
2	Copy range	• In the case of the Reverse-Copy in the PSUS status, range for merging writing into the regular and target volumes • In the case of the Reverse-Copy in the PSUE status, whole volume
3	Copy format	• Same format as that of a copy in the PAIR status
4	Applicable LDEV type	• Open-3, 8, 9, and K, and CVSs and LUSEs of them
5	Host access during copying	• P-VOL: Writing disabled S-VOL: Reading and writing disabled Note: The reason why the P-VOL is not disabled to read is to make the volume recognizable by the host and it does not mean that the data is assured.
6	Specification method	• SVP/RMC: Add a specification for the RESYNC pattern onto the pairresync screen.
7	Conditions of command reception	• The pair concerned is in the PSUS or PSUE status. • Another pair sharing the P-VOL is in the PSUE or PSUS status. → If this condition is not satisfied, the CMD RJT takes place. • When the Reverse-Resync is being executed by another pair which is sharing the P-VOL, it is impossible to change the pair status of the pair concerned. (However, the pair deletion and pair suspension requests are excluded.) • The P-VOL of the pair concerned has no pair of the HORC or in the PSUE status. (See Item No.14 in this table.)
8	Status display during copying	• SVP/remote console Pair status display: COPY(RS-R) The display of the attribute, P-VOL or S-VOL, is not changed. • RAID manager Pair status display: A new name (RCPY) is added. (COPY is currently displayed.) The display of the attribute, source or target, is not changed.
9	Condition after the copying terminates normally	• The pair concerned enters the PAIR status. • The conditions of the host access after the status transition are shown below. P-VOL: Reading and writing enabled S-VOL: Writing disabled

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10	Effects on another pair	In another pair sharing the P-VOL, the part actually copied becomes the difference after execution of this function. Example: Pair of the other target volumes in the 1:3 configuration
11	Operation when the copying terminates abnormally	(1) The pair concerned enters the PSUE status. (2) The P-VOL of the pair concerned is enabled to read and write. → Data is not assured. The S-VOL of the pair concerned is disabled to read nor write in the case of the main frame volume and disabled to write in the case of the open volume. (3) The status of a pair sharing the source volume is not changed.
12	Operation when a suspension request is received during copying	Same as above
13	Relation to the cascade function	• The Reverse-RESYNC cannot be executed for the L2 pair.
14	Relation to the HORC	• In the case where “P-VOL of the HORC” = “P-VOL of the MRCF” → The Reserve-Resync cannot be executed. (Command Reject) • In the case where “S-VOL of the HORC” = “P-VOL of the MRCF” → The Reserve-Resync cannot be executed. (Command Reject) • In the case where “S-VOL of the MRCF” = “P-VOL of the HORC” → The Reserve-Resync cannot be executed. (Command Reject) • A pair of the HORC cannot be created with the volume of the MRCF executing the Reserve-Resync. (Command Reject)

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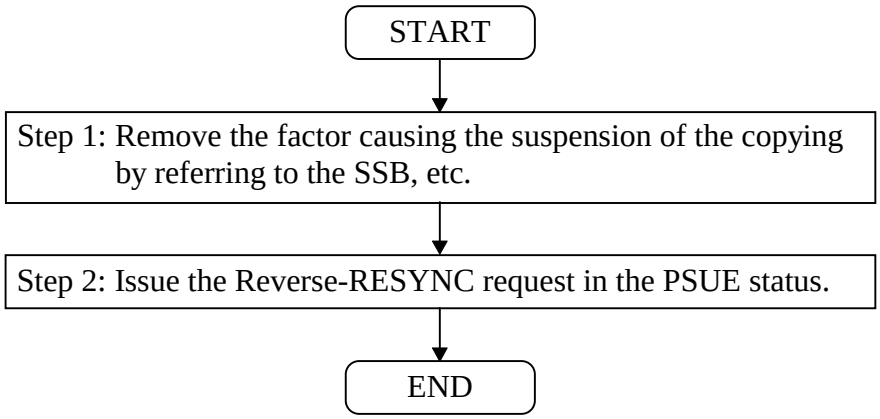
(3) Action to be taken when the pair is suspended during the Reverse-RESYNC
The recovery procedure to be used when the pair executing the Reverse-RESYNC is suspended owing to some problem or it explicitly placed the PSUE status by a command from the SVP/remote console/RAID manager is explained below.

(a) Case 1: A case where the PSUE status can be recovered without deleting the pair concerned
This is equivalent to a case where the pair encounter an event that copying cannot be continued owing to a detection of pinned data or a staging time- out.
Or, it is equivalent to a case where the pair explicitly placed in the Suspend status by a command.
<<Recovery procedure>>



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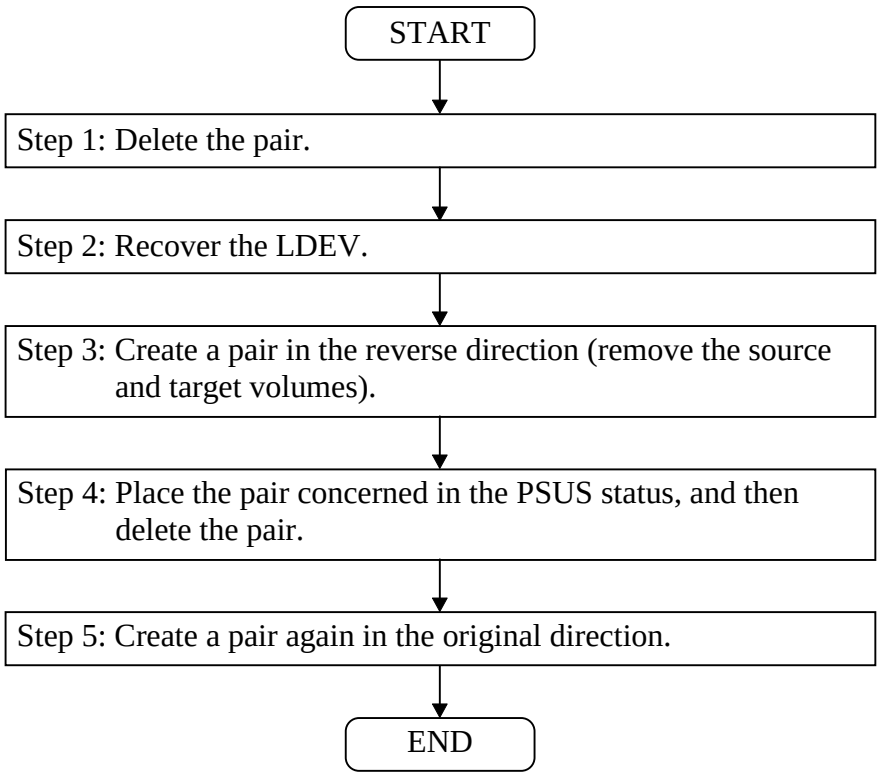
(b) Case 2: A case where the Suspend status cannot be recovered unless the pair concerned is deleted

This is equivalent to a case that the LDEV is blocked.
To recover the blockade of the LDEV, an LDEV formatting or LDEV recovery is required. Both of them cannot be executed in the state that the MRCF pair is created. (A guard works against it.) Therefore, delete the pair once, recover the LDEV, and then create the pair once again.
However, care should be taken because, in the COPY(PD) state, the data of the P-VOL is copied to the S-VOL if simply create the pair again. Recover the blockade following the procedure below.

The following procedure is applicable just to a restoration of the P-VOL using the S-VOL. A procedure for directly restoring the P-VOL when the S-VOL is blocked is not included.

• Case 2-1: A case where the source volume is blocked
<<Recovery procedure>>



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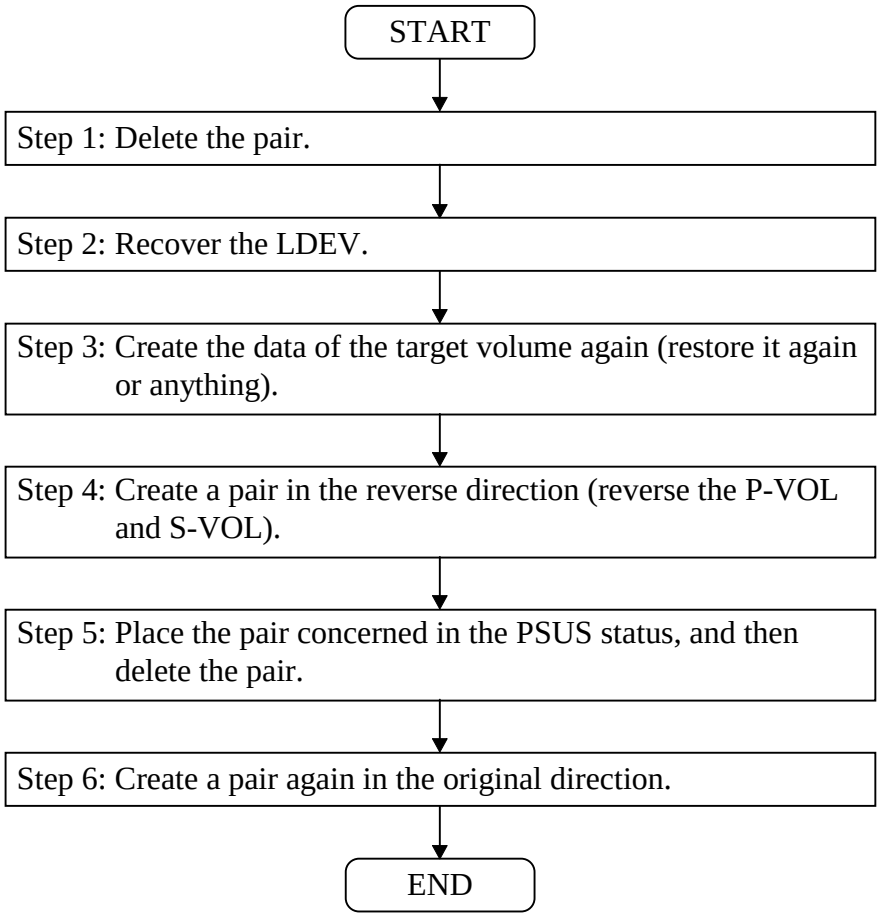
• Case 2-2: A case where the target volume is blocked

A recovery procedure for restoring data of the S-VOL is added because the copy source of the Reverse-RESYNC cannot be accessed.

<<Recovery procedure>>



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3.15 TPF

3.15.1 An outline of TPF

TPF is one of operating system (OS) which mainly used for airline customer reservation systems (CRS).
To correspond to TPF, DKC must support logical exclusive lock facility and extended cache facility. The former is a function which called MPLF (Multi-Path Lock Facility) and the later is a function which called RC (Record Cache).

7700E(MPLF) has implemented the MPLF and RC functions of TPF feature(RPQ#8B0178), using IBM public manuals;
(a) IBM3990 Transaction Processing Facility support RPQs (GA32-0134-03)
(b) IBM3990 Storage Control Reference for Model 6 (GA32-0274-03)

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(1) An outline of MPLF

This facility provides a means, using a DKC, to control concurrent usage of resources in host systems via use of logical locks. A logical lock may be defined for the control of a shared resource, where the sharing of that resource must be controlled. Each shared resource has it own name called Lock Name. Every Lock Name controls multiple lock states (2 to 16).
Figure. shows the outline of I/O sequence which uses MPLF.
DKC recognizes up to 16 MPLF users. In this figure, user A and user B are used. These users may belong to same HOST or different HOSTs. Each user must indicate MPLP (Multi-Path Lock Partition) when uses MPLF. MPLP is a means of logically subdividing the MPLs (Multi-Path Locks) for a user set. The maximum number of MPLP is four. Each MPLP has numbered from 1 to 4. The process to get permission for use MPLF is called CONNECT.
The connected user execute SET LOCK STATE process using Lock Name. The MPL corresponding to specified Lock Name is assigned to the user. This assignment is canceled by UNLOCK process. HOSTs can share the DASD without contradiction by using this MPLF.

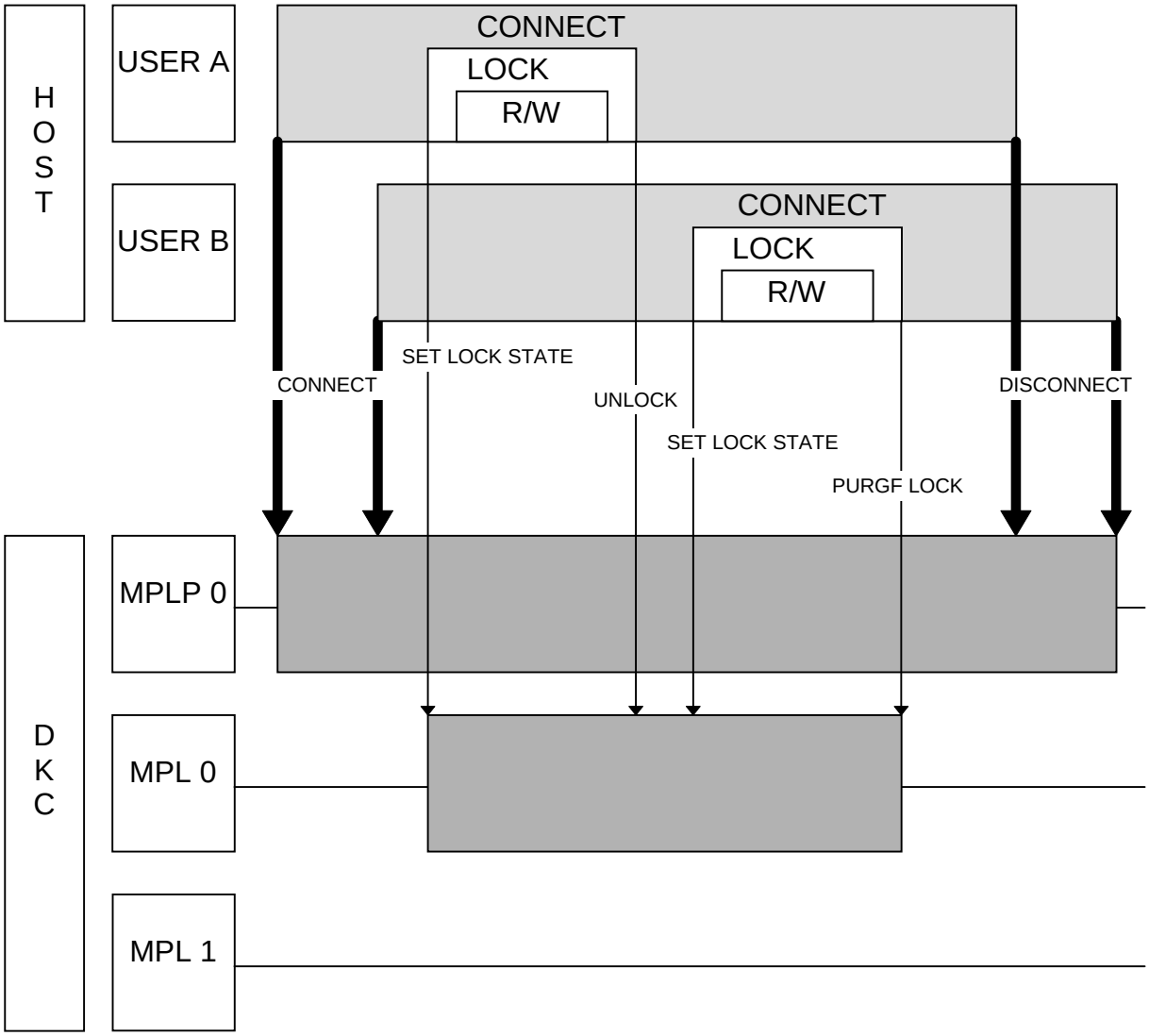

Fig. 3.15.1 An outline of MPLF

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(2) An outline of RC

RC has following two feature.
(a) Record Mode Chain
(b) Record Caching

The followings explain these features.
(a) Record Mode Chain

Record Mode Chain consist of following 4 command chains.

1) Mainline Processing (Read)
2) Mainline Processing (Write)
3) Capture
4) Restore

To execute Record Mode Chain, subsystem must be initialized for Record Caching, and Record Mode must be allowed for the addressed device. Under these conditions, Record Mode Chain works when Record Mode Chain is indicated in the Extended Global Attributes of Define Extent command. Otherwise, the chain is processed in standard mode.

A Mainline Processing chain consists of a Define Extent command, a Locate Record command, and a single Read Data or Write Update Data command.

A Capture chain consists of a Define Extent command followed by a Seek command and multiple Read Count, Key, and Data commands.

A Restore chain consists of a Define Extent command, a Locate Record command, and multiple Write Update Data commands.

(b) Record Caching

Record Caching is the naming contract with Track Caching used in standard model. At the point first initialize complete, all of cache is allocated to Track Slot as standard model. Record Cache will be allocated if Set Cache Allocation Parameters Order is issued.

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3.15.2 TPF Support Requirement

(1) OS

TPF Ver.4.1.

(2) Hardware

TPF Support Hardware Specification.

Table 3.15.2 TPF Support Hardware Specification

	7700E/MPLF
Number of logical volumes (MODs) per Box	Max.144 (6GB drives) (*1) or Max.128 (9/18GB drives) (*1)
Number of LCUs (Logical Control Unit)s per Box	Max.4
RAID level	5 or 1
Emulation type (1) LCU (2) Device	3990-6 (3990-3) 3390-1/2/3, 9 (*2), and (3380-K)
Physical Disk drive	6GB (*3) 9GB (18GB)
Box Capacity (in RAID5/3390-3 emulation)	Max.363GB ; (2.838GB×128MODs) Max.408GB ; (2.838GB×144MODs)
Connection paths to Hosts	Max.32
Concurrent data transfer paths for Hosts	Max.32
Number of logical path addresses per Box	Max.512 (*4)
Number of Multi-Path Locks	Max.4096/LCU
New features (1) CVS=Virtual LVI (2) DCR=FlashAccess (3) HRC (4) HMRCF=Shadow Image (5) HODM (6) HMBR	 Available Available Available Available (Not Available) (Not Available)

(*1) Recommendation by performance reason.
(*2) 3390-9 emulation cannot be selected with 6GB drives.
(*3) Recommendation by performance reason
(*4) 512 Logical path addresses = 16 addresses/path × 32.

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3.15.3 TPF trouble shooting method

Basically there is no difference between TPF environment and MVS for trouble shooting.

(a) To gather system error information by Syslog/EREP ...etc.
(b) To gather 7700E error information by SVP dump operation.
- Normal dump which contains TPF dump data also. (Refer SVP02-530)
(c) To send above data to T.S.C.

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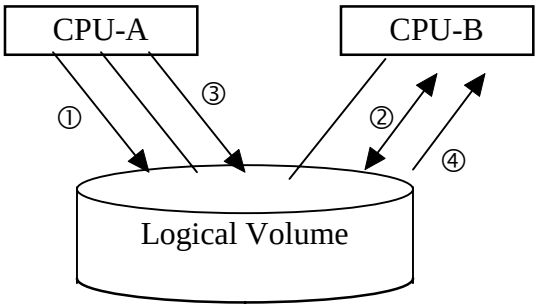
3.15.4 The differences of DASD-TPF(MPLF) vs DASD-MVS

(1) Data-exclusive method by MPLF function

MVS environments
(a) Logical volume(Device) is the unit of data-exclusive between several CPUs.
(b) “Device” is owned by one CPU during its processing(accessing), and “Device-busy” status is reported to another CPU’s accesses.
(c) “Device-end” status is used to notify the waiting CPUs
(d) when the device becomes free.

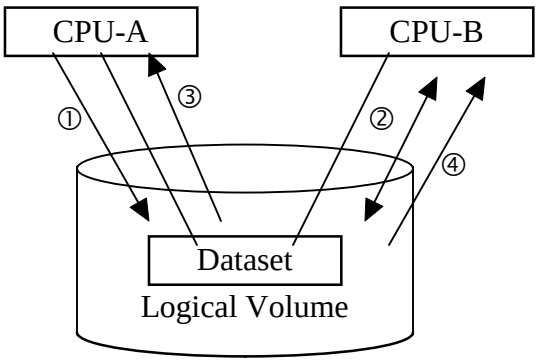
TPF environments
(a) Logical “Lock” is used for this purpose, instead of logical volume(device) of MVS.
(b) Most Read/Write CCWs have a unique: Prefix-CCW(Set Lock) to own the target lock.
And only when the request-lock is granted to, its CCW continues the following Read/Write processes.
DSB=”4C” is for granted / DSB=”0C” is for NOT-granted(wait).
(c) “Attention” status is used to notify the waiting CPUs when the lock becomes free.
(d) The relationship between Lock and Dataset is quite free.
Usually TPF users(customers) have their own definitions.

MVS environments



① Reserve/Read&Write Access by CPU-A (Successful).
② CPU-B’s trial is rejected by Device-busy (Failed).
③ Terminate its process and release the volume.
④ Free(Device-end) will be sent. CPU-B can use this volume.

TPF environments



① Set Lock/Read&Write process(*1) by CPU-A (Successful).
② CPU-B’s trial is rejected by Not-granted (failed).
③ Terminate with Unlock, by CPU-A.
④ Free(Attention) will be sent.(*2). CPU-B can use this Dataset.
(*1)Typical CCW chain:
- Set lock State(x27/order(x30));
- Read Subsystem Data(x3E);
- Tic;
- (ordinary CCW chain)
(*2)This report’s path/Address is usually different from above②.

Fig. 3.15.4-1 Environments of DASD-TPF and DASD-MVS

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(2) No path-group

MVS environments
(a) Each CPU establishes the Path-group on every DASD Online-devices, using the all connected paths.
(b) Channel and DASD (Control Unit) rotates the I/O service path to meet each occasion within this group.
(c) “Device-end” status can be reported through any-path of this group.

TPF environments
(a) TPF OS/CPU does not establish this Path-Group, even if its configuration has multiple-paths for DASD.
(b) But the Channel rotates the I/O request-path, within the connected paths. (Like old MVS way.)
(c) “Attention” report is restricted to one “Connect-Path” which has been defined during IPL (Vary-online) procedure.

(3) Connect Path/Device

(a) TPF system issues “Connect order” to define ;
- Lock tables on each DASD control-unit,
- Report path & Device for Attention interrupt.

(b) This order is code(x33) of Perform Subsystem Function (x27) command.
(c) This order is issued during the IPL process of each CPU.
(d) CPU (channel) only has the capability to change this path and device definition.

Table 3.15.4-1 Order-list of Perform Subsystem Function (x27) command

Order	Meaning
x22	Prepare to Read Lock Data
x30	Set Lock State
x31	Purge Lock
x32	Unlock
x33	Connect
x34	Disconnect

For detailed, please see the IBM RPQ manual;
“IBM 3990 Transaction Processing Facility Support RPQs” (GA32-0134-03)

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(4) Channel Re-drive function

MVS environments
(a) In general, the Channel selects the most proper path (in the Path-group) for each I/O request.
(b) In MVS environments, there is no this kind of function.

TPF environments
(a) In TPF environments,
to keep a fast IO response & IO request-order(fast-in-fast-out),
this kind of special function has been introduced. (Thus is our conjecture.)
(b) By the channel-monitor data,
Once IO request is rejected with Control-unit busy by DASD,
Sub-channel repeats a reconnect-trial to DASD (with some short interval),
until (1) to get-into DASD or (2) to reach the trial-count threshold
(in this case IO request is registered to some waiting Queue in the channel.)
(c) And once IO request is accepted by DASD control-unit,
next Control-unit judges this would be accepted or not using “Lock” status.

(5) Fixed Record-size

Dataset structure in DASD

In general, TPF software makes the following logical structure in DASDs.

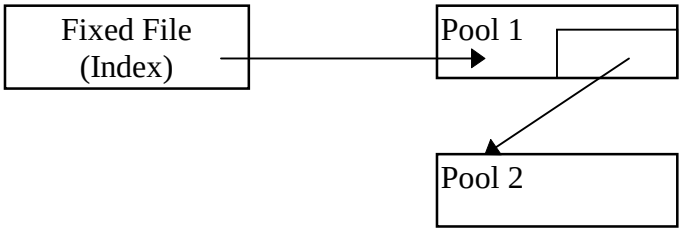

Fig. 3.15.4-2 Logical structure in DASDs

Table 3.15.4-2 Pool records Classification

Logical (usable) size	Physical size
381 Bytes	384 Bytes
1055	1056
4095	4096

There exist only three lengths for pool records.

Table 3.15.4-3 More detailed classification

381 Record	1055 Record	4095 Record
SLT (Small, Long Term)	LLT (Large, Long Term)	4LT (4KB, Long Term)
SST (Small, Short Term)	LST (Large, Short Term)	4ST (4KB, Short Term)
SDP (Small, Long Term, Duplicated)	LDP (Large, Long Term, Duplicated)	4DP (4KB, Long Term, Duplicated)

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(6) Prime/Dupe MODs pairs

(a) To improve Data-integrity of DASD,
TPF system often makes the Data-duplications
on different two DASD subsystems.
(b) The following Fig. Shows one example of this pairs.
Prime MOD(module)s and Dupe MODs are never located on
one-side of subsystem(spread to all subsystems).

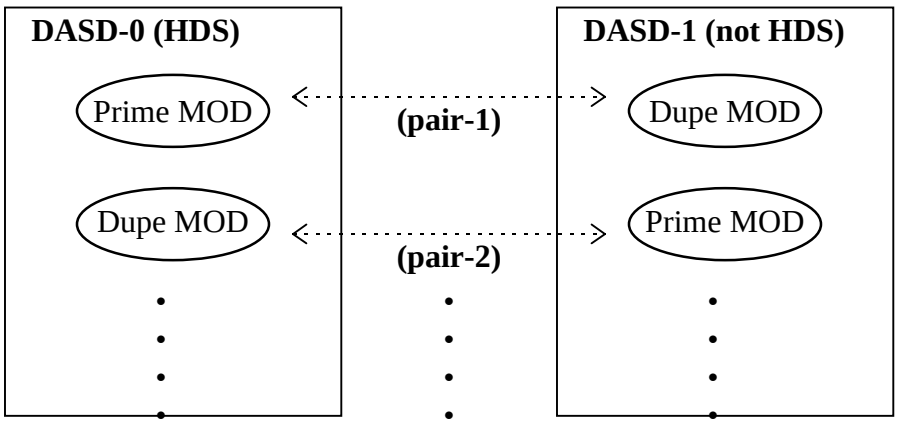

Fig. 3.15.4-3 Prime/Dupe MODs pairs

(7) Data Copy procedures

The Copy procedures are taken for the following purposes;
(a) To make a pair (To copy data from Prime MOD to Dupe),
(b) To recover the failed data (To copy the remaining data to the re-init MOD.)

There exist two ways to make a pair.
(a) AFC (All File Copy), and
(b) AMOD copy.

(a): In this copy process, the destination-drive of the copy keeps “Offline” status, and just after the completion of this copy, the source-drive is made “Offline” and the destination-drive is changed to “Online”. From the view-point of TPF software, there exists only one MOD, independent of copy process.

(b): In this copy, both source-drive and destination-drive are made “Online”.
TPF software can distinguish both drives, even if in the copy process.

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3.15.5 Notices for HRC-option setting

<SVP operation>

(1) RCU Option (see SVP04-120)

- We strongly recommend to choose “No”-side in “PPRC support by host” column of “RCU Option” window.
- We strongly recommend to choose “Not Report”-side in “Service SIM of Remote Copy” column of “RCU Option” window.

(2) Pair Option (see SVP04-180)

- We strongly recommend to choose “Copy to R-VOL”-side in “CFW Data” column of “Pair Option” window.

(3) Suspend Pair (see SVP04-210)

- We strongly recommend not to activate (to keep blank) “SSB(F/M=FB)”-lone of “Suspend Pair” window.

<Host (TPF-OS) consideration>

In MVS-OS world, 7700E with HRC expects (requires) Customers to extend I/O Patrol Timer to prevent many MIHs from reporting.

In TPF-OS world also, same consideration will be required, that is please discuss with the Customer to find the opportunity to extend “Stalled Module Queue” timer over 5 seconds.

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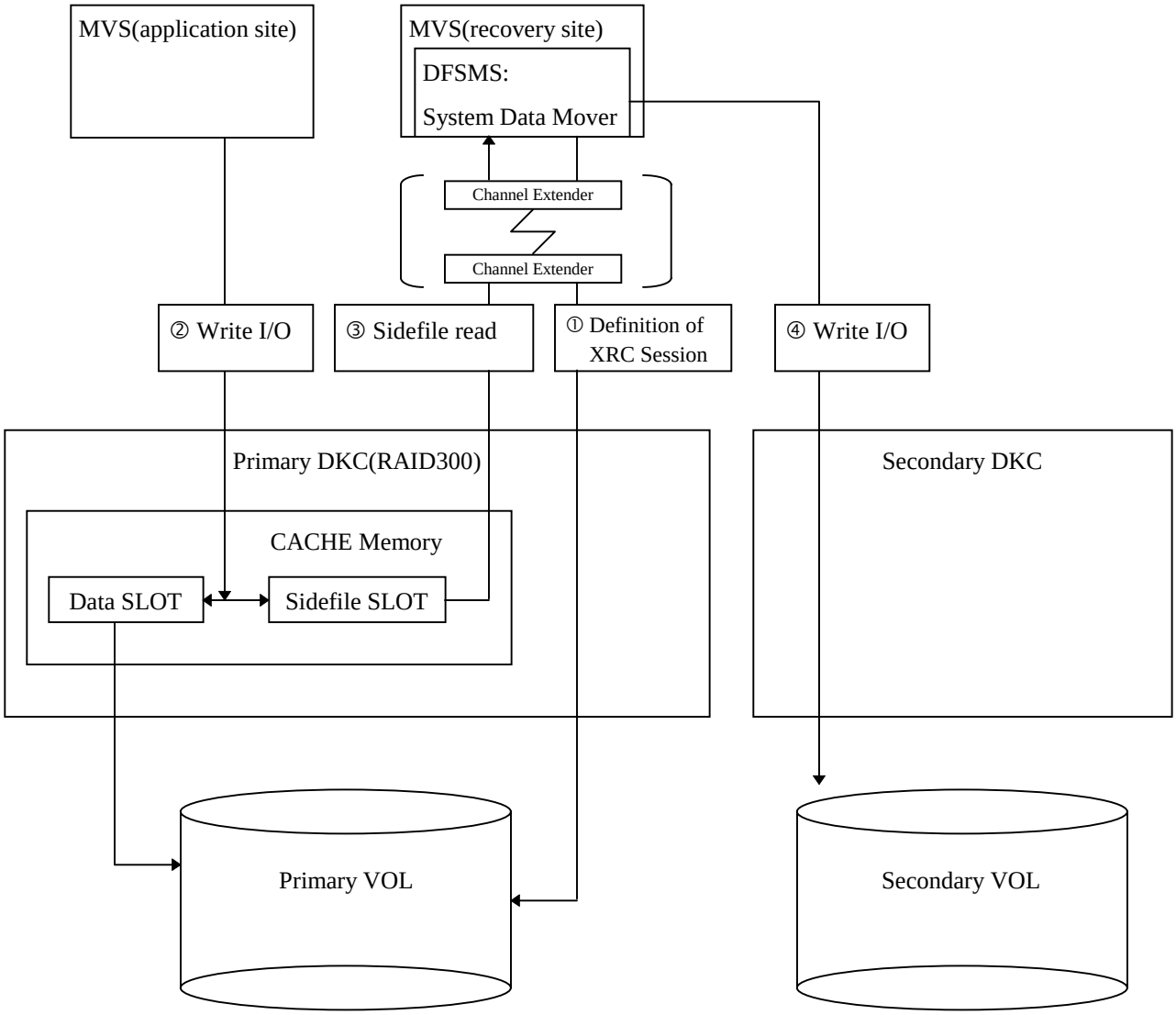
3.16 HXRC

3.16.1 An outline of HXRC

HXRC(Hitachi eXtended Remote Copy) function provides for data replication at distance in order to recover at a disaster.



- System Data Mover defines a XRC pair session.(①)
- When a write command is issued to primary volume from application site, primary DKC makes a sidefile data(replication) on cache memory.(②)
- System Data Mover reads a sidefile data non-synchronously at distance, and writes it to secondary volume.(③, ④)

Fig.3.16.1-1 An outline of HXRC

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3.16.2 HXRC Support Requirements

3.16.2.1 OS

(1) OS level
(a) MVS/ESA 4.3.0 or upper.
(b) DFSMS/MVS 1.1.0 or upper.

<Restriction of SMS 1.4 environment>
The Maximum number of HXRC pair per CU image is up to 128 under SMS 1.4 environment. CCA (Channel Connection Address) can be specified to 128 logical devices per CU images such '00' - '7F'. CCA address '80' - 'FF' for HXRC may be rejected by System Data Mover.

(2) Conditions of HXRC using
(a) The following conditions must be satisfied by OS before starting HXRC function,
• CACHE ON
• NVS ON
and must be CACHE ON status on DKC.
When CACHE OFF/NVS OFF commands are issued by OS or Cache malfunctions (includes 'Ref code=FFEE: Area temporary blocking) occur, HXRC function is stopped.

(b) I/O Patrol Value
(I) Without CHL Extender
• Current patrol time(more than 30sec).
(II) With CHL Extender
• More than 70sec.

(c) Session ID
• Up to 64Session ID's can be utilized per 1DKC for Concurrent Copy(CC) and HXRC.
• Up to 4Session ID's can be utilized per 1DKC for HXRC.
• Up to 16Session ID's can be utilized per 1VOL for Concurrent Copy and HXRC.
• Only 1Session ID can be utilized per 1VOL for HXRC.

<Specification of RAID300>
The maximum number of HXRC pair in the subsystem is up to 256.

(d) HRC/HODM
• HXRC cannot be used for the same volumes using HODM pair volumes.
• HODM cannot be used for the same volumes using HXRC pair volumes.
• HXRC must be for that volumes after deleting HODM pair volumes.

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3.16.2.2 Hardware

(1) HXRC Support Hardware Specification.

Table 3.16.2.2-1 HXRC Support Hardware Specification

CU Type	3990-6/6E
DEV Type	3390-1/2/3/3R/9
DKC model	Primary:RAID300 Secondary:RAID300/RAID200HA/DKC80/DKC90
RAID level	RAID5/RAID1
Channel	ESCON

(2) CACHE SIZE
Cache capacity should be doubled from current cache size.
(The amount of sidefile data may occupy up to 60% of total cache capacity.)

3.16.2.3 Micro-program

(1) HXRC Support Micro-program Revision.

Table 3.16.2.3-1 HXRC Support Micro-program Revision

DKCMAIN	52-36-12-00/00 or upper
SVP	51-36-12/00 or upper

CNT extender version 4.9 or upper level code is recommended.

(2) HXRC support Modes

Table 3.16.2.3-2 HXRC support Modes

Mode	Description
Mode45	Sleep wait timer used to delay activation. Mode45 OFF : Activates sleep wait timer at 40% sidefile threshold. Mode45 ON : De-activates sleep wait timer at 40% sidefile threshold.
Mode59	Variable RECSET size performance improvement for CNT channel extenders. Mode59 OFF : Performance improvement de-activated (fixed RECSET size) Mode59 ON : Performance improvement activated (variable RECSET size)
Mode97	Variable sleep wait timer duration. Mode97 OFF : Sleep wait timer duration = 100ms at 40% sidefile threshold. Mode97 ON : Sleep wait timer duration = 10ms at 40% sidefile threshold.
Mode98	Selectable SCP or session cancel at 50% sidefile threshold. Mode98 OFF : SCP activates at 50% sidefile threshold. Mode98 ON : Forced session cancel at 50% sidefile threshold.
Mode118	Warning SIM reporting at 40% sidefile threshold. Mode118 OFF : Not report SIM. Mode118 ON : Reports SIM. (30sec interval over 40% sidefile threshold)

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3.16.2.4 HXRC recommendations

(1) Recovery site CPU is the most ideal location for Data Mover.
(2) Data Mover's path should be utilized only to read sidefile.
(3) Subsystem configurations
- Cache capacity : Should be doubled from current cache size.
- Confirmation for Number of channel paths for system data mover (SDM)
- Confirmation for Work loads for the subsystem

(4) Utility device for primary volume
- Should be prepare for each XRC session.
- A low activity device should be selected as a Utility Device
- Utility Device should be specified at 1'st time before establishing pair volumes.

(5) System Data Mover (SDM)
- Confirmation for PTF levels
- No record found problem. : APAR # OW30183, OW33680
- Necessary tuning for SDM data set : Capacity, Geometry of the data set

(6) DB2
- Broken VSAM index file problem : APAR # II08859

(7) Others
- CPU MIPS : Enough for HXRC environment
- LINE CAPACITY : Enough for HXRC environment with channel extender.

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3.16.3 Online Maintenance while Concurrent Copy(CC)/HXRC using

(1) Availability of Installation and DE-installation.

Component	Maintenance Type	During initial copy		Established		Suspend	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
HDD canister	Installation	*	x	*	x	*	x
	De-installation	*	x	*	x	*	x
Cache PCB	Installation	*	x	*	x	*	x
	De-installation	*	x	*	x	*	x
CHA	Installation	x	x	x	x	x	x
	De-installation	x	x	x	x	x	x
DKA	Installation	x	x	x	x	x	x
	De-installation	x	x	x	x	x	x

x: Maintenance is available.

*: When a maintenance operation is needed while CC/HXRC is using, I/O's for CC/HXRC pair volumes or CC/HXRC itself should be stopped before the maintenance operation.
If the maintenance operation must be done while CC/HXRC is using, you must confirm that the usage of Sidefile monitor less than 20% of total Cache capacity before you start the maintenance operation. Only when the usage of Sidefile monitor is less than 20% of total Cache capacity, you can proceed the maintenance operation.
Refer to "Monitoring" in the SVP SECTION about sidefile monitor.
Select the [Information] icon in the 'SVP' window.
Next select the [Monitor] menu in the 'Information' window and select [start....].
Next select the 'Sideflie' box in the 'Item' menu in the 'Monitoring' window and select [OK].

(2) Availability of the System tuning.
When the following System tuning operation is needed while CC/HXRC is using, CC/HXRC should be stopped before the System tuning operation.

- It is impossible to change the DKC No, SSID, or DKC Emulation type by System tuning operation while CC/HXRC is using.
- When the DRV emulation type of CC/HXRC pair volumes are 3390-3 or 3390-3R, it is impossible to change the emulation type between 3390-3 and 3390-3R by CHANGE EMULATION operation while CC/HXRC is using.

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(3) Availability of the Replacement.

Component	Maintenance Type	During initial copy		Established		Suspend	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
Logical Device	Blockade	**	**	**	**	**	**
	Recovery	**	**	**	**	**	**
	Format	**	**	**	**	**	**
	Verify	x	x	x	x	x	x
HDD canister	Replace	x	x	x	x	x	x
Cache PCB	Replace	*	x	*	x	*	x
CHA	Replace	x	x	x	x	x	x
DKA	Replace	x	x	x	x	x	x
LTM PCB	Replace	x	x	x	x	x	x

x: Maintenance is available

*: When a maintenance operation is needed while CC/HXRC is using, I/O's for CC/HXRC pair volumes or CC/HXRC itself should be stopped before the maintenance operation.
If the maintenance operation must be done while CC/HXRC is using, you must confirm that the usage of Sidefile monitor less than 20% of total Cache capacity before you the start maintenance operation. Only when the usage of Sidefile monitor is less than 20% of total Cache capacity, you can proceed the maintenance operation.
Refer to "Monitoring" in the SVP SECTION about Sidefile monitor.
Select the [Information] icon in the 'SVP' window.
Next select the [Monitor] menu in the 'Information' window and select [start....].
Next select the 'Sideflie' box in the 'Item' menu in the 'Monitoring' window and select [OK].

**: When a maintenance operation is needed while CC/HXRC is using, CC/HXRC should be stopped before the maintenance operation.

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3.17 HRC Asynchronous

3.17.1 Components

Asynchronous mode is one of the update copy modes of the HRC volume pairs. The HRC asynchronous subsystem consists of the same components as HRC synchronous and HRC semi-synchronous with the following exceptions:

- A set of the HRC volume pairs named consistency group is introduced.
- Only 1-to-1 and n-to-1 (n≤4) configuration is supported
- For n-to-1 configuration, the XRC time-stamping capability is required.
- A communicating facility to transfer error information from the primary system to the secondary system is not required.

Note) In this document, the term n-to-m means that n-MCUs and m-RCUs are connected to each other to establish the HRC volume pairs. N and m is number of control units of physical unit bases, not of control unit image bases.

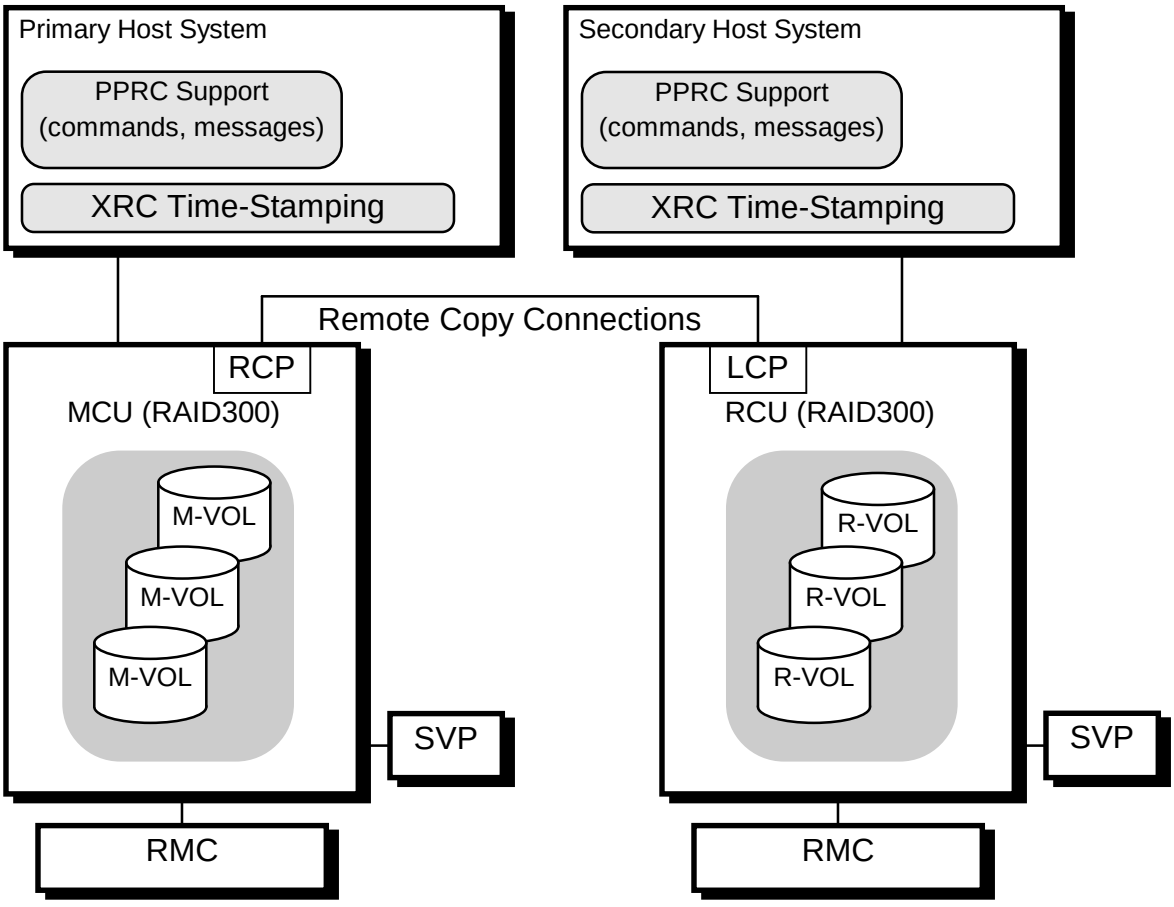

Fig. 3.17.1-1 HRC Asynchronous Subsystem Components

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(1) MCU and RCU

- Both MCU and RCU must be RAID300 or upper model.
- Maximum configuration is 4-to-1. For n-to-1 (n >1) configuration, XRC time-stamping capability is required.
- To use XRC time-stamping capability, control unit emulation must be 3990-6 basic or enhanced mode.
- Maximum number of control unit image pairings (established by Add RCU or ESTPATH) is 16.

(2) Consistency Group

- HRC asynchronous ensures update-sequence-consistency across several volume pairs. It also provides some group-based operations. A set of volume pairs treated by such group-based functions is called a consistency group.
- HRC asynchronous supports 16 consistency groups at maximum. Every HRC asynchronous volume pair belongs to one consistency group.

(3) PPRC Support

- Although HRC asynchronous is not fully compatible to PPRC, it can be controlled and monitored with PPRC host facilities, PPRC TSO commands, ICKDSF PPRC commands and some console messages. For this purpose, MVS/DFP 3.2.0 or higher level and ICKDSF release 16 or upper are available.
- Only fundamental facilities are available. Neither P/DAS SWAP nor CGROUP is supported.
- If the primary system (and the secondary system) consists of several CPU complexes, SYSPLEX timer must be installed for the common time reference.

(4) XRC Time-Stamping Capability

- In case of N-to-1 configuration, the XRC time-stamping capability requires to be installed in the primary host system. MVS/DFP 3.2.0 or higher level is required.
- In order to get benefit of time-stamping capability during copy-back process (pair establishment from the secondary to the primary subsystem), the XRC time-stamping capability recommends to be installed in the secondary system.
- If the primary system (and the secondary system) consists of several CPU complexes, SYSPLEX timer must be installed for common time reference.

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3.17.2 Consistency Group

(1) HRC Asynchronous Volume Pairs and Consistency Group

- Every HRC asynchronous volume pair belongs to one consistency group.
- When establishing the HRC asynchronous volume pair, an operator specifies the consistency group number that the volume pair will belong to with a new parameter of Add Pair and ESTPATH.
- The consistency group must be registered prior to pair establishment.

(2) Functions of Consistency Group Basis

(a) Ensuring Update Sequence Consistency

- The updated records are copied to the corresponding R-VOLs in the same order as the M-VOLs have been updated by the primary host systems.
- The update sequence consistency is ensured within a consistency group. The updated records of the different consistency groups may be copied in the different order from the original.

(b) Suspending Volumes Pairs (Error Level)

- When one R-VOLs is not updated correctly due to the failure, all the HRC asynchronous volume pairs will be suspended with keeping update sequence consistency.
- When establishing the HRC asynchronous volume pair, an operator specifies whether other volume pairs will be suspended together or not against the failure of the volume pair. A new parameter called **Error Level** is defined for this purpose.

Error Level = Group	When this volume pair is suspended due to the failure, all volume pairs in the same consistency group will be suspended together.
Error Level = Volume	Even if this volume pair is suspended due to the failure, other volume pairs in the same consistency group will not be suspended, as long as the failure prevent.

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(c) Providing the Consistency Time

The latest time stamp value of the update that has been successfully copied to the R-VOL is called a **consistency time**. The consistency time is a group basis indication. It means that all the updates performed before or at the consistency time have been successfully copied to the R-VOLs in the consistency group.

- The consistency time can be displayed with the following operations issued to the R-VOL of duplex or suspended state.
  - RMC (or SVP) Pair Status panel
  - PPRC CQUERY command
- At the R-VOLs in duplex state, the consistency time is a ticking value. Any R-VOL displays the consistency time in that instance. It can be used for feeling how long the R-VOLs are behind the M-VOLs.
- Whenever the volume pair is suspended, the consistency time of the R-VOL is frozen.
  - ① If the update sequence consistency between the R-VOL and other R-VOLs in the consistency group is ensured, the R-VOL indicates the latest consistency time of the consistency group.
  - ② Otherwise, the R-VOL indicates the latest time stamp value of the update that has been successfully copied to the R-VOL. It may be older than other R-VOLs because the consistency time of the consistency group is still ticking.
- If the R-VOL is in suspended state, the supplementary status that indicates whether the consistency time is of the consistency group (case (a) above) or the R-VOL (case (b) above) is also displayed.

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(d) Consistency Group Basis Operations

In order to make the disaster/failure recovery procedure simple, the following consistency group basis operations are provided.

• Operations at the RCU

① Deleting all suspended volume pairs except for inconsistent volume pairs
② Deleting all volume pairs regardless of the consistency among them
③ Suspending all volume pairs

• Operations at the MCU

① Suspending all volume pairs
② Deleting all volume pairs behind this unit (except for M-VOLs behind other MCU)
③ Resuming all suspended volume pairs behind this unit (except for M-VOLs behind other MCU)

(3) Configuration of the Consistency Group

(a) Disposition of the Volume Pairs

• All R-VOLs that belong to the same consistency group must be located behind one RCU.
• The M-VOLs that belong to in the same consistency group can be located behind up to 4 different MCUs.
• Up to 16 consistency groups can be established within one pair of MCU and RCU. The RCU supports up to 16 consistency groups.
• The R-VOLs of the different consistency groups can be located behind the different RCU.
• Up to 1,024 volume pairs can belong to one consistency group.

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(b) Primary Host Systems and Consistency Group

1) Primary host systems and timer type

- Every update I/O to the M-VOL of the same consistency group must be time-stamped by using common timer facility. Table 3.17.2-1 shows the relationship between the primary host system and available timer resource.
- When registering the consistency group, an operator must specify which timer resource should be used for the consistency group based functions.

Table 3.17.2-1 Primary host systems and timer resource

Primary Host System	Timer Resource	Notes on Configuration
MVS with the XRC time-stamping capability	System timer (CPU TOD clock)	• N-to-1 (N≤4) configuration is possible. • SYSPLEX timer must be installed if the primary system consists of the several CPU complexes.
Other main frame host systems	Local timer (MCU internal clock)	• Only 1-to-1 configuration allowed.
Open host systems		

2) Restrictions and notes on the primary host systems

- The primary host systems can not access the volume pairs of the same consistency group unless they have the common timer reference.
- The M-VOLs updated by the same primary host system can belong to the same or different consistency group if the M-VOLs have no requirement on update sequence consistency (i.e. they are updated independently of each other.) However it is recommended for them to belong to the different consistency groups because, for example, they might be suspended together against the failure
- Because of the same reason, the independent M-VOLs accessed by the independent primary host systems is recommended to belong to the different consistency groups, even if they can use common timer reference.

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3.17.3 HRC Asynchronous Theory of Operations

(1) Update Copy

The updates from the primary host systems and additional control information are queued in the cache storage of the MCU, and sent to the RCU independent of host I/O processes. The RCU stores the data and control information into the provisional spaces allocated in the cache storage. According to the time-stamp and the sequence information, the RCU promotes the updates in the provisional spaces the formal data of the R-VOLs in the same order as they have been performed at the MCU.

(a) Receiving Time-stamp Information

In case of the Timer Type of System specified, the MCU receives the time-stamp information as follows:

- When directed to establish the HRC asynchronous volume pair, the MCU reports the state-change-interrupt (SCI) to all the attached host systems. The host system issues a series of sense group commands to recognize what status of the device has changed. The MCU generates the response as if the device became a member of an XRC session. This response activates the XRC time-stamping capability if installed in the host systems.
- Once activated, MVS IOS routine attaches the time-stamp information (contents of time-of-day clock) to each I/O operation to read and write the device. The time-stamp information indicates when the corresponding update has been issued at the primary host system. It is transferred to the MCU at the beginning of each I/O operation.

(b) Creating Recordset

- When accepting the updates from the primary host systems, the MCU creates a set of information called a **recordset**. A recordset includes:

  ① updated record
  ② time-stamp information received
  ③ sequence number
  ④ record locations (device, cylinder, track and record number) and record length

- The **sequence number** is the number of recordsets the MCU has created for the consistency group. That is, all recordsets in each MCU and each consistency group are independently numbered.
- The recordset information other than the updated records is stored and queued into the exclusive spaces allocated in the cache storage.
- The updated records are stored as the host-dirty data and do not occupy the exclusive space until the following events happen before the recordset is sent to the RCU
  — The same record is updated again, or
  — The host-dirty status is removed by the de-staging process.
  When the above mentioned event happens, the MCU moves the updated records into an exclusive space, called **sidefile,** in the cache storage.

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(c) Sending Recordset to the RCU

- The MCU sends the recordset in a similar manner as HRC synchronous. That is, the MCU and RCP port act as the host processor channel and issue I/O operation, called Remote I/O(RIO), to the RCU.
- The RIO transfers the time-stamp information, the sequence number, the record locations and length, and the updated records in the FBA format (not in the CKD format) by one channel command, like HRC synchronous. However the parameter length and detailed specification of this channel command is different from HRC synchronous. Therefore the micro code of the store-and-forward type channel extender (i.e. Channelink and UltraNet of CNT corp.) should be upgraded to support the command.
- Unlike the recordset offloading of the XRC Data Mover, the MCU sends the recordset with directly specifying the device address of the R-VOL. The RIO independently activates each R-VOL. Furthermore, the MCU may send several recordsets by one RIO even if their sequence numbers are not contiguous to each other. Therefore the recordsets are usually sent in different order from their arrivals to the MCU.

(d) Storing Recordset into Sidefile Space

- The RCU stores the received recordsets into the spaces exclusively allocated in the cache storage. The exclusive space is called a sidefile. The updated records in the sidefile are not treated as the formal data. That is, the host I/O processes and the de-staging processes do not access the records in the sidefile at this time.
- The records in the sidefile will be promoted the formal data later. A term **settle** means to promote the records in the sidefile.
- The RCU also allocates exclusive spaces in the cache storage so that the sidefiles form a queue.
  - The RCU makes a queue per MCU and per consistency group.
  - This queue is not of the FIFO fashion. Each entry of the queue is previously assigned to each sequence number. The arrived recordsets are queued into the corresponding entries with indexed by their sequence number. The entries for the recordsets that do not arrive yet are left empty. As a result, the RCU lines up the recordsets in the order of their sequence number.

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(e) Selecting Recordset and Deciding Consistency Time

- The RCU selects the recordset to be settled with the following algorithm.

  ① Checks if there are the valid entries at the top of all the queues in the consistency group. If one of them is empty, the RCU waits for the entry.
  ② When all the top entries are filled with the valid sidefiles, the RCU selects one entry that has the smallest time-stamp. It can be settled.
  ③ Repeats step 1 and 2.

- Figure 3.17.3-1 shows an example. All the top entries are filled with the recordsets of S11/T3, S21/T2, S31/T1 and S41/T5. The RCU selects the recordset of S31/T1 to be settled because the T1 is the smallest time-stamp. Then the top entry S31/T1 is removed from the MCU3's queue. The S32 becomes the top but it is empty. The next recordset S11/T2 will be selected when recordset S32 arrives and its time-stamp is smaller than T2.

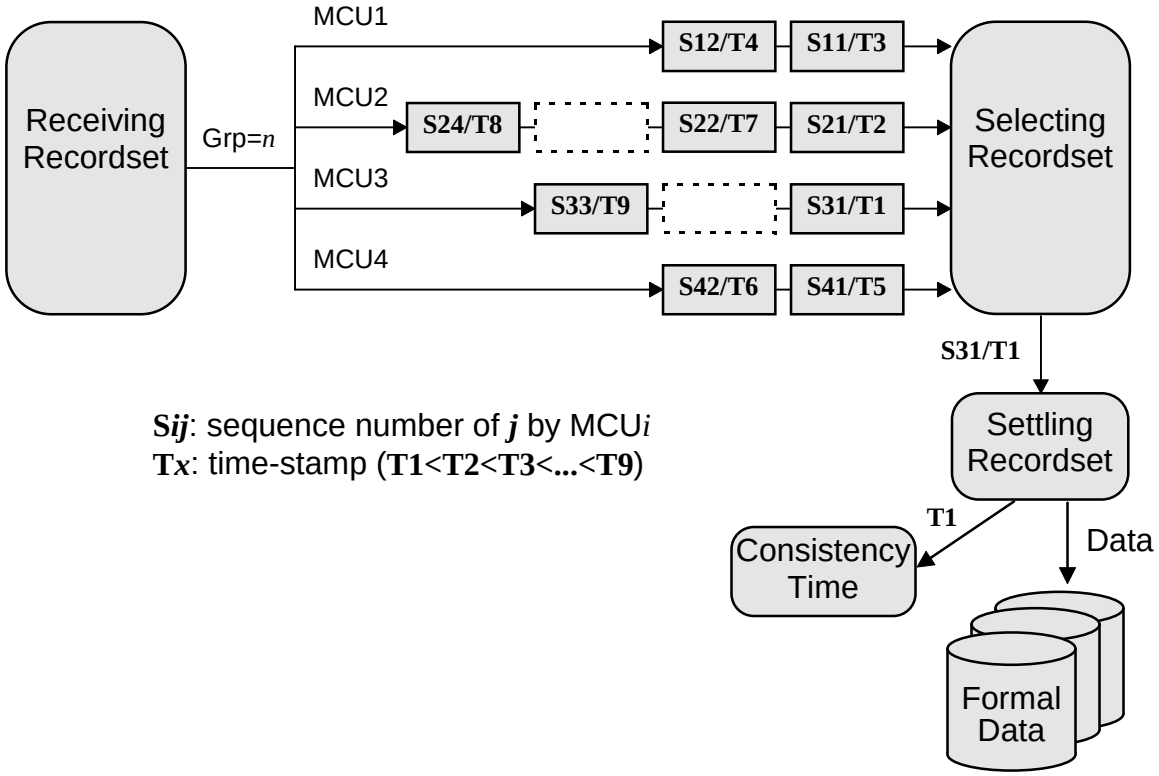

Figure 3.17.3-1 Example of Selecting Recordset at the RCU

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(f) Settling Recordset

- The recordset selected by the algorithm described in section(e) will be marked as host-dirty and treated as the formal data after that time. The time-stamp value of the recordset is promoted to the consistency time.
- The RCU settles the updated records in the recordset as follows:
  — If the corresponding track is not in cache storage (track-miss), the cache directory of the sidefile is changed to be the formal data. No data is moved.
  — If the corresponding track is in cache (track-hit), the updated records in the recordset are copied to the existing cached-track and the cache space for the sidefile is released.

3.17.4 MCU-RCU Communications to Maintain Asynchronous Copies

(1) Dummy Recordset

The RCU needs to receive the recordset continuously from all the MCUs even if the MCU does not have to create the new recordset.

- The MCU creates and sends a dummy recordset when it has received no update I/O in a second. The dummy recordset contains only the sequence number and the time-stamp information. Contents of the time-stamp information is generated by incrementing the largest time-stamp that the RCU has (the MCU reads it from the RCU before creating the dummy recordset) by one.
- The RCU receives the dummy recordset and puts it into the queue. It can help other recordsets being selected.

Another purpose of the dummy recordset is have the RCU be aware of the disaster. If the RCU can not receive any recordset in the predetermined duration (this time can be specified by Maximum Copy Delay Time parameter), the RCU regards such situation as the disaster and suspends all the HRC asynchronous volume pairs.

Due to these reasons, the MCU and RCU always need to communicate with each other once the HRC asynchronous volume pair established and not all the pairs have been suspended.

(2) Change-Status Recordset

When the volume pairs are suspended or deleted due to operations or failure, the update sequence consistency must be ensured. In order to meet this requirement, the negotiation on changing volume pair status is made by means of recordset. The recordset used for this purpose also has only the sequence number and the time-stamp information.

(3) PS OFF Notification Recordset

At the power-off sequence, the MCU creates and sends the recordset to notify of the power-off event. The recordset used for this purpose also has only the sequence number and the time-stamp information.

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3.17.5 Failure Detected by the RCU

(1) Pair Suspend by the RCU

Table 3.17.5-1 shows the failures detected by the RCU and the volume pairs to be suspended due to the failure.

Table 3.17.5-1 Volume Pairs to be Suspended by the RCU-detected Failure

Failures	Volume pairs to be suspended
The RCU could not settle the pending recordset or could not communicates with the MCU before the maximum copy delay time expired.	All pairs in the consistency group
The RCU could not receive the recordset successfully due to the hardware failure.	All pairs in the consistency group, or only the affected pair (depending on the failure)
The RCU detected the logical error while selecting the recordset to be settled.	All pairs in the consistency group
The RCU could not settle the recordset due to the hardware failure, the track condition, or the logical error.	All pairs in the consistency group, or only the affected pair (depending on the failure)

(2) Pair Suspended and Re-synchronization

For the HRC asynchronous volume pairs, both the MCU and RCU maintain the bit map for pair re-synchronization. When/after the volume pair(s) suspended, the cylinders that contain the following records are marked in the bit map as modified(to-be-copied later):

- The recordsets that have been created by the MCU but not sent the RCU yet. After marking the cylinders as modified, the recordsets are discarded.
- The recordset that have reached at the RCU but not settled yet. After marking the cylinders as modified, the recordsets are discarded.
- The records updated by the primary system after the volume pair(s) suspended

At the beginning of the pair re-synchronization, the contents of the RCU's bit map are sent to the MCU and merged into the MCU's bit map. The MCU performs the initial copy for the pair re-synchronization according to its bit map. That is, the cylinders that contain the lost recordset are re-synchronized at this time.

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3.17.6 Inflow Control for Sidefiles

- As described in section 3.17.4, both the MCU and RCU create the sidefiles for storing the recordsets. Since the sidefile is an exclusive space in the cache storage, both the MCU and RCU perform the inflow control to prevent the subsystem overload.
- Both the MCU and RCU use the threshold value specified with the RMC/SVP panel.

(1) Inflow Control by MCU

- When the amount of sidefiles reaches at the threshold, the MCU responds to the update I/Os from the primary system with the state-change-pending (SCP) or channel-command-retry request.
- If no recordset has been sent to the RCU after the specified time duration, the MCU will suspend all the volume pairs and reset the SCP condition in order to avoid the system being hung up.

(2) Inflow Control by RCU

- When the amount of sidefiles reached at the threshold, the RCU responds to the command that transfers the recordset from the MCU with the channel-command-retry request. Only the recordset of the sequence number necessary to continue settling the pending recordsets is accepted.
- If the recordset has not been settled after the specified time duration, the RCU will suspend all the volume pairs and reset the channel-command-retry condition in order to avoid the MCU being hung up.

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3.17.7 HRC Asynchronous Control Operations

This chapter describes the RMC (or SVP) operations for HRC asynchronous.

3.17.7.1 DKC Options

(1) *Async Option* - Modifying HRC Options on Physical Unit Basis

- Async Option panel provides the function to modify asynchronous options.
- These options are effective to entire physical control unit (i.e. all M-VOLs and R-VOLs behind the control unit.)
- These options can be modified when no asynchronous volume pair is established.
- These options may be modified before/after performing Port, Add RCU, and Add Group operations.

Table 3.17.7-1 Async Options on Physical Control Unit Basis

Option Name	Description
Pending Update Data Rate	• It specifies the amount of cache storage in percent that allows to be used for storing recordset (sidefile). • When the amount of cache storage for the recordset reaches the specified threshold, the MCU and RCU invokes its own inflow control as follows: — The MCU responds to the update I/Os from the primary system with the state-change-pending (SCP) or channel-command-retry request. — The RCU responds to the command that transfers recordset from the MCU with the channel-command- retry request. However the specific recordset that will help the RCU settle the pending recordset is still accepted. • Any percent between 30% and 70% can be specified with a unit of 10%. The default is 50%.
Offloading Timer	• It specifies how long the MCU can continue the inflow control described above. • The MCU stops the inflow control and suspends all asynchronous volume pairs after the specified time expires unless no recordset has been offloaded to the RCU. • Every minute between 1 to 20 and "None" can be specified. "None" is the default and means that the MCU never stops the inflow control.

Notice : If Pending Update Data Rate is modified when asynchronous volume pair is established, the host I/O timeout may occur.

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3.17.7.2 Registering/Monitoring/Deleting the Consistency Group

(1) *Add Group* - Registering Consistency Groups

- The consistency group can be registered with RMC (or SVP) attached to the MCU.
- The consistency group must be registered prior to the volume pair establishment.
- The consistency group has its own attributes and parameters, consistency group number, timer type, and others. They are specified when registered.
- The consistency group is registered in the RCU too. However it is not necessary to be specified. When the volume pair is established, the MCU directs the RCU to register the consistency group.

(a) Consistency Group Number

- The consistency group number is described with one digit of hexadecimal character.
- The volume pair control operations require the consistency group number as the parameter. The pair status displayed by Pair Status operation of RMC and CQUERY command also includes the consistency group number.

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(b) Timer Type

- The timer type must be specified out of System, Local and None when the consistency group is registered.

Table 3.17.7-2 Timer Type Attributes

Timer Type	Meaning
System	The system timer (CPU TOD clock) provided by the XRC time-stamping capability is used for controlling this consistency group.
Local	The local timer (*internal* TOD clock of this MCU) is used to for controlling this consistency group.
None	The system timer (CPU TOD clock) provided by the XRC time-stamping capability is used for controlling this consistency group. The R-VOLs in this consistency group can be located behind the different RCUs. *However the update sequence consistency across the RCUs is not ensured*. This timer type should be selected only when volume pairs are established from the original secondary to the original primary volumes (*copy back*).

- Table 3.17.7-3 shows the related configuration and timer type to be specified.

Table 3.17.7-3 Timer Types to Be Specified

Configuration			Timer type to be specified	
Host system	XRC time-stamping capability	MCU-to-RCU	For *P-to-S* copy (original direction)	For *S-to-P* copy (copy back)
Main frame	Installed	N-to-1 (n >1)	System	None
		1-to-1	System	System
	Not installed	1-to-1	Local	Local
Open systems	(unavailable)	1-to-1	Local	Local

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(c) Timeout Parameters

• The following parameters can be specified to modify the expiration time for the timeout event of the consistency group basis.

① Maximum copy delay time

Table 3.17.7-4 Maximum copy delay time to Be Specified

Name in the RMC panel	Time Out: Write Pending [min]
Available range	3 min. to 15 min or "None"(no time out event occurs)
Default	"None"
Description	It specifies the maximum delay allowed for asynchronous copy. Based on this parameter, the RCU will suspend all R-VOLs if following time out event occurs: • The RCU has received the updated data but it can not be settled in the specified time. • The RCU has had no communication from the MCU until the specified time expires

Note.) The RCU stores the updated data received into a *provisional* space of cache storage, and will make it available for use later. The term *settle* means to making it available for use.

② Maximum RCU-ready-wait time

Table 3.17.7-5 Maximum RCU-ready-wait time to Be Specified

Name in the RMC panel	Time Out: RCU Ready [min]
Available range	1 min. to 10 min or "None"(no wait)
Default	5 min.
Description	During the power-on-reset procedure, the MCU intends to communicate with the RCU and will suspend all the volume pairs if it can not communicate until the specified time expires.

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(2) *Delete Group* - Deleting Consistency Group Registration

- If no volume pair belongs to the consistency group, the group can be deleted.
- This operation is available only at the MCU. The registration to the RCU is automatically deleted, when the last volume pair in this group is deleted.
- In N-to-1 (N >1) configuration, deleting the consistency group does not affect the consistency group that has been registered in another MCU.

(3) *Group Option* - Modifying HRC Options on Group Basis

- This operation allows MCU to delete the consistency group currently registered.
- The Group Option can be operated only when no volume pair belongs to this group.

(4) *Group Status* - Displaying Consistency Group Status

- The options and the working status can be displayed on this panel.

Table 3.17.7-6 Consistency Group Status

Item	Contents	Displayed by:	
		MCU	RCU
Consistency group number	Consistency group number in one digit of hexadecimal character.	Yes	Yes
RCU serial number/SSID	Serial number and SSID of the RCU that belongs to this group.	Yes	No
Volume list	List of volumes that belong to this group and are behind this control unit.	Yes (*1)	Yes
Consistency time	Current consistency time of this group.	Yes (*2)	Yes
Timer type	Specified timer type of this group.	Yes	Yes
SEQCHK (*3)	At least one volume pair of this group has the SEQCHK status.	Yes (*2)	Yes
Maximum copy delay time	Specified maximum copy delay time.	Yes	Yes
Maximum RCU-ready-wait time	Specified maximum RCU-ready-wait time.	Yes	No

(*1) In N-to-1 (N >1) configuration, it does not include the M-VOLs behind other MCU.

(*2) The consistency time and SEQCHK status are decided by the RCU. The MCU displays these items after reading them from the RCU. If the MCU can not communicate due to communication failure, the latest contents are not displayed. Therefore these items should not be used for disaster recovery.

(*3) SEQCHK is one of the R-VOL statuses.

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3.17.7.3 Pair Status

- Suspending and Deleting state are newly defined to indicate the status in transition.
- Suspended by MCU powered-off is added as the caused of suspension.
- To indicate whether the update sequence consistency is kept or not, the *subsidiary pair status* (Group or Volume) and SEQCHK indicator are newly defined.

(1) Status in Transition - *Suspending* and *Deleting*

When suspending or deleting the HRC asynchronous volume pairs, the MCU and RCU intend to process all pending recordset before changing pair status. It takes longer time for the asynchronous volume pairs to change to suspended or simplex state than the synchronous volume pairs. Therefore adding to the conventional pair statuses (simplex, pending, duplex, suspended), two new statuses are introduced.

(a) Definitions and conditions of transition

Suspending This volume pair is *in transition from duplex or pending to suspended state*. When cause of suspension (failure or operation) is detected, all affected volume pairs change to suspending state. After completing suspension, they will automatically change to suspended state.

Deleting This volume pair is *in transition from duplex, pending or suspended to simplex state.* When accepting delete pair operation, all affected volume pairs change to deleting state. After completing delete pair operation, they will automatically change to simplex state.

(b) Indication of pair status

- Suspending and deleting statuses can be indicated *only* on RMC (or SVP) main control and pair status panels.
- For main frame host systems, these states are not indicated. Status in transition is treated as follows:
  - — In case of operations (suspend pair or delete pair), status is not changed until transition completes. After completing status transition, affected volume pairs are changed to suspended or simplex state.
  - — In case of failure, affected volume pairs are changed to suspended state when cause of suspension is detected.
  - — In any cases, the MCU or RCU report the state change interrupt (SCI) after completing status transition. IEA491E or IEA494I console messages appear on the system console at this time.

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(2) Suspended by MCU Powered-Off

When the MCU is being powered off, the MCU suspends all volume pairs behind it. The suspended volume pairs will automatically return to their original state (duplex or pending) when the MCU is powered-on again. During this suspension, the suspended R-VOLs indicate by MCU powered-off as the cause of suspension.

(a) Conditions of transition

- During power-off sequence, the MCU notifies the RCU of the power-off event. The RCU changes all related R-VOLs to suspended states and sets by MCU powered-off as the cause of suspension.
  - — Only R-VOLs which are in duplex or pending state are affected. The cause of suspension of the R-VOL that is already suspended is not changed.
  - — Only R-VOLs of which corresponding M-VOLs are behind the MCU are affected. The volume pairs between other MCU are not affected.

- During power-on sequence, the MCU notifies the RCU of the power-on event. The RCU changes all R-VOLs in suspended by MCU powered-off state to original (duplex or pending) state.

(b) Indication of pair status

- Only the RCU can indicate this cause of suspension.
- This cause of suspension is displayed as follows:
  - — RMC (or SVP) Main Control panel: OFF in the Sub column
  - — RMC (or SVP) Pair Status panel: Suspended (MCU PS OFF)
  - — PPRC CQUERY command: SUSPENDED(5) with the specific indicator in the serial number field

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(3) Consistency Status - *Group* or *Volume*

(a) Definition of the status

Group Update sequence consistency between this R-VOL and other R-VOLs in this consistency group is ensured. This R-VOL can be used for disaster recovery at the secondary system after deleting the HRC volume pair.
This status is indicated when:
— All volume pairs in this consistency group have been suspended due to the failure that affected the consistency group (not the specific volume pair.)
— The volume pair having Error Level = Group has been suspended due to the failure.
— This volume pair has been suspended by suspend pair operation with *Group* parameter.

Volume Probably this volume pair has been suspended alone. Update sequence consistency between this R-VOL and other R-VOLs in this consistency group is not ensured. This R-VOL can not be used for disaster recovery at the secondary system. This status is indicated when:
— This volume pair has Error Level = Volume and has been suspended due to the failure that did not affect entire group.
— This volume pair has been suspended by suspend pair operation with *Volume* parameter.

(b) Indication of the status

- Only the RCU can display this cause of suspension.
- This status has the meaning described above only when the R-VOL is in suspended state.
- This status is displayed as follows:
  — RMC (or SVP) Main Control panel: GRP or VOL in the Sub column
  — RMC (or SVP) Pair Status panel: GRP or VOL as “Suspended by:” item
  — PPRC CQUERY command: SUSPENDED(x) with the specific indicator in the serial number field

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(4) Alert for Non-Time-stamped Updates - *SEQCHK*

SEQCHK indicates that the volume pair has accepted some updates without time-stamp attached while the consistency group is specified to use system timer.

(a) Set/reset conditions

When the RCU is settling the updated data, the RCU turns this indicator on if the updated data is not time-stamped, otherwise turns this indicator off.

(b) Indication of this indicator

- Only the RCU can display this indicator.
- This status can be indicated unless the volume is in simplex status.
- This status is displayed as follows:
  - RMC (or SVP) Main Control panel: SEQ (on) or blank (off) in the SEQ column
  - RMC (or SVP) Pair Status panel: SEQCHK (on) or blank (off)
  - PPRC CQUERY command: The specific indicator in the serial number field

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3.17.7.4 Controlling Volume Pairs

- Basic operations to control/monitor the HRC asynchronous volume pairs are same as the HRC synchronous pairs. That is, at first the volume pairs to be operated must be selected on the main control panel, and then the operation and its parameters/options should be specified.
- For the HRC asynchronous volume pairs, some group basis operations are supported. Several volume pairs within the consistency group to which the selected volume belongs can be deleted, suspended, resumed by the group basis operations. For these operations, any volume pair within the consistency group may be selected.

(1) *Add Pair* - Establishing HRC Volume Pairs

- This operation has the MCU establish the HRC volume pair(s). Selected volumes will be the M-VOLs and the R-VOLs should be specified by the parameters.
- For asynchronous volume pairs, the MCU-RCU logical connection must be established and the consistency group must be registered prior to this operation.

(a) Basic parameters and pair options

The basic parameters and the pair options of Add Pair are described in and respectively. "Changed" column of these tables indicates the difference between HRC asynchronous and conventional HRC.

Table 3.17.7-7 Add Pair - Basic Parameters

Item	Parameters	Changed	Description
Pair configuration	- R-VOL - RCU	No	Specifies the serial number and SSID of the RCU and the logical device number of the R-VOL
Initial copy control	- Initial Copy - Priority	No	Specifies whether the initial copy for this volume pair is necessary ("Entire Volume") or not ("None") and its priority
Update copy mode	- Copy Mode	Yes	Specifies the update copy mote for this volume pair out of Synchronous, Semi-Synchronous and Asynchronous. For the asynchronous volume pair, specifies the consistency group number to which this volume pair will belong.

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Table 3.17.7-8 Add Pair/Resume Pair - Option Parameters

Option Name	Changed	For:	Description
Initial copy pace	No	Any	Specifies the initial copy pace.
Fence Level	No	Synch. Semi-synch.	Specifies the fence level out of "Data", "Status" and "Never" for synchronous and semi-synchronous volume pairs. This option is valid for the HRC synchronous and semi-synchronous volume pairs.
CFW data	No	Any	Specifies whether the CFW updates should be copied to the R-VOL or not.
DFW to R-VOL	No	HODM	Specifies the volume pair should be suspended when DFW is disabled/failed at the RCU. This option is valid only for HODM volume pairs.
Error Level	Yes (new)	Asynch.	Specifies whether all the volume pairs in the same consistency group should be suspended together or not when this volume pair is suspended. Group All the volume pairs group should be suspended together. Volume Only this volume pair may be suspended. This option is valid only for the HRC asynchronous volume pairs and the default is Group.
Pair Resume	Yes (new)	Asynch.	Specifies whether all the suspended volume pairs, which belong to the same consistency group and whose M-VOLs are behind this MCU, should be resumed together. Group All the volume pairs should be resumed together. Volume Only this volume pair may be resumed. This option is valid only for Resume Pair operation of the HRC asynchronous volume pairs and the default is Group (currently Volume).

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(b) End conditions

The Resume Pair operation with the Group option gets the normal end condition before the initial copy for each volume pair begins. If some unusual conditions (pinned tracks, correction-access status of the parity group, etc.) prevents the volume pair from being re-established, the volume pair would be still in suspended status. Therefor the result of this operation should be confirmed by referring to the actual pair status or the console messages that indicate pair status change.

(2) *Delete Pair* - Deleting HRC Volume Pairs

- In order to make the disaster recovery operations at the secondary subsystem simple, a new option that specifies the volume pairs to be deleted is supported (***Delete*** option).
- The pair status of the asynchronous volume pairs will be Deleting when the operation completes, and then Simplex after the internal process completes.

(a) Volume pairs to be deleted

Table 3.17.7-9 Delete Pair - Delete Option

Option Name	Operable at:		Description
	MCU	RCU	
Consistent Volumes	No	Yes	Specifies that the volume pairs that meet the following conditions should be deleted. — Belongs to the same consistency group as the selected volume pair and; — Is in Suspended status and; — Has the consistency status of Group. Other volume pairs than described above are not deleted. This is the default when operated at the RCU.
Group	Yes	Yes	Specifies that the all volume pairs (but volume pairs behind other MCU when operated at the MCU) in the same consistency group should be deleted.
Volume	Yes	Yes	Specifies that only selected volume pairs should be deleted. This is the default when operated at the MCU.

- This option is valid only when the asynchronous volume pair is selected.
- "Consistent Volumes" and "Group" can be specified when only one volume pair is selected.

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(b) Force option for asynchronous volume pairs

The Force option specifies that the volume pair should be deleted even if the MCU and RCU can not communicate with each other. For the asynchronous volume pairs, this option is still effective but can be specified with the Delete option of Group.

(c) End conditions

The Delete Pair operation for the asynchronous volume pairs gets the normal end condition when the operation is accepted by the MCU/RCU. The pair status of the volume pairs to be deleted are Deleting at this time. And then the pair status will be Simplex after the internal process (negotiation between the MCU and RCU) completes. Therefor the result of this operation should be confirmed by referring to the actual pair status or the console messages that indicate pair status change.

(d) Consistency time/status after deleted

Once the volume pair deleted, the consistency time/status of the volume pair will be reset. Therefor the consistency time/status should be memorized prior to this operation

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(3) *Suspend Pair* - Suspending HRC Volume Pairs

- A new option that specifies the volume pairs to be suspended is supported (Suspend option).
- The pair status of asynchronous volume pairs will be Suspending when the operation completes, and then Suspended after the internal process completes.

(a) Parameters and options

Table 3.17.7-10 Suspend Pair - Parameters and Options

Item Name		Operable at:		Description
		MCU	RCU	
SSB (F/M=FB)		Yes	Yes	Specifies that IEA494E console message should be generated.
Suspend Kind		-	-	Only "R-VOL" can be selected for the asynchronous volume pairs.
Suspend				Specifies the volume pairs to be suspended.
	Group	Yes	Yes	Specifies that all volume pairs in the same consistency group as the selected volume pair should be suspended together.
	Volume	Yes	Yes	Specifies that only the selected volume pair should be suspended.
Pending Update				Specifies how the pending recordset should be treated.
	Drain	Yes	Yes	Specifies that the volume pair(s) should be suspended after all pending recordset are settled. Refer to (3) in this section for notes on this option.
	Purge	Yes	Yes	Specified that that volume pair(s) should be suspended even if pending recordset remain. The pending recordset may be purged. If the MCU/RCU discard the pending recordset, the MCU/RCU marks the cylinders that contain discarded recordset as modified in its shared memory. The marked cylinders will be copied when the Resume Pair operated.

(b) Update sequence consistency

Regardless of the Pending Update parameter, the update sequence consistency across the volume pairs to be suspended is ensured. However, if some volume pairs have been suspended with the Volume option and other related volume pairs are updated after that, the update sequence consistency is not ensured.

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(c) Notes on Drain option

- If the Purge option specified, the volume pairs are suspend when the RCU accepts this operation. On the other hand, if the Drain option is specified, the volume pairs will be suspended when the RCU completes the steps described bellow.
  ① Accepts this operation and;
  ② Has finished settling all the pending recordsets and;
  ③ Completes the negotiation with all MCUs (reports ready-for-suspension to all the MCUs and receives their acknowledgements) without further recordset generated.

- Therefore, the procedures to get the R-VOLs whose contents are frozen at specific point in time relative to the application, are as follows
  ① Quiesce the application (Quiesce all update activity to the volume pairs) and;
  ② Perform the Suspend Pair operation with Drain option and;
  ③ Confirm that all volume pairs complete to be suspended and;
  ④ Restart the application.

- Time to disrupt the application (between 1 and 4 above) mainly depends on time for the RCU to follow steps (a) to (c) described above. That is, it depends on how many recordsets are pending and how much I/O workload the MCUs/RCU have. Since the RCU will break off above steps and forcibly suspend the volume pairs if time specified by the maximum copy delay time parameter expires, this parameter can help decide the expected disruption time.

(d) End conditions

The Suspend Pair operation for the asynchronous volume pairs gets the normal end condition when the operation is accepted by the MCU/RCU. The pair status of the volume pairs to be suspended are Suspending at this time. And then the pair status will be Suspended after the internal process (negotiation between the MCU and RCU) completes. Therefore the result of this operation should be confirmed by referring to the actual pair status or the console messages that indicate pair status change.

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(4) *Resume Pair* - Resuming HRC Volume Pairs

The Pair Resume option is newly supported. It specifies whether all suspended volume pairs, which belong to the same consistency group and whose M-VOLs are behind this MCU, should be resumed together or not. Refer to Table 3.17.7-8 for this option.

(5) *Pair Option* - Modifying HRC Options on Volume Pair Basis

Refer to Table 3.17.7-8 for the options on volume pair basis. The Error Level option can be changed regardless of the pair status (even if the volume pair is in Suspended state), but become effective at the next time of suspension.

(a) Modified items on Pair Status panel

Table 3.17.7-11 Pair Status - Modified Items on Pair Status Panel

Items	Indicated at:		Description
	MCU	RCU	
M-VOL and R-VOL	Yes	Yes	Indicates control unit image number and device number in form of "c:dd".
Pair Synchronized	Yes	Yes	Indicates the amount (%) of cylinders that are marked as modified in the bitmap for pair re-synchronization. Refer to (2) below for more detailed information.
Pair Status			Adding to the contents for the synchronous HRC volume pairs, the following are added for the asynchronous HRC volume pairs.
Suspending	Yes	Yes	Indicates that the volume pair is in transition state to Suspended.
Deleting	Yes	Yes	Indicates that the volume pair is in transition state to Simplex.
Suspended[MCU PS OFF]	No	Yes	Indicates that the volume pair has been suspended due to the power-off event of the MCU.

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(b) The Pair Synchronized indicator

- For the asynchronous volume pairs, both MCU and RCU maintain the bitmap for pair re-synchronization. The indicated percentage is calculated as follows.

— The M-VOL of Pending state indicates the remaining cylinders to be copied for pair re-synchronization.
— The R-VOL of Suspended state indicates the cylinders that contain the recordsets lost at the RCU (reached at the RCU but can not be settled before suspension).
— The M-VOL of Suspended state indicates the cylinders that contain;

① The tracks that have not copied yet by the initial copy and;
② The records updated by the primary system after suspension and;
③ The recordsets lost at the MCU (created in the MCU but can not be sent to the RCU before suspension) and;
④ The recordsets lost at the RCU.

The last item (d) is included as long as the MCU can get the information from the RCU. Otherwise, only items (a)-(c) are included. In this case, the item (d) will be included at the beginning of the pair resynchronization.

- This percentage is always calculated based on the total cylinders of the M-VOL (even if the R-VOL is larger than M-VOL).

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(c) Added items on Pair Status panel

Table 3.17.7-12 Pair Status - Added Items on Pair Status Panel

Items	Indicated at:		Description
	MCU	RCU	
C/T Group	Yes	Yes	Indicates the consistency group number to which this volume pair belongs.
C/T Type	Yes	Yes	Indicates the timer type that has been specified to control the consistency group. The displayed content is out of System, Local and None.
C/T	Yes (Note)	Yes	Indicates the consistency time of this volume pair in form of "mm/dd/yyyy hh:mm:ss.uuuuuu". (uuuuu: micro seconds)
SEQCHK	Yes (Note)	Yes	Indicates SEQCHK if the volume pair is in SEQCHK status. Otherwise it blanks.
Suspended by	No	Yes	Indicates the consistency status of the R-VOL when this volume pair is in Suspended status. Group The consistency between this R-VOL and other R-VOLs in the consistency group is ensured. Volume The consistency between this R-VOL and other R-VOLs in the consistency group is not ensured. The contents of this R-VOL may be behind other R-VOLs.

(Note) Only the RCU maintains the latest result and can display it. The result at the MCU may be behind the actual result because the MCU get the result from the RCU before displaying. Therefore the result at the MCU can be used *for monitoring the normal activities*, but can not for the disaster recovery at the RCU.

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(d) Added items

Table 3.17.7-13 Pair Status - Added Items on Pair Status Panel

Items	Indicated at:		Description
	MCU	RCU	
Grp (Lv)	Yes	Yes	Grp Indicates the consistency group number to which this volume pair belongs. (Lv) Indicates the Error Level of this volume pair, "Grp" for group or "Vol" for volume.
Sub	No	Yes	Indicates the consistency status or the others when the volume pair is in "suspended" state. GRP This R-VOL has the consistency status of Group. VOL This R-VOL has the consistency status of Volume. OFF This volume pair has been suspended due to the power-off event of the MCU.
Seq	No	Yes	Indicates SEQCHK if the volume pair is in SEQCHK status. Otherwise it blanks.

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3.17.7.5 Monitoring subsystem Statistics

(1) *Usage* - Displaying Remote I/O Statistics Information

Table 3.17.7-14 Usage - RIO Statistics in Async Copy Category

Item name	Unit	Description
Async IO count	—	Indicates the total number of RIO (Remote I/O) activities completed in a specified interval.
Total number of recordset	—	Indicates the total number of recordset sent to the RCU in a specified interval.
RCU command retries	—	Indicates the total number of RIO command retries requested by the RCU in a specified interval.
MCU command retries	—	Indicates the total number of channel command retries performed by the MCU in order to avoid cache slot conflict between the host I/O and RIO processes.
Average transfer rate	KB/sec.	Indicates the average data transfer rate of the recordset sent to the RCU in a specified interval.
Average RIO response	msec.	Indicates the average RIO response time in a specified interval.

(2) *Information/Monitor* - Displaying Subsystem Resource Usage

- The item named "Async Write Pending Data" is newly supported. It is displayed on the Information/Monitor panel of the SVP and recorded into monitor.dat file.
- "Async Write Pending Data" indicates the total amount of cache space in percent that store the pending recordset (sidefile).
- The conventional item "Sidefile" indicates the total usage of the sidefile for HXRC, Concurrent Copy and HRC asynchronous.

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3.17.8 Management/Recovery Procedures

3.17.8.1 Managing HRC Asynchronous Subsystems

(1) Checking on SEQCHK Status

- SEQCHK status would be indicated when the asynchronous volume pair in the consistency group with the timer type of System specified accepts the non-time-stamped updates from the primary system.
- SEQCHK status does not affect copy activities of HRC asynchronous and will be removed when the next time-stamped update is successfully copied to the R-VOL. However if the disaster happens before the next time-stamped update, the update sequence consistency between the R-VOL and other R-VOLs in the consistency group is not ensured. Therefor to make the disaster recovery more certain, the source of SEQCHK status should be detected and removed.
- Source of SEQCHK status to be suspected is as follows:
  — An application may issue the update I/Os with bypassing MVS standard I/O procedure.
  — An XRC time-stamping capability may not active at the primary system.
  — An Operating system of the primary system may not support the time-stamping capability.

(2) Checking on the Consistency Time

The consistency time is indicated as a part of pair status of the HRC asynchronous volume pairs. While the primary system continues to update the M-VOLs, the difference between the current time and the consistency time indicates how long the R-VOLs are behind the M-VOLs. The updates to the M-VOLs during this duration may be lost when the disaster happens

- If the disaster recovery design can not accept this delay, performance improvement by adding the remote copy resources (paths, cache amount, etc.) and/or reducing unnecessary I/O workload should be considered to get shorter delay.
- If this delay is close to the time specified by the Maximum Copy Delay Time parameter, the timeout failure may occur and the affected volume pair may be suspended due to the I/O workload fluctuations. The performance improvement described above and/or increasing this parameter setting should be considered.

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(3) Planned Outage of HRC Asynchronous Components

The MCU requires communication with the RCU even if it receives no update I/Os from the primary system. Suspending all the duplex pairs is necessary prior to the planned outage of the RCU.

(a) Planned outage of the MCU

- No special procedure is required for the asynchronous volume pairs. The MCU automatically suspends all volume pairs in Duplex/Pending state during the power-off sequence, and will remove the Suspended state at the power-on-reset sequence.
- Note that the volume pairs whose M-VOLs are behind the MCU will not be suspended. In N-to-1 configuration, the volume pairs behind other MCU(s) continue to be copied. If the full-consistent volume set requires to be kept during the planned outage, the procedures are as follows:

  ① Quiesce the applications.
  ② Perform Suspend Pair operation with Group and Purge (or Drain) option at the RCU.
  ③ Perform planned outage operation of the MCU(s).
  ④ After getting all MCUs ready to resume, perform Resume Pair operation at all MCUs.

(b) Planned outage of the RCU

- Suspending all volume pairs is required prior to the planned outage according to the followings:

  ① Suspend all volume pairs;
    1) Perform Suspended Pair operation at each MCU and;
    2) Confirm volume status with Pair Status operation.
  ② Perform planned outage operation of the RCU.
  ③ Get the RCU ready to resume.
  ④ Remove Suspended status from all volume pairs;
    1) Perform Resume Pair operation at each MCU and;
    2) Confirm volume status with Pair Status operation.

(Note) If step 1 above is not performed, the MCU detects the communication failure and suspend all affected volume pairs with generating SIM(s) and console message(s) that indicates the failure.

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(c) Planned outage of the components on the remote copy connection

The same restriction should be considered and the same procedures should be performed as the RCU for the components (channel extender, ESCON director, etc.) on the remote copy connection.

- Suspending all volume pairs is required prior to the planned outage according to the followings:

① Suspend all volume pairs;
   1) Perform Suspended Pair operation at each MCU and;
   2) Confirm volume pair status with Pair Status operation.
② Perform planned outage operation of the component.
③ Get the component ready to resume.
④ Remove Suspended status from all volume pairs;
   1) Perform Resume Pair operation at each MCU and;
   2) Confirm volume status with Pair Status operation.

(Note) If step 1 above is not performed, the MCU detects the communication failure and suspend all affected volume pairs with generating SIM(s) and console message(s) that indicates the failure.

(d) Planned outage of both MCU and RCU

- The MCU(s) must become not-ready first, and the RCU must be back before the MCU(s).

① Perform planned outage operation of the MCU(s).
② Perform planned outage of operation of the RCU.
③ Get the RCU ready to resume.
④ Get the MCU(s) ready to resume.

- Note that the MCU make all volume pairs suspended if it can not communicate with the RCU during the power-on-reset sequence. Therefor step 4 above should be started after completing step 3. If it is difficult to control due to some installation requirements (ex. Power-Control-Interface setting), consider using the Maximum RCU-ready-wait Time parameter.

(4) ICKDSF on the Asynchronous Volume Pairs

- ICKDSF activities involve write I/Os with device support authorization or diagnostic authorization instead of normal authorization. Since the MCU does not duplicate write I/Os with device support or diagnostic authorization, the HRC volume pairs must be suspended before running ICKDSF. The procedures to do are as follows:

① Perform Suspend Pair operation with Volume option at the MCU to suspend volume pair(s) for which ICKDSF will be performed.
② Perform ICKDSF.
③ Perform Resume Pair operation at the MCU.

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(5) Micro-program Exchange

No special procedure is required for the asynchronous volume pairs for the on-line micro-program exchange and the MCU's off-line micro-program exchange.
In the case of HRC Asynchronous components, Suspending all volume pairs is required prior to the RCU's off-line micro-program exchange.

① Suspend all volume pairs;
   1) Perform Suspended Pair operation at each MCU and;
   2) Confirm volume status with Pair Status operation.
② Perform micro-program exchange operation of the RCU.
③ Remove Suspended status from all volume pairs;
   1) Perform Resume Pair operation at each MCU and;
   2) Confirm volume status with Pair Status operation.

(Note) If step 1 above is not performed, the MCU detects the communication failure and suspend all affected volume pairs with generating SIM(s) and console message(s) that indicates the failure.

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3.17.8.2 Recovering from Pair Suspended

(1) Recovering from Pair Suspended - Suspended by the MCU

The cause of suspension and the recovery procedures are basically the same as HRC synchronous with exceptions that:

① The cache storage/shared memory of the one side (not both sides) may cause the HRC asynchronous volume pairs to be suspended.
② The MCU requires communicating with the RCU in power-on-reset sequence and suspends all the HRC asynchronous volume pairs if it can not do so.
③ The MCU suspends all the HRC asynchronous volume pairs if no recordset can be sent in the specified time period.

(2) Recovering from Pair Suspended - Suspended by the RCU

Adding to directed by the MCU, the RCU of HRC synchronous may detect the cause of suspension and suspended the failed volume pair(s) on its own initiative.

3.17.8.3 Disaster Recovery - Switching to the Secondary Subsystem

(1) Switching Procedures to the Secondary Subsystem

Basic procedures to switch to the secondary subsystem are as follows:

① Check pair status and memorize the consistency time of the R-VOLs.
② Make the R-VOLs simplex by performing Delete Pair operation.
③ Confirm that the R-VOLs have successfully been changed to simplex.
④ Perform IPL of the secondary system.
⑤ Perform the application restart procedure at the secondary system

(2) Suspending Volume Pairs due to the Disaster

If the RCU receives no communication with the MCU after the time specified by Maximum Copy Delay Time expires, the RCU regards this timeout event as a disaster and suspends all the HRC asynchronous volume pairs.

- Pair status of the R-VOLs normally become Suspended - Group.
- The latest time-stamp of the recordset that has been successfully settled is frozen and indicated as the consistency time of the R-VOLs.

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(3) Checking Volume Pair Status

- The R-VOLs of Suspended - Volume should not be used for the disaster recovery. Therefore Error Level of Group should be selected if the volume is essential to the disaster recovery.
- Delete Pair operation with Group option can make only the R-VOLs of Suspended - Group status. Therefore an operator seems to be able to skip this checking. However the volumes of Simplex status can not be distinguished form others after the R-VOLs in Suspended - Group status become Simplex by Delete Pair operation. Therefore at least the volumes in *Simplex* must be checked at this time.

Table 3.17.8-1 Checking R-VOL Status When Switching to the Secondary System

Pair status		Usable for recovery?	Description
Suspended	Group	Yes (*1)	Since the update sequence consistency across these R-VOLs is ensured at point in time indicated by the consistency time, these R-VOLs can be used for the disaster recovery at the secondary system. Note that some updates performed after the consistency time at the primary system may be lost.
Suspended	Volume	No	Since contents of this R-VOL may be behind other R-VOLs in the consistency group, this R-VOL should not be used for the disaster recovery if this volume requires the update sequence consistency with other volumes. Suspected reason for this status are as follows: — This R-VOL has been suspended due to the failure or Suspend Pair operation prior to the disaster. — This R-VOL was in pending status when the disaster happened. — The Error Level of Volume has been specified for this R-VOL and this R-VOL was suspended by the first symptom of the disaster.
Duplex Pending Simplex		No No No	This status does not usually take place in the disaster recovery procedure. This R-VOLs should not be used for the disaster recovery. *It should be especially noted that the volumes in simplex status can not be distinguished from others after deleted by Delete Pair operation.*

(*1) If SEQCHK status should be decided by the RCU using the XRC time-stamping capability, this R-VOL shall not be used for disaster recovery.

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(4) Memorizing the Consistency Time

The consistency time of the R-VOLs should be *memorized*. It could help the disaster recovery retrieve the lost updates.

- All the R-VOLs of Suspended - Group status indicate the same consistency time. Therefor any R-VOL of this status can represent the consistency time of the consistency group.
- Once Delete Pair operation performed, the R-VOL *never* indicates the consistency time again. Therefore the consistency time should be memorized before Delete Pair operation.

(5) Deleting Volume Pairs

By Delete Pair operation, the R-VOLs that are used for the disaster recovery should be changed to Simplex status.

- Group option of Delete Pair operation can make all the R-VOLs of Suspended - Group status Simplex. It would be helpful in reducing number of operations.
- Group option of Delete Pair operation does not change the pair status of the R-VOLs if they are other than Suspended - Group. It can prevent the inconsistent volumes from being used for the disaster recovery.

(6) Recovering the Lost Updates

HRC asynchronous provides *no* factory standard procedure to retrieve the lost updates.

- In order to detect and recreate lost updates, it is necessary for customers to check other current information, for example, data base log file that had been active at the primary system when disaster occurred. Note that the log file entries of most DBMS may be related to time-of-day clock information and the source of the consistency time is time-of-day clock of the primary system (when the timer type of System specified.).
- However such a detection/retrieval would take long time to do. The customers' disaster recovery scenario recommends to be designed to enable such a detection/retrieval *after* the application has been started at the secondary system.
- Maximum Copy Delay Time parameter of Add Group operation can control the maximum time duration during which the updates may be lost.

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3.17.8.4 Disaster Recovery - Switching Back to the Primary Subsystem

This section describes the procedures to switch back from the secondary system to the primary system. The basic concept and procedures are the same as HRC synchronous. After volume pairs establishment in the opposite direction, planned switching-back and volume pair establishment in the original direction are performed.

That is, the original R-VOLs are working as Simplex and the application is running on the secondary system by using the original R-VOLs. The original HRC asynchronous configuration/status should remain in the original MCU. In this section, the original MCU/M-VOLs and RCU/R-VOLs are called the primary subsystem and secondary subsystem respectively.

(1) Switching Back Procedures to the Primary Subsystem

(a) Make the primary subsystem and the communication facilities on the remote copy connection operable. Note that all the M-VOLs in the primary subsystem may be suspended since the original R-VOLs are now in Simplex status.

(b) Remove entire HRC asynchronous configuration remained in the *primary* subsystem:

① Make all the volume pairs Simplex by Delete Pair operation.
② Remove registration of the consistency group by Delete Group operation.
③ Remove MCU-RCU logical paths by Delete RCU operation.
④ Change the serial interface port to LCP mode.

(c) Establish HRC asynchronous in the *opposite* direction:

① Change the operating mode of the communication facilities in the opposite direction.
② Change the serial interface port of the secondary subsystem to RCP mode.
③ Register the consistency group at the secondary subsystem by Add Group operation.
④ Establish MCU-RCU path in the opposite direction at the secondary subsystem by Add RCU operation. The primary subsystem is now defined as the RCU.
⑤ Establish the HRC asynchronous volume pairs in the opposite direction. The volumes in primary and secondary subsystem are now defined as the R-VOLs and M-VOLs respectively. Note that Initial Copy of Entire Volume option must be specified.

(d) Quiesce the application at the secondary system.

(e) Confirm all the HRC asynchronous volume pairs are in Duplex status.

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(f) Remove entire HRC asynchronous configuration at the *secondary* subsystem:

① Make all the volume pairs Simplex by Delete Pair operation.
② Remove registration of the consistency group by Delete Group operation.
③ Remove MCU-RCU logical paths by Delete RCU operation.
④ Change the serial interface port to LCP mode.

(g) Establish HRC asynchronous in the original direction

① Change the operating mode of the communication facilities in opposite direction.
② Change the serial interface port of the primary subsystem to RCP mode.
③ Register the consistency group at the primary subsystem by Add Group operation.
④ Establish MCU-RCU path in opposite direction at the secondary subsystem by Add RCU operation. The secondary subsystem is now defined as the RCU.
⑤ Establish the HRC asynchronous volume pairs in the original direction. The volumes in primary and secondary subsystem are now defined as the M-VOLs and R-VOLs respectively. Note that Initial Copy of No Copy option may be specified.

(h) Make the primary subsystem online from the primary system and restart the application at the primary system.

(Note) Since the CNT channel extenders have the operating mode, they must be re-configured to change copy direction. The boxes (or nodes) to which the *current* MCU and RCU are connected must be set as channel-mode and device-mode respectively.

(2) Setting the Consistency Group for Switching Back

- For N-to-1 (N≥2) configuration, timer type of "None" muse be specified.
  - — None enables the consistency group across up to 4 RCUs to be established.
  - — However the update sequence consistency across the RCUs is not ensured.
- In 1-to-1 configuration, the update sequence consistency across all R-VOLs is ensured regardless of the timer type. However System is recommended if the secondary system can use the XRC time-stamping capability in order for the consistency time to be indicated.

Table 3.17.8-2 Timer Type for Switching Back

Original Configuration		Timer Time for Switching Back	
Number of MCU-RCU	Timer Type	XRC time-stamping capability at the secondary system?	
		Yes	No
N-to-1 (N≥2)	System	**None**	**None**
1-to-1	System	**System**	**None**
	Local	**Local**	**Local**

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3.17.9 Specification Table

Table 3.17.9-1 shown below describes the specifications and support stage of these items.

Table 3.17.9-1 Specification Table

No.	Items	Specification	Support Stage			
			1	2	3	4
Operating systems						
1-1	MVS of XRC support level	• Yes	Yes	Yes	Yes	Yes
1-2	Other M/F systems	• Yes	No	No	No	Yes
1-3	Open systems	• Yes	No	No	No	No
Support devices						
2-1	Disk subsystems (MCU/RCU)	• RAID300 only	Yes	Yes	Yes	Yes
2-2	DKC emulation type	• 3990-6 or -6E	Yes	Yes	Yes	Yes
		• 3990-3	No	No	Yes	Yes
2-3	Kind of physical drives	• No limitation	Yes	Yes	Yes	Yes
2-4	RAID levels	• RAID5	Yes	Yes	Yes	Yes
		• RAID1	No	No	Yes	Yes
2-5	Logical volume emulation	• 3390-1, -2, -3, -3R, -9	Yes	Yes	Yes	Yes
		• 3380 (for non-MVS systems)	No	No	Yes	Yes
2-6	CVS'ed logical volumes	•Yes	Yes	Yes	Yes	Yes

(To be continued)

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(Continued from preceding sheet)

Remote copy configuration						
3-1	Remote copy connections	• ESCON up to 43km	Yes	Yes	Yes	Yes
		• ESCD, MuxMaster available	Yes	Yes	Yes	Yes
		• CNT channel extenders	Yes	Yes	Yes	Yes
3-2	ESCON port setting	• MCU requires RCP setting	Yes	Yes	Yes	Yes
3-3	MCU-to-RCU connection	• 1-to-1	Yes	Yes	Yes	Yes
		• N-to-1 (N≤4)	No	No	No	No
3-4	Number of logical CU pairs	• Up to 16	Yes	Yes	Yes	Yes
3-5	Number of logical paths	• Up to 4 per a logical CU pair	Yes	Yes	Yes	Yes
3-6	Number of volume pairs	• Up to 1,024	Yes	Yes	Yes	Yes
3-7	Number of consistency groups	• 1	Yes	Yes	Yes	Yes
		• Up to 16 groups	No	No	Yes	Yes
3-8	Remote Copy volume pairs in a same unit stc.	• HRC(Synch./Semi-Synch.)	No	No	Yes	Yes
		• XRC	No	No	Yes	Yes
		• Multiplatform	No	No	No	Yes
		• HORC	No	No	No	Yes
Concurrent use of other functions for the HRC asynchronous volume pairs						
4-1	Concurrent copy	• Yes	Yes	Yes	Yes	Yes
4-2	Archival function	• Yes	Yes	Yes	Yes	Yes
4-3	DCR	• Yes	Yes	Yes	Yes	Yes
4-4	HMRCF	• R-VOL = HMRCF S-VOL	No	No	Yes	Yes
		• M-VOL = HMRCF S-VOL	No	No	Yes	Yes
		• M-VOL = HMRCF T-VOL (One side pair status is suspend)	No	No	Yes	Yes
4-5	HXRC	• XRC(R-VOL) = M-VOL	Yes	Yes	Yes	Yes
		• another pattern	No	No	No	No
4-6	HRC Synch./Semi-Synch.	• No	No	No	No	No
4-7	HODM	• No	No	No	No	No

(To be continued)

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(Continued from preceding sheet)

Detailed functions						
5-1	Timestamp information ***(Timer Type)***	• system TOD clock	Yes	Yes	Yes	Yes
		• Internal TOD clock	No	No	No	No
5-2	Volumes to be suspended against copy failure ***(Error Level)***	• All volumes	Yes	Yes	Yes	Yes
		• Only affected volume	Yes	Yes	Yes	Yes
5-3	Message when pair suspended (for M/F systems)	• SIM with unique REFCODE	Yes	Yes	Yes	Yes
		• PPRC console messages (IEA494I, IEA491E)	Yes	Yes	Yes	Yes
5-4	Information for monitoring HRC status	• Volume pair status	Yes	Yes	Yes	Yes
		• consistency time	Yes	Yes	Yes	Yes
		• consistency status (***Volume*** or ***Group)***	Yes	Yes	Yes	Yes
		• Alert to non-time-stamped writes ***(SEQCHK)***	Yes	Yes	Yes	Yes
5-5	RESYNC copy	• in addition to different cylinder maintained by an MCU and an RCU	Yes	Yes	Yes	Yes
		• in acceding order of cylinder number	Yes	Yes	Yes	Yes
		• including “in flight” data	Yes	Yes	Yes	Yes
		• under-condition of correction copy	No	No	Yes	Yes
5-6	Copy back to original volumes	• 1-to-1	Yes	Yes	Yes	Yes
		• 1-to-N	No	No	No	No
5-7	R-VOL R/W	• Yes	No	No	No	Yes

(To be continued)

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(Continued from preceding sheet)

Controlling/managing means						
6-1	Basic means	• Remote console P/P (RMC)	Yes	Yes	Yes	Yes
		• SVP (only for CE use)	Yes	Yes	Yes	Yes
		• PPRC TSO commands	No	Yes	Yes	Yes
		• PPRC console messages - IEA494I,IEA491E	Yes	Yes	Yes	Yes
		- DEVSERV PATH	Yes	Yes	Yes	Yes
6-2	RMC scripting means	• Yes	No	No	No	No
6-3	RMC operation log-out	• Yes	Yes	Yes	Yes	Yes
Control operations (✦: by either PPRC TSO commands or RMC, ✧: by RMC only)						
7-1	Volume basis operations, operable at MCU	✦ Add Pair	✧	✦	✦	✦
		✦ Delete Pair	✧	✦	✦	✦
		✦ Suspend Pair	✧	✦	✦	✦
		✦ Resume Pair	✧	✦	✦	✦
		✦ Pair Status	✧	✦	✦	✦
7-2	Group basis operations, operable at MCU	✧ Add Group	✧	✧	✧	✧
		✧ Delete Group	✧	✧	✧	✧
		✦ **Delete Pair with *Group***	No	No	✦	✦
		✦ **Suspend Pair with *Group***	No	No	✦	✦
		✧ Group Status	✧	✧	✧	✧
7-3	Volume basis operations, operable at RCU	✦ Delete Pair	✧	✦	✦	✦
		✦ Suspend Pair	✧	✦	✦	✦
		✦ Pair Status	✧	✦	✦	✦
7-4	Group basis operations, operable at RCU	✦ Delete pairs	✧	✦	✦	✦
		✦ Suspend Pair	✧	✦	✦	✦
7-5	Tuning parameters, operable at MCU	✧ Cache usage for recordset	✧	✧	✧	✧
		✧ Timeout for pending writes	✧	✧	✧	✧
		✧ Timeout for RCU ready	✧	✧	✧	✧
7-6	Statistics monitor, accumulated by MCU	✧ Amount of cache usage for recordset	✧	✧	✧	✧
		✧ Number of write per volume	✧	✧	✧	✧
		✧ Average data length	✧	✧	✧	✧

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3.18 HIHSM(Hitachi internal Hierarchical Storage Management)

3.18.1 HIHSM Overview

This document describes the function of HIHSM (Hitachi internal Hierarchical Storage Management) that is one of program products.

RAID system can be constructed by several types of physical drive and two types of RAID level (RAID1 and RAID5).

This combination of the type of physical drive and the type of RAID level provides the system that cost and performance are optimized to user environment. However, it is difficult to get information about actual utilization of physical drives in the RAID system unlike other disk subsystems.

(1) HIHSM provides solution of the problem and supports decision of users to determine system construction as described below.
  (a) Load balancing of system resources.
  Unbalance of utilization of system resources makes performance worse. HIHSM supports decision of optimized allocation of logical volumes to physical drives.
  (b) Migration of logical volumes optimized to access patterns to physical drives.
  For instance, RAID5 is suitable to sequential access, and RAID1 of DF3F1 is suitable to random access that is required small response time. HIHSM shows types of access pattern to physical drives clearly, and supports migration of logical volumes to suit the access pattern.

(2) HIHSM consists of following subfunction to achieve above purposes. Users can refer utilization of system resources monitored by monitor function, decide reallocation plan by using estimate function, and reallocate the logical volumes by volume moving (migration) function.
  (a) Monitor function monitors and shows utilization of system resources.
  (b) Estimate function estimates utilization of parity groups after migration of logical volumes.
  (c) Volume moving (migration) function moves logical volumes to specified parity groups.
  (d) Preset function makes a migration plan from information that users preset, and moves the logical volumes by the migration plan automatically.

3.18.2 Hardware requirements

WP-102B or WP-132B or hardware that equal to above types is needed as DKA.
If this hardware is not installed, you could not install this “HIHSM” Program Product.

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3.18.3 Monitor function

(1) Start and end of monitoring
Monitoring starts in DKC by direction from HIHSM utility window. The monitoring continues until the direction of ending the monitoring from HIHSM utility window.

(2) Monitoring information
Monitor function monitors utilization of system resources described below.
(a) CHP utilization and DKP utilization
(b) FBUS utilization and MBUS utilization
(c) DRR utilization
(d) Parity group utilization: Disk utilization of parity groups. The used time of physical drives in a parity groups
(e) Parity group utilization of each logical volume: The used time of physical drives of synchronous and asynchronous access on each logical volume, averaged by the number of physical drives in the parity group. Parity group utilization means sum of utilization of each logical volume in the parity group.
Above information is collected from DKC to SVP once a day automatically, or by requiring from users. The collected information of 3 months is stored in the hard disk of SVP. When the amount of the information is over 3 months, the oldest information is overwritten by new information.

(3) Viewing monitored information
Users can specify term and kind of the information to see in HIHSM utility window. In HIHSM utility window, average value and maximum value of the utilization of system resources are shown. The CHP, DKP, FBUS, MBUS, and DRR utilization are shown in one window, and parity group utilization is shown in another window.

Users can see parity group utilization and parity group utilization of each logical volume by following. (1) View parity group utilization in HIHSM main window. (2) Select one parity group in the window to show the utilization of each logical volume in the parity group.

Monitored information can be outputted to FD. User can see the outputted information by HIHSM viewer tool. The environment in which Microsoft Excel97 can work is needed to view the information. Microsoft Excel97 is a registered trademark of Microsoft corporation.

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3.18.4 Estimate function

Estimate function estimates changes of parity group utilization and parity group utilization of each logical volume after migration of the logical volume to specified parity group. Estimate function estimates the changes from the monitored information.

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3.18.5 Volume moving (migration) function

Volume moving (migration) function moves data in logical volume (source volume) to physical location of another logical volume (destination volume). Users specify the volumes in HIHSM utility window.

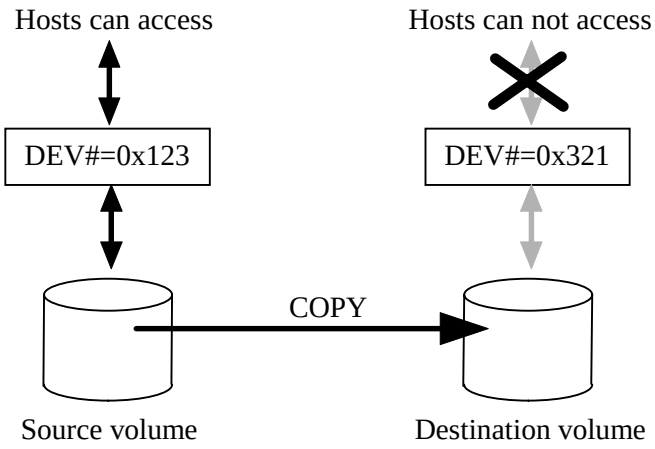

Fig. 3.18.5-1 Before moving

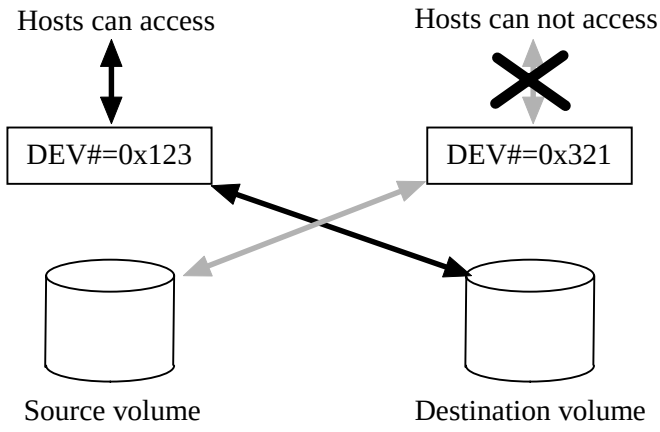

Fig. 3.18.5-2 After moving

(1) Volume moving function Overview

(a) Supported Volumes:

All types of emulation type supported by RAID except the following volumes.

- Volumes which are set as 3390-3A/B/C and so on
- Volumes which are set as Command Device
- Volumes which are used as HMRCF/HOMRCF pairs
- Volumes which are used as HRC/HORC pairs

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(b) Destination volumes:

Destination volumes must be specified to RESERVE in advance.
Users can specify the volumes to RESERVE by [Attribute] button in HIHSM utility window.
Hosts can not access the RESERVE volumes.
Users can confirm whether a volume is RESERVE or not by [Attribute] button in HIHSM utility window.
Notice: You cannot set the LUSE volumes as “Reserved”.

(c) Specifying Volumes:

Source volume and destination volume are specified by LDEV number.
An open volume also specified by one LDEV number. If the volumes are set as LUSE, you can specify by one LDEV number. HIHSM will migrate the LDEV which is one of a LUSE and its access is higher.

(d) Unit to moving:

One moving can be instructed by specifying one pair of volumes (LDEV).

(e) Moving of multi volumes:

Moving of volumes can be performed by repeating instruction about each volume.
Maximum 36 volumes can be accepted in the same time.
The maximum number of the sum of the HMRCF/HOMRCF total pairs and HIHSM migrating volume numbers is 64 or 512.
* In the case that the maximum number of HMRCF and HOMRCF pairs is 512.

(f) Abort moving:

Users can direct to abort the instructed moving before completion.
With aborting, the data in the destination volume is not guaranteed.
Users can direct to abort about each LDEV.

(g) Notice when the DKC is maintenance:

HIHSM sometimes fails the volume migration if the Cache or drive replacement installation or deinstallation is executed at the same time.

(2) Conditions for moving

Data moving is performed when all conditions about source volume and destination volume described bellow are satisfied.

(a) Both of the volumes have same emulation type.
(b) Both of the volumes have same size.
(c) There is no PIN data in the source volume.
(d) Both of the volumes are not blockade.
(e) Both of the volumes in same DKC.
(f) The volumes are not instructed to move already and not waiting to move.
(g) The volumes are not in the pair of volumes of HRC/HODM/HORC/HMRCF/HOMRCF.
Notice: After you set the HORC pair to “pairsplit -R”, the target volume of that HORC pair can be set as HIHSM’s reserved volume. If you operate HORC pairs, please be careful.
(h) The volumes are not HMRCF/HOMRCF’s reserved volumes.
(i) The volumes are not Command Device.
(j) The volumes are not set DCR.

(3) Viewing History

Users can see the history of volume moving (migration) by [History] button in HIHSM utility window.

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3.18.6 Decision of volume moving (migration)

HIHSM supports decision of users about disk system performance tuning by logical volume moving (migration). This section describes usage and points to notice about monitor function.

(1) Inspecting utilization of system resources
First of all, using monitoring function, a user investigates whether there exists overloaded resources, or imbalance of resource utilization. Then the user tunes resource utilization in the manner described in the following clause.

Note: due to average system resource utilization, there will be such a case as a portion of system performance will be negatively effected although total performance of a system will be improved. For example, if there exists RAID groups A and B of utilization 20% and 90% respectively, and if the utilization will become 55% and 55% if a logical volume residing in parity group B moves parity group A. Then response time of I/Os to parity group A will be increased while response time of I/Os and throughput to parity group B will be improved.

(2) Tuning FBUS/MBUS utilization
Since FBUSes and MBUSes are common resources in RAID300, migration of logical volumes does not improve system performance.

(3) Tuning CHP utilization
Migration of logical volumes does not improve CHP performance. Therefore if CHPs are overloaded on an average, the user should consider installation of new CHAs. And if the utilization of CHPs are imbalance, the user should consider that channel paths connecting to a CHA, which includes overloaded CHPs, is reconfigured into the connection to another CHA which includes CHPs of lower utilization.

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(4) Tuning DKP/DRR utilization

If utilization of DRRs or DKPs is in high average, the user should consider to install new DKAs and HDDs. After installation of DKAs and HDDs, logical volumes which had high traffic of write access (especially of sequential write access) should be migrated to a parity group in newly installed HDDs.

If utilization of each DKP are imbalance, the user should consider migration of logical volumes from current parity group deployed under a DKA pair of high utilization to one under a DKA pair of lower utilization. The estimate function cannot simulate the DKP utilization. Therefore this method should be applied under the prospect of large improvement. For example, there would be least improvement in case of slight difference of utilization of each DKP, or if DRRs are comparatively in high utilization.

(5) Tuning RAID group utilization

If parity groups are in high utilization, the user should consider to install new HDDs. After installation of HDDs, logical volume which had high traffic of I/Os should be migrated to a parity group in newly installed HDDs.

If utilization of each parity group are imbalance, the user should consider migration of logical volumes from current parity group of high utilization to the one of lower utilization.

These method should be applied under the prospect of large improvement. There would be least improvement in case of slight difference of utilization of each parity group, or if DRRs or DKPs are comparatively in high utilization.

When some kind of errors in the system, utilization of system resource can increase or be unbalanced.

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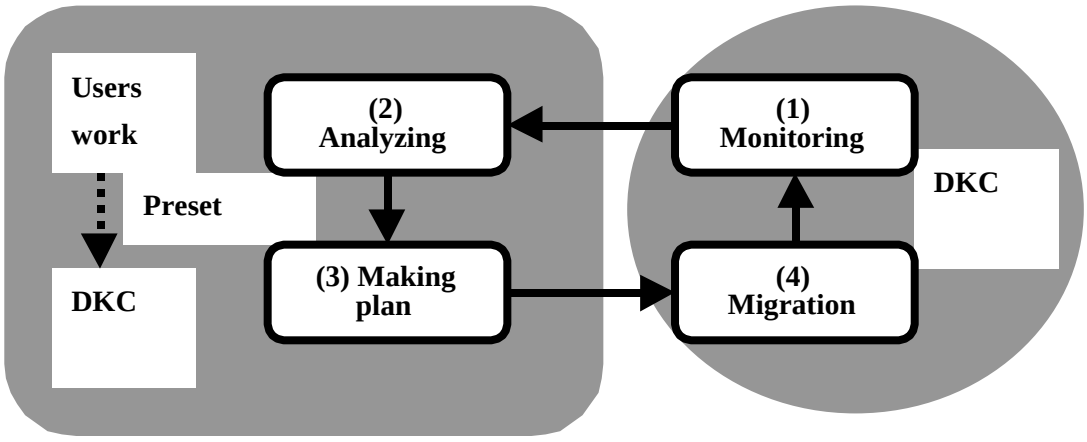
3.18.7 Preset function

(1) Preset function Overview
Preset function provides typical tuning method of HIHSM based on parameters given by users, and performs tuning plan automatically.

(2) Overview of tuning
Tuning by HIHSM can be done by following steps repeatedly.
(a) Monitoring information
(b) Analyzing information
(c) Making volume migration plan (decision of volume migration)
(d) Moving volume (migration)
(a') Monitoring information again to confirm condition and effect of the performed tuning.

Preset function eases users' work by providing typical tuning method of HIHSM based on parameters given by users, and performs tuning plan automatically. When (b) Analyzing and (c) Making plan are done by users, it can make fine tuning.



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(3) Process of tuning by preset function

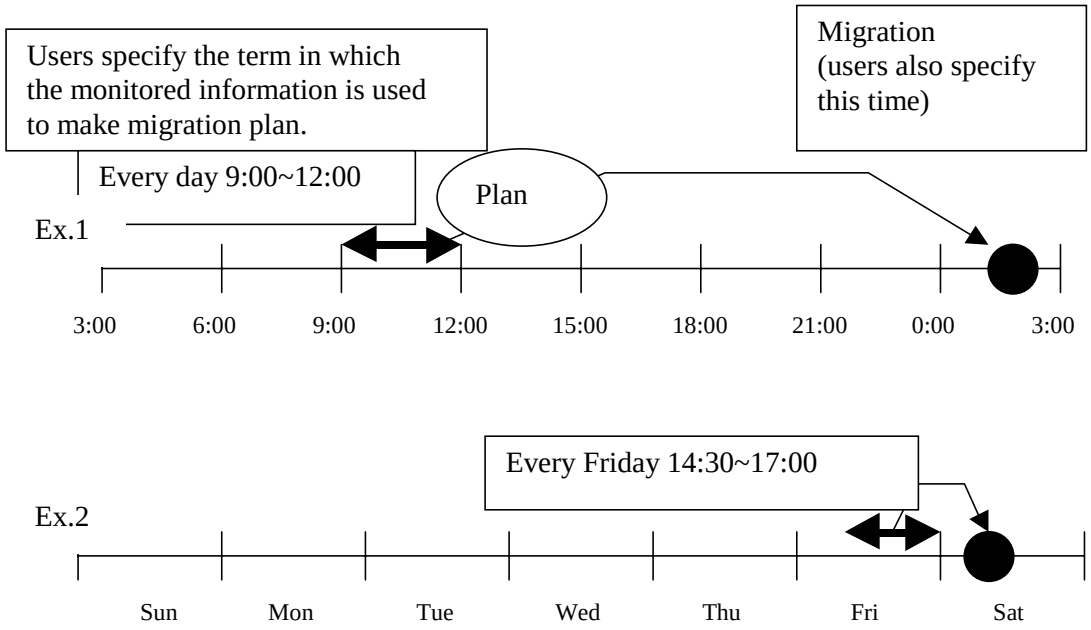
(a) Process of tuning by preset function

Preset function performs following two process.

- Making Plan: Detecting volumes that have problems by monitored information (disk utilization) and making plan of volume Migration
- Migration: Moving volume by the plan.

These two process are repeated by the cycle described above, and users give the cycle. In preset function, this cycle is supposed from one day to one week or several weeks.

Users can specify the term in which monitored information is used to make the plan from concern of users. For example, users can specify the highest load term in a day or in a week as the referred term to making plan.



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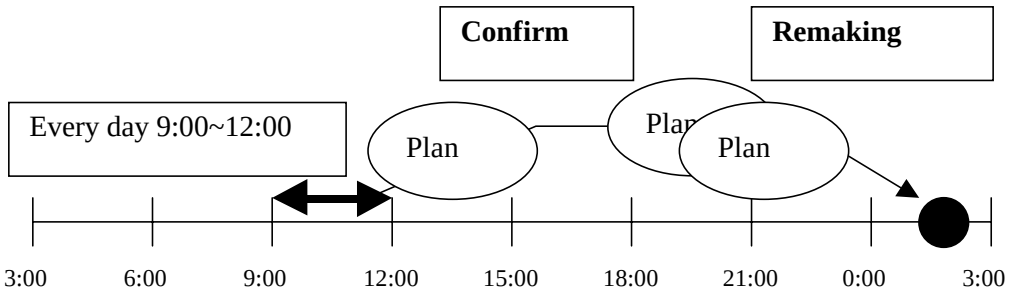
(b) Confirm and remaking of plan by users

From making plan by preset function until migration, users can see the plan and delete it if needed.

From making plan by preset function until migration, users can remake the plan manually with changing parameters.



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(4) Making plan

(a) Tuning based on disk utilization

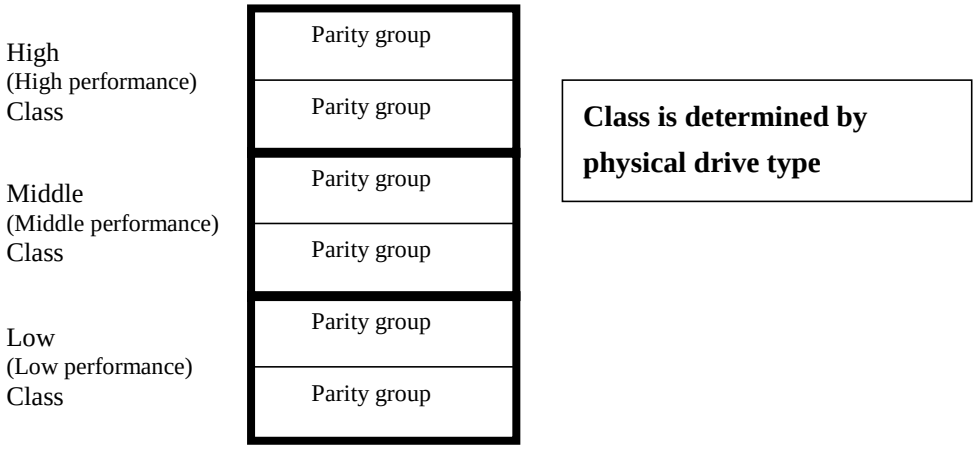
HIHSM monitors utilization of various system resources, but preset function uses disk utilization to make migration plan to solve disk neck as typical tuning method. Users should refer other information if needed.

Users also specified parameters for tuning based on disk utilization. Users should these parameters for their system (preset function provides default value for these parameters roughly).

(b) Hierarchy of parity groups and management by class

Parity groups in DKC have hierarchy by drive type and RAID type. HIHSM optimizes usage of this hierarchy. Preset function manages this hierarchy as class (parity group set).

Parity groups are divided into classes. The classes are ordered from high level (high performance) to low level (low performance). This classification is decided by performance of physical drive type of each parity group.



Preset function makes migration plan by the method described bellow. Preset function uses monitored information in the term that users specify to be referred to make the plan.

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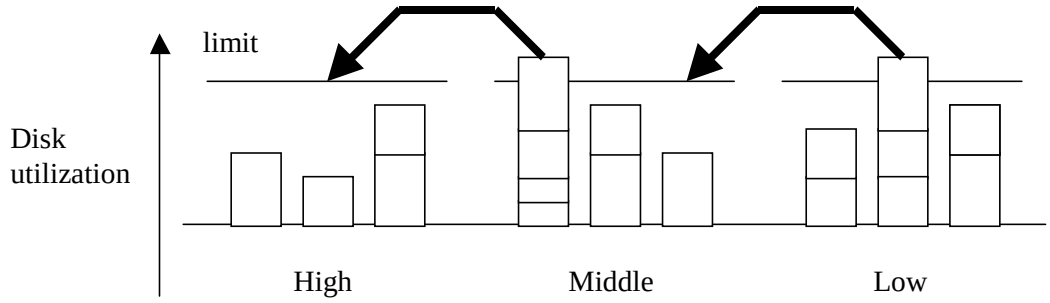
(b-1) Management by maximum limit of disk utilization

Maximum limit of disk utilization (parity group utilization) is specified to each parity group. Users should specify this limit for their system. (HIHSM uses default value but you should set them.)

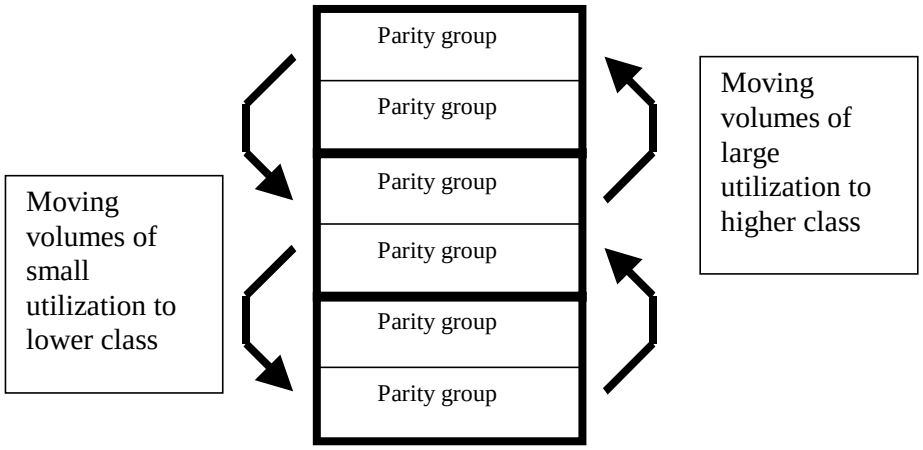
In parity groups that exceed this limit, preset function makes plan of moving volumes in this parity group from this parity groups to another parity group in higher class.

This avoids physical disk neck and provides load balancing of disk utilization.



(b-2) Selection of volumes to migration

In the migration plan described above, volumes of lager disk utilization are selected to be moved from the parity group that exceeds the limit to higher class. Moving lager utilization volumes to higher performance class is expected to makes large tuning effect. And lager utilization means lager amount of access from host, and this also makes large tuning effect. When the reserved (empty) volumes run short in the high class, volumes of smaller disk utilization are selected to be moved from higher class to lower class to make reserve volumes.



Preset function provides some criteria for you to select them, average of disk utilization, average of highest Nth value of disk utilization in the referred term, and a value considering sequential/random access pattern.

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(b-3) Specifying maximum limit of disk utilization by users

When same maximum limit of disk utilization described above is given to each class (parity group) classified by drive types, performance of each physical drive type makes performance of each class directly.

When the users specify the limit to each class with bias, users can make the difference of performance of classes lager or smaller.

Users can specify parity groups to fixed parity groups in which volumes do not be moved automatically. Preset function does not make a migration plan about fixed parity groups and volumes in the fixed parity groups.

(b-4) Notice for making plan

HIHSM can make these plan only on the following conditions.

- HIHSM can estimate the disk utilization against all migrated parity groups.
- The disk utilization rate of all migrated parity groups are not over the maximum rate. If the rate of one parity group is over. HIHSM could not make a plan.

(b-5) Notice for reference term

HIHSM could not use old information before the last volume migration in order to reduce the influence of performance by volume migration.

Therefore, HIHSM sometimes fails making a plan by lack of information.

(5) Moving (migration) by preset function

Preset function performs moving (migration) process once a day at time specified by users.

If there is a migration plan made by preset function at the time, volumes are moved by the plan.

Users can specify limit to moving to avoid overload by moving (data copy) process.

If the disk utilization of parity groups in which moving is started exceed the moving process limit, the moving in the parity group will be aborted.

Users can specify time limit to moving. If plan is not completed in the time limit, remain of plan will be executed in next day. If the new plan will be made until the next migration time, those remain plans will be deleted before making the plan.

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4. Power-on Sequences

4.1 IMPL Sequence

The IMPL sequence, which is executed when power is turned on, is executed by the following four modules:

(1) Boot loader
The boot loader performs the minimum necessary amount of initializations after a ROM boot. Subsequently, the boot loader expands the local memory loader from flash memory into local memory and transfers control to the local memory loader.

(2) Local memory loader
The local memory loader loads the Real Time OS load modules into local memory. Subsequently, the local memory loader transfers control to Real Time OS.

(3) Real Time OS
Real Time OS is a root task that initializes the tables in local memory that are used for intertask communications. Real Time OS also tests the hardware resources.

(4) DKC task
When the DKC task is created, it executes initialization routines. It initializes the most part of the environment it uses. When the environment is established so that the DKC task can start scanning, it notifies the SVP of a power event log. Subsequently, the DKC task turns on the power to the physical drives and, when the logical drives get ready, notifies the host processor of an NRTR.

The control flow of IMPL processing is shown in Fig. 4.1.

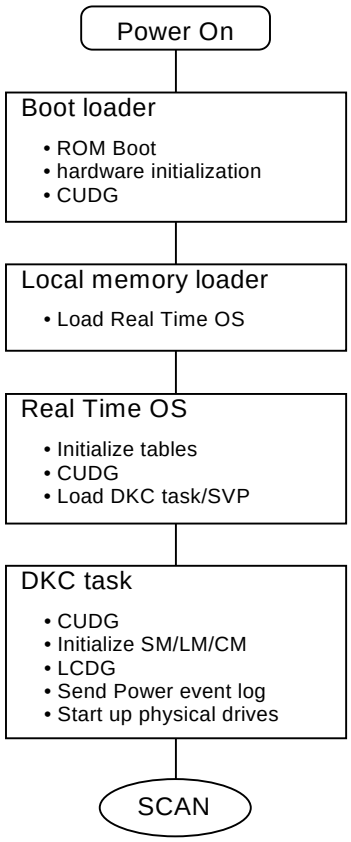

Fig. 4.1 IMPL Sequence

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4.2 Drive Power-on Sequence

An overcurrent condition will occur if two or more drives are started at the same time. To preclude the overcurrent condition, DKUs are started at the power supply level, one at a time, at approximately 10 second intervals (32 DKUs at a time in the maximum configuration).

When the logical devices get ready as the result of the startup of the physical drives, the host processor is notified to that effect.

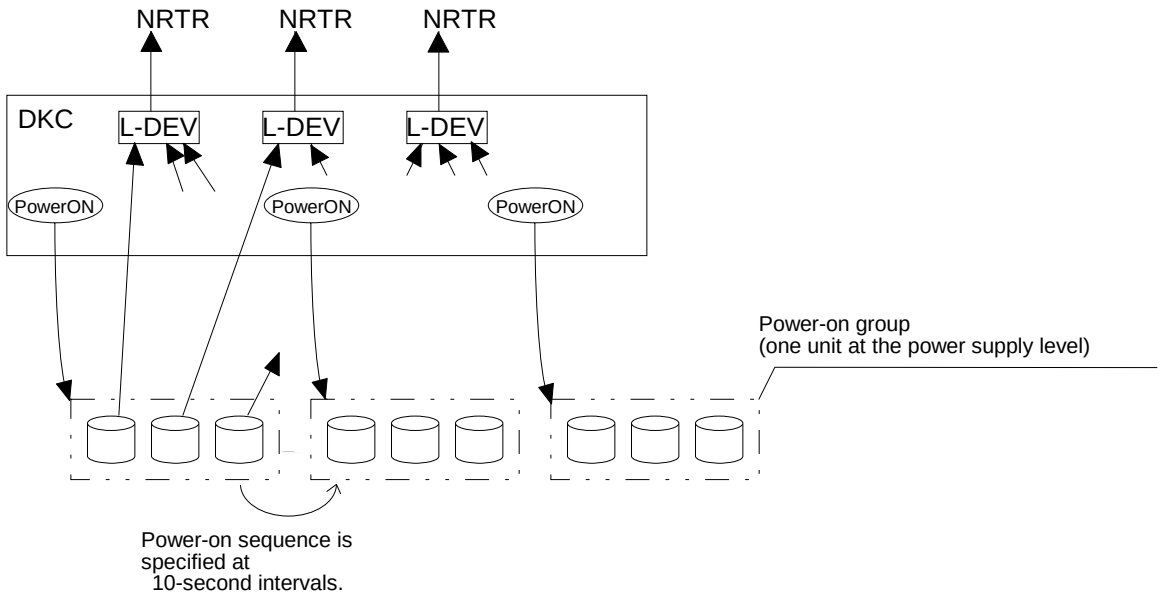

Fig. 4.2 Drive Power-on Sequence

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4.3 Planned Stop

When a power-off is specified by a maintenance personnel, this subsystem checks for termination of tasks that are blocked or running on all logical devices. When all the tasks are terminated, this subsystem disables the CHL and executes emergency destaging. If a track for which destaging fails (pinned track) occurs, this subsystem stores the pin information in shared memory. Subsequently, this subsystem saves the pin information, which is used as hand-over information, in flash memory, sends Power Event Log to the SVP, and notifies the hardware of the grant to turn off the power.

The hardware turns off main power when power-off grants for all processors are presented.

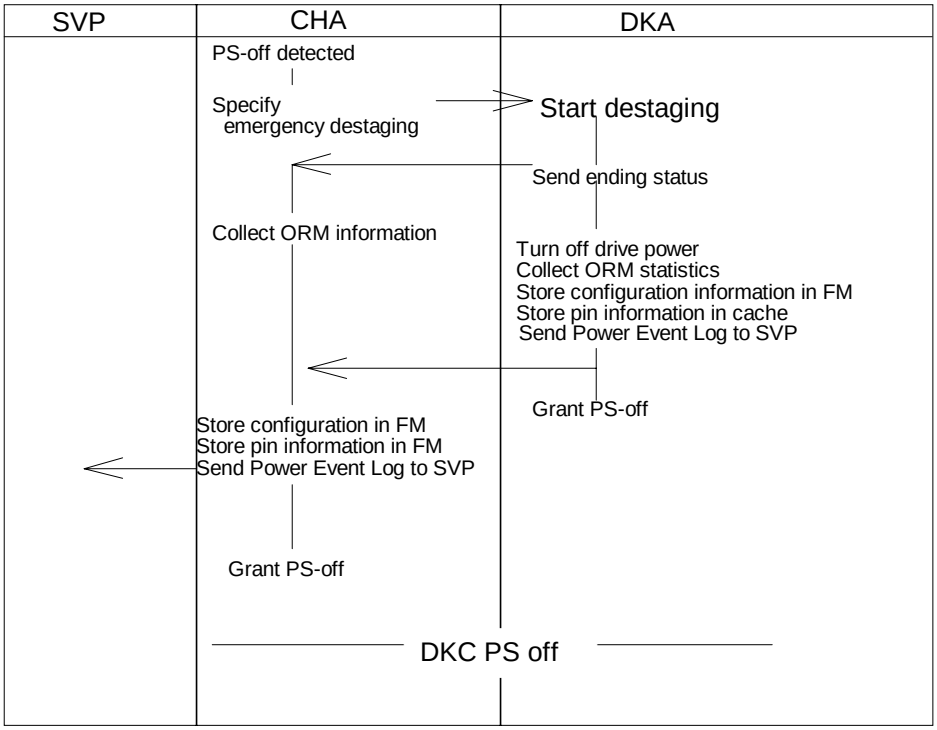

Fig. 4.3 Planned Stop Sequence

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5. Appendixes

5.1 Physical - Logical Device Matrixes

Relationship between disk drive number and parity group number (1/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-R10	HDU-R100	00/01	01-01	01-02	01-03
	HDU-R101	00/03	01-02	01-04	01-07
	HDU-R102	00/05	01-03	01-06	01-11
	HDU-R103	00/07	Spare	Spare	Spare
	HDU-R104	00/06	01-04	01-07	01-13
	HDU-R105	00/04	01-03	01-05	01-09
	HDU-R106	00/02	01-02	01-03	01-05
	HDU-R107	00/00	01-01	01-01	01-01
HDU-R11	HDU-R110	01/01	01-01	01-02	01-03
	HDU-R111	01/03	01-02	01-04	01-07
	HDU-R112	01/05	Spare	01-06	01-11
	HDU-R113	01/07	01-04	Spare	Spare
	HDU-R114	01/06	01-04	01-07	01-13
	HDU-R115	01/04	01-03	01-05	01-09
	HDU-R116	01/02	01-02	01-03	01-05
	HDU-R117	01/00	01-01	01-01	01-01
HDU-R12	HDU-R120	02/01	01-01	01-02	01-04
	HDU-R121	02/03	Spare	01-04	01-08
	HDU-R122	02/05	01-03	01-06	01-12
	HDU-R123	02/07	01-04	Spare	Spare
	HDU-R124	02/06	01-04	01-07	01-14
	HDU-R125	02/04	01-03	01-05	01-10
	HDU-R126	02/02	01-02	01-03	01-06
	HDU-R127	02/00	01-01	01-01	01-02
HDU-R13	HDU-R130	03/01	Spare	01-02	01-04
	HDU-R131	03/03	01-02	01-04	01-08
	HDU-R132	03/05	01-03	01-06	01-12
	HDU-R133	03/07	01-04	Spare	Spare
	HDU-R134	03/06	01-04	01-07	01-14
	HDU-R135	03/04	01-03	01-05	01-10
	HDU-R136	03/02	01-02	01-03	01-06
	HDU-R137	03/00	01-01	01-01	01-02

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Relationship between disk drive number and parity group number (2/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-R14	HDU-R140	04/01	02-01	02-02	02-03
	HDU-R141	04/03	02-02	02-04	02-07
	HDU-R142	04/05	02-03	02-06	02-11
	HDU-R143	04/07	Spare	02-08 (Spare)	02-15 (Spare)
	HDU-R144	04/06	02-04	02-07	02-13
	HDU-R145	04/04	02-03	02-05	02-09
	HDU-R146	04/02	02-02	02-03	02-05
	HDU-R147	04/00	02-01	02-01	02-01
HDU-R15	HDU-R150	05/01	02-01	02-02	02-03
	HDU-R151	05/03	02-02	02-04	02-07
	HDU-R152	05/05	Spare	02-06	02-11
	HDU-R153	05/07	02-04	02-08 (Spare)	02-15 (Spare)
	HDU-R154	05/06	02-04	02-07	02-13
	HDU-R155	05/04	02-03	02-05	02-09
	HDU-R156	05/02	02-02	02-03	02-05
	HDU-R157	05/00	02-01	02-01	02-01
HDU-R16	HDU-R160	06/01	02-01	02-02	02-04
	HDU-R161	06/03	Spare	02-04	02-08
	HDU-R162	06/05	02-03	02-06	02-12
	HDU-R163	06/07	02-04	02-08 (Spare)	02-16 (Spare)
	HDU-R164	06/06	02-04	02-07	02-14
	HDU-R165	06/04	02-03	02-05	02-10
	HDU-R166	06/02	02-02	02-03	02-06
	HDU-R167	06/00	02-01	02-01	02-02
HDU-R17	HDU-R170	07/01	Spare	02-02	02-04
	HDU-R171	07/03	02-02	02-04	02-08
	HDU-R172	07/05	02-03	02-06	02-12
	HDU-R173	07/07	02-04	02-08 (Spare)	02-16 (Spare)
	HDU-R174	07/06	02-04	02-07	02-14
	HDU-R175	07/04	02-03	02-05	02-10
	HDU-R176	07/02	02-02	02-03	02-06
	HDU-R177	07/00	02-01	02-01	02-02
HDU-R20	HDU-R200	00/09	05-01	05-01	05-01
	HDU-R201	00/0B	05-02	05-03	05-05
	HDU-R202	00/0D	05-03	05-05	05-09
	HDU-R203	00/08	05-01	05-07	05-13
	HDU-R204	00/0E	05-04	05-06	05-11
	HDU-R205	00/0C	05-03	05-04	05-07
	HDU-R206	00/0A	05-02	05-02	05-03

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Relationship between disk drive number and parity group number (3/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-R21	HDU-R210	01/09	05-01	05-01	05-01
	HDU-R211	01/0B	05-02	05-03	05-05
	HDU-R212	01/08	05-01	05-05	05-09
	HDU-R213	01/0E	05-04	05-07	05-13
	HDU-R214	01/0D	05-04	05-06	05-11
	HDU-R215	01/0C	05-03	05-04	05-07
	HDU-R216	01/0A	05-02	05-02	05-03
HDU-R22	HDU-R220	02/09	05-01	05-01	05-02
	HDU-R221	02/08	05-01	05-03	05-06
	HDU-R222	02/0C	05-03	05-05	05-10
	HDU-R223	02/0E	05-04	05-07	05-14
	HDU-R224	02/0D	05-04	05-06	05-12
	HDU-R225	02/0B	05-03	05-04	05-08
	HDU-R226	02/0A	05-02	05-02	05-04
HDU-R23	HDU-R230	03/08	05-01	05-01	05-02
	HDU-R231	03/0A	05-02	05-03	05-06
	HDU-R232	03/0C	05-03	05-05	05-10
	HDU-R233	03/0E	05-04	05-07	05-14
	HDU-R234	03/0D	05-04	05-06	05-12
	HDU-R235	03/0B	05-03	05-04	05-08
	HDU-R236	03/09	05-02	05-02	05-04
HDU-R24	HDU-R240	04/09	06-01	06-01	06-01
	HDU-R241	04/0B	06-02	06-03	06-05
	HDU-R242	04/0D	06-03	06-05	06-09
	HDU-R243	04/08	06-01	06-07	06-13
	HDU-R244	04/0E	06-04	06-06	06-11
	HDU-R245	04/0C	06-03	06-04	06-07
	HDU-R246	04/0A	06-02	06-02	06-03
HDU-R25	HDU-R250	05/09	06-01	06-01	06-01
	HDU-R251	05/0B	06-02	06-03	06-05
	HDU-R252	05/08	06-01	06-05	06-09
	HDU-R253	05/0E	06-04	06-07	06-13
	HDU-R254	05/0D	06-04	06-06	06-11
	HDU-R255	05/0C	06-03	06-04	06-07
	HDU-R256	05/0A	06-02	06-02	06-03

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Relationship between disk drive number and parity group number (4/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-R26	HDU-R260	06/09	06-01	06-01	06-02
	HDU-R261	06/08	06-01	06-03	06-06
	HDU-R262	06/0C	06-03	06-05	06-10
	HDU-R263	06/0E	06-04	06-07	06-14
	HDU-R264	06/0D	06-04	06-06	06-12
	HDU-R265	06/0B	06-03	06-04	06-08
	HDU-R266	06/0A	06-02	06-02	06-04
HDU-R27	HDU-R270	07/08	06-01	06-01	06-02
	HDU-R271	07/0A	06-02	06-03	06-06
	HDU-R272	07/0C	06-03	06-05	06-10
	HDU-R273	07/0E	06-04	06-07	06-14
	HDU-R274	07/0D	06-04	06-06	06-12
	HDU-R275	07/0B	06-03	06-04	06-08
	HDU-R276	07/09	06-02	06-02	06-04
HDU-L10	HDU-L100	08/01	03-01	03-02	03-03
	HDU-L101	08/03	03-02	03-04	03-07
	HDU-L102	08/05	03-03	03-06	03-11
	HDU-L103	08/07	Spare	Spare	Spare
	HDU-L104	08/06	03-04	03-07	03-13
	HDU-L105	08/04	03-03	03-05	03-09
	HDU-L106	08/02	03-02	03-03	03-05
	HDU-L107	08/00	03-01	03-01	03-01
HDU-L11	HDU-L110	09/01	03-01	03-02	03-03
	HDU-L111	09/03	03-02	03-04	03-07
	HDU-L112	09/05	Spare	03-06	03-11
	HDU-L113	09/07	03-04	Spare	Spare
	HDU-L114	09/06	03-04	03-07	03-13
	HDU-L115	09/04	03-03	03-05	03-09
	HDU-L116	09/02	03-02	03-03	03-05
	HDU-L117	09/00	03-01	03-01	03-01
HDU-L12	HDU-L120	0A/01	03-01	03-02	03-04
	HDU-L121	0A/03	Spare	03-04	03-08
	HDU-L122	0A/05	03-03	03-06	03-12
	HDU-L123	0A/07	03-04	Spare	Spare
	HDU-L124	0A/06	03-04	03-07	03-14
	HDU-L125	0A/04	03-03	03-05	03-10
	HDU-L126	0A/02	03-02	03-03	03-06
	HDU-L127	0A/00	03-01	03-01	03-02

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Relationship between disk drive number and parity group number (5/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-L13	HDU-L130	0B/01	Spare	03-02	03-04
	HDU-L131	0B/03	03-02	03-04	03-08
	HDU-L132	0B/05	03-03	03-06	03-12
	HDU-L133	0B/07	03-04	Spare	Spare
	HDU-L134	0B/06	03-04	03-07	03-14
	HDU-L135	0B/04	03-03	03-05	03-10
	HDU-L136	0B/02	03-02	03-03	03-06
	HDU-L137	0B/00	03-01	03-01	03-02
HDU-L14	HDU-L140	0C/01	04-01	04-02	04-03
	HDU-L141	0C/03	04-02	04-04	04-07
	HDU-L142	0C/05	04-03	04-06	04-11
	HDU-L143	0C/07	Spare	04-08 (Spare)	04-15 (Spare)
	HDU-L144	0C/06	04-04	04-07	04-13
	HDU-L145	0C/04	04-03	04-05	04-09
	HDU-L146	0C/02	04-02	04-03	04-05
	HDU-L147	0C/00	04-01	04-01	04-01
HDU-L15	HDU-L150	0D/01	04-01	04-02	04-03
	HDU-L151	0D/03	04-02	04-04	04-07
	HDU-L152	0D/05	Spare	04-06	04-11
	HDU-L153	0D/07	04-04	04-08 (Spare)	04-15 (Spare)
	HDU-L154	0D/06	04-04	04-07	04-13
	HDU-L155	0D/04	04-03	04-05	04-09
	HDU-L156	0D/02	04-02	04-03	04-05
	HDU-L157	0D/00	04-01	04-01	04-01
HDU-L16	HDU-L160	0E/01	04-01	04-02	04-04
	HDU-L161	0E/03	Spare	04-04	04-08
	HDU-L162	0E/05	04-03	04-06	04-12
	HDU-L163	0E/07	04-04	04-08 (Spare)	04-16 (Spare)
	HDU-L164	0E/06	04-04	04-07	04-14
	HDU-L165	0E/04	04-03	04-05	04-10
	HDU-L166	0E/02	04-02	04-03	04-06
	HDU-L167	0E/00	04-01	04-01	04-02
HDU-L17	HDU-L170	0F/01	Spare	04-02	04-04
	HDU-L171	0F/03	04-02	04-04	04-08
	HDU-L172	0F/05	04-03	04-06	04-12
	HDU-L173	0F/07	04-04	04-08 (Spare)	04-16 (Spare)
	HDU-L174	0F/06	04-04	04-07	04-14
	HDU-L175	0F/04	04-03	04-05	04-10
	HDU-L176	0F/02	04-02	04-03	04-06
	HDU-L177	0F/00	04-01	04-01	04-02

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Relationship between disk drive number and parity group number (6/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-L20	HDU-L200	08/09	07-01	07-01	07-01
	HDU-L201	08/0B	07-02	07-03	07-05
	HDU-L202	08/0D	07-03	07-05	07-09
	HDU-L203	08/08	07-01	07-07	07-13
	HDU-L204	08/0E	07-04	07-06	07-11
	HDU-L205	08/0C	07-03	07-04	07-07
	HDU-L206	08/0A	07-02	07-02	07-03
HDU-L21	HDU-L210	09/09	07-01	07-01	07-01
	HDU-L211	09/0B	07-02	07-03	07-05
	HDU-L212	09/08	07-01	07-05	07-09
	HDU-L213	09/0E	07-04	07-07	07-13
	HDU-L214	09/0D	07-04	07-06	07-11
	HDU-L215	09/0C	07-03	07-04	07-07
	HDU-L216	09/0A	07-02	07-02	07-03
HDU-L22	HDU-L220	0A/09	07-01	07-01	07-02
	HDU-L221	0A/08	07-01	07-03	07-06
	HDU-L222	0A/0C	07-03	07-05	07-10
	HDU-L223	0A/0E	07-04	07-07	07-14
	HDU-L224	0A/0D	07-04	07-06	07-12
	HDU-L225	0A/0B	07-03	07-04	07-08
	HDU-L226	0A/0A	07-02	07-02	07-04
HDU-L23	HDU-L230	0B/08	07-01	07-01	07-02
	HDU-L231	0B/0A	07-02	07-03	07-06
	HDU-L232	0B/0C	07-03	07-05	07-10
	HDU-L233	0B/0E	07-04	07-07	07-14
	HDU-L234	0B/0D	07-04	07-06	07-12
	HDU-L235	0B/0B	07-03	07-04	07-08
	HDU-L236	0B/09	07-02	07-02	07-04
HDU-L24	HDU-L240	0C/09	08-01	08-01	08-01
	HDU-L241	0C/0B	08-02	08-03	08-05
	HDU-L242	0C/0D	08-03	08-05	08-09
	HDU-L243	0C/08	08-01	08-07	08-13
	HDU-L244	0C/0E	08-04	08-06	08-11
	HDU-L245	0C/0C	08-03	08-04	08-07
	HDU-L246	0C/0A	08-02	08-02	08-03

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Relationship between disk drive number and parity group number (7/7)

HDD BOX number	Disk drive number	C#/R#	Parity group number		
			RAID5		RAID1
			6D+1P	3D+1P	
HDU-L25	HDU-L250	0D/09	08-01	08-01	08-01
	HDU-L251	0D/0B	08-02	08-03	08-05
	HDU-L252	0D/08	08-01	08-05	08-09
	HDU-L253	0D/0E	08-04	08-07	08-13
	HDU-L254	0D/0D	08-04	08-06	08-11
	HDU-L255	0D/0C	08-03	08-04	08-07
	HDU-L256	0D/0A	08-02	08-02	08-03
HDU-L26	HDU-L260	0E/09	08-01	08-01	08-02
	HDU-L261	0E/08	08-01	08-03	08-06
	HDU-L262	0E/0C	08-03	08-05	08-10
	HDU-L263	0E/0E	08-04	08-07	08-14
	HDU-L264	0E/0D	08-04	08-06	08-12
	HDU-L265	0E/0B	08-03	08-04	08-08
	HDU-L266	0E/0A	08-02	08-02	08-04
HDU-L27	HDU-L270	0F/08	08-01	08-01	08-02
	HDU-L271	0F/0A	08-02	08-03	08-06
	HDU-L272	0F/0C	08-03	08-05	08-10
	HDU-L273	0F/0E	08-04	08-07	08-14
	HDU-L274	0F/0D	08-04	08-06	08-12
	HDU-L275	0F/0B	08-03	08-04	08-08
	HDU-L276	0F/09	08-02	08-02	08-04

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5.2 Commands

This subsystem commands are classified into the following eight categories:

(1) Read commands
The read commands transfer data read from devices to channels.

(2) Write commands
The write commands transfer data from channels to devices.

(3) Search commands
The search commands follow a control command and logically search for target data.

(4) Control commands
The control commands include the seek commands that position the head at the specified cylinder and head positions. The SET SECTOR command that executes latency time processing, the LOCATE RECORD command that specifies the operation of the ECKD command, the SET FILE MASK commands that defines the permissible ranges for the write and seek operations, and the DEFINE EXTENT command that defines the permissible ranges for the write and seek operations and that defines the cache access mode.

(5) Sense commands
The sense commands transfer sense bytes and device specifications.

(6) Path control commands
The path control commands enable and disable the exclusive control of devices.

(7) TEST I/O command
The TEST I/O command transfers the specified device and its path state to a given channel in the form of DSBs.

(8) Subsystem commands
The subsystem commands include those which define cache control information in the DKCs and those which transfer cache-related information to channels.

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Table 5.2 Command Summary (1/3)

Command Name			Command Code	
			Single Track	Multitrack
Read commands	READ INITIAL PROGRAM LOAD	(RD IPL)	02	
	READ HOME ADDRESS	(RD HA)	1A	9A
	READ RECORD ZERO	(RD R0)	16	96
	READ COUNT,KEY,DATA	(RD CKD)	1E	8E
	READ KEY,DATA	(RD KD)	0E	86
	READ DATA	(RD D)	06	92
	READ COUNT	(RD C)	12	
	READ MULTIPLE COUNT,KEY AND DATA	(RD MCKD)	5E	
	READ TRACK	(RD TRK)	DE	
	READ SPECIAL HOME ADDRESS	(RD SP HA)	0A	
WRITE commands	WRITE HOME ADDRESS	(WR HA)	19	
	WRITE RECORD ZORO	(WR R0)	15	
	WRITE COUNT,KEY,DATA	(WR CKD)	1D	
	WRITE COUNT,KEY,DATA NEXT TRACK	(WR CKD NT)	9D	
	ERASE	(ERS)	11	
	WRITE KEY AND DATA	(WR KD)	0D	
	WRITE UPDATE KEY AND DATA	(WR UP KD)	8D	
	WRITE DATA	(WR D)	05	
	WRITE UPDATE DATA	(WR UP D)	85	
	WRITE SPECIAL HOME ADDRESS	(WR SP HA)	09	
SEARCH commands	SEARCH HOME ADDRESS	(SCH HA EQ)	39	B9
	SEARCH ID EQUAL	(SCH ID EQ)	31	B1
	SEARCH ID HIGH	(SCH ID HI)	51	D1
	SEARCH ID HIGH OR EQUAL	(SCH ID HE)	71	F1
	SEARCH KEY EQUAL	(SCH KEY EQ)	29	A9
	SEARCH KEY HIGH	(SCH KEY HI)	49	C9
	SEARCH KEY HIGH OR EQUAL	(SCH KEYD HE)	69	E9

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Table 5.2 Command Summary(2/3)

Command Name			Command Code	
			Single Track	Multitrack
CONTROL commands	DEFINE EXTENT	(DEF EXT)	63	
	LOCATE RECORD	(LOCATE)	47	
	LOCATE RECORD EXTENDED	(LOCATE EXT)	4B	
	SEEK	(SK)	07	
	SEEK CYLINDER	(SK CYL)	0B	
	SEEK HEAD	(SK HD)	1B	
	RECALIBRATE	(RECAL)	13	
	SET SECTOR	(SET SECT)	23	
	SET FILE MASK	(SET FM)	1F	
	READ SECTOR	(RD SECT)	22	
	SPACE COUNT	(SPC)	0F	
	NO OPERATION	(NOP)	03	
	RESTORE	(REST)	17	
	DIAGNOSTIC CONTROL	(DIAG CTL)	F3	
SENSE commands	SENSE	(SNS)	04	
	READ AND RESET BUFFERED LOG	(RRBL)	A4	
	SENSE IDENTIFICATION	(SNS ID)	E4	
	READ DEVICE CHARACTERISTICS	(RD CHR)	64	
	DIAGNOSTIC SENSE/READ	(DIAG SNS/RD)	C4	
PATH CONTROL commands	DEVICE RESERVE	(RSV)	B4	
	DEVICE RELEASE	(RLS)	94	
	UNCONDITIONAL RESERVE	(UNCON RSV)	14	
	SET PATH GROUP ID	(SET PI)	AF	
	SENSE SET PATH GROUP ID	(SNS PI)	34	
	SUSPEND MULTIPATH RECONNECTION	(SUSP MPR)	5B	
	RESET ALLEGIANCE	(RST ALG)	44	
TST I/O	TEST I/O	(TIO)	00	
TIC	TRANSFER IN CHANNEL	(TIC)	X8	

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Table.5.2 Command Summary(3/3)

Command Name			Command Code	
			Single Track	Multitrack
SUBSYSTEM commands	SET SUBSYSTEM MODE	(SET SUB MD)	87	
	PERFORM SUBSYSTEM FUNCTION	(PERF SUB FUNC)	27	
	READ SUBSYSTEM DATA	(RD SUB DATA)	3E	
	SENSE SUBSYSTEM STATUS	(SNS SUB STS)	54	
	READ MESSAGE ID	(RD MSG IDL)	4E	

Note 1: Command Reject, format 0, and message 1 are issued for commands that are not listed in this table.
Note 2: TEST I/O is a CPU instruction and cannot be specified directly. However, it appears as a command to the
interface.
Note 3: TIC is a type of command but runs only on a channel. It can never be visible to the interface.

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5.3 Comparison of pair status on SVP, Remote Console, Raid Manager

Table.5.3 Comparison of pair status on SVP, Remote Console, Raid Manager

NO	Event	Status on Raid Manager	Status on SVP, Remote Console
1	Simplex Volume	P-VOL: SMPL S-VOL: SMPL	P-VOL: SMPL S-VOL: SMPL
2	Copying LUSE Volume Partly completed (SYNC only)	P-VOL: PDUB S-VOL: PDUB	P-VOL: PDUB S-VOL: PDUB
3	Copying Volume	P-VOL: COPY S-VOL: COPY	P-VOL: COPY S-VOL: COPY
4	Pair volume	P-VOL: PAIR S-VOL: PAIR	P-VOL: PAIR S-VOL: PAIR
5	Pairsplit operation to P-VOL	P-VOL: PSUS S-VOL: SSUS	P-VOL: PSUS (S-VOL by operator) S-VOL: PSUS (S-VOL by operator)
6	Pairsplit operation to S-VOL	P-VOL: PSUS S-VOL: PSUS	P-VOL: PSUS (S-VOL by operator) S-VOL: PSUS (S-VOL by operator)
7	Pairsplit -P operation (*1) (P-VOL failure, SYNC only)	P-VOL: PSUS S-VOL: SSUS	P-VOL: PSUS (P-VOL by operator) S-VOL: PSUS (by MCU)
8	Pairsplit -R operation (*1)	P-VOL: PSUS S-VOL: SMPL	P-VOL: PSUS(Delete pair to RCU) S-VOL: SMPL
9	P-VOL Suspend (failure)	P-VOL: PSUE S-VOL: SSUS	P-VOL: PSUE (S-VOL failure) S-VOL: PSUE (S-VOL failure)
10	S-VOL Suspend (failure)	P-VOL: PSUE S-VOL: PSUE	P-VOL: PSUE (S-VOL failure) S-VOL: PSUE (S-VOL failure)
11	PS ON failure	P-VOL: PSUE S-VOL: ------	P-VOL: PSUE (MCU IMPL) S-VOL: ------
12	Copy failure (P-VOL failure)	P-VOL: PSUE S-VOL:SSUS	P-VOL: PSUE (Initial copy failed) S-VOL: PSUE (Initial copy failed)
13	Copy failure (S-VOL failure)	P-VOL: PSUE S-VOL:PSUE	P-VOL: PSUE (Initial copy failed) S-VOL: PSUE (Initial copy failed)
14	Suspending volume (ASYNC only)	P-VOL: COPY or PAIR or PSUE S-VOL: COPY or PAIR or PSUE	P-VOL: Suspending S-VOL: Suspending
15	Deleting(ASYNC only)	P-VOL: COPY or PAIR or SUS S-VOL: COPY or PAIR or SUS	P-VOL: Deleting S-VOL: Deleting
16	RCU accepted the notification of MCU's P/S-OFF	P-VOL: ------ S-VOL:SSUS	P-VOL: ------ S-VOL: PSUE (MCU P/S OFF)

*1 Operation on Raid Manager

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GLOSSARY SECTION

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ACC (Action Code); Refer to the ACC section.

ADP (ADaPter); Hardware that connects the LCM to the CHA physically and logically. The ADP contains 256 MB of internal buffer.

AP; Short for Application Program.

BSA (BUS Adapter); Hardware that connects the PCBs, FBUS, and MBUS.

CACHE; Intermediate buffer between the channels and drives. CACHE has a maximum of 16 GB (8 GB x 2 areas) of capacity. It is available and controlled as two areas of cache (cache A and cache B). It is fully battery-backed (48 hours).

CHA(CHannel Adapter); Provides the channel interface control functions and intercache data transfer functions. It is used to convert the data format between CKD and FBA. The CHA contains an internal processor and 128 bytes of edit buffer memory.

CHA (Prog.); Is a channel command control layer that processors channel commands and controls cache and data transfer operations. It is located in the CHA. CHA Prog is recognized by the logical volume number and logical block number.

CHA PCB (CHannel Adapter PaCkage Board); A PCB used to connect to the host processor. There are two types of CHA PCBs, one for optical channels and the other for metal channels. The CHA PCB for optical channels is provided with the LCM in its optical link control unit.

CM (Cache Memory); Refer to 'CACHE'.

COLD; Status that the battery is off.

CPM; Short for Cache Port Master. (Cluster for mounting the Cache Box Cased for mounting more that 6 GB of Cache memory package for connecting Cache Box.)

CPS; Short for Cache Port Slave. (Cluster for mounting the Cache Box Cased for mounting more that 6 GB of Cache memory package for connecting Cache Box.)

Disruptive; Status that there is no I/O from the host (Off-line).

DKA (DisK Adapter); Provides the control functions for data transfer between drives and cache. The DKA contains DRR (Data Recover and Reconstruct) , a party generator circuit. It supports four SCSI buses and offers 64 KB of buffer for each SCSI bus. The DKA also has an internal processor.

DMA0; Controls the data transfer between the ADP and CACHE.

DMA1; Controls data transfer between the buffers in the DKA and CACHE.

DMA2; Controls data transfer between the buffers in the DKA and drives.

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DMP (Disk Master Program); Is a RAID control layer and provides cache control, logical-to-physical address translation, and RAID control functions. DMP is located in the DKA. DMP is recognized by the logical volume number and logical blocked number.

DRIVE; Represents a SCSI drive whose internal data format is FBA (fixed length).

DSP (Disk Slave Program); Is a SCSI drive control layer and provides SCSI control, drive data transfer control, and parity control functions. It is located in the DKA . DSP is recognized by the physical volume number and LBA number.

ESC (Error Source Code); Refer to ACC section.

FBUS (Fast I/O BUS); Carries the data that is transferred between the adapter and cache. It is duplexed using two physical buses (H and L sides) each of which provides a data transfer rate of 200 MB per second. The L side bus is also used to access shared memory during interprocessor communication.

FM (Flush Memory); Each microprocessor has FM. FM is non-volatile memory which contains microcodes.

FPC (Failure Parts Code); Refer to the ACC section.

HOT; Status that the battery is on.

LCM (Link Control Module); Provides link control functions such as conversion of formats between optical and metal channel interfaces. The LCM contains an internal processor (LCP) and 2 KB of buffer memory.

LCP (Link Control Processor); Controls the optical links. LCP is identical to that which is used in the DKC90. LCP is located in the LCM.

LIVE INS; Short for Live Insertion, it is the signal cable for detecting hot-plugging.

LM (Local Memory); Each microprocessor has LM.

Main task; Consists of this subsystem control tasks (CHA Prog., DMP, DSP) and the SC kernel tasks that supervise the DKC control tasks. They switch the control tasks by making use of the SC kernel's task switching facility.

MBUS (Multi CPU BUS); Used to support interprocessor communication between the CHA Prog., DMPs, DSPs, and shared memory.

MFC (Main Failure Code); Refer to the ACC section.

Non-Disruptive; Status that there are some I/Os from the host (On-line).

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RCHA; Short for RAID Channel Adapter, it is the name of a LSI in the CHA.

SBC (Sub BUS); A data bus in the DKA.

SCA (SCSI Adapter); Controls SCSI packets.

Shared memory; Stores the shared information about the subsystem and the cache control information (director names). This type of information is used for the exclusive control of the subsystem. Like CACHE , shared memory is controlled as two areas of memory and fully non-volatile (sustained for approximately 96 hours). The size of shared memory must be 16 MB for 1 GB of cache.

SM (Shared Memory); Refer to 'Shared memory'.

SMP; Shared Memory Port

SPC (SCSI Protocol Controller); A SCSI initiator that controls the SCSI devices.

SVP Communication tasks; Controls the communication with the SVP.

Real Time OS; A basic OS for controlling the RISC processor. Its primary tasks are to control and switch between the main tasks and SVP communication tasks.

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ACC (ACTION CODE) SECTION

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5 Reference ACC05-10
Error Recovery Procedure when the other PCB is nominated ACC05-10

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1 Action Code Outline

Action Code (ACC) is made from SSB/SIM and shows possible failure parts from the log.
ACC consists of 4 bytes data. Up to 64 ACCs are generated in priority order and can point out max. 64 possible failure parts.
The way to get ACC is shown in following figure.
The procedure of parts replacement is shown in **REPLACE section** with WORK ID that consist in ACC.
The PCB name is shown in **LOCATION section**.

way to get	Kind of LOG data	
	Failure	Diagnosis
SVP Log display	SSB or SIM log	SSB or DIAG log
Remote function	SSB or SIM log	SSB log

(ACC is not created from SSB/DIAG log at presence.)

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2 Action Code Format

An ACC format is shown below.

0	1	2 3
WIC	PKC	PLC

WIC (Work Identified Code) : Shows a rough action to be taken.
(See ACC03-10)

PKC (Parts Kind Code) : Shows a possible failure part (function, performance).
(See ACC03-20 for WIC = 0X/1X)

PLC (Parts Location Code) : Shows a failure part location.

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3 List of WIC

WIC	Contents	Sheet No.	Remark
0X	Replacement	ACC04-10 ~ 04-780	Refer to ACC list
1X	Hot-replacement	ACC04-10 ~ 04-780	Refer to ACC list
2X	Reserved	—	
3X	Reserved	—	
4X	Reserved	—	
5X	Reserved	—	
6X	Reserved	—	
7X	Reserved	—	
8X	Reference to manual	ACC04-790	
9X	Collection of information	ACC04-800	
AX	Reserved	—	
BX	SW operation	ACC04-810	
CX	Execution of CUDG	ACC04-820	
DX	Breach of restriction	ACC04-825	
EX	Setting work	ACC04-830	
FX	Other	ACC04-840	

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3.1 List of PKC for WIC = 0X/1X

A list of PKC for WIC = 0X/1X (Replacement/Hot-replacement) is shown below.

PKC	Contents	Sheet No.
0X	Un-analizable	ACC04-10
1X	Processor	ACC04-20 ~ 04-50
2X	Memory	ACC04-60 ~ 04-200
3X	DKC power supply	ACC04-210 ~ 04-220
4X	DKU power supply	ACC04-230 ~ 04-250
5X	Drive	ACC04-260 ~ 04-585
6X	DKC special parts	ACC04-680 ~ 04-690
7X	DKU special parts	ACC04-700 ~ 04-760
8X	SVP special parts	ACC04-770
9X	Micro-program	ACC04-780
AX	Reserved	—
BX	Reserved	—
CX	Reserved	—
DX	Reserved	—
EX	Reserved	—
FX	Reserved	—

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4 List of ACC

4.1 WIC = 0X/1X (Replacement/Hot-replacement)

4.1.1 PKC = 0X (Un-analizable)

Table 4.1.1 List of ACC (Un-analizable) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive*		Nondisruptive*
				Hot*	Cold*	Hot
10000000		Data invalid				
10000100		SSB F/M undefined				
10000200		Un-analizable				
10000400		Configuration error				

*: Disruptive ----------Host I/O is not Activity (Channel Path off-line)
Nondisruptive----------Host I/O is Activity
Hot----------Power on State
Cold ----------Power off State

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4.1.2 PKC = 1X (Processor)

Table 4.1.2 List of ACC (Processor) (1/5)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10100000	CHA-1P	Performance Fibre Channel Adapter PCB	Performance Fibre CH (2MP)	RCH6		RCH6
10101000	CHA-1Q	↑	Performance Fibre CH (2MP) (OPTION)	↑		↑
10102000	CHA-1R	↑	Performance Fibre CH (2MP) (OPTION)	↑		↑
10103000	CHA-1S	↑	Performance Fibre CH (2MP) (OPTION)	↑		↑
10108000	CHA-2V	↑	Performance Fibre CH (2MP)	↑		↑
10109000	CHA-2W	↑	Performance Fibre CH (2MP) (OPTION)	↑		↑
1010A000	CHA-2X	↑	Performance FIbre CH (2MP) (OPTION)	↑		↑
1010B000	CHA-2Y	↑	Performance Fibre CH (2MP) (OPTION)	↑		↑
10110000		The change to other type of Channel Adapter PCB is impossible.	The change to Fibre CH from Performance Fibre CH is impossible. It must be replaced with Performance Fibre CH.			
10118000		The change to other type of Channel Adapter PCB is impossible.	The change to Performance Fibre CH from Fibre CH is impossible because the microprogram does not support Performance Fibre CH. It must be replaced with Fibre CH.			

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Table 4.1.2 List of ACC (Processor) (2/5)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10150000	TM-1N/1Z	TM-PCB	LOGIC Terminator (Front)	RTM1		RTM1
10158000	TM-2A/2M	↑	LOGIC Terminator (Rear)	RTM2		RTM2
10160000		RAID5 Booster				
10160100		All of Channel Adapter PCBs	Refer to “Isolating a Failed Part (TRBL03-10).			
10160200		All of Disk Adapter PCBs (ALL TYPES)	Refer to “Isolating a Failed Part (TRBL03-10).			
10160210		All of Disk Adapter PCBs (HMRCF SUPPORT TYPE)	Refer to “Isolating a Failed Part (TRBL03-10).			
10160300		Other PCBs	Follow the flowchart on ACC05-10.			
10160400		All of the parts on Logic Box	Refer to “Isolating a Failed Part (TRBL03-10).			
10170000	CHA-1P	Channel Adapter PCB (SCSI)	SCSI Port Channel (2MP)	RCH3		RCH3
10171100	CHA-1Q	↑	SCSI Port Channel (2MP) (Option)	↑		↑
10172100	CHA-1R	↑	SCSI Port Channel (2MP) (Option)	↑		↑
10173100	CHA-1S	↑	SCSI Port Channel (2MP) (Option)	↑		↑
10178100	CHA-2V	↑	SCSI Port Channel (2MP)	↑		↑
10179100	CHA-2W	↑	SCSI Port Channel (2MP) (Option)	↑		↑
1017A100	CHA-2X	↑	SCSI Port Channel (2MP) (Option)	↑		↑
1017B100	CHA-2Y	↑	SCSI Port Channel (2MP) (Option)	↑		↑
10180000	CHA-1P	Channel Adapter PCB (4S)	Serial 4 Port Channel	RCH1		RCH1
10181000	CHA-1Q	↑	Serial 4 Port Channel (Option)	↑		↑
10182000	CHA-1R	↑	Serial 4 Port Channel (Option)	↑		↑
10183000	CHA-1S	↑	Serial 4 Port Channel (Option)	↑		↑
10188000	CHA-2V	↑	Serial 4 Port Channel	↑		↑
10189000	CHA-2W	↑	Serial 4 Port Channel (Option)	↑		↑
1018A000	CHA-2X	↑	Serial 4 Port Channel (Option)	↑		↑
1018B000	CHA-2Y	↑	Serial 4 Port Channel (Option)	↑		↑

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Table 4.1.2 List of ACC (Processor) (3/5)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10190000	CHA-1P	Channel Adapter PCB (2S)	Serial 2 Port Channel	RCH1		RCH1
10191000	CHA-1Q	↑	Serial 2 Port Channel (Option)	↑		↑
10192000	CHA-1R	↑	Serial 2 Port Channel (Option)	↑		↑
10193000	CHA-1S	↑	Serial 2 Port Channel (Option)	↑		↑
10198000	CHA-2V	↑	Serial 2 Port Channel	↑		↑
10199000	CHA-2W	↑	Serial 2 Port Channel (Option)	↑		↑
1019A000	CHA-2X	↑	Serial 2 Port Channel (Option)	↑		↑
1019B000	CHA-2Y	↑	Serial 2 Port Channel (Option)	↑		↑
101A0000	CHA-1P	Channel Adapter PCB (4P)	Parallel 4 Port Channel	RCH2		RCH2
101A1000	CHA-1Q	↑	Parallel 4 Port Channel (Option)	↑		↑
101A2000	CHA-1R	↑	Parallel 4 Port Channel (Option)	↑		↑
101A3000	CHA-1S	↑	Parallel 4 Port Channel (Option)	↑		↑
101A8000	CHA-2V	↑	Parallel 4 Port Channel	↑		↑
101A9000	CHA-2W	↑	Parallel 4 Port Channel (Option)	↑		↑
101AA000	CHA-2X	↑	Parallel 4 Port Channel (Option)	↑		↑
101AB000	CHA-2Y	↑	Parallel 4 Port Channel (Option)	↑		↑
101B0000	CHA-1P	Channel Adapter PCB (SCSI)	SCSI Port Channel	RCH3		RCH3
101B1000	CHA-1Q	↑	SCSI Port Channel (Option)	↑		↑
101B2000	CHA-1R	↑	SCSI Port Channel (Option)	↑		↑
101B3000	CHA-1S	↑	SCSI Port Channel (Option)	↑		↑
101B8000	CHA-2V	↑	SCSI Port Channel	↑		↑
101B9000	CHA-2W	↑	SCSI Port Channel (Option)	↑		↑
101BA000	CHA-2X	↑	SCSI Port Channel (Option)	↑		↑
101BB000	CHA-2Y	↑	SCSI Port Channel (Option)	↑		↑
101C0000	DKA-1B	Disk Adapter PCB (ALL)	ALL TYPES (BASIC)	RDA1		RDA1
101C0010	DKA-1B	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (BASIC)	↑		↑
101C1000	DKA-1C	Disk Adapter PCB (ALL)	ALL TYPES (OPTION)	↑		↑
101C1010	DKA-1C	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (OPTION)	↑		↑
101C2000	DKA-1D	Disk Adapter PCB (ALL)	ALL TYPES (OPTION)	↑		↑
101C2010	DKA-1D	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (OPTION)	↑		↑
101C3000	DKA-1E	Disk Adapter PCB (ALL)	ALL TYPES (OPTION)	↑		↑
101C3010	DKA-1E	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (OPTION)	↑		↑

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Table 4.1.2 List of ACC (Processor) (4/5)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
101C8000	DKA-2H	Disk Adapter PCB (ALL)	ALL TYPES (BASIC)	RDA1		RDA1
101C8010	DKA-2H	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (BASIC)	↑		↑
101C9000	DKA-2J	Disk Adapter PCB (ALL)	ALL TYPES (OPTION)	↑		↑
101C9010	DKA-2J	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (OPTION)	↑		↑
101CA000	DKA-2K	Disk Adapter PCB (ALL)	ALL TYPES (OPTION)	↑		↑
101CA010	DKA-2K	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (OPTION)	↑		↑
101CB000	DKA-2L	Disk Adapter PCB (ALL)	ALL TYPES (OPTION)	↑		↑
101CB010	DKA-2L	Disk Adapter PCB (HMRCF)	HMRCF SUPPORT TYPE (OPTION)	↑		↑
101D0000	CHA-1P	Channel Adapter PCB (4S)	Serial 4 Port Channel (VEC)	RCH1		RCH1
101D0100	CHA-1P	Channel Adapter PCB (2S)	Serial 2 Port Channel (VEC)	↑		↑
101D1000	CHA-1Q	Channel Adapter PCB (4S)	Serial 4 Port Channel (Option) (VEC)	↑		↑
101D1100	CHA-1Q	Channel Adapter PCB (2S)	Serial 2 Port Channel (Option) (VEC)	↑		↑
101D2000	CHA-1R	Channel Adapter PCB (4S)	Serial 4 Port Channel (Option) (VEC)	↑		↑
101D2100	CHA-1R	Channel Adapter PCB (2S)	Serial 2 Port Channel (Option) (VEC)	↑		↑
101D3000	CHA-1S	Channel Adapter PCB (4S)	Serial 4 Port Channel (Option) (VEC)	↑		↑
101D3100	CHA-1S	Channel Adapter PCB (2S)	Serial 2 Port Channel (Option) (VEC)	↑		↑
101D8000	CHA-2V	Channel Adapter PCB (4S)	Serial 4 Port Channel (VEC)	↑		↑
101D8100	CHA-2V	Channel Adapter PCB (2S)	Serial 2 Port Channel (VEC)	↑		↑
101D9000	CHA-2W	Channel Adapter PCB (4S)	Serial 4 Port Channel (Option) (VEC)	↑		↑
101D9100	CHA-2W	Channel Adapter PCB (2S)	Serial 2 Port Channel (Option) (VEC)	↑		↑
101DA000	CHA-2X	Channel Adapter PCB (4S)	Serial 4 Port Channel (Option) (VEC)	↑		↑
101DA100	CHA-2X	Channel Adapter PCB (2S)	Serial 2 Port Channel (Option) (VEC)	↑		↑
101DB000	CHA-2Y	Channel Adapter PCB (4S)	Serial 4 Port Channel (Option) (VEC)	↑		↑
101DB100	CHA-2Y	Channel Adapter PCB (2S)	Serial 2 Port Channel (Option) (VEC)	↑		↑

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Table 4.1.2 List of ACC (Processor) (5/5)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
101E0000	CHA-1P	Fibre Channel Adapter PCB	Fibre Channel	RCH4		RCH4
101E1000	CHA-1Q	↑	Fibre Channel (Option)	↑		↑
101E2000	CHA-1R	↑	Fibre Channel (Option)	↑		↑
101E3000	CHA-1S	↑	Fibre Channel (Option)	↑		↑
101E8000	CHA-2V	↑	Fibre Channel	↑		↑
101E9000	CHA-2W	↑	Fibre Channel (Option)	↑		↑
101EA000	CHA-2X	↑	Fibre Channel (Option)	↑		↑
101EB000	CHA-2Y	↑	Fibre Channel (Option)	↑		↑
101F0000	CHA-1P	FibreT Channel Adapter PCB	FibreT Channel	RCH5		RCH5
101F1000	CHA-1Q	↑	FibreT Channel (Option)	↑		↑
101F2000	CHA-1R	↑	FibreT Channel (Option)	↑		↑
101F3000	CHA-1S	↑	FibreT Channel (Option)	↑		↑
101F8000	CHA-2V	↑	FibreT Channel	↑		↑
101F9000	CHA-2W	↑	FibreT Channel (Option)	↑		↑
101FA000	CHA-2X	↑	FibreT Channel (Option)	↑		↑
101FB000	CHA-2Y	↑	FibreT Channel (Option)	↑		↑

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4.1.3 PKC = 2X (Memory)

Table 4.1.3 List of ACC (Memory) (1/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10200000	CACHE-1F	Cache Memory PCB (32MB)	32MB Cache Module PCB	RCA1		RCA1
10200010	CACHE-1F	Cache Memory PCB (128MB)	128MB Cache Module PCB	RCA1		RCA1
10201000	CACHE-1T	Cache Memory PCB (32MB)	32MB Cache Module PCB	RCA2		RCA2
10201010	CACHE-1T	Cache Memory PCB (128MB)	128MB Cache Module PCB	RCA2		RCA2
10208000	CACHE-2G	Cache Memory PCB (32MB)	32MB Cache Module PCB	RCA1		RCA1
10208010	CACHE-2G	Cache Memory PCB (128MB)	128MB Cache Module PCB	RCA1		RCA1
10209000	CACHE-2U	Cache Memory PCB (32MB)	32MB Cache Module PCB	RCA2		RCA2
10209010	CACHE-2U	Cache Memory PCB (128MB)	128MB Cache Module PCB	RCA2		RCA2

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Table 4.1.3 List of ACC (Memory) (2/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10230000	CACHE-1F (CM00)	Cache Memory Module (32MB)	Installed on 10200000	RCA1		RCA1
10230001	CACHE-1F (CM01)	↑	↑	↑		↑
10230002	CACHE-1F (CM02)	↑	↑	↑		↑
10230003	CACHE-1F (CM03)	↑	↑	↑		↑
1023000F	CACHE-1F (CM0X)	↑	↑	↑		↑
10230100	CACHE-1T (CM00)	↑	Installed on 10201000	RCA2		RCA2
10230101	CACHE-1T (CM01)	↑	↑	↑		↑
10230102	CACHE-1T (CM02)	↑	↑	↑		↑
10230103	CACHE-1T (CM03)	↑	↑	↑		↑
1023010F	CACHE-1T (CM0X)	↑	↑	↑		↑
10231000	CACHE-1F (CM10)	↑	Installed on 10200000	RCA1		RCA1
10231001	CACHE-1F (CM11)	↑	↑	↑		↑
10231002	CACHE-1F (CM12)	↑	↑	↑		↑
10231003	CACHE-1F (CM13)	↑	↑	↑		↑
1023100F	CACHE-1F (CM1X)	↑	↑	↑		↑
10231100	CACHE-1T (CM10)	↑	Installed on 10201000	RCA2		RCA2
10231101	CACHE-1T (CM11)	↑	↑	↑		↑
10231102	CACHE-1T (CM12)	↑	↑	↑		↑
10231103	CACHE-1T (CM13)	↑	↑	↑		↑
1023110F	CACHE-1T (CM1X)	↑	↑	↑		↑
10232000	CACHE-1F (CM20)	↑	Installed on 10200000	RCA1		RCA1
10232001	CACHE-1F (CM21)	↑	↑	↑		↑
10232002	CACHE-1F (CM22)	↑	↑	↑		↑
10232003	CACHE-1F (CM23)	↑	↑	↑		↑
1023200F	CACHE-1F (CM2X)	↑	↑	↑		↑
10232100	CACHE-1T (CM20)	↑	Installed on 10201000	RCA2		RCA2
10232101	CACHE-1T (CM21)	↑	↑	↑		↑
10232102	CACHE-1T (CM22)	↑	↑	↑		↑
10232103	CACHE-1T (CM23)	↑	↑	↑		↑
1023210F	CACHE-1T (CM2X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (3/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10233000	CACHE-1F (CM30)	Cache Memory Module (32MB)	Installed on 10200000	RCA1		RCA1
10233001	CACHE-1F (CM31)	↑	↑	↑		↑
10233002	CACHE-1F (CM32)	↑	↑	↑		↑
10233003	CACHE-1F (CM33)	↑	↑	↑		↑
1023300F	CACHE-1F (CM3X)	↑	↑	↑		↑
10233100	CACHE-1T (CM30)	↑	Installed on 10201000	RCA2		RCA2
10233101	CACHE-1T (CM31)	↑	↑	↑		↑
10233102	CACHE-1T (CM32)	↑	↑	↑		↑
10233103	CACHE-1T (CM33)	↑	↑	↑		↑
1023310F	CACHE-1T (CM3X)	↑	↑	↑		↑
10234000	CACHE-1F (CM40)	↑	Installed on 10200000	RCA1		RCA1
10234001	CACHE-1F (CM41)	↑	↑	↑		↑
10234002	CACHE-1F (CM42)	↑	↑	↑		↑
10234003	CACHE-1F (CM43)	↑	↑	↑		↑
1023400F	CACHE-1F (CM4X)	↑	↑	↑		↑
10234100	CACHE-1T (CM40)	↑	Installed on 10201000	RCA2		RCA2
10234101	CACHE-1T (CM41)	↑	↑	↑		↑
10234102	CACHE-1T (CM42)	↑	↑	↑		↑
10234103	CACHE-1T (CM43)	↑	↑	↑		↑
1023410F	CACHE-1T (CM4X)	↑	↑	↑		↑
10235000	CACHE-1F (CM50)	↑	Installed on 10200000	RCA1		RCA1
10235001	CACHE-1F (CM51)	↑	↑	↑		↑
10235002	CACHE-1F (CM52)	↑	↑	↑		↑
10235003	CACHE-1F (CM53)	↑	↑	↑		↑
1023500F	CACHE-1F (CM5X)	↑	↑	↑		↑
10235100	CACHE-1T (CM50)	↑	Installed on 10201000	RCA2		RCA2
10235101	CACHE-1T (CM51)	↑	↑	↑		↑
10235102	CACHE-1T (CM52)	↑	↑	↑		↑
10235103	CACHE-1T (CM53)	↑	↑	↑		↑
1023510F	CACHE-1T (CM5X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (4/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10236000	CACHE-1F (CM60)	Cache Memory Module (32MB)	Installed on 10200000	RCA1		RCA1
10236001	CACHE-1F (CM61)	↑	↑	↑		↑
10236002	CACHE-1F (CM62)	↑	↑	↑		↑
10236003	CACHE-1F (CM63)	↑	↑	↑		↑
1023600F	CACHE-1F (CM6X)	↑	↑	↑		↑
10236100	CACHE-1T (CM60)	↑	Installed on 10201000	RCA2		RCA2
10236101	CACHE-1T (CM61)	↑	↑	↑		↑
10236102	CACHE-1T (CM62)	↑	↑	↑		↑
10236103	CACHE-1T (CM63)	↑	↑	↑		↑
1023610F	CACHE-1T (CM6X)	↑	↑	↑		↑
10237000	CACHE-1F (CM70)	↑	Installed on 10200000	RCA1		RCA1
10237001	CACHE-1F (CM71)	↑	↑	↑		↑
10237002	CACHE-1F (CM72)	↑	↑	↑		↑
10237003	CACHE-1F (CM73)	↑	↑	↑		↑
1023700F	CACHE-1F (CM7X)	↑	↑	↑		↑
10237100	CACHE-1T (CM70)	↑	Installed on 10201000	RCA2		RCA2
10237101	CACHE-1T (CM71)	↑	↑	↑		↑
10237102	CACHE-1T (CM72)	↑	↑	↑		↑
10237103	CACHE-1T (CM73)	↑	↑	↑		↑
1023710F	CACHE-1T (CM7X)	↑	↑	↑		↑
10238000	CACHE-2G (CM00)	↑	Installed on 10208000	RCA1		RCA1
10238001	CACHE-2G (CM01)	↑	↑	↑		↑
10238002	CACHE-2G (CM02)	↑	↑	↑		↑
10238003	CACHE-2G (CM03)	↑	↑	↑		↑
1023800F	CACHE-2G (CM0X)	↑	↑	↑		↑
10238100	CACHE-2U (CM00)	↑	Installed on 10209000	RCA2		RCA2
10238101	CACHE-2U (CM01)	↑	↑	↑		↑
10238102	CACHE-2U (CM02)	↑	↑	↑		↑
10238103	CACHE-2U (CM03)	↑	↑	↑		↑
1023810F	CACHE-2U (CM0X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (5/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10239000	CACHE-2G (CM10)	Cache Memory Module (32MB)	Installed on 10208000	RCA1		RCA1
10239001	CACHE-2G (CM11)	↑	↑	↑		↑
10239002	CACHE-2G (CM12)	↑	↑	↑		↑
10239003	CACHE-2G (CM13)	↑	↑	↑		↑
1023900F	CACHE-2G (CM1X)	↑	↑	↑		↑
10239100	CACHE-2U (CM10)	↑	Installed on 10209000	RCA2		RCA2
10239101	CACHE-2U (CM11)	↑	↑	↑		↑
10239102	CACHE-2U (CM12)	↑	↑	↑		↑
10239103	CACHE-2U (CM13)	↑	↑	↑		↑
1023910F	CACHE-2U (CM1X)	↑	↑	↑		↑
1023A000	CACHE-2G (CM20)	↑	Installed on 10208000	RCA1		RCA1
1023A001	CACHE-2G (CM21)	↑	↑	↑		↑
1023A002	CACHE-2G (CM22)	↑	↑	↑		↑
1023A003	CACHE-2G (CM23)	↑	↑	↑		↑
1023A00F	CACHE-2G (CM2X)	↑	↑	↑		↑
1023A100	CACHE-2U (CM20)	↑	Installed on 10209000	RCA2		RCA2
1023A101	CACHE-2U (CM21)	↑	↑	↑		↑
1023A102	CACHE-2U (CM22)	↑	↑	↑		↑
1023A103	CACHE-2U (CM23)	↑	↑	↑		↑
1023A10F	CACHE-2U (CM2X)	↑	↑	↑		↑
1023B000	CACHE-2G (CM30)	↑	Installed on 10208000	RCA1		RCA1
1023B001	CACHE-2G (CM31)	↑	↑	↑		↑
1023B002	CACHE-2G (CM32)	↑	↑	↑		↑
1023B003	CACHE-2G (CM33)	↑	↑	↑		↑
1023B00F	CACHE-2G (CM3X)	↑	↑	↑		↑
1023B100	CACHE-2U (CM30)	↑	Installed on 10209000	RCA2		RCA2
1023B101	CACHE-2U (CM31)	↑	↑	↑		↑
1023B102	CACHE-2U (CM32)	↑	↑	↑		↑
1023B103	CACHE-2U (CM33)	↑	↑	↑		↑
1023B10F	CACHE-2U (CM3X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (6/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1023C000	CACHE-2G (CM40)	Cache Memory Module (32MB)	Installed on 10208000	RCA1		RCA1
1023C001	CACHE-2G (CM41)	↑	↑	↑		↑
1023C002	CACHE-2G (CM42)	↑	↑	↑		↑
1023C003	CACHE-2G (CM43)	↑	↑	↑		↑
1023C00F	CACHE-2G (CM4X)	↑	↑	↑		↑
1023C100	CACHE-2U (CM40)	↑	Installed on 10209000	RCA2		RCA2
1023C101	CACHE-2U (CM41)	↑	↑	↑		↑
1023C102	CACHE-2U (CM42)	↑	↑	↑		↑
1023C103	CACHE-2U (CM43)	↑	↑	↑		↑
1023C10F	CACHE-2U (CM4X)	↑	↑	↑		↑
1023D000	CACHE-2G (CM50)	↑	Installed on 10208000	RCA1		RCA1
1023D001	CACHE-2G (CM51)	↑	↑	↑		↑
1023D002	CACHE-2G (CM52)	↑	↑	↑		↑
1023D003	CACHE-2G (CM53)	↑	↑	↑		↑
1023D00F	CACHE-2G (CM5X)	↑	↑	↑		↑
1023D100	CACHE-2U (CM50)	↑	Installed on 10209000	RCA2		RCA2
1023D101	CACHE-2U (CM51)	↑	↑	↑		↑
1023D102	CACHE-2U (CM52)	↑	↑	↑		↑
1023D103	CACHE-2U (CM53)	↑	↑	↑		↑
1023D10F	CACHE-2U (CM5X)	↑	↑	↑		↑
1023E000	CACHE-2G (CM60)	↑	Installed on 10208000	RCA1		RCA1
1023E001	CACHE-2G (CM61)	↑	↑	↑		↑
1023E002	CACHE-2G (CM62)	↑	↑	↑		↑
1023E003	CACHE-2G (CM63)	↑	↑	↑		↑
1023E00F	CACHE-2G (CM6X)	↑	↑	↑		↑
1023E100	CACHE-2U (CM60)	↑	Installed on 10209000	RCA2		RCA2
1023E101	CACHE-2U (CM61)	↑	↑	↑		↑
1023E102	CACHE-2U (CM62)	↑	↑	↑		↑
1023E103	CACHE-2U (CM63)	↑	↑	↑		↑
1023E10F	CACHE-2U (CM6X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (7/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1023F000	CACHE-2G (CM70)	Cache Memory Module (32MB)	Installed on 10208000	RCA1		RCA1
1023F001	CACHE-2G (CM71)	↑	↑	↑		↑
1023F002	CACHE-2G (CM72)	↑	↑	↑		↑
1023F003	CACHE-2G (CM73)	↑	↑	↑		↑
1023F00F	CACHE-2G (CM7X)	↑	↑	↑		↑
1023F100	CACHE-2U (CM70)	↑	Installed on 10209000	RCA2		RCA2
1023F101	CACHE-2U (CM71)	↑	↑	↑		↑
1023F102	CACHE-2U (CM72)	↑	↑	↑		↑
1023F103	CACHE-2U (CM73)	↑	↑	↑		↑
1023F10F	CACHE-2U (CM7X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (8/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10250000	CACHE-1F (SM00)	Shared Memory Module (16MB)	Installed on 10200000	RCA1		RCA1
10250100	CACHE-1F (SM01)	↑	↑	↑		↑
10250200	CACHE-1F (SM02)	↑	↑	↑		↑
10250300	CACHE-1F (SM03)	↑	↑	↑		↑
10250400	CACHE-1F (SM04)	↑	↑	↑		↑
10250500	CACHE-1F (SM05)	↑	↑	↑		↑
10250600	CACHE-1F (SM06)	↑	↑	↑		↑
10258000	CACHE-2G (SM00)	↑	Installed on 10208000	RCA1		RCA1
10258100	CACHE-2G (SM01)	↑	↑	↑		↑
10258200	CACHE-2G (SM02)	↑	↑	↑		↑
10258300	CACHE-2G (SM03)	↑	↑	↑		↑
10258400	CACHE-2G (SM04)	↑	↑	↑		↑
10258500	CACHE-2G (SM05)	↑	↑	↑		↑
10258600	CACHE-2G (SM06)	↑	↑	↑		↑
102A0000		Cache Memory PCB (Side A)	All of Cache PCBs on side A			
102A8000		Cache Memory PCB (Side B)	All of Cache PCBs on side B			
102AF000		Cache or Both side of CPM and Shared Memory	Refer to “Recovery Procedure for Cache Error (Both sides) (TRBL05-150)			
102B0000	CACHE-1F (SMXX)	Shared Memory Module (Side A)	All of Shared Memories on side A (Installed on 10200000·10200010)			
102B8000	CACHE-2G (SMXX)	Shared Memory Module (Side B)	All of Shared Memories on side B (Installed on 10208000·10208010)			

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Table 4.1.3 List of ACC (Memory) (9/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102C0000	CACHE-1F (CM00)	Cache Memory Module(128MB)	Installed on 10200010	RCA1		RCA1
102C0001	CACHE-1F (CM01)	↑	↑	↑		↑
102C0002	CACHE-1F (CM02)	↑	↑	↑		↑
102C0003	CACHE-1F (CM03)	↑	↑	↑		↑
102C000F	CACHE-1F (CM0X)	↑	↑	↑		↑
102C0100	CACHE-1T (CM00)	↑	Installed on 10201010	RCA2		RCA2
102C0101	CACHE-1T (CM01)	↑	↑	↑		↑
102C0102	CACHE-1T (CM02)	↑	↑	↑		↑
102C0103	CACHE-1T (CM03)	↑	↑	↑		↑
102C010F	CACHE-1T (CM0X)	↑	↑	↑		↑
102C1000	CACHE-1F (CM10)	↑	Installed on 10200010	RCA1		RCA1
102C1001	CACHE-1F (CM11)	↑	↑	↑		↑
102C1002	CACHE-1F (CM12)	↑	↑	↑		↑
102C1003	CACHE-1F (CM13)	↑	↑	↑		↑
102C100F	CACHE-1F (CM1X)	↑	↑	↑		↑
102C1100	CACHE-1T (CM10)	↑	Installed on 10201010	RCA2		RCA2
102C1101	CACHE-1T (CM11)	↑	↑	↑		↑
102C1102	CACHE-1T (CM12)	↑	↑	↑		↑
102C1103	CACHE-1T (CM13)	↑	↑	↑		↑
102C110F	CACHE-1T (CM1X)	↑	↑	↑		↑
102C2000	CACHE-1F (CM20)	↑	Installed on 10200010	RCA1		RCA1
102C2001	CACHE-1F (CM21)	↑	↑	↑		↑
102C2002	CACHE-1F (CM22)	↑	↑	↑		↑
102C2003	CACHE-1F (CM23)	↑	↑	↑		↑
102C200F	CACHE-1F (CM2X)	↑	↑	↑		↑
102C2100	CACHE-1T (CM20)	↑	Installed on 10201010	RCA2		RCA2
102C2101	CACHE-1T (CM21)	↑	↑	↑		↑
102C2102	CACHE-1T (CM22)	↑	↑	↑		↑
102C2103	CACHE-1T (CM23)	↑	↑	↑		↑
102C210F	CACHE-1T (CM2X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (10/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102C3000	CACHE-1F (CM30)	Cache Memory Module(128MB)	Installed on 10200010	RCA1		RCA1
102C3001	CACHE-1F (CM31)	↑	↑	↑		↑
102C3002	CACHE-1F (CM32)	↑	↑	↑		↑
102C3003	CACHE-1F (CM33)	↑	↑	↑		↑
102C300F	CACHE-1F (CM3X)	↑	↑	↑		↑
102C3100	CACHE-1T (CM30)	↑	Installed on 10201010	RCA2		RCA2
102C3101	CACHE-1T (CM31)	↑	↑	↑		↑
102C3102	CACHE-1T (CM32)	↑	↑	↑		↑
102C3103	CACHE-1T (CM33)	↑	↑	↑		↑
102C310F	CACHE-1T (CM3X)	↑	↑	↑		↑
102C4000	CACHE-1F (CM40)	↑	Installed on 10200010	RCA1		RCA1
102C4001	CACHE-1F (CM41)	↑	↑	↑		↑
102C4002	CACHE-1F (CM42)	↑	↑	↑		↑
102C4003	CACHE-1F (CM43)	↑	↑	↑		↑
102C400F	CACHE-1F (CM4X)	↑	↑	↑		↑
102C4100	CACHE-1T (CM40)	↑	Installed on 10201010	RCA2		RCA2
102C4101	CACHE-1T (CM41)	↑	↑	↑		↑
102C4102	CACHE-1T (CM42)	↑	↑	↑		↑
102C4103	CACHE-1T (CM43)	↑	↑	↑		↑
102C410F	CACHE-1T (CM4X)	↑	↑	↑		↑
102C5000	CACHE-1F (CM50)	↑	Installed on 10200010	RCA1		RCA1
102C5001	CACHE-1F (CM51)	↑	↑	↑		↑
102C5002	CACHE-1F (CM52)	↑	↑	↑		↑
102C5003	CACHE-1F (CM53)	↑	↑	↑		↑
102C500F	CACHE-1F (CM5X)	↑	↑	↑		↑
102C5100	CACHE-1T (CM50)	↑	Installed on 10201010	RCA2		RCA2
102C5101	CACHE-1T (CM51)	↑	↑	↑		↑
102C5102	CACHE-1T (CM52)	↑	↑	↑		↑
102C5103	CACHE-1T (CM53)	↑	↑	↑		↑
102C510F	CACHE-1T (CM5X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (11/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102C6000	CACHE-1F (CM60)	Cache Memory Module(128MB)	Installed on 10200010	RCA1		RCA1
102C6001	CACHE-1F (CM61)	↑	↑	↑		↑
102C6002	CACHE-1F (CM62)	↑	↑	↑		↑
102C6003	CACHE-1F (CM63)	↑	↑	↑		↑
102C600F	CACHE-1F (CM6X)	↑	↑	↑		↑
102C6100	CACHE-1T (CM60)	↑	Installed on 10201010	RCA2		RCA2
102C6101	CACHE-1T (CM61)	↑	↑	↑		↑
102C6102	CACHE-1T (CM62)	↑	↑	↑		↑
102C6103	CACHE-1T (CM63)	↑	↑	↑		↑
102C610F	CACHE-1T (CM6X)	↑	↑	↑		↑
102C7000	CACHE-1F (CM70)	↑	Installed on 10200010	RCA1		RCA1
102C7001	CACHE-1F (CM71)	↑	↑	↑		↑
102C7002	CACHE-1F (CM72)	↑	↑	↑		↑
102C7003	CACHE-1F (CM73)	↑	↑	↑		↑
102C700F	CACHE-1F (CM7X)	↑	↑	↑		↑
102C7100	CACHE-1T (CM70)	↑	Installed on 10201010	RCA2		RCA2
102C7101	CACHE-1T (CM71)	↑	↑	↑		↑
102C7102	CACHE-1T (CM72)	↑	↑	↑		↑
102C7103	CACHE-1T (CM73)	↑	↑	↑		↑
102C710F	CACHE-1T (CM7X)	↑	↑	↑		↑
102C8000	CACHE-2G (CM00)	↑	Installed on 10208010	RCA1		RCA1
102C8001	CACHE-2G (CM01)	↑	↑	↑		↑
102C8002	CACHE-2G (CM02)	↑	↑	↑		↑
102C8003	CACHE-2G (CM03)	↑	↑	↑		↑
102C800F	CACHE-2G (CM0X)	↑	↑	↑		↑
102C8100	CACHE-2U (CM00)	↑	Installed on 10209010	RCA2		RCA2
102C8101	CACHE-2U (CM01)	↑	↑	↑		↑
102C8102	CACHE-2U (CM02)	↑	↑	↑		↑
102C8103	CACHE-2U (CM03)	↑	↑	↑		↑
102C810F	CACHE-2U (CM0X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (12/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102C9000	CACHE-2G (CM10)	Cache Memory Module(128MB)	Installed on 10208010	RCA1		RCA1
102C9001	CACHE-2G (CM11)	↑	↑	↑		↑
102C9002	CACHE-2G (CM12)	↑	↑	↑		↑
102C9003	CACHE-2G (CM13)	↑	↑	↑		↑
102C900F	CACHE-2G (CM1X)	↑	↑	↑		↑
102C9100	CACHE-2U (CM10)	↑	Installed on 10209010	RCA2		RCA2
102C9101	CACHE-2U (CM11)	↑	↑	↑		↑
102C9102	CACHE-2U (CM12)	↑	↑	↑		↑
102C9103	CACHE-2U (CM13)	↑	↑	↑		↑
102C910F	CACHE-2U (CM1X)	↑	↑	↑		↑
102CA000	CACHE-2G (CM20)	↑	Installed on 10208010	RCA1		RCA1
102CA001	CACHE-2G (CM21)	↑	↑	↑		↑
102CA002	CACHE-2G (CM22)	↑	↑	↑		↑
102CA003	CACHE-2G (CM23)	↑	↑	↑		↑
102CA00F	CACHE-2G (CM2X)	↑	↑	↑		↑
102CA100	CACHE-2U (CM20)	↑	Installed on 10209010	RCA2		RCA2
102CA101	CACHE-2U (CM21)	↑	↑	↑		↑
102CA102	CACHE-2U (CM22)	↑	↑	↑		↑
102CA103	CACHE-2U (CM23)	↑	↑	↑		↑
102CA10F	CACHE-2U (CM2X)	↑	↑	↑		↑
102CB000	CACHE-2G (CM30)	↑	Installed on 10208010	RCA1		RCA1
102CB001	CACHE-2G (CM31)	↑	↑	↑		↑
102CB002	CACHE-2G (CM32)	↑	↑	↑		↑
102CB003	CACHE-2G (CM33)	↑	↑	↑		↑
102CB00F	CACHE-2G (CM3X)	↑	↑	↑		↑
102CB100	CACHE-2U (CM30)	↑	Installed on 10209010	RCA2		RCA2
102CB101	CACHE-2U (CM31)	↑	↑	↑		↑
102CB102	CACHE-2U (CM32)	↑	↑	↑		↑
102CB103	CACHE-2U (CM33)	↑	↑	↑		↑
102CB10F	CACHE-2U (CM3X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (13/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102CC000	CACHE-2G (CM40)	Cache Memory Module(128MB)	Installed on 10208010	RCA1		RCA1
102CC001	CACHE-2G (CM41)	↑	↑	↑		↑
102CC002	CACHE-2G (CM42)	↑	↑	↑		↑
102CC003	CACHE-2G (CM43)	↑	↑	↑		↑
102CC00F	CACHE-2G (CM4X)	↑	↑	↑		↑
102CC100	CACHE-2U (CM40)	↑	Installed on 10209010	RCA2		RCA2
102CC101	CACHE-2U (CM41)	↑	↑	↑		↑
102CC102	CACHE-2U (CM42)	↑	↑	↑		↑
102CC103	CACHE-2U (CM43)	↑	↑	↑		↑
102CC10F	CACHE-2U (CM4X)	↑	↑	↑		↑
102CD000	CACHE-2G (CM50)	↑	Installed on 10208010	RCA1		RCA1
102CD001	CACHE-2G (CM51)	↑	↑	↑		↑
102CD002	CACHE-2G (CM52)	↑	↑	↑		↑
102CD003	CACHE-2G (CM53)	↑	↑	↑		↑
102CD00F	CACHE-2G (CM5X)	↑	↑	↑		↑
102CD100	CACHE-2U (CM50)	↑	Installed on 10209010	RCA2		RCA2
102CD101	CACHE-2U (CM51)	↑	↑	↑		↑
102CD102	CACHE-2U (CM52)	↑	↑	↑		↑
102CD103	CACHE-2U (CM53)	↑	↑	↑		↑
102CD10F	CACHE-2U (CM5X)	↑	↑	↑		↑
102CE000	CACHE-2G (CM60)	↑	Installed on 10208010	RCA1		RCA1
102CE001	CACHE-2G (CM61)	↑	↑	↑		↑
102CE002	CACHE-2G (CM62)	↑	↑	↑		↑
102CE003	CACHE-2G (CM63)	↑	↑	↑		↑
102CE00F	CACHE-2G (CM6X)	↑	↑	↑		↑
102CE100	CACHE-2U (CM60)	↑	Installed on 10209010	RCA2		RCA2
102CE101	CACHE-2U (CM61)	↑	↑	↑		↑
102CE102	CACHE-2U (CM62)	↑	↑	↑		↑
102CE103	CACHE-2U (CM63)	↑	↑	↑		↑
102CE10F	CACHE-2U (CM6X)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (14/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102CF000	CACHE-2G (CM70)	Cache Memory Module(128MB)	Installed on 10208010	RCA1		RCA1
102CF001	CACHE-2G (CM71)	↑	↑	↑		↑
102CF002	CACHE-2G (CM72)	↑	↑	↑		↑
102CF003	CACHE-2G (CM73)	↑	↑	↑		↑
102CF00F	CACHE-2G (CM7X)	↑	↑	↑		↑
102CF100	CACHE-2U (CM70)	↑	Installed on 10209010	RCA2		RCA2
102CF101	CACHE-2U (CM71)	↑	↑	↑		↑
102CF102	CACHE-2U (CM72)	↑	↑	↑		↑
102CF103	CACHE-2U (CM73)	↑	↑	↑		↑
102CF10F	CACHE-2U (CM7X)	↑	↑	↑		↑
102D0000	CACHE-1F (SM00)	Shared Memory Module (64MB)	Installed on 10200010	RCA1		RCA1
102D0100	CACHE-1F (SM01)	↑	↑	↑		↑
102D0200	CACHE-1F (SM02)	↑	↑	↑		↑
102D0300	CACHE-1F (SM03)	↑	↑	↑		↑
102D0400	CACHE-1F (SM04)	↑	↑	↑		↑
102D0500	CACHE-1F (SM05)	↑	↑	↑		↑
102D0600	CACHE-1F (SM06)	↑	↑	↑		↑
102D1000	CACHE-1T (SM00)	↑	Installed on 10201010	RCA2		RCA2
102D1100	CACHE-1T (SM01)	↑	↑	↑		↑
102D1200	CACHE-1T (SM02)	↑	↑	↑		↑
102D1300	CACHE-1T (SM03)	↑	↑	↑		↑
102D1400	CACHE-1T (SM04)	↑	↑	↑		↑
102D1500	CACHE-1T (SM05)	↑	↑	↑		↑
102D1600	CACHE-1T (SM06)	↑	↑	↑		↑

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Table 4.1.3 List of ACC (Memory) (15/15)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
102D8000	CACHE-2G (SM00)	Shared Memory Module (64MB)	Installed on 10208010	RCA1		RCA1
102D8100	CACHE-2G (SM01)	↑	↑	↑		↑
102D8200	CACHE-2G (SM02)	↑	↑	↑		↑
102D8300	CACHE-2G (SM03)	↑	↑	↑		↑
102D8400	CACHE-2G (SM04)	↑	↑	↑		↑
102D8500	CACHE-2G (SM05)	↑	↑	↑		↑
102D8600	CACHE-2G (SM06)	↑	↑	↑		↑
102D9000	CACHE-2U (SM00)	↑	Installed on 10209010	RCA2		RCA2
102D9100	CACHE-2U (SM01)	↑	↑	↑		↑
102D9200	CACHE-2U (SM02)	↑	↑	↑		↑
102D9300	CACHE-2U (SM03)	↑	↑	↑		↑
102D9400	CACHE-2U (SM04)	↑	↑	↑		↑
102D9500	CACHE-2U (SM05)	↑	↑	↑		↑
102D9600	CACHE-2U (SM06)	↑	↑	↑		↑

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4.1.4 PKC = 3X (DKC power supply)

Table 4.1.4 List of ACC (DKC Power Supply) (1/2)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10300000	5VPS10	5V PS	5V PS for Logic (Basic)	RT20 ~22		RT20~22
10301000	5VPS11	↑	5V PS for Logic (Option)	↑		↑
10302000	5VPS12	↑	5V PS for Logic (Option)	↑		↑
10303000	5VPS13	↑	5V PS for Logic (Option)	↑		↑
10307F00		↑	5V PS for Logic (Cluster1)			
10308000	5VPS20	↑	5V PS for Logic (Basic)	RT20 ~22		RT20~22
10309000	5VPS21	↑	5V PS for Logic (Option)	↑		↑
1030A000	5VPS22	↑	5V PS for Logic (Option)	↑		↑
1030B000	5VPS23	↑	5V PS for Logic (Option)	↑		↑
1030FF00		↑	5V PS for Logic (Cluster2)			
10310000	3VPS10	3V PS	3.3V PS for Logic (Basic)	RT26 ~28		RT26~28
10311000	3VPS11	↑	3.3V PS for Logic (Option)	↑		↑
10314000	3VPS12	↑	3.3V PS for Logic (Option)	↑		↑
10315000	3VPS13	↑	3.3V PS for Logic (Option)	↑		↑
10317F00		↑	3.3V PS for Logic (Cluster1)			
10318000	3VPS20	↑	3.3V PS for Logic (Basic)	RT26 ~28		RT26~28
10319000	3VPS21	↑	3.3V PS for Logic (Option)	↑		↑
1031C000	3VPS22	↑	3.3V PS for Logic (Option)	↑		↑
1031D000	3VPS23	↑	3.3V PS for Logic (Option)	↑		↑
1031FF00		↑	3.3V PS for Logic (Cluster2)			
10320000	MPS10	Multi PS (Logic)	Multi PS for Logic (Basic)	RT23 ~25		RT23~25
10321000	MPS11	↑	Multi PS for Logic (Option)	↑		↑
10327F00		↑	Multi PS for Logic (Cluster1)			
10328000	MPS20	↑	Multi PS for Logic (Basic)	RT23 ~25		RT23~25
10329000	MPS21	↑	Multi PS for Logic (Option)	↑		↑
1032FF00		↑	Multi PS for Logic (Cluster2)			
10330000	Battery-10	Battery ASSY	Battery for Shared Memory	RT14		RT14
10331000	Battery-11	↑	Battery for Cache Memory	↑		↑
10332000	Battery-12	↑	Battery for Cache Memory	↑		↑
10338000	Battery-20	↑	Battery for Shared Memory	↑		↑
10339000	Battery-21	↑	Battery for Cache Memory	↑		↑
1033A000	Battery-22	↑	Battery for Cache Memory	↑		↑

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Table 4.1.4 List of ACC (DKC Power Supply) (2/2)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10340000	BATT CTR-10	Bttery Controller PCB	Battery Controller for Shared Memory	RT15		RT15
10341000	BATT CTR-11	↑	Battery Controller for Cache Memory	↑		↑
10342000	BATT CTR-12	↑	Battery Controller for Cache Memory	↑		↑
10348000	BATT CTR-20	↑	Battery Controller for Shared Memory	↑		↑
10349000	BATT CTR-21	↑	Battery Controller for Cache Memory	↑		↑
1034A000	BATT CTR-22	↑	Battery Controller for Cache Memory	↑		↑
10350000	breaker box-1	Breaker Box	Breaker box for Cluster 1	RT12		RT12
10358000	breaker box-2	↑	Breaker box for Cluster 2	RT13		RT13
10360000	outlet box	Outlet Box	Outlet box in DKC	RT16		RT16
10368000	outlet box	↑	Outlet box in DKC	RT16		RT16
10380000		PS CHECK	Refer to “Isolating a Failed Part (TRBL03-10)”.			

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4.1.5 PKC = 4X (DKU power supply)

Table 4.1.5 List of ACC (DKU Power Supply) (1/3)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10400000	MPS-R100	Multi PS (HDD)	Multiple power supply for HDU-R10	RT30		RT30
10400400	MPS-R101	↑	↑	↑		↑
10400800	MPS-R110	↑	Multiple power supply for HDU-R11	↑		↑
10400C00	MPS-R111	↑	↑	↑		↑
10401000	MPS-R120	↑	Multiple power supply for HDU-R12	↑		↑
10401400	MPS-R121	↑	↑	↑		↑
10401800	MPS-R130	↑	Multiple power supply for HDU-R13	↑		↑
10401C00	MPS-R131	↑	↑	↑		↑
10402000	MPS-R140	↑	Multiple power supply for HDU-R14	↑		↑
10402400	MPS-R141	↑	↑	↑		↑
10402800	MPS-R150	↑	Multiple power supply for HDU-R15	↑		↑
10402C00	MPS-R151	↑	↑	↑		↑
10403000	MPS-R160	↑	Multiple power supply for HDU-R16	↑		↑
10403400	MPS-R161	↑	↑	↑		↑
10403800	MPS-R170	↑	Multiple power supply for HDU-R17	↑		↑
10403C00	MPS-R171	↑	↑	↑		↑
10404000	MPS-R200	↑	Multiple power supply for HDU-R20	↑		↑
10404400	MPS-R201	↑	↑	↑		↑
10404800	MPS-R210	↑	Multiple power supply for HDU-R21	↑		↑
10404C00	MPS-R211	↑	↑	↑		↑
10405000	MPS-R220	↑	Multiple power supply for HDU-R22	↑		↑
10405400	MPS-R221	↑	↑	↑		↑
10405800	MPS-R230	↑	Multiple power supply for HDU-R23	↑		↑
10405C00	MPS-R231	↑	↑	↑		↑
10406000	MPS-R240	↑	Multiple power supply for HDU-R24	↑		↑
10406400	MPS-R241	↑	↑	↑		↑
10406800	MPS-R250	↑	Multiple power supply for HDU-R25	↑		↑
10406C00	MPS-R251	↑	↑	↑		↑
10407000	MPS-R260	↑	Multiple power supply for HDU-R26	↑		↑
10407400	MPS-R261	↑	↑	↑		↑
10407800	MPS-R270	↑	Multiple power supply for HDU-R27	↑		↑
10407C00	MPS-R271	↑	↑	↑		↑

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Table 4.1.5 List of ACC (DKU Power Supply) (2/3)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10408000	MPS-L100	Multi PS (HDD)	Multiple power supply for HDU-L10	RT30		RT30
10408400	MPS-L101	↑	↑	↑		↑
10408800	MPS-L110	↑	Multiple power supply for HDU-L11	↑		↑
10408C00	MPS-L111	↑	↑	↑		↑
10409000	MPS-L120	↑	Multiple power supply for HDU-L12	↑		↑
10409400	MPS-L121	↑	↑	↑		↑
10409800	MPS-L130	↑	Multiple power supply for HDU-L13	↑		↑
10409C00	MPS-L131	↑	↑	↑		↑
1040A000	MPS-L140	↑	Multiple power supply for HDU-L14	↑		↑
1040A400	MPS-L141	↑	↑	↑		↑
1040A800	MPS-L150	↑	Multiple power supply for HDU-L15	↑		↑
1040AC00	MPS-L151	↑	↑	↑		↑
1040B000	MPS-L160	↑	Multiple power supply for HDU-L16	↑		↑
1040B400	MPS-L161	↑	↑	↑		↑
1040B800	MPS-L170	↑	Multiple power supply for HDU-L17	↑		↑
1040BC00	MPS-L171	↑	↑	↑		↑
1040C000	MPS-L200	↑	Multiple power supply for HDU-L20	↑		↑
1040C400	MPS-L201	↑	↑	↑		↑
1040C800	MPS-L210	↑	Multiple power supply for HDU-L21	↑		↑
1040CC00	MPS-L211	↑	↑	↑		↑
1040D000	MPS-L220	↑	Multiple power supply for HDU-L22	↑		↑
1040D400	MPS-L221	↑	↑	↑		↑
1040D800	MPS-L230	↑	Multiple power supply for HDU-L23	↑		↑
1040DC00	MPS-L231	↑	↑	↑		↑
1040E000	MPS-L240	↑	Multiple power supply for HDU-L24	↑		↑
1040E400	MPS-L241	↑	↑	↑		↑
1040E800	MPS-L250	↑	Multiple power supply for HDU-L25	↑		↑
1040EC00	MPS-L251	↑	↑	↑		↑
1040F000	MPS-L260	↑	Multiple power supply for HDU-L26	↑		↑
1040F400	MPS-L261	↑	↑	↑		↑
1040F800	MPS-L270	↑	Multiple power supply for HDU-L27	↑		↑
1040FC00	MPS-L271	↑	↑	↑		↑
1040FF00		↑				

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Table 4.1.5 List of ACC (DKU Power Supply) (3/3)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10410000	AC BOX-R10	AC BOX	AC Box in 1st. Disk Unit(DKU-R1)	RT32		RT32
10410800	AC BOX-R11	↑	↑	RT33		RT33
10414000	AC BOX-R20	↑	AC Box in 2nd. Disk Unit(DKU-R2)	↑		↑
10414800	AC BOX-R21	↑	↑	↑		↑
10418000	AC BOX-L10	↑	AC Box in 3rd. Disk Unit(DKU-L1)	↑		↑
10418800	AC BOX-L11	↑	↑	↑		↑
1041C000	AC BOX-L20	↑	AC Box in 4th. Disk Unit(DKU-L2)	↑		↑
1041C800	AC BOX-L21	↑	↑	↑		↑

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4.1.6 PKC = 5X (Drive)

A list of ACC (Drive) is shown below.

ACC	Sheet No.	Remark
1050XXXX	ACC04-262 ~ 04-285	DKR2B-J18
1051XXXX	ACC04-290 ~ 04-315	DKR1B-J36
1052XXXX	ACC04-320 ~ 04-345	DK308-90 Compatible (DK308-90/DK309-90)
1053XXXX	ACC04-350 ~ 04-375	DK3F2-15
1054XXXX	ACC04-380 ~ 04-405	DK3F2-16
1055XXXX	ACC04-410 ~ 04-435	DK309-18 Compatible (DK309-18/DK30A-18)
1056XXXX	ACC04-440 ~ 04-465	DK30A-36
1057XXXX	ACC04-470 ~ 04-495	DK3F2-90
1058XXXX	ACC04-500 ~ 04-525	HDD canister
1059XXXX	ACC04-530 ~ 04-555	DK3F1-60 *1
105AXXXX	ACC04-560 ~ 04-585	DK30A-19 Compatible (DK309-19/DK30A-19)
105BXXXX	ACC04-590 ~ 04-615	DKR1B-J47

*1: It is displayed “DK3F1-60 COMPATIBLE” on SVP, but it means “DK3F1-60”.

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Table 4.1.6.1 List of ACC (Drive:DKR2B-J18) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10500000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DKR2B-J18)	RDKxx		RDKxx
10500100	HDD-L100	↑	↑	↑		↑
10500200	HDD-L106	↑	↑	↑		↑
10500300	HDD-L101	↑	↑	↑		↑
10500400	HDD-L105	↑	↑	↑		↑
10500500	HDD-L102	↑	↑	↑		↑
10500600	HDD-L104	↑	↑	↑		↑
10500700	HDD-L103	↑	↑	↑		↑
10500800	HDD-L117	↑	HDD canister in HDU-L11 (DKR2B-J18)	↑		↑
10500900	HDD-L110	↑	↑	↑		↑
10500A00	HDD-L116	↑	↑	↑		↑
10500B00	HDD-L111	↑	↑	↑		↑
10500C00	HDD-L115	↑	↑	↑		↑
10500D00	HDD-L112	↑	↑	↑		↑
10500E00	HDD-L114	↑	↑	↑		↑
10500F00	HDD-L113	↑	↑	↑		↑
10501000	HDD-L127	↑	HDD canister in HDU-L12 (DKR2B-J18)	↑		↑
10501100	HDD-L120	↑	↑	↑		↑
10501200	HDD-L126	↑	↑	↑		↑
10501300	HDD-L121	↑	↑	↑		↑
10501400	HDD-L125	↑	↑	↑		↑
10501500	HDD-L122	↑	↑	↑		↑
10501600	HDD-L124	↑	↑	↑		↑
10501700	HDD-L123	↑	↑	↑		↑
10501800	HDD-L137	↑	HDD canister in HDU-L13 (DKR2B-J18)	↑		↑
10501900	HDD-L130	↑	↑	↑		↑
10501A00	HDD-L136	↑	↑	↑		↑
10501B00	HDD-L131	↑	↑	↑		↑
10501C00	HDD-L135	↑	↑	↑		↑
10501D00	HDD-L132	↑	↑	↑		↑
10501E00	HDD-L134	↑	↑	↑		↑
10501F00	HDD-L133	↑	↑	↑		↑
10502000	HDD-L147	↑	HDD canister in HDU-L14 (DKR2B-J18)	↑		↑
10502100	HDD-L140	↑	↑	↑		↑
10502200	HDD-L146	↑	↑	↑		↑
10502300	HDD-L141	↑	↑	↑		↑
10502400	HDD-L145	↑	↑	↑		↑
10502500	HDD-L142	↑	↑	↑		↑
10502600	HDD-L144	↑	↑	↑		↑
10502700	HDD-L143	↑	↑	↑		↑
10502800	HDD-L157	↑	HDD canister in HDU-L15 (DKR2B-J18)	↑		↑
10502900	HDD-L150	↑	↑	↑		↑

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Table 4.1.6.1 List of ACC (Drive:DKR2B-J18) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10502A00	HDD-L156	HDD canister	HDD canister in HDU-L15 (DKR2B-J18)	RDKxx		RDKxx
10502B00	HDD-L151	↑	↑	↑		↑
10502C00	HDD-L155	↑	↑	↑		↑
10502D00	HDD-L152	↑	↑	↑		↑
10502E00	HDD-L154	↑	↑	↑		↑
10502F00	HDD-L153	↑	↑	↑		↑
10503000	HDD-L167	↑	HDD canister in HDU-L16 (DKR2B-J18)	↑		↑
10503100	HDD-L160	↑	↑	↑		↑
10503200	HDD-L166	↑	↑	↑		↑
10503300	HDD-L161	↑	↑	↑		↑
10503400	HDD-L165	↑	↑	↑		↑
10503500	HDD-L162	↑	↑	↑		↑
10503600	HDD-L164	↑	↑	↑		↑
10503700	HDD-L163	↑	↑	↑		↑
10503800	HDD-L177	↑	HDD canister in HDU-L17 (DKR2B-J18)	↑		↑
10503900	HDD-L170	↑	↑	↑		↑
10503A00	HDD-L176	↑	↑	↑		↑
10503B00	HDD-L171	↑	↑	↑		↑
10503C00	HDD-L175	↑	↑	↑		↑
10503D00	HDD-L172	↑	↑	↑		↑
10503E00	HDD-L174	↑	↑	↑		↑
10503F00	HDD-L173	↑	↑	↑		↑
10504000	HDD-L207	↑	HDD canister in HDU-L20 (DKR2B-J18)	↑		↑
10504100	HDD-L200	↑	↑	↑		↑
10504200	HDD-L206	↑	↑	↑		↑
10504300	HDD-L201	↑	↑	↑		↑
10504400	HDD-L205	↑	↑	↑		↑
10504500	HDD-L202	↑	↑	↑		↑
10504600	HDD-L204	↑	↑	↑		↑
10504700	HDD-L203	↑	↑	↑		↑
10504800	HDD-L217	↑	HDD canister in HDU-L21 (DKR2B-J18)	↑		↑
10504900	HDD-L210	↑	↑	↑		↑
10504A00	HDD-L216	↑	↑	↑		↑
10504B00	HDD-L211	↑	↑	↑		↑
10504C00	HDD-L215	↑	↑	↑		↑
10504D00	HDD-L212	↑	↑	↑		↑
10504E00	HDD-L214	↑	↑	↑		↑
10504F00	HDD-L213	↑	↑	↑		↑
10505000	HDD-L227	↑	HDD canister in HDU-L22 (DKR2B-J18)	↑		↑
10505100	HDD-L220	↑	↑	↑		↑
10505200	HDD-L226	↑	↑	↑		↑
10505300	HDD-L221	↑	↑	↑		↑
10505400	HDD-L225	↑	↑	↑		↑

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Table 4.1.6.1 List of ACC (Drive:DKR2B-J18) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10505500	HDD-L222	HDD canister	HDD canister in HDU-L22 (DKR2B-J18)	RDKxx		RDKxx
10505600	HDD-L224	↑	↑	↑		↑
10505700	HDD-L223	↑	↑	↑		↑
10505800	HDD-L237	↑	HDD canister in HDU-L23 (DKR2B-J18)	↑		↑
10505900	HDD-L230	↑	↑	↑		↑
10505A00	HDD-L236	↑	↑	↑		↑
10505B00	HDD-L231	↑	↑	↑		↑
10505C00	HDD-L235	↑	↑	↑		↑
10505D00	HDD-L232	↑	↑	↑		↑
10505E00	HDD-L234	↑	↑	↑		↑
10505F00	HDD-L233	↑	↑	↑		↑
10506000	HDD-L247	↑	HDD canister in HDU-L24 (DKR2B-J18)	↑		↑
10506100	HDD-L240	↑	↑	↑		↑
10506200	HDD-L246	↑	↑	↑		↑
10506300	HDD-L241	↑	↑	↑		↑
10506400	HDD-L245	↑	↑	↑		↑
10506500	HDD-L242	↑	↑	↑		↑
10506600	HDD-L244	↑	↑	↑		↑
10506700	HDD-L243	↑	↑	↑		↑
10506800	HDD-L257	↑	HDD canister in HDU-L25 (DKR2B-J18)	↑		↑
10506900	HDD-L250	↑	↑	↑		↑
10506A00	HDD-L256	↑	↑	↑		↑
10506B00	HDD-L251	↑	↑	↑		↑
10506C00	HDD-L255	↑	↑	↑		↑
10506D00	HDD-L252	↑	↑	↑		↑
10506E00	HDD-L254	↑	↑	↑		↑
10506F00	HDD-L253	↑	↑	↑		↑
10507000	HDD-L267	↑	HDD canister in HDU-L26 (DKR2B-J18)	↑		↑
10507100	HDD-L260	↑	↑	↑		↑
10507200	HDD-L266	↑	↑	↑		↑
10507300	HDD-L261	↑	↑	↑		↑
10507400	HDD-L265	↑	↑	↑		↑
10507500	HDD-L262	↑	↑	↑		↑
10507600	HDD-L264	↑	↑	↑		↑
10507700	HDD-L263	↑	↑	↑		↑
10507800	HDD-L277	↑	HDD canister in HDU-L27 (DKR2B-J18)	↑		↑
10507900	HDD-L270	↑	↑	↑		↑
10507A00	HDD-L276	↑	↑	↑		↑
10507B00	HDD-L271	↑	↑	↑		↑
10507C00	HDD-L275	↑	↑	↑		↑
10507D00	HDD-L272	↑	↑	↑		↑
10507E00	HDD-L274	↑	↑	↑		↑
10507F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.1 List of ACC (Drive:DKR2B-J18) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10508000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DKR2B-J18)	RDKxx		RDKxx
10508100	HDD-R100	↑	↑	↑		↑
10508200	HDD-R106	↑	↑	↑		↑
10508300	HDD-R101	↑	↑	↑		↑
10508400	HDD-R105	↑	↑	↑		↑
10508500	HDD-R102	↑	↑	↑		↑
10508600	HDD-R104	↑	↑	↑		↑
10508700	HDD-R103	↑	↑	↑		↑
10508800	HDD-R117	↑	HDD canister in HDU-R11 (DKR2B-J18)	↑		↑
10508900	HDD-R110	↑	↑	↑		↑
10508A00	HDD-R116	↑	↑	↑		↑
10508B00	HDD-R111	↑	↑	↑		↑
10508C00	HDD-R115	↑	↑	↑		↑
10508D00	HDD-R112	↑	↑	↑		↑
10508E00	HDD-R114	↑	↑	↑		↑
10508F00	HDD-R113	↑	↑	↑		↑
10509000	HDD-R127	↑	HDD canister in HDU-R12 (DKR2B-J18)	↑		↑
10509100	HDD-R120	↑	↑	↑		↑
10509200	HDD-R126	↑	↑	↑		↑
10509300	HDD-R121	↑	↑	↑		↑
10509400	HDD-R125	↑	↑	↑		↑
10509500	HDD-R122	↑	↑	↑		↑
10509600	HDD-R124	↑	↑	↑		↑
10509700	HDD-R123	↑	↑	↑		↑
10509800	HDD-R137	↑	HDD canister in HDU-R13 (DKR2B-J18)	↑		↑
10509900	HDD-R130	↑	↑	↑		↑
10509A00	HDD-R136	↑	↑	↑		↑
10509B00	HDD-R131	↑	↑	↑		↑
10509C00	HDD-R135	↑	↑	↑		↑
10509D00	HDD-R132	↑	↑	↑		↑
10509E00	HDD-R134	↑	↑	↑		↑
10509F00	HDD-R133	↑	↑	↑		↑
1050A000	HDD-R147	↑	HDD canister in HDU-R14 (DKR2B-J18)	↑		↑
1050A100	HDD-R140	↑	↑	↑		↑
1050A200	HDD-R146	↑	↑	↑		↑
1050A300	HDD-R141	↑	↑	↑		↑
1050A400	HDD-R145	↑	↑	↑		↑
1050A500	HDD-R142	↑	↑	↑		↑
1050A600	HDD-R144	↑	↑	↑		↑
1050A700	HDD-R143	↑	↑	↑		↑
1050A800	HDD-R157	↑	HDD canister in HDU-R15 (DKR2B-J18)	↑		↑
1050A900	HDD-R150	↑	↑	↑		↑
1050AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.1 List of ACC (Drive:DKR2B-J18) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1050AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DKR2B-J18)	RDKxx		RDKxx
1050AC00	HDD-R155	↑	↑	↑		↑
1050AD00	HDD-R152	↑	↑	↑		↑
1050AE00	HDD-R154	↑	↑	↑		↑
1050AF00	HDD-R153	↑	↑	↑		↑
1050B000	HDD-R167	↑	HDD canister in HDU-R16 (DKR2B-J18)	↑		↑
1050B100	HDD-R160	↑	↑	↑		↑
1050B200	HDD-R166	↑	↑	↑		↑
1050B300	HDD-R161	↑	↑	↑		↑
1050B400	HDD-R165	↑	↑	↑		↑
1050B500	HDD-R162	↑	↑	↑		↑
1050B600	HDD-R164	↑	↑	↑		↑
1050B700	HDD-R163	↑	↑	↑		↑
1050B800	HDD-R177	↑	HDD canister in HDU-R17 (DKR2B-J18)	↑		↑
1050B900	HDD-R170	↑	↑	↑		↑
1050BA00	HDD-R176	↑	↑	↑		↑
1050BB00	HDD-R171	↑	↑	↑		↑
1050BC00	HDD-R175	↑	↑	↑		↑
1050BD00	HDD-R172	↑	↑	↑		↑
1050BE00	HDD-R174	↑	↑	↑		↑
1050BF00	HDD-R173	↑	↑	↑		↑
1050C000	HDD-R207	↑	HDD canister in HDU-R20 (DKR2B-J18)	↑		↑
1050C100	HDD-R200	↑	↑	↑		↑
1050C200	HDD-R206	↑	↑	↑		↑
1050C300	HDD-R201	↑	↑	↑		↑
1050C400	HDD-R205	↑	↑	↑		↑
1050C500	HDD-R202	↑	↑	↑		↑
1050C600	HDD-R204	↑	↑	↑		↑
1050C700	HDD-R203	↑	↑	↑		↑
1050C800	HDD-R217	↑	HDD canister in HDU-R21 (DKR2B-J18)	↑		↑
1050C900	HDD-R210	↑	↑	↑		↑
1050CA00	HDD-R216	↑	↑	↑		↑
1050CB00	HDD-R211	↑	↑	↑		↑
1050CC00	HDD-R215	↑	↑	↑		↑
1050CD00	HDD-R212	↑	↑	↑		↑
1050CE00	HDD-R214	↑	↑	↑		↑
1050CF00	HDD-R213	↑	↑	↑		↑
1050D000	HDD-R227	↑	HDD canister in HDU-R22 (DKR2B-J18)	↑		↑
1050D100	HDD-R220	↑	↑	↑		↑
1050D200	HDD-R226	↑	↑	↑		↑
1050D300	HDD-R221	↑	↑	↑		↑
1050D400	HDD-R225	↑	↑	↑		↑
1050D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.1 List of ACC (Drive:DKR2B-J18) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1050D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DKR2B-J18)	RDKxx		RDKxx
1050D700	HDD-R223	↑	↑	↑		↑
1050D800	HDD-R237	↑	HDD canister in HDU-R23 (DKR2B-J18)	↑		↑
1050D900	HDD-R230	↑	↑	↑		↑
1050DA00	HDD-R236	↑	↑	↑		↑
1050DB00	HDD-R231	↑	↑	↑		↑
1050DC00	HDD-R235	↑	↑	↑		↑
1050DD00	HDD-R232	↑	↑	↑		↑
1050DE00	HDD-R234	↑	↑	↑		↑
1050DF00	HDD-R233	↑	↑	↑		↑
1050E000	HDD-R247	↑	HDD canister in HDU-R24 (DKR2B-J18)	↑		↑
1050E100	HDD-R240	↑	↑	↑		↑
1050E200	HDD-R246	↑	↑	↑		↑
1050E300	HDD-R241	↑	↑	↑		↑
1050E400	HDD-R245	↑	↑	↑		↑
1050E500	HDD-R242	↑	↑	↑		↑
1050E600	HDD-R244	↑	↑	↑		↑
1050E700	HDD-R243	↑	↑	↑		↑
1050E800	HDD-R257	↑	HDD canister in HDU-R25 (DKR2B-J18)	↑		↑
1050E900	HDD-R250	↑	↑	↑		↑
1050EA00	HDD-R256	↑	↑	↑		↑
1050EB00	HDD-R251	↑	↑	↑		↑
1050EC00	HDD-R255	↑	↑	↑		↑
1050ED00	HDD-R252	↑	↑	↑		↑
1050EE00	HDD-R254	↑	↑	↑		↑
1050EF00	HDD-R253	↑	↑	↑		↑
1050F000	HDD-R267	↑	HDD canister in HDU-R26 (DKR2B-J18)	↑		↑
1050F100	HDD-R260	↑	↑	↑		↑
1050F200	HDD-R266	↑	↑	↑		↑
1050F300	HDD-R261	↑	↑	↑		↑
1050F400	HDD-R265	↑	↑	↑		↑
1050F500	HDD-R262	↑	↑	↑		↑
1050F600	HDD-R264	↑	↑	↑		↑
1050F700	HDD-R263	↑	↑	↑		↑
1050F800	HDD-R277	↑	HDD canister in HDU-R27 (DKR2B-J18)	↑		↑
1050F900	HDD-R270	↑	↑	↑		↑
1050FA00	HDD-R276	↑	↑	↑		↑
1050FB00	HDD-R271	↑	↑	↑		↑
1050FC00	HDD-R275	↑	↑	↑		↑
1050FD00	HDD-R272	↑	↑	↑		↑
1050FE00	HDD-R274	↑	↑	↑		↑
1050FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.2 List of ACC (Drive:DKR1B-J36) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10510000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DKR1B-J36)	RDKxx		RDKxx
10510100	HDD-L100	↑	↑	↑		↑
10510200	HDD-L106	↑	↑	↑		↑
10510300	HDD-L101	↑	↑	↑		↑
10510400	HDD-L105	↑	↑	↑		↑
10510500	HDD-L102	↑	↑	↑		↑
10510600	HDD-L104	↑	↑	↑		↑
10510700	HDD-L103	↑	↑	↑		↑
10510800	HDD-L117	↑	HDD canister in HDU-L11 (DKR1B-J36)	↑		↑
10510900	HDD-L110	↑	↑	↑		↑
10510A00	HDD-L116	↑	↑	↑		↑
10510B00	HDD-L111	↑	↑	↑		↑
10510C00	HDD-L115	↑	↑	↑		↑
10510D00	HDD-L112	↑	↑	↑		↑
10510E00	HDD-L114	↑	↑	↑		↑
10510F00	HDD-L113	↑	↑	↑		↑
10511000	HDD-L127	↑	HDD canister in HDU-L12 (DKR1B-J36)	↑		↑
10511100	HDD-L120	↑	↑	↑		↑
10511200	HDD-L126	↑	↑	↑		↑
10511300	HDD-L121	↑	↑	↑		↑
10511400	HDD-L125	↑	↑	↑		↑
10511500	HDD-L122	↑	↑	↑		↑
10511600	HDD-L124	↑	↑	↑		↑
10511700	HDD-L123	↑	↑	↑		↑
10511800	HDD-L137	↑	HDD canister in HDU-L13 (DKR1B-J36)	↑		↑
10511900	HDD-L130	↑	↑	↑		↑
10511A00	HDD-L136	↑	↑	↑		↑
10511B00	HDD-L131	↑	↑	↑		↑
10511C00	HDD-L135	↑	↑	↑		↑
10511D00	HDD-L132	↑	↑	↑		↑
10511E00	HDD-L134	↑	↑	↑		↑
10511F00	HDD-L133	↑	↑	↑		↑
10512000	HDD-L147	↑	HDD canister in HDU-L14 (DKR1B-J36)	↑		↑
10512100	HDD-L140	↑	↑	↑		↑
10512200	HDD-L146	↑	↑	↑		↑
10512300	HDD-L141	↑	↑	↑		↑
10512400	HDD-L145	↑	↑	↑		↑
10512500	HDD-L142	↑	↑	↑		↑
10512600	HDD-L144	↑	↑	↑		↑
10512700	HDD-L143	↑	↑	↑		↑
10512800	HDD-L157	↑	HDD canister in HDU-L15 (DKR1B-J36)	↑		↑
10512900	HDD-L150	↑	↑	↑		↑
10512A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.2 List of ACC (Drive:DKR1B-J36) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10512B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DKR1B-J36)	RDKxx		RDKxx
10512C00	HDD-L155	↑	↑	↑		↑
10512D00	HDD-L152	↑	↑	↑		↑
10512E00	HDD-L154	↑	↑	↑		↑
10512F00	HDD-L153	↑	↑	↑		↑
10513000	HDD-L167	↑	HDD canister in HDU-L16 (DKR1B-J36)	↑		↑
10513100	HDD-L160	↑	↑	↑		↑
10513200	HDD-L166	↑	↑	↑		↑
10513300	HDD-L161	↑	↑	↑		↑
10513400	HDD-L165	↑	↑	↑		↑
10513500	HDD-L162	↑	↑	↑		↑
10513600	HDD-L164	↑	↑	↑		↑
10513700	HDD-L163	↑	↑	↑		↑
10513800	HDD-L177	↑	HDD canister in HDU-L17 (DKR1B-J36)	↑		↑
10513900	HDD-L170	↑	↑	↑		↑
10513A00	HDD-L176	↑	↑	↑		↑
10513B00	HDD-L171	↑	↑	↑		↑
10513C00	HDD-L175	↑	↑	↑		↑
10513D00	HDD-L172	↑	↑	↑		↑
10513E00	HDD-L174	↑	↑	↑		↑
10513F00	HDD-L173	↑	↑	↑		↑
10514000	HDD-L207	↑	HDD canister in HDU-L20 (DKR1B-J36)	↑		↑
10514100	HDD-L200	↑	↑	↑		↑
10514200	HDD-L206	↑	↑	↑		↑
10514300	HDD-L201	↑	↑	↑		↑
10514400	HDD-L205	↑	↑	↑		↑
10514500	HDD-L202	↑	↑	↑		↑
10514600	HDD-L204	↑	↑	↑		↑
10514700	HDD-L203	↑	↑	↑		↑
10514800	HDD-L217	↑	HDD canister in HDU-L21 (DKR1B-J36)	↑		↑
10514900	HDD-L210	↑	↑	↑		↑
10514A00	HDD-L216	↑	↑	↑		↑
10514B00	HDD-L211	↑	↑	↑		↑
10514C00	HDD-L215	↑	↑	↑		↑
10514D00	HDD-L212	↑	↑	↑		↑
10514E00	HDD-L214	↑	↑	↑		↑
10514F00	HDD-L213	↑	↑	↑		↑
10515000	HDD-L227	↑	HDD canister in HDU-L22 (DKR1B-J36)	↑		↑
10515100	HDD-L220	↑	↑	↑		↑
10515200	HDD-L226	↑	↑	↑		↑
10515300	HDD-L221	↑	↑	↑		↑
10515400	HDD-L225	↑	↑	↑		↑
10515500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.2 List of ACC (Drive:DKR1B-J36) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10515600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DKR1B-J36)	RDKxx		RDKxx
10515700	HDD-L223	↑	↑	↑		↑
10515800	HDD-L237	↑	HDD canister in HDU-L23 (DKR1B-J36)	↑		↑
10515900	HDD-L230	↑	↑	↑		↑
10515A00	HDD-L236	↑	↑	↑		↑
10515B00	HDD-L231	↑	↑	↑		↑
10515C00	HDD-L235	↑	↑	↑		↑
10515D00	HDD-L232	↑	↑	↑		↑
10515E00	HDD-L234	↑	↑	↑		↑
10515F00	HDD-L233	↑	↑	↑		↑
10516000	HDD-L247	↑	HDD canister in HDU-L24 (DKR1B-J36)	↑		↑
10516100	HDD-L240	↑	↑	↑		↑
10516200	HDD-L246	↑	↑	↑		↑
10516300	HDD-L241	↑	↑	↑		↑
10516400	HDD-L245	↑	↑	↑		↑
10516500	HDD-L242	↑	↑	↑		↑
10516600	HDD-L244	↑	↑	↑		↑
10516700	HDD-L243	↑	↑	↑		↑
10516800	HDD-L257	↑	HDD canister in HDU-L25 (DKR1B-J36)	↑		↑
10516900	HDD-L250	↑	↑	↑		↑
10516A00	HDD-L256	↑	↑	↑		↑
10516B00	HDD-L251	↑	↑	↑		↑
10516C00	HDD-L255	↑	↑	↑		↑
10516D00	HDD-L252	↑	↑	↑		↑
10516E00	HDD-L254	↑	↑	↑		↑
10516F00	HDD-L253	↑	↑	↑		↑
10517000	HDD-L267	↑	HDD canister in HDU-L26 (DKR1B-J36)	↑		↑
10517100	HDD-L260	↑	↑	↑		↑
10517200	HDD-L266	↑	↑	↑		↑
10517300	HDD-L261	↑	↑	↑		↑
10517400	HDD-L265	↑	↑	↑		↑
10517500	HDD-L262	↑	↑	↑		↑
10517600	HDD-L264	↑	↑	↑		↑
10517700	HDD-L263	↑	↑	↑		↑
10517800	HDD-L277	↑	HDD canister in HDU-L27 (DKR1B-J36)	↑		↑
10517900	HDD-L270	↑	↑	↑		↑
10517A00	HDD-L276	↑	↑	↑		↑
10517B00	HDD-L271	↑	↑	↑		↑
10517C00	HDD-L275	↑	↑	↑		↑
10517D00	HDD-L272	↑	↑	↑		↑
10517E00	HDD-L274	↑	↑	↑		↑
10517F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.2 List of ACC (Drive:DKR1B-J36) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10518000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DKR1B-J36)	RDKxx		RDKxx
10518100	HDD-R100	↑	↑	↑		↑
10518200	HDD-R106	↑	↑	↑		↑
10518300	HDD-R101	↑	↑	↑		↑
10518400	HDD-R105	↑	↑	↑		↑
10518500	HDD-R102	↑	↑	↑		↑
10518600	HDD-R104	↑	↑	↑		↑
10518700	HDD-R103	↑	↑	↑		↑
10518800	HDD-R117	↑	HDD canister in HDU-R11 (DKR1B-J36)	↑		↑
10518900	HDD-R110	↑	↑	↑		↑
10518A00	HDD-R116	↑	↑	↑		↑
10518B00	HDD-R111	↑	↑	↑		↑
10518C00	HDD-R115	↑	↑	↑		↑
10518D00	HDD-R112	↑	↑	↑		↑
10518E00	HDD-R114	↑	↑	↑		↑
10518F00	HDD-R113	↑	↑	↑		↑
10519000	HDD-R127	↑	HDD canister in HDU-R12 (DKR1B-J36)	↑		↑
10519100	HDD-R120	↑	↑	↑		↑
10519200	HDD-R126	↑	↑	↑		↑
10519300	HDD-R121	↑	↑	↑		↑
10519400	HDD-R125	↑	↑	↑		↑
10519500	HDD-R122	↑	↑	↑		↑
10519600	HDD-R124	↑	↑	↑		↑
10519700	HDD-R123	↑	↑	↑		↑
10519800	HDD-R137	↑	HDD canister in HDU-R13 (DKR1B-J36)	↑		↑
10519900	HDD-R130	↑	↑	↑		↑
10519A00	HDD-R136	↑	↑	↑		↑
10519B00	HDD-R131	↑	↑	↑		↑
10519C00	HDD-R135	↑	↑	↑		↑
10519D00	HDD-R132	↑	↑	↑		↑
10519E00	HDD-R134	↑	↑	↑		↑
10519F00	HDD-R133	↑	↑	↑		↑
1051A000	HDD-R147	↑	HDD canister in HDU-R14 (DKR1B-J36)	↑		↑
1051A100	HDD-R140	↑	↑	↑		↑
1051A200	HDD-R146	↑	↑	↑		↑
1051A300	HDD-R141	↑	↑	↑		↑
1051A400	HDD-R145	↑	↑	↑		↑
1051A500	HDD-R142	↑	↑	↑		↑
1051A600	HDD-R144	↑	↑	↑		↑
1051A700	HDD-R143	↑	↑	↑		↑
1051A800	HDD-R157	↑	HDD canister in HDU-R15 (DKR1B-J36)	↑		↑
1051A900	HDD-R150	↑	↑	↑		↑
1051AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.2 List of ACC (Drive:DKR1B-J36) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1051AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DKR1B-J36)	RDKxx		RDKxx
1051AC00	HDD-R155	↑	↑	↑		↑
1051AD00	HDD-R152	↑	↑	↑		↑
1051AE00	HDD-R154	↑	↑	↑		↑
1051AF00	HDD-R153	↑	↑	↑		↑
1051B000	HDD-R167	↑	HDD canister in HDU-R16 (DKR1B-J36)	↑		↑
1051B100	HDD-R160	↑	↑	↑		↑
1051B200	HDD-R166	↑	↑	↑		↑
1051B300	HDD-R161	↑	↑	↑		↑
1051B400	HDD-R165	↑	↑	↑		↑
1051B500	HDD-R162	↑	↑	↑		↑
1051B600	HDD-R164	↑	↑	↑		↑
1051B700	HDD-R163	↑	↑	↑		↑
1051B800	HDD-R177	↑	HDD canister in HDU-R17 (DKR1B-J36)	↑		↑
1051B900	HDD-R170	↑	↑	↑		↑
1051BA00	HDD-R176	↑	↑	↑		↑
1051BB00	HDD-R171	↑	↑	↑		↑
1051BC00	HDD-R175	↑	↑	↑		↑
1051BD00	HDD-R172	↑	↑	↑		↑
1051BE00	HDD-R174	↑	↑	↑		↑
1051BF00	HDD-R173	↑	↑	↑		↑
1051C000	HDD-R207	↑	HDD canister in HDU-R20 (DKR1B-J36)	↑		↑
1051C100	HDD-R200	↑	↑	↑		↑
1051C200	HDD-R206	↑	↑	↑		↑
1051C300	HDD-R201	↑	↑	↑		↑
1051C400	HDD-R205	↑	↑	↑		↑
1051C500	HDD-R202	↑	↑	↑		↑
1051C600	HDD-R204	↑	↑	↑		↑
1051C700	HDD-R203	↑	↑	↑		↑
1051C800	HDD-R217	↑	HDD canister in HDU-R21 (DKR1B-J36)	↑		↑
1051C900	HDD-R210	↑	↑	↑		↑
1051CA00	HDD-R216	↑	↑	↑		↑
1051CB00	HDD-R211	↑	↑	↑		↑
1051CC00	HDD-R215	↑	↑	↑		↑
1051CD00	HDD-R212	↑	↑	↑		↑
1051CE00	HDD-R214	↑	↑	↑		↑
1051CF00	HDD-R213	↑	↑	↑		↑
1051D000	HDD-R227	↑	HDD canister in HDU-R22 (DKR1B-J36)	↑		↑
1051D100	HDD-R220	↑	↑	↑		↑
1051D200	HDD-R226	↑	↑	↑		↑
1051D300	HDD-R221	↑	↑	↑		↑
1051D400	HDD-R225	↑	↑	↑		↑
1051D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.2 List of ACC (Drive:DKR1B-J36) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1051D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DKR1B-J36)	RDKxx		RDKxx
1051D700	HDD-R223	↑	↑	↑		↑
1051D800	HDD-R237	↑	HDD canister in HDU-R23 (DKR1B-J36)	↑		↑
1051D900	HDD-R230	↑	↑	↑		↑
1051DA00	HDD-R236	↑	↑	↑		↑
1051DB00	HDD-R231	↑	↑	↑		↑
1051DC00	HDD-R235	↑	↑	↑		↑
1051DD00	HDD-R232	↑	↑	↑		↑
1051DE00	HDD-R234	↑	↑	↑		↑
1051DF00	HDD-R233	↑	↑	↑		↑
1051E000	HDD-R247	↑	HDD canister in HDU-R24 (DKR1B-J36)	↑		↑
1051E100	HDD-R240	↑	↑	↑		↑
1051E200	HDD-R246	↑	↑	↑		↑
1051E300	HDD-R241	↑	↑	↑		↑
1051E400	HDD-R245	↑	↑	↑		↑
1051E500	HDD-R242	↑	↑	↑		↑
1051E600	HDD-R244	↑	↑	↑		↑
1051E700	HDD-R243	↑	↑	↑		↑
1051E800	HDD-R257	↑	HDD canister in HDU-R25 (DKR1B-J36)	↑		↑
1051E900	HDD-R250	↑	↑	↑		↑
1051EA00	HDD-R256	↑	↑	↑		↑
1051EB00	HDD-R251	↑	↑	↑		↑
1051EC00	HDD-R255	↑	↑	↑		↑
1051ED00	HDD-R252	↑	↑	↑		↑
1051EE00	HDD-R254	↑	↑	↑		↑
1051EF00	HDD-R253	↑	↑	↑		↑
1051F000	HDD-R267	↑	HDD canister in HDU-R26 (DKR1B-J36)	↑		↑
1051F100	HDD-R260	↑	↑	↑		↑
1051F200	HDD-R266	↑	↑	↑		↑
1051F300	HDD-R261	↑	↑	↑		↑
1051F400	HDD-R265	↑	↑	↑		↑
1051F500	HDD-R262	↑	↑	↑		↑
1051F600	HDD-R264	↑	↑	↑		↑
1051F700	HDD-R263	↑	↑	↑		↑
1051F800	HDD-R277	↑	HDD canister in HDU-R27 (DKR1B-J36)	↑		↑
1051F900	HDD-R270	↑	↑	↑		↑
1051FA00	HDD-R276	↑	↑	↑		↑
1051FB00	HDD-R271	↑	↑	↑		↑
1051FC00	HDD-R275	↑	↑	↑		↑
1051FD00	HDD-R272	↑	↑	↑		↑
1051FE00	HDD-R274	↑	↑	↑		↑
1051FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.3 List of ACC (Drive:DK308-90 Compatible) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10520000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK308-90 Compatible)	RDKxx		RDKxx
10520100	HDD-L100	↑	↑	↑		↑
10520200	HDD-L106	↑	↑	↑		↑
10520300	HDD-L101	↑	↑	↑		↑
10520400	HDD-L105	↑	↑	↑		↑
10520500	HDD-L102	↑	↑	↑		↑
10520600	HDD-L104	↑	↑	↑		↑
10520700	HDD-L103	↑	↑	↑		↑
10520800	HDD-L117	↑	HDD canister in HDU-L11 (DK308-90 Compatible)	↑		↑
10520900	HDD-L110	↑	↑	↑		↑
10520A00	HDD-L116	↑	↑	↑		↑
10520B00	HDD-L111	↑	↑	↑		↑
10520C00	HDD-L115	↑	↑	↑		↑
10520D00	HDD-L112	↑	↑	↑		↑
10520E00	HDD-L114	↑	↑	↑		↑
10520F00	HDD-L113	↑	↑	↑		↑
10521000	HDD-L127	↑	HDD canister in HDU-L12 (DK308-90 Compatible)	↑		↑
10521100	HDD-L120	↑	↑	↑		↑
10521200	HDD-L126	↑	↑	↑		↑
10521300	HDD-L121	↑	↑	↑		↑
10521400	HDD-L125	↑	↑	↑		↑
10521500	HDD-L122	↑	↑	↑		↑
10521600	HDD-L124	↑	↑	↑		↑
10521700	HDD-L123	↑	↑	↑		↑
10521800	HDD-L137	↑	HDD canister in HDU-L13 (DK308-90 Compatible)	↑		↑
10521900	HDD-L130	↑	↑	↑		↑
10521A00	HDD-L136	↑	↑	↑		↑
10521B00	HDD-L131	↑	↑	↑		↑
10521C00	HDD-L135	↑	↑	↑		↑
10521D00	HDD-L132	↑	↑	↑		↑
10521E00	HDD-L134	↑	↑	↑		↑
10521F00	HDD-L133	↑	↑	↑		↑
10522000	HDD-L147	↑	HDD canister in HDU-L14 (DK308-90 Compatible)	↑		↑
10522100	HDD-L140	↑	↑	↑		↑
10522200	HDD-L146	↑	↑	↑		↑
10522300	HDD-L141	↑	↑	↑		↑
10522400	HDD-L145	↑	↑	↑		↑
10522500	HDD-L142	↑	↑	↑		↑
10522600	HDD-L144	↑	↑	↑		↑
10522700	HDD-L143	↑	↑	↑		↑
10522800	HDD-L157	↑	HDD canister in HDU-L15 (DK308-90 Compatible)	↑		↑
10522900	HDD-L150	↑	↑	↑		↑
10522A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.3 List of ACC (Drive:DK308-90 Compatible) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10522B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK308-90 Compatible)	RDKxx		RDKxx
10522C00	HDD-L155	↑	↑	↑		↑
10522D00	HDD-L152	↑	↑	↑		↑
10522E00	HDD-L154	↑	↑	↑		↑
10522F00	HDD-L153	↑	↑	↑		↑
10523000	HDD-L167	↑	HDD canister in HDU-L16 (DK308-90 Compatible)	↑		↑
10523100	HDD-L160	↑	↑	↑		↑
10523200	HDD-L166	↑	↑	↑		↑
10523300	HDD-L161	↑	↑	↑		↑
10523400	HDD-L165	↑	↑	↑		↑
10523500	HDD-L162	↑	↑	↑		↑
10523600	HDD-L164	↑	↑	↑		↑
10523700	HDD-L163	↑	↑	↑		↑
10523800	HDD-L177	↑	HDD canister in HDU-L17 (DK308-90 Compatible)	↑		↑
10523900	HDD-L170	↑	↑	↑		↑
10523A00	HDD-L176	↑	↑	↑		↑
10523B00	HDD-L171	↑	↑	↑		↑
10523C00	HDD-L175	↑	↑	↑		↑
10523D00	HDD-L172	↑	↑	↑		↑
10523E00	HDD-L174	↑	↑	↑		↑
10523F00	HDD-L173	↑	↑	↑		↑
10524000	HDD-L207	↑	HDD canister in HDU-L20 (DK308-90 Compatible)	↑		↑
10524100	HDD-L200	↑	↑	↑		↑
10524200	HDD-L206	↑	↑	↑		↑
10524300	HDD-L201	↑	↑	↑		↑
10524400	HDD-L205	↑	↑	↑		↑
10524500	HDD-L202	↑	↑	↑		↑
10524600	HDD-L204	↑	↑	↑		↑
10524700	HDD-L203	↑	↑	↑		↑
10524800	HDD-L217	↑	HDD canister in HDU-L21 (DK309-90 Compatible)	↑		↑
10524900	HDD-L210	↑	↑	↑		↑
10524A00	HDD-L216	↑	↑	↑		↑
10524B00	HDD-L211	↑	↑	↑		↑
10524C00	HDD-L215	↑	↑	↑		↑
10524D00	HDD-L212	↑	↑	↑		↑
10524E00	HDD-L214	↑	↑	↑		↑
10524F00	HDD-L213	↑	↑	↑		↑
10525000	HDD-L227	↑	HDD canister in HDU-L22 (DK309-90 Compatible)	↑		↑
10525100	HDD-L220	↑	↑	↑		↑
10525200	HDD-L226	↑	↑	↑		↑
10525300	HDD-L221	↑	↑	↑		↑
10525400	HDD-L225	↑	↑	↑		↑
10525500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.3 List of ACC (Drive:DK308-90 Compatible) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10525600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK308-90 Compatible)	RDKxx		RDKxx
10525700	HDD-L223	↑	↑	↑		↑
10525800	HDD-L237	↑	HDD canister in HDU-L23 (DK308-90 Compatible)	↑		↑
10525900	HDD-L230	↑	↑	↑		↑
10525A00	HDD-L236	↑	↑	↑		↑
10525B00	HDD-L231	↑	↑	↑		↑
10525C00	HDD-L235	↑	↑	↑		↑
10525D00	HDD-L232	↑	↑	↑		↑
10525E00	HDD-L234	↑	↑	↑		↑
10525F00	HDD-L233	↑	↑	↑		↑
10526000	HDD-L247	↑	HDD canister in HDU-L24 (DK308-90 Compatible)	↑		↑
10526100	HDD-L240	↑	↑	↑		↑
10526200	HDD-L246	↑	↑	↑		↑
10526300	HDD-L241	↑	↑	↑		↑
10526400	HDD-L245	↑	↑	↑		↑
10526500	HDD-L242	↑	↑	↑		↑
10526600	HDD-L244	↑	↑	↑		↑
10526700	HDD-L243	↑	↑	↑		↑
10526800	HDD-L257	↑	HDD canister in HDU-L25 (DK308-90 Compatible)	↑		↑
10526900	HDD-L250	↑	↑	↑		↑
10526A00	HDD-L256	↑	↑	↑		↑
10526B00	HDD-L251	↑	↑	↑		↑
10526C00	HDD-L255	↑	↑	↑		↑
10526D00	HDD-L252	↑	↑	↑		↑
10526E00	HDD-L254	↑	↑	↑		↑
10526F00	HDD-L253	↑	↑	↑		↑
10527000	HDD-L267	↑	HDD canister in HDU-L26 (DK308-90 Compatible)	↑		↑
10527100	HDD-L260	↑	↑	↑		↑
10527200	HDD-L266	↑	↑	↑		↑
10527300	HDD-L261	↑	↑	↑		↑
10527400	HDD-L265	↑	↑	↑		↑
10527500	HDD-L262	↑	↑	↑		↑
10527600	HDD-L264	↑	↑	↑		↑
10527700	HDD-L263	↑	↑	↑		↑
10527800	HDD-L277	↑	HDD canister in HDU-L27 (DK308-90 Compatible)	↑		↑
10527900	HDD-L270	↑	↑	↑		↑
10527A00	HDD-L276	↑	↑	↑		↑
10527B00	HDD-L271	↑	↑	↑		↑
10527C00	HDD-L275	↑	↑	↑		↑
10527D00	HDD-L272	↑	↑	↑		↑
10527E00	HDD-L274	↑	↑	↑		↑
10527F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.3 List of ACC (Drive:DK308-90 Compatible) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10528000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK308-90 Compatible)	RDKxx		RDKxx
10528100	HDD-R100	↑	↑	↑		↑
10528200	HDD-R106	↑	↑	↑		↑
10528300	HDD-R101	↑	↑	↑		↑
10528400	HDD-R105	↑	↑	↑		↑
10528500	HDD-R102	↑	↑	↑		↑
10528600	HDD-R104	↑	↑	↑		↑
10528700	HDD-R103	↑	↑	↑		↑
10528800	HDD-R117	↑	HDD canister in HDU-R11 (DK308-90 Compatible)	↑		↑
10528900	HDD-R110	↑	↑	↑		↑
10528A00	HDD-R116	↑	↑	↑		↑
10528B00	HDD-R111	↑	↑	↑		↑
10528C00	HDD-R115	↑	↑	↑		↑
10528D00	HDD-R112	↑	↑	↑		↑
10528E00	HDD-R114	↑	↑	↑		↑
10528F00	HDD-R113	↑	↑	↑		↑
10529000	HDD-R127	↑	HDD canister in HDU-R12 (DK308-90 Compatible)	↑		↑
10529100	HDD-R120	↑	↑	↑		↑
10529200	HDD-R126	↑	↑	↑		↑
10529300	HDD-R121	↑	↑	↑		↑
10529400	HDD-R125	↑	↑	↑		↑
10529500	HDD-R122	↑	↑	↑		↑
10529600	HDD-R124	↑	↑	↑		↑
10529700	HDD-R123	↑	↑	↑		↑
10529800	HDD-R137	↑	HDD canister in HDU-R13 (DK308-90 Compatible)	↑		↑
10529900	HDD-R130	↑	↑	↑		↑
10529A00	HDD-R136	↑	↑	↑		↑
10529B00	HDD-R131	↑	↑	↑		↑
10529C00	HDD-R135	↑	↑	↑		↑
10529D00	HDD-R132	↑	↑	↑		↑
10529E00	HDD-R134	↑	↑	↑		↑
10529F00	HDD-R133	↑	↑	↑		↑
1052A000	HDD-R147	↑	HDD canister in HDU-R14 (DK308-90 Compatible)	↑		↑
1052A100	HDD-R140	↑	↑	↑		↑
1052A200	HDD-R146	↑	↑	↑		↑
1052A300	HDD-R141	↑	↑	↑		↑
1052A400	HDD-R145	↑	↑	↑		↑
1052A500	HDD-R142	↑	↑	↑		↑
1052A600	HDD-R144	↑	↑	↑		↑
1052A700	HDD-R143	↑	↑	↑		↑
1052A800	HDD-R157	↑	HDD canister in HDU-R15 (DK308-90 Compatible)	↑		↑
1052A900	HDD-R150	↑	↑	↑		↑
1052AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.3 List of ACC (Drive:DK308-90 Compatible) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1052AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DK308-90 Compatible)	RDKxx		RDKxx
1052AC00	HDD-R155	↑	↑	↑		↑
1052AD00	HDD-R152	↑	↑	↑		↑
1052AE00	HDD-R154	↑	↑	↑		↑
1052AF00	HDD-R153	↑	↑	↑		↑
1052B000	HDD-R167	↑	HDD canister in HDU-R16 (DK308-90 Compatible)	↑		↑
1052B100	HDD-R160	↑	↑	↑		↑
1052B200	HDD-R166	↑	↑	↑		↑
1052B300	HDD-R161	↑	↑	↑		↑
1052B400	HDD-R165	↑	↑	↑		↑
1052B500	HDD-R162	↑	↑	↑		↑
1052B600	HDD-R164	↑	↑	↑		↑
1052B700	HDD-R163	↑	↑	↑		↑
1052B800	HDD-R177	↑	HDD canister in HDU-R17 (DK308-90 Compatible)	↑		↑
1052B900	HDD-R170	↑	↑	↑		↑
1052BA00	HDD-R176	↑	↑	↑		↑
1052BB00	HDD-R171	↑	↑	↑		↑
1052BC00	HDD-R175	↑	↑	↑		↑
1052BD00	HDD-R172	↑	↑	↑		↑
1052BE00	HDD-R174	↑	↑	↑		↑
1052BF00	HDD-R173	↑	↑	↑		↑
1052C000	HDD-R207	↑	HDD canister in HDU-R20 (DK308-90 Compatible)	↑		↑
1052C100	HDD-R200	↑	↑	↑		↑
1052C200	HDD-R206	↑	↑	↑		↑
1052C300	HDD-R201	↑	↑	↑		↑
1052C400	HDD-R205	↑	↑	↑		↑
1052C500	HDD-R202	↑	↑	↑		↑
1052C600	HDD-R204	↑	↑	↑		↑
1052C700	HDD-R203	↑	↑	↑		↑
1052C800	HDD-R217	↑	HDD canister in HDU-R21 (DK308-90 Compatible)	↑		↑
1052C900	HDD-R210	↑	↑	↑		↑
1052CA00	HDD-R216	↑	↑	↑		↑
1052CB00	HDD-R211	↑	↑	↑		↑
1052CC00	HDD-R215	↑	↑	↑		↑
1052CD00	HDD-R212	↑	↑	↑		↑
1052CE00	HDD-R214	↑	↑	↑		↑
1052CF00	HDD-R213	↑	↑	↑		↑
1052D000	HDD-R227	↑	HDD canister in HDU-R22 (DK308-90 Compatible)	↑		↑
1052D100	HDD-R220	↑	↑	↑		↑
1052D200	HDD-R226	↑	↑	↑		↑
1052D300	HDD-R221	↑	↑	↑		↑
1052D400	HDD-R225	↑	↑	↑		↑
1052D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.3 List of ACC (Drive:DK308-90 Compatible) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1052D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK308-90 Compatible)	RDKxx		RDKxx
1052D700	HDD-R223	↑	↑	↑		↑
1052D800	HDD-R237	↑	HDD canister in HDU-R23 (DK308-90 Compatible)	↑		↑
1052D900	HDD-R230	↑	↑	↑		↑
1052DA00	HDD-R236	↑	↑	↑		↑
1052DB00	HDD-R231	↑	↑	↑		↑
1052DC00	HDD-R235	↑	↑	↑		↑
1052DD00	HDD-R232	↑	↑	↑		↑
1052DE00	HDD-R234	↑	↑	↑		↑
1052DF00	HDD-R233	↑	↑	↑		↑
1052E000	HDD-R247	↑	HDD canister in HDU-R24 (DK308-90 Compatible)	↑		↑
1052E100	HDD-R240	↑	↑	↑		↑
1052E200	HDD-R246	↑	↑	↑		↑
1052E300	HDD-R241	↑	↑	↑		↑
1052E400	HDD-R245	↑	↑	↑		↑
1052E500	HDD-R242	↑	↑	↑		↑
1052E600	HDD-R244	↑	↑	↑		↑
1052E700	HDD-R243	↑	↑	↑		↑
1052E800	HDD-R257	↑	HDD canister in HDU-R25 (DK308-90 Compatible)	↑		↑
1052E900	HDD-R250	↑	↑	↑		↑
1052EA00	HDD-R256	↑	↑	↑		↑
1052EB00	HDD-R251	↑	↑	↑		↑
1052EC00	HDD-R255	↑	↑	↑		↑
1052ED00	HDD-R252	↑	↑	↑		↑
1052EE00	HDD-R254	↑	↑	↑		↑
1052EF00	HDD-R253	↑	↑	↑		↑
1052F000	HDD-R267	↑	HDD canister in HDU-R26 (DK308-90 Compatible)	↑		↑
1052F100	HDD-R260	↑	↑	↑		↑
1052F200	HDD-R266	↑	↑	↑		↑
1052F300	HDD-R261	↑	↑	↑		↑
1052F400	HDD-R265	↑	↑	↑		↑
1052F500	HDD-R262	↑	↑	↑		↑
1052F600	HDD-R264	↑	↑	↑		↑
1052F700	HDD-R263	↑	↑	↑		↑
1052F800	HDD-R277	↑	HDD canister in HDU-R27 (DK308-90 Compatible)	↑		↑
1052F900	HDD-R270	↑	↑	↑		↑
1052FA00	HDD-R276	↑	↑	↑		↑
1052FB00	HDD-R271	↑	↑	↑		↑
1052FC00	HDD-R275	↑	↑	↑		↑
1052FD00	HDD-R272	↑	↑	↑		↑
1052FE00	HDD-R274	↑	↑	↑		↑
1052FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.4 List of ACC (Drive:DK3F2-15) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10530000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK3F2-15)	RDKxx		RDKxx
10530100	HDD-L100	↑	↑	↑		↑
10530200	HDD-L106	↑	↑	↑		↑
10530300	HDD-L101	↑	↑	↑		↑
10530400	HDD-L105	↑	↑	↑		↑
10530500	HDD-L102	↑	↑	↑		↑
10530600	HDD-L104	↑	↑	↑		↑
10530700	HDD-L103	↑	↑	↑		↑
10530800	HDD-L117	↑	HDD canister in HDU-L11 (DK3F2-15)	↑		↑
10530900	HDD-L110	↑	↑	↑		↑
10530A00	HDD-L116	↑	↑	↑		↑
10530B00	HDD-L111	↑	↑	↑		↑
10530C00	HDD-L115	↑	↑	↑		↑
10530D00	HDD-L112	↑	↑	↑		↑
10530E00	HDD-L114	↑	↑	↑		↑
10530F00	HDD-L113	↑	↑	↑		↑
10531000	HDD-L127	↑	HDD canister in HDU-L12 (DK3F2-15)	↑		↑
10531100	HDD-L120	↑	↑	↑		↑
10531200	HDD-L126	↑	↑	↑		↑
10531300	HDD-L121	↑	↑	↑		↑
10531400	HDD-L125	↑	↑	↑		↑
10531500	HDD-L122	↑	↑	↑		↑
10531600	HDD-L124	↑	↑	↑		↑
10531700	HDD-L123	↑	↑	↑		↑
10531800	HDD-L137	↑	HDD canister in HDU-L13 (DK3F2-15)	↑		↑
10531900	HDD-L130	↑	↑	↑		↑
10531A00	HDD-L136	↑	↑	↑		↑
10531B00	HDD-L131	↑	↑	↑		↑
10531C00	HDD-L135	↑	↑	↑		↑
10531D00	HDD-L132	↑	↑	↑		↑
10531E00	HDD-L134	↑	↑	↑		↑
10531F00	HDD-L133	↑	↑	↑		↑
10532000	HDD-L147	↑	HDD canister in HDU-L14 (DK3F2-15)	↑		↑
10532100	HDD-L140	↑	↑	↑		↑
10532200	HDD-L146	↑	↑	↑		↑
10532300	HDD-L141	↑	↑	↑		↑
10532400	HDD-L145	↑	↑	↑		↑
10532500	HDD-L142	↑	↑	↑		↑
10532600	HDD-L144	↑	↑	↑		↑
10532700	HDD-L143	↑	↑	↑		↑
10532800	HDD-L157	↑	HDD canister in HDU-L15 (DK3F2-15)	↑		↑
10532900	HDD-L150	↑	↑	↑		↑
10532A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.4 List of ACC (Drive:DK3F2-15) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10532B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK3F2-15)	RDKxx		RDKxx
10532C00	HDD-L155	↑	↑	↑		↑
10532D00	HDD-L152	↑	↑	↑		↑
10532E00	HDD-L154	↑	↑	↑		↑
10532F00	HDD-L153	↑	↑	↑		↑
10533000	HDD-L167	↑	HDD canister in HDU-L16 (DK3F2-15)	↑		↑
10533100	HDD-L160	↑	↑	↑		↑
10533200	HDD-L166	↑	↑	↑		↑
10533300	HDD-L161	↑	↑	↑		↑
10533400	HDD-L165	↑	↑	↑		↑
10533500	HDD-L162	↑	↑	↑		↑
10533600	HDD-L164	↑	↑	↑		↑
10533700	HDD-L163	↑	↑	↑		↑
10533800	HDD-L177	↑	HDD canister in HDU-L17 (DK3F2-15)	↑		↑
10533900	HDD-L170	↑	↑	↑		↑
10533A00	HDD-L176	↑	↑	↑		↑
10533B00	HDD-L171	↑	↑	↑		↑
10533C00	HDD-L175	↑	↑	↑		↑
10533D00	HDD-L172	↑	↑	↑		↑
10533E00	HDD-L174	↑	↑	↑		↑
10533F00	HDD-L173	↑	↑	↑		↑
10534000	HDD-L207	↑	HDD canister in HDU-L20 (DK3F2-15)	↑		↑
10534100	HDD-L200	↑	↑	↑		↑
10534200	HDD-L206	↑	↑	↑		↑
10534300	HDD-L201	↑	↑	↑		↑
10534400	HDD-L205	↑	↑	↑		↑
10534500	HDD-L202	↑	↑	↑		↑
10534600	HDD-L204	↑	↑	↑		↑
10534700	HDD-L203	↑	↑	↑		↑
10534800	HDD-L217	↑	HDD canister in HDU-L21 (DK3F2-15)	↑		↑
10534900	HDD-L210	↑	↑	↑		↑
10534A00	HDD-L216	↑	↑	↑		↑
10534B00	HDD-L211	↑	↑	↑		↑
10534C00	HDD-L215	↑	↑	↑		↑
10534D00	HDD-L212	↑	↑	↑		↑
10534E00	HDD-L214	↑	↑	↑		↑
10534F00	HDD-L213	↑	↑	↑		↑
10535000	HDD-L227	↑	HDD canister in HDU-L22 (DK3F2-15)	↑		↑
10535100	HDD-L220	↑	↑	↑		↑
10535200	HDD-L226	↑	↑	↑		↑
10535300	HDD-L221	↑	↑	↑		↑
10535400	HDD-L225	↑	↑	↑		↑
10535500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.4 List of ACC (Drive:DK3F2-15) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10535600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK3F2-15)	RDKxx		RDKxx
10535700	HDD-L223	↑	↑	↑		↑
10535800	HDD-L237	↑	HDD canister in HDU-L23 (DK3F2-15)	↑		↑
10535900	HDD-L230	↑	↑	↑		↑
10535A00	HDD-L236	↑	↑	↑		↑
10535B00	HDD-L231	↑	↑	↑		↑
10535C00	HDD-L235	↑	↑	↑		↑
10535D00	HDD-L232	↑	↑	↑		↑
10535E00	HDD-L234	↑	↑	↑		↑
10535F00	HDD-L233	↑	↑	↑		↑
10536000	HDD-L247	↑	HDD canister in HDU-L24 (DK3F2-15)	↑		↑
10536100	HDD-L240	↑	↑	↑		↑
10536200	HDD-L246	↑	↑	↑		↑
10536300	HDD-L241	↑	↑	↑		↑
10536400	HDD-L245	↑	↑	↑		↑
10536500	HDD-L242	↑	↑	↑		↑
10536600	HDD-L244	↑	↑	↑		↑
10536700	HDD-L243	↑	↑	↑		↑
10536800	HDD-L257	↑	HDD canister in HDU-L25 (DK3F2-15)	↑		↑
10536900	HDD-L250	↑	↑	↑		↑
10536A00	HDD-L256	↑	↑	↑		↑
10536B00	HDD-L251	↑	↑	↑		↑
10536C00	HDD-L255	↑	↑	↑		↑
10536D00	HDD-L252	↑	↑	↑		↑
10536E00	HDD-L254	↑	↑	↑		↑
10536F00	HDD-L253	↑	↑	↑		↑
10537000	HDD-L267	↑	HDD canister in HDU-L26 (DK3F2-15)	↑		↑
10537100	HDD-L260	↑	↑	↑		↑
10537200	HDD-L266	↑	↑	↑		↑
10537300	HDD-L261	↑	↑	↑		↑
10537400	HDD-L265	↑	↑	↑		↑
10537500	HDD-L262	↑	↑	↑		↑
10537600	HDD-L264	↑	↑	↑		↑
10537700	HDD-L263	↑	↑	↑		↑
10537800	HDD-L277	↑	HDD canister in HDU-L27 (DK3F2-15)	↑		↑
10537900	HDD-L270	↑	↑	↑		↑
10537A00	HDD-L276	↑	↑	↑		↑
10537B00	HDD-L271	↑	↑	↑		↑
10537C00	HDD-L275	↑	↑	↑		↑
10537D00	HDD-L272	↑	↑	↑		↑
10537E00	HDD-L274	↑	↑	↑		↑
10537F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.4 List of ACC (Drive:DK3F2-15) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10538000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK3F2-15)	RDKxx		RDKxx
10538100	HDD-R100	↑	↑	↑		↑
10538200	HDD-R106	↑	↑	↑		↑
10538300	HDD-R101	↑	↑	↑		↑
10538400	HDD-R105	↑	↑	↑		↑
10538500	HDD-R102	↑	↑	↑		↑
10538600	HDD-R104	↑	↑	↑		↑
10538700	HDD-R103	↑	↑	↑		↑
10538800	HDD-R117	↑	HDD canister in HDU-R11 (DK3F2-15)	↑		↑
10538900	HDD-R110	↑	↑	↑		↑
10538A00	HDD-R116	↑	↑	↑		↑
10538B00	HDD-R111	↑	↑	↑		↑
10538C00	HDD-R115	↑	↑	↑		↑
10538D00	HDD-R112	↑	↑	↑		↑
10538E00	HDD-R114	↑	↑	↑		↑
10538F00	HDD-R113	↑	↑	↑		↑
10539000	HDD-R127	↑	HDD canister in HDU-R12 (DK3F2-15)	↑		↑
10539100	HDD-R120	↑	↑	↑		↑
10539200	HDD-R126	↑	↑	↑		↑
10539300	HDD-R121	↑	↑	↑		↑
10539400	HDD-R125	↑	↑	↑		↑
10539500	HDD-R122	↑	↑	↑		↑
10539600	HDD-R124	↑	↑	↑		↑
10539700	HDD-R123	↑	↑	↑		↑
10539800	HDD-R137	↑	HDD canister in HDU-R13 (DK3F2-15)	↑		↑
10539900	HDD-R130	↑	↑	↑		↑
10539A00	HDD-R136	↑	↑	↑		↑
10539B00	HDD-R131	↑	↑	↑		↑
10539C00	HDD-R135	↑	↑	↑		↑
10539D00	HDD-R132	↑	↑	↑		↑
10539E00	HDD-R134	↑	↑	↑		↑
10539F00	HDD-R133	↑	↑	↑		↑
1053A000	HDD-R147	↑	HDD canister in HDU-R14 (DK3F2-15)	↑		↑
1053A100	HDD-R140	↑	↑	↑		↑
1053A200	HDD-R146	↑	↑	↑		↑
1053A300	HDD-R141	↑	↑	↑		↑
1053A400	HDD-R145	↑	↑	↑		↑
1053A500	HDD-R142	↑	↑	↑		↑
1053A600	HDD-R144	↑	↑	↑		↑
1053A700	HDD-R143	↑	↑	↑		↑
1053A800	HDD-R157	↑	HDD canister in HDU-R15 (DK3F2-15)	↑		↑
1053A900	HDD-R150	↑	↑	↑		↑
1053AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.4 List of ACC (Drive:DK3F2-15) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1053AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DK3F2-15)	RDKxx		RDKxx
1053AC00	HDD-R155	↑	↑	↑		↑
1053AD00	HDD-R152	↑	↑	↑		↑
1053AE00	HDD-R154	↑	↑	↑		↑
1053AF00	HDD-R153	↑	↑	↑		↑
1053B000	HDD-R167	↑	HDD canister in HDU-R16 (DK3F2-15)	↑		↑
1053B100	HDD-R160	↑	↑	↑		↑
1053B200	HDD-R166	↑	↑	↑		↑
1053B300	HDD-R161	↑	↑	↑		↑
1053B400	HDD-R165	↑	↑	↑		↑
1053B500	HDD-R162	↑	↑	↑		↑
1053B600	HDD-R164	↑	↑	↑		↑
1053B700	HDD-R163	↑	↑	↑		↑
1053B800	HDD-R177	↑	HDD canister in HDU-R17 (DK3F2-15)	↑		↑
1053B900	HDD-R170	↑	↑	↑		↑
1053BA00	HDD-R176	↑	↑	↑		↑
1053BB00	HDD-R171	↑	↑	↑		↑
1053BC00	HDD-R175	↑	↑	↑		↑
1053BD00	HDD-R172	↑	↑	↑		↑
1053BE00	HDD-R174	↑	↑	↑		↑
1053BF00	HDD-R173	↑	↑	↑		↑
1053C000	HDD-R207	↑	HDD canister in HDU-R20 (DK3F2-15)	↑		↑
1053C100	HDD-R200	↑	↑	↑		↑
1053C200	HDD-R206	↑	↑	↑		↑
1053C300	HDD-R201	↑	↑	↑		↑
1053C400	HDD-R205	↑	↑	↑		↑
1053C500	HDD-R202	↑	↑	↑		↑
1053C600	HDD-R204	↑	↑	↑		↑
1053C700	HDD-R203	↑	↑	↑		↑
1053C800	HDD-R217	↑	HDD canister in HDU-R21 (DK3F2-15)	↑		↑
1053C900	HDD-R210	↑	↑	↑		↑
1053CA00	HDD-R216	↑	↑	↑		↑
1053CB00	HDD-R211	↑	↑	↑		↑
1053CC00	HDD-R215	↑	↑	↑		↑
1053CD00	HDD-R212	↑	↑	↑		↑
1053CE00	HDD-R214	↑	↑	↑		↑
1053CF00	HDD-R213	↑	↑	↑		↑
1053D000	HDD-R227	↑	HDD canister in HDU-R22 (DK3F2-15)	↑		↑
1053D100	HDD-R220	↑	↑	↑		↑
1053D200	HDD-R226	↑	↑	↑		↑
1053D300	HDD-R221	↑	↑	↑		↑
1053D400	HDD-R225	↑	↑	↑		↑
1053D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.4 List of ACC (Drive:DK3F2-15) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1053D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK3F2-15)	RDKxx		RDKxx
1053D700	HDD-R223	↑	↑	↑		↑
1053D800	HDD-R237	↑	HDD canister in HDU-R23 (DK3F2-15)	↑		↑
1053D900	HDD-R230	↑	↑	↑		↑
1053DA00	HDD-R236	↑	↑	↑		↑
1053DB00	HDD-R231	↑	↑	↑		↑
1053DC00	HDD-R235	↑	↑	↑		↑
1053DD00	HDD-R232	↑	↑	↑		↑
1053DE00	HDD-R234	↑	↑	↑		↑
1053DF00	HDD-R233	↑	↑	↑		↑
1053E000	HDD-R247	↑	HDD canister in HDU-R24 (DK3F2-15)	↑		↑
1053E100	HDD-R240	↑	↑	↑		↑
1053E200	HDD-R246	↑	↑	↑		↑
1053E300	HDD-R241	↑	↑	↑		↑
1053E400	HDD-R245	↑	↑	↑		↑
1053E500	HDD-R242	↑	↑	↑		↑
1053E600	HDD-R244	↑	↑	↑		↑
1053E700	HDD-R243	↑	↑	↑		↑
1053E800	HDD-R257	↑	HDD canister in HDU-R25 (DK3F2-15)	↑		↑
1053E900	HDD-R250	↑	↑	↑		↑
1053EA00	HDD-R256	↑	↑	↑		↑
1053EB00	HDD-R251	↑	↑	↑		↑
1053EC00	HDD-R255	↑	↑	↑		↑
1053ED00	HDD-R252	↑	↑	↑		↑
1053EE00	HDD-R254	↑	↑	↑		↑
1053EF00	HDD-R253	↑	↑	↑		↑
1053F000	HDD-R267	↑	HDD canister in HDU-R26 (DK3F2-15)	↑		↑
1053F100	HDD-R260	↑	↑	↑		↑
1053F200	HDD-R266	↑	↑	↑		↑
1053F300	HDD-R261	↑	↑	↑		↑
1053F400	HDD-R265	↑	↑	↑		↑
1053F500	HDD-R262	↑	↑	↑		↑
1053F600	HDD-R264	↑	↑	↑		↑
1053F700	HDD-R263	↑	↑	↑		↑
1053F800	HDD-R277	↑	HDD canister in HDU-R27 (DK3F2-15)	↑		↑
1053F900	HDD-R270	↑	↑	↑		↑
1053FA00	HDD-R276	↑	↑	↑		↑
1053FB00	HDD-R271	↑	↑	↑		↑
1053FC00	HDD-R275	↑	↑	↑		↑
1053FD00	HDD-R272	↑	↑	↑		↑
1053FE00	HDD-R274	↑	↑	↑		↑
1053FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.5 List of ACC (Drive:DK3F2-16) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10540000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK3F2-16)	RDKxx		RDKxx
10540100	HDD-L100	↑	↑	↑		↑
10540200	HDD-L106	↑	↑	↑		↑
10540300	HDD-L101	↑	↑	↑		↑
10540400	HDD-L105	↑	↑	↑		↑
10540500	HDD-L102	↑	↑	↑		↑
10540600	HDD-L104	↑	↑	↑		↑
10540700	HDD-L103	↑	↑	↑		↑
10540800	HDD-L117	↑	HDD canister in HDU-L11 (DK3F2-16)	↑		↑
10540900	HDD-L110	↑	↑	↑		↑
10540A00	HDD-L116	↑	↑	↑		↑
10540B00	HDD-L111	↑	↑	↑		↑
10540C00	HDD-L115	↑	↑	↑		↑
10540D00	HDD-L112	↑	↑	↑		↑
10540E00	HDD-L114	↑	↑	↑		↑
10540F00	HDD-L113	↑	↑	↑		↑
10541000	HDD-L127	↑	HDD canister in HDU-L12 (DK3F2-16)	↑		↑
10541100	HDD-L120	↑	↑	↑		↑
10541200	HDD-L126	↑	↑	↑		↑
10541300	HDD-L121	↑	↑	↑		↑
10541400	HDD-L125	↑	↑	↑		↑
10541500	HDD-L122	↑	↑	↑		↑
10541600	HDD-L124	↑	↑	↑		↑
10541700	HDD-L123	↑	↑	↑		↑
10541800	HDD-L137	↑	HDD canister in HDU-L13 (DK3F2-16)	↑		↑
10541900	HDD-L130	↑	↑	↑		↑
10541A00	HDD-L136	↑	↑	↑		↑
10541B00	HDD-L131	↑	↑	↑		↑
10541C00	HDD-L135	↑	↑	↑		↑
10541D00	HDD-L132	↑	↑	↑		↑
10541E00	HDD-L134	↑	↑	↑		↑
10541F00	HDD-L133	↑	↑	↑		↑
10542000	HDD-L147	↑	HDD canister in HDU-L14 (DK3F2-16)	↑		↑
10542100	HDD-L140	↑	↑	↑		↑
10542200	HDD-L146	↑	↑	↑		↑
10542300	HDD-L141	↑	↑	↑		↑
10542400	HDD-L145	↑	↑	↑		↑
10542500	HDD-L142	↑	↑	↑		↑
10542600	HDD-L144	↑	↑	↑		↑
10542700	HDD-L143	↑	↑	↑		↑
10542800	HDD-L157	↑	HDD canister in HDU-L15 (DK3F2-16)	↑		↑
10542900	HDD-L150	↑	↑	↑		↑
10542A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.5 List of ACC (Drive:DK3F2-16) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10542B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK3F2-16)	RDKxx		RDKxx
10542C00	HDD-L155	↑	↑	↑		↑
10542D00	HDD-L152	↑	↑	↑		↑
10542E00	HDD-L154	↑	↑	↑		↑
10542F00	HDD-L153	↑	↑	↑		↑
10543000	HDD-L167	↑	HDD canister in HDU-L16 (DK3F2-16)	↑		↑
10543100	HDD-L160	↑	↑	↑		↑
10543200	HDD-L166	↑	↑	↑		↑
10543300	HDD-L161	↑	↑	↑		↑
10543400	HDD-L165	↑	↑	↑		↑
10543500	HDD-L162	↑	↑	↑		↑
10543600	HDD-L164	↑	↑	↑		↑
10543700	HDD-L163	↑	↑	↑		↑
10543800	HDD-L177	↑	HDD canister in HDU-L17 (DK3F2-16)	↑		↑
10543900	HDD-L170	↑	↑	↑		↑
10543A00	HDD-L176	↑	↑	↑		↑
10543B00	HDD-L171	↑	↑	↑		↑
10543C00	HDD-L175	↑	↑	↑		↑
10543D00	HDD-L172	↑	↑	↑		↑
10543E00	HDD-L174	↑	↑	↑		↑
10543F00	HDD-L173	↑	↑	↑		↑
10544000	HDD-L207	↑	HDD canister in HDU-L20 (DK3F2-16)	↑		↑
10544100	HDD-L200	↑	↑	↑		↑
10544200	HDD-L206	↑	↑	↑		↑
10544300	HDD-L201	↑	↑	↑		↑
10544400	HDD-L205	↑	↑	↑		↑
10544500	HDD-L202	↑	↑	↑		↑
10544600	HDD-L204	↑	↑	↑		↑
10544700	HDD-L203	↑	↑	↑		↑
10544800	HDD-L217	↑	HDD canister in HDU-L21 (DK3F2-16)	↑		↑
10544900	HDD-L210	↑	↑	↑		↑
10544A00	HDD-L216	↑	↑	↑		↑
10544B00	HDD-L211	↑	↑	↑		↑
10544C00	HDD-L215	↑	↑	↑		↑
10544D00	HDD-L212	↑	↑	↑		↑
10544E00	HDD-L214	↑	↑	↑		↑
10544F00	HDD-L213	↑	↑	↑		↑
10545000	HDD-L227	↑	HDD canister in HDU-L22 (DK3F2-16)	↑		↑
10545100	HDD-L220	↑	↑	↑		↑
10545200	HDD-L226	↑	↑	↑		↑
10545300	HDD-L221	↑	↑	↑		↑
10545400	HDD-L225	↑	↑	↑		↑
10545500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.5 List of ACC (Drive:DK3F2-16) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10545600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK3F2-16)	RDKxx		RDKxx
10545700	HDD-L223	↑	↑	↑		↑
10545800	HDD-L237	↑	HDD canister in HDU-L23 (DK3F2-16)	↑		↑
10545900	HDD-L230	↑	↑	↑		↑
10545A00	HDD-L236	↑	↑	↑		↑
10545B00	HDD-L231	↑	↑	↑		↑
10545C00	HDD-L235	↑	↑	↑		↑
10545D00	HDD-L232	↑	↑	↑		↑
10545E00	HDD-L234	↑	↑	↑		↑
10545F00	HDD-L233	↑	↑	↑		↑
10546000	HDD-L247	↑	HDD canister in HDU-L24 (DK3F2-16)	↑		↑
10546100	HDD-L240	↑	↑	↑		↑
10546200	HDD-L246	↑	↑	↑		↑
10546300	HDD-L241	↑	↑	↑		↑
10546400	HDD-L245	↑	↑	↑		↑
10546500	HDD-L242	↑	↑	↑		↑
10546600	HDD-L244	↑	↑	↑		↑
10546700	HDD-L243	↑	↑	↑		↑
10546800	HDD-L257	↑	HDD canister in HDU-L25 (DK3F2-16)	↑		↑
10546900	HDD-L250	↑	↑	↑		↑
10546A00	HDD-L256	↑	↑	↑		↑
10546B00	HDD-L251	↑	↑	↑		↑
10546C00	HDD-L255	↑	↑	↑		↑
10546D00	HDD-L252	↑	↑	↑		↑
10546E00	HDD-L254	↑	↑	↑		↑
10546F00	HDD-L253	↑	↑	↑		↑
10547000	HDD-L267	↑	HDD canister in HDU-L26 (DK3F2-16)	↑		↑
10547100	HDD-L260	↑	↑	↑		↑
10547200	HDD-L266	↑	↑	↑		↑
10547300	HDD-L261	↑	↑	↑		↑
10547400	HDD-L265	↑	↑	↑		↑
10547500	HDD-L262	↑	↑	↑		↑
10547600	HDD-L264	↑	↑	↑		↑
10547700	HDD-L263	↑	↑	↑		↑
10547800	HDD-L277	↑	HDD canister in HDU-L27 (DK3F2-16)	↑		↑
10547900	HDD-L270	↑	↑	↑		↑
10547A00	HDD-L276	↑	↑	↑		↑
10547B00	HDD-L271	↑	↑	↑		↑
10547C00	HDD-L275	↑	↑	↑		↑
10547D00	HDD-L272	↑	↑	↑		↑
10547E00	HDD-L274	↑	↑	↑		↑
10547F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.5 List of ACC (Drive:DK3F2-16) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10548000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK3F2-16)	RDKxx		RDKxx
10548100	HDD-R100	↑	↑	↑		↑
10548200	HDD-R106	↑	↑	↑		↑
10548300	HDD-R101	↑	↑	↑		↑
10548400	HDD-R105	↑	↑	↑		↑
10548500	HDD-R102	↑	↑	↑		↑
10548600	HDD-R104	↑	↑	↑		↑
10548700	HDD-R103	↑	↑	↑		↑
10548800	HDD-R117	↑	HDD canister in HDU-R11 (DK3F2-16)	↑		↑
10548900	HDD-R110	↑	↑	↑		↑
10548A00	HDD-R116	↑	↑	↑		↑
10548B00	HDD-R111	↑	↑	↑		↑
10548C00	HDD-R115	↑	↑	↑		↑
10548D00	HDD-R112	↑	↑	↑		↑
10548E00	HDD-R114	↑	↑	↑		↑
10548F00	HDD-R113	↑	↑	↑		↑
10549000	HDD-R127	↑	HDD canister in HDU-R12 (DK3F2-16)	↑		↑
10549100	HDD-R120	↑	↑	↑		↑
10549200	HDD-R126	↑	↑	↑		↑
10549300	HDD-R121	↑	↑	↑		↑
10549400	HDD-R125	↑	↑	↑		↑
10549500	HDD-R122	↑	↑	↑		↑
10549600	HDD-R124	↑	↑	↑		↑
10549700	HDD-R123	↑	↑	↑		↑
10549800	HDD-R137	↑	HDD canister in HDU-R13 (DK3F2-16)	↑		↑
10549900	HDD-R130	↑	↑	↑		↑
10549A00	HDD-R136	↑	↑	↑		↑
10549B00	HDD-R131	↑	↑	↑		↑
10549C00	HDD-R135	↑	↑	↑		↑
10549D00	HDD-R132	↑	↑	↑		↑
10549E00	HDD-R134	↑	↑	↑		↑
10549F00	HDD-R133	↑	↑	↑		↑
1054A000	HDD-R147	↑	HDD canister in HDU-R14 (DK3F2-16)	↑		↑
1054A100	HDD-R140	↑	↑	↑		↑
1054A200	HDD-R146	↑	↑	↑		↑
1054A300	HDD-R141	↑	↑	↑		↑
1054A400	HDD-R145	↑	↑	↑		↑
1054A500	HDD-R142	↑	↑	↑		↑
1054A600	HDD-R144	↑	↑	↑		↑
1054A700	HDD-R143	↑	↑	↑		↑
1054A800	HDD-R157	↑	HDD canister in HDU-R15 (DK3F2-16)	↑		↑
1054A900	HDD-R150	↑	↑	↑		↑
1054AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.5 List of ACC (Drive:DK3F2-16) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1054AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DK3F2-16)	RDKxx		RDKxx
1054AC00	HDD-R155	↑	↑	↑		↑
1054AD00	HDD-R152	↑	↑	↑		↑
1054AE00	HDD-R154	↑	↑	↑		↑
1054AF00	HDD-R153	↑	↑	↑		↑
1054B000	HDD-R167	↑	HDD canister in HDU-R16 (DK3F2-16)	↑		↑
1054B100	HDD-R160	↑	↑	↑		↑
1054B200	HDD-R166	↑	↑	↑		↑
1054B300	HDD-R161	↑	↑	↑		↑
1054B400	HDD-R165	↑	↑	↑		↑
1054B500	HDD-R162	↑	↑	↑		↑
1054B600	HDD-R164	↑	↑	↑		↑
1054B700	HDD-R163	↑	↑	↑		↑
1054B800	HDD-R177	↑	HDD canister in HDU-R17 (DK3F2-16)	↑		↑
1054B900	HDD-R170	↑	↑	↑		↑
1054BA00	HDD-R176	↑	↑	↑		↑
1054BB00	HDD-R171	↑	↑	↑		↑
1054BC00	HDD-R175	↑	↑	↑		↑
1054BD00	HDD-R172	↑	↑	↑		↑
1054BE00	HDD-R174	↑	↑	↑		↑
1054BF00	HDD-R173	↑	↑	↑		↑
1054C000	HDD-R207	↑	HDD canister in HDU-R20 (DK3F2-16)	↑		↑
1054C100	HDD-R200	↑	↑	↑		↑
1054C200	HDD-R206	↑	↑	↑		↑
1054C300	HDD-R201	↑	↑	↑		↑
1054C400	HDD-R205	↑	↑	↑		↑
1054C500	HDD-R202	↑	↑	↑		↑
1054C600	HDD-R204	↑	↑	↑		↑
1054C700	HDD-R203	↑	↑	↑		↑
1054C800	HDD-R217	↑	HDD canister in HDU-R21 (DK3F2-16)	↑		↑
1054C900	HDD-R210	↑	↑	↑		↑
1054CA00	HDD-R216	↑	↑	↑		↑
1054CB00	HDD-R211	↑	↑	↑		↑
1054CC00	HDD-R215	↑	↑	↑		↑
1054CD00	HDD-R212	↑	↑	↑		↑
1054CE00	HDD-R214	↑	↑	↑		↑
1054CF00	HDD-R213	↑	↑	↑		↑
1054D000	HDD-R227	↑	HDD canister in HDU-R22 (DK3F2-16)	↑		↑
1054D100	HDD-R220	↑	↑	↑		↑
1054D200	HDD-R226	↑	↑	↑		↑
1054D300	HDD-R221	↑	↑	↑		↑
1054D400	HDD-R225	↑	↑	↑		↑
1054D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.5 List of ACC (Drive:DK3F2-16) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1054D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK3F2-16)	RDKxx		RDKxx
1054D700	HDD-R223	↑	↑	↑		↑
1054D800	HDD-R237	↑	HDD canister in HDU-R23 (DK3F2-16)	↑		↑
1054D900	HDD-R230	↑	↑	↑		↑
1054DA00	HDD-R236	↑	↑	↑		↑
1054DB00	HDD-R231	↑	↑	↑		↑
1054DC00	HDD-R235	↑	↑	↑		↑
1054DD00	HDD-R232	↑	↑	↑		↑
1054DE00	HDD-R234	↑	↑	↑		↑
1054DF00	HDD-R233	↑	↑	↑		↑
1054E000	HDD-R247	↑	HDD canister in HDU-R24 (DK3F2-16)	↑		↑
1054E100	HDD-R240	↑	↑	↑		↑
1054E200	HDD-R246	↑	↑	↑		↑
1054E300	HDD-R241	↑	↑	↑		↑
1054E400	HDD-R245	↑	↑	↑		↑
1054E500	HDD-R242	↑	↑	↑		↑
1054E600	HDD-R244	↑	↑	↑		↑
1054E700	HDD-R243	↑	↑	↑		↑
1054E800	HDD-R257	↑	HDD canister in HDU-R25 (DK3F2-16)	↑		↑
1054E900	HDD-R250	↑	↑	↑		↑
1054EA00	HDD-R256	↑	↑	↑		↑
1054EB00	HDD-R251	↑	↑	↑		↑
1054EC00	HDD-R255	↑	↑	↑		↑
1054ED00	HDD-R252	↑	↑	↑		↑
1054EE00	HDD-R254	↑	↑	↑		↑
1054EF00	HDD-R253	↑	↑	↑		↑
1054F000	HDD-R267	↑	HDD canister in HDU-R26 (DK3F2-16)	↑		↑
1054F100	HDD-R260	↑	↑	↑		↑
1054F200	HDD-R266	↑	↑	↑		↑
1054F300	HDD-R261	↑	↑	↑		↑
1054F400	HDD-R265	↑	↑	↑		↑
1054F500	HDD-R262	↑	↑	↑		↑
1054F600	HDD-R264	↑	↑	↑		↑
1054F700	HDD-R263	↑	↑	↑		↑
1054F800	HDD-R277	↑	HDD canister in HDU-R27 (DK3F2-16)	↑		↑
1054F900	HDD-R270	↑	↑	↑		↑
1054FA00	HDD-R276	↑	↑	↑		↑
1054FB00	HDD-R271	↑	↑	↑		↑
1054FC00	HDD-R275	↑	↑	↑		↑
1054FD00	HDD-R272	↑	↑	↑		↑
1054FE00	HDD-R274	↑	↑	↑		↑
1054FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.6 List of ACC (Drive:DK309-18 Compatible) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10550000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK309-18 Compatible)	RDKxx		RDKxx
10550100	HDD-L100	↑	↑	↑		↑
10550200	HDD-L106	↑	↑	↑		↑
10550300	HDD-L101	↑	↑	↑		↑
10550400	HDD-L105	↑	↑	↑		↑
10550500	HDD-L102	↑	↑	↑		↑
10550600	HDD-L104	↑	↑	↑		↑
10550700	HDD-L103	↑	↑	↑		↑
10550800	HDD-L117	↑	HDD canister in HDU-L11 (DK309-18 Compatible)	↑		↑
10550900	HDD-L110	↑	↑	↑		↑
10550A00	HDD-L116	↑	↑	↑		↑
10550B00	HDD-L111	↑	↑	↑		↑
10550C00	HDD-L115	↑	↑	↑		↑
10550D00	HDD-L112	↑	↑	↑		↑
10550E00	HDD-L114	↑	↑	↑		↑
10550F00	HDD-L113	↑	↑	↑		↑
10551000	HDD-L127	↑	HDD canister in HDU-L12 (DK309-18 Compatible)	↑		↑
10551100	HDD-L120	↑	↑	↑		↑
10551200	HDD-L126	↑	↑	↑		↑
10551300	HDD-L121	↑	↑	↑		↑
10551400	HDD-L125	↑	↑	↑		↑
10551500	HDD-L122	↑	↑	↑		↑
10551600	HDD-L124	↑	↑	↑		↑
10551700	HDD-L123	↑	↑	↑		↑
10551800	HDD-L137	↑	HDD canister in HDU-L13 (DK309-18 Compatible)	↑		↑
10551900	HDD-L130	↑	↑	↑		↑
10551A00	HDD-L136	↑	↑	↑		↑
10551B00	HDD-L131	↑	↑	↑		↑
10551C00	HDD-L135	↑	↑	↑		↑
10551D00	HDD-L132	↑	↑	↑		↑
10551E00	HDD-L134	↑	↑	↑		↑
10551F00	HDD-L133	↑	↑	↑		↑
10552000	HDD-L147	↑	HDD canister in HDU-L14 (DK309-18 Compatible)	↑		↑
10552100	HDD-L140	↑	↑	↑		↑
10552200	HDD-L146	↑	↑	↑		↑
10552300	HDD-L141	↑	↑	↑		↑
10552400	HDD-L145	↑	↑	↑		↑
10552500	HDD-L142	↑	↑	↑		↑
10552600	HDD-L144	↑	↑	↑		↑
10552700	HDD-L143	↑	↑	↑		↑
10552800	HDD-L157	↑	HDD canister in HDU-L15 (DK309-18 Compatible)	↑		↑
10552900	HDD-L150	↑	↑	↑		↑
10552A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.6 List of ACC (Drive:DK309-18 Compatible) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10552B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK309-18 Compatible)	RDKxx		RDKxx
10552C00	HDD-L155	↑	↑	↑		↑
10552D00	HDD-L152	↑	↑	↑		↑
10552E00	HDD-L154	↑	↑	↑		↑
10552F00	HDD-L153	↑	↑	↑		↑
10553000	HDD-L167	↑	HDD canister in HDU-L16 (DK309-18 Compatible)	↑		↑
10553100	HDD-L160	↑	↑	↑		↑
10553200	HDD-L166	↑	↑	↑		↑
10553300	HDD-L161	↑	↑	↑		↑
10553400	HDD-L165	↑	↑	↑		↑
10553500	HDD-L162	↑	↑	↑		↑
10553600	HDD-L164	↑	↑	↑		↑
10553700	HDD-L163	↑	↑	↑		↑
10553800	HDD-L177	↑	HDD canister in HDU-L17 (DK309-18 Compatible)	↑		↑
10553900	HDD-L170	↑	↑	↑		↑
10553A00	HDD-L176	↑	↑	↑		↑
10553B00	HDD-L171	↑	↑	↑		↑
10553C00	HDD-L175	↑	↑	↑		↑
10553D00	HDD-L172	↑	↑	↑		↑
10553E00	HDD-L174	↑	↑	↑		↑
10553F00	HDD-L173	↑	↑	↑		↑
10554000	HDD-L207	↑	HDD canister in HDU-L20 (DK309-18 Compatible)	↑		↑
10554100	HDD-L200	↑	↑	↑		↑
10554200	HDD-L206	↑	↑	↑		↑
10554300	HDD-L201	↑	↑	↑		↑
10554400	HDD-L205	↑	↑	↑		↑
10554500	HDD-L202	↑	↑	↑		↑
10554600	HDD-L204	↑	↑	↑		↑
10554700	HDD-L203	↑	↑	↑		↑
10554800	HDD-L217	↑	HDD canister in HDU-L21 (DK309-18 Compatible)	↑		↑
10554900	HDD-L210	↑	↑	↑		↑
10554A00	HDD-L216	↑	↑	↑		↑
10554B00	HDD-L211	↑	↑	↑		↑
10554C00	HDD-L215	↑	↑	↑		↑
10554D00	HDD-L212	↑	↑	↑		↑
10554E00	HDD-L214	↑	↑	↑		↑
10554F00	HDD-L213	↑	↑	↑		↑
10555000	HDD-L227	↑	HDD canister in HDU-L22 (DK309-18 Compatible)	↑		↑
10555100	HDD-L220	↑	↑	↑		↑
10555200	HDD-L226	↑	↑	↑		↑
10555300	HDD-L221	↑	↑	↑		↑
10555400	HDD-L225	↑	↑	↑		↑
10555500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.6 List of ACC (Drive:DK309-18 Compatible) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10555600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK309-18 Compatible)	RDKxx		RDKxx
10555700	HDD-L223	↑	↑	↑		↑
10555800	HDD-L237	↑	HDD canister in HDU-L23 (DK309-18 Compatible)	↑		↑
10555900	HDD-L230	↑	↑	↑		↑
10555A00	HDD-L236	↑	↑	↑		↑
10555B00	HDD-L231	↑	↑	↑		↑
10555C00	HDD-L235	↑	↑	↑		↑
10555D00	HDD-L232	↑	↑	↑		↑
10555E00	HDD-L234	↑	↑	↑		↑
10555F00	HDD-L233	↑	↑	↑		↑
10556000	HDD-L247	↑	HDD canister in HDU-L24 (DK309-18 Compatible)	↑		↑
10556100	HDD-L240	↑	↑	↑		↑
10556200	HDD-L246	↑	↑	↑		↑
10556300	HDD-L241	↑	↑	↑		↑
10556400	HDD-L245	↑	↑	↑		↑
10556500	HDD-L242	↑	↑	↑		↑
10556600	HDD-L244	↑	↑	↑		↑
10556700	HDD-L243	↑	↑	↑		↑
10556800	HDD-L257	↑	HDD canister in HDU-L25 (DK309-18 Compatible)	↑		↑
10556900	HDD-L250	↑	↑	↑		↑
10556A00	HDD-L256	↑	↑	↑		↑
10556B00	HDD-L251	↑	↑	↑		↑
10556C00	HDD-L255	↑	↑	↑		↑
10556D00	HDD-L252	↑	↑	↑		↑
10556E00	HDD-L254	↑	↑	↑		↑
10556F00	HDD-L253	↑	↑	↑		↑
10557000	HDD-L267	↑	HDD canister in HDU-L26 (DK309-18 Compatible)	↑		↑
10557100	HDD-L260	↑	↑	↑		↑
10557200	HDD-L266	↑	↑	↑		↑
10557300	HDD-L261	↑	↑	↑		↑
10557400	HDD-L265	↑	↑	↑		↑
10557500	HDD-L262	↑	↑	↑		↑
10557600	HDD-L264	↑	↑	↑		↑
10557700	HDD-L263	↑	↑	↑		↑
10557800	HDD-L277	↑	HDD canister in HDU-L27 (DK309-18 Compatible)	↑		↑
10557900	HDD-L270	↑	↑	↑		↑
10557A00	HDD-L276	↑	↑	↑		↑
10557B00	HDD-L271	↑	↑	↑		↑
10557C00	HDD-L275	↑	↑	↑		↑
10557D00	HDD-L272	↑	↑	↑		↑
10557E00	HDD-L274	↑	↑	↑		↑
10557F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.6 List of ACC (Drive:DK309-18 Compatible) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10558000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK309-18 Compatible)	RDKxx		RDKxx
10558100	HDD-R100	↑	↑	↑		↑
10558200	HDD-R106	↑	↑	↑		↑
10558300	HDD-R101	↑	↑	↑		↑
10558400	HDD-R105	↑	↑	↑		↑
10558500	HDD-R102	↑	↑	↑		↑
10558600	HDD-R104	↑	↑	↑		↑
10558700	HDD-R103	↑	↑	↑		↑
10558800	HDD-R117	↑	HDD canister in HDU-R11 (DK309-18 Compatible)	↑		↑
10558900	HDD-R110	↑	↑	↑		↑
10558A00	HDD-R116	↑	↑	↑		↑
10558B00	HDD-R111	↑	↑	↑		↑
10558C00	HDD-R115	↑	↑	↑		↑
10558D00	HDD-R112	↑	↑	↑		↑
10558E00	HDD-R114	↑	↑	↑		↑
10558F00	HDD-R113	↑	↑	↑		↑
10559000	HDD-R127	↑	HDD canister in HDU-R12 (DK309-18 Compatible)	↑		↑
10559100	HDD-R120	↑	↑	↑		↑
10559200	HDD-R126	↑	↑	↑		↑
10559300	HDD-R121	↑	↑	↑		↑
10559400	HDD-R125	↑	↑	↑		↑
10559500	HDD-R122	↑	↑	↑		↑
10559600	HDD-R124	↑	↑	↑		↑
10559700	HDD-R123	↑	↑	↑		↑
10559800	HDD-R137	↑	HDD canister in HDU-R13 (DK309-18 Compatible)	↑		↑
10559900	HDD-R130	↑	↑	↑		↑
10559A00	HDD-R136	↑	↑	↑		↑
10559B00	HDD-R131	↑	↑	↑		↑
10559C00	HDD-R135	↑	↑	↑		↑
10559D00	HDD-R132	↑	↑	↑		↑
10559E00	HDD-R134	↑	↑	↑		↑
10559F00	HDD-R133	↑	↑	↑		↑
1055A000	HDD-R147	↑	HDD canister in HDU-R14 (DK309-18 Compatible)	↑		↑
1055A100	HDD-R140	↑	↑	↑		↑
1055A200	HDD-R146	↑	↑	↑		↑
1055A300	HDD-R141	↑	↑	↑		↑
1055A400	HDD-R145	↑	↑	↑		↑
1055A500	HDD-R142	↑	↑	↑		↑
1055A600	HDD-R144	↑	↑	↑		↑
1055A700	HDD-R143	↑	↑	↑		↑
1055A800	HDD-R157	↑	HDD canister in HDU-R15 (DK309-18 Compatible)	↑		↑
1055A900	HDD-R150	↑	↑	↑		↑
1055AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.6 List of ACC (Drive:DK309-18 Compatible) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1055AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DK309-18 Compatible)	RDKxx		RDKxx
1055AC00	HDD-R155	↑	↑	↑		↑
1055AD00	HDD-R152	↑	↑	↑		↑
1055AE00	HDD-R154	↑	↑	↑		↑
1055AF00	HDD-R153	↑	↑	↑		↑
1055B000	HDD-R167	↑	HDD canister in HDU-R16 (DK309-18 Compatible)	↑		↑
1055B100	HDD-R160	↑	↑	↑		↑
1055B200	HDD-R166	↑	↑	↑		↑
1055B300	HDD-R161	↑	↑	↑		↑
1055B400	HDD-R165	↑	↑	↑		↑
1055B500	HDD-R162	↑	↑	↑		↑
1055B600	HDD-R164	↑	↑	↑		↑
1055B700	HDD-R163	↑	↑	↑		↑
1055B800	HDD-R177	↑	HDD canister in HDU-R17 (DK309-18 Compatible)	↑		↑
1055B900	HDD-R170	↑	↑	↑		↑
1055BA00	HDD-R176	↑	↑	↑		↑
1055BB00	HDD-R171	↑	↑	↑		↑
1055BC00	HDD-R175	↑	↑	↑		↑
1055BD00	HDD-R172	↑	↑	↑		↑
1055BE00	HDD-R174	↑	↑	↑		↑
1055BF00	HDD-R173	↑	↑	↑		↑
1055C000	HDD-R207	↑	HDD canister in HDU-R20 (DK309-18 Compatible)	↑		↑
1055C100	HDD-R200	↑	↑	↑		↑
1055C200	HDD-R206	↑	↑	↑		↑
1055C300	HDD-R201	↑	↑	↑		↑
1055C400	HDD-R205	↑	↑	↑		↑
1055C500	HDD-R202	↑	↑	↑		↑
1055C600	HDD-R204	↑	↑	↑		↑
1055C700	HDD-R203	↑	↑	↑		↑
1055C800	HDD-R217	↑	HDD canister in HDU-R21 (DK309-18 Compatible)	↑		↑
1055C900	HDD-R210	↑	↑	↑		↑
1055CA00	HDD-R216	↑	↑	↑		↑
1055CB00	HDD-R211	↑	↑	↑		↑
1055CC00	HDD-R215	↑	↑	↑		↑
1055CD00	HDD-R212	↑	↑	↑		↑
1055CE00	HDD-R214	↑	↑	↑		↑
1055CF00	HDD-R213	↑	↑	↑		↑
1055D000	HDD-R227	↑	HDD canister in HDU-R22 (DK309-18 Compatible)	↑		↑
1055D100	HDD-R220	↑	↑	↑		↑
1055D200	HDD-R226	↑	↑	↑		↑
1055D300	HDD-R221	↑	↑	↑		↑
1055D400	HDD-R225	↑	↑	↑		↑
1055D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.6 List of ACC (Drive:DK309-18 Compatible) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1055D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK309-18 Compatible)	RDKxx		RDKxx
1055D700	HDD-R223	↑	↑	↑		↑
1055D800	HDD-R237	↑	HDD canister in HDU-R23 (DK309-18 Compatible)	↑		↑
1055D900	HDD-R230	↑	↑	↑		↑
1055DA00	HDD-R236	↑	↑	↑		↑
1055DB00	HDD-R231	↑	↑	↑		↑
1055DC00	HDD-R235	↑	↑	↑		↑
1055DD00	HDD-R232	↑	↑	↑		↑
1055DE00	HDD-R234	↑	↑	↑		↑
1055DF00	HDD-R233	↑	↑	↑		↑
1055E000	HDD-R247	↑	HDD canister in HDU-R24 (DK309-18 Compatible)	↑		↑
1055E100	HDD-R240	↑	↑	↑		↑
1055E200	HDD-R246	↑	↑	↑		↑
1055E300	HDD-R241	↑	↑	↑		↑
1055E400	HDD-R245	↑	↑	↑		↑
1055E500	HDD-R242	↑	↑	↑		↑
1055E600	HDD-R244	↑	↑	↑		↑
1055E700	HDD-R243	↑	↑	↑		↑
1055E800	HDD-R257	↑	HDD canister in HDU-R25 (DK309-18 Compatible)	↑		↑
1055E900	HDD-R250	↑	↑	↑		↑
1055EA00	HDD-R256	↑	↑	↑		↑
1055EB00	HDD-R251	↑	↑	↑		↑
1055EC00	HDD-R255	↑	↑	↑		↑
1055ED00	HDD-R252	↑	↑	↑		↑
1055EE00	HDD-R254	↑	↑	↑		↑
1055EF00	HDD-R253	↑	↑	↑		↑
1055F000	HDD-R267	↑	HDD canister in HDU-R26 (DK309-18 Compatible)	↑		↑
1055F100	HDD-R260	↑	↑	↑		↑
1055F200	HDD-R266	↑	↑	↑		↑
1055F300	HDD-R261	↑	↑	↑		↑
1055F400	HDD-R265	↑	↑	↑		↑
1055F500	HDD-R262	↑	↑	↑		↑
1055F600	HDD-R264	↑	↑	↑		↑
1055F700	HDD-R263	↑	↑	↑		↑
1055F800	HDD-R277	↑	HDD canister in HDU-R27 (DK309-18 Compatible)	↑		↑
1055F900	HDD-R270	↑	↑	↑		↑
1055FA00	HDD-R276	↑	↑	↑		↑
1055FB00	HDD-R271	↑	↑	↑		↑
1055FC00	HDD-R275	↑	↑	↑		↑
1055FD00	HDD-R272	↑	↑	↑		↑
1055FE00	HDD-R274	↑	↑	↑		↑
1055FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.7 List of ACC (Drive:DK30A-36) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10560000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK30A-36)	RDKxx		RDKxx
10560100	HDD-L100	↑	↑	↑		↑
10560200	HDD-L106	↑	↑	↑		↑
10560300	HDD-L101	↑	↑	↑		↑
10560400	HDD-L105	↑	↑	↑		↑
10560500	HDD-L102	↑	↑	↑		↑
10560600	HDD-L104	↑	↑	↑		↑
10560700	HDD-L103	↑	↑	↑		↑
10560800	HDD-L117	↑	HDD canister in HDU-L11 (DK30A-36)	↑		↑
10560900	HDD-L110	↑	↑	↑		↑
10560A00	HDD-L116	↑	↑	↑		↑
10560B00	HDD-L111	↑	↑	↑		↑
10560C00	HDD-L115	↑	↑	↑		↑
10560D00	HDD-L112	↑	↑	↑		↑
10560E00	HDD-L114	↑	↑	↑		↑
10560F00	HDD-L113	↑	↑	↑		↑
10561000	HDD-L127	↑	HDD canister in HDU-L12 (DK30A-36)	↑		↑
10561100	HDD-L120	↑	↑	↑		↑
10561200	HDD-L126	↑	↑	↑		↑
10561300	HDD-L121	↑	↑	↑		↑
10561400	HDD-L125	↑	↑	↑		↑
10561500	HDD-L122	↑	↑	↑		↑
10561600	HDD-L124	↑	↑	↑		↑
10561700	HDD-L123	↑	↑	↑		↑
10561800	HDD-L137	↑	HDD canister in HDU-L13 (DK30A-36)	↑		↑
10561900	HDD-L130	↑	↑	↑		↑
10561A00	HDD-L136	↑	↑	↑		↑
10561B00	HDD-L131	↑	↑	↑		↑
10561C00	HDD-L135	↑	↑	↑		↑
10561D00	HDD-L132	↑	↑	↑		↑
10561E00	HDD-L134	↑	↑	↑		↑
10561F00	HDD-L133	↑	↑	↑		↑
10562000	HDD-L147	↑	HDD canister in HDU-L14 (DK30A-36)	↑		↑
10562100	HDD-L140	↑	↑	↑		↑
10562200	HDD-L146	↑	↑	↑		↑
10562300	HDD-L141	↑	↑	↑		↑
10562400	HDD-L145	↑	↑	↑		↑
10562500	HDD-L142	↑	↑	↑		↑
10562600	HDD-L144	↑	↑	↑		↑
10562700	HDD-L143	↑	↑	↑		↑
10562800	HDD-L157	↑	HDD canister in HDU-L15 (DK30A-36)	↑		↑
10562900	HDD-L150	↑	↑	↑		↑
10562A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.7 List of ACC (Drive:DK30A-36) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10562B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK30A-36)	RDKxx		RDKxx
10562C00	HDD-L155	↑	↑	↑		↑
10562D00	HDD-L152	↑	↑	↑		↑
10562E00	HDD-L154	↑	↑	↑		↑
10562F00	HDD-L153	↑	↑	↑		↑
10563000	HDD-L167	↑	HDD canister in HDU-L16 (DK30A-36)	↑		↑
10563100	HDD-L160	↑	↑	↑		↑
10563200	HDD-L166	↑	↑	↑		↑
10563300	HDD-L161	↑	↑	↑		↑
10563400	HDD-L165	↑	↑	↑		↑
10563500	HDD-L162	↑	↑	↑		↑
10563600	HDD-L164	↑	↑	↑		↑
10563700	HDD-L163	↑	↑	↑		↑
10563800	HDD-L177	↑	HDD canister in HDU-L17 (DK30A-36)	↑		↑
10563900	HDD-L170	↑	↑	↑		↑
10563A00	HDD-L176	↑	↑	↑		↑
10563B00	HDD-L171	↑	↑	↑		↑
10563C00	HDD-L175	↑	↑	↑		↑
10563D00	HDD-L172	↑	↑	↑		↑
10563E00	HDD-L174	↑	↑	↑		↑
10563F00	HDD-L173	↑	↑	↑		↑
10564000	HDD-L207	↑	HDD canister in HDU-L20 (DK30A-36)	↑		↑
10564100	HDD-L200	↑	↑	↑		↑
10564200	HDD-L206	↑	↑	↑		↑
10564300	HDD-L201	↑	↑	↑		↑
10564400	HDD-L205	↑	↑	↑		↑
10564500	HDD-L202	↑	↑	↑		↑
10564600	HDD-L204	↑	↑	↑		↑
10564700	HDD-L203	↑	↑	↑		↑
10564800	HDD-L217	↑	HDD canister in HDU-L21 (DK30A-36)	↑		↑
10564900	HDD-L210	↑	↑	↑		↑
10564A00	HDD-L216	↑	↑	↑		↑
10564B00	HDD-L211	↑	↑	↑		↑
10564C00	HDD-L215	↑	↑	↑		↑
10564D00	HDD-L212	↑	↑	↑		↑
10564E00	HDD-L214	↑	↑	↑		↑
10564F00	HDD-L213	↑	↑	↑		↑
10565000	HDD-L227	↑	HDD canister in HDU-L22 (DK30A-36)	↑		↑
10565100	HDD-L220	↑	↑	↑		↑
10565200	HDD-L226	↑	↑	↑		↑
10565300	HDD-L221	↑	↑	↑		↑
10565400	HDD-L225	↑	↑	↑		↑
10565500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.7 List of ACC (Drive:DK30A-36) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10565600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK30A-36)	RDKxx		RDKxx
10565700	HDD-L223	↑	↑	↑		↑
10565800	HDD-L237	↑	HDD canister in HDU-L23 (DK30A-36)	↑		↑
10565900	HDD-L230	↑	↑	↑		↑
10565A00	HDD-L236	↑	↑	↑		↑
10565B00	HDD-L231	↑	↑	↑		↑
10565C00	HDD-L235	↑	↑	↑		↑
10565D00	HDD-L232	↑	↑	↑		↑
10565E00	HDD-L234	↑	↑	↑		↑
10565F00	HDD-L233	↑	↑	↑		↑
10566000	HDD-L247	↑	HDD canister in HDU-L24 (DK30A-36)	↑		↑
10566100	HDD-L240	↑	↑	↑		↑
10566200	HDD-L246	↑	↑	↑		↑
10566300	HDD-L241	↑	↑	↑		↑
10566400	HDD-L245	↑	↑	↑		↑
10566500	HDD-L242	↑	↑	↑		↑
10566600	HDD-L244	↑	↑	↑		↑
10566700	HDD-L243	↑	↑	↑		↑
10566800	HDD-L257	↑	HDD canister in HDU-L25 (DK30A-36)	↑		↑
10566900	HDD-L250	↑	↑	↑		↑
10566A00	HDD-L256	↑	↑	↑		↑
10566B00	HDD-L251	↑	↑	↑		↑
10566C00	HDD-L255	↑	↑	↑		↑
10566D00	HDD-L252	↑	↑	↑		↑
10566E00	HDD-L254	↑	↑	↑		↑
10566F00	HDD-L253	↑	↑	↑		↑
10567000	HDD-L267	↑	HDD canister in HDU-L26 (DK30A-36)	↑		↑
10567100	HDD-L260	↑	↑	↑		↑
10567200	HDD-L266	↑	↑	↑		↑
10567300	HDD-L261	↑	↑	↑		↑
10567400	HDD-L265	↑	↑	↑		↑
10567500	HDD-L262	↑	↑	↑		↑
10567600	HDD-L264	↑	↑	↑		↑
10567700	HDD-L263	↑	↑	↑		↑
10567800	HDD-L277	↑	HDD canister in HDU-L27 (DK30A-36)	↑		↑
10567900	HDD-L270	↑	↑	↑		↑
10567A00	HDD-L276	↑	↑	↑		↑
10567B00	HDD-L271	↑	↑	↑		↑
10567C00	HDD-L275	↑	↑	↑		↑
10567D00	HDD-L272	↑	↑	↑		↑
10567E00	HDD-L274	↑	↑	↑		↑
10567F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.7 List of ACC (Drive:DK30A-36) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10568000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK30A-36)	RDKxx		RDKxx
10568100	HDD-R100	↑	↑	↑		↑
10568200	HDD-R106	↑	↑	↑		↑
10568300	HDD-R101	↑	↑	↑		↑
10568400	HDD-R105	↑	↑	↑		↑
10568500	HDD-R102	↑	↑	↑		↑
10568600	HDD-R104	↑	↑	↑		↑
10568700	HDD-R103	↑	↑	↑		↑
10568800	HDD-R117	↑	HDD canister in HDU-R11 (DK30A-36)	↑		↑
10568900	HDD-R110	↑	↑	↑		↑
10568A00	HDD-R116	↑	↑	↑		↑
10568B00	HDD-R111	↑	↑	↑		↑
10568C00	HDD-R115	↑	↑	↑		↑
10568D00	HDD-R112	↑	↑	↑		↑
10568E00	HDD-R114	↑	↑	↑		↑
10568F00	HDD-R113	↑	↑	↑		↑
10569000	HDD-R127	↑	HDD canister in HDU-R12 (DK30A-36)	↑		↑
10569100	HDD-R120	↑	↑	↑		↑
10569200	HDD-R126	↑	↑	↑		↑
10569300	HDD-R121	↑	↑	↑		↑
10569400	HDD-R125	↑	↑	↑		↑
10569500	HDD-R122	↑	↑	↑		↑
10569600	HDD-R124	↑	↑	↑		↑
10569700	HDD-R123	↑	↑	↑		↑
10569800	HDD-R137	↑	HDD canister in HDU-R13 (DK30A-36)	↑		↑
10569900	HDD-R130	↑	↑	↑		↑
10569A00	HDD-R136	↑	↑	↑		↑
10569B00	HDD-R131	↑	↑	↑		↑
10569C00	HDD-R135	↑	↑	↑		↑
10569D00	HDD-R132	↑	↑	↑		↑
10569E00	HDD-R134	↑	↑	↑		↑
10569F00	HDD-R133	↑	↑	↑		↑
1056A000	HDD-R147	↑	HDD canister in HDU-R14 (DK30A-36)	↑		↑
1056A100	HDD-R140	↑	↑	↑		↑
1056A200	HDD-R146	↑	↑	↑		↑
1056A300	HDD-R141	↑	↑	↑		↑
1056A400	HDD-R145	↑	↑	↑		↑
1056A500	HDD-R142	↑	↑	↑		↑
1056A600	HDD-R144	↑	↑	↑		↑
1056A700	HDD-R143	↑	↑	↑		↑
1056A800	HDD-R157	↑	HDD canister in HDU-R15 (DK30A-36)	↑		↑
1056A900	HDD-R150	↑	↑	↑		↑
1056AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.7 List of ACC (Drive:DK30A-36) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1056AB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DK30A-36)	RDKxx		RDKxx
1056AC00	HDD-R155	↑	↑	↑		↑
1056AD00	HDD-R152	↑	↑	↑		↑
1056AE00	HDD-R154	↑	↑	↑		↑
1056AF00	HDD-R153	↑	↑	↑		↑
1056B000	HDD-R167	↑	HDD canister in HDU-R16 (DK30A-36)	↑		↑
1056B100	HDD-R160	↑	↑	↑		↑
1056B200	HDD-R166	↑	↑	↑		↑
1056B300	HDD-R161	↑	↑	↑		↑
1056B400	HDD-R165	↑	↑	↑		↑
1056B500	HDD-R162	↑	↑	↑		↑
1056B600	HDD-R164	↑	↑	↑		↑
1056B700	HDD-R163	↑	↑	↑		↑
1056B800	HDD-R177	↑	HDD canister in HDU-R17 (DK30A-36)	↑		↑
1056B900	HDD-R170	↑	↑	↑		↑
1056BA00	HDD-R176	↑	↑	↑		↑
1056BB00	HDD-R171	↑	↑	↑		↑
1056BC00	HDD-R175	↑	↑	↑		↑
1056BD00	HDD-R172	↑	↑	↑		↑
1056BE00	HDD-R174	↑	↑	↑		↑
1056BF00	HDD-R173	↑	↑	↑		↑
1056C000	HDD-R207	↑	HDD canister in HDU-R20 (DK30A-36)	↑		↑
1056C100	HDD-R200	↑	↑	↑		↑
1056C200	HDD-R206	↑	↑	↑		↑
1056C300	HDD-R201	↑	↑	↑		↑
1056C400	HDD-R205	↑	↑	↑		↑
1056C500	HDD-R202	↑	↑	↑		↑
1056C600	HDD-R204	↑	↑	↑		↑
1056C700	HDD-R203	↑	↑	↑		↑
1056C800	HDD-R217	↑	HDD canister in HDU-R21 (DK30A-36)	↑		↑
1056C900	HDD-R210	↑	↑	↑		↑
1056CA00	HDD-R216	↑	↑	↑		↑
1056CB00	HDD-R211	↑	↑	↑		↑
1056CC00	HDD-R215	↑	↑	↑		↑
1056CD00	HDD-R212	↑	↑	↑		↑
1056CE00	HDD-R214	↑	↑	↑		↑
1056CF00	HDD-R213	↑	↑	↑		↑
1056D000	HDD-R227	↑	HDD canister in HDU-R22 (DK30A-36)	↑		↑
1056D100	HDD-R220	↑	↑	↑		↑
1056D200	HDD-R226	↑	↑	↑		↑
1056D300	HDD-R221	↑	↑	↑		↑
1056D400	HDD-R225	↑	↑	↑		↑
1056D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.7 List of ACC (Drive:DK30A-36) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1056D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK30A-36)	RDKxx		RDKxx
1056D700	HDD-R223	↑	↑	↑		↑
1056D800	HDD-R237	↑	HDD canister in HDU-R23 (DK30A-36)	↑		↑
1056D900	HDD-R230	↑	↑	↑		↑
1056DA00	HDD-R236	↑	↑	↑		↑
1056DB00	HDD-R231	↑	↑	↑		↑
1056DC00	HDD-R235	↑	↑	↑		↑
1056DD00	HDD-R232	↑	↑	↑		↑
1056DE00	HDD-R234	↑	↑	↑		↑
1056DF00	HDD-R233	↑	↑	↑		↑
1056E000	HDD-R247	↑	HDD canister in HDU-R24 (DK30A-36)	↑		↑
1056E100	HDD-R240	↑	↑	↑		↑
1056E200	HDD-R246	↑	↑	↑		↑
1056E300	HDD-R241	↑	↑	↑		↑
1056E400	HDD-R245	↑	↑	↑		↑
1056E500	HDD-R242	↑	↑	↑		↑
1056E600	HDD-R244	↑	↑	↑		↑
1056E700	HDD-R243	↑	↑	↑		↑
1056E800	HDD-R257	↑	HDD canister in HDU-R25 (DK30A-36)	↑		↑
1056E900	HDD-R250	↑	↑	↑		↑
1056EA00	HDD-R256	↑	↑	↑		↑
1056EB00	HDD-R251	↑	↑	↑		↑
1056EC00	HDD-R255	↑	↑	↑		↑
1056ED00	HDD-R252	↑	↑	↑		↑
1056EE00	HDD-R254	↑	↑	↑		↑
1056EF00	HDD-R253	↑	↑	↑		↑
1056F000	HDD-R267	↑	HDD canister in HDU-R26 (DK30A-36)	↑		↑
1056F100	HDD-R260	↑	↑	↑		↑
1056F200	HDD-R266	↑	↑	↑		↑
1056F300	HDD-R261	↑	↑	↑		↑
1056F400	HDD-R265	↑	↑	↑		↑
1056F500	HDD-R262	↑	↑	↑		↑
1056F600	HDD-R264	↑	↑	↑		↑
1056F700	HDD-R263	↑	↑	↑		↑
1056F800	HDD-R277	↑	HDD canister in HDU-R27 (DK30A-36)	↑		↑
1056F900	HDD-R270	↑	↑	↑		↑
1056FA00	HDD-R276	↑	↑	↑		↑
1056FB00	HDD-R271	↑	↑	↑		↑
1056FC00	HDD-R275	↑	↑	↑		↑
1056FD00	HDD-R272	↑	↑	↑		↑
1056FE00	HDD-R274	↑	↑	↑		↑
1056FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.8 List of ACC (Drive:DK3F2-90) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10570000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK3F2-90)	RDKxx		RDKxx
10570100	HDD-L100	↑	↑	↑		↑
10570200	HDD-L106	↑	↑	↑		↑
10570300	HDD-L101	↑	↑	↑		↑
10570400	HDD-L105	↑	↑	↑		↑
10570500	HDD-L102	↑	↑	↑		↑
10570600	HDD-L104	↑	↑	↑		↑
10570700	HDD-L103	↑	↑	↑		↑
10570800	HDD-L117	↑	HDD canister in HDU-L11 (DK3F2-90)	↑		↑
10570900	HDD-L110	↑	↑	↑		↑
105790A00	HDD-L116	↑	↑	↑		↑
10570B00	HDD-L111	↑	↑	↑		↑
10570C00	HDD-L115	↑	↑	↑		↑
10570D00	HDD-L112	↑	↑	↑		↑
10570E00	HDD-L114	↑	↑	↑		↑
10570F00	HDD-L113	↑	↑	↑		↑
10571000	HDD-L127	↑	HDD canister in HDU-L12 (DK3F2-90)	↑		↑
10571100	HDD-L120	↑	↑	↑		↑
10571200	HDD-L126	↑	↑	↑		↑
10571300	HDD-L121	↑	↑	↑		↑
10571400	HDD-L125	↑	↑	↑		↑
10571500	HDD-L122	↑	↑	↑		↑
10571600	HDD-L124	↑	↑	↑		↑
10571700	HDD-L123	↑	↑	↑		↑
10571800	HDD-L137	↑	HDD canister in HDU-L13 (DK3F2-90)	↑		↑
10571900	HDD-L130	↑	↑	↑		↑
10571A00	HDD-L136	↑	↑	↑		↑
10571B00	HDD-L131	↑	↑	↑		↑
10571C00	HDD-L135	↑	↑	↑		↑
10571D00	HDD-L132	↑	↑	↑		↑
10571E00	HDD-L134	↑	↑	↑		↑
10571F00	HDD-L133	↑	↑	↑		↑
10572000	HDD-L147	↑	HDD canister in HDU-L14 (DK3F2-90)	↑		↑
10572100	HDD-L140	↑	↑	↑		↑
10572200	HDD-L146	↑	↑	↑		↑
10572300	HDD-L141	↑	↑	↑		↑
10572400	HDD-L145	↑	↑	↑		↑
10572500	HDD-L142	↑	↑	↑		↑
10572600	HDD-L144	↑	↑	↑		↑
10572700	HDD-L143	↑	↑	↑		↑
10572800	HDD-L157	↑	HDD canister in HDU-L15 (DK3F2-90)	↑		↑
10572900	HDD-L150	↑	↑	↑		↑
10572A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.8 List of ACC (Drive:DK3F2-90) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10572B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK3F2-90)	RDKxx		RDKxx
10572C00	HDD-L155	↑	↑	↑		↑
10572D00	HDD-L152	↑	↑	↑		↑
10572E00	HDD-L154	↑	↑	↑		↑
10572F00	HDD-L153	↑	↑	↑		↑
10573000	HDD-L167	↑	HDD canister in HDU-L16 (DK3F2-90)	↑		↑
10573100	HDD-L160	↑	↑	↑		↑
10573200	HDD-L166	↑	↑	↑		↑
10573300	HDD-L161	↑	↑	↑		↑
10573400	HDD-L165	↑	↑	↑		↑
10573500	HDD-L162	↑	↑	↑		↑
10573600	HDD-L164	↑	↑	↑		↑
10573700	HDD-L163	↑	↑	↑		↑
10573800	HDD-L177	↑	HDD canister in HDU-L17 (DK3F2-90)	↑		↑
10573900	HDD-L170	↑	↑	↑		↑
10573A00	HDD-L176	↑	↑	↑		↑
10573B00	HDD-L171	↑	↑	↑		↑
10573C00	HDD-L175	↑	↑	↑		↑
10573D00	HDD-L172	↑	↑	↑		↑
10573E00	HDD-L174	↑	↑	↑		↑
10573F00	HDD-L173	↑	↑	↑		↑
10574000	HDD-L207	↑	HDD canister in HDU-L20 (DK3F2-90)	↑		↑
10574100	HDD-L200	↑	↑	↑		↑
10574200	HDD-L206	↑	↑	↑		↑
10574300	HDD-L201	↑	↑	↑		↑
10574400	HDD-L205	↑	↑	↑		↑
10574500	HDD-L202	↑	↑	↑		↑
10574600	HDD-L204	↑	↑	↑		↑
10574700	HDD-L203	↑	↑	↑		↑
10574800	HDD-L217	↑	HDD canister in HDU-L21 (DK3F2-90)	↑		↑
10574900	HDD-L210	↑	↑	↑		↑
10574A00	HDD-L216	↑	↑	↑		↑
10574B00	HDD-L211	↑	↑	↑		↑
10574C00	HDD-L215	↑	↑	↑		↑
10574D00	HDD-L212	↑	↑	↑		↑
10574E00	HDD-L214	↑	↑	↑		↑
10574F00	HDD-L213	↑	↑	↑		↑
10575000	HDD-L227	↑	HDD canister in HDU-L22 (DK3F2-90)	↑		↑
10575100	HDD-L220	↑	↑	↑		↑
10575200	HDD-L226	↑	↑	↑		↑
10575300	HDD-L221	↑	↑	↑		↑
10575400	HDD-L225	↑	↑	↑		↑
10575500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.8 List of ACC (Drive:DK3F2-90) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10575600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK3F2-90)	RDKxx		RDKxx
10575700	HDD-L223	↑	↑	↑		↑
10575800	HDD-L237	↑	HDD canister in HDU-L23 (DK3F2-90)	↑		↑
10575900	HDD-L230	↑	↑	↑		↑
10575A00	HDD-L236	↑	↑	↑		↑
10575B00	HDD-L231	↑	↑	↑		↑
10575C00	HDD-L235	↑	↑	↑		↑
10575D00	HDD-L232	↑	↑	↑		↑
10575E00	HDD-L234	↑	↑	↑		↑
10575F00	HDD-L233	↑	↑	↑		↑
10576000	HDD-L247	↑	HDD canister in HDU-L24 (DK3F2-90)	↑		↑
10576100	HDD-L240	↑	↑	↑		↑
10576200	HDD-L246	↑	↑	↑		↑
10576300	HDD-L241	↑	↑	↑		↑
10576400	HDD-L245	↑	↑	↑		↑
10576500	HDD-L242	↑	↑	↑		↑
10576600	HDD-L244	↑	↑	↑		↑
10576700	HDD-L243	↑	↑	↑		↑
10576800	HDD-L257	↑	HDD canister in HDU-L25 (DK3F2-90)	↑		↑
10576900	HDD-L250	↑	↑	↑		↑
10576A00	HDD-L256	↑	↑	↑		↑
10576B00	HDD-L251	↑	↑	↑		↑
10576C00	HDD-L255	↑	↑	↑		↑
10576D00	HDD-L252	↑	↑	↑		↑
10576E00	HDD-L254	↑	↑	↑		↑
10576F00	HDD-L253	↑	↑	↑		↑
10577000	HDD-L267	↑	HDD canister in HDU-L26 (DK3F2-90)	↑		↑
10577100	HDD-L260	↑	↑	↑		↑
10577200	HDD-L266	↑	↑	↑		↑
10577300	HDD-L261	↑	↑	↑		↑
10577400	HDD-L265	↑	↑	↑		↑
10577500	HDD-L262	↑	↑	↑		↑
10577600	HDD-L264	↑	↑	↑		↑
10577700	HDD-L263	↑	↑	↑		↑
10577800	HDD-L277	↑	HDD canister in HDU-L27 (DK3F2-90)	↑		↑
10577900	HDD-L270	↑	↑	↑		↑
10577A00	HDD-L276	↑	↑	↑		↑
10577B00	HDD-L271	↑	↑	↑		↑
10577C00	HDD-L275	↑	↑	↑		↑
10577D00	HDD-L272	↑	↑	↑		↑
10577E00	HDD-L274	↑	↑	↑		↑
10577F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.8 List of ACC (Drive:DK3F2-90) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10578000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK3F2-90)	RDKxx		RDKxx
10578100	HDD-R100	↑	↑	↑		↑
10578200	HDD-R106	↑	↑	↑		↑
10578300	HDD-R101	↑	↑	↑		↑
10578400	HDD-R105	↑	↑	↑		↑
10578500	HDD-R102	↑	↑	↑		↑
10578600	HDD-R104	↑	↑	↑		↑
10578700	HDD-R103	↑	↑	↑		↑
10578800	HDD-R117	↑	HDD canister in HDU-R11 (DK3F2-90)	↑		↑
10578900	HDD-R110	↑	↑	↑		↑
10578A00	HDD-R116	↑	↑	↑		↑
10578B00	HDD-R111	↑	↑	↑		↑
10578C00	HDD-R115	↑	↑	↑		↑
10578D00	HDD-R112	↑	↑	↑		↑
10578E00	HDD-R114	↑	↑	↑		↑
10578F00	HDD-R113	↑	↑	↑		↑
10579000	HDD-R127	↑	HDD canister in HDU-R12 (DK3F2-90)	↑		↑
10579100	HDD-R120	↑	↑	↑		↑
10579200	HDD-R126	↑	↑	↑		↑
10579300	HDD-R121	↑	↑	↑		↑
10579400	HDD-R125	↑	↑	↑		↑
10579500	HDD-R122	↑	↑	↑		↑
10579600	HDD-R124	↑	↑	↑		↑
10579700	HDD-R123	↑	↑	↑		↑
10579800	HDD-R137	↑	HDD canister in HDU-R13 (DK3F2-90)	↑		↑
10579900	HDD-R130	↑	↑	↑		↑
10579A00	HDD-R136	↑	↑	↑		↑
10579B00	HDD-R131	↑	↑	↑		↑
10579C00	HDD-R135	↑	↑	↑		↑
10579D00	HDD-R132	↑	↑	↑		↑
10579E00	HDD-R134	↑	↑	↑		↑
10579F00	HDD-R133	↑	↑	↑		↑
1057A000	HDD-R147	↑	HDD canister in HDU-R14 (DK3F2-90)	↑		↑
1057A100	HDD-R140	↑	↑	↑		↑
1057A200	HDD-R146	↑	↑	↑		↑
1057A300	HDD-R141	↑	↑	↑		↑
1057A400	HDD-R145	↑	↑	↑		↑
1057A500	HDD-R142	↑	↑	↑		↑
1057A600	HDD-R144	↑	↑	↑		↑
1057A700	HDD-R143	↑	↑	↑		↑
1057A800	HDD-R157	↑	HDD canister in HDU-R15 (DK3F2-90)	↑		↑
1057A900	HDD-R150	↑	↑	↑		↑

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Table 4.1.6.8 List of ACC (Drive:DK3F2-90) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1057AA00	HDD-R156	HDD canister	HDD canister in HDU-R15 (DK3F2-90)	RDKxx		RDKxx
1057AB00	HDD-R151	↑	↑	↑		↑
1057AC00	HDD-R155	↑	↑	↑		↑
1057AD00	HDD-R152	↑	↑	↑		↑
1057AE00	HDD-R154	↑	↑	↑		↑
1057AF00	HDD-R153	↑	↑	↑		↑
1057B000	HDD-R167	↑	HDD canister in HDU-R16 (DK3F2-90)	↑		↑
1057B100	HDD-R160	↑	↑	↑		↑
1057B200	HDD-R166	↑	↑	↑		↑
1057B300	HDD-R161	↑	↑	↑		↑
1057B400	HDD-R165	↑	↑	↑		↑
1057B500	HDD-R162	↑	↑	↑		↑
1057B600	HDD-R164	↑	↑	↑		↑
1057B700	HDD-R163	↑	↑	↑		↑
1057B800	HDD-R177	↑	HDD canister in HDU-R17 (DK3F2-90)	↑		↑
1057B900	HDD-R170	↑	↑	↑		↑
1057BA00	HDD-R176	↑	↑	↑		↑
1057BB00	HDD-R171	↑	↑	↑		↑
1057BC00	HDD-R175	↑	↑	↑		↑
1057BD00	HDD-R172	↑	↑	↑		↑
1057BE00	HDD-R174	↑	↑	↑		↑
1057BF00	HDD-R173	↑	↑	↑		↑
1057C000	HDD-R207	↑	HDD canister in HDU-R20 (DK3F2-90)	↑		↑
1057C100	HDD-R200	↑	↑	↑		↑
1057C200	HDD-R206	↑	↑	↑		↑
1057C300	HDD-R201	↑	↑	↑		↑
1057C400	HDD-R205	↑	↑	↑		↑
1057C500	HDD-R202	↑	↑	↑		↑
1057C600	HDD-R204	↑	↑	↑		↑
1057C700	HDD-R203	↑	↑	↑		↑
1057C800	HDD-R217	↑	HDD canister in HDU-R21 (DK3F2-90)	↑		↑
1057C900	HDD-R210	↑	↑	↑		↑
1057CA00	HDD-R216	↑	↑	↑		↑
1057CB00	HDD-R211	↑	↑	↑		↑
1057CC00	HDD-R215	↑	↑	↑		↑
1057CD00	HDD-R212	↑	↑	↑		↑
1057CE00	HDD-R214	↑	↑	↑		↑
1057CF00	HDD-R213	↑	↑	↑		↑
1057D000	HDD-R227	↑	HDD canister in HDU-R22 (DK3F2-90)	↑		↑
1057D100	HDD-R220	↑	↑	↑		↑
1057D200	HDD-R226	↑	↑	↑		↑
1057D300	HDD-R221	↑	↑	↑		↑
1057D400	HDD-R225	↑	↑	↑		↑
1057D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.8 List of ACC (Drive: DK3F2-90) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1057D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK3F2-90)	RDKxx		RDKxx
1057D700	HDD-R223	↑	↑	↑		↑
1057D800	HDD-R237	↑	HDD canister in HDU-R23 (DK3F2-90)	↑		↑
1057D900	HDD-R230	↑	↑	↑		↑
1057DA00	HDD-R236	↑	↑	↑		↑
1057DB00	HDD-R231	↑	↑	↑		↑
1057DC00	HDD-R235	↑	↑	↑		↑
1057DD00	HDD-R232	↑	↑	↑		↑
1057DE00	HDD-R234	↑	↑	↑		↑
1057DF00	HDD-R233	↑	↑	↑		↑
1057E000	HDD-R247	↑	HDD canister in HDU-R24 (DK3F2-90)	↑		↑
1057E100	HDD-R240	↑	↑	↑		↑
1057E200	HDD-R246	↑	↑	↑		↑
1057E300	HDD-R241	↑	↑	↑		↑
1057E400	HDD-R245	↑	↑	↑		↑
1057E500	HDD-R242	↑	↑	↑		↑
1057E600	HDD-R244	↑	↑	↑		↑
1057E700	HDD-R243	↑	↑	↑		↑
1057E800	HDD-R257	↑	HDD canister in HDU-R25 (DK3F2-90)	↑		↑
1057E900	HDD-R250	↑	↑	↑		↑
1057EA00	HDD-R256	↑	↑	↑		↑
1057EB00	HDD-R251	↑	↑	↑		↑
1057EC00	HDD-R255	↑	↑	↑		↑
1057ED00	HDD-R252	↑	↑	↑		↑
1057EE00	HDD-R254	↑	↑	↑		↑
1057EF00	HDD-R253	↑	↑	↑		↑
1057F000	HDD-R267	↑	HDD canister in HDU-R26 (DK3F2-90)	↑		↑
1057F100	HDD-R260	↑	↑	↑		↑
1057F200	HDD-R266	↑	↑	↑		↑
1057F300	HDD-R261	↑	↑	↑		↑
1057F400	HDD-R265	↑	↑	↑		↑
1057F500	HDD-R262	↑	↑	↑		↑
1057F600	HDD-R264	↑	↑	↑		↑
1057F700	HDD-R263	↑	↑	↑		↑
1057F800	HDD-R277	↑	HDD canister in HDU-R27 (DK3F2-90)	↑		↑
1057F900	HDD-R270	↑	↑	↑		↑
1057FA00	HDD-R276	↑	↑	↑		↑
1057FB00	HDD-R271	↑	↑	↑		↑
1057FC00	HDD-R275	↑	↑	↑		↑
1057FD00	HDD-R272	↑	↑	↑		↑
1057FE00	HDD-R274	↑	↑	↑		↑
1057FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.9 List of ACC (Drive:HDD canister) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10580000	HDD-L107	HDD canister	HDD canister in HDU-L10	RDKxx		RDKxx
10580100	HDD-L100	↑	↑	↑		↑
10580200	HDD-L106	↑	↑	↑		↑
10580300	HDD-L101	↑	↑	↑		↑
10580400	HDD-L105	↑	↑	↑		↑
10580500	HDD-L102	↑	↑	↑		↑
10580600	HDD-L104	↑	↑	↑		↑
10580700	HDD-L103	↑	↑	↑		↑
10580800	HDD-L117	↑	HDD canister in HDU-L11	↑		↑
10580900	HDD-L110	↑	↑	↑		↑
10580A00	HDD-L116	↑	↑	↑		↑
10580B00	HDD-L111	↑	↑	↑		↑
10580C00	HDD-L115	↑	↑	↑		↑
10580D00	HDD-L112	↑	↑	↑		↑
10580E00	HDD-L114	↑	↑	↑		↑
10580F00	HDD-L113	↑	↑	↑		↑
10581000	HDD-L127	↑	HDD canister in HDU-L12	↑		↑
10581100	HDD-L120	↑	↑	↑		↑
10581200	HDD-L126	↑	↑	↑		↑
10581300	HDD-L121	↑	↑	↑		↑
10581400	HDD-L125	↑	↑	↑		↑
10581500	HDD-L122	↑	↑	↑		↑
10581600	HDD-L124	↑	↑	↑		↑
10581700	HDD-L123	↑	↑	↑		↑
10581800	HDD-L137	↑	HDD canister in HDU-L13	↑		↑
10581900	HDD-L130	↑	↑	↑		↑
10581A00	HDD-L136	↑	↑	↑		↑
10581B00	HDD-L131	↑	↑	↑		↑
10581C00	HDD-L135	↑	↑	↑		↑
10581D00	HDD-L132	↑	↑	↑		↑
10581E00	HDD-L134	↑	↑	↑		↑
10581F00	HDD-L133	↑	↑	↑		↑
10582000	HDD-L147	↑	HDD canister in HDU-L14	↑		↑
10582100	HDD-L140	↑	↑	↑		↑
10582200	HDD-L146	↑	↑	↑		↑
10582300	HDD-L141	↑	↑	↑		↑
10582400	HDD-L145	↑	↑	↑		↑
10582500	HDD-L142	↑	↑	↑		↑
10582600	HDD-L144	↑	↑	↑		↑
10582700	HDD-L143	↑	↑	↑		↑
10582800	HDD-L157	↑	HDD canister in HDU-L15	↑		↑
10582900	HDD-L150	↑	↑	↑		↑
10582A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.9 List of ACC (Drive:HDD canister) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10582B00	HDD-L151	HDD canister	HDD canister in HDU-L15	RDKxx		RDKxx
10582C00	HDD-L155	↑	↑	↑		↑
10582D00	HDD-L152	↑	↑	↑		↑
10582E00	HDD-L154	↑	↑	↑		↑
10582F00	HDD-L153	↑	↑	↑		↑
10583000	HDD-L167	↑	HDD canister in HDU-L16	↑		↑
10583100	HDD-L160	↑	↑	↑		↑
10583200	HDD-L166	↑	↑	↑		↑
10583300	HDD-L161	↑	↑	↑		↑
10583400	HDD-L165	↑	↑	↑		↑
10583500	HDD-L162	↑	↑	↑		↑
10583600	HDD-L164	↑	↑	↑		↑
10583700	HDD-L163	↑	↑	↑		↑
10583800	HDD-L177	↑	HDD canister in HDU-L17	↑		↑
10583900	HDD-L170	↑	↑	↑		↑
10583A00	HDD-L176	↑	↑	↑		↑
10583B00	HDD-L171	↑	↑	↑		↑
10583C00	HDD-L175	↑	↑	↑		↑
10583D00	HDD-L172	↑	↑	↑		↑
10583E00	HDD-L174	↑	↑	↑		↑
10583F00	HDD-L173	↑	↑	↑		↑
10584000	HDD-L207	↑	HDD canister in HDU-L20	↑		↑
10584100	HDD-L200	↑	↑	↑		↑
10584200	HDD-L206	↑	↑	↑		↑
10584300	HDD-L201	↑	↑	↑		↑
10584400	HDD-L205	↑	↑	↑		↑
10584500	HDD-L202	↑	↑	↑		↑
10584600	HDD-L204	↑	↑	↑		↑
10584700	HDD-L203	↑	↑	↑		↑
10584800	HDD-L217	↑	HDD canister in HDU-L21	↑		↑
10584900	HDD-L210	↑	↑	↑		↑
10584A00	HDD-L216	↑	↑	↑		↑
10584B00	HDD-L211	↑	↑	↑		↑
10584C00	HDD-L215	↑	↑	↑		↑
10584D00	HDD-L212	↑	↑	↑		↑
10584E00	HDD-L214	↑	↑	↑		↑
10584F00	HDD-L213	↑	↑	↑		↑
10585000	HDD-L227	↑	HDD canister in HDU-L22	↑		↑
10585100	HDD-L220	↑	↑	↑		↑
10585200	HDD-L226	↑	↑	↑		↑
10585300	HDD-L221	↑	↑	↑		↑
10585400	HDD-L225	↑	↑	↑		↑
10585500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.9 List of ACC (Drive:HDD canister) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10585600	HDD-L224	HDD canister	HDD canister in HDU-L22	RDKxx		RDKxx
10585700	HDD-L223	↑	↑	↑		↑
10585800	HDD-L237	↑	HDD canister in HDU-L23	↑		↑
10585900	HDD-L230	↑	↑	↑		↑
10585A00	HDD-L236	↑	↑	↑		↑
10585B00	HDD-L231	↑	↑	↑		↑
10585C00	HDD-L235	↑	↑	↑		↑
10585D00	HDD-L232	↑	↑	↑		↑
10585E00	HDD-L234	↑	↑	↑		↑
10585F00	HDD-L233	↑	↑	↑		↑
10586000	HDD-L247	↑	HDD canister in HDU-L24	↑		↑
10586100	HDD-L240	↑	↑	↑		↑
10586200	HDD-L246	↑	↑	↑		↑
10586300	HDD-L241	↑	↑	↑		↑
10586400	HDD-L245	↑	↑	↑		↑
10586500	HDD-L242	↑	↑	↑		↑
10586600	HDD-L244	↑	↑	↑		↑
10586700	HDD-L243	↑	↑	↑		↑
10586800	HDD-L257	↑	HDD canister in HDU-L25	↑		↑
10586900	HDD-L250	↑	↑	↑		↑
10586A00	HDD-L256	↑	↑	↑		↑
10586B00	HDD-L251	↑	↑	↑		↑
10586C00	HDD-L255	↑	↑	↑		↑
10586D00	HDD-L252	↑	↑	↑		↑
10586E00	HDD-L254	↑	↑	↑		↑
10586F00	HDD-L253	↑	↑	↑		↑
10587000	HDD-L267	↑	HDD canister in HDU-L26	↑		↑
10587100	HDD-L260	↑	↑	↑		↑
10587200	HDD-L266	↑	↑	↑		↑
10587300	HDD-L261	↑	↑	↑		↑
10587400	HDD-L265	↑	↑	↑		↑
10587500	HDD-L262	↑	↑	↑		↑
10587600	HDD-L264	↑	↑	↑		↑
10587700	HDD-L263	↑	↑	↑		↑
10587800	HDD-L277	↑	HDD canister in HDU-L27	↑		↑
10587900	HDD-L270	↑	↑	↑		↑
10587A00	HDD-L276	↑	↑	↑		↑
10587B00	HDD-L271	↑	↑	↑		↑
10587C00	HDD-L275	↑	↑	↑		↑
10587D00	HDD-L272	↑	↑	↑		↑
10587E00	HDD-L274	↑	↑	↑		↑
10587F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.9 List of ACC (Drive:HDD canister) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10588000	HDD-R107	HDD canister	HDD canister in HDU-R10	RDKxx		RDKxx
10588100	HDD-R100	↑	↑	↑		↑
10588200	HDD-R106	↑	↑	↑		↑
10588300	HDD-R101	↑	↑	↑		↑
10588400	HDD-R105	↑	↑	↑		↑
10588500	HDD-R102	↑	↑	↑		↑
10588600	HDD-R104	↑	↑	↑		↑
10588700	HDD-R103	↑	↑	↑		↑
10588800	HDD-R117	↑	HDD canister in HDU-R11	↑		↑
10588900	HDD-R110	↑	↑	↑		↑
10588A00	HDD-R116	↑	↑	↑		↑
10588B00	HDD-R111	↑	↑	↑		↑
10588C00	HDD-R115	↑	↑	↑		↑
10588D00	HDD-R112	↑	↑	↑		↑
10588E00	HDD-R114	↑	↑	↑		↑
10588F00	HDD-R113	↑	↑	↑		↑
10589000	HDD-R127	↑	HDD canister in HDU-R12	↑		↑
10589100	HDD-R120	↑	↑	↑		↑
10589200	HDD-R126	↑	↑	↑		↑
10589300	HDD-R121	↑	↑	↑		↑
10589400	HDD-R125	↑	↑	↑		↑
10589500	HDD-R122	↑	↑	↑		↑
10589600	HDD-R124	↑	↑	↑		↑
10589700	HDD-R123	↑	↑	↑		↑
10579800	HDD-R137	↑	HDD canister in HDU-R13	↑		↑
10579900	HDD-R130	↑	↑	↑		↑
10579A00	HDD-R136	↑	↑	↑		↑
10579B00	HDD-R131	↑	↑	↑		↑
10579C00	HDD-R135	↑	↑	↑		↑
10579D00	HDD-R132	↑	↑	↑		↑
10579E00	HDD-R134	↑	↑	↑		↑
10579F00	HDD-R133	↑	↑	↑		↑
1058A000	HDD-R147	↑	HDD canister in HDU-R14	↑		↑
1058A100	HDD-R140	↑	↑	↑		↑
1058A200	HDD-R146	↑	↑	↑		↑
1058A300	HDD-R141	↑	↑	↑		↑
1058A400	HDD-R145	↑	↑	↑		↑
1058A500	HDD-R142	↑	↑	↑		↑
1058A600	HDD-R144	↑	↑	↑		↑
1058A700	HDD-R143	↑	↑	↑		↑
1058A800	HDD-R157	↑	HDD canister in HDU-R15	↑		↑
1058A900	HDD-R150	↑	↑	↑		↑
1058AA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.9 List of ACC (Drive:HDD canister) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1058AB00	HDD-R151	HDD canister	HDD canister in HDU-R15	RDKxx		RDKxx
1058AC00	HDD-R155	↑	↑	↑		↑
1058AD00	HDD-R152	↑	↑	↑		↑
1058AE00	HDD-R154	↑	↑	↑		↑
1058AF00	HDD-R153	↑	↑	↑		↑
1058B000	HDD-R167	↑	HDD canister in HDU-R16	↑		↑
1058B100	HDD-R160	↑	↑	↑		↑
1058B200	HDD-R166	↑	↑	↑		↑
1058B300	HDD-R161	↑	↑	↑		↑
1058B400	HDD-R165	↑	↑	↑		↑
1058B500	HDD-R162	↑	↑	↑		↑
1058B600	HDD-R164	↑	↑	↑		↑
1058B700	HDD-R163	↑	↑	↑		↑
1058B800	HDD-R177	↑	HDD canister in HDU-R17	↑		↑
1058B900	HDD-R170	↑	↑	↑		↑
1058BA00	HDD-R176	↑	↑	↑		↑
1058BB00	HDD-R171	↑	↑	↑		↑
1058BC00	HDD-R175	↑	↑	↑		↑
1058BD00	HDD-R172	↑	↑	↑		↑
1058BE00	HDD-R174	↑	↑	↑		↑
1058BF00	HDD-R173	↑	↑	↑		↑
1058C000	HDD-R207	↑	HDD canister in HDU-R20	↑		↑
1058C100	HDD-R200	↑	↑	↑		↑
1058C200	HDD-R206	↑	↑	↑		↑
1058C300	HDD-R201	↑	↑	↑		↑
1058C400	HDD-R205	↑	↑	↑		↑
1058C500	HDD-R202	↑	↑	↑		↑
1058C600	HDD-R204	↑	↑	↑		↑
1058C700	HDD-R203	↑	↑	↑		↑
1058C800	HDD-R217	↑	HDD canister in HDU-R21	↑		↑
1058C900	HDD-R210	↑	↑	↑		↑
1058CA00	HDD-R216	↑	↑	↑		↑
1058CB00	HDD-R211	↑	↑	↑		↑
1058CC00	HDD-R215	↑	↑	↑		↑
1058CD00	HDD-R212	↑	↑	↑		↑
1058CE00	HDD-R214	↑	↑	↑		↑
1058CF00	HDD-R213	↑	↑	↑		↑
1058D000	HDD-R227	↑	HDD canister in HDU-R22	↑		↑
1058D100	HDD-R220	↑	↑	↑		↑
1058D200	HDD-R226	↑	↑	↑		↑
1058D300	HDD-R221	↑	↑	↑		↑
1058D400	HDD-R225	↑	↑	↑		↑
1058D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.9 List of ACC (Drive:HDD canister) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1058D600	HDD-R224	HDD canister	HDD canister in HDU-R22	RDKxx		RDKxx
1058D700	HDD-R223	↑	↑	↑		↑
1058D800	HDD-R237	↑	HDD canister in HDU-R23	↑		↑
1058D900	HDD-R230	↑	↑	↑		↑
1058DA00	HDD-R236	↑	↑	↑		↑
1058DB00	HDD-R231	↑	↑	↑		↑
1058DC00	HDD-R235	↑	↑	↑		↑
1058DD00	HDD-R232	↑	↑	↑		↑
1058DE00	HDD-R234	↑	↑	↑		↑
1058DF00	HDD-R233	↑	↑	↑		↑
1058E000	HDD-R247	↑	HDD canister in HDU-R24	↑		↑
1058E100	HDD-R240	↑	↑	↑		↑
1058E200	HDD-R246	↑	↑	↑		↑
1058E300	HDD-R241	↑	↑	↑		↑
1058E400	HDD-R245	↑	↑	↑		↑
1058E500	HDD-R242	↑	↑	↑		↑
1058E600	HDD-R244	↑	↑	↑		↑
1058E700	HDD-R243	↑	↑	↑		↑
1058E800	HDD-R257	↑	HDD canister in HDU-R25	↑		↑
1058E900	HDD-R250	↑	↑	↑		↑
1058EA00	HDD-R256	↑	↑	↑		↑
1058EB00	HDD-R251	↑	↑	↑		↑
1058EC00	HDD-R255	↑	↑	↑		↑
1058ED00	HDD-R252	↑	↑	↑		↑
1058EE00	HDD-R254	↑	↑	↑		↑
1058EF00	HDD-R253	↑	↑	↑		↑
1058F000	HDD-R267	↑	HDD canister in HDU-R26	↑		↑
1058F100	HDD-R260	↑	↑	↑		↑
1058F200	HDD-R266	↑	↑	↑		↑
1058F300	HDD-R261	↑	↑	↑		↑
1058F400	HDD-R265	↑	↑	↑		↑
1058F500	HDD-R262	↑	↑	↑		↑
1058F600	HDD-R264	↑	↑	↑		↑
1058F700	HDD-R263	↑	↑	↑		↑
1058F800	HDD-R277	↑	HDD canister in HDU-R27	↑		↑
1058F900	HDD-R270	↑	↑	↑		↑
1058FA00	HDD-R276	↑	↑	↑		↑
1058FB00	HDD-R271	↑	↑	↑		↑
1058FC00	HDD-R275	↑	↑	↑		↑
1058FD00	HDD-R272	↑	↑	↑		↑
1058FE00	HDD-R274	↑	↑	↑		↑
1058FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.10 List of ACC (Drive:DK3F1-60) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10590000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK3F1-60)	RDKxx		RDKxx
10590100	HDD-L100	↑	↑	↑		↑
10590200	HDD-L106	↑	↑	↑		↑
10590300	HDD-L101	↑	↑	↑		↑
10590400	HDD-L105	↑	↑	↑		↑
10590500	HDD-L102	↑	↑	↑		↑
10590600	HDD-L104	↑	↑	↑		↑
10590700	HDD-L103	↑	↑	↑		↑
10590800	HDD-L117	↑	HDD canister in HDU-L11 (DK3F1-60)	↑		↑
10590900	HDD-L110	↑	↑	↑		↑
10590A00	HDD-L116	↑	↑	↑		↑
10590B00	HDD-L111	↑	↑	↑		↑
10590C00	HDD-L115	↑	↑	↑		↑
10590D00	HDD-L112	↑	↑	↑		↑
10590E00	HDD-L114	↑	↑	↑		↑
10590F00	HDD-L113	↑	↑	↑		↑
10591000	HDD-L127	↑	HDD canister in HDU-L12 (DK3F1-60)	↑		↑
10591100	HDD-L120	↑	↑	↑		↑
10591200	HDD-L126	↑	↑	↑		↑
10591300	HDD-L121	↑	↑	↑		↑
10591400	HDD-L125	↑	↑	↑		↑
10591500	HDD-L122	↑	↑	↑		↑
10591600	HDD-L124	↑	↑	↑		↑
10591700	HDD-L123	↑	↑	↑		↑
10591800	HDD-L137	↑	HDD canister in HDU-L13 (DK3F1-60)	↑		↑
10591900	HDD-L130	↑	↑	↑		↑
10591A00	HDD-L136	↑	↑	↑		↑
10591B00	HDD-L131	↑	↑	↑		↑
10591C00	HDD-L135	↑	↑	↑		↑
10591D00	HDD-L132	↑	↑	↑		↑
10591E00	HDD-L134	↑	↑	↑		↑
10591F00	HDD-L133	↑	↑	↑		↑
10592000	HDD-L147	↑	HDD canister in HDU-L14 (DK3F1-60)	↑		↑
10592100	HDD-L140	↑	↑	↑		↑
10592200	HDD-L146	↑	↑	↑		↑
10592300	HDD-L141	↑	↑	↑		↑
10592400	HDD-L145	↑	↑	↑		↑
10592500	HDD-L142	↑	↑	↑		↑
10592600	HDD-L144	↑	↑	↑		↑
10592700	HDD-L143	↑	↑	↑		↑
10592800	HDD-L157	↑	HDD canister in HDU-L15 (DK3F1-60)	↑		↑
10592900	HDD-L150	↑	↑	↑		↑
10592A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.10 List of ACC (Drive:DK3F1-60) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10592B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK3F1-60)	RDKxx		RDKxx
10592C00	HDD-L155	↑	↑	↑		↑
10592D00	HDD-L152	↑	↑	↑		↑
10592E00	HDD-L154	↑	↑	↑		↑
10592F00	HDD-L153	↑	↑	↑		↑
10593000	HDD-L167	↑	HDD canister in HDU-L16 (DK3F1-60)	↑		↑
10593100	HDD-L160	↑	↑	↑		↑
10593200	HDD-L166	↑	↑	↑		↑
10593300	HDD-L161	↑	↑	↑		↑
10593400	HDD-L165	↑	↑	↑		↑
10593500	HDD-L162	↑	↑	↑		↑
10593600	HDD-L164	↑	↑	↑		↑
10593700	HDD-L163	↑	↑	↑		↑
10593800	HDD-L177	↑	HDD canister in HDU-L17 (DK3F1-60)	↑		↑
10593900	HDD-L170	↑	↑	↑		↑
10593A00	HDD-L176	↑	↑	↑		↑
10593B00	HDD-L171	↑	↑	↑		↑
10593C00	HDD-L175	↑	↑	↑		↑
10593D00	HDD-L172	↑	↑	↑		↑
10593E00	HDD-L174	↑	↑	↑		↑
10593F00	HDD-L173	↑	↑	↑		↑
10594000	HDD-L207	↑	HDD canister in HDU-L20 (DK3F1-60)	↑		↑
10594100	HDD-L200	↑	↑	↑		↑
10594200	HDD-L206	↑	↑	↑		↑
10594300	HDD-L201	↑	↑	↑		↑
10594400	HDD-L205	↑	↑	↑		↑
10594500	HDD-L202	↑	↑	↑		↑
10594600	HDD-L204	↑	↑	↑		↑
10594700	HDD-L203	↑	↑	↑		↑
10594800	HDD-L217	↑	HDD canister in HDU-L21 (DK3F1-60)	↑		↑
10594900	HDD-L210	↑	↑	↑		↑
10594A00	HDD-L216	↑	↑	↑		↑
10594B00	HDD-L211	↑	↑	↑		↑
10594C00	HDD-L215	↑	↑	↑		↑
10594D00	HDD-L212	↑	↑	↑		↑
10594E00	HDD-L214	↑	↑	↑		↑
10594F00	HDD-L213	↑	↑	↑		↑
10595000	HDD-L227	↑	HDD canister in HDU-L22 (DK3F1-60)	↑		↑
10595100	HDD-L220	↑	↑	↑		↑
10595200	HDD-L226	↑	↑	↑		↑
10595300	HDD-L221	↑	↑	↑		↑
10595400	HDD-L225	↑	↑	↑		↑
10595500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.10 List of ACC (Drive:DK3F1-60) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10595600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK3F1-60)	RDKxx		RDKxx
10595700	HDD-L223	↑	↑	↑		↑
10595800	HDD-L237	↑	HDD canister in HDU-L23 (DK3F1-60)	↑		↑
10595900	HDD-L230	↑	↑	↑		↑
10595A00	HDD-L236	↑	↑	↑		↑
10595B00	HDD-L231	↑	↑	↑		↑
10595C00	HDD-L235	↑	↑	↑		↑
10595D00	HDD-L232	↑	↑	↑		↑
10595E00	HDD-L234	↑	↑	↑		↑
10595F00	HDD-L233	↑	↑	↑		↑
10596000	HDD-L247	↑	HDD canister in HDU-L24 (DK3F1-60)	↑		↑
10596100	HDD-L240	↑	↑	↑		↑
10596200	HDD-L246	↑	↑	↑		↑
10596300	HDD-L241	↑	↑	↑		↑
10596400	HDD-L245	↑	↑	↑		↑
10596500	HDD-L242	↑	↑	↑		↑
10596600	HDD-L244	↑	↑	↑		↑
10596700	HDD-L243	↑	↑	↑		↑
10596800	HDD-L257	↑	HDD canister in HDU-L25 (DK3F1-60)	↑		↑
10596900	HDD-L250	↑	↑	↑		↑
10596A00	HDD-L256	↑	↑	↑		↑
10596B00	HDD-L251	↑	↑	↑		↑
10596C00	HDD-L255	↑	↑	↑		↑
10596D00	HDD-L252	↑	↑	↑		↑
10596E00	HDD-L254	↑	↑	↑		↑
10596F00	HDD-L253	↑	↑	↑		↑
10597000	HDD-L267	↑	HDD canister in HDU-L26 (DK3F1-60)	↑		↑
10597100	HDD-L260	↑	↑	↑		↑
10597200	HDD-L266	↑	↑	↑		↑
10597300	HDD-L261	↑	↑	↑		↑
10597400	HDD-L265	↑	↑	↑		↑
10597500	HDD-L262	↑	↑	↑		↑
10597600	HDD-L264	↑	↑	↑		↑
10597700	HDD-L263	↑	↑	↑		↑
10597800	HDD-L277	↑	HDD canister in HDU-L27 (DK3F1-60)	↑		↑
10597900	HDD-L270	↑	↑	↑		↑
10597A00	HDD-L276	↑	↑	↑		↑
10597B00	HDD-L271	↑	↑	↑		↑
10597C00	HDD-L275	↑	↑	↑		↑
10597D00	HDD-L272	↑	↑	↑		↑
10597E00	HDD-L274	↑	↑	↑		↑
10597F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.10 List of ACC (Drive:DK3F1-60) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10598000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK3F1-60)	RDKxx		RDKxx
10598100	HDD-R100	↑	↑	↑		↑
10598200	HDD-R106	↑	↑	↑		↑
10598300	HDD-R101	↑	↑	↑		↑
10598400	HDD-R105	↑	↑	↑		↑
10598500	HDD-R102	↑	↑	↑		↑
10598600	HDD-R104	↑	↑	↑		↑
10598700	HDD-R103	↑	↑	↑		↑
10598800	HDD-R117	↑	HDD canister in HDU-R11 (DK3F1-60)	↑		↑
10598900	HDD-R110	↑	↑	↑		↑
10598A00	HDD-R116	↑	↑	↑		↑
10598B00	HDD-R111	↑	↑	↑		↑
10598C00	HDD-R115	↑	↑	↑		↑
10598D00	HDD-R112	↑	↑	↑		↑
10598E00	HDD-R114	↑	↑	↑		↑
10598F00	HDD-R113	↑	↑	↑		↑
10599000	HDD-R127	↑	HDD canister in HDU-R12 (DK3F1-60)	↑		↑
10599100	HDD-R120	↑	↑	↑		↑
10599200	HDD-R126	↑	↑	↑		↑
10599300	HDD-R121	↑	↑	↑		↑
10599400	HDD-R125	↑	↑	↑		↑
10599500	HDD-R122	↑	↑	↑		↑
10599600	HDD-R124	↑	↑	↑		↑
10599700	HDD-R123	↑	↑	↑		↑
10599800	HDD-R137	↑	HDD canister in HDU-R13 (DK3F1-60)	↑		↑
10599900	HDD-R130	↑	↑	↑		↑
10599A00	HDD-R136	↑	↑	↑		↑
10599B00	HDD-R131	↑	↑	↑		↑
10599C00	HDD-R135	↑	↑	↑		↑
10599D00	HDD-R132	↑	↑	↑		↑
10599E00	HDD-R134	↑	↑	↑		↑
10599F00	HDD-R133	↑	↑	↑		↑
1059A000	HDD-R147	↑	HDD canister in HDU-R14 (DK3F1-60)	↑		↑
1059A100	HDD-R140	↑	↑	↑		↑
1059A200	HDD-R146	↑	↑	↑		↑
1059A300	HDD-R141	↑	↑	↑		↑
1059A400	HDD-R145	↑	↑	↑		↑
1059A500	HDD-R142	↑	↑	↑		↑
1059A600	HDD-R144	↑	↑	↑		↑
1059A700	HDD-R143	↑	↑	↑		↑
1059A800	HDD-R157	↑	HDD canister in HDU-R15 (DK3F1-60)	↑		↑
1059A900	HDD-R150	↑	↑	↑		↑

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Table 4.1.6.10 List of ACC (Drive:DK3F1-60) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1059AA00	HDD-R156	HDD canister	HDD canister in HDU-R15 (DK3F1-60)	RDKxx		RDKxx
1059AB00	HDD-R151	↑	↑	↑		↑
1059AC00	HDD-R155	↑	↑	↑		↑
1059AD00	HDD-R152	↑	↑	↑		↑
1059AE00	HDD-R154	↑	↑	↑		↑
1059AF00	HDD-R153	↑	↑	↑		↑
1059B000	HDD-R167	↑	HDD canister in HDU-R16 (DK3F1-60)	↑		↑
1059B100	HDD-R160	↑	↑	↑		↑
1059B200	HDD-R166	↑	↑	↑		↑
1059B300	HDD-R161	↑	↑	↑		↑
1059B400	HDD-R165	↑	↑	↑		↑
1059B500	HDD-R162	↑	↑	↑		↑
1059B600	HDD-R164	↑	↑	↑		↑
1059B700	HDD-R163	↑	↑	↑		↑
1059B800	HDD-R177	↑	HDD canister in HDU-R17 (DK3F1-60)	↑		↑
1059B900	HDD-R170	↑	↑	↑		↑
1059BA00	HDD-R176	↑	↑	↑		↑
1059BB00	HDD-R171	↑	↑	↑		↑
1059BC00	HDD-R175	↑	↑	↑		↑
1059BD00	HDD-R172	↑	↑	↑		↑
1059BE00	HDD-R174	↑	↑	↑		↑
1059BF00	HDD-R173	↑	↑	↑		↑
1059C000	HDD-R207	↑	HDD canister in HDU-R20 (DK3F1-60)	↑		↑
1059C100	HDD-R200	↑	↑	↑		↑
1059C200	HDD-R206	↑	↑	↑		↑
1059C300	HDD-R201	↑	↑	↑		↑
1059C400	HDD-R205	↑	↑	↑		↑
1059C500	HDD-R202	↑	↑	↑		↑
1059C600	HDD-R204	↑	↑	↑		↑
1059C700	HDD-R203	↑	↑	↑		↑
1059C800	HDD-R217	↑	HDD canister in HDU-R21 (DK3F1-60)	↑		↑
1059C900	HDD-R210	↑	↑	↑		↑
1059CA00	HDD-R216	↑	↑	↑		↑
1059CB00	HDD-R211	↑	↑	↑		↑
1059CC00	HDD-R215	↑	↑	↑		↑
1059CD00	HDD-R212	↑	↑	↑		↑
1059CE00	HDD-R214	↑	↑	↑		↑
1059CF00	HDD-R213	↑	↑	↑		↑
1059D000	HDD-R227	↑	HDD canister in HDU-R22 (DK3F1-60)	↑		↑
1059D100	HDD-R220	↑	↑	↑		↑
1059D200	HDD-R226	↑	↑	↑		↑
1059D300	HDD-R221	↑	↑	↑		↑
1059D400	HDD-R225	↑	↑	↑		↑
1059D500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.10 List of ACC (Drive:DK3F1-60) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1059D600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK3F1-60)	RDKxx		RDKxx
1059D700	HDD-R223	↑	↑	↑		↑
1059D800	HDD-R237	↑	HDD canister in HDU-R23 (DK3F1-60)	↑		↑
1059D900	HDD-R230	↑	↑	↑		↑
1059DA00	HDD-R236	↑	↑	↑		↑
1059DB00	HDD-R231	↑	↑	↑		↑
1059DC00	HDD-R235	↑	↑	↑		↑
1059DD00	HDD-R232	↑	↑	↑		↑
1059DE00	HDD-R234	↑	↑	↑		↑
1059DF00	HDD-R233	↑	↑	↑		↑
1059E000	HDD-R247	↑	HDD canister in HDU-R24 (DK3F1-60)	↑		↑
1059E100	HDD-R240	↑	↑	↑		↑
1059E200	HDD-R246	↑	↑	↑		↑
1059E300	HDD-R241	↑	↑	↑		↑
1059E400	HDD-R245	↑	↑	↑		↑
1059E500	HDD-R242	↑	↑	↑		↑
1059E600	HDD-R244	↑	↑	↑		↑
1059E700	HDD-R243	↑	↑	↑		↑
1059E800	HDD-R257	↑	HDD canister in HDU-R25 (DK3F1-60)	↑		↑
1059E900	HDD-R250	↑	↑	↑		↑
1059EA00	HDD-R256	↑	↑	↑		↑
1059EB00	HDD-R251	↑	↑	↑		↑
1059EC00	HDD-R255	↑	↑	↑		↑
1059ED00	HDD-R252	↑	↑	↑		↑
1059EE00	HDD-R254	↑	↑	↑		↑
1059EF00	HDD-R253	↑	↑	↑		↑
1059F000	HDD-R267	↑	HDD canister in HDU-R26 (DK3F1-60)	↑		↑
1059F100	HDD-R260	↑	↑	↑		↑
1059F200	HDD-R266	↑	↑	↑		↑
1059F300	HDD-R261	↑	↑	↑		↑
1059F400	HDD-R265	↑	↑	↑		↑
1059F500	HDD-R262	↑	↑	↑		↑
1059F600	HDD-R264	↑	↑	↑		↑
1059F700	HDD-R263	↑	↑	↑		↑
1059F800	HDD-R277	↑	HDD canister in HDU-R27 (DK3F1-60)	↑		↑
1059F900	HDD-R270	↑	↑	↑		↑
1059FA00	HDD-R276	↑	↑	↑		↑
1059FB00	HDD-R271	↑	↑	↑		↑
1059FC00	HDD-R275	↑	↑	↑		↑
1059FD00	HDD-R272	↑	↑	↑		↑
1059FE00	HDD-R274	↑	↑	↑		↑
1059FF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.11 List of ACC (Drive:DK30A-19 Compatible) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105A0000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DK30A-19 Compatible)	RDKxx		RDKxx
105A0100	HDD-L100	↑	↑	↑		↑
105A0200	HDD-L106	↑	↑	↑		↑
105A0300	HDD-L101	↑	↑	↑		↑
105A0400	HDD-L105	↑	↑	↑		↑
105A0500	HDD-L102	↑	↑	↑		↑
105A0600	HDD-L104	↑	↑	↑		↑
105A0700	HDD-L103	↑	↑	↑		↑
105A0800	HDD-L117	↑	HDD canister in HDU-L11 (DK30A-19 Compatible)	↑		↑
105A0900	HDD-L110	↑	↑	↑		↑
105A90A00	HDD-L116	↑	↑	↑		↑
105A0B00	HDD-L111	↑	↑	↑		↑
105A0C00	HDD-L115	↑	↑	↑		↑
105A0D00	HDD-L112	↑	↑	↑		↑
105A0E00	HDD-L114	↑	↑	↑		↑
105A0F00	HDD-L113	↑	↑	↑		↑
105A1000	HDD-L127	↑	HDD canister in HDU-L12 (DK30A-19 Compatible)	↑		↑
105A1100	HDD-L120	↑	↑	↑		↑
105A1200	HDD-L126	↑	↑	↑		↑
105A1300	HDD-L121	↑	↑	↑		↑
105A1400	HDD-L125	↑	↑	↑		↑
105A1500	HDD-L122	↑	↑	↑		↑
105A1600	HDD-L124	↑	↑	↑		↑
105A1700	HDD-L123	↑	↑	↑		↑
105A1800	HDD-L137	↑	HDD canister in HDU-L13 (DK30A-19 Compatible)	↑		↑
105A1900	HDD-L130	↑	↑	↑		↑
105A1A00	HDD-L136	↑	↑	↑		↑
105A1B00	HDD-L131	↑	↑	↑		↑
105A1C00	HDD-L135	↑	↑	↑		↑
105A1D00	HDD-L132	↑	↑	↑		↑
105A1E00	HDD-L134	↑	↑	↑		↑
105A1F00	HDD-L133	↑	↑	↑		↑
105A2000	HDD-L147	↑	HDD canister in HDU-L14 (DK30A-19 Compatible)	↑		↑
105A2100	HDD-L140	↑	↑	↑		↑
105A2200	HDD-L146	↑	↑	↑		↑
105A2300	HDD-L141	↑	↑	↑		↑
105A2400	HDD-L145	↑	↑	↑		↑
105A2500	HDD-L142	↑	↑	↑		↑
105A2600	HDD-L144	↑	↑	↑		↑
105A2700	HDD-L143	↑	↑	↑		↑
105A2800	HDD-L157	↑	HDD canister in HDU-L15 (DK30A-19 Compatible)	↑		↑
105A2900	HDD-L150	↑	↑	↑		↑
105A2A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.11 List of ACC (Drive:DK30A-19 Compatible) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105A2B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DK30A-19 Compatible)	RDKxx		RDKxx
105A2C00	HDD-L155	↑	↑	↑		↑
105A2D00	HDD-L152	↑	↑	↑		↑
105A2E00	HDD-L154	↑	↑	↑		↑
105A2F00	HDD-L153	↑	↑	↑		↑
105A3000	HDD-L167	↑	HDD canister in HDU-L16 (DK30A-19 Compatible)	↑		↑
105A3100	HDD-L160	↑	↑	↑		↑
105A3200	HDD-L166	↑	↑	↑		↑
105A3300	HDD-L161	↑	↑	↑		↑
105A3400	HDD-L165	↑	↑	↑		↑
105A3500	HDD-L162	↑	↑	↑		↑
105A3600	HDD-L164	↑	↑	↑		↑
105A3700	HDD-L163	↑	↑	↑		↑
105A3800	HDD-L177	↑	HDD canister in HDU-L17 (DK30A-19 Compatible)	↑		↑
105A3900	HDD-L170	↑	↑	↑		↑
105A3A00	HDD-L176	↑	↑	↑		↑
105A3B00	HDD-L171	↑	↑	↑		↑
105A3C00	HDD-L175	↑	↑	↑		↑
105A3D00	HDD-L172	↑	↑	↑		↑
105A3E00	HDD-L174	↑	↑	↑		↑
105A3F00	HDD-L173	↑	↑	↑		↑
105A4000	HDD-L207	↑	HDD canister in HDU-L20 (DK30A-19 Compatible)	↑		↑
105A4100	HDD-L200	↑	↑	↑		↑
105A4200	HDD-L206	↑	↑	↑		↑
105A4300	HDD-L201	↑	↑	↑		↑
105A4400	HDD-L205	↑	↑	↑		↑
105A4500	HDD-L202	↑	↑	↑		↑
105A4600	HDD-L204	↑	↑	↑		↑
105A4700	HDD-L203	↑	↑	↑		↑
105A4800	HDD-L217	↑	HDD canister in HDU-L21 (DK30A-19 Compatible)	↑		↑
105A4900	HDD-L210	↑	↑	↑		↑
105A4A00	HDD-L216	↑	↑	↑		↑
105A4B00	HDD-L211	↑	↑	↑		↑
105A4C00	HDD-L215	↑	↑	↑		↑
105A4D00	HDD-L212	↑	↑	↑		↑
105A4E00	HDD-L214	↑	↑	↑		↑
105A4F00	HDD-L213	↑	↑	↑		↑
105A5000	HDD-L227	↑	HDD canister in HDU-L22 (DK30A-19 Compatible)	↑		↑
105A5100	HDD-L220	↑	↑	↑		↑
105A5200	HDD-L226	↑	↑	↑		↑
105A5300	HDD-L221	↑	↑	↑		↑
105A5400	HDD-L225	↑	↑	↑		↑
105A5500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.11 List of ACC (Drive:DK30A-19 Compatible) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105A5600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DK30A-19 Compatible)	RDKxx		RDKxx
105A5700	HDD-L223	↑	↑	↑		↑
105A5800	HDD-L237	↑	HDD canister in HDU-L23 (DK30A-19 Compatible)	↑		↑
105A5900	HDD-L230	↑	↑	↑		↑
105A5A00	HDD-L236	↑	↑	↑		↑
105A5B00	HDD-L231	↑	↑	↑		↑
105A5C00	HDD-L235	↑	↑	↑		↑
105A5D00	HDD-L232	↑	↑	↑		↑
105A5E00	HDD-L234	↑	↑	↑		↑
105A5F00	HDD-L233	↑	↑	↑		↑
105A6000	HDD-L247	↑	HDD canister in HDU-L24 (DK30A-19 Compatible)	↑		↑
105A6100	HDD-L240	↑	↑	↑		↑
105A6200	HDD-L246	↑	↑	↑		↑
105A6300	HDD-L241	↑	↑	↑		↑
105A6400	HDD-L245	↑	↑	↑		↑
105A6500	HDD-L242	↑	↑	↑		↑
105A6600	HDD-L244	↑	↑	↑		↑
105A6700	HDD-L243	↑	↑	↑		↑
105A6800	HDD-L257	↑	HDD canister in HDU-L25 (DK30A-19 Compatible)	↑		↑
105A6900	HDD-L250	↑	↑	↑		↑
105A6A00	HDD-L256	↑	↑	↑		↑
105A6B00	HDD-L251	↑	↑	↑		↑
105A6C00	HDD-L255	↑	↑	↑		↑
105A6D00	HDD-L252	↑	↑	↑		↑
105A6E00	HDD-L254	↑	↑	↑		↑
105A6F00	HDD-L253	↑	↑	↑		↑
105A7000	HDD-L267	↑	HDD canister in HDU-L26 (DK30A-19 Compatible)	↑		↑
105A7100	HDD-L260	↑	↑	↑		↑
105A7200	HDD-L266	↑	↑	↑		↑
105A7300	HDD-L261	↑	↑	↑		↑
105A7400	HDD-L265	↑	↑	↑		↑
105A7500	HDD-L262	↑	↑	↑		↑
105A7600	HDD-L264	↑	↑	↑		↑
105A7700	HDD-L263	↑	↑	↑		↑
105A7800	HDD-L277	↑	HDD canister in HDU-L27 (DK30A-19 Compatible)	↑		↑
105A7900	HDD-L270	↑	↑	↑		↑
105A7A00	HDD-L276	↑	↑	↑		↑
105A7B00	HDD-L271	↑	↑	↑		↑
105A7C00	HDD-L275	↑	↑	↑		↑
105A7D00	HDD-L272	↑	↑	↑		↑
105A7E00	HDD-L274	↑	↑	↑		↑
105A7F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.11 List of ACC (Drive:DK30A-19 Compatible) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105A8000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DK30A-19 Compatible)	RDKxx		RDKxx
105A8100	HDD-R100	↑	↑	↑		↑
105A8200	HDD-R106	↑	↑	↑		↑
105A8300	HDD-R101	↑	↑	↑		↑
105A8400	HDD-R105	↑	↑	↑		↑
105A8500	HDD-R102	↑	↑	↑		↑
105A8600	HDD-R104	↑	↑	↑		↑
105A8700	HDD-R103	↑	↑	↑		↑
105A8800	HDD-R117	↑	HDD canister in HDU-R11 (DK30A-19 Compatible)	↑		↑
105A8900	HDD-R110	↑	↑	↑		↑
105A8A00	HDD-R116	↑	↑	↑		↑
105A8B00	HDD-R111	↑	↑	↑		↑
105A8C00	HDD-R115	↑	↑	↑		↑
105A8D00	HDD-R112	↑	↑	↑		↑
105A8E00	HDD-R114	↑	↑	↑		↑
105A8F00	HDD-R113	↑	↑	↑		↑
105A9000	HDD-R127	↑	HDD canister in HDU-R12 (DK30A-19 Compatible)	↑		↑
105A9100	HDD-R120	↑	↑	↑		↑
105A9200	HDD-R126	↑	↑	↑		↑
105A9300	HDD-R121	↑	↑	↑		↑
105A9400	HDD-R125	↑	↑	↑		↑
105A9500	HDD-R122	↑	↑	↑		↑
105A9600	HDD-R124	↑	↑	↑		↑
105A9700	HDD-R123	↑	↑	↑		↑
105A9800	HDD-R137	↑	HDD canister in HDU-R13 (DK30A-19 Compatible)	↑		↑
105A9900	HDD-R130	↑	↑	↑		↑
105A9A00	HDD-R136	↑	↑	↑		↑
105A9B00	HDD-R131	↑	↑	↑		↑
105A9C00	HDD-R135	↑	↑	↑		↑
105A9D00	HDD-R132	↑	↑	↑		↑
105A9E00	HDD-R134	↑	↑	↑		↑
105A9F00	HDD-R133	↑	↑	↑		↑
105AA000	HDD-R147	↑	HDD canister in HDU-R14 (DK30A-19 Compatible)	↑		↑
105AA100	HDD-R140	↑	↑	↑		↑
105AA200	HDD-R146	↑	↑	↑		↑
105AA300	HDD-R141	↑	↑	↑		↑
105AA400	HDD-R145	↑	↑	↑		↑
105AA500	HDD-R142	↑	↑	↑		↑
105AA600	HDD-R144	↑	↑	↑		↑
105AA700	HDD-R143	↑	↑	↑		↑
105AA800	HDD-R157	↑	HDD canister in HDU-R15 (DK30A-19 Compatible)	↑		↑
105AA900	HDD-R150	↑	↑	↑		↑

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Table 4.1.6.11 List of ACC (Drive:DK30A-19 Compatible) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105AAA00	HDD-R156	HDD canister	HDD canister in HDU-R15 (DK30A-19 Compatible)	RDKxx		RDKxx
105AAB00	HDD-R151	↑	↑	↑		↑
105AAC00	HDD-R155	↑	↑	↑		↑
105AAD00	HDD-R152	↑	↑	↑		↑
105AAE00	HDD-R154	↑	↑	↑		↑
105AAF00	HDD-R153	↑	↑	↑		↑
105AB000	HDD-R167	↑	HDD canister in HDU-R16 (DK30A-19 Compatible)	↑		↑
105AB100	HDD-R160	↑	↑	↑		↑
105AB200	HDD-R166	↑	↑	↑		↑
105AB300	HDD-R161	↑	↑	↑		↑
105AB400	HDD-R165	↑	↑	↑		↑
105AB500	HDD-R162	↑	↑	↑		↑
105AB600	HDD-R164	↑	↑	↑		↑
105AB700	HDD-R163	↑	↑	↑		↑
105AB800	HDD-R177	↑	HDD canister in HDU-R17 (DK30A-19 Compatible)	↑		↑
105AB900	HDD-R170	↑	↑	↑		↑
105ABA00	HDD-R176	↑	↑	↑		↑
105ABB00	HDD-R171	↑	↑	↑		↑
105ABC00	HDD-R175	↑	↑	↑		↑
105ABD00	HDD-R172	↑	↑	↑		↑
105ABE00	HDD-R174	↑	↑	↑		↑
105ABF00	HDD-R173	↑	↑	↑		↑
105AC000	HDD-R207	↑	HDD canister in HDU-R20 (DK30A-19 Compatible)	↑		↑
105AC100	HDD-R200	↑	↑	↑		↑
105AC200	HDD-R206	↑	↑	↑		↑
105AC300	HDD-R201	↑	↑	↑		↑
105AC400	HDD-R205	↑	↑	↑		↑
105AC500	HDD-R202	↑	↑	↑		↑
105AC600	HDD-R204	↑	↑	↑		↑
105AC700	HDD-R203	↑	↑	↑		↑
105AC800	HDD-R217	↑	HDD canister in HDU-R21 (DK30A-19 Compatible)	↑		↑
105AC900	HDD-R210	↑	↑	↑		↑
105ACA00	HDD-R216	↑	↑	↑		↑
105ACB00	HDD-R211	↑	↑	↑		↑
105ACC00	HDD-R215	↑	↑	↑		↑
105ACD00	HDD-R212	↑	↑	↑		↑
105ACE00	HDD-R214	↑	↑	↑		↑
105ACF00	HDD-R213	↑	↑	↑		↑
105AD000	HDD-R227	↑	HDD canister in HDU-R22 (DK30A-19 Compatible)	↑		↑
105AD100	HDD-R220	↑	↑	↑		↑
105AD200	HDD-R226	↑	↑	↑		↑
105AD300	HDD-R221	↑	↑	↑		↑
105AD400	HDD-R225	↑	↑	↑		↑
105AD500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.11 List of ACC (Drive: DK30A-19 Compatible) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105AD600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DK30A-19 Compatible)	RDKxx		RDKxx
105AD700	HDD-R223	↑	↑	↑		↑
105AD800	HDD-R237	↑	HDD canister in HDU-R23 (DK30A-19 Compatible)	↑		↑
105AD900	HDD-R230	↑	↑	↑		↑
105ADA00	HDD-R236	↑	↑	↑		↑
105ADB00	HDD-R231	↑	↑	↑		↑
105ADC00	HDD-R235	↑	↑	↑		↑
105ADD00	HDD-R232	↑	↑	↑		↑
105ADE00	HDD-R234	↑	↑	↑		↑
105ADF00	HDD-R233	↑	↑	↑		↑
105AE000	HDD-R247	↑	HDD canister in HDU-R24 (DK30A-19 Compatible)	↑		↑
105AE100	HDD-R240	↑	↑	↑		↑
105AE200	HDD-R246	↑	↑	↑		↑
105AE300	HDD-R241	↑	↑	↑		↑
105AE400	HDD-R245	↑	↑	↑		↑
105AE500	HDD-R242	↑	↑	↑		↑
105AE600	HDD-R244	↑	↑	↑		↑
105AE700	HDD-R243	↑	↑	↑		↑
105AE800	HDD-R257	↑	HDD canister in HDU-R25 (DK30A-19 Compatible)	↑		↑
105AE900	HDD-R250	↑	↑	↑		↑
105AEA00	HDD-R256	↑	↑	↑		↑
105AEB00	HDD-R251	↑	↑	↑		↑
105AEC00	HDD-R255	↑	↑	↑		↑
105AED00	HDD-R252	↑	↑	↑		↑
105AEE00	HDD-R254	↑	↑	↑		↑
105AEF00	HDD-R253	↑	↑	↑		↑
105AF000	HDD-R267	↑	HDD canister in HDU-R26 (DK30A-19 Compatible)	↑		↑
105AF100	HDD-R260	↑	↑	↑		↑
105AF200	HDD-R266	↑	↑	↑		↑
105AF300	HDD-R261	↑	↑	↑		↑
105AF400	HDD-R265	↑	↑	↑		↑
105AF500	HDD-R262	↑	↑	↑		↑
105AF600	HDD-R264	↑	↑	↑		↑
105AF700	HDD-R263	↑	↑	↑		↑
105AF800	HDD-R277	↑	HDD canister in HDU-R27 (DK30A-19 Compatible)	↑		↑
105AF900	HDD-R270	↑	↑	↑		↑
105AFA00	HDD-R276	↑	↑	↑		↑
105AFB00	HDD-R271	↑	↑	↑		↑
105AFC00	HDD-R275	↑	↑	↑		↑
105AFD00	HDD-R272	↑	↑	↑		↑
105AFE00	HDD-R274	↑	↑	↑		↑
105AFF00	HDD-R273	↑	↑	↑		↑

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Table 4.1.6.12 List of ACC (Drive:DKR1B-J47) (1/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105B0000	HDD-L107	HDD canister	HDD canister in HDU-L10 (DKR1B-J47)	RDKxx		RDKxx
105B0100	HDD-L100	↑	↑	↑		↑
105B0200	HDD-L106	↑	↑	↑		↑
105B0300	HDD-L101	↑	↑	↑		↑
105B0400	HDD-L105	↑	↑	↑		↑
105B0500	HDD-L102	↑	↑	↑		↑
105B0600	HDD-L104	↑	↑	↑		↑
105B0700	HDD-L103	↑	↑	↑		↑
105B0800	HDD-L117	↑	HDD canister in HDU-L11 (DKR1B-J47)	↑		↑
105B0900	HDD-L110	↑	↑	↑		↑
105B0A00	HDD-L116	↑	↑	↑		↑
105B0B00	HDD-L111	↑	↑	↑		↑
105B0C00	HDD-L115	↑	↑	↑		↑
105B0D00	HDD-L112	↑	↑	↑		↑
105B0E00	HDD-L114	↑	↑	↑		↑
105B0F00	HDD-L113	↑	↑	↑		↑
105B1000	HDD-L127	↑	HDD canister in HDU-L12 (DKR1B-J47)	↑		↑
105B1100	HDD-L120	↑	↑	↑		↑
105B1200	HDD-L126	↑	↑	↑		↑
105B1300	HDD-L121	↑	↑	↑		↑
105B1400	HDD-L125	↑	↑	↑		↑
105B1500	HDD-L122	↑	↑	↑		↑
105B1600	HDD-L124	↑	↑	↑		↑
105B1700	HDD-L123	↑	↑	↑		↑
105B1800	HDD-L137	↑	HDD canister in HDU-L13 (DKR1B-J47)	↑		↑
105B1900	HDD-L130	↑	↑	↑		↑
105B1A00	HDD-L136	↑	↑	↑		↑
105B1B00	HDD-L131	↑	↑	↑		↑
105B1C00	HDD-L135	↑	↑	↑		↑
105B1D00	HDD-L132	↑	↑	↑		↑
105B1E00	HDD-L134	↑	↑	↑		↑
105B1F00	HDD-L133	↑	↑	↑		↑
105B2000	HDD-L147	↑	HDD canister in HDU-L14 (DKR1B-J47)	↑		↑
105B2100	HDD-L140	↑	↑	↑		↑
105B2200	HDD-L146	↑	↑	↑		↑
105B2300	HDD-L141	↑	↑	↑		↑
105B2400	HDD-L145	↑	↑	↑		↑
105B2500	HDD-L142	↑	↑	↑		↑
105B2600	HDD-L144	↑	↑	↑		↑
105B2700	HDD-L143	↑	↑	↑		↑
105B2800	HDD-L157	↑	HDD canister in HDU-L15 (DKR1B-J47)	↑		↑
105B2900	HDD-L150	↑	↑	↑		↑
105B2A00	HDD-L156	↑	↑	↑		↑

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Table 4.1.6.12 List of ACC (Drive:DKR1B-J47) (2/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105B2B00	HDD-L151	HDD canister	HDD canister in HDU-L15 (DKR1B-J47)	RDKxx		RDKxx
105B2C00	HDD-L155	↑	↑	↑		↑
105B2D00	HDD-L152	↑	↑	↑		↑
105B2E00	HDD-L154	↑	↑	↑		↑
105B2F00	HDD-L153	↑	↑	↑		↑
105B3000	HDD-L167	↑	HDD canister in HDU-L16 (DKR1B-J47)	↑		↑
105B3100	HDD-L160	↑	↑	↑		↑
105B3200	HDD-L166	↑	↑	↑		↑
105B3300	HDD-L161	↑	↑	↑		↑
105B3400	HDD-L165	↑	↑	↑		↑
105B3500	HDD-L162	↑	↑	↑		↑
105B3600	HDD-L164	↑	↑	↑		↑
105B3700	HDD-L163	↑	↑	↑		↑
105B3800	HDD-L177	↑	HDD canister in HDU-L17 (DKR1B-J47)	↑		↑
105B3900	HDD-L170	↑	↑	↑		↑
105B3A00	HDD-L176	↑	↑	↑		↑
105B3B00	HDD-L171	↑	↑	↑		↑
105B3C00	HDD-L175	↑	↑	↑		↑
105B3D00	HDD-L172	↑	↑	↑		↑
105B3E00	HDD-L174	↑	↑	↑		↑
105B3F00	HDD-L173	↑	↑	↑		↑
105B4000	HDD-L207	↑	HDD canister in HDU-L20 (DKR1B-J47)	↑		↑
105B4100	HDD-L200	↑	↑	↑		↑
105B4200	HDD-L206	↑	↑	↑		↑
105B4300	HDD-L201	↑	↑	↑		↑
105B4400	HDD-L205	↑	↑	↑		↑
105B4500	HDD-L202	↑	↑	↑		↑
105B4600	HDD-L204	↑	↑	↑		↑
105B4700	HDD-L203	↑	↑	↑		↑
105B4800	HDD-L217	↑	HDD canister in HDU-L21 (DKR1B-J47)	↑		↑
105B4900	HDD-L210	↑	↑	↑		↑
105B4A00	HDD-L216	↑	↑	↑		↑
105B4B00	HDD-L211	↑	↑	↑		↑
105B4C00	HDD-L215	↑	↑	↑		↑
105B4D00	HDD-L212	↑	↑	↑		↑
105B4E00	HDD-L214	↑	↑	↑		↑
105B4F00	HDD-L213	↑	↑	↑		↑
105B5000	HDD-L227	↑	HDD canister in HDU-L22 (DKR1B-J47)	↑		↑
105B5100	HDD-L220	↑	↑	↑		↑
105B5200	HDD-L226	↑	↑	↑		↑
105B5300	HDD-L221	↑	↑	↑		↑
105B5400	HDD-L225	↑	↑	↑		↑
105B5500	HDD-L222	↑	↑	↑		↑

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Table 4.1.6.12 List of ACC (Drive:DKR1B-J47) (3/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105B5600	HDD-L224	HDD canister	HDD canister in HDU-L22 (DKR1B-J47)	RDKxx		RDKxx
105B5700	HDD-L223	↑	↑	↑		↑
105B5800	HDD-L237	↑	HDD canister in HDU-L23 (DKR1B-J47)	↑		↑
105B5900	HDD-L230	↑	↑	↑		↑
105B5A00	HDD-L236	↑	↑	↑		↑
105B5B00	HDD-L231	↑	↑	↑		↑
105B5C00	HDD-L235	↑	↑	↑		↑
105B5D00	HDD-L232	↑	↑	↑		↑
105B5E00	HDD-L234	↑	↑	↑		↑
105B5F00	HDD-L233	↑	↑	↑		↑
105B6000	HDD-L247	↑	HDD canister in HDU-L24 (DKR1B-J47)	↑		↑
105B6100	HDD-L240	↑	↑	↑		↑
105B6200	HDD-L246	↑	↑	↑		↑
105B6300	HDD-L241	↑	↑	↑		↑
105B6400	HDD-L245	↑	↑	↑		↑
105B6500	HDD-L242	↑	↑	↑		↑
105B6600	HDD-L244	↑	↑	↑		↑
105B6700	HDD-L243	↑	↑	↑		↑
105B6800	HDD-L257	↑	HDD canister in HDU-L25 (DKR1B-J47)	↑		↑
105B6900	HDD-L250	↑	↑	↑		↑
105B6A00	HDD-L256	↑	↑	↑		↑
105B6B00	HDD-L251	↑	↑	↑		↑
105B6C00	HDD-L255	↑	↑	↑		↑
105B6D00	HDD-L252	↑	↑	↑		↑
105B6E00	HDD-L254	↑	↑	↑		↑
105B6F00	HDD-L253	↑	↑	↑		↑
105B7000	HDD-L267	↑	HDD canister in HDU-L26 (DKR1B-J47)	↑		↑
105B7100	HDD-L260	↑	↑	↑		↑
105B7200	HDD-L266	↑	↑	↑		↑
105B7300	HDD-L261	↑	↑	↑		↑
105B7400	HDD-L265	↑	↑	↑		↑
105B7500	HDD-L262	↑	↑	↑		↑
105B7600	HDD-L264	↑	↑	↑		↑
105B7700	HDD-L263	↑	↑	↑		↑
105B7800	HDD-L277	↑	HDD canister in HDU-L27 (DKR1B-J47)	↑		↑
105B7900	HDD-L270	↑	↑	↑		↑
105B7A00	HDD-L276	↑	↑	↑		↑
105B7B00	HDD-L271	↑	↑	↑		↑
105B7C00	HDD-L275	↑	↑	↑		↑
105B7D00	HDD-L272	↑	↑	↑		↑
105B7E00	HDD-L274	↑	↑	↑		↑
105B7F00	HDD-L273	↑	↑	↑		↑

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Table 4.1.6.12 List of ACC (Drive:DKR1B-J47) (4/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105B8000	HDD-R107	HDD canister	HDD canister in HDU-R10 (DKR1B-J47)	RDKxx		RDKxx
105B8100	HDD-R100	↑	↑	↑		↑
105B8200	HDD-R106	↑	↑	↑		↑
105B8300	HDD-R101	↑	↑	↑		↑
105B8400	HDD-R105	↑	↑	↑		↑
105B8500	HDD-R102	↑	↑	↑		↑
105B8600	HDD-R104	↑	↑	↑		↑
105B8700	HDD-R103	↑	↑	↑		↑
105B8800	HDD-R117	↑	HDD canister in HDU-R11 (DKR1B-J47)	↑		↑
105B8900	HDD-R110	↑	↑	↑		↑
105B8A00	HDD-R116	↑	↑	↑		↑
105B8B00	HDD-R111	↑	↑	↑		↑
105B8C00	HDD-R115	↑	↑	↑		↑
105B8D00	HDD-R112	↑	↑	↑		↑
105B8E00	HDD-R114	↑	↑	↑		↑
105B8F00	HDD-R113	↑	↑	↑		↑
105B9000	HDD-R127	↑	HDD canister in HDU-R12 (DKR1B-J47)	↑		↑
105B9100	HDD-R120	↑	↑	↑		↑
105B9200	HDD-R126	↑	↑	↑		↑
105B9300	HDD-R121	↑	↑	↑		↑
105B9400	HDD-R125	↑	↑	↑		↑
105B9500	HDD-R122	↑	↑	↑		↑
105B9600	HDD-R124	↑	↑	↑		↑
105B9700	HDD-R123	↑	↑	↑		↑
105B9800	HDD-R137	↑	HDD canister in HDU-R13 (DKR1B-J47)	↑		↑
105B9900	HDD-R130	↑	↑	↑		↑
105B9A00	HDD-R136	↑	↑	↑		↑
105B9B00	HDD-R131	↑	↑	↑		↑
105B9C00	HDD-R135	↑	↑	↑		↑
105B9D00	HDD-R132	↑	↑	↑		↑
105B9E00	HDD-R134	↑	↑	↑		↑
105B9F00	HDD-R133	↑	↑	↑		↑
105BA000	HDD-R147	↑	HDD canister in HDU-R14 (DKR1B-J47)	↑		↑
105BA100	HDD-R140	↑	↑	↑		↑
105BA200	HDD-R146	↑	↑	↑		↑
105BA300	HDD-R141	↑	↑	↑		↑
105BA400	HDD-R145	↑	↑	↑		↑
105BA500	HDD-R142	↑	↑	↑		↑
105BA600	HDD-R144	↑	↑	↑		↑
105BA700	HDD-R143	↑	↑	↑		↑
105BA800	HDD-R157	↑	HDD canister in HDU-R15 (DKR1B-J47)	↑		↑
105BA900	HDD-R150	↑	↑	↑		↑
105BAA00	HDD-R156	↑	↑	↑		↑

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Table 4.1.6.12 List of ACC (Drive:DKR1B-J47) (5/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105BAB00	HDD-R151	HDD canister	HDD canister in HDU-R15 (DKR1B-J47)	RDKxx		RDKxx
105BAC00	HDD-R155	↑	↑	↑		↑
105BAD00	HDD-R152	↑	↑	↑		↑
105BAE00	HDD-R154	↑	↑	↑		↑
105BAF00	HDD-R153	↑	↑	↑		↑
105BB000	HDD-R167	↑	HDD canister in HDU-R16 (DKR1B-J47)	↑		↑
105BB100	HDD-R160	↑	↑	↑		↑
105BB200	HDD-R166	↑	↑	↑		↑
105BB300	HDD-R161	↑	↑	↑		↑
105BB400	HDD-R165	↑	↑	↑		↑
105BB500	HDD-R162	↑	↑	↑		↑
105BB600	HDD-R164	↑	↑	↑		↑
105BB700	HDD-R163	↑	↑	↑		↑
105BB800	HDD-R177	↑	HDD canister in HDU-R17 (DKR1B-J47)	↑		↑
105BB900	HDD-R170	↑	↑	↑		↑
105BBA00	HDD-R176	↑	↑	↑		↑
105BBB00	HDD-R171	↑	↑	↑		↑
105BBC00	HDD-R175	↑	↑	↑		↑
105BBD00	HDD-R172	↑	↑	↑		↑
105BBE00	HDD-R174	↑	↑	↑		↑
105BBF00	HDD-R173	↑	↑	↑		↑
105BC000	HDD-R207	↑	HDD canister in HDU-R20 (DKR1B-J47)	↑		↑
105BC100	HDD-R200	↑	↑	↑		↑
105BC200	HDD-R206	↑	↑	↑		↑
105BC300	HDD-R201	↑	↑	↑		↑
105BC400	HDD-R205	↑	↑	↑		↑
105BC500	HDD-R202	↑	↑	↑		↑
105BC600	HDD-R204	↑	↑	↑		↑
105BC700	HDD-R203	↑	↑	↑		↑
105BC800	HDD-R217	↑	HDD canister in HDU-R21 (DKR1B-J47)	↑		↑
105BC900	HDD-R210	↑	↑	↑		↑
105BCA00	HDD-R216	↑	↑	↑		↑
105BCB00	HDD-R211	↑	↑	↑		↑
105BCC00	HDD-R215	↑	↑	↑		↑
105BCD00	HDD-R212	↑	↑	↑		↑
105BCE00	HDD-R214	↑	↑	↑		↑
105BCF00	HDD-R213	↑	↑	↑		↑
105BD000	HDD-R227	↑	HDD canister in HDU-R22 (DKR1B-J47)	↑		↑
105BD100	HDD-R220	↑	↑	↑		↑
105BD200	HDD-R226	↑	↑	↑		↑
105BD300	HDD-R221	↑	↑	↑		↑
105BD400	HDD-R225	↑	↑	↑		↑
105BD500	HDD-R222	↑	↑	↑		↑

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Table 4.1.6.12 List of ACC (Drive:DKR1B-J47) (6/6)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
105BD600	HDD-R224	HDD canister	HDD canister in HDU-R22 (DKR1B-J47)	RDKxx		RDKxx
105BD700	HDD-R223	↑	↑	↑		↑
105BD800	HDD-R237	↑	HDD canister in HDU-R23 (DKR1B-J47)	↑		↑
105BD900	HDD-R230	↑	↑	↑		↑
105BDA00	HDD-R236	↑	↑	↑		↑
105BDB00	HDD-R231	↑	↑	↑		↑
105BDC00	HDD-R235	↑	↑	↑		↑
105BDD00	HDD-R232	↑	↑	↑		↑
105BDE00	HDD-R234	↑	↑	↑		↑
105BDF00	HDD-R233	↑	↑	↑		↑
105BE000	HDD-R247	↑	HDD canister in HDU-R24 (DKR1B-J47)	↑		↑
105BE100	HDD-R240	↑	↑	↑		↑
105BE200	HDD-R246	↑	↑	↑		↑
105BE300	HDD-R241	↑	↑	↑		↑
105BE400	HDD-R245	↑	↑	↑		↑
105BE500	HDD-R242	↑	↑	↑		↑
105BE600	HDD-R244	↑	↑	↑		↑
105BE700	HDD-R243	↑	↑	↑		↑
105BE800	HDD-R257	↑	HDD canister in HDU-R25 (DKR1B-J47)	↑		↑
105BE900	HDD-R250	↑	↑	↑		↑
105BEA00	HDD-R256	↑	↑	↑		↑
105BEB00	HDD-R251	↑	↑	↑		↑
105BEC00	HDD-R255	↑	↑	↑		↑
105BED00	HDD-R252	↑	↑	↑		↑
105BEE00	HDD-R254	↑	↑	↑		↑
105BEF00	HDD-R253	↑	↑	↑		↑
105BF000	HDD-R267	↑	HDD canister in HDU-R26 (DKR1B-J47)	↑		↑
105BF100	HDD-R260	↑	↑	↑		↑
105BF200	HDD-R266	↑	↑	↑		↑
105BF300	HDD-R261	↑	↑	↑		↑
105BF400	HDD-R265	↑	↑	↑		↑
105BF500	HDD-R262	↑	↑	↑		↑
105BF600	HDD-R264	↑	↑	↑		↑
105BF700	HDD-R263	↑	↑	↑		↑
105BF800	HDD-R277	↑	HDD canister in HDU-R27 (DKR1B-J47)	↑		↑
105BF900	HDD-R270	↑	↑	↑		↑
105BFA00	HDD-R276	↑	↑	↑		↑
105BFB00	HDD-R271	↑	↑	↑		↑
105BFC00	HDD-R275	↑	↑	↑		↑
105BFD00	HDD-R272	↑	↑	↑		↑
105BFE00	HDD-R274	↑	↑	↑		↑
105BFF00	HDD-R273	↑	↑	↑		↑

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4.1.7 PKC = 6X (DKC special parts)

Table 4.1.7 List of ACC (DKC Special Parts) (1/2)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10600000	OP panel-1	OP panel PCB	Operation panel PCB (cluster 1)	RT2		RT2
10608000	OP panel-2	↑	Operation panel PCB (cluster 2)	↑		↑
10610000	CE panel	CE Panel PCB	CE panel PCB	RT3		RT3
10620000	System Panel	System Panel PCB	Restart/Assist switch PCB	RT1		RT1
10630000	PCI CONN	PCI CONN PCB	PCI control PCB	RT6		RT6
10640000	RCU CONN	RCU CONN PCB	RCU control PCB	RT7		RT7
10650000	FLGFAN11	FAN ASSY (Logic)	FAN ASSY for Front Logic Box	RT8		RT8
10650100	RLGFAN11	↑	FAN ASSY for Rear Logic Box	↑		↑
10651000	FLGFAN12	↑	FAN ASSY for Front Logic Box	↑		↑
10651100	RLGFAN12	↑	FAN ASSY for Rear Logic Box	↑		↑
10652000	FPSFAN11	FAN ASSY (PS)	FAN ASSY for Front PS Box	RT8		RT8
10652100	RPSFAN11	↑	FAN ASSY for Rear PS Box	↑		↑
10653000	FPSFAN12	↑	FAN ASSY for Front PS Box	↑		↑
10653100	RPSFAN12	↑	FAN ASSY for Rear PS Box	↑		↑
10658000	FLGFAN21	FAN ASSY (Logic)	FAN ASSY for Front Logic Box	RT8		RT8
10658100	RLGFAN21	↑	FAN ASSY for Rear Logic Box	↑		↑
10659000	FLGFAN22	↑	FAN ASSY for Front Logic Box	↑		↑
10659100	RLGFAN22	↑	FAN ASSY for Rear Logic Box	↑		↑
1065A000	FPSFAN21	FAN ASSY (PS)	FAN ASSY for Front PS Box	RT8		RT8
1065A100	RPSFAN21	↑	FAN ASSY for Rear PS Box	↑		↑
1065B000	FPSFAN22	↑	FAN ASSY for Front PS Box	↑		↑
1065B100	RPSFAN22	↑	FAN ASSY for Rear PS Box	↑		↑

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Table 4.1.7 List of ACC (DKC Special Parts) (2/2)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10660000	THF-1	TH ASSY (Logic)	Thermostat ASSY for Front Logic Box	RT9		RT9
10661000	THF-2	TH ASSY (Logic)	Thermostat ASSY for Front Logic Box	↑		↑
10662000	THR-1	TH ASSY (Logic)	Thermostat ASSY for Rear Logic Box	↑		↑
10663000	THR-2	TH ASSY (Logic)	Thermostat ASSY for Rear Logic Box	↑		↑
10670000	EPO SW	EPO switch	Emergency power off switch	RT4		RT4
10680000		FLOGIC Box	Front Logic box			
10681000		RLOGIC Box	Rear Logic box			
10690000	FLogic Power Supply Box	FLOGIC PS Box	Front Logic power supply box			
10691000	RLogic Power Supply Box	RLOGIC PS Box	Rear Logic power supply box			
106B0000	PWRCTL-1	PWRCTL PCB	Monitor of power supply voltage level (Cluster 1)	RT5		RT5
106B8000	PWRCTL-2	↑	Monitor of power supply voltage level (Cluster 2)	↑		↑
106C0000	RS CONN	RS CONN PCB	RS control PCB	RT17		RT17
106D0000		KEY LOCK ASSY				

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4.1.8 PKC = 7X (DKU special parts)

Table 4.1.8 List of ACC (DKU Special Parts) (1/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10700000	FAN-R100	FAN ASSY (HDD)	FAN ASSY for HDU-R10	RT31		RT31
10700100	FAN-R101	↑	↑	↑		↑
10700200	FAN-R102	↑	↑	↑		↑
10700800	FAN-R110	↑	FAN ASSY for HDU-R11	↑		↑
10700900	FAN-R111	↑	↑	↑		↑
10700A00	FAN-R112	↑	↑	↑		↑
10701000	FAN-R120	↑	FAN ASSY for HDU-R12	↑		↑
10701100	FAN-R121	↑	↑	↑		↑
10701200	FAN-R122	↑	↑	↑		↑
10701800	FAN-R130	↑	FAN ASSY for HDU-R13	↑		↑
10701900	FAN-R131	↑	↑	↑		↑
10701A00	FAN-R132	↑	↑	↑		↑
10702000	FAN-R140	↑	FAN ASSY for HDU-R14	↑		↑
10702100	FAN-R141	↑	↑	↑		↑
10702200	FAN-R142	↑	↑	↑		↑
10702800	FAN-R150	↑	FAN ASSY for HDU-R15	↑		↑
10702900	FAN-R151	↑	↑	↑		↑
10702A00	FAN-R152	↑	↑	↑		↑
10703000	FAN-R160	↑	FAN ASSY for HDU-R16	↑		↑
10703100	FAN-R161	↑	↑	↑		↑
10703200	FAN-R162	↑	↑	↑		↑
10703800	FAN-R170	↑	FAN ASSY for HDU-R17	↑		↑
10703900	FAN-R171	↑	↑	↑		↑
10703A00	FAN-R172	↑	↑	↑		↑
10704000	FAN-R200	↑	FAN ASSY for HDU-R20	↑		↑
10704100	FAN-R201	↑	↑	↑		↑
10704200	FAN-R202	↑	↑	↑		↑

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Table 4.1.8 List of ACC (DKU Special Parts) (2/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10704800	FAN-R210	FAN ASSY (HDD)	FAN ASSY for HDU-R21	RT31		RT31
10704900	FAN-R211	↑	↑	↑		↑
10704A00	FAN-R212	↑	↑	↑		↑
10705000	FAN-R220	↑	FAN ASSY for HDU-R22	↑		↑
10705100	FAN-R221	↑	↑	↑		↑
10705200	FAN-R222	↑	↑	↑		↑
10705800	FAN-R230	↑	FAN ASSY for HDU-R23	↑		↑
10705900	FAN-R231	↑	↑	↑		↑
10705A00	FAN-R232	↑	↑	↑		↑
10706000	FAN-R240	↑	FAN ASSY for HDU-R24	↑		↑
10706100	FAN-R241	↑	↑	↑		↑
10706200	FAN-R242	↑	↑	↑		↑
10706800	FAN-R250	↑	FAN ASSY for HDU-R25	↑		↑
10706900	FAN-R251	↑	↑	↑		↑
10706A00	FAN-R252	↑	↑	↑		↑
10707000	FAN-R260	↑	FAN ASSY for HDU-R26	↑		↑
10707100	FAN-R261	↑	↑	↑		↑
10707200	FAN-R262	↑	↑	↑		↑
10707800	FAN-R270	↑	FAN ASSY for HDU-R27	↑		↑
10707900	FAN-R271	↑	↑	↑		↑
10707A00	FAN-R272	↑	↑	↑		↑
10708000	FAN-L100	↑	FAN ASSY for HDU-L10	↑		↑
10708100	FAN-L101	↑	↑	↑		↑
10708200	FAN-L102	↑	↑	↑		↑
10708800	FAN-L110	↑	FAN ASSY for HDU-L11	↑		↑
10708900	FAN-L111	↑	↑	↑		↑
10708A00	FAN-L112	↑	↑	↑		↑
10709000	FAN-L120	↑	FAN ASSY for HDU-L12	↑		↑
10709100	FAN-L121	↑	↑	↑		↑
10709200	FAN-L122	↑	↑	↑		↑
10709800	FAN-L130	↑	FAN ASSY for HDU-L13	↑		↑
10709900	FAN-L131	↑	↑	↑		↑
10709A00	FAN-L132	↑	↑	↑		↑
1070A000	FAN-L140	↑	FAN ASSY for HDU-L14	↑		↑
1070A100	FAN-L141	↑	↑	↑		↑
1070A200	FAN-L142	↑	↑	↑		↑

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Table 4.1.8 List of ACC (DKU Special Parts) (3/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1070A800	FAN-L150	FAN ASSY (HDD)	FAN ASSY for HDU-L15	RT31		RT31
1070A900	FAN-L151	↑	↑	↑		↑
1070AA00	FAN-L152	↑	↑	↑		↑
1070B000	FAN-L160	↑	FAN ASSY for HDU-L16	↑		↑
1070B100	FAN-L161	↑	↑	↑		↑
1070B200	FAN-L162	↑	↑	↑		↑
1070B800	FAN-L170	↑	FAN ASSY for HDU-L17	↑		↑
1070B900	FAN-L171	↑	↑	↑		↑
1070BA00	FAN-L172	↑	↑	↑		↑
1070C000	FAN-L200	↑	FAN ASSY for HDU-L20	↑		↑
1070C100	FAN-L201	↑	↑	↑		↑
1070C200	FAN-L202	↑	↑	↑		↑
1070C800	FAN-L210	↑	FAN ASSY for HDU-L21	↑		↑
1070C900	FAN-L211	↑	↑	↑		↑
1070CA00	FAN-L212	↑	↑	↑		↑
1070D000	FAN-L220	↑	FAN ASSY for HDU-L22	↑		↑
1070D100	FAN-L221	↑	↑	↑		↑
1070D200	FAN-L222	↑	↑	↑		↑
1070D800	FAN-L230	↑	FAN ASSY for HDU-L23	↑		↑
1070D900	FAN-L231	↑	↑	↑		↑
1070DA00	FAN-L232	↑	↑	↑		↑
1070E000	FAN-L240	↑	FAN ASSY for HDU-L24	↑		↑
1070E100	FAN-L241	↑	↑	↑		↑
1070E200	FAN-L242	↑	↑	↑		↑
1070E800	FAN-L250	↑	FAN ASSY for HDU-L25	↑		↑
1070E900	FAN-L251	↑	↑	↑		↑
1070EA00	FAN-L252	↑	↑	↑		↑
1070F000	FAN-L260	↑	FAN ASSY for HDU-L26	↑		↑
1070F100	FAN-L261	↑	↑	↑		↑
1070F200	FAN-L262	↑	↑	↑		↑
1070F800	FAN-L270	↑	FAN ASSY for HDU-L27	↑		↑
1070F900	FAN-L271	↑	↑	↑		↑
1070FA00	FAN-L272	↑	↑	↑		↑

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Table 4.1.8 List of ACC (DKU Special Parts) (4/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10710000	DKUMN-R1F	DKUMN PCB	DKUMN PCB in front of Basic Disk Unit (DKU-R1)	RT29		RT29
10711000	DKUMN-R1R	↑	DKUMN PCB in rear of Basic Disk Unit (DKU-R1)	↑		↑
10714000	DKUMN-R2F	↑	DKUMN PCB in front of Second Disk Unit (DKU-R2)	↑		↑
10715000	DKUMN-R2R	↑	DKUMN PCB in rear of Second Disk Unit (DKU-R2)	↑		↑
10718000	DKUMN-L1F	↑	DKUMN PCB in front of Third Disk Unit (DKU-L1)	↑		↑
10719000	DKUMN-L1R	↑	DKUMN PCB in rear of Third Disk Unit (DKU-L1)	↑		↑
1071C000	DKUMN-L2F	↑	DKUMN PCB in front of Fourth Disk Unit (DKU-L2)	↑		↑
1071D000	DKUMN-L2R	↑	DKUMN PCB in rear of Fourth Disk Unit (DKU-L2)	↑		↑
1071FF00		↑	All of DKUMN PCBs			

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Table 4.1.8 List of ACC (DKU Special Parts) (5/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10720000	SC BFR-R10U	SCSI BFR PCB	SCSI Buffer PCB for HDU-R10 with SCSI Cable	RSC1		RSC1
10720400	SC BFR-R10L	↑	SCSI Buffer PCB for HDU-R10 with SCSI Cable	↑		↑
10720800	SC BFR-R11U	↑	SCSI Buffer PCB for HDU-R11 with SCSI Cable	↑		↑
10720C00	SC BFR-R11L	↑	SCSI Buffer PCB for HDU-R11 with SCSI Cable	↑		↑
10721000	SC BFR-R12U	↑	SCSI Buffer PCB for HDU-R12 with SCSI Cable	↑		↑
10721400	SC BFR-R12L	↑	SCSI Buffer PCB for HDU-R12 with SCSI Cable	↑		↑
10721800	SC BFR-R13U	↑	SCSI Buffer PCB for HDU-R13 with SCSI Cable	↑		↑
10721C00	SC BFR-R13L	↑	SCSI Buffer PCB for HDU-R13 with SCSI Cable	↑		↑
10722000	SC BFR-R14U	↑	SCSI Buffer PCB for HDU-R14 with SCSI Cable	↑		↑
10722400	SC BFR-R14L	↑	SCSI Buffer PCB for HDU-R14 with SCSI Cable	↑		↑
10722800	SC BFR-R15U	↑	SCSI Buffer PCB for HDU-R15 with SCSI Cable	↑		↑
10722C00	SC BFR-R15L	↑	SCSI Buffer PCB for HDU-R15 with SCSI Cable	↑		↑
10723000	SC BFR-R16U	↑	SCSI Buffer PCB for HDU-R16 with SCSI Cable	↑		↑
10723400	SC BFR-R16L	↑	SCSI Buffer PCB for HDU-R16 with SCSI Cable	↑		↑
10723800	SC BFR-R17U	↑	SCSI Buffer PCB for HDU-R17 with SCSI Cable	↑		↑
10723C00	SC BFR-R17L	↑	SCSI Buffer PCB for HDU-R17 with SCSI Cable	↑		↑
10724000	SC BFR-R20U	↑	SCSI Buffer PCB for HDU-R20 with SCSI Cable	↑		↑
10724400	SC BFR-R20L	↑	SCSI Buffer PCB for HDU-R20 with SCSI Cable	↑		↑
10724800	SC BFR-R21U	↑	SCSI Buffer PCB for HDU-R21 with SCSI Cable	↑		↑
10724C00	SC BFR-R21L	↑	SCSI Buffer PCB for HDU-R21 with SCSI Cable	↑		↑
10725000	SC BFR-R22U	↑	SCSI Buffer PCB for HDU-R22 with SCSI Cable	↑		↑
10725400	SC BFR-R22L	↑	SCSI Buffer PCB for HDU-R22 with SCSI Cable	↑		↑
10725800	SC BFR-R23U	↑	SCSI Buffer PCB for HDU-R23 with SCSI Cable	↑		↑
10725C00	SC BFR-R23L	↑	SCSI Buffer PCB for HDU-R23 with SCSI Cable	↑		↑
10726000	SC BFR-R24U	↑	SCSI Buffer PCB for HDU-R24 with SCSI Cable	↑		↑
10726400	SC BFR-R24L	↑	SCSI Buffer PCB for HDU-R24 with SCSI Cable	↑		↑
10726800	SC BFR-R25U	↑	SCSI Buffer PCB for HDU-R25 with SCSI Cable	↑		↑
10726C00	SC BFR-R25L	↑	SCSI Buffer PCB for HDU-R25 with SCSI Cable	↑		↑
10727000	SC BFR-R26U	↑	SCSI Buffer PCB for HDU-R26 with SCSI Cable	↑		↑
10727400	SC BFR-R26L	↑	SCSI Buffer PCB for HDU-R26 with SCSI Cable	↑		↑
10727800	SC BFR-R27U	↑	SCSI Buffer PCB for HDU-R27 with SCSI Cable	↑		↑
10727C00	SC BFR-R27L	↑	SCSI Buffer PCB for HDU-R27 with SCSI Cable	↑		↑

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Table 4.1.8 List of ACC (DKU Special Parts) (6/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10728000	SC BFR-L10U	SCSI BFR PCB	SCSI Buffer PCB for HDU-L10 with SCSI Cable	RSC1		RSC1
10728400	SC BFR-L10L	↑	SCSI Buffer PCB for HDU-L10 with SCSI Cable	↑		↑
10728800	SC BFR-L11U	↑	SCSI Buffer PCB for HDU-L11 with SCSI Cable	↑		↑
10728C00	SC BFR-L11L	↑	SCSI Buffer PCB for HDU-L11 with SCSI Cable	↑		↑
10729000	SC BFR-L12U	↑	SCSI Buffer PCB for HDU-L12 with SCSI Cable	↑		↑
10729400	SC BFR-L12L	↑	SCSI Buffer PCB for HDU-L12 with SCSI Cable	↑		↑
10729800	SC BFR-L13U	↑	SCSI Buffer PCB for HDU-L13 with SCSI Cable	↑		↑
10729C00	SC BFR-L13L	↑	SCSI Buffer PCB for HDU-L13 with SCSI Cable	↑		↑
1072A000	SC BFR-L14U	↑	SCSI Buffer PCB for HDU-L14 with SCSI Cable	↑		↑
1072A400	SC BFR-L14L	↑	SCSI Buffer PCB for HDU-L14 with SCSI Cable	↑		↑
1072A800	SC BFR-L15U	↑	SCSI Buffer PCB for HDU-L15 with SCSI Cable	↑		↑
1072AC00	SC BFR-L15L	↑	SCSI Buffer PCB for HDU-L15 with SCSI Cable	↑		↑
1072B000	SC BFR-L16U	↑	SCSI Buffer PCB for HDU-L16 with SCSI Cable	↑		↑
1072B400	SC BFR-L16L	↑	SCSI Buffer PCB for HDU-L16 with SCSI Cable	↑		↑
1072B800	SC BFR-L17U	↑	SCSI Buffer PCB for HDU-L17 with SCSI Cable	↑		↑
1072BC00	SC BFR-L17L	↑	SCSI Buffer PCB for HDU-L17 with SCSI Cable	↑		↑
1072C000	SC BFR-L20U	↑	SCSI Buffer PCB for HDU-L20 with SCSI Cable	↑		↑
1072C400	SC BFR-L20L	↑	SCSI Buffer PCB for HDU-L20 with SCSI Cable	↑		↑
1072C800	SC BFR-L21U	↑	SCSI Buffer PCB for HDU-L21 with SCSI Cable	↑		↑
1072CC00	SC BFR-L21L	↑	SCSI Buffer PCB for HDU-L21 with SCSI Cable	↑		↑
1072D000	SC BFR-L22U	↑	SCSI Buffer PCB for HDU-L22 with SCSI Cable	↑		↑
1072D400	SC BFR-L22L	↑	SCSI Buffer PCB for HDU-L22 with SCSI Cable	↑		↑
1072D800	SC BFR-L23U	↑	SCSI Buffer PCB for HDU-L23 with SCSI Cable	↑		↑
1072DC00	SC BFR-L23L	↑	SCSI Buffer PCB for HDU-L23 with SCSI Cable	↑		↑
1072E000	SC BFR-L24U	↑	SCSI Buffer PCB for HDU-L24 with SCSI Cable	↑		↑
1072E400	SC BFR-L24L	↑	SCSI Buffer PCB for HDU-L24 with SCSI Cable	↑		↑
1072E800	SC BFR-L25U	↑	SCSI Buffer PCB for HDU-L25 with SCSI Cable	↑		↑
1072EC00	SC BFR-L25L	↑	SCSI Buffer PCB for HDU-L25 with SCSI Cable	↑		↑
1072F000	SC BFR-L26U	↑	SCSI Buffer PCB for HDU-L26 with SCSI Cable	↑		↑
1072F400	SC BFR-L26L	↑	SCSI Buffer PCB for HDU-L26 with SCSI Cable	↑		↑
1072F800	SC BFR-L27U	↑	SCSI Buffer PCB for HDU-L27 with SCSI Cable	↑		↑
1072FC00	SC BFR-L27L	↑	SCSI Buffer PCB for HDU-L27 with SCSI Cable	↑		↑

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Table 4.1.8 List of ACC (DKU Special Parts) (7/7)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
1072FF00		SCSI BFR PCB				
10730000	HDU-R10	HDD Back Board	HDU box in Basic Disk Unit (DKU-R1)	RDKxx		RDKxx
10730800	HDU-R11	↑	↑	↑		↑
10731000	HDU-R12	↑	↑	↑		↑
10731800	HDU-R13	↑	↑	↑		↑
10732000	HDU-R14	↑	↑	↑		↑
10732800	HDU-R15	↑	↑	↑		↑
10733000	HDU-R16	↑	↑	↑		↑
10733800	HDU-R17	↑	↑	↑		↑
10734000	HDU-R20	↑	HDD back board in Second Disk Unit (DKU-R2)	↑		↑
10734800	HDU-R21	↑	↑	↑		↑
10735000	HDU-R22	↑	↑	↑		↑
10735800	HDU-R23	↑	↑	↑		↑
10736000	HDU-R24	↑	↑	↑		↑
10736800	HDU-R25	↑	↑	↑		↑
10737000	HDU-R26	↑	↑	↑		↑
10737800	HDU-R27	↑	↑	↑		↑
10738000	HDU-L10	↑	HDD back board in Third Disk Unit (DKU-L1)	↑		↑
10738800	HDU-L11	↑	↑	↑		↑
10739000	HDU-L12	↑	↑	↑		↑
10739800	HDU-L13	↑	↑	↑		↑
1073A000	HDU-L14	↑	↑	↑		↑
1073A800	HDU-L15	↑	↑	↑		↑
1073B000	HDU-L16	↑	↑	↑		↑
1073B800	HDU-L17	↑	↑	↑		↑
1073C000	HDU-L20	↑	HDD back board in Fourth Disk Unit (DKU-L2)	↑		↑
1073C800	HDU-L21	↑	↑	↑		↑
1073D000	HDU-L22	↑	↑	↑		↑
1073D800	HDU-L23	↑	↑	↑		↑
1073E000	HDU-L24	↑	↑	↑		↑
1073E800	HDU-L25	↑	↑	↑		↑
1073F000	HDU-L26	↑	↑	↑		↑
1073F800	HDU-L27	↑	↑	↑		↑
10740000		HDD				

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4.1.9 PKC = 8X (SVP special parts)

Table 4.1.9 List of ACC (SVP Special Parts) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10800000	SVP	SVP	Service Processor (PC)	RT10		RT10
10810000	SSVP	SSVP PCB	SSVP PCB (ASSIST board)	RT11		RT11
10820000	SVP MODEM	SVP MODEM	SVP ASSIST MODEM			
10830000	HITRACK	HITRACK	HITRACK board			
10840000	SVP-PS1	SVP PS	SVP Power Supply (cluster 1)	RT18		RT18
10848000	SVP-PS2	↑	SVP Power Supply (cluster 2)	RT18		RT18
10850000	HUB	HUB	HUB	RT19		RT19
10860000	SSVP MODEM	SSVP MODEM	SSVP ASSIST MODEM			

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4.1.10 PKC = 9X (Micro-program)

Table 4.1.10 List of ACC (Micro-program) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
10900000	CHA-1P	CHP0-1P MICRO	Get Dump and Call Support Center			
10901000	CHA-1P	CHP1-1P MICRO	↑			
10902000	CHA-1Q	CHP2-1Q MICRO	↑			
10903000	CHA-1Q	CHP3-1Q MICRO	↑			
10904000	CHA-1R	CHP4-1R MICRO	↑			
10905000	CHA-1R	CHP5-1R MICRO	↑			
10906000	CHA-1S	CHP6-1S MICRO	↑			
10907000	CHA-1S	CHP7-1S MICRO	↑			
10908000	CHA-2V	CHP8-2V MICRO	↑			
10909000	CHA-2V	CHP9-2V MICRO	↑			
1090A000	CHA-2W	CHPA-2W MICRO	↑			
1090B000	CHA-2W	CHPB-2W MICRO	↑			
1090C000	CHA-2X	CHPC-2X MICRO	↑			
1090D000	CHA-2X	CHPD-2X MICRO	↑			
1090E000	CHA-2Y	CHPE-2Y MICRO	↑			
1090F000	CHA-2Y	CHPF-2Y MICRO	↑			
10920000	DKA-1B	DKP10-1B MICRO	↑			
10921000	DKA-1C	DKP11-1C MICRO	↑			
10922000	DKA-1D	DKP12-1D MICRO	↑			
10923000	DKA-1E	DKP13-1E MICRO	↑			
10928000	DKA-2H	DKP14-2H MICRO	↑			
10929000	DKA-2J	DKP15-2J MICRO	↑			
1092A000	DKA-2K	DKP16-2K MICRO	↑			
1092B000	DKA-2L	DKP17-2L MICRO	↑			
10940000	SVP	SVP MICRO	↑			
10940100	SSVP	SSVP MICRO	↑			

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4.2 WIC = 8X (Reference to manual)

Table 4.2.1 List of ACC (Reference to manual) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
80000000		See Manual	Refer to “Isolating a failed part (TRBL03-10)”			
80F00000		TSC CALL				
80F00100		FM WRITE	Refer to the reference code 7900XY or 7901XY (SIM-RC02-150)			

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4.3 WIC = 9X (Collection of information)

Table 4.3.1 List of ACC (Collection of Information) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
90000000		Get DKC Dump	Call Support Center			
90000100		Get SVP Dump	↑			
90000200		Get SSVP Dump	↑			
91000000		Refer to the related log (SIM)	Refer to “Recovery Procedure for Drive Restoration Failures”. (TRBL05-170)			
91000100		Refer to the related log (SSB)				
92000000		Check MP version	Refer to SVP section			
92000100		Check LCP version	↑			
92000200		Check MCP version	↑			
92000300		Check LCDG version	↑			
92000400		Check BOOT(ROM) version	↑			
92000500		Check BOOT(RAM) version	↑			
92000600		Check SVP version	↑			
92000700		Check SSVP version	↑			
92000800		Check CUDG version	↑			
93000000		Check PIN slot	Refer to “Recovery Procedure for Faulty Tracks”. (TRBL04-10)			

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4.4 WIC = BX (SW operation)

Table 4.4.1 List of ACC (SW operation) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
B0000000		TURN BREAKER OFF	Refer to “The power cannot be turned off”. (TRBL03-90)			
B8000000		MPS ON				

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4.5 WIC = CX (Execution of CUDG)

Table 4.5.1 List of ACC (Execution of CUDG) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
C0006060		Execution of Correction Copy				
C0006061		Execution of Dynamic Sparing				
C0006070		Execution of CUDG				
C0006078		Execution of DKU In-line				
C00060F0		User JOB				

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4.6 WIC = DX (Breach of restriction)

Table 4.6.1 List of ACC (Breach of restriction) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
D0000000		Confirm of restriction	Breach of restriction when adding the DKU frame.			
D0001000		↑	Breach of restriction when adding the drive.			

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4.7 WIC = EX (Setting work)

Table 4.7.1 List of ACC (Setting Work) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
E0000000		Re-definition of Configuration Information	Re-define the configuration information referring to INSTALLATION section. And monitor it.			
E1000000		Re-definition of ASSIST Configuration Information	Re-define the ASSIST configuration information referring to ASSIST section. And monitor it.			

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4.8 WIC = FX (Other)

Table 4.8.1 List of ACC (No Action) (1/1)

ACC	Location	Function Name	Additional Information	WORK ID		
				Disruptive		Nondisruptive
				Hot	Cold	Hot
F0000000		NO ACTION				
F0100000		remove FD	SVP could not reboot because the FD was inserted. Remove the FD.			

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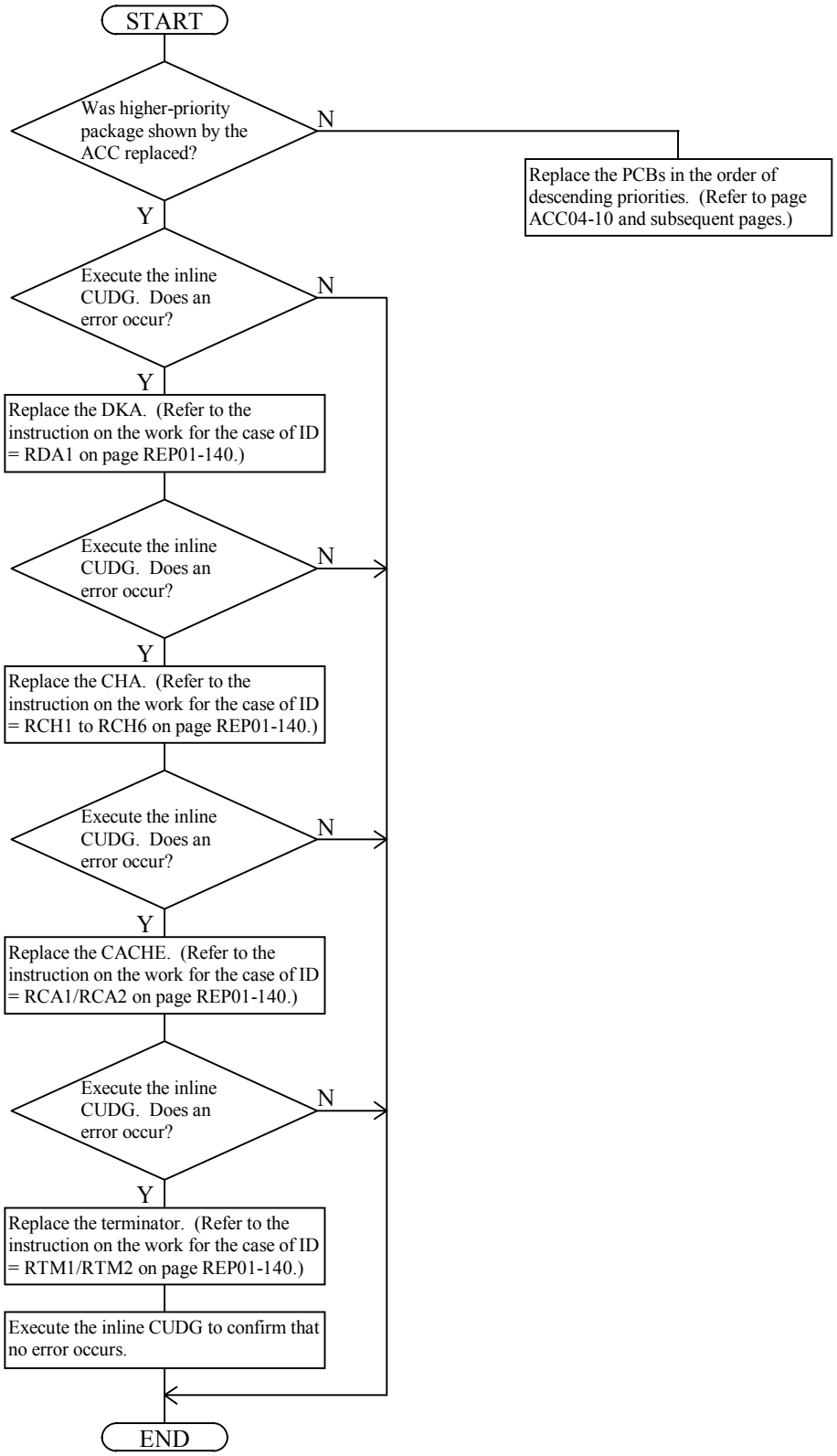
5 Reference

- Error recovery procedure when the other PCB is nominated
  When the other PCB is nominated, recover the error following the procedure below.



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SIM RC SECTION

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Contents

1 Reference Code ---------- SIM-RC01-10

2 Reference Codes ---------- SIM-RC02-10
2.1 SIM Reference Codes Detected by the Processor ---------- SIM-RC02-10
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3 SIM Format ---------- SIM-RC03-10

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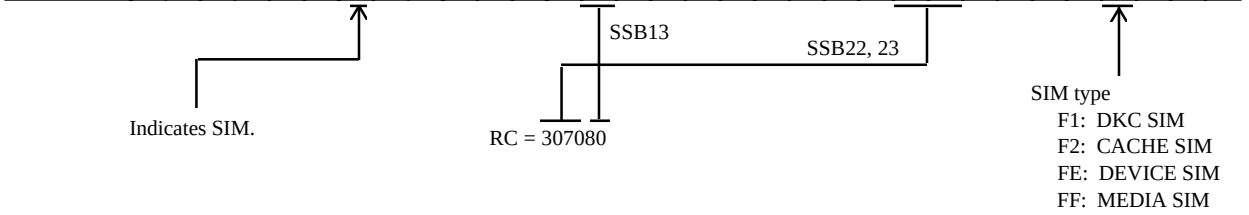
1 Reference Code

A six-byte reference code (RC) is provided for a SIM (service information message) to identify an error and error section. The following shows 32 SIM bytes and reference codes.

Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
SIM SSB	00	90	10	00	00	00	8F	E0	44	10	00	04	00	**80**	04	0C	69	00	00	00	00	02	**30**	**70**	05	10	42	C0	**F1**	00	02	00



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2 Reference Codes

SIMs are roughly classified into two types: SIMs detected by the processor and SIMs detected by the SVP.

2.1 SIM Reference Codes Detected by the Processor

SIM Reference Codes Detected by the Processor (1/7)

Error		REF CODE 22	23	13	SIM 28	Level of error	Host report	Remarks
LCP/MCP error	LCM Hardware error	21	3Z	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: LCP#/MCP#1 (*3) Z: LCP#/MCP#2 (*3)
	ADP permanent error	21	70	X0	F1	Moderate	Yes	X: CHA PCB# (*1)
	ADP temporary error	21	71	XY	F1	Service	No	X: CHA PCB# (*1) Y: LCP#/MCP#0 (*3)
	ADP blocking	21	72	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: LCP#/MCP#0 (*3)
	AL_PA value conflict	21	90	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
CHA Processor error	CHK1A threshold over	30	70	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHK1B threshold over	30	71	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHK3 threshold over	30	72	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	Processor blocking	30	73	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: MP# in PCB
	FM threshold over	30	74	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	FM error	30	75	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: MP# in PCB
	Incorrect SUM value of FM	30	76	XY	F1	(*27)	No	X: CHA PCB# (*1) Y: MP# in PCB
	LDEV blockade (Effect of processor blockade)	30	90	XY	F1	Serious	Yes	X: CHA PCB# (*1) Y: MP# in PCB
	CHF PCB exchange impossible (No PERFORMANCE FIBRE)	31	97	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHF PCB exchange impossible (No supported Micro-Program)	31	98	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	P/S OFF impossible	38	8F	00	F1	Moderate	No	
	P/S OFF impossible (Device reserved)	38	9F	00	F1	Moderate	No	
	Undefined Package is mounted	39	90	XY	F1	Moderate	No	X: CHA PCB# (*1,5) Y: MP# in PCB
	V-R or serial number is inconsistent	39	91	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: MP# in PCB
	Replace failed	39	93	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: MP# in PCB
	Micro-program version up	39	94	X0	F1	Service	No	X: MP version after replacing (*23)
	Micro-program version up impossible	39	95	XY	F1	Service	No	X: Present MP version (*23) Y: reason code (*13)
	Package type changed	39	96	XY	F1	Service	No	X: CHA PCB# (*1) Y: Change type# (*14)

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SIM Reference Codes Detected by the Processor (2/7)

Error		REF CODE			SIM	Level of error	Host report	Remarks	
		22	23	13	28				
CHA Processor error	CHF PCB exchange impossible (No PERFORMANCE FIBRE)	39	97	XY	F1	Service	No	X: CHA PCB# Y: MP# in PCB	(*1)
	CHF PCB exchange impossible (No supported Micro-program)	39	98	XY	F1	Service	No	X: CHA PCB# Y: MP# in PCB	(*1)
	CHF PCB is exchanged to PERFORMANCE FIBRE	39	99	XY	F1	Service	No	X: CHA PCB# Y: MP# in PCB	(*1)
	CHT PCB exchange impossible (4GL ↔ 4GS)	39	9F	X0	F1	Moderate	No	X: CHA PCB#	(*1)

[Note] REF CODE = 3073

If a recoverable processor failure (Micro logical error, CHK-1A) occurs, SIM (REF CODE = 3073) is reported to HOST.

REF CODE = 3998

CHF PCB is 'PERFORMANCE FIBRE'. SIM message says 'cannot analyzed', because the version of the installed micro-program does not support 'PERFORMANCE FIBRE'.

You must replace this PCB by no 'PERFORMANCE FIBRE' CHF PCB.

REF CODE = 3999

After this, if you replace 'PERFORMANCE FIBRE' CHF PCB by no 'PERFORMANCE FIBRE' CHF PCB, you must follow 'Installation and De-Installation' procedure. Do not follow 'Replace' procedure.

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SIM Reference Codes Detected by the Processor (3/7)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
DKA Processor error	CHK1A threshold over	31	70	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	CHK1B threshold over	31	71	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	CHK3 threshold over	31	72	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	Processor blocking	31	73	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	FM threshold over	31	74	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	FM error	31	75	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	Incorrect SUM value of FM	31	76	XY	F1	(*27)	No	X: DKA PCB# (*1) Y: MP# in PCB
	LDEV blockade (Effect of processor blockade)	31	90	XY	F1	Serious	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	P/S OFF impossible	3C	8F	00	F1	Moderate	No	
	P/S OFF impossible (Device reserved)	3C	9F	00	F1	Moderate	No	
	Undefined Package is mounted	3D	90	XY	F1	Moderate	No	X: DKA PCB# (*1,5) Y: MP# in PCB
	V-R or serial number is inconsistent	3D	91	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: MP# in PCB
	Replace failed	3D	93	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: MP# in PCB
	Micro-program version up	3D	94	X0	F1	Service	No	X: MP version after replacing (*23)
	Micro-program version up impossible	3D	95	XY	F1	Service	No	X: Present MP version (*23) Y: reason code (*13)
M-bus error	Warning of M bus open (SMC detected)	FF	D0	XY	F1	Moderate	No	X: 0 = Side A, 1 = Side B (*2) Y: 0 = L, 1 = H
	Bus blocking	FF	EA	0X	F1	Serious	Yes	Y: 0 = L, 1 = H (*18)
	CHK3 threshold over	FF	EB	0X	F1	Service	No	Y: 0 = L, 1 = H
M-bus error (CHA side)	Warning of M bus open (SMP detected)	FF	D1	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (A) (SMP detected)	FF	D2	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (B) (SMP detected)	FF	D4	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus DISABLE (SMP detected)	FF	D5	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus ABTRST (SMP detected)	FF	D6	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of SM DISABLE (SMP detected)	FF	D7	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = Side A, 1 = Side B (*2)
	M-bus arbiter enable off	FF	D8	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H

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SIM Reference Codes Detected by the Processor (4/7)

Error		REF CODE			SIM	Level of	Host	Remarks
		22	23	13	28	error	report	
M-bus error (DKA side)	Warning of M bus open (SMP detected)	FF	51	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (A) (SMP detected)	FF	52	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (B) (SMP detected)	FF	54	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus DISABLE (SMP detected)	FF	55	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus ABTRST (SMP detected)	FF	56	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of SM DISABLE (SMP detected)	FF	57	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = Side A, 1 = Side B (*2)
	M-bus arbiter enable off	FF	58	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
F-bus error	Bus blocking	FF	FA	0X	F1	Serious	Yes	X: 0 = L, 1 = H (*18)
F-bus error (CHA side)	Warning of F bus DISABLE (BSA detected)	FF	B0	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	F-bus arbiter enable off	FF	B1	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of F bus open (BSA detected)	FF	FC	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of LIVEINS (BSA detected)	FF	FD	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of CHK error (BSA detected)	FF	FE	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
F-bus error (DKA side)	Warning of F bus DISABLE (BSA detected)	FF	30	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	F-bus arbiter enable off	FF	31	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of F bus open (BSA detected)	FF	7C	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of LIVEINS (BSA detected)	FF	7D	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of CHK error (BSA detected)	FF	7E	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
CHA, CHK2 (processor)	RCHA temporary error	3F	84	X0	F1	Service	No	X: CHA PCB# (*1)
	RCHA blocking	3F	85	X0	F1	Serious	Yes	X: CHA PCB# (*1)
CHS, CHK2 (processor)	SCP path temporary error	3F	86	XY	F1	Service	No	X: CHA PCB# (*1) Y: SCP#
	SCP path blockade	3F	87	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: SCP#
DKA CHK2 (processor)	Pinned slot	CF	4X	XX	F1	Moderate	No	XXX: LDEV#
	DRR temporary error	CF	80	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	SCA temporary error (0-3)	CF	81	XY	F1	Service	No	X: DKA PCB# (*1) Y: Port# (*4)
	DRR blocking	CF	82	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	SCA blocking (0-3)	CF	83	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: Port# (*4)

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SIM Reference Codes Detected by the Processor (5/7)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
DKA CHK2 (processor)	SCSI port blocking (Effect of PATH INLINE failed) (0-3)	CF	84	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: Port# (*4)
	LDEV blockade (Effect of SCA blockade)	CF	90	XY	F1	Serious	Yes	X: DKA PCB# (*1) Y: Port# (*4)
Cache data error	Pinned slot	FF	4X	XX	F2	Moderate	No	XXX: LDEV#
Cache error	Coexistence of cache SIMM sizes (*24)	FF	CC	XY	F2	Service	No	X: Replacement content 1: 512MB→128MB, 2:128MB→512MB Y: Non-replaced side 1: Side A, 2: Side B
	Area is volatiled	FF	CD	0X	F2	Service	No	X: 0 = Side A, 1 = Side B (*2)
	Package is volatiled	FF	CE	0X	F2	Service	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd
	Module group is volatiled	FF	CF	YX	F2	Service	No	X: PCB#: 0 ~3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Correctable error	FF	F0	YX	F2	Service	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Cache temporary error	FF	F1	YX	F2	Service	Yes	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Module group blocking	FF	F2	YX	F2	Moderate	Yes	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Package blocking	FF	F3	0X	F2	Moderate	Yes	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd
	Area blocking	FF	F4	0X	F2	Serious	Yes	X: 0 = Side A, 1 = Side B (*2)
	Both area failed	FF	F5	0X	F2	Moderate	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd
Shared memory error	Loss of duplicated information	FF	DE	XX	F1	Service	No	XX: Lost information type (*25)
	One side Area is volatiled	FF	DF	0X	F1	Service	No	X: 0 = Side A, 1 = Side B (*2)
	Correctable error	FF	E0	YX	F1	Service	No	X: 0 = Side A, 1 = Side B Y: Module# (*2,10)
	Uncorrectable error	FF	E1	0X	F1	Service	Yes	X: 0 = Side A, 1 = Side B (*2,10)
	Area blocking	FF	E2	0X	F1	Serious	Yes	X: 0 = Side A, 1 = Side B (*2,10)
	Real memory size inconsistent	FF	E3	XY	F1	Serious	No	X:Number of module (side A) Y:Number of module (side B) (*8)
	Replace failed (*21)	FF	E4	0X	F1	Serious	No	X: 0 = Side A, 1 = Side B (*2)
	Both side invalid	FF	E5	00	F1	Acute	No	
	Configuration information compare error (*22)	FF	E6	00	F1	Acute	No	
	Shared memory is volatiled.	FF	E7	00	F1	Serious	No	
	Configration unmatch	FF	E8	00	F1	Acute	No	
	CHK3 threshold over	FF	EC	0X	F1	Service	No	X: 0 = Side A, 1 = Side B (*2)
	Area temporary blocking (*20)	FF	EE	0X	F1	Service	Yes	X: 0 = Side A, 1 = Side B (*2)
	Rebooted without volatilization after an instantaneous down	FF	EF	00	F1	Service	No	

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SIM Reference Codes Detected by the Processor (6/7)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Drive error (normal R/W)	SCSI temporary error	DF	7Y	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	Drive temporary error	EF	1A	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive media error	43	40	XX	FF	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
	SCSI blockade	DF	8Y	XX	FE	Moderate	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	LDEV blockade (Effect of SCSI blockade) *15	DF	9Y	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	SCSI ID error	DF	A0	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive serial number check error	EF	50	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive blockade (drive)	EF	10	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive blockade (Effect of Dynamic sparing normal end)	EF	11	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	LDEV blockade (Effect of drive blockade) *15	EF	90	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive blockade (media)	43	C0	XX	FF	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Correction copy start *7	45	10	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy normal end *7	45	20	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy abnormal end *7	45	21	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy discontinued *7	45	22	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy warning end* *7 (With blockade LDEV or some error)	45	24	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4d+RDEV#:4b) (Source side drive)

* : Warning end : (1) LDEV blockade status is detected, and copy process for the LDEV is skipped.
(2) Some failure is detected, and copy process is complete.

** : When the drive is 3380 emulation mode, the SIM is not reported to host.

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SIM Reference Codes Detected by the Processor (7/7)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Drive error (normal R/W)	Dynamic sparing start *7 (Drive copy)	46	10	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing normal end *7 (Drive copy)	46	20	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing abnormal end (Drive copy) *7	46	21	XX	FE	Moderate	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing discontinued *7	46	22	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing warning end* (With blockade LDEV or some error) (Drive copy) *7	46	24	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Pinned slot	EF	4X	XX	FE	Moderate	No	XXX: LDEV#
	LDEV read only	EF	3X	XX	FE	Serious	Yes **	XXX: LDEV#
Drive error (ORM)	SCSI temporary error	50	0Y	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	Drive temporary error	50	10	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive media error	50	20	XX	FF	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
SVP interface error (CHA side)	Ethernet error for SVP	14	00	X0	F1	Moderate	Yes	X: CHA PCB# (*1)
	SIM transfer failure to SVP	14	01	X0	F1	Serious	Yes	X: CHA PCB# (*1)
SVP interface error (DKA side)	Ethernet error for SVP	15	00	X0	F1	Moderate	Yes	X: DKA PCB# (*1)
	SIM transfer failure to SVP	15	01	X0	F1	Serious	Yes	X: DKA PCB# (*1)
Power error	HDU power off	AC	50	XY	F1	Moderate	Yes	X: DKU number (*12) Y: HDU number (*12)
	HDU power recovered	AC	51	XY	F1	Service	No	X: DKU number (*12) Y: HDU number (*12)

* : Warning end : (1) LDEV blockade status is detected, and copy process for the LDEV is skipped.
(2) Some failure is detected, and copy process is complete.

** : When the drive is 3380 emulation mode, the SIM is not reported to host.

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SIM Reference Codes Detected by the Processor for HRC/HODM/HORC (1/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
RCP error	Logical path(s) on the remote copy connections was logically blocked (Due to an error conditions)	21	80	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: LCP#1 (*3)
	The logical path has been recovered from blocked condition on the remote copy conditions.	21	81	XY	F1	Service	Yes (*17)	X: CHA PCB# (*1) Y: LCP#1 (*3)
Pair volume status error	HRC/HORC started the initial copy or out of sync for this volume.	D0	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC/HORC completed the initial copy for this volume.	D0	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC/HORC for this volume was deleted. (Operation from an SVP/remote console or a host processor)	D0	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	MCU changed volume pair status. (Operation from an SVP/remote console or a host processor)	D0	3X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL is changed. *28	D1	YX	XX	FE	Service	Yes (*17)	XXX: LDEV# Y: (*16)
	RCU changed status of R-VOL to suspend. (Operation from an SVP/remote console or a host processor.) *28	D2	0X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from suspend to simplex. (Operation from an SVP/remote console or a host processor.) *28	D2	1X	XX	FE	Service	No	XXX: LDEV#
	Status of R-VOL was changed from duplex to simplex. (Operation from an SVP/remote console or a host processor.) *28	D2	2X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from pendingduplex to simplex. (Operation from an SVP/remote console or a host processor.) *28	D2	3X	XX	FE	Service	No	XXX: LDEV#
	HODM started the migration copy or out of sync for this volume.	D3	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HODM completed the migration copy for this volume.	D3	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HODM for this volume was deleted. (Operation from an SVP/remote console)	D3	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HODM started the erase operation for the R-VOL. *28	D3	AX	XX	FE	Service	No (*17)	XXX: LDEV#
	HODM completed the erase operation for the R-VOL. *28	D3	BX	XX	FE	Service	No (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC/HODM/HORC (2/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	HRC/HODM/HORC for this volume was suspended (Due to an unrecoverable failure on the remote copy connections.)	D4	0X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM/HORC for this volume was suspended (Due to an unrecoverable failure on the M-VOL or the remote copy connections) *28	D4	1X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM/HORC for this volume was suspended (Due to an unrecoverable failure on the R-VOL) *28	D4	2X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Caused by DFW to the R-VOL was prohibited) *28	D4	3X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HORC for this volume was suspended (Due to an internal error condition detected by the RCU)	D4	4X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HORC for this volume was suspended (Caused by Delete pair operation was issued to the R-VOL) *28	D4	5X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	Erase operation for this volume was not completed. (Due to anerror conditions)	D4	8X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	MCU detected a Moderate Level SIM for RCU.	D4	DX	XX	FE	Moderate	Yes (*19)	XXX: LDEV#
	MCU detected an Acute or Serious Level SIM for RCU.	D4	EX	XX	FE	Serious	Yes (*19)	XXX: LDEV#
	Status of the M-VOL was not consistent with the R-VOL. *28	D4	FX	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC (Semi-synchronous) (1/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	HRC started the initial copy or out of sync for this volume.	D8	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC completed the initial copy for this volume.	D8	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was deleted. (Operation from an SVP/remote console or a host processor)	D8	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	MCU changed volume pair status. (Operation from an SVP/remote console or a host processor)	D8	3X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL is changed. *28	D9	YX	XX	FE	Service	Yes (*17)	XXX: LDEV# Y: (*16)
	RCU changed status of R-VOL to suspend. (Operation from an SVP/remote console or a host processor.) *28	DA	0X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from suspend to simplex. (Operation from an SVP/remote console or a host processor.) *28	DA	1X	XX	FE	Service	No	XXX: LDEV#
	Status of R-VOL was changed from duplex to simplex. (Operation from an SVP/remote console or a host processor.) *28	DA	2X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from pendingduplex to simplex. (Operation from an SVP/remote console or a host processor.) *28	DA	3X	XX	FE	Service	No	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the remote copy connections.)	DC	0X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the M-VOL or the remote copy connections) *28	DC	1X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the R-VOL) *28	DC	2X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Caused by DFW to the R-VOL was prohibited) *28	DC	3X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Due to an internal error condition detected by the RCU)	DC	4X	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC (Semi-synchronous) (2/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	HRC for this volume was suspended (Caused by Delete pair operation was issued to the R-VOL) *28	DC	5X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	Status of the M-VOL was not consistent with the R-VOL. *28	DC	FX	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC/HORC (Asynchronous) (1/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	HRC started the initial copy or out of sync for this volume.	D5	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC completed the initial copy for this volume.	D5	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was accepted delete pair operation. (Operation from an SVP/remote console or a host processor)	D5	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was accepted suspend pair operation. (Operation from an SVP/remote console or a host processor)	D5	3X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	Delete pair operation for this HRC volume has completed.	D5	4X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	Suspend pair operation for this HRC volume has completed.	D5	5X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	The R-VOL status has changed as requested by MCU. *28	D6	YX	XX	FE	Service	Yes (*17)	XXX: LDEV# Y: (*16)
	The R-VOL has accepted/completed state change as requested by operation. (Operation from an SVP/remote console or a host processor.) *28	D7	ZX	XX	FE	Service	No	XXX: LDEV# Z: (*26)
	The M-VOL has suspended. (Due to an unrecoverable failure on the remote copy connections.) *28	DB	0X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Due to an unrecoverable failure on the M-VOL or the remote copy connections) *28	DB	1X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Due to an unrecoverable failure on the R-VOL) *28	DB	2X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Caused by DFW to the R-VOL was prohibited) *28	DB	3X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Caused by Suspend pair operation was issued to the R-VOL) *28	DB	4X	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC/HORC (Asynchronous) (2/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	The M-VOL has suspended. (Caused by Delete pair operation was issued to the R-VOL) *28	DB	5X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The R-VOL has suspended. (Due to an unrecoverable failure on the remote copy connections) *28	DB	6X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The R-VOL has suspended. (Due to an unrecoverable failure on the R-VOL) *28	DB	7X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The R-VOL has suspended. (Due to an MCU power-off event) *28	DB	8X	XX	FE	Service	No	XXX: LDEV#
	MCU detected a Service Level SIM for RCU.	DB	CX	XX	FE	Service	Yes	XXX: LDEV#
	MCU detected a Moderate Level SIM for RCU.	DB	DX	XX	FE	Moderate	Yes	XXX: LDEV#
	MCU detected an Acute or Serious Level SIM for RCU.	DB	EX	XX	FE	Serious	Yes	XXX: LDEV#
	Status of the M-VOL was not consistent with the R-VOL. *28	DB	FX	XX	FE	Serious	Yes (*17)	XXX: LDEV#

Notice : SIM which REF.CODE is DB7XXX may be reported in the following case.

- When the Suspend Pair operation with the Drain option is accepted by the MCU/RCU under the host I/O.
- When the Delete Pair operation with the Group option is accepted by the RCU under the host I/O.

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SIM Reference Codes Detected by the Processor for HMRCF (1/1)

Error		REF CODE			SIM	Level of	Host	Remarks
		22	23	13	28	error	report	
HMRCF error	Copy warning end (CU#=0)	47	A0	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy warning end (CU#=1)	47	A1	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy warning end (CU#=2)	47	A2	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy warning end (CU#=3)	47	A3	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=0) (S-Vol blocked) *28	47	B0	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=1) (S-Vol blocked) *28	47	B1	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=2) (S-Vol blocked) *28	47	B2	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=3) (S-Vol blocked) *28	47	B3	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=0) (T-Vol blocked) *28	47	C0	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=1) (T-Vol blocked) *28	47	C1	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=2) (T-Vol blocked) *28	47	C2	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=3) (T-Vol blocked) *28	47	C3	XX	FE	Moderate	No	XX:T-Vol# *28
	Copy abnormal end (CU#=0) (others)	47	D0	XX	FE	Moderate	Yes	XX:T-Vol# *28
	Copy abnormal end (CU#=1) (others)	47	D1	XX	FE	Moderate	Yes	XX:T-Vol# *28
	Copy abnormal end (CU#=2) (others)	47	D2	XX	FE	Moderate	Yes	XX:T-Vol# *28
	Copy abnormal end (CU#=3) (others)	47	D3	XX	FE	Moderate	Yes	XX:T-Vol# *28
HIHSM error	HIHSM Volume Migration Failed (CU#=0)	47	F0	XX	FE	Moderate	No	XX:S-Vol#
	HIHSM Volume Migration Failed (CU#=1)	47	F1	XX	FE	Moderate	No	XX:S-Vol#
	HIHSM Volume Migration Failed (CU#=2)	47	F2	XX	FE	Moderate	No	XX:S-Vol#
	HIHSM Volume Migration Failed (CU#=3)	47	F3	XX	FE	Moderate	No	XX:S-Vol#

SIM Reference Codes Detected by the Processor for HXRC (1/1)

Error		REF CODE			SIM	Level of	Host	Remarks
		22	23	13	28	error	report	
HXRC Warning	SIM reporting over 40% sidefile threshold	49	0X	XX	FE	Service	Yes	XX:LDEV No.

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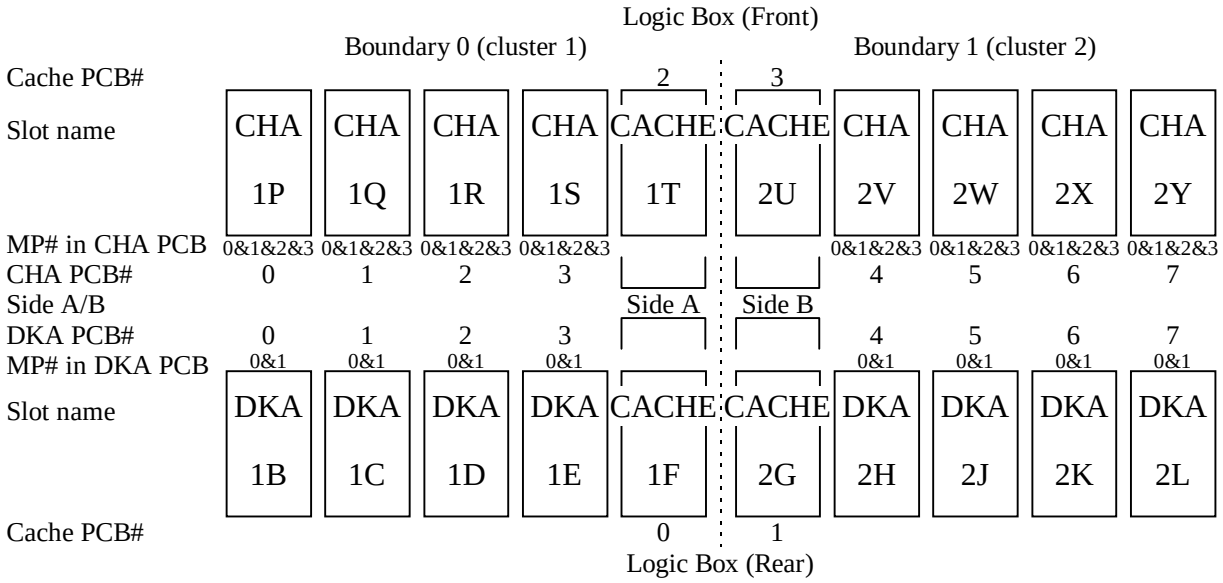
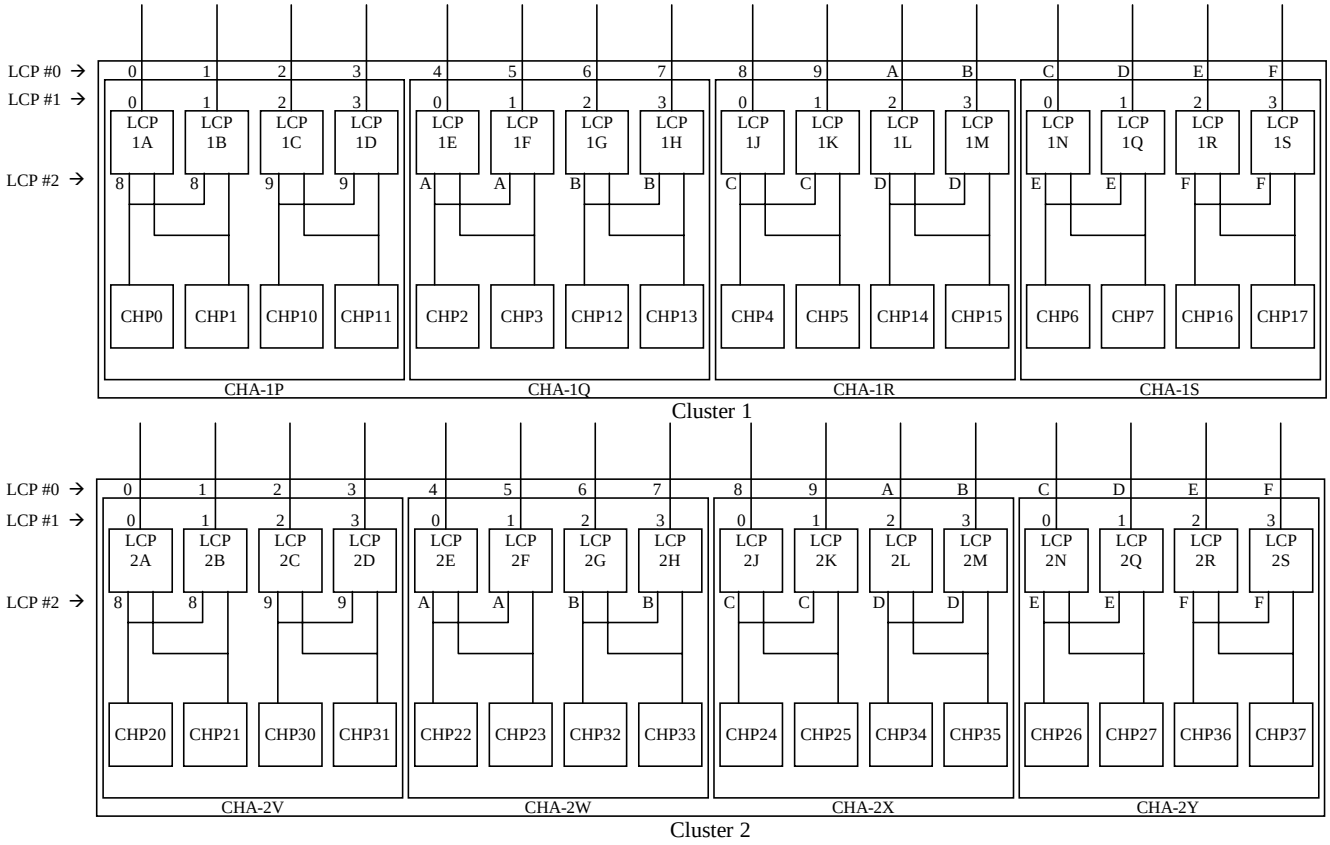
(*1) CHA PCB#: x‘0’ to x‘7’ indicates the CHA PCB number. See the figure below.
DKA PCB#: x‘0’ to x‘7’ indicates the DKA PCB number. See the figure below.
Cache PCB#: x‘0’ to x‘3’ indicates the Cache PCB number. See the figure below.

(*2) Side A/B: Indicates the side of cache/shared memory. See the figure below.



(*3) LCP #0: x‘0’ to x‘F’ indicates the LCP number.
LCP #1: x‘0’ to x‘3’ indicates the LCP number.
LCP #2: x‘8’ to x‘F’ indicates the LCP number.



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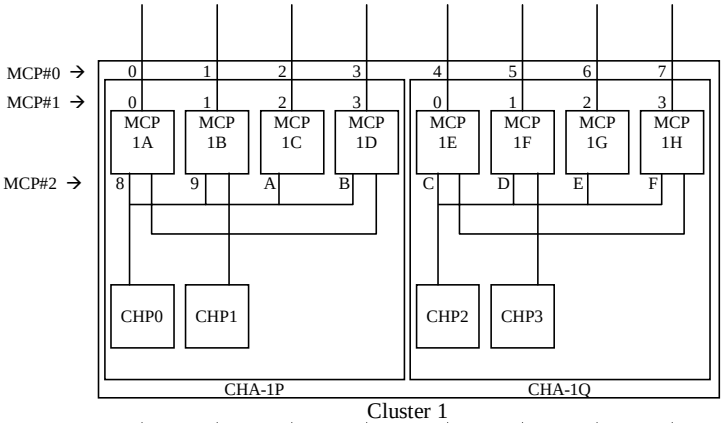
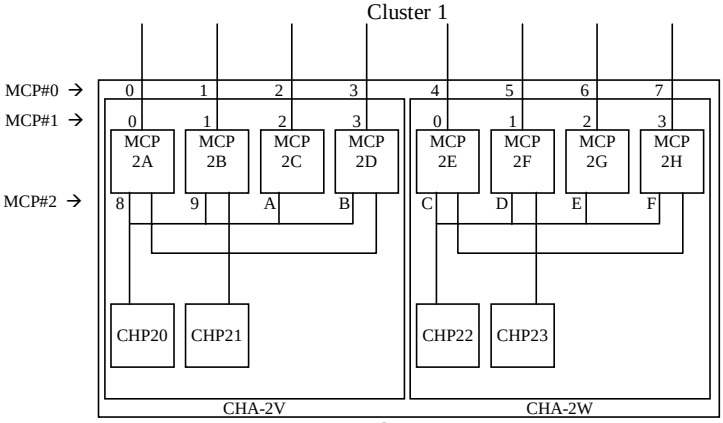
MCP #0: x‘0’ to x‘7’ indicates the MCP number.
MCP #1: x‘0’ to x‘3’ indicates the MCP number.
MCP #2: x‘8’ to x‘F’ indicates the MCP number.

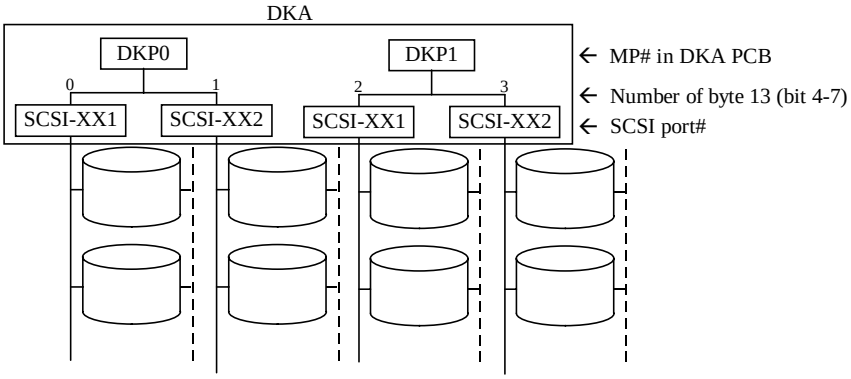


Cluster 1



Cluster 2

(*4) Port #: x‘0’ to x‘3’ indicates the SCSI port number. See the figure below.



(*5) The package that is not defined in the configuration information exists.
If it is prepared for new installation, it is necessary to do the new installation procedure.
Otherwise it should be pulled out by executing P/S off.

(*7) Isolate the error according to the procedure shown in TRBL05-170.

(*8) Recover the error according to the procedure shown in TRBL05-260.

(*10) Perform error isolation according to the procedure given in the two separate pages attached to TRBL05-280.

(*11) If memory module group (CMxx) is designated by FPC, that module may be isolated from associated SSBs. Isolate the memory module according to the procedure given in the page attached to TRBL05-290.

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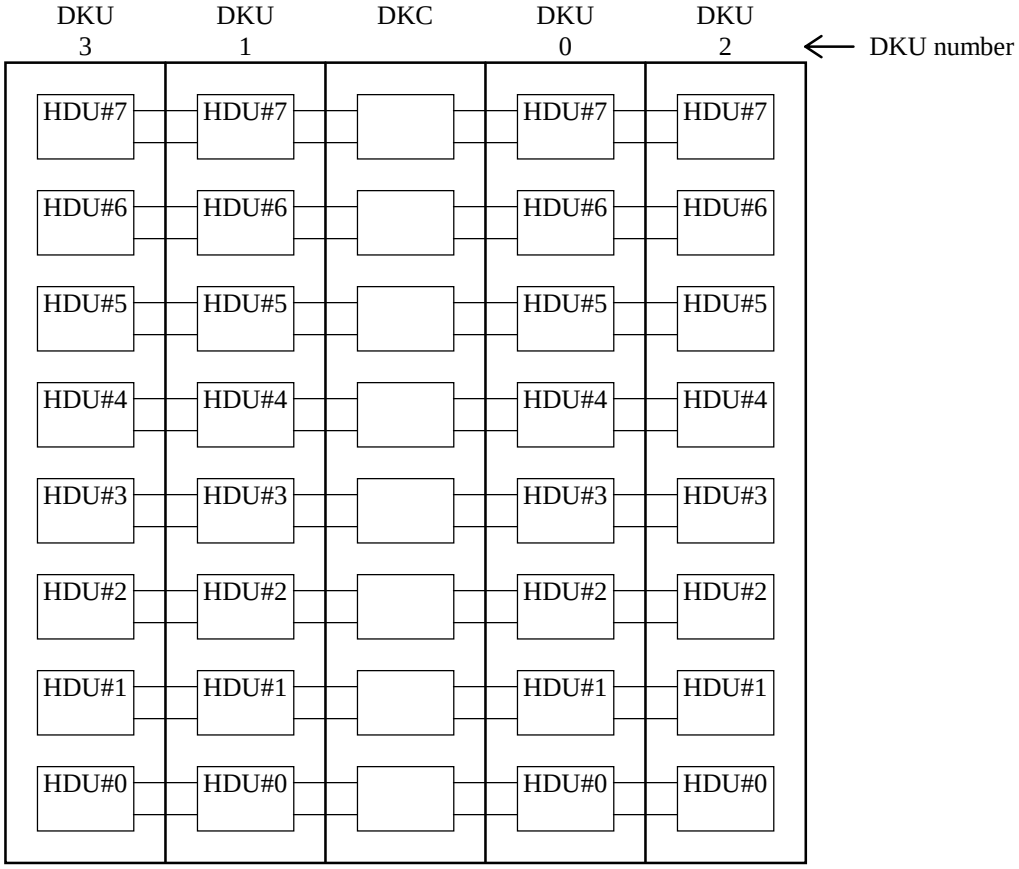
(*12) DKU#: x‘0’ to x‘3’ indicates DKU number. See the figure below.
HDU#: x‘0’ to x‘7’ indicates HDU number. See the figure below.



(*13) reason code
x‘0’ : Pinned data exist
x‘1’ : The shutdown of the power supply was occurred
x‘2’ : Invalid Version/Revision exists

(*15) Recover LDEVs according to the procedure shown in TRBL05-330.

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(*16) Change pair status number
x'0': From simplex to duplex pending
x'1': From simplex to duplex
x'2': From pending duplex to duplex
x'3': From pending duplex to suspend
x'4': From duplex to suspend
x'5': From duplex to simplex
x'6': From pending duplex to simplex
x'7': From suspend to simplex
x'8': From suspend to duplex pending

(*17) You can suppress reporting the HRC/HODM Service SIM to the HOST by RCU Option operation (PPRC support by HOST and Service SIM of HRC/HODM).

- Service level SIM -

PPRC support by HOST	Service SIM or HRC/HODM	level of error	HRC	HODM
Yes	Report	DKC_SIM	Host Report	Host Report
		DEV_SIM	Not Host Report	Host Report
	Not Report	DKC_SIM	Not Host Report	Not Host Report
		DEV_SIM	Not Host Report	Not Host Report
No	Report	DKC_SIM	Host Report	Host Report
		DEV_SIM	Host Report	Host Report
	Not Report	DKC_SIM	Not Host Report	Not Host Report
		DEV_SIM	Not Host Report	Not Host Report

- Moderate or Serious level SIM -

PPRC support by HOST	level of error	HRC	HODM
Yes	DKC_SIM	Host Report	Host Report
	DEV_SIM	Not Host Report	Host Report
No	DKC_SIM	Host Report	Host Report
	DEV_SIM	Host Report	Host Report

(*18) Isolate the error according to the procedure shown in TRBL05-20.

(*19) SIMs which REF.CODE are D4DX, D4EX are reported in case of HODM.
In case of HRC, SIMs reported from RCU are reported to the host by MCU.

Severity Level	RC of reported SIM for HRC	RC of reported SIM for HODM
Acute or Serious	No modification	D4EX
Moderate	No modification	D4DX
Service (Not HRC SIM)	No modification	Not reported
Service (HRC SIM)	Not reported	Not reported

(*20) This temporary blocking is to recover the logical table on SM and be automatically recovered.

(*21) In case of the replacement of the cache memory PCB on the side having blocked SM (see REP01-140 work ID = RCA1), insert the removed cache memory PCB again.

(*22) The LDEV is blocked because of an error (inconsistency between data on the A and B sides) of configuration information stored in the SM. Recover the error following the instruction of the Technical Support Center.

(*23) X represents the X in a program version "?X-??-??/??".

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(*24) Cache SIMM sizes of sides A and B are different because the replacement of the cache memory has been performed on one side only. Perform the replacement left referring to the description in the remark column.

(*25) Type of the lost information is reported according to the bit position. (There may be the case that two or more bits are set.)

(*26) Change pair status number
x'0': Accepted Suspend Pair operation
x'1': Accepted Delete Pair operation (The R-VOL is in suspended status)
x'2': Accepted Delete Pair operation (The R-VOL is in duplex status)
x'3': Accepted Delete Pair operation (The R-VOL is in pending duplex status)
x'4': Completed Suspend Pair operation
x'5': Completed Delete Pair operation

(*27) In the case that the error is detected in the area of ROM, the level of error is "Modetate" in other case "Service".

(*28) Volume Name Definition

	System (On SVP)	Open
Pair Volume	M-VOL	P-VOL
	R-VOL	S-VOL
HMRCF/HIHSM	T-VOL	S-VOL
	S-VOL	P-VOL

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2.2 SIM Reference Codes Detected by the SVP

SIM Reference Codes Detected by the SVP

Error		REF code			SIM	Level of	Host	Remarks
		22	23	13	28	error	report	
Environmental error	Temperature abnormal	BF	1X *1	XX *13	F1	Moderate	Yes	
	Voltage alarm	BF	2X *2	XX *13	F1	Moderate	Yes	
	Voltage warning	BF	3X *3	XX *13	F1	Moderate	Yes	
	P/S warning	BF	4X *4	XX *13	F1	Moderate	Yes	
	Battery warning	BF	5X *5	XX *13	F1	Moderate	Yes	
	AC warning	BF	6X *6	XX *13	F1	Moderate	Yes	
	Fan abnormality : CL1 logic	BF	7X *7	10	F1	Moderate	Yes	
	Fan abnormality : CL2 logic	BF	7X *8	20	F1	Moderate	Yes	
	Fan abnormality : HDU-R1X	BF	7X *9	3X *13	F1	Moderate	Yes	
	Fan abnormality : HDU-L1X	BF	7X *9	4X *13	F1	Moderate	Yes	
	Fan abnormality : HDU-R2X	BF	7X *9	5X *13	F1	Moderate	Yes	
	Fan abnormality : HDU-L2X	BF	7X *9	6X *13	F1	Moderate	Yes	
	JP remains	BF	8X *10	XX *13	F1	Moderate	Yes	
	Environment monitor error	BF	9X *11	XX *13	F1	Service	No	
	Environment monitor disagreement	BF	AX *12	XX *13	F1	Moderate	No	
	SVP P/S abnormal	BF	C0	XX *13	F1	Moderate	Yes	
SVP error	Logical inconsistency	70	XX *14	00	F1	Moderate	No	
	HEEP error	71	XX *14	00	F1	Moderate	No	
	File error	72	XX *14	00	F1	Moderate	No	
	LAN error	73	XX *14	00	F1	Moderate	No	
	S-SVP error	74	XX *14	XX *15	F1	Moderate	No	
	Windows error	75	XX *14	00	F1	Moderate	No	
	CUDG3 detected error	76	01	XX *16	F1	Moderate	No	
	LCDG3 detected error	76	10	XX *16	F1	Moderate	No	
	BOOT detected error (CHA)	79	00	XY *18	F1	Moderate	No	*21
	BOOT detected error (DKA)	79	01	XY *19	F1	Moderate	No	*21
End status of remote microprogram exchange	Normal end	7A	00	00	F1	Service	No	
	Abnormal end (SVP)	7A	01	00	F1	Service	No	
	Abnormal end (MP)	7A	02	XX *21	F1	Service	No	
	Version check error	7A	03	XX *17	F1	Service	No	
	Sum check error	7A	04	XX *17	F1	Service	No	
	LCP patch error	7A	05	XX *20	F1	Service	No	
	Warning (Configuration nconsistency)	7A	10	00	F1	Service	No	
	Warning (S-SVP busy)	7A	11	00	F1	Service	No	
	Warning (LCP busy)	7A	12	XX *20	F1	Service	No	
Dump received	WCHK1 dump(CHA)	30	80	XY *18	F1	Moderate	No	
	WCHK1 dump(DKA)	31	80	XY *19	F1	Moderate	No	
	ABEND dump(CHA)	30	81	XY *18	F1	Moderate	No	
	ABEND dump(DKA)	31	81	XY *19	F1	Moderate	No	
Backup Server	Backup Server Failure detected by SVP	BE	00	00	F1	Moderate	No	
	ATL Failure	BE	01	00	F1	Moderate	No	
	MT Failure	BE	02	00	F1	Moderate	No	
	OS Failure	BE	03	00	F1	Moderate	No	
	NetWorker Error	BE	04	00	F1	Moderate	No	
	Application Error	BE	05	00	F1	Moderate	No	

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*1 Contents of byte 23 when a temperature abnormality occurred

Byte 23	Error
10	Abnormal temperature (over 60 ºC) is detected in the front side .
11	Abnormal temperature (over 60 ºC) is detected in the back side.
12	Abnormal temperature (over 45 ºC) is detected in the front side .
13	Abnormal temperature (over 45 ºC) is detected in the back side.

*2 Contents of byte 23 when a voltage alarm was given

Byte 23	Error
20	5V voltage has dropped below 80%.
21	3V voltage has dropped below 80%.
22	12V voltage has dropped below 80%.

*3 Contents of byte 23 when a voltage warning was given

Byte 23	Error
30	Voltage for shared memory has dropped below 80 %.
32	Voltage for cache memory has dropped below 80 %.
33	12V voltage has dropped below 80 %.

*4 Contents of byte 23 when a P/S warning was given

Byte 23	Error
40	5V PS 0 box abnormality has been detected.
41	5V PS 1 box abnormality has been detected.
42	5V PS 2 box abnormality has been detected.
43	5V PS 3 box abnormality has been detected.
44	3V PS 0 box abnormality has been detected.
45	3V PS 1 box abnormality has been detected.
46	3V PS 2 box abnormality has been detected.
47	3V PS 3 box abnormality has been detected.
48	Multi PS 0 box abnormality has been detected.
49	Multi PS 1 box abnormality has been detected.
4A	HDD P/L Multi PS 1 box abnormality has been detected.
4B	HDD P/L Multi PS 0 box abnormality has been detected.

*5 Contents of byte 23 when a battery warning was given

Byte 23	Error
50	Battery0 or BATT-CTR0 abnormality has been detected..
52	Battery1 or BATT-CTR1 abnormality has been detected.
53	Battery2 or BATT-CTR2 abnormality has been detected.
5A	Battery0 abnormality has been detected.(DIAG)
5B	Battery1 abnormality has been detected.(DIAG)
5C	Battery2 abnormality has been detected.(DIAG)

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*6 Contents of byte 23 when an AC warning was given

Byte 23	Error
60	AC power off/interruption of the breaker box occurred.

*7 Contents of byte 23 when a fan lock in a CL1 Logic Box occurred.

Byte 23	Error
70	Low rotation speed of FPSFAN12A has been detected.
71	Low rotation speed of FPSFAN12B has been detected.
72	Low rotation speed of FPSFAN11A has been detected.
73	Low rotation speed of FPSFAN11B has been detected.
74	Low rotation speed of RPSFAN11A has been detected.
75	Low rotation speed of RPSFAN11B has been detected.
76	Low rotation speed of RPSFAN12A has been detected.
77	Low rotation speed of RPSFAN12B has been detected.
78	Low rotation speed of FLGFAN12A has been detected.
79	Low rotation speed of FLGFAN12B has been detected.
7A	Low rotation speed of FLGFAN11A has been detected.
7B	Low rotation speed of FLGFAN11B has been detected.
7C	Low rotation speed of RLGFAN11A has been detected.
7D	Low rotation speed of RLGFAN11B has been detected.
7E	Low rotation speed of RLGFAN12A has been detected.
7F	Low rotation speed of RLGFAN12B has been detected.

*8 Contents of byte 23 when a fan lock in a CL2 Logic Box occurred.

Byte 23	Error
70	Low rotation speed of FPSFAN21A has been detected.
71	Low rotation speed of FPSFAN21B has been detected.
72	Low rotation speed of FPSFAN22A has been detected.
73	Low rotation speed of FPSFAN22B has been detected.
74	Low rotation speed of RPSFAN21A has been detected.
75	Low rotation speed of RPSFAN21B has been detected.
76	Low rotation speed of RPSFAN22A has been detected.
77	Low rotation speed of RPSFAN22B has been detected.
78	Low rotation speed of FLGFAN22A has been detected.
79	Low rotation speed of FLGFAN22B has been detected.
7A	Low rotation speed of FLGFAN21A has been detected.
7B	Low rotation speed of FLGFAN21B has been detected.
7C	Low rotation speed of RLGFAN21A has been detected.
7D	Low rotation speed of RLGFAN21B has been detected.
7E	Low rotation speed of RLGFAN22A has been detected.
7F	Low rotation speed of RLGFAN22B has been detected.

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*9 Contens of byte 23 when a fan lock in a HDU occurred.

Byte 23	Error
70	Low rotation speed of FAN-XXX2A-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
71	Low rotation speed of FAN-XXX1A-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
72	Low rotation speed of FAN-XXX0A-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
73	Low rotation speed of FAN-XXX2B-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
74	Low rotation speed of FAN-XXX1B-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
75	Low rotation speed of FAN-XXX0B-ASSY has been detected. (FAN-XXX:the part shown in byte 13)

*10 Contents of byte 23 when warning of JP (Jumper plug) remains was given

Byte 23	Error
81	JP for LOGIC 1 remains.
82	JP for LOGIC 2 remains.
85	JP for HDU-XX0~HDU-XX3 remains.
86	JP for HDU-XX4~HDU-XX7 remains.

*11 Contents of byte 23 when an environment monitor error occurred

Byte 23	Error
90	Environment monitor register access error
91	Basic clock error of the environment monitor PCB occurred.
92	Parity error of the environment monitor PCB occurred.
93	Battery diagnostic mode setting failure.

*12 Contents of byte 23 when an environment monitors disagreement error occurred

Byte 23	Error
A0	An environment monitors disagreement error occurred.
A1	An environment monitors disagreement error of P/S occurred

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*13 Contents of byte 13 when an environmental abnormality error occurred

Byte 13	Error section	Byte 13	Error section
10	Logic 1	55	HDU-R25
20	Logic 2	56	HDU-R26
30	HDU-R10	57	HDU-R27
31	HDU-R11	60	HDU-L20
32	HDU-R12	61	HDU-L21
33	HDU-R13	62	HDU-L22
34	HDU-R14	63	HDU-L23
35	HDU-R15	64	HDU-L24
36	HDU-R16	65	HDU-L25
37	HDU-R17	66	HDU-L26
40	HDU-L10	67	HDU-L27
41	HDU-L11	70	DKUMN-R1F
42	HDU-L12	71	DKUMN-R1R
43	HDU-L13	72	DKUMN-L1F
44	HDU-L14	73	DKUMN-L1R
45	HDU-L15	74	DKUMN-R2F
46	HDU-L16	75	DKUMN-R2R
47	HDU-L17	76	DKUMN-L2F
50	HDU-R20	77	DKUMN-L2R
51	HDU-R21	80	PWRCTL-1
52	HDU-R22	81	PWRCTL-2
53	HDU-R23	90	AC BOX-R10
54	HDU-R24	91	AC BOX-R11

*14 Contents of byte 23 when a logical error, a HEEP error, a file error, a LAN ereor or Windows error occurred

Byte 23

Byte 23	Error
0x00	Dump task
0x01	DKU inline
0x02	Microprogram change (online)
0x03	Information
0x04	LOGOUT
0x05	PATH inline
0x06	Back Ground
0x07	DIAG
0x08	Install
0x09	Online
0x0A	Microprogram change (offline)
0x0B	Special PCB maintenance
0x0C	Common communication function
0xEF	Other AP

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*15 Contents of byte 23 and byte 13 when a S-SVP logical error occurred

Byte 23
S-SVP error code (High byte)
Byte 13
S-SVP error code (Low byte)

*16 Contents of byte 13 when a CUDG detection error occurred

Byte13(bit0-bit5)

Byte 13 (bit 0 - bit 5)	MPID	Byte 13 (bit 0 - bit 5)	MPID
000000	CHP00-1P	011000	CHP24-2X
000001	CHP01-1P	011001	CHP25-2X
000010	CHP10-1P	011010	CHP34-2X
000011	CHP11-1P	011011	CHP35-2X
000100	CHP02-1Q	011100	CHP26-2Y
000101	CHP03-1Q	011101	CHP27-2Y
000110	CHP12-1Q	011110	CHP36-2Y
000111	CHP13-1Q	011111	CHP37-2Y
001000	CHP04-1R	100000	DKP08-1B
001001	CHP05-1R	100001	DKP18-1B
001010	CHP14-1R	100010	DKP09-1C
001011	CHP15-1R	100011	DKP19-1C
001100	CHP06-1S	100100	DKP0A-1D
001101	CHP07-1S	100101	DKP1A-1D
001110	CHP16-1S	100110	DKP0B-1E
001111	CHP17-1S	100111	DKP1B-1E
010000	CHP20-2V	101000	DKP28-2H
010001	CHP21-2V	101001	DKP38-2H
010010	CHP30-2V	101010	DKP29-2J
010011	CHP31-2V	101011	DKP39-2J
010100	CHP22-2W	101100	DKP2A-2K
010101	CHP23-2W	101101	DKP3A-2K
010110	CHP32-2W	101110	DKP2B-2L
010111	CHP33-2W	101111	DKP3B-2L

Byte13(bit6-bit7)

Byte 13 (bit 6 - bit 7)	Section
00	CHA/DKA
01	CACHE+Shared Memory
10	CACHE PORT+Shared Memory
11	CACHE

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*17 Contents of byte 13 when a version check error or sum check error occurred

Byte 13	Micro-program type
00	RAM BOOT
01	DKC MANI
02	LCP
03	MCP
04	LCDG
05	DKU
06	SVP
07	S-SVP

*18 Contents of byte 13 when a CHP error occurred.

Contents of high byte of Byte13(X).

High byte of Byte 13	Contents
0	1st. CHA of cluster 1
1	2nd. CHA of cluster 1
2	3rd. CHA of cluster 1
3	4th. CHA of cluster 1
4	1st. CHA of cluster 2
5	2nd. CHA of cluster 2
6	3rd. CHA of cluster 2
7	4th. CHA of cluster 2

Contents of low byte of Byte13(Y).

High byte of Byte 13	Contents
0	1st. CHP of the CHA
1	2nd. CHP of the CHA
2	3rd. CHP of the CHA
3	4th. CHP of the CHA

In WCHK1 dump and ABEND dump received SIM = 3080XX, 3081XX, the system error code is indicated on the SIM log detail screen in the format [YYYY] as in Reference Code 3080X0[YYYY].

*19 Contents of byte 13 when a DKP error occurred.

Contents of high byte of Byte13(X).

High byte of Byte 13	Contents
0	1st. DKA of cluster 1
1	2nd. DKA of cluster 1
2	3rd. DKA of cluster 1
3	4th. DKA of cluster 1
4	1st. DKA of cluster 2
5	2nd. DKA of cluster 2
6	3rd. DKA of cluster 2
7	4th. DKA of cluster 2

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Contents of low byte of Byte13(Y).

High byte of Byte 13	Contents
0	1st. DKP of the DKA
1	2nd. DKP of the DKA

In WCHK1 dump and ABEND dump received SIM = 3180XX, 3181XX, the system error code is indicated on the SIM log detail screen in the format [YYYY] as in Reference Code 3180X0[YYYY].

*20 Contents of byte 13

Contents of high byte of Byte13(X).

High byte of Byte 13	Contents
0	1st. CHA of cluster 1
1	2nd. CHA of cluster 1
2	3rd. CHA of cluster 1
3	4th. CHA of cluster 1
4	1st. CHA of cluster 2
5	2nd. CHA of cluster 2
6	3rd. CHA of cluster 2
7	4th. CHA of cluster 2

Contents of low byte of Byte13(Y).

High byte of Byte 13	Contents
0	1st. LCP of the CHA
1	2nd. LCP of the CHA
2	3rd. LCP of the CHA
3	4th. LCP of the CHA

*21 Execute the following procedures according to the error code of initialization function which is shown in 5C-5Fth byte of the SSB with error code 3309. Also, the SSB is the relative log of SIM with the reference code 7900xx or 7901xx.

Code (4-bytes)	Procedures	Note
21000041	P/K Replace	Replace the package with another new one.
31000041	MP-Install	Execute it when the P/S OFF is executed with Shut Down Jumpers to install the micro-programs.
	① P/S OFF ② Pull out the Shut Down Jumpers ③ P/S ON	Execute them when you have forgotten to pull out Shut Down Jumpers in the normal P/S ON.
42000041	P/K Replace	Replace the package with another new one.
48000041	Refer to Note(1)	
55000041	P/K Replace	Replace the package with another new one.
56000041	① SVP Replace ② MP-Install ③ P/K Replace	Use the same package in ③.
others	① MP-Install ② P/K Replace	Use the same package in ②.

(P/K means a package.)

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You never fail to make sure the installed micro program version and the each processor's status by displaying the status (Status display) after the above procedures was finished.
Then, for the micro program version, "Currently running Microprogram Version" and "Stored Microprogram Version per Processor" must be confirmed.

Reference address are as follows.

P/K Replace	REP01-140
SVP Replace	REP01-150 (Work ID : RT10)
MP-Install	MICRO-FC05-10
SSB with the error code 3309	SSBLOG05-2370

[Note(1)]: ① Confirm the PCB name of the package that is set now.
② In the case that the package is the same as the type of the package which you specified in the define configuration.
(a) MP-Install
(b) P/K Replace (Use the same package)
In the case that the package is not same as the type of the package that you specified in the define configuration information.
(a) MP-Install

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3 SIM Format

SIM Format (DKC SIM SSB28 = x‘F1’)

	0	1	2	3	4	5	6	7
0	x‘00’							
1	Permanent Error	‘0’		‘1’	x‘0’			
2	‘0’			‘1’	x‘0’			
3	x‘000000’							
4								
5								
6	Serial # valid	Device address valid	Track address valid	‘0’	Format (x‘F’)			
7	SIM sense record ID (x‘E0’)							
8	Range subject to the error (Note 1)				Range affected by repair (Note 2)			
9	Level of error (Note 3)		Number of faulty SPs (Note 4)	Number of SPs in SSID (Note 5)	Number of faulty SSIDs (Note 6)	Number of affected SSIDs (Note 7)	Status (Note 8)	0
10	Resend SIM (Note 9)	(‘0000000’)						
11	Hardware level (Note 10)							
12	Hardware level (Note 10)							
13	Isolation code (Note 11)							
14	SSB ID (Note 12)	SIM sequence number (SIM log record #)						SVP ID (Note 13)
15	DKC serial number (x‘0C6900’+DKC sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (Note 14)							
23								
24	Logging and Message Control (Note 15)							
25	Program action code (x‘10’)							
26	Dual Frame	EDCC Mode	‘00’		Nonsynchro-nous operation	Serial channel	Report output (1)	‘0’
27	‘0’	‘0000’				Extension path configuration	Fenced storage path	
28	x‘F1’							
29	Affected SSID							
30								
31	x‘00’							

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SIM Format (CACHE SIM SSB28 = x‘F2’)

	0	1	2	3	4	5	6	7
0	x‘00’							
1	Permanent Error	‘0’		‘1’	x‘0’			
2	‘0’			‘1’	x‘0’			
3	x‘000000’							
4								
5								
6	Serial # valid	Device address valid	Track address valid	‘0’	Format (x‘F’)			
7	SIM sense record ID (x‘E0’)							
8	Range subject to the error (Note 1)				Range affected by repair (Note 2)			
9	Level of error (Note 3)		Number of faulty SPs (Note 4)	Number of SPs in SSID (Note 5)	Number of faulty SSIDs (Note 6)	Number of affected SSIDs (Note 7)	Status (Note 8)	0
10	Resend SIM (Note 9)	(‘0000000’)						
11	Hardware level (Note 10)							
12	Hardware level (Note 10)							
13	Isolation code (Note 11)							
14	SSB ID (Note 12)	SIM sequence number (SIM log record #)						SVP ID (Note 13)
15	DKC serial number (x‘0C6900’+DKC sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (Note 14)							
23								
24	Logging and Message Control (Note 15)							
25	Program action code (x‘10’)							
26	Dual Frame	EDCC Mode	‘00’		Nonsynchro-nous operation	Serial channel	Report output	‘0’
27	‘0’	‘0000’				Extension path configuration	Fenced storage path	
28	x‘F2’							
29	Affected SSID							
30								
31	x‘00’							

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SIM Format (DEVICE SIM SSB28 = x‘FE’)

	0	1	2	3	4	5	6	7
0	x‘0000’							
1								
2	Storage Control Type (x‘06’)							
3	x‘00’							
4	Affected SP		Device Address					
5	Device Type							
6	Serial # valid	Device address valid	Track address valid	‘0’	Format (x‘F’)			
7	SSB ID (Note 12)	SIM Sequence ID						SVP ID (Note 13)
8	Device Exception (x‘1’)				Service Message (Note 16)			
9	Level of error (Note 3)		‘000000’					
10	Resend SIM (Note 9)	(‘0000000’)						
11	Exception Class Fru List Code (x‘80’)							
12	Hardware and Microcode Corequisite Indicator (x‘01’)							
13	Device Address (See reference code)							
14	Action Flag (x‘05’)							
15	Drive serial number (x‘0C69’+DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (Note 14)							
23								
24	Logging & Message Control (Note 15)							
25	Program Action Code (x‘10’)							
26	Dual Frame	EDCC Mode	x‘0’	x‘0’	Nonsynchro-nous operation	Serial Channel	‘1’	‘0’
27	x‘0’				x‘0’	Extention path configuration	Storage path	
28	x‘FE’							
29	x‘000000’							
30								
31								

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SIM Format (MEDIA SIM SSB28 = x‘FF’)

	0	1	2	3	4	5	6	7
0	x‘0000’							
1								
2	Storage Control Type (x‘06’)							
3	x‘00’							
4	Affected SP		Device Address					
5	Device Type							
6	Serial # valid	Device address valid	Track address valid	‘0’	Format (x‘F’)			
7	SSB ID (Note 12)	SIM Sequence ID						SVP ID (Note 13)
8	Device Exception (x‘1’)				Service Message (x‘1’)			
9	Level of error (Note 3)	Media Maintenance Procedure Number (correctable: x‘07’, uncorrectable: x‘05’)						
10	Resend SIM (Note 9)	(‘0000000’)						
11	Exception Class Fru List Code (x‘80’)							
12	Hardware and Microcode Corequisite Indicator (x‘01’)							
13	Device Address (See reference code)							
14	Correctable: x‘87’, uncorrectable: x‘85’							
15	Drive serial number (x‘0C69’+DKU sequenc number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (Note 14)							
23								
24	Logging & Message Control (Note 15)							
25	Program Action Code (x‘10’)							
26	Dual Frame	EDCC Mode	x‘0’	x‘0’	Nonsynchro-nous operation	Serial Channel	‘1’	‘0’
27	x‘0’				x‘0’	Extention path configuration	Storage path	
28	x‘FF’							
29	Cylinder Address High							
30	Cylinder Address Low							
31	Head Address							

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Notes:

1. Range subject to the error
   (1) When byte 28 is x‘F1’ (DKC SIM)

   x‘0’: Not used
   x‘1’: Error range not known
   x‘2’: SP error
   x‘3’: CHL-I error
   x‘4’: Not affect performance
   x‘5’ to x‘F’: Not used

   (2) When byte 28 is x‘F2’ (CACHE SIM)

   x‘0’: Not used
   x‘1’: Error range not known
   x‘2’: Error between SP and CACHE
   x‘3’: CACHE error
   x‘4’: DC/FW error
   x‘5’: FW error
   x‘6’ to x‘F’: Not used

2. Range affected by repair
   (1) When byte 28 is x‘F1’ (DKC SIM)

   x‘0’: Not used
   x‘1’: Repair range not known
   x‘2’: Repair does not affect performance
   x‘3’: SP disabled during repair
   x‘4’: SSID disabled during repair
   x‘5’ to x‘F’: Not used

   (2) When byte 28 is x‘F2’ (CACHE SIM)

   x‘0’: Not used
   x‘1’: Repair range not known
   x‘2’: Repair does not affect performance
   x‘3’: CACHE error
   x‘4’: DC/FW error
   x‘5’: FW error
   x‘6’ to x‘F’: Not used

3. Level of error
   B‘00’: Service SIM
   B‘01’: Moderate SIM
   B‘10’: Serious SIM
   B‘11’: Acute SIM

4. Number of faulty SPs
   B‘0’: 1 SP
   B‘1’: 2 SPs

5. Number of SPs in SSID
   B‘0’: 2 SPs
   B‘1’: 4 SPs

6. Number of faulty SSIDs
   B‘0’: 1
   B‘1’: 2

7. Number of affected SSIDs
   B‘0’: 1
   B‘1’: 2

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8. Status
   B‘0’: Degeneration
   B‘1’: Stop

9. Resend SIM
   B‘0’: Unresent SIM
   B‘1’: Resent SIM

10. Hardware level
    Bit 0: ESCON hardware level

When bit 0 is 0:

- Bit 1: Not used
- Bits 2-3: Report storage path
- Bits 4-5: Number of channels per cluster
  - B‘00’ = 4
  - B‘01’ = 8
  - B‘10’ = Not used
  - B‘11’ = Not used
- Bit 6: NVS
  - B‘0’ = No NVS
  - B‘1’ = NVS provided
- Bit 7: Not used
- Bits 8-10: Cache size
  - 000: Non cache
  - 001: 256MB
  - 010: 512MB
  - 011: 768MB
  - 100: 1024MB
  - 101: 1280MB
  - 110: 1536MB
  - 111: Over 1536MB
- Bits 11-13: Cluster hardware level
- Bits 14-15: Cache/NVS hardware level

When bit 0 is 1:

- Bit 1: Not used
- Bits 2-3: Error storage path
- Bits 4-7: Number of channels per cluster
  - 0000: Metal = 4, ESCON = 0
  - 0001: Metal = 8, ESCON = 0
  - 0010: Metal = 4, ESCON = 2
  - 0100: Metal = 4, ESCON = 4
  - 0110: Metal = 0, ESCON = 2
  - 1000: Metal = 0, ESCON = 4
  - 1010: Metal = 0, ESCON = 8
  - 1100: Metal = 0, ESCON = 6
- Bit 8: Dual frame
  - 0: Dual frame
  - 1: Modular power
- Bits 9-11: Cache size
  - 000: Non cache
  - 001: 256MB
  - 010: 512MB
  - 011: 768MB
  - 100: 1024MB
  - 101: 1280MB
  - 110: 1536MB
  - 111: Over 1536MB
- Bits 12-13: Cluster hardware level
- Bits 14-15: Cache/NVS hardware level

11. Isolation code
    Byte 13 ≠ X‘00’ Bytes 22 and 23 are a symptom code.
    Byte 13 = X‘00’ Bytes 22 and 23 are an isolation code. This byte is byte 2 of the association code.

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12. SSB ID
    B‘0’ = SVP
    B‘1’ = SP

13. SVP ID
    B‘0’ = SVP1
    B‘1’ = SVP2

14. Symptom code
    See bytes 22 and 23 of the reference codes listed in Sections 2.1 and 2.2.

15. Logging and Message control
    Bit 0 - 3: Not used
    Bit 4 - 5: Logging
        B‘00’: Do not log
        B‘01’: Unconditional log
        B‘10’: Log only once
        B‘11’: Log only if persistent
    Bit 6 - 7: Operator message
        B‘00’: No message
        B‘01’: Unconditional message
        B‘10’: Send only once
        B‘11’: Send only if persistent

16. Service Message
    x‘1’: Action
    x‘C’: No action

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SVP MESSAGE SECTION

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Contents

1 Type of Messages Displayed by the SVP ---------- SVPMSG01-10
2 Actions by Warning Messages ---------- SVPMSG02-10
3 Recovery procedure for SVP failures ---------- SVPMSG03-10
4 New type of message displayed by the SVP (Message ID) ---------- SVPMSG04-10
5 Error when operating HRC & HODM ---------- SVPMSG05-10
6 Action according to the error code ---------- SVPMSG06-10

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1 Type of Messages Displayed by the SVP

Waiting for input

Information Message

Warning Message

Warning Message

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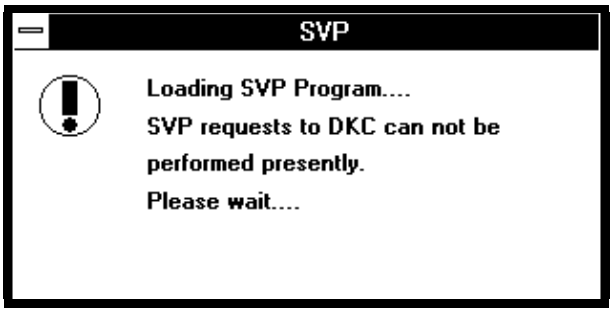
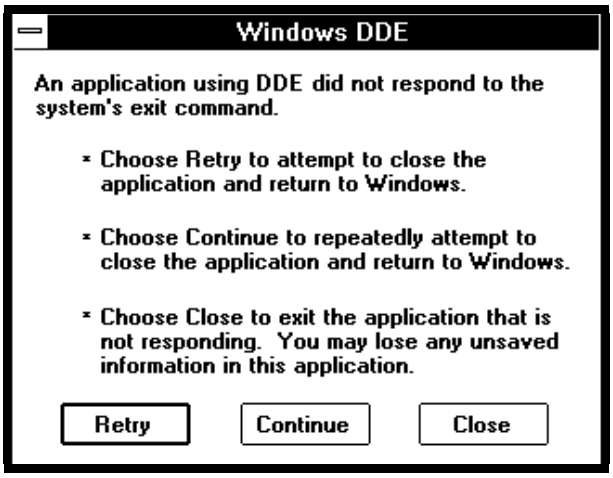
2 Action by Warning Messages



[Explanation]; Communication between DKC and SVP is not available.

[Action]; Wait until this message is extinguished, then do a next operation.



[Explanation]; The application is already stopped.
This phenomenon sometimes occurs in the process of stopping a system.

[Action]; Select (CL) [Close], and reboot PC.

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3 Recovery procedure for SVP failures

3.1 Types of SVP failures

① Display of “Syserr’s Clues” windows dialog box.
② Windows display hang up.
(1)Keyboard operation possible.
(2)Keyboard operation not possible.
③ Display of non windows error. (System error)

3.2 Recovery procedure based on type of failure.

See TRBL03-71

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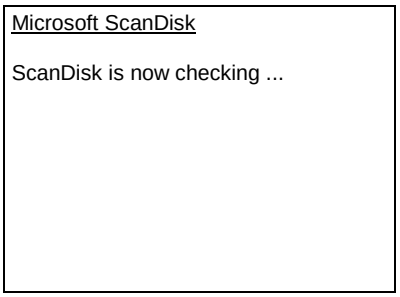
3.3 SVP HD Diagnosis

If SVP HD (Hard Drive) may be failed, do as following procedures.

(1) What is running?
a. See what is displayed.
If Windows is displayed, Go to (2).
If DOS prompt like “C:\” is displayed, Go to (3).

(2) Exit Windows (Stop SVP)
a. Select (CL) “Start button”.
b. Select (CL) “Shut Down”.
c. Select (CL) “Restart the computer in MS-DOS mode?”, and select (CL) [Yes].
d. Go to (3).

(3) SVP HD Diagnosis
a. Type the under-lined command and press Enter-key as following.
C: \>\DKC200\OTHERS\SVPHDDG
b. Watch the diagnosis messages displayed on the screen.
After the diagnosis, read messages, and do following action.



Diagnosis messages

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Message	Explanation	Action
SVP HD TEST:NORMAL END	Diagnosis has completed.	Go to (4).
SVP HD TEST:PROBLEM HAS DETECTED	There are some problems in SVP HD.	Read following message.
SVP HD TEST:ABNORMAL END	Diagnosis has incompleted.	Read following message.
SVP HD TEST:SYNTAX ERROR	Diagnosis program may be destroyed.	Read following message.
SVP HD TEST:PROBLEM HAS FIXED	Diagnosis has repaired SVP HD.	Go to (4).
SVP HD TEST:ABORTED	Diagnosis has aborted by operator.	Read following message.
SVP HD TEST:FIX START	Diagnosis has launched to repair SVP HD.	Go to (3) b.
Do you want to try to fix SVP HD.[y,n]	Confirm your operation.	Press ‘y’ key to fix SVP HD. Press ‘n’ key not to fix SVP HD and to abort diagnosis.
Please turn off SVP and replace it.	SVP should be replaced.	Power off SVP. Replace SVP.

(4) Reboot SVP

a. Press 3 keys simultaneously —— Ctrl-key, Alt-key and Del-key —— to reboot SVP.

[End of SVP HD Diagnosis]

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4 New type of message displayed by the SVP (Message ID)

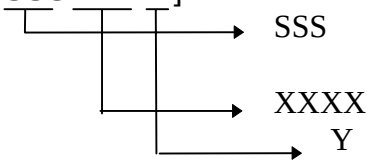
4.1 About Message ID

SVP added a message ID for each displayed message. (Some of them are not supported).
In this section, we described all message ID with the action. If SVP displays the message with ID number, please refer to the table to react.

4.2 Message ID format.

Message ID has a following format .

[Format] [SSSXXXXY] : Message Format



SSS : Application ID in which displayed the message was created.

XXXX : Message ID (Decimal number from 0000 to 9999)

Y : Kind of Message. There are 3 kinds as followed.
- I : Information,
- W: Warning / Error or important confirmation.
- E : Fatal Error

4.3 Note

(1) In this section, we use “%s” and “%d” strings in the messages.
These are the variable which will be determined in execution.
%s means a string variable.
%d means a numeric variable.

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4.4 SVP Message ID Table

ID	Kind	Description
0001	**I**	Please insert CONFIG FD in FDD
	[Contents]	Set the CONFIG FD in the FDD.
	[Action]	Set the CONFIG FD.
0002	**W**	Error has occurred. Please insert correct FD.
	[Contents]	An error occurred. Set the correct FD.
	[Action]	Set the CONFIG FD.
0003	**I**	Reading the subsystem configuration data...
	[Contents]	Subsystem configuration information is being read.
	[Action]	Wait until the data reading is completed.
0004	**I**	Copying the subsystem configuration data...
	[Contents]	Subsystem configuration data is being copied.
	[Action]	Wait until the data copying is completed.
0005	**I**	\"Loading Configuration information from FD\" has been already performed successfully. Some operation cannot be performed again.
	[Contents]	The DKC replacement terminated normally. "FD to DKC" cannot be executed.
	[Action]	Do not execute "FD to DKC".
0006	**I**	Please remove FD and connect DKU to Controller. When completed, select[OK].
	[Contents]	Remove the FD and connect the DKU. After the connection is completed, select the [OK] button.
	[Action]	Remove the FD and connect the DKU.
0007	**I**	\"Save Configuration information to FD\" is completed. Please remove FD and turn of the subsystem. Wait until power is off. [READY LED at CE panel is off.]
	[Contents]	"DKC to FD" was completed. Remove the FD and power off the subsystem. Wait until the power is turned off.
	[Action]	Wait until the power is turned off.
0008	**I**	Input data dose not match.
	[Contents]	The input data does not agree.
	[Action]	Input the correct old DKC serial number, new DKC serial number, and system ID.

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ID	Kind	Description
0009	**I**	Please execute \"Load Configuration information from FD\" in New DKC, without Configuration Old DKU to New DKC.
	[Contents]	Execute "FD to DKU" from the new DKC. The DKU, however, must not be connected.
	[Action]	Replace the DKC and execute "FD to DKU"
0010	**I**	Turn on the subsystem. Wait until power is on. [READY LED at CE Panel is on.]
	[Contents]	Turn on the power switch of the subsystem and wait until it becomes ready.
	[Action]	Power on the subsystem and wait until the DKC becomes ready.
0011	**W**	Please vary offline the connected channel paths. If does select OK.
	[Contents]	Check if the connected channel paths are already made off-line.
	[Action]	Check if the I/O is inactive, then select OK.
0012	**I**	DKU PATH INLINE is now running...
	[Contents]	DKU PATH INLINE is being executed.
	[Action]	Wait until DKU PATH INLINE is finished.
0013	**I**	This will end the DKU PATH INLINE.
	[Contents]	DKU PATH INLINE is now terminated.
	[Action]	None
0014	**W**	Timeout error has occurred. Please confirm the abnormal path with the status function and restore it first, then retry \"Load Configuration information from FD\".
	[Contents]	DKU PATH INLINE terminated abnormally. Confirm the abnormal path with the status function and recover it. Then reexecute "FD to DKC".
	[Action]	Confirm the abnormal path and recover it.
0015	**W**	Connection error has occurred. Please confirm the connection. Then Retry the operation.
	[Contents]	A connection error occurred during DKU PATH INLINE execution. Check the connection. Do you want to execute DKU PATH INLINE once again?
	[Action]	Check the connection, and select whether to reexecute DKU PATH INLINE.
0016	**W**	SVP did not execute DKU PATH INLINE to all installed DKAs. Please retry.
	[Contents]	PATH INLINE was not executed for all the installed DKAs. Re-execute it.
	[Action]	Re-execute it.

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ID	Kind	Description
0017	**I**	Changing the subsystem configuration data... **[Contents]** Subsystem configuration data is being changed. **[Action]** Wait until the data change is completed.
0018	**W**	\"Load Configuration information from FD\" is completed. Please vary online the connected channel paths. Please check subsystem status with STATUS and log with INFORMATION. **[Contents]** "FD to DKC" has been completed. Check the subsystem status and log with STATUS and INFORMATION, respectively. **[Action]** Check the subsystem status and log.
0019	**W**	DKU error has occurred. Please confirm the abnormal part with the status function then restore it. **[Contents]** A DKU error occurred during DKU PATH INLINE execution. Confirm the abnormal section with the status function and recover it. **[Action]** Confirm the abnormal section of the DKU and recover it.
0020	**W**	Error has occurred. Please confirm the status function, then retry \"Load Configuration information from FD\". **[Contents]** An error occurred. Confirm the status function and reexecute "FD to DKC". **[Action]** Reexecute "FD to DKC".
0021	**E**	Configuration data has been broken. Please call Technical Support Center. **[Contents]** The configuration data is damaged. Please contact the Technical Support Center (TSC). **[Action]** Contact the Technical Support Center (TSC).
0022	**I**	In order to check the validity of this operation, please input following data. **[Contents]** Validity check of the serial number and SSID **[Action]** Input the serial number and SSID.
0023	**W**	Timeout error has occurred. Please confirm the abnormal part with the status function and restore it first. **[Contents]** The process terminated abnormally. Confirm the abnormal section with the status function and recover it. **[Action]** Confirm the abnormal section and recover it.
0024	**I**	Please Retry. (Error Code = %04X) **[Contents]** Request for HRC operation retry **[Action]** Repeat the process.

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ID	Kind	Description
0025	**I**	Communication error has occurred between MCU and RCU. (Error Code = %04X)
	[Contents]	An error occurred during MCU-RCU communication or the MCU-RCU path is missing.
	[Action]	Check if the MCU-RCU path exists.
0026	**I**	You can't change the Remote Copy status. (Error Code = %04X)
	[Contents]	The Remote Copy status cannot be changed.
	[Action]	Dump?
0027	**I**	Invalid Serial Number of RCU. (Error Code = %04X)
	[Contents]	The serial number of the RCU is incorrect.
	[Action]	Confirm the serial number of the RCU and input the correct number again.
0028	**I**	There is a pair of Volume under the RCU.
	[Contents]	There is a volume pair under the RCU.
	[Action]	Retry after deleting the volume pair.
0029	**W**	Internal error has occurred. (Error Code = %04X)
	[Contents]	An internal error occurred.
	[Action]	Dump?
0030	**W**	The status of the cache under MCU is bud.
	[Contents]	The status of the cache placed under the control of the MCU is not correct.
	[Action]	Dump? Or replace?
0031	**W**	The status of the cache under RCU is bad.
	[Contents]	The status of the cache placed under the control of the RCU is not correct.
	[Action]	Dump? Or replace?
0032	**I**	The path between MCU and RCU established. (Error Code = %04X)
	[Contents]	The path between the MCU and RCU is not established.
	[Action]	Retry the operation after establishing the path.
0033	**W**	M-VOL has a pin track. (Error Code = %04X)
	[Contents]	There is an M-VOL pin slot.
	[Action]	Recover the pin and retry the operation.
0034	**W**	R-VOL has a Pin track. (Error Code = %04X)
	[Contents]	There is an R-VOL pin slot.
	[Action]	Recover the R-VOL pin and retry the operation.

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ID	Kind	Description
0035	**W**	R-VOL is not usable. (Error Code = %04X) **[Contents]** The R-VOL cannot be used. **[Action]** Check the status of the R-VOL.
0036	**I**	R-VOL is reserved /R-VOL already established path group. (Error Code = %04X) **[Contents]** The R-VOL is reserved or the path group was already established. **[Action]** Retry the operation after checking the status of the R-VOL.
0037	**I**	Invalid track format. (Error Code = %04X) **[Contents]** The track format is incorrect. **[Action]** Retry the operation after checking the emulation type of the VOL.
0038	**I**	This volume has established pair. (Error Code = %04X) **[Contents]** The specified VOL is neither M-VOL nor R-VOL. **[Action]** Retry the operation after checking the VOL.
0039	**I**	Invalid RCU Serial Number./Invalid RCU SSID. (Error Code = %04X) **[Contents]** The serial number/SSID of the RCU is incorrect. **[Action]** Input the correct serial number/SSID of the RCU.
0040	**I**	Suspend mode is not for S-VOL. (Error Code = %04X) **[Contents]** When the suspend mode was specified for the R-VOL, that mode was not the S-VOL suspend mode. **[Action]** Retry the operation after checking if the suspend mode is specified correctly.
0041	**W**	Invalid R-VOL. (Error Code = %04X) **[Contents]** The R-VOL is incorrect. **[Action]** Check the status of the R-VOL.
0042	**W**	Timeout error has occurred. **[Contents]** A timeout error occurred. **[Action]** Check the status of the DKC and retry the operation.
0043	**I**	Invalid parameter. (Error Code = %04X) **[Contents]** The parameter is incorrect. **[Action]** Check the input data.
0044	**I**	Microcode don't support this function. (Error Code = %04X) **[Contents]** The MAIN microprogram does not support this function. **[Action]** Check the version number of the microcode.

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ID	Kind	Description
0045	**W**	Communication Error has occurred between SVP and SSVP. (Error Code =%04x)
	[Contents]	An error occurred in the communication between the SVP and SSVP.
	[Action]	Check the status of the SSVP.
0046	**I**	Communication busy. Please Retry later. (Error Code = %04X)
	[Contents]	Communication is busy.
	[Action]	Wait for a while, then retry the operation.
0047	**I**	There is no CU. (Error Code = %04X)
	[Contents]	The corresponding CU does not exist.
	[Action]	Check the input data.
0048	**I**	There is some path. (Error Code = %04X)
	[Contents]	There exists the same path.
	[Action]	Check the input data.
0049	**I**	The number of path is over high limit. (Error Code =%04X)
	[Contents]	The number of paths exceeds its maximum allowable value.
	[Action]	Check the operation.
0050	**I**	This path dose not exist. (Error Code = %04X)
	[Contents]	The specified path does not exist.
	[Action]	Check the input data.
0051	**I**	The number of path is under low limit. (Error Code = %04X)
	[Contents]	The number of paths is below its minimum allowable value.
	[Action]	Retry the operation after recovering the R-VOL pin.
0052	**I**	The CHA dose not support Remote Copy. (Error Code = %04X)
	[Contents]	The CHA does not support Remote Copy.
	[Action]	Please replace the CHA and retry.
0053	**W**	There are other blocking parts.
	[Contents]	There exists other blocked section.
	[Action]	Retry the operation after recovering the blocked section.
0054	**W**	Previously you should end the pair. Do you stop this process?
	[Contents]	Terminate the pair before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to terminate the pair or [No] to contact the Technical Support Center.

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ID	Kind	Description
0055	**W**	Previously you should suspend the pair. Do you stop this process?
	[Contents]	Suspend the pair before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to suspend the pair or [No] to contact the Technical Support Center.
0056	**W**	Previously you should end or suspend the pair. Do you stop this process?
	[Contents]	Terminate or suspend the pair before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to terminate/suspend the pair or [No] to contact the Technical Support Center.
0057	**W**	Previously you should end the pair from M-VOL. Do you stop this process?
	[Contents]	Terminate the pair from the M-VOL before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to terminate the pair from the M-VOL or [No] to contact the Technical Support Center.
0058	**W**	Previously you should suspend the pair from M-VOL. Do you stop this process?
	[Contents]	Suspend the pair from the M-VOL before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to suspend the pair from the M-VOL or [No] to contact the Technical Support Center.
0059	**W**	Previously you should end or suspend the pair from M-VOL. Do you stop this process?
	[Contents]	Terminate or suspend the pair from the M-VOL before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to terminate/suspend the pair from the M-VOL or [No] to contact the Technical Support Center.
0060	**W**	Previously you should end the pair. Do you stop this process?
	[Contents]	Release the path before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to release the path or [No] to contact the Technical Support Center.
0061	**W**	Previously you should end the pair from MCU. Do you stop this process?
	[Contents]	Release the path from the MCU before executing maintenance. Do you want to terminate the process?
	[Action]	Select [Yes] to release the path from the MCU or [No] to contact the Technical Support Center.

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ID	Kind	Description
0062	**W**	Some physical device status(Data/spare) is changed. If it was caused by define configuration, you should deinstallation, first. If it was caused by drive copy process, you should close ONLINE, and start ONLINE again. **[Contents]** Some drive attribute (data/spare) data have been changed. If the change was caused by the definition of the configuration data, execute the physical device deletion first. If the change was caused by the drive copy process, restart the ONLINE after closing it once. **[Action]** If the drive attribute (data/spare) activation was caused by the definition of the configuration data, execute the physical device deletion first. If the activation was caused by the drive copy process, restart the ONLINE.
0063	**W**	Please Close 'INFORMATION' window during replacement procedure of ""%s"", if it is opened. Then press OK. **[Contents]** Leave the ′INFORMATION′ window closed while replacing the LTM. **[Action]** Close the ′INFORMATION′ window if it is open.
0064	**W**	Please close 'INFORMATION' window during blocking cluster, if it is opened. Then press OK. **[Contents]** Leave the ′INFORMATION′ window closed while blocking the cluster . **[Action]** Close the ′INFORMATION′ window if it is open.
0065	**W**	Please Close 'INFORMATION' window during recovery procedure of BUS, if it is opened. Then press OK. **[Contents]** Leave the ′INFORMATION′ window closed while recovering the bus. **[Action]** Close the ′INFORMATION′ window if it is open.
0066	**W**	Pinned Track exists. Do you stop this process? **[Contents]** There exists pinned data. Do you want to cancel the process? **[Action]** Select [Yes] to cancel the process, or select [No] to contact the Technical Support Center and input the password.
0087	**A**	Mutual exclusive error has occurred. A %S task has already executed now. **[Contents]** An exclusive error occurred. The %S task has been already executed. **[Action]** Wait for a while or cancel the active task, and then reexecute the process.
0088	**W**	Internal fatal error has occurred. **[Contents]** An error occurred during internal processing. **[Action]** Terminate the application program or reboot the PC.

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ID	Kind	Description
0100	**W**	Warning : Cache Box Cluster-1 Thermal Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0101	**W**	Warning : Cache Box Cluster-2 Thermal Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0102	**W**	Warning : Cache Box Cluster-1 12V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0103	**W**	Warning : Cache Box Cluster-2 12V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0104	**W**	Warning : Cache Box Cluster-1 5V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0105	**W**	Warning : Cache Box Cluster-2 5V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0106	**W**	Warning : Cache Box Cluster-1 3V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0107	**W**	Warning : Cache Box Cluster-2 3V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0108	**I**	Cannot open copy.log!!!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0109	**I**	Logfile header read error!!!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0110	**I**	Memory Allocate Error!!!
	[Contents]	Memory error in the PC
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0111	**I**	This program support RAID5/0/1. Can not display this copy information. **[Contents]** The microprogram version does not agree with the environmental configuration information. **[Action]** Check the microprogram version number. If it is correct, call the TSC since the configuration information may have been damaged.
0112	**W**	Warning : Logic Box Cluster-1 Thermal Alarm bit don't match. **[Contents]** An error in the environment monitoring system was detected. **[Action]** Refer to the SIM/SSB log.
0113	**W**	Warning : Logic Box Cluster-2 Thermal Alarm bit don't match. **[Contents]** An error in the environment monitoring system was detected. **[Action]** Refer to the SIM/SSB log.
0114	**W**	Warning : Logic Box Cluster-1 12V Alarm bit don't match. **[Contents]** An error in the environment monitoring system was detected. **[Action]** Refer to the SIM/SSB log.
0115	**W**	Warning : Logic Box Cluster-1 5V Alarm bit don't match. **[Contents]** An error in the environment monitoring system was detected. **[Action]** Refer to the SIM/SSB log.
0116	**W**	Warning : Logic Box Cluster-1 3.3V Alarm bit don't match. **[Contents]** An error in the environment monitoring system was detected. **[Action]** Refer to the SIM/SSB log.
0117	**W**	Connection error occurred. SVP-DKC **[Contents]** An error occurred in the communication between the SVP and DKC. **[Action]** Isolate the abnormal section following the procedure below: ① Rebooting the PC ② Checking the LAN card/LAN cable ③ Checking the IP address of the PC ④ Replacing the PC ⑤ Turning on and then off the DKC (Care should be taken.)
0118	**W**	Connection error occurred. SVP-SSVP **[Contents]** An error occurred in the communication between the SVP and SSVP. **[Action]** Isolate the abnormal section following the procedure below: ① Rebooting the PC ② Dummy replacing the SSVP (Removing and inserting it) ③ Checking the RS-232C cable ④ Replacing the PC ⑤ Replacing the SSVP
0120	**I**	STATUS Initialize general error. **[Contents]** SVP self-inconsistency. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0121	**I**	Memory allocation error occurred. **[Contents]** SVP self-inconsistency. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0122	**I**	Object construction error occurred. **[Contents]** SVP self-inconsistency. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0123	**I**	File I/O error occurred. **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0124	**I**	Load from config file (OFFLINE). **[Contents]** Message for debugging. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0125	**W**	Cluster-1 is failed! **[Contents]** An error was detected in the cluster 1. **[Action]** Refer to the SIM/SSB log.
0126	**W**	Cluster-2 is failed! **[Contents]** An error was detected in the cluster 2. **[Action]** Refer to the SIM/SSB log.
0127	**I**	This program support RAID5/0/1. Can not display this LDEV information. **[Contents]** The microprogram version does not agree with the environment configuration information. **[Action]** Check the microprogram version number. If it is correct, call the TSC since the configuration information may have been damaged.
0128	**I**	Map data get Error from SVP **[Contents]** SVP self-inconsistency. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0129	**I**	Map data get Error from FM **[Contents]** SVP self-inconsistency. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0130	**I**	This program support RAID5/0/1. Can not display this PDEV information. **[Contents]** The microprogram version does not agree with the environmental configuration information. **[Action]** Check the microprogram version number. If it is correct, call the TSC since the configuration information may have been damaged.

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ID	Kind	Description
0131	**I**	Error : DDE initialization failed.
	[Contents]	SVP self-inconsistency.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0132	**I**	Error : Connection initialization failed.
	[Contents]	SVP self-inconsistency.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0133	**I**	CDkc Data :: Get Data Ptr's ID is not entry ID!
	[Contents]	SVP self-inconsistency.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0134	**I**	CDkc Data :: SetItem Ptr's MemberID is out of array!
	[Contents]	SVP self-inconsistency.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0135	**W**	Warning : HDU PS 12V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0136	**W**	Warning : HDU PS 5V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0137	**I**	Drive ID get error
	[Contents]	Incorrect drive information was detected.
	[Action]	Collect the FDCopy data and call the TSC.
0138	**W**	Warning : Logic Box Cluster-2 12V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0139	**W**	Warning : Logic Box Cluster-2 5V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0140	**W**	Warning : Logic Box Cluster-2 3.3V Alarm bit don't match.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Refer to the SIM/SSB log.
0141	**I**	Cannot open verdkc.dbg file!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0142	**I**	Cannot open verlmcpt.dbg file! **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0143	**I**	Cannot open verpdev.dbg file! **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0144	**I**	Cannot open verfm.dbg file! **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0145	**I**	Illegal define line! Cannot read. **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0147	**I**	This will end the Status. **[Contents]** Close of the Status window. **[Action]** None
0148	**I**	Configuration read error has occurred. **[Contents]** An error occurred during configuration information reading. **[Action]** Isolate the abnormal section following the procedure below: ① Rebooting the PC ② Checking the LAN card/LAN cable ③ Checking the IP address in the PC ④ Replacing the PC ⑤ Turning the DKC off and then on. (Care should be taken.)
0149	**I**	Time out error **[Contents]** A timeout error occurred. **[Action]** Isolate the abnormal section following the procedure below: ① Rebooting the PC ② Checking the LAN card/LAN cable ③ Checking the IP address in the PC ④ Replacing the PC ⑤ Turning the DKC off and then on. (Care should be taken.)
0150	**I**	File open/read error!!! **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
0151	**I**	Cannot find config information. Please check config files or config version! **[Contents]** File error in the PC. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0152	**I**	Config entry is not found. Please check config files or config version!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0153	**I**	Area security was failed!!!
	[Contents]	Memory error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0154	**I**	Syscst.dat file write Error!!!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0155	**I**	Invalid character in Spare. Please reset input value.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0156	**I**	Invalid Spare range!!! Please adjust Spare.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0157	**I**	Invalid character in GRP. Please reset input value.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0158	**I**	Invalid GRP range!! Please adjust GRP.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0159	**I**	No Value in GRP!!! Please set a valid GRP.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0160	**I**	No Value in Spare!!! Please set a valid Spare.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0161	**I**	Error ! : in dsvp_makeconfig_5
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0162	**I**	Not defined drive type etc. Cannot set. Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0163	**I**	Already Set all groups!!! Cannot change setting.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0164	**I**	Already Set all spares!!! Cannot change setting.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0165	**I**	Invalid character in LDEV. Please reset input value.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0166	**I**	Invalid Spare range. Please adjust GRP.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0167	**I**	No Value in LDEV!!! Please set a valid LDEV.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0168	**I**	Invalid LDEV range!!! Please adjust LDEV.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0169	**I**	Invalid Spare range(Increase Mode)!!! Please adjust Spare.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0170	**I**	Invalid Spare range(Overflow)!!! Please adjust Spare.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0171	**I**	LDEV-PDEV Item not selected!!! Please Select.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0172	**I**	Emulation Type Item not selected!!! Please Select.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0173	**I**	Drive Type Item not selected!!! Please Select.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.

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ID	Kind	Description
0174	**I**	Invalid GRP range(Overflow)!!! Please adjust GRP.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0175	**I**	Already Set Spare attribute!!! Please subtract GRP count.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0176	**I**	Overlap LDEV number!!! Please adjust LDEV.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0177	**I**	Invalid Emulation Type!!! Please adjust Emulation Type.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0178	**I**	Illegal emulation type define! Cannot find emulation type to change. Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0179	**I**	Illegal emulation type define! Cannot find select emulation. Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0180	**I**	Other emulation type found! Cannot change emulation type.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0181	**I**	This time is 3390-3R to 3390-3 change mode. Cannot change emulation. Please select cancel.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0182	**I**	This time is 3390-3 to 3390-3R change mode. Cannot change emulation. Please select cancel.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0183	**I**	Not changed emulation type. Please change emulation or select cancel.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.

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ID	Kind	Description
0184	**I**	Cannot change emulation type!!! Mix emulation limited(32 boundary).
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0185	**I**	Cannot change emulation type!!! Mix emulation limited.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0186	**I**	This time is increase mode!!! Cannot decrease.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0187	**I**	Cannot decrease first group in B4-1!!!
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0188	**I**	This time is decrease mode!!! Cannot increase.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0189	**I**	Memory Allocate Error!!!
	[Contents]	Memory error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0190	**I**	Cannot Set timer!!! return FALSE
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0191	**I**	Clear this B4's setting?
	[Contents]	Is it okay to clear the data?
	[Action]	Answer the question.
0192	**I**	Cannot clear first group in B4-1!!! Clear other group.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0193	**I**	Cannot understand button no.
	[Contents]	None
	[Action]	None
0194	**I**	Illegal B4 data found! Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0195	**I**	Illegal VDS data found! Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0196	**I**	Illegal config.ini data found! Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0197	**I**	Illegal emulation data found! Mix emulation limited. Cannot check mix emulation. Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0198	**E**	Invalid emulation type. Please call Technical Support Center.
	[Contents]	An emulation type which cannot be recognized was detected.
	[Action]	Call the TSC.
0199	**I**	Are you sure you want to correct emulation type?
	[Contents]	Is the input data correct?
	[Action]	Answer the question.
0200	**I**	Cannot set drive type table etc. Please check config*.txt file.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0201	**I**	Drive Configuration OK?
	[Contents]	Is the input data correct?
	[Action]	Answer the question.
0202	**I**	LDEV undecided group found. Please select LDEV disperse Button.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0203	**I**	Invalid drive configuration. (B4-1:Group1 not set)!!!
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0204	**I**	No drive configuration!!! Please set a valid configuration.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.

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ID	Kind	Description
0205	**I**	Installation Error!!!
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0206	**I**	Cancel Drive Configuration OK?
	[Contents]	Is it okay to cancel the data?
	[Action]	Answer the question.
0207	**I**	Clear all setting?
	[Contents]	Is it okay to clear the data?
	[Action]	Answer the question.
0208	**I**	Free LDEV ID not found! Please delete some groups or select Cancel.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0209	**I**	LDEV disperse process complete.
	[Contents]	Normal termination.
	[Action]	None
0210	**I**	Illegal B2 data found! Please check config files or config version.
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0211	**I**	Invalid drive configuration. (B2-1:Group1 not set)!!!
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0212	**I**	Do you want to relocate LDEV ID (pattern A)?
	[Contents]	Do you want to make the change?
	[Action]	Answer the question.
0213	**I**	Do you want to relocate LDEV ID (pattern B)?
	[Contents]	Do you want to make the change?
	[Action]	Answer the question.
0214	**I**	Cannot decrease first group in B2-1!!!
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0215	**I**	Clear this B2's setting?
	[Contents]	Is it okay to clear the data?
	[Action]	Answer the question.

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ID	Kind	Description
0216	**I**	Cannot clear first group in B2-1!!! Clear other group.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0217	**I**	Invalid Spare range!!! Please adjust GRP.
	[Contents]	Input data is incorrect.
	[Action]	Input the correct data.
0218	**I**	Not find delete file
	[Contents]	No file to be deleted is found.
	[Action]	None
0219	**I**	Cannot delete HD file !!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0220	**I**	Cannot delete c:\\dkc200\\tmp\\fdcp.lzh
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0221	**I**	This will end the Fdcopy.
	[Contents]	End of the FDcopy
	[Action]	None
0222	**I**	Start compressing files into HD. After that, can't execute copying to FD.
	[Contents]	Start the creation of files in the HD. When the creation is completed, copy the files onto the FD.
	[Action]	Follow the instruction of the message.
0223	**I**	Cannot delete c:\\dkc200\\tmp\\hdcp.lzh
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0224	**I**	HD file open error !!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0225	**I**	Make directory error !!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0226	**I**	FD file open error !!
	[Contents]	File error in the PC (FD).
	[Action]	Check if the FD is write-protected, and retry the operation. If the error cannot be recovered, replace the FD.
0227	**I**	HD file read error !!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0228	**I**	FD file write error !!
	[Contents]	PC FD File error in the PC (FD).
	[Action]	Check if the FD is write-protected, and retry the operation. If the error cannot be recovered, replace the FD.
0229	**I**	FD file close error !!
	[Contents]	File error in the PC (FD).
	[Action]	Retry the operation. If the error cannot be recovered, replace the FD.
0230	**I**	FD file remove error !!
	[Contents]	File error in the PC (FD).
	[Action]	Retry the operation. If the error cannot be recovered, replace the FD.
0231	**I**	One file %d division !!
	[Contents]	Compressed file cannot be divided more than the indicated number.
	[Action]	Dump and log files cannot be compressed to FD.
0232	**I**	Are you sure you want to continue copying ? \n [OK] to restart. \n [Cancel] to stop copying.
	[Contents]	Are you sure you want to continue copying ? If you continue copying, please select [OK] to restart. Otherwise, select [Cancel].
	[Action]	If you continue copying, please select [OK] to restart. Otherwise, select [Cancel].
0233	**I**	This FD is full !!
	[Contents]	The FD is full.
	[Action]	Set a new FD.
0234	**I**	HD file close error !!
	[Contents]	File error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0235	**I**	File copy was canceled !
	[Contents]	Cancellation of the copy process.
	[Action]	None

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ID	Kind	Description
0236	**I**	mess_buff
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0237	**I**	Could not access FD. \n FD is not DOS formatted. \n FD is not inserted. \n FD is write protected.
	[Contents]	You could not access FD. Because, FD is not DOS formatted, FD is not inserted or FD is write protected.
	[Action]	Please insert a FD which is DOS formatted and not be write protected.
0238	**I**	FALSE !! listbox indication.
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0239	**I**	FALSE !! get list string.
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0240	**I**	FALSE !! delete list string.
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0241	**I**	err access !!
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0242	**I**	FALSE !! delete directory.
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0243	**I**	Cannot delete FD file !!
	[Contents]	File error in the PC (FD).
	[Action]	Check if the FD is write-protected, and retry the operation. If the error cannot be recovered, replace the FD.
0244	**I**	This is no space FD.
	[Contents]	The FD is full.
	[Action]	Set a new FD.
0245	**I**	FALSE !! delete directory.
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
0246	**I**	COMPRESSION ERROR
	[Contents]	An error occurred during a compression process.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0247	**I**	File compression was canceled !
	[Contents]	The cancellation was executed during a compression process.
	[Action]	None
0248	**I**	Temporize files canceled !
	[Contents]	The cancellation was executed during a temporary file copy.
	[Action]	None
0249	**I**	Compression cancel error !!
	[Contents]	An error occurred because of the cancellation during a compression process.
	[Action]	Retry the operation. If the error cannot be recovered, reboot the PC.
0250	**I**	Copyright (C) 1995,1996,Hitachi,Ltd.
	[Contents]	Copyright indication.
	[Action]	None
0251	**I**	Cannot Set timer!!!
	[Contents]	Error in the PC.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.
0252	**I**	Please retry operation(Error Code = %04x).
	[Contents]	A mistake was found in the input data.
	[Action]	Retry the operation following the instruction of the message.
0253		Logical Path between the MCU and the RCU is not active(Error Code = %04x).
	[Contents]	An error occurred in the communication between the MCU and the RCU or there is no path provided between the MCU and the RCU.
	[Action]	Check the paths between the MCU and the RCU.
0254		The pair status of the M-VOL is not valid(Error Code = %04x).
	[Contents]	Status of the pair of the MVOL is invalid.
	[Action]	Check the pair status of the MVOL.

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ID	Kind	Description
0255		The specified number of Path is less than the Minimum number of Paths on RCU Option screen(Error Code = %04x).
	[Contents]	Number of paths is less than the minimum value.
	[Action]	Check the setting of paths.
0256		The specified number of Path is less than the Minimum number of Paths on RCU Option screen as a result of communication error between MCU and RCU(Error Code = %04x).
	[Contents]	Number of paths is less than the minimum value due to a communication error between the MCU and the RCU.
	[Action]	Check the paths between the MCU and the RCU.
0257		The path could not be deleted due to communication error between MCU & RCU(Error Code = %04x).
	[Contents]	The path could not be deleted due to a communication error between the MCU and the RCU.
	[Action]	Check the paths between the MCU and the RCU.
0258		Parameter specified by Remote Copy operation is invalid(Error Code = %04x).
	[Contents]	The M-VOL status specified by the Remote Copy(HRC/HORC) operation is invalid (the inputted value is invalid).
	[Action]	Check the inputted value and operate once again.
0259		Parameter specified by HODM operation is invalid(Error Code = %04x).
	[Contents]	The M-VOL status specified by the HODM operation is invalid (the inputted value is invalid).
	[Action]	Check the inputted value and operate once again.
0260		The pair status of the R-VOL is not valid(Error Code = %04x).
	[Contents]	The R-VOL status is invalid (the inputted value is invalid).
	[Action]	Check the inputted value and operate once again.
0261		Invalid serial number or SSID of RCU(Error Code = %04x).
	[Contents]	The RCU production serial number is invalid.
	[Action]	Check the RCU production serial number and input it once again.
0262		Remote Copy is not supported under the DKC emulation type of the MCU(Error Code = %04x).
	[Contents]	The Remote Copy cannot be supported by the DKC emulation type set in the MCU.
	[Action]	Check the setting of the MCU.

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ID	Kind	Description
0263		Specified RCU has some Remote Copy volume pair establish(Error Code = %04x).
	[Contents]	The specified RCU has some Remote Copy volume pairs.
	[Action]	Check the RCU volume pairs.
0264		Internal error occurred(Error Code = %04x).
	[Contents]	An internal error occurs.
	[Action]	Collect the dumps.
0265		Invalid number of path(Error Code = %04x).
	[Contents]	Number of paths is invalid.
	[Action]	Check the inputted value.
0266		Specified port of MCU is not RCP(Error Code = %04x).
	[Contents]	The SA-ID is invalid.
	[Action]	Check the inputted value.
0267		Invalid Destination Link Address(Error Code = %04x).
	[Contents]	Specified link address is not within the range from 00 to 03.
	[Action]	Check the inputted value.
0268		The specified logical path already exists(Error Code = %04x).
	[Contents]	Addresses of the SA-ID and Link are duplicate.
	[Action]	Check the inputted value.
0269		Too many RCUs(Allowed Four RCUs)(Error Code = %04x).
	[Contents]	Too many RCUs are set.
	[Action]	Check the setting.
0270		Path establishing is not complete(Error Code = %04x).
	[Contents]	Path generation failed partially.
	[Action]	Retry.
0271		Path establishing is failed(Error Code = %04x).
	[Contents]	Path generation failed completely.
	[Action]	Retry.
0272		Edited path is rejected because the specified path is the last path of some Remote Copy pair(Error Code = %04x).
	[Contents]	No operation can be performed because the specified path includes the last path of the Remote Copy.
	[Action]	Check the specified path once again.

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ID	Kind	Description
0273		NVS status of MCU is not active(Error Code = %04x).
	[Contents]	Cache status under the MCU is incorrect.
	[Action]	Collect the dumps or execute the replacement.
0274		NVS status of RCU is not active(Error Code = %04x).
	[Contents]	Cache status under the RCU is incorrect.
	[Action]	Collect the dumps or execute the replacement.
0275		The logical paths between MCU and RCU are not established(Error Code = %04x).
	[Contents]	Paths between the MCU and the RCU are not established.
	[Action]	Establish the paths and then retry.
0276		Pinned track exist on the M-VOL(Error Code = %04x).
	[Contents]	There is a Pin slot in the M-VOL.
	[Action]	Recover the Pin and retry.
0277		Pinned track exist on the R-VOL(Error Code = %04x).
	[Contents]	There is a Pin slot in the R-VOL.
	[Action]	Repair the Pin of the R-VOL and then retry.
0278		M-VOL is not usable(Error Code = %04x).
	[Contents]	The M-VOL cannot be used.
	[Action]	Check the status of the M-VOL.
0279		The R-VOL is already used by other system(Error Code = %04x).
	[Contents]	The R-VOL is reserved or the path group has been established.
	[Action]	Check the status of the R-VOL and then retry.
0280		Remote Copy is not supported under the DKC emulation type of the M-VOL(Error Code = %04x).
	[Contents]	The Remote Copy cannot be supported by the DKC emulation type set in the M-VOL.
	[Action]	Check the status of the M-VOL.
0281		No more volume pair waiting for copy(Error Code = %04x).
	[Contents]	There is no pair waiting for execution.
	[Action]	Check the registered contents of the pairs and retry.
0282		Specified volume is not part of Remote Copy pair(Error Code = %04x).
	[Contents]	Specified pair is not Remote Copy pair.
	[Action]	Check the specified pair.

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ID	Kind	Description
0283		Suspend operation is not valid for R-VOL(Error Code = %04x).
	[Contents]	Although the suspension instruction is issued to the R- VOL, no suspension instruction is issued to the S-VOL.
	[Action]	Check the suspension instruction and then retry.
0284		Invalid R-VOL(Error Code = %04x).
	[Contents]	The R-VOl is invalid.
	[Action]	Check the R-VOL status.
0285		Time out error has occurred(Error Code = %04x).
	[Contents]	Connection to the DKC from the remote PC was terminated abnormally.
	[Action]	Check the connection on the DKC side and operate once again.
0286		Invalid parameter(Error Code = %04x).
	[Contents]	Parameter is invalid.
	[Action]	Check the inputted value.
0287		Microcode does not support this function(Error Code = %04x).
	[Contents]	Main microcode does not support the function.
	[Action]	Check the version of the microcode.
0289		There is no CU(Error Code = %04x).
	[Contents]	There is no object CU.
	[Action]	Check the inputted value.
0290		There is a same path(Error Code = %04x).
	[Contents]	There is the same path.
	[Action]	Check the inputted value.
0291		The number of path is over high limit(Error Code = %04x).
	[Contents]	Number of paths is more than the upper limit.
	[Action]	Check the operation.
0292		The path does not exist(Error Code = %04x).
	[Contents]	The concerned path does not exist.
	[Action]	Check the specified path.
0293		The number of path is under low limit(Error Code = %04x).
	[Contents]	Number of paths is less than the lower limit.
	[Action]	Repair the Pin of the R-VOL and then retry.

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ID	Kind	Description
0294		The CHA does not support Remote Copy(Error Code = %04x).
	[Contents]	The concerned CHA does not support Remote Copy.
	[Action]	Check the PCB of the CHA.
0295		There are other blocked parts(Error Code = %04x).
	[Contents]	There are other blocked sections.
	[Action]	Recover the blocked sections and then retry.
0296		Operation is rejected because of maintenance in progress(Error Code = %04x).
	[Contents]	Operation was rejected because the SVP was under the maintenance.
	[Action]	Close the ONLINE and INSTALL screen and then retry.
0297		Communication error has occurred between Console-SVP(Error Code = %04x).
	[Contents]	An error occurred in the communication between the console and the SVP.
	[Action]	Check the SVP status and the connection between the console and the SVP.
0298		Pending data exist on the port(Error Code = %04x).
	[Contents]	There is pending data on the port.
	[Action]	Retry.
0299		Port exchange error has occurred(Error Code = %04x).
	[Contents]	An error occurred during switching of the port.
	[Action]	Replace the concerned CHA.
0300		Invalid port type(Error Code = %04x).
	[Contents]	Port type is invalid.
	[Action]	Check the port status and retry.
0301		Logical paths exist on the port(Error Code = %04x).
	[Contents]	There are logical paths on the port.
	[Action]	Disperse them on the paths and retry.
0302		Specified number of Path is less than the Minimum Paths on RCU Option screen(Error Code = %04x).
	[Contents]	Specified number of paths is less than the minimum value.
	[Action]	Check the number of paths to be specified.

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ID	Kind	Description
0303		Currently running microprogram version does not support the specified operation(Error Code = %04x).
	[Contents]	Microprogram version not support the concerned operation.
	[Action]	Check the microprogram version.
0304		Specified volume may be online from HOST(Error Code = %04x).
	[Contents]	The HODM cannot start because the subsystem is in online state with the host.
	[Action]	Switch the subsystem to the offline state and then operate.
0305		Warning!! R-VOL status change failed after M-VOL status change. Confirm R-VOL status(Error Code = %04x).
	[Contents]	Change of the R-VOL status failed.
	[Action]	Check the R-VOL status.
0306		HODM volume pair cannot be terminated because migration copy is in progress and the specified volume may be online from HOST(Error Code = %04x).
	[Contents]	The HODM cannot start because the subsystem is in online state with the host.
	[Action]	Switch the subsystem to the offline state and then operate.
0307		Specified R-VOL is still online from HOST(Error Code = %04x).
	[Contents]	Since the R-VOL is online with the host, the HOST cannot start.
	[Action]	Check if the R-VOL number is correct. If it is not correct, input the correct R-VOL number immediately. If it is correct, place the R-VOL offline from the host.
0308		Unknown Error Code(Error Code = %04x).
	[Contents]	An error which is not registered occurs.
	[Action]	Collect the dumps.
0309		Please exchange channel cable connecting.
	[Contents]	Exchange the connection of the channel cable.
	[Action]	Follow the message.
0310		Are you sure you want to exchange LCP/RCP ports? The concerned paths should be deleted before the operation.
	[Contents]	Do you want to exchange the LCP and the RCP ports? It is necessary to delete the connected paths before starting this operation.
	[Action]	Check that the connected paths have been deleted and then perform the operation.

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ID	Kind	Description
0311		Are you sure you want to exchange LCP/RCP ports? Please confirm the concerned channel paths are varied offline.
	[Contents]	Do you want to exchange the LCP and the RCP ports? It is necessary to place the connected paths offline before starting this operation.
	[Action]	Check that the connected paths are offline and then perform the operation.
0312		Are you sure you want to delete the path?
	[Contents]	Checking deletion of the path.
	[Action]	When OK is selected, the path is deleted. The processing is interrupted by selecting Cancel.
0313		Are you sure you want to delete the RCU?
	[Contents]	Checking deletion of the RCU.
	[Action]	When OK is selected, the RCU is deleted. The processing is interrupted by selecting Cancel.
0314		Are you sure you want to delete the volume pair?
	[Contents]	Checking deletion of the volume pair.
	[Action]	When OK is selected, the volume pair is deleted. The processing is interrupted by selecting Cancel.
0315		Are you sure you want to suspend the volume pair?
	[Contents]	Checking suspension of the volume pair.
	[Action]	When OK is selected, the volume pair is suspended. The processing is interrupted by selecting Cancel.
0316		Are you sure you want to erase data on the R-VOL?
	[Contents]	Checking deletion of the R-VOL data.
	[Action]	When OK is selected, the R-VOL is deleted. The processing is interrupted by selecting Cancel.
0317		Can't execute specified function while Remote Copy monitoring is active. If you want to execute the function, please stop the monitoring function at first and retry again.
	[Contents]	Since the Remote Copy operation monitor is in operation, the function of Remote Copy setting system cannot be used.
	[Action]	Complete the operation monitor and then use the function.
0318		Connection error occurred between Remote Console and DKC.
	[Contents]	No communication can be executed with the remote console.
	[Action]	Retry the communication.
0319		HODM is not supported under the DKC emulation type of the MCU(Error Code = %04x).
	[Contents]	The HODM cannot be supported by the DKC emulation type set in the MCU.
	[Action]	Check the set contents on the MCU side.

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ID	Kind	Description
0320		Remote Copy is not supported under the DKC type of the RCU(Error Code = %04x).
	[Contents]	The Remote Copy(HRC/HORC) cannot be supported by the DKC emulation type set in the RCU.
	[Action]	Check the set contents on the RCU side.
0321		HODM is not supported under the DKC type of the RCU (Error Code = %04x).
	[Contents]	The HODM cannot be supported by the DKC emulation type set in the RCU.
	[Action]	Check the set contents on the RCU side.
0322		Invalid serial number or SSID of MCU(Error Code = %04x).
	[Contents]	Production serial number and/or SSID of the MCU is invalid.
	[Action]	Check the inputted value once again.
0323		Invalid serial number or SSID of RCU(Error Code = %04x).
	[Contents]	Production serial number and/or SSID of the RCU is invalid.
	[Action]	Check the inputted value once again.
0324		Subsystem Cache status of MCU is not active(Error Code = %04x).
	[Contents]	Status of the MCU sub cache is invalid.
	[Action]	Check the status of the MCU side.
0325		One side of Cache on MCU is blocked(Error Code = %04x).
	[Contents]	Cache of the MCU is blocked.
	[Action]	Check the status of the MCU side.
0326		Unexpected error occurred on MCU(Error Code = %04x).
	[Contents]	MCU error
	[Action]	Check the status of the MCU side.
0327		Subsystem Cache status of RCU is not active(Error Code = %04x).
	[Contents]	Sub cache status of the RCU is invalid.
	[Action]	Check the RCU status.
0328		Track Format of M-VOL and R-VOL do not match(Error Code = %04x).
	[Contents]	Track formats of the M-VOL and the R-VOL are invalid.
	[Action]	Compare the track formats of the M-VOL and the R-VOL.
0329		Number of cylinders on M-VOL and R-VOL are not equal(Error Code = %04x).
	[Contents]	Number of cylinders of the M-VOL does not coincide with that of the R-VOL.
	[Action]	Compare the numbers of cylinders of the M-VOL and the R- VOL.

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ID	Kind	Description
0330		Device Cache status of R-VOL is not active(Error Code = %04x).
	[Contents]	Cache status of the R-VOL device is invalid.
	[Action]	Check the cache status on the R-VOL side.
0331		DFW status of R-VOL is not active(Error Code = %04x).
	[Contents]	The DFW status of the R-VOL is invalid.
	[Action]	Check the DFW status on the R-VOL side.
0332		R-VOL is not usable(Error Code = %04x).
	[Contents]	The R-VOL cannot be used.
	[Action]	Check the R-VOL status.
0333		HODM is not supported under the Device emulation type of the M-VOL(Error Code = %04x).
	[Contents]	Device type of the M-VOL is not supported by the HODM.
	[Action]	Check the device type of the M-VOL.
0334		Remote Copy is not supported under the Device emulation type of the R-VOL(Error Code = %04x).
	[Contents]	Device type of the R-VOL is not supported by the Remote Copy (HRC/HORC).
	[Action]	Check the device type of the R-VOL.
0335		HODM is not supported under the Device emulation type of the R-VOL(Error Code = %04x).
	[Contents]	Device type of the R-VOL is not supported by the HODM.
	[Action]	Check the device type of the R-VOL.
0336		The RCU is still in HODM condition(Error Code = %04x).
	[Contents]	The RCU is already used by the HODM.
	[Action]	Wait until the HODM on the RCU side is completed.
0337		The RCU is still in Remote Copy condition(Error Code = %04x).
	[Contents]	The RCU is already used by the Remote Copy(HRC/HORC).
	[Action]	Wait until the Remote Copy(HRC/HORC) on the RCU side is completed.
0338		Specified volume is not Remote Copy pair.(Not in DuplexAvail, Pending Duplex, Suspend Duplex state)(Error Code = %04x).
	[Contents]	Specified volume is not the Remote Copy pair.
	[Action]	Check the specified volume.
0339		This application is already running.
	[Contents]	The application is already running.
	[Action]	None

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ID	Kind	Description
0340		Invalid Password.
	[Contents]	Inputted password is invalid.
	[Action]	Enter the password again.
0341		ONLINE, INSTALL and DIAGNOSIS are exclusive.
	[Contents]	Multiple operation running is suppressed.
	[Action]	Start after closing other application.
0342		This will end the %s.
	[Contents]	End of the application.
	[Action]	None
0343		Copyright (C) 1994-1996,Hitachi,Ltd.
	[Contents]	Copyright indication.
	[Action]	None
0344		The process can't be continued due to the shortage of memory.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0345		The %s log file will be deleted.
	[Contents]	Concerned log file deletion has been completed.
	[Action]	None
0346		The %s log doesn't exist.
	[Contents]	Concerned log file cannot be closed.
	[Action]	Reboot the PC. If it cannot be recovered, replace the PC.
0347		Error has occurred in inputting the log file.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0348		The detailed information of the specified log can't be seen.
	[Contents]	Detailed information of the log file cannot be referred to.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0349		Deleting the log file %s has failed.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0350		Please specify the log that you want to see the detailed information.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
0351		Only decimal figure is permitted. Please check input figures again!
	[Contents]	Input is invalid.
	[Action]	Input correct data (decimal number).
0352		Only hexadecimal figure is permitted. Please check input figures again!
	[Contents]	Input is invalid.
	[Action]	Input correct data (hexadecimal number).
0353		File output is not specified. \r A detailed display is invalid.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0354		Incomplete SIM exists
	[Contents]	An incomplete SIM exists.
	[Action]	Refer to the SIM log and recover the failed section.
0355		Only 1000 SSBs can be displayed at once. Use Search function to display previous SSBs.
	[Contents]	Number of SSB logs has exceeded 1000. Use the search function to display logs not included in the number.
	[Action]	Follow the message.
0356		Referred log is not found. - Overlapped by new log - Not yet received from DKC
	[Contents]	Concerned log cannot be found. It has been thrust out by new logs or it has not been sent from the DKC.
	[Action]	If it has been thrust out, it cannot be referred to. If it has not been sent from the DKC, wait for a few minutes and then retry.
0357		Referred log is not found. - Deleted by CE - Not filed because of same SIM existence
	[Contents]	Concerned log cannot be found because the SIM log has been already deleted.
	[Action]	None
0358		This will complete the SIM#%u.
	[Contents]	The SIM completion has been completed.
	[Action]	None
0359		Initializing the threshold value is finished.
	[Contents]	Initialization of the threshold value log has been completed.
	[Action]	None

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ID	Kind	Description
0360		Invalid interval value.
	[Contents]	Inputted data is incorrect.
	[Action]	Input correct data.
0361		The combination of the interval that exceeds 3600 seconds and processor operation cannot be executed.
	[Contents]	Input is invalid.
	[Action]	Input a number between 5 and 3600.
0362		DKC Monitor will be terminated.
	[Contents]	Monitoring has been completed.
	[Action]	None
0363		Check table read error.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0364		Parity match is not supported.
	[Contents]	The parity matching function is not supported.
	[Action]	Perform the microprogram version up.
0365		Do you want to format physical drives?
	[Contents]	Do you want to execute the physical device formatting?
	[Action]	Answer to the inquiry.
0366		Do you want to format logical devices?
	[Contents]	Do you want to execute the logical device formatting?
	[Action]	Answer to the inquiry.
0367		Formatting drives will be stopped.
	[Contents]	Formatting was aborted due to cancellation.
	[Action]	None
0368		Formatting devices will be stopped.
	[Contents]	Formatting was aborted due to cancellation.
	[Action]	None
0369		Available only in modify mode.
	[Contents]	Only the modify mode can be used.
	[Action]	Change the mode to "modify".
0370		Formatting physical drives was rejected by DKC.
	[Contents]	An error was reported from the DKC during formatting.
	[Action]	Confirm the Status/log, recover the error, and format them again.

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ID	Kind	Description
0371		Formatting logical devices rejected by DKC.
	[Contents]	An error was reported from the DKC during formatting.
	[Action]	Confirm the Status/log, recover the error, and format them again.
0372		Physical drives are not equipped.
	[Contents]	Physical devices are not set.
	[Action]	Set them again.
0373		Installation is in progress. Wait...
	[Contents]	Installation is being executed. Wait for a while.
	[Action]	Wait.
0374		Formatting physical drives is in progress. Wait...
	[Contents]	Formatting is being executed. Wait for a while.
	[Action]	Wait.
0375		Formatting logical devices is in progress. Wait...
	[Contents]	Formatting is being executed. Wait for a while.
	[Action]	Wait.
0376		DKC emulation type is inconsistent with DKU emulation type.
	[Contents]	Emulation types of the DKC and the DKU are inconsistent with each other.
	[Action]	Input correct data.
0377		There is inconsistency between PCB type, drive type and cache module size.
	[Contents]	Drive type an cache module size are inconsistent with the PCB type.
	[Action]	Input correct data.
0378		Cache/shared memory capacity is different between cluster-1 and cluster-2. Cluster-1:SM %dMB,CM %dMB Cluster-2:SM %dMB,CM %dMB
	[Contents]	Cache and SM capacities of the cluster 1 is inconsistent with those of the cluster 2.
	[Action]	Input correct data.
0379		Subsystem ID is inconsistent with DKC emulation type. Do you continue this process without a check on it?
	[Contents]	Setting of subsystem ID is inconsistent with the DKC emulation type. Nevertheless, do you continue this process?
	[Action]	Check if there is any problem in the inputted data and then answer to the inquiry.

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ID	Kind	Description
0380		CHA is not selected.
	[Contents]	The CHA is not selected.
	[Action]	Select a correct CHA.
0381		Cache capacity is 2GBx2 or less. It is inconsistent with cache redundant power supply.
	[Contents]	Cache capacity is inconsistent with the cache redundant power supply.
	[Action]	Input correct data.
0382		Illegal redundant power supply.
	[Contents]	Setting of the redundant power supply is illegal.
	[Action]	Input correct data.
0383		Logical devices are inconsistent with the device control value.
	[Contents]	Number of the controlled devices is inconsistent with that of the LDEVs.
	[Action]	Input correct data.
0384		2x%dMB total shared memory is required.
	[Contents]	The displayed SM is required.
	[Action]	Attach the SM to the cache PCB.
0385		Definition of device structure was finished. Change subsystem configuration by using Renewal Subsystem function.
	[Contents]	Setting of configuration information has been completed. Execute "Renewal Subsystem" after this.
	[Action]	Execute "Renewal Subsystem".
0386		The specified control value is inconsistent with device address. Please check and select the control value again.
	[Contents]	Number of the controlled devices is inconsistent with the device addresses.
	[Action]	Input correct data.
0387		Device address will be adjusted.
	[Contents]	Device addresses have been adjusted.
	[Action]	None
0388		Channel speed is not specified.
	[Contents]	Inputted channel speed is invalid.
	[Action]	Input correct data.

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ID	Kind	Description
0389		Mixed drive types are defined. Please define only one drive type.
	[Contents]	A mix of drive types was set.
	[Action]	Cancel the mix of drive types and make the setting again.
0390		Capacity of shared memory will be insufficient. First of all, you should check [Shared Memory Addition], RAID levels and emulation types.
	[Contents]	Capacity of shared memory will be insufficient.
	[Action]	Check the capacity of shared memory, RAID levels and emulation type.
0391		This application is already running.
	[Contents]	The application is already running.
	[Action]	None
0392		Invalid Password.
	[Contents]	Inputted password is invalid.
	[Action]	Input a valid password.
0393		ONLINE,INSTALL and DIAGNOSIS are exclusive.
	[Contents]	ONLINE, INSTALL, and DIAGNOSIS cannot be run simultaneously.
	[Action]	Close unnecessary screen(s) and restart.
0394		Invalid Parameter.
	[Contents]	Parameter is invalid.
	[Action]	Input correct data.
0395		This will end the %s.
	[Contents]	The screen is closed.
	[Action]	None
0396		Error has occurred in the DKC.
	[Contents]	An error occurred in the communication with the DKC.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Replace the PC. ④ Power off, then on the DKC. (Care should be taken.)
0397		Copyright (C) 1994-1996,Hitachi,Ltd.
	[Contents]	Copyright indication.
	[Action]	None
0398		Only decimal figure is permitted. Please check input figures again!
	[Contents]	Input is invalid.
	[Action]	Input correct data (decimal number).

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ID	Kind	Description
0399		Only hexadecimal figure is permitted. Please check input figures again!
	[Contents]	Input is invalid.
	[Action]	Input correct data (hexadecimal number).
0400		LCP is not selected.
	[Contents]	The LCP is not selected.
	[Action]	Input correct data.
0401		Invalid Parameter. Please check the CDEV# again.
	[Contents]	Setting of CDEV# is invalid.
	[Action]	Input correct data.
0402		Invalid Parameter. Please check the RDEV# again.
	[Contents]	Setting of RDEV# is invalid.
	[Action]	Input correct data.
0403		Receiving the SCSI dump has done.
	[Contents]	The DKU (SCSI) dump was acquired.
	[Action]	None
0404		The specified processor isn't equipped.
	[Contents]	A processor which is not in the configuration was selected.
	[Action]	Input correct data.
0405		Specified dump lengths are beyond the maximum.
	[Contents]	Collected dump size exceeded the maximum value.
	[Action]	Execute an FD copy and call the TSC.
0406		Save current changes?
	[Contents]	May the current changes be saved?
	[Action]	Answer to the inquiry.
0407		Memory allocation was in failure. Global memory space is insufficient.
	[Contents]	Memory failure in the PC.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0408		Memory lock error.
	[Contents]	Memory failure in the PC.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0409		SVP memory manager can manage no more memory allocation.
	[Contents]	Memory failure in the PC.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
0410		File open error in %s.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0411		Parameter error.
	[Contents]	Parameter is invalid.
	[Action]	Input correct data.
0412		Program error occurred! Parameter of allocate function is illegal. Allocation size is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0413		Program error occurred! File I/O process was required. But file size is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0414		Program error occurred! File I/O process was required. But global memory address is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0415		Program error occurred! Memory block free process was required. But memory address is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0416		Timer setting error occurred.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0417		Copy slot number over the limit.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0418		Copy waiting time over the limit.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0419		Condition of securing cache segment over the limit.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
0420		Amount of cache segment over the limit.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0421		There is no response from DKC within the time limit.
	[Contents]	Communication with the DKC resulted in time-out.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ③ Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
0422		SVP-DKC data communication was in failure. You should confirm that data sending task is in action.
	[Contents]	Communication with the DKC resulted in time-out.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
0423		Memory allocation for communication error occurred.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0424		Micro program downloading is failed.
	[Contents]	An error occurred in the microprogram replacement.
	[Action]	Confirm the Status/log, recover the error, and replace the microprogram again.
0425		Are you sure you want to interrupt this process?
	[Contents]	May the processing under execution be interrupted?
	[Action]	Answer to the inquiry.
0426		Are you sure you want to change system option in DKC?
	[Contents]	May the system option data be sent to the DKC?
	[Action]	Answer to the inquiry.
0427		Parameter error [%s]!
	[Contents]	Parameter error
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
0428		This function is available in Modify mode. Please vary the current mode to Modify.
	[Contents]	This function can be used only in modify mode.
	[Action]	Set the mode to "modify".
0429		Illegal configuration.
	[Contents]	Configuration information is invalid.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0430		If you want to allow Dynamic Sparing,You must allow Correction Copy,also. Please redefine System Option.
	[Contents]	If you use the dynamic sparing and the correction copy, you must set them in the system option.
	[Action]	Make a setting in the system option if necessary.
0431		Time out error.
	[Contents]	A time out error occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
0432		Manual Dump received.
	[Contents]	Manual dump has been terminated.
	[Action]	None
0433		Manual Dump receiving...
	[Contents]	Manual dump is being received.
	[Action]	None
0434		Scan Dump receiving...
	[Contents]	Scan dump is being received.
	[Action]	None
0435		Trace Area Dump receiving...
	[Contents]	Trace area dump is being received.
	[Action]	None
0436		Can not read LCP Memory.
	[Contents]	LCP memory read error
	[Action]	Refer to the Status/log and recover the problem.

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ID	Kind	Description
0437		1 Touch Dump received.
	[Contents]	One-touch dump has been completed.
	[Action]	None
0438		LCP Dump receiving...
	[Contents]	LCP dump is being received.
	[Action]	None
0439		Trace Area Dump received.
	[Contents]	Trace area dump has been completed.
	[Action]	None
0440		LM/SM Dump receiving...
	[Contents]	LM/SM dump is being received.
	[Action]	None
0441		TPF Dump receiving...
	[Contents]	TPF dump is being received.
	[Action]	None
0442		TPF Dump received.
	[Contents]	TPF dump has been completed.
	[Action]	None
0443		The Revision you inputted is older than old revision.\r Are you sure you want to change to the revision ?
	[Contents]	Is it permitted that the PCB revision becomes older than the set one? +G433 + G429
	[Action]	Make a setting if necessary.
0444		Illegal DKC Serial Number.
	[Contents]	Inputted DKC serial number is illegal.
	[Action]	Input correct data.
0445		Illegal Sub System ID.
	[Contents]	Inputted SSID is illegal.
	[Action]	Input correct data.
0446		Illegal Cache Capacity.
	[Contents]	Inputted cache capacity is illegal.
	[Action]	Input correct data.

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ID	Kind	Description
0447		Illegal Emulation Type.
	[Contents]	Inputted emulation type is illegal.
	[Action]	Input correct data.
0448		Illegal DKA Number.
	[Contents]	Inputted DKA number is illegal.
	[Action]	Input correct data.
0449		Illegal Drive Configuration.
	[Contents]	Inputted drive configuration is illegal.
	[Action]	Input correct data.
0450		Illegal RAID Level / Type.
	[Contents]	Inputted RAID level/type is illegal.
	[Action]	Input correct data.
0451		Device number %2.2x is defined more than once.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
0452		Logical devices are inconsistent with the device control value. Please increase the device control value by System Tuning function.
	[Contents]	Number of controlled devices is inconsistent with the device addresses.
	[Action]	Input correct data using the system tuning function.
0453		Because spare drives are being used, this operation isn't available.
	[Contents]	This operation was treated as being abnormal because the spare drives are being used.
	[Action]	Check if it is a correct operation.
0454		There is more than one change in device configuration. Please reconfirm the structure.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
0455		Too many spare drives.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
0456		Scan Dump received.
	[Contents]	Scan dump has been completed.
	[Action]	None

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ID	Kind	Description
0457		Shared memory will volatilize forcibly.
	[Contents]	The SM was volatilized forcibly.
	[Action]	None
0458		Shared memory volatilized.
	[Contents]	The SM was volatilized.
	[Action]	None
0459		Trace Read Error.\r RC = %02x
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0460		Processor is not selected.
	[Contents]	The processor is not selected.
	[Action]	Select it.
0461		Micro Program or configuration is not selected.
	[Contents]	The type is not selected.
	[Action]	Select it.
0462		Are you sure you want to install the defined configuration?
	[Contents]	May the initial configuration setting be executed?
	[Action]	Answer to the inquiry.
0463		IP address can not be exchanged.
	[Contents]	IP address cannot be changed.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0464		Installation was finished. Wait until power is down.(PS-ON LED at CE Panel is off)
	[Contents]	Initialization has been completed. Wait until power is turned off.
	[Action]	Wait until power is turned off.
0465		Please reboot PC.
	[Contents]	Execute the PC reboot.
	[Action]	Answer to the inquiry or quit Windows.
0466		There is no response from subsystem within the time limit. Please confirm the logical device status.
	[Contents]	There is no response from the DKC.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0467		Formatting logical devices rejected by subsystem. LDEV = %hx
	[Contents]	An error was notified from the DKC.
	[Action]	Confirm the Status/log and recover the problem.
0468		Formatting was finished.
	[Contents]	Formatting has been completed.
	[Action]	None
0469		Communication error has occurred.
	[Contents]	A communication error occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
0470		File read error at \"c:\\dkc200\\config\\dkcprp.dat\".
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0471		Cannot update revision.\r The location is not installed PCB.
	[Contents]	Since the concerned PCB is not installed, the revision change cannot be done.
	[Action]	Select a correct PCB.
0472		Cannot update revision.\r The location is blocked by error.
	[Contents]	Since the concerned PCB is blocked, the revision change cannot be done.
	[Action]	Recover the concerned PCB by replacing it.
0473		Cannot update revision.\r The locations PCB is not supported.
	[Contents]	The revision update function of the concerned PCB is not supported.
	[Action]	None
0474		The data you inputted is older then old revision.
	[Contents]	Inputted data is older than the set one.
	[Action]	Input correct data.
0475		There is an error, when writing revision to FM.
	[Contents]	An error occurred while a revision is being written to the FM.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0476		There is an error, when reading new revision from FM.
	[Contents]	An error occurred while a new revision is being read from the FM.
	[Action]	Confirm the Status/log and recover the problem.
0477		The data you inputted is wrong.
	[Contents]	Inputted data is incorrect.
	[Action]	Input correct data.
0478		Do you set Configuration data in SVP?
	[Contents]	Do you set the SVP configuration information?
	[Action]	Answer to the inquiry.
0479		Do you set Configuration data in DKC?
	[Contents]	Do you set the DKC configuration information?
	[Action]	Answer to the inquiry.
0480		The specified PDEV is't equipped.
	[Contents]	The specified PDEV is not installed.
	[Action]	Input correct data.
0481		Micro Program Exchange is success.
	[Contents]	Microprogram exchange has been terminated normally.
	[Action]	None
0482		Micro Program Exchange is Fault.
	[Contents]	Microprogram exchange has been terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0483		Please insert config FD in FDD.
	[Contents]	Insert a floppy disk in the floppy disk drive.
	[Action]	Answer to the inquiry.
0484		Backup is done. Remove FD.
	[Contents]	Remove a floppy disk.
	[Action]	Answer to the inquiry.
0485		Back up is failed. Please insert correct FD.
	[Contents]	Insert a correct floppy disk.
	[Action]	Answer to the inquiry.
0486		The capacity of cache is inconsistent with RAID level.
	[Contents]	Cache capacity is inconsistent with the RAID level.
	[Action]	Input correct data.

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ID	Kind	Description
0487		File I/O error has occurred. Mode can not be changed.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0488		Password is invalid.
	[Contents]	Password is invalid.
	[Action]	Input a valid password.
0489		Some configuration files are destroyed. Please start and exit ONLINE, and then retry again. If the result is NG, please call Technical Support Center.
	[Contents]	A configuration information file error occurred.
	[Action]	After opening and then closing the ONLINE, execute installation again. If the failure is not recovered, call the TSC.
0490		Some configuration files are destroyed. Please download the configuration files from Config FD and retry again. If the result is NG, please call Technical Support Center.
	[Contents]	A configuration information file error occurred.
	[Action]	Execute a:\all_conf from CONFIG FD, open and then close the ONLINE, and execute the installation again. If the failure is not recovered, call the TSC.
0491		You should set RAID configuration again.
	[Contents]	Inputted RAID level/type is illegal.
	[Action]	Input correct data.
0492		The creating LCP loadfile...
	[Contents]	The LCP load file has been initialized.
	[Action]	None
0493		Wait...
	[Contents]	Wait.
	[Action]	Wait.
0494		Turn off the subsystem.
	[Contents]	Turn off the DKC power.
	[Action]	Answer to the inquiry.
0495		It is necessary to turn off DKC Subsystem after finish following process. \rDo you continue this operation?
	[Contents]	The DKC power must be turned off after the operation is completed. Do you continue this?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
0496		PWRCTL-1
	[Contents]	None
	[Action]	None
0497		PWRCTL-2
	[Contents]	None
	[Action]	None
0498		DKC-F210I-71
	[Contents]	None
	[Action]	None
0499		DKC-F210I-72
	[Contents]	None
	[Action]	None
0500		DKC-F210I-70
	[Contents]	None
	[Action]	None
0501		Processing to disable the environment check...
	[Contents]	Since the SSVP is not ready, check process cannot be executed.
	[Action]	Retry after the SSVP becomes ready.
0502		Processing to enable the environment check...
	[Contents]	Since the SSVP is ready, the check process is executed.
	[Action]	None
0503		Setting communication environment failed.
	[Contents]	An error in the communication with the SSVP occurred.
	[Action]	Retry after the SSVP becomes ready.
0504		Environment monitor package, ""%s,"" is failed.
	[Contents]	An error in the environment monitoring system was detected.
	[Action]	Confirm the Status/log and recover the problem.
0505		Reading the environment monitor...
	[Contents]	The environment monitoring result is being read.
	[Action]	Wait until the process finished.
0506		Please vary the drives off-line only whose emulation type will be changed. And enter a password to continue.
	[Contents]	Make the drives off-line, then change the emulation type.
	[Action]	Input a password to continue.

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ID	Kind	Description
0507		Please confirm the drives whose emulation type will be changed have been already varied off-line.
	[Contents]	After checking if the drives are off-line, change the emulation type.
	[Action]	Continue after checking if the connection with the host is put in off-line mode.
0508		Changing emulation type is normal end. Please vary the drives on-line.
	[Contents]	Change of the emulation type was terminated normally.
	[Action]	Put the connection to the host in on-line mode.
0509		Changing emulation type is failed.
	[Contents]	Change of emulation type was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0510		Changing emulation type...
	[Contents]	Emulation type is being changed.
	[Action]	Wait until the process is finished.
0511		[ONL2066I] Timer setting error has occurred. Wait for 30 seconds, then press OK.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0512		This application is already running.
	[Contents]	The application is already running.
	[Action]	None
0513		[ONL2035W] You should suspend the Remote Copy volume pair using SVP operation on MCU. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should suspend the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
0514		[ONL2036W] You should delete or suspend the Remote Copy volume pair using SVP operation on MCU before hand. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end or suspend the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.

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ID	Kind	Description
0515		[ONL2037W] You should delete the logical path of Remote Copy. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
0516		[ONL2038W] This HSTA may include the last logical path between MCU and RCU of Remote Copy. Please check if there is a alternate path from MCU at first. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end the path from MCU. If [No], SVP will continue the process, but you must be careful to operate.
	Note.1	Before you replace CHA, please vary off-line the path to the CHA which is connected from MCU. After replacement, please vary online the path. If you de-install CHA, please vary off-line the path to the CHA which is connected from MCU.
0517		[ONL2059W] Remote data copy in progress. Please wait for copy end or you should delete or suspend the Remote Copy volume pair. Do you stop this process?
	[Contents]	SVP detects the data copy by Remote Copy.
	[Action]	If [Yes] is selected, you should wait until copy is finished, or you should delete or suspend the pair after you negotiate with your customer. If [No] is selected, SVP will stop the process.

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ID	Kind	Description
0518		[ONL2060W] It is possible to suspend the Remote Copy volume pair or you can not operate Remote Copy more. Do you stop this process?
	[Contents]	SVP detects the warning that Remote Copy pair will be suspended or you could not operate more.
	[Action]	If [Yes] is selected, SVP will stop the process, but if [No] is selected, SVP will continue the process.
0519		[ONL2073W] You should add the alternate path, or if the Fence Level is Data/Status, you should delete the pair volume or if the Fence Level is Never, you should suspend the pair volume. Do you stop this process?
	[Contents]	Alternate path must be added or pair must be deleted or suspended.
	[Action]	Please select [Yes] to stop operation and decide with your customer which you have to do, add Remote Copy(HRC/HORC) alternate path, or delete the pair if the fence level of the volume is Data/Status, suspend the pair if the fence level of the volume is never. And retry. If you select [No], SVP will continue the process.
0520		[ONL2074W] You should add the alternate path or delete the Remote Copy pair. Do you stop this process?
	[Contents]	Alternate path must be added or pair must be deleted.
	[Action]	Please select [Yes] to stop the operation and add the alternate path or delete the pair by decided by customers. If you select [No], SVP will continue the process.
0521		[ONL2075W] You should add the alternate path. Do you stop this process?
	[Contents]	Alternate path must be added.
	[Action]	Please select [Yes] to stop the operation and add the alternate path by decided with customers.
0522		[ONL2076W] HODM data copy in progress. Please wait for copy end or you should add alternate path. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. You should finish HODM copy or add alternate path by decided with customers and retry again. If you select [No], SVP will continue the process.
0523		[ONL2077W] You should add the alternate path or stop the I/O from Host. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. Please decide with your customer which you have to do, add the HODM alternate path or stop the I/O from HOST. If you select [No], SVP will continue the process.

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ID	Kind	Description
0524		[ONL2078W] You should add the alternate path or delete the HODM pair. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. You should delete the pair or add alternate path by decided with customers and retry again. If you select [No], SVP will continue the process.
0525		Save current changes?
	[Contents]	May the change be saved?
	[Action]	Answer to the inquiry.
0526		Memory allocation was in failure. Global memory space is insufficient.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0527		Memory lock error.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0528		SVP memory manager can manage no more memory allocation.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0529		File open error in %s.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0530		Parameter error.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0531		Program error occurred! Parameter of allocate function is illegal. Allocation size is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0532		Program error occurred! File I/O process was required. But file size is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0533		Program error occurred! File I/O process was required. But global memory address is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
0534		Program error occurred! Memory block free process was required. But memory address is zero.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0535		You can not do processor reset to the Cache Memory or the Shared Memory PCB.
	[Contents]	Processor reset cannot be executed with the CM/SM PCB.
	[Action]	Make a correct selection.
0536		Timer setting error occurred.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0537		The CHA is being blocked...
	[Contents]	The CHA is blocked.
	[Action]	None
0538		Blocking the CHA is completed.
	[Contents]	Blockade of the CHA has been completed.
	[Action]	None
0539		Do you want to pull out the CHA now?
	[Contents]	Do you want to pull out the CHA PCB?
	[Action]	Answer to the inquiry.
0540		The DKA is being blocked...
	[Contents]	The DKA is blocked.
	[Action]	None
0541		Restoring the CHA...
	[Contents]	The CHA is being restored.
	[Action]	None
0542		Restoring the CHA is completed. Please check subsystem status with STATUS.
	[Contents]	Restoration of the CHA has been competed.
	[Action]	Check if there is any problem in status.
0543		The DKA is being blocked...
	[Contents]	The DKA is blocked.
	[Action]	None

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ID	Kind	Description
0544		Upgrading the physical device...
	[Contents]	The physical device is being upgraded.
	[Action]	None
0545		De-installation of the physical device...
	[Contents]	The physical device is being deinstalled.
	[Action]	None
0546		Restoring the physical device is failed.
	[Contents]	Restoration of the physical device was terminated abnormally.
	[Action]	Confirm the Status/log and restore the problem.
0547		Upgrading of the physical device is failed.
	[Contents]	Replacement of the physical device was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0548		Upgrading of the physical device is completed.
	[Contents]	Replacement of the physical device was terminated normally.
	[Action]	None
0549		De-installation of the physical device is failed.
	[Contents]	Deinstallation of the physical device was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0550		De-installation of the physical device is completed.
	[Contents]	Deinstallation of the physical device was terminated normally.
	[Action]	None
0551		The LED of the physical device has lit.
	[Contents]	The LED of the physical device is turned on.
	[Action]	None
0552		Memory allocation for communication error occurred.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
0553		Micro program (LCP) downloading is now progress...
	[Contents]	LCP microprogram is being downloaded.
	[Action]	Wait until the process is finished.
0554		Micro program downloading is failed.
	[Contents]	Microprogram download error
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0555		Configuration data has been changed. Ending Online Maintenance results in cancellation of all changes. Are you sure you want to end Online Maintenance?
	[Contents]	Configuration data has been changed. Ending Online Maintenance results in cancellation of all changes.
	[Action]	If you want to finish, select [Yes]. If cancel, select [No].
0556		Are you sure you want to renew the shared memory of subsystem?
	[Contents]	Do you want to renew the SM?
	[Action]	Answer to the inquiry.
0557		If de-installation of the CHA/DKA,the physical devices or the redundant power supply has been completed, press OK.
	[Contents]	If de-installation of the CHA/DKA,the physical devices or the redundant power supply has been completed, press OK.
	[Action]	If the power supply has been completed, press OK.
0558		Changing the configuration data, for equipment of shared/cache memory...
	[Contents]	Change of the configuration data to the SM/CM has been completed.
	[Action]	None
0559		Installation of shared/cache memory was in failed.
	[Contents]	Installation of the SM/CM was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0560		Changing the configuration data, for installation of shared/cache memory...
	[Contents]	Installation of the SM/CM has been completed.
	[Action]	None
0561		De-installation of shared/cache memory was in failed.
	[Contents]	Deinstallation of the SM/CM was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0562		Automatic subsystem check for error prevention will be performed when blocking target PCB. Yes = Normal replacement No = Forcible replacement (possible critical errors)
	[Contents]	Error prevention check detected it.
	[Action]	Select either of them according to the message.
0563		Blocking the CHA is failed.
	[Contents]	Blockade of the CHA failed.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0564		Blocking the DKA is failed.
	[Contents]	Blockade of the DKA failed.
	[Action]	Confirm the Status/log and recover the problem.
0565		Initializing of shared memory is failed.
	[Contents]	Initialization of the SM failed.
	[Action]	Confirm the Status/log and recover the problem.
0566		Renewal process has completed. Please check subsystem status.
	[Contents]	Change configuration has completed.
	[Action]	Please check subsystem status, and select [OK].
0567		Are you sure you want to switch the SCSI Buffer LED on?
	[Contents]	Do you want to switch the SCSI buffer LED on?
	[Action]	Answer to the inquiry.
0568		Restoring the Cache Memory PCB...
	[Contents]	Cache PCB is being restored.
	[Action]	None
0569		Restoring the Cache Memory PCB is completed. Please check subsystem status with STATUS.
	[Contents]	Restoration of the cache PCB has been completed.
	[Action]	None
0570		Do you want to copy the data to the spare disk now?
	[Contents]	Do you want to save (copy) the data to the spare disk?
	[Action]	None
0571		Restoring the physical device...
	[Contents]	Physical device is being restored.
	[Action]	None
0572		Are you sure you want to block the physical device? If you select [Yes],physically pulling off and putting in of HDD canister will be unavoidable.
	[Contents]	This is a confirmation message.
	[Action]	Select either of them according to the message.
0573		Copying the data to the spare disk has started.
	[Contents]	Copy of the data to the spare disk has started.
	[Action]	None

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ID	Kind	Description
0574		Are you sure you want to block the CHA? If you select [Yes],physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	This is a confirmation message.
	[Action]	Select either of them according to the message.
0575		The physical device is being blocked...
	[Contents]	Blockade of the physical device has been completed.
	[Action]	None
0576		Copy slot number over the limit.
	[Contents]	Number of the copy slots exceeded the maximum value.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0577		Copy waiting time over the limit.
	[Contents]	A timeout of copying occurred.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0578		Do you want to pull out the DKA now?
	[Contents]	Do you want to pull out the DKA?
	[Action]	Answer to the inquiry.
0579		Do you want to restore the DKA now?
	[Contents]	Do you want to restore the DKA?
	[Action]	Answer to the inquiry.
0580		Are you sure you want to de-installation the DKA?
	[Contents]	Do you want to execute the DKA deinstallation?
	[Action]	Answer to the inquiry.
0581		Are you sure you want to upgrade the DKA?
	[Contents]	Do you want to execute the DKA replacement?
	[Action]	Answer to the inquiry.
0582		Restoring the DKA...
	[Contents]	The DKA is being restored.
	[Action]	None
0583		Upgrading the DKA...
	[Contents]	The DKA is being added.
	[Action]	None
0584		De-installation of the DKA...
	[Contents]	The DKA is being deinstalled.
	[Action]	None

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ID	Kind	Description
0585		Blocking the DKA is completed.
	[Contents]	Blockade of the DKA has been completed.
	[Action]	Confirm the Status/log and recover the problem.
0586		Restoring the DKA is failed.
	[Contents]	Restoration of the DKA was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0587		Restoring the DKA is completed. Please check subsystem status with STATUS.
	[Contents]	Restoration of the DKA has been completed.
	[Action]	Check the DKC status with the Status.
0588		Upgrading of the DKA is failed.
	[Contents]	Upgrading the DKA was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0589		Upgrading of the DKA is completed.
	[Contents]	Addition of the DKA has been completed.
	[Action]	None
0590		De-installation of the DKA is failed.
	[Contents]	Deinstallation of the DKA was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0591		De-installation of the DKA is completed.
	[Contents]	Deinstallation of the DKA has been completed.
	[Action]	None
0592		The LED of the DKA has lit.
	[Contents]	The LED of the DKA is turned on.
	[Action]	None
0593		De-installation of the Cache Memory PCB is completed.
	[Contents]	Deinstallation of the cache memory (or memories) has been completed.
	[Action]	Confirm the Status/log and recover the problem.
0594		Blocking the Shared Memory PCB is failed.
	[Contents]	Blockade of the SM failed.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0595		Restoring the Shared Memory PCB is failed.
	[Contents]	Deinstallaiton of the SM was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0596		Restoring the Shared Memory is completed. Please check subsystem status with STATUS.
	[Contents]	Restoration of the SM has been completed.
	[Action]	None
0597		Upgrading of the Shared Memory PCB is failed.
	[Contents]	Addition of the SM was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0598		Upgrading of the Shared Memory PCB is completed.
	[Contents]	Addition of the SM has been completed.
	[Action]	None
0599		De-installation of the Shared Memory PCB is failed.
	[Contents]	Deinstallation of the SM was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0600		De-installation of the Shared Memory PCB is completed.
	[Contents]	Deinstallation of the SM has been completed.
	[Action]	None
0601		Are you sure you want to block the Shared Memory PCB? If you select [Yes],physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	This is a confirmation message.
	[Action]	Select either of them according to the message.
0602		Do you want to pull out the Shared Memory PCB now?
	[Contents]	Do you want to pull out the SM PCB?
	[Action]	Answer to the inquiry.
0603		Are you sure you want to upgrade the Shared Memory PCB?
	[Contents]	Do you want to add the SM PCB?
	[Action]	Answer to the inquiry.
0604		Are you sure you want to de-installation the Shared Memory PCB?
	[Contents]	Do you want to deinstall the SM PCB?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
0605		The LED of the Shared Memory PCB has lit.
	[Contents]	The LED of the SM PCB is turned on.
	[Action]	None
0606		Do you want to restore the Shared Memory PCB now?
	[Contents]	Do you want to restore the SM PCB?
	[Action]	Answer to the inquiry.
0607		Are you sure you want to block the DKA? If you select [Yes],physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	-
	[Action]	-
0608		Changing of arbiter master is rejected. error code = 13 MP code = %s
	[Contents]	Switch of the arbiter master failed.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0609		Micro Program in the PCB(CHA/DKA) will not be renewed in this replacement[Replace(for BUS access check)]. If you want to renew Micro Program, you should select [Replace].
	[Contents]	This is a mode in which the microprogram replacement is not executed. If a microprogram need to be replaced, execute "Replace."
	[Action]	Answer to the inquiry.
0610	**W**	Mapping of the drives has been changed, because spare drives are being used. Copy back the drives to recover the original mapping. \nDo you want to stop this process?
	[Contents]	Mapping of the drives has been changed, because spare drives are being used. Copy back the drives to recover the original mapping. Do you want to stop this process?
	[Action]	If you select [Yes], copy back the drives to recover the original mapping. If you select [No], Contact the Technical Support Center.
0611		Are you sure you want to replace the SCSI buffer? If you select [Yes],blocking of the DKA will be unavoidable.
	[Contents]	Do you want to replace the SCSI buffer though the DKA is blocked when replacing it?
	[Action]	Answer to the inquiry.
0612		Are you sure you want to change tuning parameter in DKC?
	[Contents]	Do you want to transfer the threshold value data to the DKC?
	[Action]	Answer to the inquiry.
0613		[TUNING.DAT] file is illegal. Please confirm it.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
0614		ONL0062W Some physical device status(Data/Spare) is changed. If it was caused by define configuration, you should de-installation,first. If it is was caused by drive copy process, you should close ONLINE, and start ONLINE again.
	[Contents]	-
	[Action]	-
0615		Internal subsystem status is under maintenance(%s). No maintenance can be performed now. Do you stop this process?
	[Contents]	The subsystem is under maintenance. No other maintenance operations can be performed at present.
	[Action]	Terminate the processing once and wait until the maintenance is completed.
0616		If you want to allow Dynamic Sparing, You must allow Correction Copy, also. Please redefine System Option.
	[Contents]	When dynamic sparing is to be specified, it is necessary to specify correction copy also.
	[Action]	Set the system option once again.
0617		Replace the Memory PCBs. When completed, please press OK.
	[Contents]	Replacement of the SM/CM PCB has been completed.
	[Action]	Answer to the inquiry.
0618		SCSI BUS initialization process is running...
	[Contents]	Initialization of the SCSI bus is being executed.
	[Action]	Wait until the process is finished.
0619		Copying the data to the spare disk...
	[Contents]	The data is being copied to the spare disk.
	[Action]	Wait until the process is finished.
0620		Blocking the physical device is completed.
	[Contents]	Blockade of the physical device has been terminated.
	[Action]	None
0621		Do you want to pull out the physical device now?
	[Contents]	Do you want to pull out the physical device?
	[Action]	Answer to the inquiry.
0622		Do you want to restore the physical device now?
	[Contents]	Do you want to restore the physical device?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
0623		Are you sure you want to format the physical device?
	[Contents]	Do you want to execute the physical device formatting?
	[Action]	Answer to the inquiry.
0624		Formatting the physical device...
	[Contents]	Formatting of the physical device is being executed.
	[Action]	Wait until the process is finished.
0625		Do you want to recover the data from spare disk now?
	[Contents]	Transfer of the data from the spare disk is being executed.
	[Action]	Wait until the process is finished.
0626		Recovering the data from spare disk...
	[Contents]	Data is being recovered from the spare disk.
	[Action]	Wait until the process is finished.
0627		Recovering the data from spare disk has started.
	[Contents]	Data recovery from the spare disk has started.
	[Action]	None
0628		Are you sure you want to block the Cache Memory PCB? If you select [Yes], physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	This is a confirmation message.
	[Action]	Select either of them according to the message.
0629		The Cache Memory PCB is being blocked...
	[Contents]	The cache memory PCB was blocked.
	[Action]	Please check the status.
0630		Do you want to pull out the Cache Memory PCB now?
	[Contents]	Do you want to pull out the cache memory PCB?
	[Action]	Answer to the inquiry.
0631		Do you want to restore the Cache Memory PCB now?
	[Contents]	Do you want to restore the cache memory PCB?
	[Action]	Reply the message.
0632		Are you sure you want to interrupt this process?
	[Contents]	Do you want to interrupt the processing being executed?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
0633		Copying the data to the spare disk is failed.
	[Contents]	Copy of the data to the spare disk was terminated abnormally.
	[Action]	Please check the status.
0634		Recovering the data from spare disk was interrupted.
	[Contents]	Recovery of the data from the spare disk was terminated abnormally.
	[Action]	Please check the status.
0635		Correction copy from disk drives was interrupted.
	[Contents]	Correction copy from the data drives was interrupted.
	[Action]	Confirm the Status/log and recover the problem.
0636		Correction copy from disk drives has started.
	[Contents]	Correction copy from the data drives has started.
	[Action]	None
0637		Correction copy from disk drives is in progress...
	[Contents]	Correction copy from data drives is being executed.
	[Action]	Wait until the process is finished.
0638		Do you want to do a correction copy from disk drives now?
	[Contents]	Do you want to execute a correction copy from data drives?
	[Action]	Answer to the inquiry.
0639		Another process is now going on in Online Maintenance task. This process can't be executed with that one.
	[Contents]	Another process is being executed.
	[Action]	Wait until another processing is completed.
0640		Stop
	[Contents]	None
	[Action]	None
0641		This process was interrupted by scheduled system down processing.
	[Contents]	The P/S off process was interrupted.
	[Action]	None
0642		Disk drive maintenance process was failed.
	[Contents]	The data drive maintenance was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0643		DKC system error occurred. process was interrupted.
	[Contents]	The processing was interrupted since the DKC failure occurred.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0644		This HDU group [HDU-L17] is maximum in the system.
	[Contents]	This HDU-L17 is the last HDU group in the system.
	[Action]	None
0645		This HDU group [HDU-R10] is minimum in the system.
	[Contents]	This HDU-R10 is the top HDU group in the system.
	[Action]	None
0646		Equip the unit, or not can be instructed per a unit.
	[Contents]	-
	[Action]	-
0647		The unit which you specified is now under maintenance. The same unit can not receive multiple maintenance.
	[Contents]	Another process is being executed.
	[Action]	Wait until another processing is completed.
0648		Parameter error 28.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0649		Parameter error 30.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0650		Parameter error 31.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0651		Disk copy interruption submitted to the DKC.
	[Contents]	The disk copy interruption process was executed.
	[Action]	None
0652		Interrupting disk copy...
	[Contents]	Disk copy is being executed.
	[Action]	None
0653		Formatting the physical device is failed.
	[Contents]	Formatting of the physical device was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0654		Formatting the physical device is completed.
	[Contents]	Formatting of the physical device has been completed.
	[Action]	None

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ID	Kind	Description
0655		You can not execute INLINE CUDG to the CHA.
	[Contents]	INLINE CUDG cannot be executed.
	[Action]	Confirm the Status/log and recover the problem.
0656		You can not execute INLINE CUDG to the DKA.
	[Contents]	INLINE CUDG cannot be executed.
	[Action]	Confirm the Status/log and recover the problem.
0657		Are you sure you want to perform INLINE CUDG for Cache Memory and Shared Memory?
	[Contents]	Do you want to perform the INLINE CUDG for the CM/SM?
	[Action]	Answer to the inquiry.
0658		Are you sure you want to perform INLINE CUDG for Shared Memory?
	[Contents]	Do you want to perform the INLINE CUDG for the SM?
	[Action]	Answer to the inquiry.
0659		You can not execute INLINE CUDG to the PCB that has no processor, cache memory or shared memory.
	[Contents]	INLINE CUDG for the CM/SM cannot be executed.
	[Action]	Confirm the Status/log and recover the problem.
0660		Are you sure you want to change system option in DKC?
	[Contents]	Do you want to send the change of the system option to the DKC?
	[Action]	Answer to the inquiry.
0661		Do you want to add the CPS now?
	[Contents]	Do you want to add the CPS?
	[Action]	Answer to the inquiry.
0662		Do you want to delete the CPS now?
	[Contents]	Do you want to delete the CPS?
	[Action]	Answer to the inquiry.
0663		Are you sure you want to block the CPS PCB? It cause blocking all Cache Memory PCBs in the side. If you select [Yes],physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	-
	[Action]	-
0664		There is no need to shut-up CPS.
	[Contents]	The CPS does not need to be blocked.
	[Action]	None

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ID	Kind	Description
0665		Correction copy from disk drives is failed.
	[Contents]	Correction copy form the data drives was terminated abnormally.
	[Action]	None
0666		Recovering the data from spare disk is failed.
	[Contents]	Recovery of the data from the spare disk was terminated abnormally.
	[Action]	None
0667		Data de-staging in Shared Memory PCB is completed.
	[Contents]	Destaging of data to the SM PCB has been completed.
	[Action]	None
0668		Data de-staging in Cache Memory PCB is completed.
	[Contents]	Destaging of data to the CM PCB has been completed.
	[Action]	None
0669		Blocking the Cache Memory PCB is completed. Data de-staging is now running.
	[Contents]	Blockade of the CM PCB has been completed and destaging of the data is being executed.
	[Action]	None
0670		Blocking the Shared Memory PCB is completed. Data de-staging is now running.
	[Contents]	Blockade of the SM PCB has been completed and destaging of the data is being executed.
	[Action]	None
0671		Disk drive [%s] is not yet equipped in subsystem. Before definition of RAID configuration data, please equip the disk drive, first.
	[Contents]	No disk drive is installed.
	[Action]	Install the disk drive before setting the RAID.
0672		Please specify the physical device to maintenance.
	[Contents]	Specify a physical device maintenance.
	[Action]	None
0673		Please select single item in the logical device list.
	[Contents]	Select only one item from the LDEV list.
	[Action]	None
0674		This function is available in Modify mode. Please vary the current mode to Modify.
	[Contents]	This function can be used only in modify mode.
	[Action]	Set the mode to “modify”.

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ID	Kind	Description
0675		RAID configuration data changing is now progress...
	[Contents]	RAID configuration information is being changed.
	[Action]	None
0676		Reboot the processor in progress...
	[Contents]	The processor is being rebooted.
	[Action]	None
0677		Reboot the processor is completed.
	[Contents]	Rebooting of the processor has been completed.
	[Action]	None
0678		There is no only Cache Memory PCB in this system.
	[Contents]	The DKC in which only the CM PCB is installed
	[Action]	None
0679		You can not do processor reboot to the Cache Memory or the Shared Memory PCB.
	[Contents]	Processor reboot cannot be specified due to the CM/SM PCB.
	[Action]	None
0680		Interrupting correction copy from disk drives...
	[Contents]	Correction copy from the data drives is being interrupted.
	[Action]	None
0681		Interrupting process that recovering the data from spare disk...
	[Contents]	Data recovery from the spare disk is being interrupted.
	[Action]	None
0682		Interrupting logical device formatting...
	[Contents]	Logical device formatting is being interrupted.
	[Action]	None
0683		Are you sure you want to block the Shared Memory and Cache Memory PCB? If you select [Yes],physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	This is a confirmation message.
	[Action]	Select either of them according to the message.
0684		Do you want to restore the Shared Memory and Cache Memory PCB now?
	[Contents]	Do you want to restore the SM/CM PCB?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
0685		Are you sure you want to perform INLINE CUDG for Shared Memory and Cache Memory?
	[Contents]	Do you want to perform the INCLINE CUDG for the SM/CM?
	[Action]	Answer to the inquiry.
0686		Do you want to pull out the Shared Memory and Cache Memory PCB now?
	[Contents]	Do you want to pull out the SM/CM PCB?
	[Action]	Answer to the inquiry.
0687		Are you sure you want to upgrade the Shared Memory and Cache Memory PCB?
	[Contents]	Do you want to add the SM/CM PCB?
	[Action]	Answer to the inquiry.
0688		De-installation of the CHA is completed.
	[Contents]	Deinstallation of the CHA has been completed.
	[Action]	None
0689		De-installation of the CHA is failed.
	[Contents]	Deinstallation of the CHA was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0690		The LED of the CHA has lit.
	[Contents]	The LED of the CHA is turned on.
	[Action]	None
0691		The Shared Memory PCB is being blocked...
	[Contents]	The SM PCB is being blocked.
	[Action]	None
0692		Restoring the Shared Memory PCB...
	[Contents]	The SM PCB is being restored.
	[Action]	None
0693		Upgrading the Shared Memory PCB...
	[Contents]	The SM PCB is being added.
	[Action]	None
0694		De-installation of the Shared Memory PCB...
	[Contents]	The SM PCB is being deinstalled.
	[Action]	None

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ID	Kind	Description
0695		Upgrading the Cache Memory PCB...
	[Contents]	The CM PCB is being added.
	[Action]	None
0696		De-installation of the Cache Memory PCB...
	[Contents]	The CM PCB is being deinstalled.
	[Action]	None
0697		Blocking the Cache Memory PCB is failed.
	[Contents]	Blockade of the CM PCB was terminated abnormally.
	[Action]	None
0698		Restoring the Cache Memory PCB is failed.
	[Contents]	Restoration of the CM PCB was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0699		The LED of the Cache Memory PCB has lit.
	[Contents]	The LED of the CM PCB is turned on.
	[Action]	None
0700		Upgrading of the Cache Memory PCB is failed.
	[Contents]	Addition of the CM PCB was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0701		Upgrading of the Cache Memory PCB is completed.
	[Contents]	Addition of the CM PCB has been completed.
	[Action]	None
0702		De-installation of the Cache Memory PCB is failed.
	[Contents]	Deinstallation of the CM PCB was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0703		Changing the logical device configuration data...
	[Contents]	The logical device configuration information is being changed.
	[Action]	None
0704		Please replace the physical device. After replacement, please press OK.
	[Contents]	Execute the physical device replacement.
	[Action]	Execute the replacement and then press OK.
0705		Checking the physical device status...
	[Contents]	The physical device status is being checked.
	[Action]	None

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ID	Kind	Description
0706		Spinning down the physical device...
	[Contents]	The physical device is being spinned down.
	[Action]	None
0707		Spinning up the physical device...
	[Contents]	The physical device is being spinned up.
	[Action]	None
0708		Spinning down the physical devices...
	[Contents]	The physical device is being spinned down.
	[Action]	None
0709		Illegal configuration.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0710		SVP could not spin up the physical devices.
	[Contents]	Spinning up of the physical device cannot be executed.
	[Action]	Execute the replacement of the concerned device.
0711		Correction copy interruption submitted to the DKC.
	[Contents]	Interruption of a correction copy is transmitted to the DKC.
	[Action]	None
0712		Copying the data to the spare disk is interrupted.
	[Contents]	Interruption of the data copy to the spare disk was executed.
	[Action]	None
0713		Lighting LED of the PCB...
	[Contents]	The LED of the PCB is turned on.
	[Action]	None
0714		Blocking the Shared Memory and Cache Memory PCB is completed.
	[Contents]	Blockade of the SM/CM PCB has been completed.
	[Action]	None
0715		Restoring the Shared Memory and Cache Memory PCB is completed. Please check subsystem status with STATUS.
	[Contents]	Restoration of the SM/CM PCB has been completed.
	[Action]	Check the DKC status using the Status.
0716		Blocking the CPS PCB is completed.
	[Contents]	Blockade of the CPS PCB has been completed.
	[Action]	None

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ID	Kind	Description
0717		Restoring the CPS PCB is completed. Please check subsystem status with STATUS.
	[Contents]	Restoration of the CPS PCB has been completed.
	[Action]	Check the DKC status using the Status.
0718		Basic power supply is abnormal.
	[Contents]	The basic power supply is abnormal.
	[Action]	Execute the power supply replacement.
0719		SVP could not control the environment monitor.
	[Contents]	The environment monitor cannot be updated.
	[Action]	Wait until the SSVP becomes ready. If it cannot be performed still, replace the SSVP.
0720		SVP could not access to the environment monitor.
	[Contents]	The environment monitor cannot be accessed.
	[Action]	Wait until the SSVP becomes ready. If it cannot be performed still, replace the SSVP.
0721		Replaced PCB is abnormal. Are you sure you want to perform INLINE CUDG, once more?
	[Contents]	Replacement of the PCB was terminated abnormally. Do you want to perform the INLINE CUDG once more?
	[Action]	Answer to the inquiry.
0722		Pending CFW data exist. Cache maintenance is prohibited.
	[Contents]	Cache maintenance is inhibited because the CFW data remains.
	[Action]	None
0723		Redundant power supply is abnormal.
	[Contents]	The redundant power supply is abnormal.
	[Action]	Confirm the Status/log and recover the problem.
0724		This PCB restarting is done.
	[Contents]	The redundant power supply is abnormal.
	[Action]	None
0725		This PCB restarting is fail.
	[Contents]	Restart of the PCB was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0726		This PCB can not restart.
	[Contents]	Restart of the PCB cannot be executed.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0727		Only one processor in this PCB restarting is done.
	[Contents]	Only one processor can be specified for the PC restarting function.
	[Action]	None
0728		Half side of the cache memory configuration has been already changed. You should confirm the status, and redefine the Device Structure.
	[Contents]	Configuration of half side cache memory was changed.
	[Action]	Check the status and define the device configuration once again.
0729		SVP-DKC Version unmatch! Close ONLINE task, and confirm the version.
	[Contents]	Version of the SVP and DKC are inconsistent with each other.
	[Action]	Make the microprogram versions consistent each other.
0730		Please replace the SCSI Buffer. After replacement, please press OK.
	[Contents]	Execute the SCSI buffer replacement.
	[Action]	Answer to the inquiry.
0731		SET ID = %s
	[Contents]	Make a setting of the ID.
	[Action]	None
0732		Previously failed or blocked parts should be serviced first. Do you stop this process?
	[Contents]	Do you continue the maintenance though there is a failed or blocked part?
	[Action]	Confirm the Status/log, and recover the problem or continue the maintenance depending on the case.
0733		Confirm the blocked part with the status function, and restore it first.
	[Contents]	Restore the blocked section and then perform the maintenance.
	[Action]	Confirm the Status/log and recover the problem.
0734	**W**	Internal subsystem status is under maintenance(%s). No maintenance can be performed now.
	[Contents]	Maintenance work is being inhibited.
	[Action]	Confirm the status and wait until the maintenance can be executed. See TRBL05-160.
0735		Redundancy is lost and blocking this part stops subsystem functionality. Do you stop this process ?
	[Contents]	Do you continue the maintenance though the redundancy is lost by blockade this part?
	[Action]	Confirm the Status/log, and recover the problem or continue the maintenance depending on the case.

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ID	Kind	Description
0736		Please try again.
	[Contents]	Retry.
	[Action]	Retry.
0737		Changing of arbiter master is rejected . error code = %s
	[Contents]	An error occurred due to the switching of the arbiter master.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0738		SVP could not light the LED of the SCSI Buffer. Please pull the SCSI Buffer out.
	[Contents]	Pull out the SCSI buffer since the LED of the SCSI buffer could not be turned on.
	[Action]	Pull out the SCSI buffer.
0739		Mapping of the de-install drives has been changed. Return it to the original mapping using copy back function.
	[Contents]	Mapping of the deinstalled drives was changed.
	[Action]	Return the mapping to the original one using the copy back function.
0740		Do you want to pull out CPM PCB only now?
	[Contents]	Do you want to execute the pulling out of the CPM PCB only?
	[Action]	Answer to the inquiry.
0741		Changing of arbiter master is rejected . error code = 4 MP code = %s
	[Contents]	An error occurred due to a switching of the arbiter master.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0742		When you push [OK], the LED of the CPM PCB will be lit and then please insert the jumper into the CPS PCB.
	[Contents]	This is an operation guidance message.
	[Action]	Check and operate according to the message.
0743		Are you sure you want to de-installation the Shared Memory Cache Memory PCB?
	[Contents]	Do you want to deinstall the SM/CM PCB?
	[Action]	Answer to the inquiry.
0744		Parameter error 32.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0745		Parameter error 33.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.

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ID	Kind	Description
0746		Parameter error 34.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0747		Parameter error [%s]!
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0748		You have cast same command to DKC. The object is already blocked.
	[Contents]	-
	[Action]	-
0749		Configuration data changing is fail. Return code = [%s]
	[Contents]	Change of the configuration information was terminated abnormally.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0750		Do you want to restore the CPS PCB now?
	[Contents]	Do you want to execute the CPS PCB restoration?
	[Action]	Answer to the inquiry.
0751		Condition of securing cache segment over the limit.
	[Contents]	The cache segment value exceeded the threshold value for blockade.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0752		Amount of cache segment over the limit.
	[Contents]	The cache segment value exceeded the total value.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0753		There is no response from DKC within the time limit.
	[Contents]	Communication with the DKC resulted in time-out.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0754		Restoring the CHA is failed.
	[Contents]	Restoration of the CHA was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0755		Are you sure you want to upgrade the CHA?
	[Contents]	Do you want to execute the CHA addition?
	[Action]	Answer to the inquiry.
0756		Are you sure you want to upgrade the physical device?
	[Contents]	Do you want to execute the physical device addition?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
0757		Are you sure you want to upgrade the Cache Memory PCB?
	[Contents]	Do you want to execute the CM PCB addition?
	[Action]	Answer to the inquiry.
0758		Are you sure you want to de-installation the CHA?
	[Contents]	Do you want to execute the CHA deinstallation?
	[Action]	Answer to the inquiry.
0759		Are you sure you want to de-installation the Physical drive?
	[Contents]	Do you want to execute the physical device deinstallation?
	[Action]	Answer to the inquiry.
0760		Are you sure you want to de-installation the Cache Memory PCB?
	[Contents]	Do you want to execute the CM PCB deinstallation?
	[Action]	Answer to the inquiry.
0761		Upgrading the CHA...
	[Contents]	The CHA is being added.
	[Action]	None
0762		Upgrading of the CHA is completed.
	[Contents]	Addition of the CHA has been completed.
	[Action]	None
0763		Upgrading of the CHA is failed.
	[Contents]	Addition of the CHA was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0764		De-installation of the CHA...
	[Contents]	The CHA is being deinstalled.
	[Action]	None
0765		Blocking the logical device is completed.
	[Contents]	Blockade of the logical device has been completed.
	[Action]	None
0766		Blocking the logical device is failed.
	[Contents]	Blockade of the logical device was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0767		Restoring the logical device is completed.
	[Contents]	Restoration of the logical device has been completed.
	[Action]	None

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ID	Kind	Description
0768		Restoring the logical device is failed.
	[Contents]	Restoration of the logical device was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0769		There is no logical device which correspond to the physical device.
	[Contents]	There is no logical device which corresponds to the physical device.
	[Action]	Execute the confirmation of the configuration information.
0770		Waiting for Power Event...
	[Contents]	Wait for the power event.
	[Action]	Wait.
0771		Please replace the PCB. After replacement, please press OK.
	[Contents]	Select OK after replacing the PCB.
	[Action]	Answer to the inquiry.
0772		Are you sure you want to replace the micro program?
	[Contents]	Do you want to execute the microprogram replacement?
	[Action]	Answer to the inquiry.
0773		SVP could not stop the motor of the physical device.
	[Contents]	The motor of the physical device cannot be stopped.
	[Action]	Execute the replacement of the concerned device.
0774		SVP could not light the LED of the physical device.
	[Contents]	The LED of the physical device cannot be turned on.
	[Action]	Execute the replacement of the concerned device.
0775		Upgrading the logical device...
	[Contents]	The logical device is being added.
	[Action]	None
0776		De-installation of the logical device...
	[Contents]	The logical device is being deinstalled.
	[Action]	None
0777		Changing of arbiter master is failed.
	[Contents]	Change of the arbiter master was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0778		Spinning up the physical devices...
	[Contents]	The physical device is being spinned up.
	[Action]	None

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ID	Kind	Description
0779		SVP can receive no more maintenance direction.
	[Contents]	Maintenance instructions cannot be done at all.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0780		Parameter error 01.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0781		Parameter error 03.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0782		Parameter error 04.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0783		Parameter error 05.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0784		Parameter error 10.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0785		Parameter error 11.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0786		Parameter error 12.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0787		Parameter error 13.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0788		Parameter error 14.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0789		Parameter error 15.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.

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ID	Kind	Description
0790		Parameter error 16.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0791		Parameter error 02.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0792		Parameter error 18.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0793		Are you sure you want to reset processor?
	[Contents]	May the processor be reset?
	[Action]	Answer to the inquiry.
0794		This maintenance is now in progress. You can not direct multiple this maintenance.
	[Contents]	You cannot execute other maintenance because this maintenance is being executed.
	[Action]	Wait until the maintenance is completed.
0795		Resetting the processor in progress...
	[Contents]	The processor is being reset.
	[Action]	None
0796		Resetting the processor is failed.
	[Contents]	Reset of the processor was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0797		Resetting the processor is completed.
	[Contents]	Reset of the processor has been completed.
	[Action]	None
0798		Parameter error 19.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0799		Parameter error 20.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.

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ID	Kind	Description
0800		Parameter error 21.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0801		Parameter error 23.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0802		Parameter error 25.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0803		Half side of the cache memory configuration has been already changed. Are you sure you want to renew the other side of cache memory?
	[Contents]	Configuration of half side cache memory was changed.
	[Action]	Operate after checking whether it can be renewed.
0804		The logical device is not yet blocked. LDEV = %s
	[Contents]	Blockade of the logical device is not completed yet.
	[Action]	Wait for a while and retry.
0805		Formatting the logical device is failed. LDEV = %s
	[Contents]	Formatting of the logical device was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0806		Are you sure you want to restart the Micro processor?
	[Contents]	Do you want to execute the restart of the microprocessor?
	[Action]	Answer to the inquiry.
0807		SVP requirement is rejected by DKC. You should confirm status of the target.
	[Contents]	Instructions of the SVP were rejected by the DKC.
	[Action]	Confirm the Status/log and recover the problem.
0808		Some physical devices were failed to equip. You should check the physical/logical device status.
	[Contents]	Two or more physical devices are blocked.
	[Action]	Confirm the Status/log and recover the problem.
0809		This Physical Devices is not under recovering. You should check the physical/logical device status.
	[Contents]	The physical device cannot be recovered.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0810		Recovering of DKA-HDU Path is failed.
	[Contents]	Recovery of the path between the DKA and the HDU was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0811		Interruption of the disk copy is failed.
	[Contents]	Interruption of the disk copy was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0812		Interruption of the correction copy is failed.
	[Contents]	Interruption of the correction copy was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0813		Renewal process has failed.
	[Contents]	The renewal processing was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0814		SCSI BUS initialization is failed.
	[Contents]	Initialization of the SCSI bus was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0815		All the DKA which connected to the Physical Device is blocked.
	[Contents]	All the DKCs connected to the physical device are blocked.
	[Action]	Check the DKA status.
0816		LDCB Address bitmap %s
	[Contents]	-
	[Action]	-
0817		Installation(de-installation) is not yet completed. It must be taken up first before new installation(de-installation). Please redefine configuration as what you wanted to install(de-install),then renew subsystem again.
	[Contents]	Addition (deinstallation) is not completed.
	[Action]	Operate according to the message.
0818		Installation(de-installation) is not yet completed. installation(de-installation) will be taken up from now. +F0858 But,first of all,configuration must be redefined as what you wanted to install(de-install). Have you already redefined it?
	[Contents]	Addition (deinstallation) is not completed..
	[Action]	Operate according to the message.

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ID	Kind	Description
0819		Shared Memory is blocked. Please restore it,first.
	[Contents]	The SM was blocked.
	[Action]	Perform the restoration.
0820		Formatting the logical device was not interrupted.
	[Contents]	Formatting of the logical device cannot be interrupted.
	[Action]	Confirm the Status/log and recover the problem.
0821		Illegal data received.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0822		Confirm all the Physical Devices have been restored,and please format all the blocked Logical Devices.
	[Contents]	This is a confirmation message.
	[Action]	Check the status according to the message and operate.
0823		Please don't de-install the redundant power supply(ACBOX) before blocking of Cluster-2. If de-installation of the CHA/DKA or the physical devices other than the redundant power supply has been completed, press OK.
	[Contents]	Do not deinstall the redundant power supply box when the Cluster-2 is blocked.
	[Action]	Check and operate according to the message.
0824		Please select single item. [%s]
	[Contents]	Two or more items cannot be selected at the same time.
	[Action]	Select one item only.
0825		Replace or pull out the Memory PCBs of cluster-%s. When completed, please press OK.
	[Contents]	Pull out and then insert the SM/CM PCB of the indicated cluster.
	[Action]	Answer to the inquiry after pulling it out and then insert it.
0826		The logical devices are not normal.
	[Contents]	The logical devices will not become normal.
	[Action]	Refer to the Status/log and recover the problem.
0827		Verifying the logical devices is not supported.
	[Contents]	The parity matching function is not supported yet.
	[Action]	Execute the microprogram version up.
0828		Verifying the logical devices is finished.
	[Contents]	Parity matching check has been completed.
	[Action]	None

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ID	Kind	Description
0829		Executing LCP/MCP Patch Editor Task is failed. Confirm the existence of the load module.
	[Contents]	Failure in the PC.
	[Action]	Execute the PC replacement.
0830		Are you sure you want to perform DKU PATH INLINE for the physical device?
	[Contents]	May the DKU Path Inline be executed?
	[Action]	Answer to the inquiry.
0831		DKU PATH INLINE is now running...
	[Contents]	The DKU Path Inline is being executed.
	[Action]	None
0832		The path to the physical device is normal.
	[Contents]	Pass connection with the physical device is normal.
	[Action]	None
0833		All the path to the physical device is abnormal. Error code = [%s]
	[Contents]	All the connections with the physical device were terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0834		The logical device [%s] is not yet equipped in subsystem.
	[Contents]	The logical device is not reflected yet on the configuration information.
	[Action]	Collect the one-touch dump/FD copy and solve the problem.
0835		The logical device is not yet blocked.
	[Contents]	Blockade of the logical device is not completed yet.
	[Action]	Confirm the Status/log and recover the problem.
0836		Are you sure you want to switch the SCSI Buffer LED off?
	[Contents]	Do you want to turn the SCSI buffer LED off?
	[Action]	Answer to the inquiry.
0837		This is not DKA, Please select DKA for SCSI Buffer LED maintenance.
	[Contents]	The DKA is not selected.
	[Action]	Select the DKA and perform the processing.
0838		No SCSI was selected, so there is no action to DKC.
	[Contents]	-
	[Action]	-

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ID	Kind	Description
0839		Please confirm you have already varied off the concerned Channel paths. If OK, please press OK.
	[Contents]	Check if the connection with the channel path is placed offline.
	[Action]	After checking it, answer to the inquiry.
0840		Blocking the CHA was canceled.
	[Contents]	Blockade of the CHA was canceled.
	[Action]	None
0841		Blocking the DKA was canceled.
	[Contents]	Blockade of the DKC was canceled.
	[Action]	None
0842		Is the LED of the target PCB lit?
	[Contents]	Is the LED turned on?
	[Action]	Answer to the inquiry.
0843		Please insert the jumper into the target PCB, then pull it out without considering the status of the LED.
	[Contents]	This is an operation guidance message.
	[Action]	Check and operate according to the message.
0844		This function is available in Debug mode only. Please vary the current mode to Debug.
	[Contents]	-
	[Action]	-
0845		DKU INLINE is now running...
	[Contents]	The DKU INLINE is being executed.
	[Action]	None
0846		Executing Special PCB Maintenance Task is failed. Confirm the existence of Special PCB Maintenance load module.
	[Contents]	Failure in the PC
	[Action]	Execute the PC replacement.
0847		The target is not yet equipped to subsystem.
	[Contents]	-
	[Action]	-
0848		RAID configuration data changing is completed.
	[Contents]	Change of the RAID configuration information has been completed.
	[Action]	None

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ID	Kind	Description
0849		RAID configuration data changing is failed.
	[Contents]	Change of the RAID configuration information was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0850		Please select single item.
	[Contents]	Two or more items cannot be selected.
	[Action]	Select one item only.
0851		Checking the physical device condition...
	[Contents]	Status of the physical device is being checked.
	[Action]	None
0852		Shared memory module number over the limit.
	[Contents]	Number of the SM modules exceeded the maximum value.
	[Action]	None
0853		Shared memory renewal is in progress...
	[Contents]	The SM status is being renewed.
	[Action]	None
0854		The physical device is not yet blocked. Please block it first.
	[Contents]	Blockade of the physical device is not completed yet.
	[Action]	Execute the blockade.
0855		There is no redundancy in the physical devices. So, you can not perform correction copy.
	[Contents]	Correction copy cannot be executed because there is no redundancy.
	[Action]	Execute the physical device replacement.
0856		Upgrading and de-installation can not be performed in same time. Please redefine the Device Structures.
	[Contents]	Both an addition and a removal are specified.
	[Action]	Execute either setting.
0857		The replaced physical device is normal.
	[Contents]	Replacement of the physical device has been completed.
	[Action]	None
0858		The replaced physical device is abnormal. Error code = [%s]
	[Contents]	Replacement of the physical device was terminated abnormally.
	[Action]	Refer to the Status/log and recover the problem.

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ID	Kind	Description
0859		Password was invalid.
	[Contents]	Inputted password is invalid.
	[Action]	Input a correct password.
0860		Do you want to stop this process?
	[Contents]	Do you want to stop the processing?
	[Action]	Answer to the inquiry.
0861		Formatting the logical device is already completed.
	[Contents]	Formatting of the logical device has been already completed.
	[Action]	None
0862		Correction copy from disk drives was already completed.
	[Contents]	Correction copy from the data drives has been already completed.
	[Action]	None
0863		Recovering the data from spare disk was already completed.
	[Contents]	Recovery of the data form the spare disk has been completed.
	[Action]	None
0864		Disk copy was already completed.
	[Contents]	Disk copy has been completed.
	[Action]	None
0865		Are you sure you want to perform DKU INLINE for the physical device?
	[Contents]	May the DKU INLINE be executed for the physical device?
	[Action]	None
0866		The target PCB is not yet blocked. Please block it first.
	[Contents]	The target PCB is not blocked.
	[Action]	Block the concerned section.
0867		Blocking the Cache Memory PCB results in loss of cache redundancy. Are you sure you want to block the PCB?
	[Contents]	May the blockade of the CM PCB be executed though blocking them results in loss of redundancy?
	[Action]	After calling the TSC, block it under unavoidable circumstances.
0868		De-installation of the unit may cause fatal damage to subsystem. Do you want to stop this process?
	[Contents]	Removal of the concerned section causes unrecoverable status of the subsystem.
	[Action]	After calling the TSC, block it under unavoidable circumstances.

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ID	Kind	Description
0869		Please install the units in the system before starting this process. If installation has been completed, push OK.
	[Contents]	Execute the installation of the concerned section.
	[Action]	Answer to the inquiry after installing it.
0870		There is no change in configuration data (upgrade / de-installation).
	[Contents]	Configuration information is not changed yet.
	[Action]	Input correct data.
0871		The physical device is now under recovering. Do you want to continue de-installation process?
	[Contents]	The physical device is being recovered.
	[Action]	Wait for the recovering processing or continue the deinstallation.
0872		Replace or insert the Memory PCBs of cluster-%s. When completed, please press OK.
	[Contents]	Replace or insert the SM/CM PCB of the concerned cluster.
	[Action]	Answer to the inquiry after replacing or inserting it.
0873		Subsystem is now under initializing. Please retry after minutes.
	[Contents]	Initialization is being executed.
	[Action]	Wait for a few minutes and retry.
0874		Blocking the DKA is rejected by subsystem KERNEL.
	[Contents]	Logical inconsistency in the DKC
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0875		Pending CFW data exist. You should terminate CFW jobs first or these jobs will be aborted.
	[Contents]	Maintenance cannot be executed because the CFW job remains.
	[Action]	Retry after completing the CFW job.
0876		DKC subsystem is too busy. Please retry when the subsystem load is lower.
	[Contents]	The DKC is busy.
	[Action]	Wait for a few minutes and retry.
0877		Subsystem internal job is unsuccessful in restoring of Shared Memory.
	[Contents]	SM restoration cannot be executed because the job remains in the DKC.
	[Action]	Wait for a few minutes and retry. When it is not restored, collect the one-touch dump/ FD copy and call the TSC.

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ID	Kind	Description
0878		Processor was not blocked within the time limit. Please confirm the processor status. If it is not blocked,please retry again.
	[Contents]	The blockade could no be executed due to time out.
	[Action]	Refer to the Status/log and recover the problem. When it is not recovered, collect the one- touch dump/FD copy and call the TSC.
0879		Formatting the logical devices was not finished within the time limit. Please confirm the logical device status.
	[Contents]	Formatting of the logical device could not be executed due to time out.
	[Action]	Refer to the Status/log and recover the problem. When it is not recovered, collect the one- touch dump/FD copy and call the TSC.
0880		Configurations are different between DKC and SVP. You need the password to continue.
	[Contents]	Configuration information is different between the DKC and the SVP.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0881		Configurations are different between DKC and SVP. You need installation first.
	[Contents]	Configuration information is different between the DKC and the SVP.
	[Action]	Execute the installation (Def Conf & Install).
0882		Blocking this part lost the data housed in the logical device. Do you stop this process ?
	[Contents]	Data in the logical device will be destroyed.
	[Action]	After calling the TSC, block it under unavoidable circumstances.
0883		Processor was not restored within the time limit. Please confirm the processor status. If it is not restored,please retry again.
	[Contents]	The processor was not restored within the time limit.
	[Action]	Confirm the Status/log and recover the problem.
0884		Verifying the logical devices is failed.
	[Contents]	Matching check of the logical devices was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0885		Verifying the logical devices is stopped.
	[Contents]	Matching check of the logical devices was canceled.
	[Action]	None
0886		Verifying the logical devices is interrupted by SVP.
	[Contents]	Matching check of the logical devices was interrupted by the SVP.
	[Action]	None

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ID	Kind	Description
0887		Verifying the logical devices...
	[Contents]	The matching of the logical devices is being checked.
	[Action]	None
0888		Please insert dump FD and push [Yes]. If you don't have dump FD,please push[No].
	[Contents]	Insert the dump FD.
	[Action]	Answer to the inquiry.
0889		SVP can not connect with the replaced PCB. Please retry [Replace] of PCB.
	[Contents]	Replacement of the PCB cannot be executed.
	[Action]	Confirm the Status/log and recover the problem.
0890		Some path to the physical device is abnormal. Error code = [%s]
	[Contents]	Some paths to the physical device is abnormal.
	[Action]	Confirm the Status/log and recover the problem.
0891		SCSI cable is connected inadequately. Please check the SCSI cable. Error code = [%s]
	[Contents]	Connection of the SCSI cable is abnormal.
	[Action]	Confirm the Status/log and recover the problem.
0892		DKA path status changing is failed(Although restoration of DKA itself is competed). Some path status may be not correct. Please execute Path INLINE later. Spin up process will be continued from now.
	[Contents]	Change of the DKA path status failed.
	[Action]	After a while, execute the path inline.
0893		SVP can not restore the data in the logical devices automatically.
	[Contents]	The data in the logical devices cannot be restored.
	[Action]	Confirm the Status/log and recover the problem.
0894		LDEV can be restored by Logical Device Maintenance. Do you want to continue?
	[Contents]	Restoration cannot be executed due to the logical device maintenance.
	[Action]	Answer to the inquiry.
0895		Logical restoration check is failed. Though, PDEV replace may be possible. Do you want to continue?
	[Contents]	Logical restoration check failed. However, the PDEV can be replaced.
	[Action]	Operate according to the message.

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ID	Kind	Description
0896		Do you want to restore Logical Device and Physical Device ? Yes : Logical Device and Physical Device No : Logical Device only
	[Contents]	Do you want to restore the logical/physical device?
	[Action]	Answer to the inquiry.
0897		SVP could not spin up the physical devices. %s
	[Contents]	Spinning up of the physical device cannot be executed.
	[Action]	Confirm the Status/log and recover the problem.
0898		Product Number of the Physical Device is illegal. Please check the Physical Device. %s
	[Contents]	Product serial number of the physical device is illegal.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0899		Please retry in manual restoration.
	[Contents]	Do you want to retry?
	[Action]	Answer to the inquiry.
0900		Emulation type is different. Please de-installation the Spare Drive.
	[Contents]	Emulation type is illegal.
	[Action]	Execute the spare drive removal.
0901		Emulation type check is not supported.
	[Contents]	The emulation check function is not supported.
	[Action]	Execute the microprogram version up.
0902		Gathering PDEV information...
	[Contents]	PDEV information is being gathered
	[Action]	None
0903		Please remove the dump FD.
	[Contents]	Remove the dump FD.
	[Action]	Remove the dump FD.
0904		Previously failed or blocked parts should be serviced first.
	[Contents]	A failed or blocked section exists.
	[Action]	Confirm the Status/log and recover the problem.
0905		Invalid Error Stop value. Please input again.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.

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ID	Kind	Description
0906		It is not necessary to verify the specified logical device. Because the RAID type is RAID0.
	[Contents]	The matching check of the logical device is not necessary because the RAID level is RAID0.
	[Action]	None
0907		Please replace these PCBs whose LED was lighted on.(%s) (A)If the PCB was detected by DIAG, please replace the PCB. (B)If the PCB was not detected by DIAG, please remove and insert the same PCB. When completed, please press OK.
	[Contents]	Replace the PCBs whose LED is on.
	[Action]	Operate according to the message.
0908		Error was detected at SCSI cable. Location = %s Please replace the SCSI cable.
	[Contents]	An error was detected in the connection of the SCSI cable.
	[Action]	Replace the abnormal section.
0909		[ONL0066W] Pinned Track exists.
	[Contents]	A PIN data exists.
	[Action]	Execute the restoration of the PIN data.
0910		[ONL0066W] Pinned Track exists. Do you stop this process?
	[Contents]	A PIN data exists.
	[Action]	Answer to the inquiry.
0911		[ONL2031W] Maintenance object devices include Remote Copy volumes. You should delete the Remote Copy volume pair.
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation and end the Remote Copy volume pair.
0912		[ONL2032W] You should suspend the Remote Copy volume pair. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation. You should delete RCU operation by decided with customers and retry again.
0913		[ONL2033W] This part includes the last logical path between MCU and RCU of Remote Copy. You should delete or suspend the Remote Copy volume pair. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end or suspend the pair. If [No], SVP will continue the process, but you must be careful to operate.

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ID	Kind	Description
0914		[ONL2034W] Maintenance object devices include Remote Copy volumes. You should delete the Remote Copy volume pair using SVP operation on MCU.
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation and delete the Remote Copy volume pair.

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ID	Kind	Description
0915		Not Supported
	[Contents]	The function is not supported.
	[Action]	Execute the microprogram version up.
0916		Entered Entry No. does not exist in file.
	[Contents]	The concerned entry No. does not exist.
	[Action]	Input correct data.
0917		FM Write Task Execute Error
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
0918		Entry No=%02Xh , Number Of Patches=%d
	[Contents]	Number of patches in the concerned entry is displayed.
	[Action]	None
0919		All Of Entry No , Number Of Patches=%d
	[Contents]	Number of patches in all the entries is displayed.
	[Action]	None
0920		Are you sure you want to execute Online Patch?\r
	[Contents]	Do you want to execute an on-line patch?
	[Action]	Answer to the inquiry.
0921		Are you sure you want to download the LCP?
	[Contents]	Do you want to download the LCP?
	[Action]	Answer to the inquiry.
0922		Are you sure you want to download the MCP?
	[Contents]	Do you want to download the MCP?
	[Action]	Answer to the inquiry.
0923		Available only in modify mode.
	[Contents]	It is a function of the modify mode.
	[Action]	Change the mode to “modify”.
0924		DKC emulation type is inconsistent with DKU emulation type.
	[Contents]	Emulation types of the DKC and the DKU are inconsistent.
	[Action]	Review the configuration information and make the setting again.
0925		DKC emulation type is not compatible with DKU type. DKC type = I-3990-6 and there is a DKU type = I-3380-K in use.
	[Contents]	Emulation types of the DKC and the DKU are inconsistent.
	[Action]	Review the configuration information and make the setting again.

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ID	Kind	Description
0926		You need to change DKC type to I-3990-3. (DKC P/S off, generation change and OS IPL are required.) Please readjust DKC type when possible.
	[Contents]	It is necessary to change the DKC type.
	[Action]	Check whether the DKC type can be changed and operate.
0927		Cache/shared memory capacity is different between cluster-1 and cluster-2. Cluster-1:SM %dMB,CM %dMB Cluster-2:SM %dMB,CM %dMB
	[Contents]	CM/SM capacities of the cluster 1 and the cluster 2 are different.
	[Action]	Review the configuration information and make the setting again.
0928		Subsystem ID is inconsistent with DKC emulation type. Do you continue this process without a check on it?
	[Contents]	The SSID emulation type is inconsistent with the DKC emulation type.
	[Action]	Review the configuration information and make the setting again.
0929		CHA is not selected.
	[Contents]	The CHA is not selected.
	[Action]	Select the CHA.
0930		Cache capacity is 2GBx2 or less. It is inconsistent with cache redundant power supply.
	[Contents]	The cache redundant power supply cannot be set because the cache capacity is small.
	[Action]	Review the configuration information and make the setting again.
0931		Illegal redundant power supply.
	[Contents]	Setting of the redundant power supply is illegal.
	[Action]	Review the configuration information and make the setting again.
0932		Logical devices are inconsistent with the device control value.
	[Contents]	The number of logical devices is inconsistent with that of the controlled devices.
	[Action]	Review the configuration information and make the setting again.
0933		2x%dMB total shared memory is required.
	[Contents]	The indicated SM is required.
	[Action]	Install the indicated SM on the PCB.
0934		Definition of device structure was finished. Change subsystem configuration by using Renewal Subsystem function.
	[Contents]	Setting of configuration information has been completed. Execute "Renewal Subsystem" after this.
	[Action]	Execute "Renewal Subsystem."

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ID	Kind	Description
0935		Change Subsystem
	[Contents]	Change of the configuration information.
	[Action]	None
0936		The specified control value is inconsistent with device address. Please check and select the control value again.
	[Contents]	The number of devices is inconsistent with that of the controlled devices.
	[Action]	Review the configuration information and make the setting again.
0937		Channel Configuration
	[Contents]	Change of the channel configuration information.
	[Action]	None
0938		Device address will be adjusted.
	[Contents]	The device number is adjusted.
	[Action]	None
0939		Channel speed is not specified.
	[Contents]	Inputted channel speed is invalid.
	[Action]	Input correct data.
0940		RAID1 or I-3390-9 can not be installed.
	[Contents]	RAID1 or 1-3390-9 is not set.
	[Action]	Review the configuration information and make the setting again.
0941		ONLINE,INSTALL and DIAGNOSIS are exclusive.
	[Contents]	The ONLINE, INSTALL, and DIAGNOSIS screen cannot be activated at the same time.
	[Action]	Close the active screen and then open the required screen.
0942		Exit
	[Contents]	Termination of the screen.
	[Action]	None
0943		This will end the %s.
	[Contents]	Termination of the screen.
	[Action]	None
0944		Online Maintenance
	[Contents]	On-line maintenance screen
	[Action]	None

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ID	Kind	Description
0945		Copyright (C) 1994-1996,Hitachi,Ltd.
	[Contents]	Copyright indication.
	[Action]	None
0946		SVP
	[Contents]	SVP (title)
	[Action]	None
0947		DKC emulation type is not compatible with DKU type. DKC type = I-3990-6 and there is a DKU type = I-3380-K in use.
	[Contents]	The DKC emulation type is inconsistent with the DKU type.
	[Action]	Review the configuration information and make the setting again.
0948		There is inconsistency between PCB type, drive type and cache module size.
	[Contents]	A combination of PCB type, drive type, and cache module size is illegal.
	[Action]	Review the configuration information and make the setting again.
0949		File I/O error has occurred. Mode can not be changed.
	[Contents]	Only the modify mode can be executed.
	[Action]	Change the mode to “modify”.
0950		Password is invalid.
	[Contents]	Inputted password is invalid.
	[Action]	Input correct data.
0951		Parallel Channels are not equipped.
	[Contents]	There are no parallel channels in the configuration information.
	[Action]	Review the configuration information and make the setting again.
0952		This operation will be unavoidable changing I/O generation.
	[Contents]	-
	[Action]	-
0953		Configurations are not changed.
	[Contents]	The configuration information is not changed yet.
	[Action]	Review the configuration information and make the setting again.
0954		Please replace the parallel CHAs. The new configuration will be available after the replacement.
	[Contents]	It is necessary to replace the CHA.
	[Action]	After the replacement, a new configuration can be defined.

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ID	Kind	Description
0955		Does DKC support \"SM addition\"?
	[Contents]	-
	[Action]	-
0956		Does DKC support \"New Cache Directory\"?
	[Contents]	-
	[Action]	-
0957		SPC Blockade
	[Contents]	Blockade of the SPC
	[Action]	None
0958		Config DownLoad Start
	[Contents]	Download of the configuration information was started.
	[Action]	None
0959		Sum Sum Sum
	[Contents]	-
	[Action]	-
0960		Config DownLoad
	[Contents]	The configuration information is being downloaded.
	[Action]	None
0961		Config DownLoad End
	[Contents]	Download of the configuration information has been completed.
	[Action]	None
0962		Restore SPC
	[Contents]	The SPC is being restored.
	[Action]	None
0963		[ONL2079W] Remote data copy in progress. please wait for copy end or you should delete or suspend the Remote Copy volume pair using SVP operation on MCU. Do you stop this process?
	[Contents]	-
	[Action]	-
0964		Setting communication environment failed.
	[Contents]	Setting of the communication environment was terminated abnormally.
	[Action]	-

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ID	Kind	Description
0965		Environment monitor package, ""%s,"" is failed.
	[Contents]	An error was detected in the environment monitor.
	[Action]	Execute the replacement of the concerned PCB.
0966		Please vary the drives off-line only whose emulation type will be changed. And enter a password to continue.
	[Contents]	Place the drive connection off-line in order to change the emulation type.
	[Action]	Continue the processing by inputting a password after placing it off-line.
0967		Please confirm the drives whose emulation type will be changed have been already varied off-line.
	[Contents]	Place the connection off-line in order to change the emulation type.
	[Action]	Place it off-line.
0968		Changing emulation type is normal end. Please vary the drives on-line.
	[Contents]	Change of the emulation type has been completed.
	[Action]	Place the connection with the drive on-line.
0969		Changing emulation type is failed.
	[Contents]	Change of the emulation type was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
0970		Warning. Can't disable the environment check.
	[Contents]	The environment monitor disabling process cannot be executed.
	[Action]	Wait until the SSVP becomes ready.
0971		Warning. Can't enable the environment check.
	[Contents]	The environment monitor resuming process cannot be executed.
	[Action]	Wait until the SSVP becomes ready.
0972		Emulation type change error has occurred.
	[Contents]	An error was detected in the emulation type changing process.
	[Action]	Confirm the Status/log and recover the problem.
0973		Warning. Can't read the environment monitor.
	[Contents]	The environment monitoring data cannot be read.
	[Action]	Wait until the SSVP becomes ready.
0974		Online Patch Execute Error !!
	[Contents]	An error occurred during execution of the on-line patch.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
0975		Online Patch Normal End
	[Contents]	On-line patch has been completed.
	[Action]	None
0976		Are you sure you want to download the LCP and MCP?
	[Contents]	May the download of the LCP/MCP be executed?
	[Action]	Answer to the inquiry.
0977		Target Is Not Equipped
	[Contents]	The target does not exist in the configuration information.
	[Action]	Select the section where it exists.
0978		Are you sure you want to download the LCP?
	[Contents]	Do you execute the download to the LCP.
	[Action]	Answer to the inquiry.
0979		Configuration File Read Error
	[Contents]	File failure in the PC.
	[Action]	Execute the PC replacement.
0980		Entry No. should be a 2_digit hexadecimal number.
	[Contents]	Entry Nos. must be hexadecimal.
	[Action]	None
0981		Invalid Control Information
	[Contents]	A file in the PC is invalid.
	[Action]	Execute the PC replacement.
0982		Check Byte Parity Error
	[Contents]	File failure in the PC
	[Action]	Execute the PC replacement.
0983		Sum Check Error
	[Contents]	File failure in the PC
	[Action]	Execute the PC replacement.
0984		File I/O Error
	[Contents]	File failure in the PC
	[Action]	Execute the PC replacement.
0985		Invalid Secret Key is entered.
	[Contents]	Input is invalid
	[Action]	Input correct data.

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ID	Kind	Description
0986		Unable to get timer.
	[Contents]	Failure in the PC
	[Action]	Execute the PC replacement.
0987		The writing of ASSIST configuration file has not completed.
	[Contents]	File failure in the PC
	[Action]	Execute the PC replacement.
0988		You can't open this window because this SVP is not MASTER SVP.
	[Contents]	This is a function which can be used only in the master SVP.
	[Action]	None
0989		DDE Common Function Error
	[Contents]	Logic in the PC is contradictory.
	[Action]	Execute the PC reboot.
0990		Memory Error
	[Contents]	Memory failure in the PC
	[Action]	Execute the PC reboot, and when it cannot be recovered, replace the PC.
0991		A master is double defined.
	[Contents]	Two masters were defined in the RS422 connection.
	[Action]	Review the configuration information and make the setting again.
0992		Connection error has occurred. SVP-SSVP
	[Contents]	An error occurred in the communication between the SVP and the SSVP.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.
0993		The connection failed.
	[Contents]	An error occurred in the communication between the SVP and the SSVP.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.

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ID	Kind	Description
0994		There is not replying from the master.
	[Contents]	There is no response from the master.
	[Action]	Review the connection of RS422 and the configuration information.
0995		It isn't possible to open window because SVP attribute isn't set.
	[Contents]	SVP attribute is not set yet.
	[Action]	Review the configuration information and make the setting again.
0996		The physical address overlaps.
	[Contents]	Definition of the physical address duplicates.
	[Action]	Review the configuration information and make the setting again.
0997		The logical address overlaps.
	[Contents]	Definition of the logical address duplicates.
	[Action]	Review the configuration information and make the setting again.
0998		Input telephone no delete OK?
	[Contents]	May the deletion of the telephone number be executed?
	[Action]	Answer to the inquiry.
0999		Input center delete OK?
	[Contents]	May the deletion of the center setting be executed?
	[Action]	Answer to the inquiry.
1000		The Auto Call/Auto Answer Link information can be initialized. May it be initialized?
	[Contents]	May the auto call/auto answer link information be initialized?
	[Action]	Answer to the inquiry.
1001		Are you sure to erase all ASSIST History Logs?
	[Contents]	May the ASSIST history log be deleted?
	[Action]	Answer to the inquiry.
1002		Copyright (C) 1995,1996,Hitachi,Ltd.
	[Contents]	Copyright indication.
	[Action]	None
1003		ASSIST Setup finished.
	[Contents]	Termination of the screen.
	[Action]	None
1004		This will end the ASSIST.
	[Contents]	Termination of the screen.
	[Action]	None

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ID	Kind	Description
1005		Entered password is invalid.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1006		registration number overflow
	[Contents]	Number of registrations exceeded the maximum value.
	[Action]	Review the configuration information and make the setting again.
1007		Set correct HDD Model number.
	[Contents]	HDD model number is illegal.
	[Action]	Review the configuration information and make the setting again.
1008		Set correct HDD product number.
	[Contents]	HDD product serial number is illegal.
	[Action]	Review the configuration information and make the setting again.
1009		Please insert CONFIG FD in FDD to backup ASSIST configuration.
	[Contents]	Execution of the backup.
	[Action]	Insert the CONFIG FD into the FDD.
1010		ASSIST configuration backup is done. Remove FD.
	[Contents]	Backup has been completed.
	[Action]	Remove the CONFIG FD from the FDD.
1011		ASSIST configuration backup is failed.
	[Contents]	Backup was terminated abnormally.
	[Action]	Check if it is the CONFIG FD.
1012		DKCMAIN isn't selected as FC target.
	[Contents]	DKCMAIN is not selected as an FC target.
	[Action]	Select the DKCMAIN.
1013		The file which can execute only online micro-program exchange exists in FC target.When selecting YES,they aren't changed.And they are deleted. Do you continue processing?
	[Contents]	There is a file which can be executed only by online microprogram exchange.
	[Action]	Check and operate according to the message.
1014		CHS not Selected. Please select CHS.
	[Contents]	The CHS is not selected.
	[Action]	Select the CHS. (Review the configuration information.)

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ID	Kind	Description
1015		PORT not Selected. Please select PORT.
	[Contents]	The port is not selected.
	[Action]	Select a port. (Review the configuration information.)
1016		SCSI not Selected. Please select SCSI.
	[Contents]	SCSI is not selected.
	[Action]	Select the SCSI. (Review the configuration information.)
1017		LUN not Selected. Please select LUN.
	[Contents]	LUN is not selected.
	[Action]	Select the LUN. (Review the configuration information.)
1018		LDEV not Selected. Please select LDEV.
	[Contents]	LDEV is not selected.
	[Action]	Select LDEV. (Review the configuration information.)
1019		Already exist setting(CHS,PORT,LDEV)! Please adjust setting.
	[Contents]	An duplicated definition was made.
	[Action]	Review the configuration information and make the setting again.
1020		This setting was deleted in former operation. Please confirm setting.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1021		Already exist setting(CHS,PORT,SCSI,LUN)! Please adjust setting.
	[Contents]	An duplicated definition was made.
	[Action]	Review the configuration information and make the setting again.
1022		Overflow listbox! Cannot add setting.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1023		tab set error
	[Contents]	Logic in the PC is contradictory.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1024		Clear all setting?
	[Contents]	May all the settings be cleared?
	[Action]	Answer to the inquiry.
1025		Not select setting! Cannot delete.
	[Contents]	It cannot be deleted because it is not selected.
	[Action]	Select it.

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ID	Kind	Description
1026		Delete select setting?
	[Contents]	May the selected section be deleted?
	[Action]	Answer to the inquiry.
1027		Select setting was already deleted!
	[Contents]	The selected section has been already deleted.
	[Action]	None
1028		Cannot delete setting! LDEV was already deleted.
	[Contents]	The LDEV has been already deleted.
	[Action]	None
1029		Select path not found.
	[Contents]	The selected path cannot be found.
	[Action]	Select a correct path.
1030		SCSI PATH configuration OK?
	[Contents]	Is the setting correct?
	[Action]	Answer to the inquiry.
1031		Enter error
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1032		Cancel SCSI PATH configuration?
	[Contents]	Do you want to cancel the setting?
	[Action]	Answer to the inquiry.
1033		Cannot found path setting which has select LDEV.
	[Contents]	Path setting data cannot be found.
	[Action]	Select the LDEV and execute it again.
1034		Duplicate execution.
	[Contents]	Multiple operation cannot be done.
	[Action]	Wait.
1035		SVP cannot create dialog box.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1036		SVP cannot make Windows procedure instance.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
1037		SVP cannot create dump file.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1038		SVP cannot open batch file.
	[Contents]	Batch file cannot be opened.
	[Action]	Input a correct file name.
1039		Initial process of Network port error has occurred.(error code = %d)
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1040		Communication error has occurred.(error code = %d)
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken)
1041		Time-out error has occurred.
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should taken)
1042		File read error has occurred.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1043		Process is normal end.
	[Contents]	The processing has been completed.
	[Action]	None
1044		Dump file is 1MB over. Do you want to remove file ?
	[Contents]	Do you want to move the file because the dump data exceeded 1 MB?
	[Action]	Answer to the inquiry.

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ID	Kind	Description
1045		Process is error end.
	[Contents]	Microprogram exchange was terminated abnormally.
	[Action]	Make a note of the phenomenon and call the TSC.
1046		System Timer error has occurred.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1047		The processor of an obstacle blockade exists.\r Processing is stopped.
	[Contents]	Do you want to stop the processing because there is a failed section?
	[Action]	Stop the processing. When you want to continue the processing, do so after calling the TSC.
1048		An exchange of microprogram finished.\r Turn off the power of subsystem then turn on the power of subsystem. Wait until READY lamp is lightened. Please select OK after you confirm the READY lamp is lightened.
	[Contents]	Replacement of the microprogram is completed. Turn off and then turn on the power by the DKC, and wait until the READY lamp comes on.
	[Action]	Answer to the inquiry when the READY lamp comes on.
1049		On exchanging a microprogram, An error has occurred.\r Processing is stopped.\r Confirm the status and version of subsystem.
	[Contents]	Replacement of the microprogram was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
1050		An exchange of a microprogram finished. Please check subsystem status and microprogram version with STATUS.
	[Contents]	Replacement of the microprogram has been completed.
	[Action]	Check the version data and check if there is no abnormal section using the Status.
1051		It failed in the writing to the flash memory.
	[Contents]	Writing onto the FM was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
1052		%s reboot error occurred.
	[Contents]	An error occurred in the DKC reboot.
	[Action]	Confirm the Status/log and recover the problem.
1053		The DKU microprogram is not updated because of the same revision.
	[Contents]	The microprogram replacement is not executed because the versions are the same.
	[Action]	None

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ID	Kind	Description
1054		All processor are blocked status.\r Is recovery processing done?
	[Contents]	All processors are blocked.
	[Action]	Confirm the Status/log and recover the problem.
1055		Time out error.
	[Contents]	A time-out error occurred.
	[Action]	Confirm the Status/log and recover the problem.
1056		LCP is not equipped.
	[Contents]	The LCP is not installed.
	[Action]	-
1057		MCP is not equipped.
	[Contents]	The MCP is not installed.
	[Action]	-
1058		File size check error.
	[Contents]	File failure in the PC
	[Action]	Execute the PC replacement.
1059		An error has occurred in %s blockade processing.
	[Contents]	The blockade process was terminated abnormally
	[Action]	Confirm the Status/log and recover the problem.
1060		The SCSI path of a blockade state exists.
	[Contents]	There is a SCSI path blockade.
	[Action]	Confirm the Status/log and recover the problem.
1061		%s is a blockade state.
	[Contents]	The indicated section is blocked.
	[Action]	Confirm the Status/log and recover the problem.
1062		An error has occurred.\r Processor : %s\r Phase : %s\r Micro Program :%s
	[Contents]	The processing was terminated abnormally in the indicated phase.
	[Action]	Confirm the Status/log and recover the problem.
1063		File I/O error has occurred.
	[Contents]	File failure in the PC
	[Action]	Check the FD. When the failure is not recovered, reboot the PC. If it cannot be recovered, replace the PC.

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ID	Kind	Description
1064		Memory error has occurred.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1065		SUM check error has occurred.
	[Contents]	A sum check error occurred.
	[Action]	Check the FD. When the failure is not recovered, reboot the PC. If it cannot be recovered, replace the PC.
1066		Execute a replace function after confirming the status of a CHA/DKA.
	[Contents]	Execute the replacement after checking the CHA/DKA status.
	[Action]	Check if there is no problem using the Status/log.
1067		Subsystem is busy.\r Version down can't be performed now.
	[Contents]	The version down cannot be executed because the DKC is busy.
	[Action]	Wait until the DKC busy state is canceled.
1068		No response from %s
	[Contents]	There is no response.
	[Action]	Confirm the Status/log and recover the problem.
1069		It became an error by a download of the DKU microprogram.
	[Contents]	Download of the DKU microprogram replacement was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
1070		Are you sure you want to forcibly exchange the microprogram for all disk drives? If you choose yes,the disk drive(s) will have revision down!
	[Contents]	Do you want to forcibly continue although the DKU microprogram version is downgraded.
	[Action]	Answer to the inquiry.
1071		The DKU microprogram is old revision. An exchange of the DKU microprogram will be started.
	[Contents]	The DKU microprogram replacement has been started using the old microprogram.
	[Action]	None
1072		Please confirm you have already varied off all channel paths. If OK, press return.
	[Contents]	Place the channel path off-line.
	[Action]	Answer to the inquiry after placing the channel path off-line.

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ID	Kind	Description
1073		The version of Main microprogram is inconsistent with the SVP.
	[Contents]	The microprogram versions of the DKCMAIN and the SVP are inconsistent with each other.
	[Action]	Execute the microprogram version up to make the combination correct.
1074		File copy processing was interrupted. DKC subsystem will be recovered.
	[Contents]	The recovery is being executed because the file copy was interrupted.
	[Action]	None
1075		It is not a microprogram for the high speed adapters.
	[Contents]	The PCB type is inconsistent with the microprogram.
	[Action]	Execute the microprogram version up to make the version correct.
1076		It is not a microprogram for the high speed adapters. You need the password to continue.
	[Contents]	The PCB type is inconsistent with the microprogram.
	[Action]	When continuing using a password, do it after calling the TSC.
1077		It is not a high speed adapter. You need the password to continue.
	[Contents]	The PCB type is that concerned.
	[Action]	When continuing using a password, do it after calling the TSC.
1078		Are you inserting the jumper?
	[Contents]	Is the jumper inserted?
	[Action]	Answer to the inquiry.
1079		It is not a right microprogram for the SCSI channel adapters.
	[Contents]	It is not a microprogram applicable to SCSI.
	[Action]	Execute the microprogram version up to make the version correct.
1080		Please confirm you have already stopped all SCSI channel paths. If OK, press return.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1081		An exchange of a microprogram finished. Please check subsystem status and microprogram version with STATUS. Phase : %s
	[Contents]	Replacement of the microprogram has been completed.
	[Action]	Check the version data and check if there is no abnormal section using of the Status.

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ID	Kind	Description
1082		Can't find a file (BKTASK.DAT)!
	[Contents]	File failure in the PC
	[Action]	Execute the PC replacement.
1083		Cannot change SSVP microprogram while following process is in action. SSVP microprogram download SSVP memory dump SVP-SSVP communication error
	[Contents]	Change of the SSVP microprogram cannot be executed.
	[Action]	Check the SSVP status using the Status.
1084		Communication Initialize error!
	[Contents]	An error occurred in initializing the communication.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1085		DKC-SVP communication blockade error has occurred.
	[Contents]	A communication error occurred in the blockade process.
	[Action]	Confirm the Status/log and recover the problem.
1086		DKC-SVP communication restore error has occurred. Confirm the cables are connected correctly. Then press OK.
	[Contents]	A communication error occurred in the recovery process.
	[Action]	Confirm the Status/log and recover the problem.
1087		Files backup failed and copy stop.
	[Contents]	An error occurred in backing up a file.
	[Action]	Check the FD. When the failure is not recovered, reboot the PC. If it cannot be recovered, replace the PC.
1088		Information file doesn't exist or open error has occurred!
	[Contents]	File failure in the PC.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1089		Insert correct FD(No.%u) in FDD
	[Contents]	The FD is incorrect.
	[Action]	Insert a correct FD.
1090		Insert No.%s FD in FDD
	[Contents]	Insert an FD into the FDD.
	[Action]	Insert an FD.
1091		Memory allocation error.
	[Contents]	Memory failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
1092		Microprogram back up error.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1093		Microprogram version disagreement and copy stop.
	[Contents]	Copy process was canceled because the microprogram version is inconsistent.
	[Action]	Execute the microprogram version up.
1094		Old files erase failed , copy stop.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1095		Read/Write error has occurred!
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1096		Remove FD No.%d
	[Contents]	Remove the FD.
	[Action]	Remove the FD.
1097		SSVP RESET switch on.
	[Contents]	The SSVP RESET switch was turned on.
	[Action]	None
1098		Sum Check Error
	[Contents]	A sum check error was detected.
	[Action]	Check the FD
1099		SVP-SSVP communication blockade error has occurred.
	[Contents]	A communication error with the SSVP occurred.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.

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ID	Kind	Description
1100		SVP-SSVP communication restore error has occurred. Do you want to retry it?
	[Contents]	A communication error with the SSVP occurred.
	[Action]	Retry. When the error is not recovered, isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP. ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.
1101		The directory create error and copy stop.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1102		The file read error and copy stop.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1103		The file size is wrong and copy stop.
	[Contents]	A file in the FD is illegal.
	[Action]	Insert a correct FD.
1104		The necessary file can not be read
	[Contents]	A file in the FD is illegal.
	[Action]	Insert a correct FD.
1105		This will reboot SVP.
	[Contents]	Execute the SVP reboot.
	[Action]	None
1106		""%s"" are failed. Are the LED of them are turned off?
	[Contents]	The processing was terminated abnormally. Did the LED go out?
	[Action]	Answer to the inquiry.
1107		\"%s\" will be blocked during replacement (only parallel channels). Do you want to replace the \"%s?\"
	[Contents]	An error occurred during the replacement.
	[Action]	Answer to the inquiry.
1108		\"CE PANEL INH\" jumper plug is not attached. If you want to abort the replacement of the \"%s,\" press CANCEL.
	[Contents]	The CE PANEL INH jumper is not connected.
	[Action]	Answer to the inquiry.

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ID	Kind	Description
1109		\"CE PANEL INH\" jumper plug is not detached. Please detach it. Then press OK.
	[Contents]	The CE PANEL INH jumper is not removed.
	[Action]	After removing the jumper, press OK.
1110		\"EPO SW\" is active.
	[Contents]	The EPO switch is active.
	[Action]	None
1111		\"EPO SW\" is active. Please set \"EPO SW\" off. Then press OK.
	[Contents]	Turn off the EPO switch.
	[Action]	After turning off the EPO switch, press OK.
1112		\"EPO SW\" is not connected with PWRCTL-2.
	[Contents]	The EPO switch is not connected to the PWRCTL-2.
	[Action]	Check the connection with the PWRCTL-2.
1113		\"EPO SW\" is not connected with PWRCTL-2. Please check connection. Then press OK.
	[Contents]	The EPO switch is not connected to the PWRCTL-2.
	[Action]	Check the connection with the PWRCTL-2.
1114		\"FORCE OFFLINE\" switch of\ "%s\" is invalid. Switch it to \"%s.\" Then press OK.
	[Contents]	The displayed FORCE OFFLINE switch status is illegal.
	[Action]	After changing the switch status, press OK.
1115		(%s,error code = %lx) Please retry when the subsystem load is lower. Please press 'Cancel'
	[Contents]	An error occurred.
	[Action]	After start of the DKC is completed, press Cancel. Please refer to SVPMSG06-10.
1116		[SPC2066I] Timer setting error has occurred. Wait for 30 seconds, then press OK.
	[Contents]	Logic in the PC is contradictory.
	[Action]	Wait for 30 seconds and retry. When the problem is not solved, reboot the PC, and if it cannot be recovered still, replace the PC.
1117		After checking \"EPO SW\" three times, the error status is not changed. \"PWRCTL PCB\" may have problem.
	[Contents]	The EPO switch status could not be changed.
	[Action]	Replace the PWRCTL PCB.

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ID	Kind	Description
1118		After checking jumper plug three times, the error status is not changed. \"PWRCTL PCB\" may have problem.
	[Contents]	The jumper status could not be changed.
	[Action]	Replace the PWRCTL PCB.
1119		After checking switch of \"%s\" three times, the error status is not changed. Please replace it again.
	[Contents]	The concerned switch status could not be changed.
	[Action]	Replace the PWRCTL PCB.
1120		After replacement SSVP, confirm the following subjects. The cables are connected correctly. Turn \"SSVP ENABLE\" switch to \"ENABLE.\" Then press OK.
	[Contents]	The SSVP is being replaced.
	[Action]	Check the cable connection. After setting the SSVP ENABLE switch to ENABLE, press OK.
1121		After turning the switches to following positions, press OK. \n\n%s
	[Contents]	Display the switch status.
	[Action]	After changing to the indicated switch status, press OK.
1122		Are the LED of the target PCB(s) turned on ?
	[Contents]	Was the LED turned on?
	[Action]	Answer to the inquiry.
1123		Are the LEDs correctly turned on? If the LEDs are turned on incorrectly, please wait a minute and press No.
	[Contents]	Was the LED turned on?
	[Action]	Answer to the inquiry.
1124		Are the LEDs turned on as follows? \n\n%s
	[Contents]	Was the LED turned on as indicated?
	[Action]	Answer to the inquiry.
1125		Are you sure SVP will be blocked?
	[Contents]	May the blockade of the SVP be executed.
	[Action]	Answer to the inquiry.
1126		Blocking DKC-SVP communication.
	[Contents]	Communication with the DKC is blocked.
	[Action]	None
1127		Bus arbiter change error has occurred. (error code = %lx)
	[Contents]	Change of the bus arbiter was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.

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ID	Kind	Description
1128		BUS test error has occurred. (error code = %lx)
	[Contents]	An error occurred in the bus test.
	[Action]	Retrieve the contents of the error code with M.M. Please refer to SVPMSG06-10.
1129		CACHE blockade error has occurred.
	[Contents]	An error occurred in the blockade of the cache.
	[Action]	Confirm the Status/log and recover the problem.
1130		CACHE restore error has occurred.
	[Contents]	An error occurred during the cache restoration.
	[Action]	Confirm the Status/log and recover the problem.
1131		Can't Turn on the LED of the target PCBs.
	[Contents]	The LED cannot be turned on.
	[Action]	Confirm the Status/log and recover the problem.
1133		Cannot confirm the mate PSs are in NORMAL.
	[Contents]	The PS cannot be put into normal status.
	[Action]	Confirm the Status/log and recover the problem.
1134		Cannot confirm the %s are in NORMAL.
	[Contents]	The PS status could not be checked.
	[Action]	Restart the SVP and SSVP and perform the maintenance from the beginning.
1135	**W**	Cannot confirm the PSs are in NORMAL. If you want to continue, confirm PSs are in normal and press OK.
	[Contents]	The PS status could not be checked.
	[Action]	When continuing the replacement, check if the listed PS is normal and then select the “OK” button. When you cancel it, select “Cancel”.
1136		Cannot replace target because the mate PSs are in failure. At first, please switch ""%s"" to ""DISABLE,"" and replace them. After replacement, switch them to ""ENABLE"" and press OK.
	[Contents]	The PS became abnormal.
	[Action]	Set the switch to DISABLE status to and perform the replacement. After completing the replacement, return the switch status to ENABLE and press OK.

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ID	Kind	Description
1137		CHA blockade error has occurred.
	[Contents]	An error occurred due to the blockade of the CHA.
	[Action]	Confirm the Status/log and recover the problem.
1138		CHA restore error has occurred.
	[Contents]	An error occurred in a restoration of the CHA.
	[Action]	Confirm the Status/log and recover the problem.
1139		CHP blockade error has occurred.
	[Contents]	An error occurred due to the blockade of the CHP.
	[Action]	Confirm the Status/log and recover the problem.
1140		CHP restore error has occurred.
	[Contents]	An error occurred in a restoration of the CHP.
	[Action]	Confirm the Status/log and recover the problem.
1141		Cluster failure report blockade error has occurred. (error code = %lx)
	[Contents]	An error occurred in the restoration of the cluster failure report.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1142		Cluster failure report restore error has occurred. (error code = %lx)
	[Contents]	An error occurred in the restoration of the cluster failure report.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1143		Cluster is not ready.
	[Contents]	Cluster is not ready.
	[Action]	Wait until the cluster starts.
1144		Configuration read error has occurred.
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
1145		DKA blockade error has occurred.
	[Contents]	An error occurred in the blockade of the DKA.
	[Action]	Confirm the Status/log and recover the problem.
1146		DKA restore error has occurred.
	[Contents]	An error occurred in the restoration of the DKA.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
1147		DKA restore error has occurred.(Path)
	[Contents]	An error occurred in the restoration of the DKA (path).
	[Action]	Confirm the Status/log and recover the problem.
1148		DKA restore error has occurred.(SCSI Path)
	[Contents]	An error occurred in the restoration of the DKA (SCSI path).
	[Action]	Confirm the Status/log and recover the problem.
1149		DKC-SVP communication blockade error has occurred.
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
1150		DKC-SVP communication restore error has occurred.
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
1151		DKC-SVP communication restore error has occurred. Confirm the cables are connected correctly. Then press OK.
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC. ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should be taken.)
1152		DKP blockade error has occurred.
	[Contents]	An error occurred in the blockade of the DKP.
	[Action]	Confirm the Status/log and recover the problem.
1153		DKP restore error has occurred.
	[Contents]	An error occurred in the restoration of the DKP.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
1154		Do you replace %s ?
	[Contents]	Do you want to replace it?
	[Action]	Answer to the inquiry
1155		Do you want to block Cache Box-%d ?
	[Contents]	Do you want to execute the CACHE Box replacement?
	[Action]	Answer to the inquiry
1156		Do you want to check PS status?
	[Contents]	Do you want to check the PS status?
	[Action]	Answer to the inquiry
1157		Do you want to display communication parameter?
	[Contents]	Do you want to display the communication data on the screen?
	[Action]	Answer to the inquiry
1158		Do you want to recover %s?
	[Contents]	Do you want to recover it?
	[Action]	Answer to the inquiry
1159		Do you want to recover Cache Box-%d ?
	[Contents]	Do you want to recover the CACHE Box?
	[Action]	Answer to the inquiry
1160		Do you want to recover Cluster-%d ?
	[Contents]	Do you want to recover the cluster?
	[Action]	Answer to the inquiry
1161		Do you want to replace the "%s?"
	[Contents]	Do you want to replace it?
	[Action]	Answer to the inquiry
1162		Do you want to set configuration all option installed?
	[Contents]	Do you want to set all options?
	[Action]	Answer to the inquiry
1163		Emulation type change error has occurred.
	[Contents]	An error occurred in the change of the emulation type.
	[Action]	Confirm the Status/log and recover the problem.
1164		Environment monitor package, \"%s,\" is failed.
	[Contents]	A failure occurred in the environment monitor.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
1165		Environment monitor system may have problem. Please check connection between DKUMN and HDD back board.
	[Contents]	A failure occurred in the environment monitor.
	[Action]	Check the cable connection between the DKUMN and the HDD back board.
1166		Environment monitor system may have problem. Please check connection between PWRCTL PCB and back board.
	[Contents]	A failure occurred in the environment monitor.
	[Action]	Check the cable connection between the PWRCTL and the back board.
1167		Environment monitor system may have problem. Please check connection between PWRCTL PCB and HDD back board.
	[Contents]	A failure occurred in the environment monitor.
	[Action]	Check the cable connection between the PWRCTL and the HDD back board.
1168		F-BUS/H blockade error has occurred. (error code = %lx)
	[Contents]	An error occurred in the blockade of the F-BUS/H.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1169		F-BUS/H restore error has occurred. (error code = %lx)
	[Contents]	An error occurred in the restoration of the F-BUS/H.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1170		F-BUS/L blockade error has occurred. (error code = %lx)
	[Contents]	An error occurred in the blockade of the F-BUS/L.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1171		F-BUS/L restore error has occurred. (error code = %lx)
	[Contents]	An error occurred in the restoration of the F-BUS/L.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1172		Information of PWRCTL-1 and 2 are not same. Please check \"PWRCTL PCB.\"
	[Contents]	Information of the PWRCTL-1 is not the same as that of the PWRCTL-2.
	[Action]	Check the setting of the PWRCTL-1 and the PWRCTL-2.
1173		Initializing communication failed.
	[Contents]	A communication failure occurred in the initialization.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
1174		LTM PCB LED OFF error has occurred. (error code = %lx)
	[Contents]	An error occurred in turning the LED off.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1175		LTM PCB LED ON error has occurred. (error code = %lx)
	[Contents]	An error occurred in turning the LED on.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1176		M-BUS blockade error has occurred. (error code = %lx)
	[Contents]	An error occurred in the blockade of the M-BUS.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1177		M-BUS restore error has occurred. (error code = %lx)
	[Contents]	An error occurred in the restoration of the M-BUS.
	[Action]	Confirm the Status/log and recover the problem. Please refer to SVPMSG06-10.
1178		No redundancy. The redundant sub-system bus has been blocked.
	[Contents]	The bus will be blocked due to lack of redundancy.
	[Action]	None
1179		OP panel blockade error has occurred.
	[Contents]	An error occurred in the blockade of the OP panel.
	[Action]	Confirm the Status/log and recover the problem.
1180		OP panel restore error has occurred.
	[Contents]	An error occurred in the restoration of the OP panel.
	[Action]	Confirm the Status/log and recover the problem.
1181		Parameter error has occurred.
	[Contents]	Logic in the DKC is contradictory.
	[Action]	Collect one-touch dump/FD copy and call the TSC.
1182		Please attach \"CE PANEL INH\" jumper plug. Then press OK.
	[Contents]	Connect the CE PANEL INH jumper.
	[Action]	Press OK after connecting it.
1183		Please attach jumper into the target PCBs. Then press OK.
	[Contents]	Execute the jumper setting.
	[Action]	Press OK after setting it.

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ID	Kind	Description
1184		Please check following. 1.The PCB is inserted correctly. 2.The jumper plug is detached from the PCB. 3.Press 'Retry' to recover
	[Contents]	A failure occurred.
	[Action]	Perform the recovery according to the following procedure. ① Is the PCB inserted correctly? ② Is the jumper removed? ③ When results of the steps ① and ② are OK, press "Retry".
1185		Please check following. 1.The breaker is turned on. 2.Switch of PSs and all environment monitor packages are ENABLE. 3.Turn to "CHK RST" the \"CHK RST/IND TEST\" Sw on \"CE panel.\" 4.Press RETRY to recover.
	[Contents]	A failure occurred.
	[Action]	Perform the recovery according to the following procedure. ① Is the breaker turned on? ② Are the PS and the environment monitor connected? ③ Push up the CHK RST switch. ④ When results of steps ①, ②, and ③ are OK, press "Retry."
1186	**I**	Please confirm you have already varied off the concerned channel path(s).
	[Contents]	Check if the concerned channel is turned off.
	[Action]	Check if the specified channel is turned off. Select OK after checking it. Select "Cancel" to interrupt the processing.
1187	**I**	Please confirm you have already varied off the concerned channel path(s). Do you want to replace the ""%s?""
	[Contents]	Check if the concerned channel is turned off. Do you want to replace %s?
	[Action]	First, check if the names of the parts to be replaced are correct. If they are correct, check if the concerned channel is turned off. After checking it, select OK. When you interrupt the processing select “Cancel”.
1188	**I**	Please confirm you have already varied off the concerned channel path(s). Do you want to block Cluster-%d ?
	[Contents]	Check if the concerned channel is turned off. Do you want to block the Cluster-%d?
	[Action]	First, check if the cluster number to be blocked is correct. If it is correct, check if the concerned channel is turned off. After checking it, select "Yes". When you interrupt the processing, select “No”.
1189		Please detach \"CE PANEL INH\" jumper plug. Then press OK.
	[Contents]	Remove the CE PANEL INH jumper.
	[Action]	Press OK after removing the jumper.

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ID	Kind	Description
1190		Please execute following. 1.Read following messages and press OK. 2.Turn off %s,and replace it. (Also power of SVP will be down) 3.Turn on %s,and execute recovering of Cluster-1.
	[Contents]	Perform the processing according to the displayed procedure.
	[Action]	① When the guidance is displayed, push OK. ② Execute the replacement after powering off. ③ Execute recovering of Cluster-1 after powering on.
1191		Please execute following. 1.Switch MPS in Cluster-%d and PSs in Cache Box-%d to DISABLE. 2.Switch them to ENABLE. 3.Turn to ""CHK RST"" the ""CHK RST/IND TEST"" Sw on ""CE panel."" 4.Press 'OK'
	[Contents]	Perform the processing according to the displayed procedure.
	[Action]	① Set the MPS switch in the cluster and the PS switch in the CACHE BOX to DISABLE. ② Set the switches in ① to ENABLE. ③ Push up the CHK RST switch. ④ Press OK.
1192	**I**	Please execute following. \n1.Switch all PSs in Cluster-%d to DISABLE. \n2.Switch them to ENABLE. \n3.Turn to ""CHK RST"" the ""CHK RST/IND TEST"" Switch on ""CE panel."" \n4.Press 'OK.'
	[Contents]	Perform the processing according to the displayed procedure.
	[Action]	(1)Set the switch of the all PSs in the Cluster to DISABLE. (2) Set the switch in (1) to ENABLE. (3) Push up the CHK RST switch. (4) Press OK.
1193		Please execute following. 1.Switch PSs in Cache Box-%d to DISABLE. 2.Switch them to ENABLE. 3.Turn to ""CHK RST"" the ""CHK RST/IND TEST"" Sw on ""CE panel."" 4.Press 'OK'
	[Contents]	Perform the processing according to the displayed procedure.
	[Action]	① Set the PS switch in the CACHE BOX to DISABLE. ② Set the switch in step ① to ENABLE. ③ Push up the CHK RST switch. ④ Press OK.
1194	**I**	Please execute following. \n1.Turn off Breaker Box-%d. \n2.Turn on Breaker Box-%d. \n3.Press 'OK.'
	[Contents]	Perform operations according to the displayed procedure.
	[Action]	① Turn off the breaker BOX. ② Turn on the breaker BOX. ③ Press OK.

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ID	Kind	Description
1195		Please memorize channel name that switch is REMOTE position. Then press OK. **[Contents]** Make a note of the name of a channel which is in remote status. **[Action]** After making a note of it, press OK.
1196	**I**	Please power off SVP, and replace ""%s."" After replacement, power on SVP. **[Contents]** Turn off the SVP power, execute the replacement, and lastly turn on the SVP power. **[Action]** Turn off the SVP power, execute the replacement, and lastly turn on the SVP power.
1197		Please quit active application! **[Contents]** Terminate the active application. **[Action]** Terminate the active application.
1198		Please replace the \"%s.\" After replacement, press OK. **[Contents]** Execute the replacement of the concerned section. **[Action]** After the replacement, press OK.
1199		Please replace the \"KEY LOCK ASSY\". After replacement, press OK. **[Contents]** Execute the replacement of the KEY LOCK ASSY. **[Action]** After the replacement, press OK.
1200		Please replace the \"System panel\". After replacement, press OK. **[Contents]** Execute the replacement of the system panel. **[Action]** After the replacement, press OK.
1201		Please replace the target PCBs, when replacement completed press OK. **[Contents]** Execute the replacement of the PCB. **[Action]** After the replacement, press OK.
1202		Please retry when the subsystem load is lower. Please press 'Cancel' **[Contents]** Retry because the DKC is not started. **[Action]** Press "Cancel."
1203		Please return REMOTE/LOCAL Sw, on "CE panel," as before. Then press OK. **[Contents]** Set the REMOTE/LOCAL switch on the CE panel to the opposite. **[Action]** After setting it to the opposite, press OK.

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ID	Kind	Description
1204		Please set \"REMOTE/LOCAL\" switch \"%s,\" and \"FORCE OFFLINE\" switch \"%s.\" Then press OK.
	[Contents]	Set the REMOTE/LOCAL and FORCE OFFLINE switch to the displayed status.
	[Action]	After changing them to the displayed status, press OK.
1205		Please set "REMOTE/LOCAL" switch of "%s" "%s." Then press OK.
	[Contents]	Set the REMOTE/LOCAL switches to the displayed status.
	[Action]	After changing them to the displayed status, press OK.
1206		Please set all channel switches to DISABLE, and FORCE OFF switch to NORMAL. Then press OK.
	[Contents]	Set all channel switches to DISABLE and the FORCE OFF switch to NORMAL.
	[Action]	After setting them, press OK.
1207		Please set channel switches to REMOTE that has been REMOTE position before replacement. Then press OK.
	[Contents]	Before replacement, set the channel switch to REMOTE.
	[Action]	After setting them, press OK.
1208		Please set REMOTE/LOCAL switch to LOCAL. Then press OK.
	[Contents]	Set the REMOTE/LOCAL switch to LOCAL.
	[Action]	After setting them, press OK.
1209		Please switch \"%s\" to \"DISABLE,\" and replace it. After replacement, switch it to \"ENABLE\" and press OK.
	[Contents]	Set it to DISABLE and execute the replacement. After replacing it, set it to ENABLE again.
	[Action]	Set it to DISABLE and execute the replacement. After the replacement, set it to ENABLE again.
1210		Please switch \"DKUMN-%s\" of all DKU to \"DISABLE.\" Then press OK.
	[Contents]	Set the switch of the DKUMN to DISABLE.
	[Action]	After setting them, press OK.
1211		Please switch \"DKUMN-%s\" of all DKU to \"ENABLE.\" Then press OK.
	[Contents]	Set the switch of the DKUMN to DISABLE.
	[Action]	After setting them, press OK.
1212		Please switch \"DKUMN-%s%s\" to "DISABLE." Then press OK.
	[Contents]	Set the switch of the DKUMN to DISABLE.
	[Action]	After setting them, press OK.

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ID	Kind	Description
1213		Please switch \"DKUMN-%s%s\" to \"ENABLE.\" Then press OK.
	[Contents]	Set the switch of the DKUMN to DISABLE.
	[Action]	After setting them, press OK.
1214		Please switch \"MPS%d0\" to \"DISABLE,\" and switch it to \"ENABLE\" and press OK.
	[Contents]	After setting the switch of the MPS to DISABLE, then set it to ENABLE.
	[Action]	After setting them, press OK.
1215		Please switch \"power supply\" to \"DISABLE,\" and replace it. After replacement, switch it to \"ENABLE\" and press OK.
	[Contents]	Set the power supply switch to DISABLE and execute the replacement. After completing the replacement, change it to ENABLE.
	[Action]	Set the power supply switch to DISABLE and execute the replacement. After completing the replacement, change it to ENABLE, then press OK.
1216		Please switch REMOTE/LOCAL Sw, on \"CE panel,\" to the LOCAL position. Then press OK.
	[Contents]	Set the REMOTE/LOCAL switch to LOCAL.
	[Action]	After setting them, press OK.
1217		Please turn to \"CHK RST\" the \"CHK RST/IND TEST\" Sw on \"CE panel.\"
	[Contents]	Set the CHK RST/IND TEST switch on the CE panel to the CHK RST.
	[Action]	After setting them, press OK.
1218		Please up IND TEST switch, and check LED on. Then press OK.
	[Contents]	Push up the IND TEST switch and check if the LED comes on.
	[Action]	After checking it, press OK.
1219		Press OK, then retry.
	[Contents]	Press OK.
	[Action]	Execute a retry.
1220		PWRCTL PCB LED OFF error has occurred.
	[Contents]	An error occurred in the LED OFF process of the PWRCTL PCB.
	[Action]	Confirm the Status/log and recover the problem.
1221		PWRCTL PCB LED ON error has occurred.
	[Contents]	An error occurred in the LED ON process of the PWRCTL PCB.
	[Action]	Confirm the Status/log and recover the problem.

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ID	Kind	Description
1222		Redundant power supply is not installed. Please use the way to maintenance Cluster or Cache Box.
	[Contents]	The redundant power supply is not set.
	[Action]	Perform maintenance of the cluster or the CACHE BOX.
1223	**I**	REMOTE MAINTENANCE SWITCH TEST :\nAfter turning switch to DISABLE position, press OK.
	[Contents]	The REMOTE MAINTENANCE switch is being tested.
	[Action]	Set the switch to DISABLE after completing the test, then press OK.
1224	**I**	REMOTE MAINTENANCE SWITCH TEST :\nAfter turning switch to ENABLE position, press OK.
	[Contents]	The REMOTE MAINTENANCE switch is being tested.
	[Action]	Set the switch to ENABLE after completing the test, then press OK.
1225		REMOTE/LOCAL Sw is not \"LOCAL.\" Please check it. If you want to abort the replacement of the "PCI CONN," press CANCEL.
	[Contents]	Do you terminate the replacement of the PCI CONN because the status is not set to local.
	[Action]	When you want to continue, check the switch status. When you terminate it, press “CANCEL”.
1226		Replacement of the \"%s\" failed.
	[Contents]	Replacement was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
1227		Replacement of the \"%s\" is done.
	[Contents]	Replacement has been completed.
	[Action]	None
1228		Replacement of the \"KEY LOCK ASSY\" failed.
	[Contents]	Replacement was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
1229		Replacement of the \"KEY LOCK ASSY\" is done.
	[Contents]	Replacement has been completed.
	[Action]	None
1230		Replacement of the \"System panel\" failed.
	[Contents]	Replacement was terminated abnormally.
	[Action]	Confirm the Status/log and recover the problem.
1231		Replacement of the \"System panel\" is done.
	[Contents]	Replacement has been completed.
	[Action]	None

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ID	Kind	Description
1232	**I**	RESTART SWITCH TEST :\nAfter turning switch, press OK.
	[Contents]	The RESTART switch is being tested.
	[Action]	Change the switch after completing the test.
1233		Restoring DKC-SVP communication...
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should taken)
1234		Setting communication environment failed.
	[Contents]	An error in the communication with the SSVP occurred.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.
1235		SM blockade error has occurred.
	[Contents]	An error occurred in the blockade of the SM.
	[Action]	Confirm the Status/log and recover the problem.
1236		SM restore error has occurred.
	[Contents]	An error occurred in the restoration of the SM.
	[Action]	Confirm the Status/log and recover the problem.
1237		Some PSs are in failure. Please replace the PSs first.
	[Contents]	Two or more PSs are abnormal.
	[Action]	Execute the replacement of the PS.
1238		SPC0063W Please close 'STATUS' and 'INFORMATION' windows during replacement procedure of \"%s\", if they are open. Then press OK.
	[Contents]	The processing cannot be performed because the STATUS or INFORMATION window is open.
	[Action]	After closing the STATUS or INFORMATION screen, press OK.
1239		SPC0064W Please close 'STATUS' and 'INFORMATION' windows during blocking cluster, if they are open. Then press OK.
	[Contents]	The processing cannot be performed because the STATUS or INFORMATION window is open.
	[Action]	After closing the STATUS or INFORMATION screen, press OK.

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ID	Kind	Description
1240		SPC0065W Please close 'STATUS' and 'INFORMATION' windows during recovery procedure of BUS, if they are open. Then press OK.
	[Contents]	The processing cannot be performed because the STATUS or INFORMATION window is open.
	[Action]	After closing the STATUS or INFORMATION screen, press OK.
1241		SSVP hardware change start. System panel and the environment check will be disabled. SVP-SSVP communication will be blocked.
	[Contents]	The replacement of the SSVP starts. The system panel and the environment monitor become invalid during the replacement. Communication between the SVP and the SSVP will also be blocked.
	[Action]	Check the contents of the message and select OK.
1242		SSVP hardware error is supposed. Replace SSVP first.
	[Contents]	It is assumed that an SSVP hardware failure occurred.
	[Action]	Execute the replacement of the SSVP.
1243		SSVP LED OFF error has occurred.
	[Contents]	An error occurred in turning the SSVP LED off.
	[Action]	Execute the replacement of the SSVP.
1244		SSVP LED ON error has occurred.
	[Contents]	An error occurred in turning the SSVP LED on.
	[Action]	Execute the replacement of the SSVP.
1245		SSVP microprogram download has failed. After confirming the RS-232C cable is connected correctly, push reset button of SSVP.
	[Contents]	An error occurred in the downloading of the SSVP microprogram.
	[Action]	Check the connection of the RS-232C cable, and then press the SSVP RESET switch.
1246		SSVP microprogram download has failed! After confirming the RS-232C cable is connected correctly. Turn \"SSVP ENABLE\" switch to\"ENABLE.\" Then press OK.
	[Contents]	An error occurred in the downloading of the SSVP microprogram.
	[Action]	Check the connection of the RS-232C cable, then set the SSVP ENABLE switch to ENABLE.
1247		SVP hardware change start. DKC-SVP communication will be blocked.
	[Contents]	The replacement of the SSVP started.
	[Action]	None

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ID	Kind	Description
1248		SVP-SSVP communication error has occurred. **[Contents]** An error in the communication with the SSVP occurred. **[Action]** Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.
1249		SVP-SSVP communication will be blocked. **[Contents]** The communication with the SSVP is being excluded. **[Action]** None
1250		Switch status is wrong. Do you retry switch test? **[Contents]** The status of the switch is abnormal. **[Action]** Answer to the inquiry and then retry.
1251	**I**	SWITCHES TEST :\nAfter setting a test pattern, press OK. If all tests are done normally, press Cancel. **[Contents]** Set a test pattern and execute the test. **[Action]** After setting the test pattern, press OK. When the test terminated normally, press Cancel.
1252		The blockade has failed. **[Contents]** The blockade was terminated abnormally. **[Action]** Confirm the Status/log and recover the problem.
1253		The blockade has finished. Cache Box is blocked. **[Contents]** The blockade of the CACHE BOX has been completed. **[Action]** None
1254		The blockade has finished. Cluster is blocked. **[Contents]** The blockade of the cluster has been completed. **[Action]** None
1255		The mate PSs are in failure. Please replace the mate PSs first. **[Contents]** An error occurred in the PS. **[Action]** Execute the PS replacement.
1256	**E**	The %s are in failure. Please replace the %s first. **[Contents]** The replacement cannot be executed because the PS is faulty. **[Action]** Replace a faulty PS first.

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ID	Kind	Description
1257		The replacement has failed.
	[Contents]	The replacement was terminated abnormally.
	[Action]	Check the Status/log and solve the problem.
1258		The replacement of \"RCU CONN\" is done. And the OP panels are restored (only parallel channels).
	[Contents]	The replacement of the RCU CONN has been completed. Restoration of the OP panel has been also completed.
	[Action]	None
1259		The replacement of %s has finished and Cache Box is enabled.
	[Contents]	The replacement has been completed. The CACHE BOX has become connectable also.
	[Action]	None
1260	**I**	The replacement of %s has finished and Cluster is enabled. The concerned channel path(s) are available. Please vary the path(s) on.
	[Contents]	The replacement has been completed. The cluster can be used. Turn on the channel.
	[Action]	Perform the work instructed by the message and select OK.
1261		The replacement of %s has finished.
	[Contents]	The replacement has been completed.
	[Action]	None
1262		The replacement of LTM PCB is done. And the OP panel is restored (only parallel channels).
	[Contents]	The replacement of the LTM PCB has been completed. Restoration of the OP panel has been also completed.
	[Action]	None
1263	**I**	The replacement of LTM PCB is done. The concerned channel path(s) are available. Please vary the path(s) on. And the OP panel is restored (only parallel channels).
	[Contents]	The replacement of the LTM has been completed. The concerned channel can be used. Turn on the channel. The OP panel has also been restored (parallel channels only).
	[Action]	Perform the work instructed by the message and select OK.
1264		The replacement of SSVP has completed.
	[Contents]	The replacement of the SSVP has been completed.
	[Action]	None
1265		The replacement of SSVP has failed.
	[Contents]	The replacement of the SSVP was terminated abnormally.
	[Action]	Check the Status/log and solve the problem.

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ID	Kind	Description
1266		The restore has failed.
	[Contents]	The restoration was terminated abnormally.
	[Action]	Check the Status/log and solve the problem.
1267		The restore has finished.
	[Contents]	The restoration has been completed.
	[Action]	None
1268		The restore has finished. Cache Box is enabled.
	[Contents]	The replacement has been completed. The CACHE BOX has also become connectable.
	[Action]	None
1269	**I**	The restore has finished. Cluster is enabled. The concerned channel path(s) are available. Please vary the path(s) on.
	[Contents]	The restoration has finished. Cluster is enabled. The concerned channel path(s) are available. Please vary the path(s) on.
	[Action]	Please operate written in message, and select OK.
1270		This operation will block Cache Box-%d before recovery. Do you want to continue ?
	[Contents]	Before executing the restoration, block the CACHE BOX.
	[Action]	Answer to the inquiry.
1271		This operation will block Cache Box-%d. Do you want to replace the \"%s?\"
	[Contents]	Do you want to perform the replacement though the CACHE BOX need to be blocked?
	[Action]	Answer to the inquiry.
1272	**I**	This operation will block Cluster-%d before recovery. Please confirm you have already varied off the concerned channel path(s). Do you want to continue ?
	[Contents]	Block the cluster -%d before the restoration. Check if the concerned channel is turned off. Do you want to continue?
	[Action]	Determine whether if the concerned cluster may be blocked. If it may be blocked, check if the concerned channel is turned off. After checking it, select OK. When you interrupt it, select "Cancel".
1273		This will end SVP operation. Replace SVP after turning off.
	[Contents]	Power off the SVP and execute the replacement.
	[Action]	Power off the SVP and execute the replacement.

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ID	Kind	Description
1274		Turn \"SSVP ENABLE\" switch to \"DISABLE\", then replace SSVP. After replacement, press OK.
	[Contents]	Execute the replacement of the SSVP.
	[Action]	After setting the SSVP ENABLE switch to DISABLE, replace the SSVP. Press OK after completing the replacement.
1275		Turn off the breaker which supplies power source for %s. After that please replace it. When replacement is completed, press OK.
	[Contents]	Execute the replacement with power off.
	[Action]	Turn off the breaker and execute the replacement. After completing the replacement, press OK.
1276		Turning off the LED of the target PCBs.
	[Contents]	The LED was turned off.
	[Action]	None
1277		Turning on the LED of the target PCBs.
	[Contents]	The LED was turned on.
	[Action]	None
1278		Warning. Can't blockade CHA.
	[Contents]	The CHA cannot be blocked.
	[Action]	Check the Status/log and solve the problem.
1279		Warning. Can't blockade CHP.
	[Contents]	The CHP cannot be blocked.
	[Action]	Check the Status/log and solve the problem.
1280		Warning. Can't blockade Cluster failure report.
	[Contents]	The cluster failure report cannot be blocked.
	[Action]	Check the Status/log and solve the problem.
1281		Warning. Can't blockade DKA.
	[Contents]	The DKA cannot be blocked.
	[Action]	Check the Status/log and solve the problem.
1282		Warning. Can't blockade DKP.
	[Contents]	The DKP cannot be blocked.
	[Action]	Check the Status/log and solve the problem.
1283		Warning. Can't blockade OP panel.
	[Contents]	The OP panel cannot be blocked.
	[Action]	Check the Status/log and solve the problem.

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ID	Kind	Description
1284		Warning. Can't change the bus arbiter.
	[Contents]	The bus arbiter cannot be switched.
	[Action]	Check the Status/log and solve the problem.
1285		Warning. Can't disable SVP failure report.
	[Contents]	The SVP failure report cannot be separated.
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1286		Warning. Can't disable the environment check.
	[Contents]	The environment monitor check cannot be separated.
	[Action]	Wait until the SSVP starts and retry. When it is still unsuccessful, replace the SSVP.
1287		Warning. Can't disable the monitor of SVP by SSVP.
	[Contents]	The SVP monitor cannot be separated by the SSVP.
	[Action]	Wait until the SSVP starts and retry. When it is still unsuccessful, replace the SSVP.
1288		Warning. Can't enable the environment check.
	[Contents]	The environment monitor check cannot be connected.
	[Action]	Wait until the SSVP starts and retry. When it is still unsuccessful, replace the SSVP.
1289		Warning. Can't enable the monitor of SVP by SSVP.
	[Contents]	The SVP monitor cannot be connected by the SSVP.
	[Action]	Wait until the SSVP starts and retry. When it is still unsuccessful, replace the SSVP.
1290		Warning. Can't read OP panel information.
	[Contents]	The OP panel information cannot be read.
	[Action]	Wait until the SSVP starts and retry. When it is still unsuccessful, replace the SSVP.
1291		Warning. Can't read the environment monitor.
	[Contents]	The environment monitoring result cannot be read.
	[Action]	Wait until the SSVP starts and retry. When it is still unsuccessful, replace the SSVP.
1292		Previously failed or blocked parts should be serviced first. Do you stop this process ?
	[Contents]	Do you continue the maintenance though there is a failed or blocked part?
	[Action]	Confirm the Status/log, and recover the problem or continue the maintenance as necessary.

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ID	Kind	Description
1293		Confirm the blocked part with the status function, and restore it first.
	[Contents]	Replace the blocked section.
	[Action]	Confirm the blocked section by means of the Status and execute the replacement.
1294		Internal subsystem status is under maintenance(%s). No maintenance can be performed now.
	[Contents]	No maintenance can be performed now.
	[Action]	Confirm the blocked section by means of the Status and wait until the active processing is completed.
1295		Redundancy is lost and blocking this part stops subsystem functionality. Do you stop this process ?
	[Contents]	Do you stop the maintenance because the redundancy will be lost when continue the process?
	[Action]	When you want to continue, do so after calling the TSC.
1296		Please try again.
	[Contents]	Execute the retry.
	[Action]	Execute the retry.
1297		Blocking this part lost the data housed in the logical device. Do you stop this process ?
	[Contents]	Do you stop the maintenance because the logical device data will be lost?
	[Action]	When you want to continue, do so after calling the TSC.
1298		Pending CFW data exist. You should terminate CFW jobs first or these jobs will be aborted.
	[Contents]	Terminate the CFW data.
	[Action]	Terminate the CFW data.
1299		[SPC0066W] Pinned Track exists.
	[Contents]	A PIN data exists.
	[Action]	None
1300		[SPC0066W] Pinned Track exists. Do you stop this process?
	[Contents]	Do you stop the maintenance because a PIN data exists?
	[Action]	When you want to continue, do so after calling the TSC.
1301		[SPC2031W] Maintenance object devices include Remote Copy volumes. You should delete the Remote Copy volume pair.
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation and end the Remote Copy volume pair.

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ID	Kind	Description
1302		[SPC2032W] You should suspend the Remote Copy volume pair. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation. You should delete RCU operation by decided with customers and retry again.
1303		[SPC2033W] This part includes the last logical path between MCU and RCU of Remote Copy. You should delete or suspend the Remote Copy volume pair. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end or suspend the pair. If [No], SVP will continue the process, but you must be careful to operate.
1304		[SPC2034W] Maintenance object devices include Remote Copy volumes. You should delete the Remote Copy volume pair using SVP operation on MCU.
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation and delete the Remote Copy volume pair.
1305		[SPC2035W] You should suspend the Remote Copy volume pair using SVP operation on MCU. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should suspend the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
1306		[SPC2036W] You should delete or suspend the Remote Copy volume pair using SVP operation on MCU before hand. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end or suspend the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
1307		[SPC2037W] You should delete the logical path of Remote Copy. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.

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ID	Kind	Description
1308		[SPC2038W] This HSTA may include the last logical path between MCU and RCU of Remote Copy. Please check if there is a alternate path from MCU at first. Do you stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end the path from MCU. If [No], SVP will continue the process, but you must be careful to operate.
	Note.1	Before you replace CHA, please vary off-line the path to the CHA which is connected from MCU. After replacement, please vary online the path. If you de-install CHA, please vary off-line the path to the CHA which is connected from MCU.
1309		[SPC2059W] Remote data copy in progress. Please wait for copy end or you should delete or suspend the Remote Copy volume pair. Do you stop this process?
	[Contents]	SVP detects the data copy by Remote Copy.
	[Action]	If [Yes] is selected, you should wait until copy is finished, or you should delete or suspend the pair after you negotiate with your customer. If [No] is selected, SVP will stop the process.
1310		[SPC2060W] It is possible to suspend the Remote Copy volume pair or you can not operate Remote Copy more. Do you stop this process?
	[Contents]	SVP detects the warning that Remote Copy pair will be suspended or you could not operate more.
	[Action]	If [Yes] is selected, SVP will stop the process, but if [No] is selected, SVP will continue the process.
1311		[SPC2073W] You should add the alternate path, or if the Fence Level is Data/Status, you should delete the pair volume or if the Fence Level is Never, you should suspend the pair volume. Do you stop this process?
	[Contents]	Alternate path must be added or pair must be deleted or suspended.
	[Action]	Please select [Yes] to stop operation and decide with your customer which you have to do, add Remote Copy(HRC/HORC) alternate path, or delete the pair if the fence level of the volume is Data/Status, suspend the pair if the fence level of the volume is never. And retry. If you select [No], SVP will continue the process.

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ID	Kind	Description
1312		[SPC2074W] You should add the alternate path or delete the Remote Copy pair. Do you stop this process?
	[Contents]	Alternate path must be added or pair must be deleted.
	[Action]	Please select [Yes] to stop the operation and add the alternate path or delete the pair by decided by customers. If you select [No], SVP will continue the process.
1313		[SPC2075W] You should add the alternate path. Do you stop this process?
	[Contents]	Alternate path must be added.
	[Action]	Please select [Yes] to stop the operation and add the alternate path by decided with customers.
1314		[SPC2076W] HODM data copy in progress. Please wait for copy end or you should add alternate path. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. You should finish HODM copy or add alternate path by decided with customers and retry again. If you select [No], SVP will continue the process.
1315		[SPC2077W] You should add the alternate path or stop the I/O from Host. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. Please decide with your customer which you have to do, add the HODM alternate path or stop the I/O from HOST. If you select [No], SVP will continue the process.
1316		[SPC2078W] You should add the alternate path or delete the Remote Copy pair. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. You should delete the pair or add alternate path by decided with customers and retry again. If you select [No], SVP will continue the process.
1317		[SPC2079W] Remote data copy in progress. please wait for copy end or you should delete or suspend the Remote Copy volume pair using SVP operation on MCU. Do you stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. You should wait until Remote Copy is finished copy or you have to delete or suspend the Remote Copy pair from MCU by decided with customers and retry again.
1318		Invalid character in Action EC code. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.

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ID	Kind	Description
1319		Invalid character in Action UC code. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1320		Invalid character in Error code. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1321		Invalid character in F/M. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1322		Invalid character in DAY(DD). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1323		Invalid value in DAY(DD). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1324		Invalid character in HOUR(hh). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1325		Invalid value in HOUR(hh). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1326		Invalid character in MINUTE(mm). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1327		Invalid value in MINUTE(mm). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1328		Invalid character in MONTH(MM). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1329		Invalid value in MONTH(MM). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.

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ID	Kind	Description
1330		Invalid character in SECOND(ss). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1331		Invalid value in SECOND(ss). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1332		Invalid character in YEAR(YY). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1333		Invalid value in YEAR(YY). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1334		Invalid character in LDEV. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1335		Invalid value in LDEV. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1336		Invalid character in From date. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1337		Invalid character in DATE(DD). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1338		Invalid value in DATE(DD). Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1339		Invalid character in Bit Pattern1. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1340		Invalid character in Byte No1. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.

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ID	Kind	Description
1341		Invalid value in Byte No1. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1342		Invalid character in E/F. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1343		Invalid character in Byte No2. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1344		Invalid character in Bit Pattern2. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1345		Invalid value in Byte No2. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1346		Invalid value in PDEV. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1347		No Value in Date/Time!!! Please set a valid Date/Time.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1348		Invalid Date range. Please adjust From/To Date.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1349		No Value in Action Code!!! Please set a valid Action Code.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1350		No Value in Error Code!!! Please set a valid Error Code.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1351		No Value in LDEV!!! Please set a valid LDEV.
	[Contents]	Input is invalid.
	[Action]	Input correct data.

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ID	Kind	Description
1352		No Value in Format/Message!!! Please set a valid Format/Message.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1353		No Value in Byte No1/Bit Pattern1!!! Please set a valid Byte No/Bit Pattern.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1354		No Value in Byte No2/Bit Pattern2!!! Please set a valid Byte No/Bit Pattern.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1355		No Value in PDEV!!! Please set a valid PDEV.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1356		Invalid character in PDEV. Please reset input value.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1357		Parameter Error !!!(1) Usage ssbsrh param_adr_str
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1358		Cannot open ssb logfile!!!
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1359		Cannot read header ssb logfile!!!
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1360		Cannot create output file!!!
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1361		Cannot malloc read buffer!!! return FALSE
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
1362		Cannot open ssb logfile!!! return FALSE
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1363		Logfile read short return short:0
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1364		Logfile read short return short:1
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1365		Logfile read short return short:2
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1366		Logfile read short return short:3
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1367		Cannot Set timer!!!
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1368		Cannot open ssb.dsp!!!
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1369		Set correct HDD Model number.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1370		Set correct HDD product number.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1371		File I/O Error
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1372		All slave SVP are registered.
	[Contents]	All slave SVPs have been registered.
	[Action]	None

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ID	Kind	Description
1373		Invalid Secret Key is entered.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1374		The two keys you entered are not same.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1375		Unable to get timer.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1376		Communication with SSVP has not completed.
	[Contents]	A communication error with the SSVP occurred.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.
1377		You can't open this window because this SVP is not MASTER SVP.
	[Contents]	This is a function which can be used only in the master SVP.
	[Action]	None
1378		Node Status Read has been incomplete.
	[Contents]	Reading of the Node Status failed.
	[Action]	Check the connection between the slave SVP and the RS422 cable.
1379		Are you sure that you change the modem mode into \"Loop Back Mode\"?
	[Contents]	Do you want to change the modem setting to "Loop Back Mode?"
	[Action]	Answer to the inquiry.
1380		Are you sure that you change the modem mode into \"Normal Mode\"?
	[Contents]	Do you want to change the modem setting to "Normal Mode?"
	[Action]	Answer to the inquiry.
1381		Please insert CONFIG FD in FDD to backup ASSIST configuration.
	[Contents]	Backup of the configuration information to the CONFIG FD.
	[Action]	Insert the CONFIG FD into the FDD.

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ID	Kind	Description
1382		ASSIST configuration backup is done. Remove FD.
	[Contents]	Backup of the configuration information has been completed.
	[Action]	Remove the CONFIG FD from the FDD.
1383		Checking ASSIST configuration files.
	[Contents]	The configuration data file is being checked.
	[Action]	None
1384		ASSIST Configuration File will be loaded in HDD. Are you sure that an FD is ready to load it?
	[Contents]	-
	[Action]	-
1385		ASSIST Configuration File has loaded in HDD.
	[Contents]	-
	[Action]	-
1386		ASSIST configuration backup is failed.
	[Contents]	Backup was terminated abnormally.
	[Action]	Check if the FD is correct.
1387		ASSIST Setup finished.
	[Contents]	Microprogram exchange has been terminated normally.
	[Action]	None
1388		Entered password is invalid.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1389		SVP application requires windows to be running in the 386 enhanced mode. Please restart windows in the 386 enhanced mode.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1390		This application is already running.
	[Contents]	Two or more applications cannot be run concurrently.
	[Action]	None
1391		Invalid Password.
	[Contents]	Input is invalid.
	[Action]	Input correct data.

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ID	Kind	Description
1392		ONLINE,INSTALL and DIAGNOSIS are exclusive.
	[Contents]	Two or more tasks cannot be opened concurrently.
	[Action]	Retry after closing the active task.
1393		This will end the %s.
	[Contents]	End of the task
	[Action]	None
1394		Copyright (C) 1994-1996,Hitachi,Ltd.
	[Contents]	Copyright indication.
	[Action]	None
1395		Only decimal figure is permitted.Please check input figures again!
	[Contents]	Input is invalid.
	[Action]	Input correct data (decimal number).
1396		Are you sure to reload the LCP and end the LCDG4?
	[Contents]	Do you want to terminate the LCDG4 and reload the LCP?
	[Action]	Answer to the inquiry.
1397		Are you sure to reload the LCP and end the ACE?
	[Contents]	Do you want to terminate the ACE and reload the LCP?
	[Action]	Answer to the inquiry.
1398		LCP is not selected.
	[Contents]	The LCP is not selected.
	[Action]	Select the LCP.
1399		Processor is not selected.
	[Contents]	The processor is not selected.
	[Action]	Select a processor.
1400		HDU Unit Test will be stopped.
	[Contents]	The processing was interrupted.
	[Action]	Confirm the Status/log and recover the problem.
1401		CUDG will be stopped. Processor:%s
	[Contents]	CUDG was interrupted.
	[Action]	Confirm the log and recover the problem.
1402		Illegal Operation.
	[Contents]	-
	[Action]	-

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ID	Kind	Description
1403		HDU Unit Test is running. Wait...
	[Contents]	The processing is being executed.
	[Action]	None
1404		Select the correct group item.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1405		Are you sure you want to remove the CUDG Group?
	[Contents]	Do you move the CUDG group?
	[Action]	Answer to the inquiry.
1406		Group items or infinity items are included.
	[Contents]	Two or more groups or items are included.
	[Action]	None
1407		CUDG finishes. Processor:%s
	[Contents]	CUDG has been completed.
	[Action]	None
1408		Too many groups or items are specified.
	[Contents]	Two or more groups or items were specified.
	[Action]	Specify only one group or item.
1409		INLINE CUDG is running. Wait...
	[Contents]	INLINE CUDG is being executed.
	[Action]	None
1410		There are too many items in specified group. Surplus items are ignored.
	[Contents]	Specification of the top group or item was validated since two or more groups or items were specified.
	[Action]	None
1411		CUDG will be restarted. Processor:%s
	[Contents]	CUDG was restarted.
	[Action]	None
1412		Have you already varied off all the paths?
	[Contents]	Is the connection to the CPU separated?
	[Action]	None

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ID	Kind	Description
1413		You can do CUDG under off-line.
	[Contents]	CUDG can be executed in the off-line mode.
	[Action]	None
1414		Illegal Action Time.
	[Contents]	-
	[Action]	-
1415		CUDG will be interrupted. Processor:%s
	[Contents]	The processing was interrupted.
	[Action]	None
1416		Are LCP %s interrupted?
	[Contents]	Do you want to interrupt the processing?
	[Action]	Answer to the inquiry.
1417		Are LCP %s restarted?
	[Contents]	Do you want to restart it?
	[Action]	Answer to the inquiry.
1418		Are LCP %s stopped?
	[Contents]	May the process be terminated?
	[Action]	Answer to the inquiry.
1419		Inline CUDG can not execute.
	[Contents]	-
	[Action]	-
1420		Illegal Routine No.
	[Contents]	-
	[Action]	-
1421		Can not read from drive C.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1422		No response from SUB SVP.
	[Contents]	A communication error with the SSVP occurred.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.

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ID	Kind	Description
1423		Take off jumper wire.
	[Contents]	Remove the jumper.
	[Action]	Remove the jumper.
1424		No response from DKC.
	[Contents]	A communication error with the DKC occurred.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should taken)
1425		No response from DKC or SUB-SVP.
	[Contents]	A communication error with the DKC or the SSVP occurred.
	[Action]	Confirm whether the error occurred in the DKC or the SSVP by means of the Status. Then, perform the recovering procedure.
1426		Join jumper wire.
	[Contents]	Set a jumper.
	[Action]	Set a jumper.
1427		Error response from SUB SVP.
	[Contents]	An error was reported from the SSVP.
	[Action]	After collecting the SSVP dump, collect the FD copy.
1428		There is no processor for interrupt.
	[Contents]	-
	[Action]	-
1429		There is no processor for stop.
	[Contents]	-
	[Action]	-
1430		Turn off the DKC subsystem.
	[Contents]	Power off the DKC.
	[Action]	Power off the DKC.
1431		Select items or groups.
	[Contents]	Select items or groups.
	[Action]	Select items or groups.

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ID	Kind	Description
1432		The group can not be displayed.
	[Contents]	-
	[Action]	-
1433		There is no processor for restart.
	[Contents]	-
	[Action]	-
1434		Wait until loading has been finished.
	[Contents]	Wait until the loading is completed.
	[Action]	Wait until the loading is completed.
1435		Select items or groups.
	[Contents]	Select items or groups.
	[Action]	Select items or groups.
1436		Select single CHA.
	[Contents]	Select only one CHA.
	[Action]	Select only one CHA.
1437		Select single processor.
	[Contents]	Select only one processor.
	[Action]	Select only one processor.
1438		No CHP is available. Check the CHP status.
	[Contents]	-
	[Action]	-
1439		Select items or groups.
	[Contents]	Select items or groups.
	[Action]	Select items or groups.
1440		Illegal Routine No.
	[Contents]	Input is invalid.
	[Action]	Input correct data.
1441		Wait until loading has been finished.
	[Contents]	Wait until the loading is completed.
	[Action]	Wait until the loading is completed.
1442		Can not read from drive C.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
1443		No response from SUB SVP.
	[Contents]	A communication error with the SSVP occurred.
	[Action]	Isolate the problem according to the following procedure. ① Reboot the PC ② Reset the SSVP ③ Check the RS232C cable ④ Replace the PC. ⑤ Replace the SSVP.
1444		Take off jumper wire.
	[Contents]	Remove the jumper.
	[Action]	Remove the jumper.
1445		No response from DKC.
	[Contents]	There is no response from the DKC.
	[Action]	Isolate problems according to the following procedure. ① Reboot the PC. ② Check the LAN card/LAN cable. ③ Check the IP address of the PC ④ Replace the PC. ⑤ Power off, then on the DKC. (Care should taken)
1446		No response from DKC or SUB-SVP.
	[Contents]	A communication error with the DKC or the SSVP occurred.
	[Action]	Confirm whether the error occurred in the DKC or the SSVP by means of the Status. Then, perform the recovering procedure.
1447		Join jumper wire.
	[Contents]	Set a jumper.
	[Action]	Set a jumper.
1448		Error response from SUB SVP.
	[Contents]	An error was reported from the SSVP.
	[Action]	After collecting the SSVP dump, collect the FD copy.
1449		SYSERR can't open DRWATSON.LOG.
	[Contents]	File failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1450		SYSERR can't read the parameter file.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.

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ID	Kind	Description
1451		SYSERR can't create it's window class.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1452		SYSERR can't create it's window.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1453		SYSERR can't install a fault handler.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1454		SYSERR is running.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1455		Please reboot PC.
	[Contents]	Execute the PC reboot.
	[Action]	Execute the PC reboot.
1456		SYSERR can't register message.
	[Contents]	Failure in the PC
	[Action]	Reboot the PC. If It cannot be recovered, replace the PC.
1457		Error of the obstacle SCSI path may be occurred from now. Though DKA and normal SCSI path will be restored completely.
	[Contents]	Although an abnormal section remains, recovery of the DKA and SCSI paths was terminated normally.
	[Action]	Refer the Status/log and recover the problem.
1458		The cache/shared memory is now under de-staging process.
	[Contents]	Destining is being executed.
	[Action]	None
1459		The order the Fd is different. Please insert the %s FD.
	[Contents]	-
	[Action]	-
1460		Warning. The microprogram version will be various version. Are you sure you stop exchanging microprogram ?
	[Contents]	-
	[Action]	-

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ID	Kind	Description
2001	**I**	Please retry operation. **[Contents]** SVP requires the retry operation for Remote Copy. **[Action]** Please retry the same operation for a few times.
2002	**I**	Logical Path between the MCU and the RCU is not active. **[Contents]** Logical Path does not exist between MCU and RCU **[Action]** Confirm the path status on RCU Status screen, and reestablish the paths with Edit Path.
2003	**I**	The pair status of the M-VOL is not valid. **[Contents]** The pair status is not permissible status for the operation. **[Action]** Renew and confirm the Remote Copy (HRC/HODM/HORC) screen. If M-VOL is permissible status please retry the operation.
2004	**I**	Invalid serial number or SSID of RCU, or RCU is not permissible type for Remote Copy operation. **[Contents]** - Invalid serial number or SSID. - At HRC operation, RCU is not DKC310I. - At HODM operation, RCU is not DKC80I-3 or DKC90I-3. **[Action]** Confirm serial number and SSID of RCU, and set correct value. Please refer to error code table more detail.
2005	**I**	The specified RCU or SSID has some Remote Copy volume pairs. **[Contents]** Delete RCU or Edit SSID operation was rejected because the specified RCU or SSID has some Remote Copy volume pairs. **[Action]** 1 Case of Delete RCU operation. Please retry again after delete all pairs that the specified RCU has. 2 Case of Edit SSID operation. Please retry again after delete all pairs that the specified SSID has.
2006	**E**	Internal error occurred (Error code = %04x). **[Contents]** Internal error has occurred. **[Action]** See SSB LOG, and call technical support center to report them with the error code
2007	**I**	NVS status of MCU is not active (Error code = %04x). **[Contents]** MCU NVS status specified by HOST is not active. **[Action]** Confirm the NVS status of the MCU from HOST, set it on and retry. If it cannot set on, please call TSC.
2008	**I**	NVS status of RCU is not active (Error code = %04x). **[Contents]** RCU NVS status specified by HOST is not active. **[Action]** Confirm the NVS status of the RCU from HOST, set it on and retry. If it cannot set on, please call TSC.

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ID	Kind	Description
2009	**I**	The logical paths between MCU and RCU are not established.
	[Contents]	The logical paths between MCU and RCU are not established.
	[Action]	Confirm the paths status between MCU and RCU.
2010	**W**	Pinned track exist on the M-VOL.
	[Contents]	Pinned track exists on the M-VOL.
	[Action]	Confirm pin track status of the M-VOL, and clear the volume of the pinned tracks.
2011	**W**	Pinned track exist on the R-VOL.
	[Contents]	Pinned track exists on the R-VOL.
	[Action]	Confirm pin track status of the R-VOL, and clear the volume of the pinned tracks.
2012	**W**	The specified M-VOL is not in permissible condition of Remote Copy. \n(Error Code = %04x)
	[Contents]	
	[Action]	
2013	**I**	The R-VOL is already used by other system. (Error Code = %04x)
	[Contents]	The R-VOL is already used by other system. For example, 1.The R-VOL is already used by Dual Copy. 2.The R-VOL is already used by XRC or HXRC 3.The R-VOL is already used by pprc or HRC. 4.The R-VOL is already used by Concurrent Copy. 5.The R-VOL is reserved. 6.The R-VOL already used by HMRCF.
	[Action]	Confirm the R-VOL status of the RCU from HOST or SVP.
2014	**I**	Remote Copy is not supported under the DKC emulation type of the M-VOL.
	[Contents]	(The meaning is same as the message)
	[Action]	Confirm the Device emulation type with Refer Configuration, and refer to INST SECTION of the Maintenance Manual.
2015	**I**	Specified volume is not part of Remote Copy pair.
	[Contents]	Specified volume is not Remote Copy pair.
	[Action]	Please check the volume.

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ID	Kind	Description
2016	**I**	Remote Copy is not supported under the Controller emulation type of the MCU. **[Contents]** Remote Copy(HRC/HORC) is not supported under the Controller emulation type of the MCU. **[Action]** Confirm the Controller emulation type, and refer to INST SECTION of the Maintenance Manual.
2017	**I**	Suspend operation is not valid for R-VOL. **[Contents]** Suspend mode is not for R-VOL **[Action]** Please confirm the suspend and retry.
2018	**E**	Invalid R-VOL. **[Contents]** Invalid R-VOL **[Action]** Please confirm the R-VOL status.
2019	**W**	Time out error has occurred. **[Contents]** Time out error has occurred. **[Action]** Please confirm the Controller status and retry. Refer to SVPMSG05-30 “5. Error when operating HRC & HODM & HORC”.
2020	**I**	Invalid parameter. **[Contents]** Invalid parameter. **[Action]** Please check the inputted value and retry.
2021	**I**	Microcode does not support this function. **[Contents]** DKC-MAIN microprograms don't support this function. **[Action]** Please check the DKC-MAIN version.
2022	**W**	Communication error has occurred between SVP-SSVP. **[Contents]** Communication Error has occurred between SVP and SSVP. **[Action]** Please check the SSVP status and retry.
2023	**E**	Communication busy. Please retry later (Error code = %04x). **[Contents]** Communication busy. Please Retry later. **[Action]** Please wait for a moment and retry.
2024	**I**	There is no CU. **[Contents]** There is no CU **[Action]** Please confirm the CPU lamp.
2025	**I**	There is a same path. **[Contents]** There is a same path. **[Action]** Please check the inputted value.

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ID	Kind	Description
2026	**I**	The number of path is over high limit.
	[Contents]	The number of path is over high limit.
	[Action]	Please check the operation.
2027	**I**	The path dose not exist.
	[Contents]	The path dose not exist.
	[Action]	Please check the inputted value.
2028	**I**	The number of path is under low limit.
	[Contents]	The number of path is under low limit.
	[Action]	Please check the operation.
2029	**I**	The CHA does not support Remote Copy.
	[Contents]	The CHA does not support Remote Copy.
	[Action]	Please replace the CHA and retry.
2030	**W**	There are other blocked parts.
	[Contents]	SVP detected other blocked parts which are influenced to the Remote Copy operation.
	[Action]	After recovering their blocked parts, please retry the same operation.
2031	**W**	Maintenance object devices included Remote Copy volumes. You should delete the Remote Copy volume pair.
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation and end the Remote Copy volume pair.
2032	**W**	By this operation, all connected Remote Copy path(s) must be deleted. Please execute Delete RCU and retry this operation.
	[Contents]	SVP detected the warning operation.
	[Action]	Please select [OK] to stop the operation. You should delete RCU operation by decided with customers and retry again.
2033	**W**	This part includes the last logical path between MCU and RCU of Remote Copy. You should delete or suspend the Remote Copy volume pair. Do you want to stop this process?
	[Contents]	SVP detected the warning operation.
	[Action]	If [Yes], SVP will stop the process so that you should end or suspend the pair. If [No], SVP will continue the process, but you must be careful to operate.

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ID	Kind	Description
2034	**W**	Maintenance object devices include Remote Copy volumes. You should delete the Remote Copy volume pair using SVP operation on MCU. **[Contents]** SVP detected the warning operation. **[Action]** Please select [OK] to stop the operation and delete the Remote Copy volume pair.
2035	**W**	You should suspend the Remote Copy volume pair using SVP operation on MCU. Do you want to stop this process? **[Contents]** SVP detected the warning operation. **[Action]** If [Yes], SVP will stop the process so that you should suspend the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
2036	**W**	You should delete or suspend the Remote Copy volume pair using SVP operation on MCU before hand. Do you want to stop this process? **[Contents]** SVP detected the warning operation. **[Action]** If [Yes], SVP will stop the process so that you should end or suspend the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
2037	**W**	You should delete the logical path of Remote Copy. Do you want to stop this process? **[Contents]** SVP detected the warning operation. **[Action]** If [Yes], SVP will stop the process so that you should end the pair from M-VOL. If [No], SVP will continue the process, but you must be careful to operate.
2038	**W**	This CHA may include the last logical path between MCU and RCU of Remote Copy. Please check if there is a alternate path from MCU at first. Do you want to stop this process? **[Contents]** SVP detected the warning operation. **[Action]** If [Yes], SVP will stop the process so that you should end the path from MCU. If [No], SVP will continue the process, but you must be careful to operate. Note.1 Before you replace CHA, please vary off-line the path to the CHA which is connected from MCU. After replacement, please vary online the path. If you de-install CHA, please vary off-line the path to the CHA which is connected from MCU.
2039	**E**	Invalid number of Path (Error code = %04x). **[Contents]** The Specified number of paths do not cover 1 to 4. **[Action]** Confirm the number of paths you specified and retry. If it does not work properly, please call TSC.

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ID	Kind	Description
2040	**E**	Specified port of MCU is not RCP (Error code = %04x). **[Contents]** (The meaning is same as the message) **[Action]** Confirm the configuration of LCP/RCP. And specify correct Port or change the port to RCP and retry. If it does not work properly, please call TSC.
2041	**E**	Invalid Destination Link Address (Error code = %04x). **[Contents]** The specified Logical Address is not 00 or 03. **[Action]** Confirm Logical Address and set correct Link Address and retry. If it does not work properly, please call TSC.
2042	**I**	The specified logical path already exists (Error code = %04x). **[Contents]** The specified Link address and port are already used. **[Action]** Confirm all existing logical path address, and specify other Link address or RCP port.
2043	**I**	Invalid serial number, SSID or Link Address of RCU (Error code = %04x). **[Contents]** (The meaning is same as the message) **[Action]** Confirm serial number, SSID and Link Address of RCU, and set correct value. If value is correct, confirm channel cable connecting to RCU and retry. If it does not work properly, please call TSC.
2044	**I**	Too many RCUs. (Allowed Four RCUs) (Error code = %04x). **[Contents]** 4 RCUs are already entered. **[Action]** Please check the inputted value and retry.
2045	**E**	Path establishing is not complete. **[Contents]** Path establishing was partly failed. **[Action]** Confirm the path connections between MCU and RCU. Then retry the operation.
2046	**E**	Path establishing is failed. **[Contents]** Path establishing was failed. **[Action]** Confirm the path connections between MCU and RCU. Then retry the operation.
2047	**I**	The Edit Path operation was rejected because the specified path is the last path of some Remote Copy pair. **[Contents]** Same as the message. The Edit Path operation was rejected because the specified path is the last path of some Remote Copy pair. **[Action]** Add another path, or delete all pairs on the RCU. Then retry the operation.
2048	**I**	Pending data on the port (Error code = %04x). **[Contents]** SVP detected the pending data on the port. **[Action]** Please retry again.

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ID	Kind	Description
2049	**E**	Port exchange error has occurred. **[Contents]** SVP detected Port exchange error. **[Action]** Please replace the target CHA.
2050	**I**	Logical paths exist on the port (Error code = %04x). **[Contents]** SVP detected logical paths on the port. **[Action]** Please delete the path and retry.
2051	**E**	Unknown Error Code. **[Contents]** SVP detected unknown error code. **[Action]** Please call TSC.
2052	**W**	Are you sure you want to delete the RCU? **[Contents]** This message is to check your operation again. **[Action]** If you continue, please select [OK],if you stop the operation, please select [Cancel].
2053	**W**	Are you sure you want to delete the path? **[Contents]** This message is to check your operation again. **[Action]** If you continue, please select [OK],if you stop the operation, please select [Cancel].
2054	**W**	Are you sure you want to delete the volume pair? **[Contents]** This message is to check your operation again. **[Action]** If you continue, please select [OK],if you stop the operation, please select [Cancel].
2055	**W**	Are you sure you want to suspend the volume pair? **[Contents]** This message is to check your operation again. **[Action]** If you continue, please select [OK],if you stop the operation, please select [Cancel].
2056	**W**	Are you sure you want to erase data on the R-VOL? **[Contents]** This message is to check your operation again. **[Action]** If you continue, please select [OK],if you stop the operation, please select [Cancel].
2057	**W**	Are you sure you want to exchange LCP/RCP ports? Please confirm the concerned channel paths are varied off-line. **[Contents]** This message is to check your operation. **[Action]** Please vary off-line the concerned path. If you continue, please select [OK],if you stop the operation, please select [No].

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ID	Kind	Description
2058	**I**	Please exchange channel cable connecting. **[Contents]** SVP promote you to exchange channel cable connecting. **[Action]** Please follow the message.
2059	**W**	Remote data copy in progress. Please wait for copy end or you should delete or suspend the Remote Copy volume pair. Do you want to stop this process? **[Contents]** SVP detects the data copy by Remote Copy. **[Action]** If [Yes] is selected, you should wait until copy is finished, or you should delete or suspend the pair after you negotiate with your customer. If [No] is selected, SVP will stop the process.
2060	**W**	The Remote Copy volume pair may be suspended. No maintenance operations are possible during Remote initial copy. Do you want to stop this process? **[Contents]** SVP detects the warning that Remote Copy pair will be suspended or you could not operate more. **[Action]** If [Yes] is selected, SVP will stop the process, but if [No] is selected, SVP will continue the process.
2061	**I**	Operation is rejected because of maintenance in progress. **[Contents]** (The meaning is same as the message) **[Action]** Please exit other SVP applications(ONLINE or INSTALL if you executed) and retry.
2062	**I**	No more volume pair waiting for copy. **[Contents]** There is no waiting pair. **[Action]** Please check the pair status and retry.
2063	**E**	Communication error has occurred between Console-SVP (Error code = %04x). **[Contents]** Communication error has occurred. **[Action]** Please check the SVP status and connectivity status between Console-SVP and retry. If it does not work properly, please call TSC.
2064	**W**	Are you sure you want to exchange RCP/LCP ports? The concerned paths should be deleted before the operation. **[Contents]** This message is to check your operation. **[Action]** If the concerned paths does not delete, please select [No] and delete it. If you continue , please [Yes].
2065	**W**	Invalid port type. **[Contents]** (The meaning is same as the message) **[Action]** Please check the port status and retry.

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ID	Kind	Description
2066	**I**	Timer setting error has occurred. Wait for 30 seconds, then press OK. **[Contents]** (The meaning is same as the message) **[Action]** Please wait for 30 seconds and reboot SVP.
2067	**I**	Timer setting error has occurred. Wait for 30 seconds, then press OK. **[Contents]** (The meaning is same as the message) **[Action]** Please wait for 30 seconds. And select [OK] and reboot SVP.
2068	**I**	Specified number of Path is less than the Minimum Paths on RCU Option screen (Error code = %04x). **[Contents]** SVP rejected the number was less than the minimum. **[Action]** Please check the number of Paths
2069	**I**	Currently running microprogram version does not support the specified operation (Error code = %04x). **[Contents]** Microprograms do not support. **[Action]** Please check the microprograms version. If the version of microprograms supported Remote Copy functions, please exchange LCP microprogram again.
2070	**I**	Specified volume may be online from HOST (Error code = %04x). **[Contents]** HODM cannot start because the volume is online from HOST. **[Action]** Please check if the volume is online. If online, please vary offline the path and retry. And, if the volume is attached VM system, please vary offline the path from VM system, too.
2071	**E**	R-VOL status change failed after M-VOL status change. Confirm R-VOL status. **[Contents]** (The meaning is same as the message) **[Action]** Please confirm the R-VOL status
2072	**I**	HODM volume pair cannot be terminated because migration copy is in progress and the specified volume may be online from HOST (Error code = %04x). **[Contents]** HODM could not start because the specified volume may be online from HOST. **[Action]** Please check the status if migration copy is in progress or the volume is online.

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ID	Kind	Description
2073	**W**	You should add the alternate path, or if the Fence Level is Data/Status, you should delete the pair volume, or if the Fence Level is Never, you should suspend the pair volume. Do you want to stop this process?
	[Contents]	Alternate path must be added or pair must be deleted or suspended.
	[Action]	Please select [Yes] to stop operation and decide with your customer which you have to do, add Remote Copy(HRC/HORC) alternate path, or delete the pair if the fence level of the volume is Data/Status, suspend the pair if the fence level of the volume is never. And retry. If you select [No], SVP will continue the process.
2074	**W**	You should add the alternate path or delete the Remote Copy pair. Do you want to stop this process?
	[Contents]	Alternate path must be added or pair must be deleted.
	[Action]	Please select [Yes] to stop the operation and add the alternate path or delete the pair by decided by customers. If you select [No], SVP will continue the process.
2075	**W**	You should add the alternate path. Do you want to stop this process?
	[Contents]	Alternate path must be added.
	[Action]	Please select [Yes] to stop the operation and add the alternate path by decided with customers.
2076	**W**	HODM data copy in progress. Please wait for copy end or you should add alternate path. Do you want to stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. You should finish HODM copy or add alternate path by decided with customers and retry again. If you select [No], SVP will continue the process.
2077	**W**	You should add the alternate path or stop the I/O from Host. Do you want to stop this process?
	[Contents]	(The meaning is same as the message)
	[Action]	Please select [Yes] to stop the operation. Please decide with your customer which you have to do, add the HODM alternate path or stop the I/O from HOST. If you select [No], SVP will continue the process.

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ID	Kind	Description
2078	**W**	You should add the alternate path or delete the HODM pair. Do you want to stop this process? **[Contents]** (The meaning is same as the message) **[Action]** Please select [Yes] to stop the operation. You should delete the pair or add alternate path by decided with customers and retry again. If you select [No], SVP will continue the process.
2079	**W**	Remote data copy in progress. Please wait for copy end or you should delete or suspend the Remote Copy volume pair using SVP operation on MCU. Do you want to stop this process? **[Contents]** (The meaning is same as the message) **[Action]** Please select [Yes] to stop the operation. You should wait until Remote Copy is finished copy or you have to delete or suspend the Remote Copy pair from MCU by decided with customers and retry again.
2080	**I**	Specified R-VOL is still online from HOST. **[Contents]** (The meaning is same as the message) **[Action]** Please check if the input number of R-VOL is correct. If not, input the correct R-VOL number. If the number is correct, please vary offline the concerned path from the host. And, if the R-VOL is attached VM system, please vary offline the concerned path from VM system, too.
2081	**E**	Connection error occurred between Remote Console and Controller. **[Contents]** Remote Console could not connect to the DKC. SVP sometimes displays “Controller” as “Subsystem” but these are same meaning. **[Action]** Please check the connection and retry the same operation.
2082	**I**	Wait 10 minutes. Then please check if subsystem's status is OK and no SIM. After that press [OK]. **[Contents]** Remote Console could not connect to the DKC. **[Action]** Please check the connection and retry the same operator.
2083	**I**	Can't execute specified function while Remote Copy monitoring is active. If you want to execute the function, please stop the monitoring function at first and retry again. **[Contents]** Remote Console could not connect to the DKC. **[Action]** Please check the connection and retry the same operator.

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ID	Kind	Description
2084	**I**	The specified number of Path is less than the Minimum number of Paths on RCU Option screen (Error code = %04x). **[Contents]** The number of Paths is less than the Minimum number of Paths on RCU option screen. **[Action]** Confirm the number of Minimum Paths with RCU Option screen and retry the operation after establishing the number of paths more than Minimum Paths.
2085	**W**	The specified number of Path is less than the Minimum number of Paths on RCU Option screen as a result of communication error between MCU and RCU (Error code = %04x). **[Contents]** The number of Paths is less than the Minimum number of Paths on RCU option screen as a result of communication error between MCU and RCU. **[Action]** Confirm the path status on RCU Status screen, and reestablish the paths with Edit Path.
2086	**W**	The path could not be deleted due to communication error between MCU and RCU. **[Contents]** The path couldn't be deleted due to the communication error between MCU and RCU or the blockade of the CHA. **[Action]** Confirm the CHA status with "STATUS" on the MCU. If the CHA is blockaded, replace it by a new one. Then retry the operation.
2087	**I**	Parameter specified by Remote Copy operation is invalid. **[Contents]** Parameter specified by Remote Copy(HRC/HORC) operation is invalid. For example, the R-VOL which is specified is already used as the R-VOL of another Remote Copy pair. **[Action]** Please establish the correct parameter and retry the operation.
2088	**I**	Parameter specified by HODM operation is invalid. **[Contents]** Parameter specified by HODM operation is invalid. For example, the R-VOL which is specified is already used as the R-VOL of another HODM pair. **[Action]** Please establish the correct parameter and retry the operation.
2089	**I**	The pair status of the R-VOL is not valid. **[Contents]** The pair status is not permissible status for the operation. **[Action]** Renew and confirm the Remote Copy (HRC/HODM/HORC) screen. If R-VOL is permissible status please retry the operation.

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ID	Kind	Description
2090	**I**	HODM is not supported under the Controller emulation type of the MCU. **[Contents]** HODM is not supported under the Controller emulation type of the MCU. **[Action]** Confirm the Controller emulation type and refer to INST SECTION of the Maintenance Manual.
2091	**I**	Remote Copy is not supported under the Controller type of the RCU. **[Contents]** Remote Copy(HRC/HORC) is not supported under the Controller emulation type of the RCU. **[Action]** Confirm the Controller emulation type, and refer to INST SECTION of the Maintenance Manual.
2092	**I**	HODM is not supported under the Controller type of the RCU. **[Contents]** HODM is not supported under the Controller emulation type of the RCU. **[Action]** Confirm the Controller emulation type and refer to INST SECTION of the Maintenance Manual.
2093	**E**	Invalid serial number or SSID of MCU. **[Contents]** Invalid serial number or SSID of MCU **[Action]** Confirm the serial number or SSID of MCU. Retry with correct parameter. If it does not work properly, please call TSC.
2094	**I**	Invalid serial number or SSID of RCU. **[Contents]** Invalid serial number or SSID of RCU **[Action]** Confirm the serial number or SSID of RCU. Please retry again.
2095	**I**	Subsystem Cache status of MCU is not active. **[Contents]** Inactive Subsystem Cache status on MCU. **[Action]** Confirm the Subsystem Cache status of MCU from HOST. If it is off, set it on and retry. If it cannot set on, call TSC.
2096	**W**	One side of Cache on MCU is blocked. **[Contents]** Invalid Cache status on MCU. **[Action]** Check the Cache of MCU and recover it. Then retry the operation.
2097	**W**	Unexpected error occurred on MCU. **[Contents]** Unexpected error occurred on MCU. **[Action]** Call TSC.

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ID	Kind	Description
2098	**I**	Subsystem Cache status of RCU is not active.
	[Contents]	Inactive Subsystem Cache status on RCU.
	[Action]	Confirm the Subsystem Cache status of RCU from HOST. If it is off, set it on and retry. If it cannot set on, call TSC.
2099	**I**	Track Format of M-VOL and R-VOL do not match.
	[Contents]	Track Format of M-VOL and R-VOL do not match.
	[Action]	Confirm the Device type of the specified M-VOL and R-VOL.
2100	**I**	Combinations of the device emulation of M-VOL with R-VOL is not supported.
	[Contents]	Combinations of the device emulation of M-VOL with R-VOL is not supported. 1.Combination of the device type. 2.Combination of the number of cylinders.
	[Action]	Confirm the device emulation of the specified M-VOL and R-VOL.
2101	**I**	Device Cache status of R-VOL is not active.
	[Contents]	Inactive the Device Cache status of R-VOL.
	[Action]	Confirm the Device Cache status of R-VOL from HOST. If it is off, set it on and retry. If it cannot set on, call TSC.
2102	**I**	DFW status of R-VOL is not active.
	[Contents]	Inactive the DFW status of R-VOL.
	[Action]	Confirm the DFW status of R-VOL from HOST. If it is off, set it on and retry. If it cannot set on, call TSC.
2103	**W**	The Specified R-VOL is not usable.
	[Contents]	Specified R-VOL is not usable to be status of following. 1.The specified volume has not been installed. 2.The specified volume is defined as Command Device for RAID manager.
	[Action]	Confirm the configuration of the specified R-VOL.
2104	**I**	HODM is not supported under the Device emulation type of the M-VOL.
	[Contents]	HODM is not supported under the Device emulation type of the M-VOL.
	[Action]	Confirm the Device emulation type of the specified M-VOL and refer to INST SECTION of the Maintenance Manual.

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ID	Kind	Description
2105	**I**	Remote Copy is not supported under the Device emulation type of the R-VOL. **[Contents]** Remote Copy(HRC/HORC) is not supported under the Device emulation type of the R-VOL. **[Action]** Confirm the Device emulation type of the specified R-VOL with Refer Configuration , and refer to INST SECTION of the Maintenance Manual.
2106	**I**	HODM is not supported under the Device emulation type of the R-VOL. **[Contents]** HODM is not supported under the Device emulation type of the R-VOL. **[Action]** Confirm the Device emulation type of the specified R-VOL and refer to INST SECTION of the Maintenance Manual.
2107	**I**	The RCU is still in HODM condition. **[Contents]** The RCU containing the R-VOL specified "ADD HODM PAIR " is used as RCU of HODM. **[Action]** Verify the operation whether the RCU is using as HODM. Then retry the operation after "Del RCU" once.
2108	**I**	The RCU is still in Remote Copy condition. **[Contents]** The RCU containing the R-VOL specified "ADD HRC PAIR " is used as RCU of Remote Copy(HRC/HORC). **[Action]** Verify the operation whether the RCU is using as HRC. Then retry the operation after "Del RCU" once.
2109	**W**	Connection error occurred between Remote Console and Controller. **[Contents]** Remote Console could not connect to Controller. **[Action]** Please check
2110	**W**	Please confirm the specified R-VOLs are varied off-line. **[Contents]** When entering HODM pair, SVP guides an operator to confirm the specified R-VOLs are varied off-line. **[Action]** If you finish confirming the specified R-VOLs are varied off-line, please select "OK". If not, please select "Cancel".
2111	**W**	The CHA-PCB type was not available so that SVP could not restore. **[Contents]** SVP detected the CHA-PCB type was not available. **[Action]** If [OK], SVP will finish this process. Please prepare the same PCB before replacement or the same PCB as you define. And retry again.

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ID	Kind	Description
2112	**W**	The CHA-PCB does not support Remote Copy so that SVP could not restore. Please check the PCB type and retry. **[Contents]** SVP could not recover because of the different type of CHA-PCB. **[Action]** There are two cases that the port is set as RCP or the PCB does not support Remote Copy. Please check the PCB. If [OK], SVP will finish this process. Please prepare the same PCB before replacement or the same PCB as you define. And retry again.
2113	**W**	SVP could not recover. SVP has already set RCP port, but the PCB does not support Remote Copy. **[Contents]** SVP could not recover. **[Action]** If [OK], SVP will finish this process. Please prepare the same PCB before replacement or the same PCB as you define. And retry again.
2114	**I**	The target PCB does not support Remote Copy. Please replace the PCB which supports Remote Copy necessary. **[Contents]** SVP detected the PCB does not support Remote Copy. **[Action]** Please replace to the PCB which supports Remote Copy.
2115	**W**	There are no more paths than the Minimum Paths on RCU option screen. **[Contents]** The number of Paths is less than the Minimum number of Paths on RCU option screen as a result of communication error between MCU and RCU. **[Action]** Confirm the path status on RCU Status screen, and reestablish the paths with Edit Path.
2116	**I**	Specified volume is not part of Remote Copy pair(Not in Duplex Avail, Pending Duplex, Suspend Duplex state) (Error code = %04x). **[Contents]** Specified volume is not Remote Copy pair. **[Action]** Please check the volume.
2117	**W**	WARNING:Destination volume of specified volume pair may contain some inconsistency because volume copy is not completed yet. Full volume initialization is required before re-using it. Own Dev X:XX S/N XXXX SSID XXXX Pair Dev X:XXX If you want to delete pair, press OK. **[Contents]** #REF! **[Action]** #REF!

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ID	Kind	Description
2118	**W**	This subsystem is now processing by Remote Copy. It is necessary to execute \"Delete RCU\" because the Remote Copy cannot control their status. Do you want to stop this process? **[Contents]** This subsystem is used by Remote Copy. **[Action]** If [Yes], SVP finishes this process. Please contact your customer to delete RCU and retry. If [No], SVP continues this process.
2119	**W**	This subsystem is now processing by Remote Copy. It is necessary to execute \"Delete RCU\" from MCU side because the Remote Copy cannot control the status. Do you want to stop this process? **[Contents]** This subsystem is used by Remote Copy. **[Action]** If [Yes], SVP finishes this process. Please contact your customer to delete RCU from MCU side and retry. If [No], SVP continues this process.
2120	**I**	The Cache on MCU is automatically recovering now. Please wait a few minutes then retry again (Error code = %04x). **[Contents]** Please follow the message. **[Action]** Please select [OK] and wait a few minutes. After, retry again.
2121	**I**	R-VOL option change operation failed so that only M-VOL option was modified, because RCU side did not support a fence level displaying function (Error code = %04x). **[Contents]** R-VOL option change operation failed because the RCU side does not support to display fence level. SVP changed only M-VOL option. **[Action]** Please select [OK].
2122	**E**	Pair option change operation failed because communication error has occurred or R-VOL status is invalid (Error code = %04x). **[Contents]** SVP detected the communication error or R-VOL status invalid. **[Action]** Please check the status.
2123	**I**	Pair option change was refused because M-VOL is suspend (Error code = %04x). **[Contents]** SVP detected M-VOL was suspend. **[Action]** Please retry after Resume Pair for M-VOL.
2124	**W**	Do you want to continue? **[Contents]** SVP detected some error when a set of pairs was entered/deleted/recovered/changed options. **[Action]** If [Yes], SVP continues this operation. If [No], SVP finishes.
2125	**I**	Multi platform feature has been already installed in MCU (Error code = %04x). **[Contents]** SVP detected Multi platform feature has been installed in MCU. **[Action]** Remote Copy function is exclusive to Multi platform feature. Please de-install CHS PCB(s) in MCU before Remote Copy function is performed.

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ID	Kind	Description
2126	**I**	Multi platform feature has been already installed in RCU (Error code = %04x). **[Contents]** SVP detected Multi platform feature has been installed in RCU. **[Action]** Remote Copy function is exclusive to Multi platform feature. Please de-install CHS PCB(s) in MCU before Remote Copy function is performed.
2127	**I**	Multi platform feature has been already installed in subsystem. **[Contents]** SVP detected Multi platform feature has been installed. **[Action]** Please check the configuration of this machine.
2128	**W**	Warning!! Through this operation, M-VOL status will be changed to Simplex mode forcibly, but R-VOL status will not be changed. If you do this operation, please change the R-VOL status to Simplex mode. **[Contents]** SVP detected the pair which was forced delete was HRC/HORC and the mode was other than Simplex. **[Action]** Please select [OK] and change the R-VOL to Simplex.
2129	**W**	Warning!! Through this operation, M-VOL status will be changed to Simplex mode even if the M-VOL is online to the host. **[Contents]** SVP detected the pair which was forced delete was HODM and the status was other than waiting erase. **[Action]** Please contact your customer to change the mode to Simplex. After, please select [OK].
2130	**E**	Illegal microprogram version was included. Please execute microprograms exchange. **[Contents]** SVP detected illegal version of microprograms. **[Action]** Please execute microprograms exchange.
2131	**I**	In this microprogram version, you can not define both Remote Copy and SCSI configuration simultaneously. Please define either Remote Copy or SCSI configuration. **[Contents]** This microprogram does not support to set Remote Copy and Multi platform feature together. **[Action]** Please set either Remote Copy or Multi platform.
2132	**I**	The target has connected SCSI channel port. Please delete the connected SCSI Path at first. **[Contents]** SVP detected that the target has connected SCSI channel port. **[Action]** Please erase SCSI path set and de-install the target.
2133	**I**	Valid RCP port does not exist. **[Contents]** There is no valid RCP Port. **[Action]** Please select [OK] to stop this process and check the port.

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ID	Kind	Description
2134	**E**	Specified volume contain some R-VOLs. You can change parameters for only M-VOLs, not for R-VOLs. **[Contents]** When you change the parameters against suspend pair, the specified volume contain some R-VOLs so that SVP could not change parameters against R-VOL. **[Action]** Please select [OK] to stop this process. SVP will change the parameters against M-VOLs only.
2135	**I**	Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI path(s). Do you want to continue this process? **[Contents]** You should shutdown concerned connecting SCSI host(s) or switch to the alternate SCSI channel path(s). **[Action]** If you do not confirm yet, please select [No] to stop the process. If you already has confirmed, please select [Yes] to continue.
2136	**I**	Multi platform feature has been already installed in MCU. **[Contents]** Multi platform feature has been already installed in MCU. **[Action]** Remote Copy function is exclusive to Multi platform feature. Please de-install CHS/CHF/CHT PCB(s) in MCU before Remote Copy function is performed.
2137	**I**	Multi platform feature has been already installed in RCU. **[Contents]** Multi platform feature has been already installed in RCU. **[Action]** Remote Copy function is exclusive to Multi platform feature. Please de-install CHS/CHF/CHT PCB(s) in RCU before Remote Copy function is performed.
2138	**W**	Not enough memory. Please exit other applications and retry again. **[Contents]** SVP detected a lack of memory. **[Action]** If you execute other applications, please exit them and retry. Please select [OK] to stop the process.
2139	**E**	This controller needs maintenance. **[Contents]** The connected controller needs the maintenance. **[Action]** Please call technical support center.
2140	**I**	SCSI path definition was completed. **[Contents]** SVP finished the definition. **[Action]** Please confirm the message and select [OK]. After, please reboot the HOST and check the connectivity.
2141	**E**	The SCSI path(s) could not be changed. Please retry again. **[Contents]** SVP failed to define the SCSI paths. **[Action]** Please retry again or call TSC.

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ID	Kind	Description
2142	**E**	Port restoration was failed. **[Contents]** SVP failed to restore the port. **[Action]** Please select [OK] to stop the process, and call TSC.
2143	**W**	This controller does not equip SCSI device. **[Contents]** SVP detected the controller does not equip SCSI device. **[Action]** Please select [OK] to stop the process and check the controller to equip SCSI device.
2144	**W**	It is possible that host I/O of following port(s) does not stop. Please shutdown concerned connecting SCSI host(s) or change port one by one.PORT#:%s %s = CL1-x,x,x,x (x = A - H), CL2-x,x,x,x (x = A - H) **[Contents]** SVP detected the host I/O. **[Action]** Please select [OK] to stop the process and stop the HOST's I/O. Please set other ports and retry again.
2145	**E**	The following ports could not be changed. Please check those PORTs status by STATUS. PORT#:%s %s = CL1-x,x,x,x (x = A - H), CL2-x,x,x,x (x = A - H) **[Contents]** SVP could not change the port. If the host I/O of the ports does not finish completely, sometimes error will be occurred. **[Action]** Please select [OK] to stop the process and check the target port status by STATUS and contents of setting data. If the port is blocked, please replace the target PCB. If the port is normal, please finish host I/O of the ports and set to the same port again.
2146	**I**	Please confirm you have already varied off the concerned channel path(s). Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to replace the “%s?” **[Contents]** This is a confirmation message. Please check the concerned connecting SCSI host(s). **[Action]** If you confirm and the replacing parts is correct, please select [Yes] to continue. If you could not confirm, please select [No] to stop the process.
2147	**I**	Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to replace the “%s?” **[Contents]** This is a confirmation message. Please check the concerned connecting SCSI host(s). **[Action]** If you confirm and the replacing parts is correct, please select [Yes] to continue. If you could not confirm, please select [No] to stop the process.

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ID	Kind	Description
2148	**I**	Please confirm you have already varied off the concerned channel path(s). Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to block Cluster-%d? **[Contents]** This is a confirmation message. Please check the concerned channel path(s) and SCSI hosts(s). **[Action]** If you confirm and the target blocking cluster is correct, please select [Yes] to continue. If you could not confirm, please select [No] to stop this process.
2149	**I**	Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to block Cluster-%D? **[Contents]** This is a confirmation message. Please check the concerned connecting SCSI host(s). **[Action]** If you confirm and the target blocking cluster is correct, please select [Yes] to continue. If you could not confirm, please select [No] to stop this process.
2150	**I**	This operation will block Cluster-%d before recovery. Please confirm following items. ¥n 1. Varied off the channel path(s). ¥n 2. Shutdown connecting SCSI host(s) or switched to the alternate SCSI channel path(s). ¥n Do you want to continue? **[Contents]** This is a confirmation message. Please check the channel path(s). **[Action]** If you confirm that the target cluster will be blocked, please select [OK] to continue. If you could not confirm, please select [Cancel] to stop this process.
2151	**I**	The operation will block Cluster-%d before recovery. Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to continue? **[Contents]** This is a confirmation message. Please check the concerned connecting SCSI host(s). **[Action]** If you confirm that the target cluster will be blocked, please select [Yes] to continue. If you could not confirm, please select [No] to stop this process.
2152	**I**	The replacement of %s has finished and Cluster is enabled. The concerned channel path(s) and SCSI channel path(s) are available. Please vary the path(s) on. **[Contents]** The replacement process has finished so that please follow as this message. **[Action]** After varying the path(s) on, please select [OK].

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ID	Kind	Description
2153	**I**	The replacement of %s has finished and Cluster is enabled. The concerned SCSI channel path(s) are available. **[Contents]** The replacement has finished. **[Action]** Please select [OK] to finish this process.
2154	**I**	The restore has finished. Cluster is enabled. The concerned channel path(s) and SCSI channel path(s) are available. Please vary the path(s) on. **[Contents]** The restore has finished. Please follow as this message. **[Action]** After varying the path(s) on, please select [OK].
2155	**I**	The restore has finished. Cluster is enabled. The concerned SCSI channel path(s) are available. **[Contents]** The restore has finished. **[Action]** Please select [OK] to finish this process.
2156	**E**	Subsystem configuration data was not changed. **[Contents]** The program could not change the data because it detected some error in the subsystem. **[Action]** Please select [OK] to finish this process. The subsystem might have some blocking parts so that you should call technical support center.
2157	**E**	The following ports could not be changed. Please check those ports. Port#:%s **[Contents]** The program could not change those ports. **[Action]** Please select [OK] to finish this process. And retry again. If the same message is displayed, you may call technical support center.
2158	**E**	The SCSI path(s) could not be changed. **[Contents]** The program could not change the SCSI path(s). **[Action]** Please select [OK] to finish this process. Before displaying this message, another message may be displayed. Please follow this message.

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ID	Kind	Description
2159	**I**	The number of minimum paths is more than the number of normal paths. (Error Code = %x) **[Contents]** Setting the number of minimum paths of the RCU Option Setting operation is rejected because the number of minimum paths is more than the number of normal paths. **[Action]** Please do the operation according to the Error Code. (1) Error Code = 100c : Set the number of minimum paths after adding normal paths so that the number of minimum paths won't be more than the number of normal paths. (2) Error Code = 100d : Delete paths after adding normal paths or descreasing the number of minimum paths so that the number of minimum paths won't be more than the number of normal paths.
2160	**I**	Invalid Logical Addresses are specified. (Error Code = %x) **[Contents]** The Add RCU operation or the Edit Path operation is rejected because some Logical Addresses of added paths are invalid. **[Action]** 1. Case of Add RCU operation Specify the same Logical Address. 2. Case of Edit Path operation Specify the same Logical Address as existing paths. (Refer to the Edit Path Screen).
2161	**I**	The existing logical addresses are not equal. (Error Code = %x) **[Contents]** The edit Path operation is rejected because Logical Addresses of existing paths are not equal. **[Action]** Execute the Delete RCU Operation and the Add RCU operation again. You must specify the same Logical Address.
2162	**E**	Remote Console detected internal error. **[Contents]** The program detected the internal error. **[Action]** Please select [OK] to stop the process. And retry again. If the message is displayed, please restart the same programs after closing it, or you should reboot this PC.
2163	**W**	The target controller is being maintained now. After maintaing, please retry again. **[Contents]** The target controller might been maintained. For example, (1) "ONLINE" program is running. (2) "INSTALL" program is running. (3) "Diag" program is running. **[Action]** Please select [OK] to stop this process. After finishing maintained, please retry again.
2164	**I**	The target controller does not support this function. **[Contents]** The program detected that the target controller did not support this function. **[Action]** Please select [OK] to stop this process. If you need this function, please call technical support center.

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ID	Kind	Description
2165	**W**	WARNING!! If you continue this operation without stopping I/O, you may lost your data. **[Contents]** Please be careful to do this operation. **[Action]** Please confirm that the concerned SCSI host(s) is shutdown or there is no I/O from the host(s). After this message, the program continue processing this function. But if some error will be detected, the subsystem will occurred some fatal error. Therefore, please be careful to continue the process and select [OK].
2166	**I**	The M-VOL is already used by other system. (Error Code = %04x) **[Contents]** The M-VOL is already used by other system. For example, 1. The M-VOL is already used by HXRC. 2. The M-VOL is already used by HMRCF. **[Action]** Confirm the M-VOL status of the MCU from HOST or svp.
2167	**W**	As the result of this operation, you will not be able to re-start Erase R-VOL operation. **[Contents]** As the result of this operation, you will not be able to re-start Erase R-VOL operation. **[Action]** If it is no problem not to be able to restart Erase R-VOL operation, please select [OK]. If not, please select [Cancel].
2168	**W**	As the result of this operation, you will not be able to re-start Erase R-VOL operation. To delete the pair forcibly, please try again with 'Force' option. **[Contents]** As the result of this operation, you will not be able to re-start Erase R-VOL operation. To delete the pair forcibly, please try again with 'Force' option. **[Action]** Delete the pair with 'Force' option.
2169	**E**	Invalid parameter. **[Contents]** The parameter's value was invalid. **[Action]** Call technical support center.
2170	**I**	Are you sure you want to de-install the function? **[Contents]** This operation de-install the function. If the function is running, it will be stopped by this operation. **[Action]** If you want to de-install, press [OK]. If you don't press [Cancel].
2171	**I**	This function is not supported. **[Contents]** This function is not supported. **[Action]** If you want to install the function, call technical support center.

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ID	Kind	Description
2172	**I**	This option needs special FD. Please insert the FD.
	[Contents]	This option needs special FD.
	[Action]	If you have a special FD, please insert it and press [OK]. If you don't, press [Cancel].
2173	**I**	Invalid FD.
	[Contents]	Inserted FD is not available. This message will be displayed in the Option Install (HMBR) under the following conditions. (a) The FD is not for Option Installation. (b) The FD is for Option Installation, but the FD has already used to install into another Controller. (c) The FD has Write Protect.
	[Action]	Please check the inserted FD. And retry again by using available Fd.
2174	**E**	Combination of the controller type of MCU with RCU is not supported. (Error Code = %04x)
	[Contents]	Combination of the controller type of MCU with RCU is not supported.
	[Action]	Confirm the controller type of the specified MCU and RCU.
2175	**E**	Internal error has occurred.
	[Contents]	Internal error has occurred. Or system resource is not enough.
	[Action]	Please terminate another needless application, and retry again. Or reboot remote console.
2176	**W**	File I/O error has occurred. (File = %s)
	[Contents]	File I/O error has occurred.
	[Action]	Please retry again. If the error occurs after rebooting remote console, re-install all remote console program products.
2177	**W**	There are too many products to list all of them.
	[Contents]	There are too many remote console products to list all the information.
	[Action]	Please retry again. If the error occurs after rebooting remote console, re-install all remote console program products.
2178	**W**	There are no products.
	[Contents]	There are no remote console products.
	[Action]	Please retry again. If the error occurs after rebooting remote console, re-install all remote console program products.

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ID	Kind	Description
2179	**W**	If Microprogram is exchanged, some function in action will end abnormally. Do you want to continue? %s
	[Contents]	This microprogram does not support some functions. After microprogram exchange, some function in action will end abnormally.
	[Action]	At first, you should note Bitmap in this message and select [Cancel] to stop microprogram exchange. Next, please refer to the Function Bit Map Table in M-FC section. Bitmap in message corresponds the table so you should recognize function which is described about bit on item. Please do the corresponding action in this table. After all, please retry microprogram exchange again.
2180	**E**	File I/O error has occurred.
	[Contents]	File I/O error has occurred.
	[Action]	Please check if the floppy disk is not write protect. If it is so, release the write protect and retry again.
2181	**W**	Warning!! Initial copy mode 'None' is selected for some volume pairs. Are you sure that the M-VOL and the R-VOL of these pairs are already synchronized?
	[Contents]	Initial copy mode 'None' is selected for some volume pairs. Confirm that the M-VOL and the R-VOL of these pairs are already synchronized.
	[Action]	Confirm the M-VOL and the R-VOL of specified pairs are already synchronized.
2182	**I**	%s is already normal, so restoration has not executed.
	[Contents]	Selected Bus is already normal, so restoration has not executed.
	[Action]	Nothing
2183	**E**	Configuration file read error has occurred.
	[Contents]	Error has occurred on reading configuration form SVP file.
	[Action]	Retry maintenance, but same error has occurred, reboot SVP.
2184	**W**	The unused FD is inserted though the option is installed in this controller. If you select [OK] with checking 'ON' in the next window, the FD will be used only for this controller.
	[Contents]	The unused FD is inserted though there will be used FD because the function is installed. If you select [OK] with checking 'ON' in the next window, the FD will be used only for this controller.
	[Action]	Please look for the used FD this controller, and use it. If you need to continue the operation, please select [OK].
2185	**I**	Please remove the special FD.
	[Contents]	Please remove the special FD from SVP.
	[Action]	Please remove the FD, and select [OK].

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ID	Kind	Description
2186	**I**	Too many ECC groups which you selected! **[Contents]** Your selection was not correct. **[Action]** Please check the ECC group.
2187	**I**	Too many Spare Drives which you selected! **[Contents]** Your selection was not correct. **[Action]** Please check the spare drives and select again.
2188	**I**	You select different attribute ECC group other groups, Please select same attribute ECC group. **[Contents]** Your selected group was not correct. **[Action]** Please check the ECC group and select again.
2189	**I**	The ECC group which you selected is already setup complete. Please select **[Contents]** Your selected group was not correct. **[Action]** Please check the group and select again.
2190	**I**	Too many logical devices. **[Contents]** Too many logical devices. **[Action]** Please check the logical devices.
2191	**I**	Please enter number of cylinders. **[Contents]** Please enter number of cylinders. **[Action]** Please check the number and enter.
2192	**I**	Too many logical devices(Customized Volume). **[Contents]** Too many logical devices (Customized Volume). **[Action]** Please check the logical devices.
2193	**I**	There is no enough free space to enter the CV of this size. \nPlease check the size of CV. **[Contents]** There is no enough free space to enter the CV of this size. Please check the size of CV which you entered. **[Action]** Please check the size of CV, and enter correct size again.
2194	**I**	This configuration could not follow the mixture rule of LDEV emulation type. **[Contents]** LDEV ID which you entered could not follow the mixture rule of LDEV emulation type. **[Action]** Please clear LDEV ID which you defined just before, and define correct LDEV ID.
2195	**I**	This logical device ID is already used. **[Contents]** This logical device ID is already used. **[Action]** Please check the device ID.

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ID	Kind	Description
2196	**I**	Please enter logical device ID. **[Contents]** Please enter logical device ID. **[Action]** Please check the correct logical device ID and enter.
2197	**I**	This logical device ID is already used. **[Contents]** The device ID is already used. **[Action]** Please check the logical device ID again.
2198	**I**	Invalid SSID. **[Contents]** Invalid SSID was detected. **[Action]** Please check the SSID.
2199	**I**	This SSID is already used. **[Contents]** The SSID was already used. **[Action]** Please check the SSID again.
2200	**I**	Capacity of Shared memory which you entered is lower than minimum capacity. **[Contents]** You entered the wrong capacity. **[Action]** Please check the minimum capacity and enter again.
2201	**W**	This name has already defined. Please input another name. **[Contents]** This name has already defined. Please input another name. **[Action]** Select [OK] , and input another name.
2202	**W**	This controller has already defined. **[Contents]** The serial number has already defined. **[Action]** Check the serial number.
2203	**W**	WARNING: Panel switches status is ignored because "Set Force" option is specified. Are you sure you want to change the devices status forcibly? **[Contents]** You set the Set Force option so that Remote Console will set the Lock/ Read only/ Read-Write to the target devices forcibly. **[Action]** If you want to change the devices status forcibly, please select Yes. Remote Console will set your setting information to the target devices forcibly. If you do not what to change, please select No. Remote Console will stop changing the status.
2204	**I**	Please confirm that system configuration of SCSI host returned the original condition. **[Contents]** Confirm that system configuration of SCSI host returned the original condition. **[Action]** Select OK after confirming that system configuration of SCSI host returned the original condition.

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ID	Kind	Description
2205	**I**	Backup file for SCSI path information already exists. Do you replace existing file ?
	[Contents]	This message checks whether you will replace existing backup file for SCSI path information with new one.
	[Action]	If you replace existing backup file, select [Yes] button.
2206	**I**	Controller is not ready.
	[Contents]	Controller which you want to connect or you have connected is not ready to execute Remote Console function.
	[Action]	Please check the target controller if it is ready.
2207	**I**	Keylock Panel is not built-in.
	[Contents]	A Controller Which you what to connect does not equip the Keylock Panel.
	[Action]	Please check the target controller if the Keylock Panel has already equipped.
2208	**W**	Switches status does not match Keylock Panel. Please open "Device Status Overview" screen, and confirm switches status.
	[Contents]	When setting the lock/Read-only/Read-Write to the devices, the Keylock panel has already changed and your setting information will not be available.
	[Action]	Please select Refresh button to display the last status of panel switches in the "Device Status Overview" screen. And please retry again.
2209	**I**	Backup file for SCSI path information was made.
	[Contents]	This is end of making a backup file for SCSI path information.
	[Action]	
2210	**I**	Are you sure you want to restore SCSI path information with backup files ?
	[Contents]	[Yes]:SCSI path information will be restored with backup files and redraw screen. [No]:Do nothing.
	[Action]	[Restore] button is selected. Are you sure you want to restore SCSI path information with backup files?
2211	**I**	This will make SCSI path information a backup file for.
	[Contents]	If you select [OK] button, this will make a backup file for SCSI path information.
	[Action]	If you make a backup file, select [OK] button.

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ID	Kind	Description
2212	**I**	Without making a backup file for SCSI path information, do you delete selected SCSI path definition? **[Contents]** This message checks whether you will delete selected SCSI path definition without making a backup file for SCSI path information. **[Action]** In case of deleting selected SCSI path definition without making a backup file, select [Yes] button. Otherwise, select [No] button to make backup file.
2213	**I**	PORT is not selected. Please select PORT(S). **[Contents]** This message says that you need to select PORT(S) form PORT display column before selecting [Set] button. **[Action]** Please select PORT(S) from PORT display column.
2214	**I**	MODE is not selected. Please select MODE. **[Contents]** This message says that you need to select MODE from MODE display column before selecting [Set] button. **[Action]** Please select MODE from MODE display column.
2215	**I**	Please select [Backup] button for making a backup file. **[Contents]** This message prompts to select [Backup] button for making a backup file for SCSI path information. **[Action]** If you make a backup file for SCSI path information, please select [Backup] button.
2216	**I**	Do you want to check sub system status? **[Contents]** Select checking or not sub system status. **[Action]** If you want to check sub system status, select [Yes]. If you don't want to check, select [No].
2217	**E**	Error has occurred at DKU path inline. Please confirm connection of target part, and press Retry. **[Contents]** Possibly you have connected the wrong terminal of replaced part and cable. **[Action]** Connect cable to the right terminal, and select [Retry]. If connection has not wrong, select [Cancel].
2218	**E**	Please reboot the PC and do the same operation again. IF you could not do the same operation, please call Technical Support Center. **[Contents]** SVP detected invalid data so that you should reboot PC. **[Action]** Alter selecting [OK], please reboot the PC and do the same operation again. IF you could not do the same operation, please call Technical Support Center.

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ID	Kind	Description
2219	**W**	No available configuration. Please check CONFIG files or CONFIG version.
	[Contents]	There is no drive type/emulation type for install in CONFIG file.
	[Action]	Check CONFIG version, if invalid, install CONFIG valid version.
2220	**W**	You have installed maximum number of logical devices.
	[Contents]	You have installed max. number of available logical devices.
	[Action]	Check all logical device ID which you entered (compare with work sheet).
2221	**W**	No enough free logical device ID. Please enter another logical device ID.
	[Contents]	There is no enough free logical device ID from ID you are entered to end of ID.
	[Action]	Check all logical device ID which you entered (compare with work sheet).
2222	**W**	No enough free SS ID. Please enter another SS ID.
	[Contents]	There is no enough free SS ID form ID you entered to end of ID.
	[Action]	Check all SS ID which entered (compare with work sheet).
2223	**W**	Please select DCR type.
	[Contents]	No select DCR type.
	[Action]	Select DCR type.
2224	**W**	Invalid parameter.
	[Contents]	You enter invalid parameter of DCR configuration.
	[Action]	Check all parameter and enter valid parameter.
2225	**W**	There is no enough DCR area.
	[Contents]	You enter over available size of DCR.
	[Action]	Check all parameter and enter valid parameter (compare with work sheet).
2226	**W**	Different DKr type is already uses in this area.
	[Contents]	DCR area which you entered is already used for another DCR type.
	[Action]	Check DCR type, cylinder, head which you entered and enter valid parameter (compare with work sheet).

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ID	Kind	Description
2228	**E**	Operation is rejected by controller. **[Contents]** Operation is rejected by controller. **[Action]** Please retry later.
2229	**E**	Operation is rejected while KEYLOCK ASSY is under maintenance. **[Contents]** Operation is rejected while KEYLOCK ASSY is under maintenance. **[Action]** Wait until KEYLOCK ASSY replacement is over.
2230	**W**	Redundant power supply is not installed. Please use the way to maintenance Cluster. **[Contents]** Replacement of power supply is not able to execute the configuration of the subsystem. **[Action]** Block cluster and replace the power supply.
2231	**E**	Logical error has occurred. **[Contents]** Logical error has occurred. **[Action]** Reboot SVP, and retry.
2232	**W**	You cannot replace "%s." Because additional PS is installed. When power off the breaker, active PSs will be short. **[Contents]** You cannot replace target part, at the PS configuration of the subsystem. When power off the breaker, PSs will be short. **[Action]** Install all option power supply, or de-install redundant power supply temporarily.
2233	**E**	DKC emulation type is inconsistent with DKU emulation type. **[Contents]** SVP cannot set the combination of the DKC emulation type and the DKU emulation type. **[Action]** Please select [OK] and finish this process. After, please execute Define & Configuration with the correct type.
2234	**E**	Enter correct number (%u-%u). **[Contents]** Enter correct number between (x) to (y). **[Action]** Enter correct number between (x) to (y).
2235	**E**	Enter correct address (%u-%u). **[Contents]** Enter correct address between (x) to (y). **[Action]** Enter correct address between (x) to (y).
2236	**W**	Initializing SSVP (PHASE %d/16). Please wait. **[Contents]** Initializing SSVP (PHASE XX/16). Please wait. **[Action]** If XX is 14, please do the following action. (a) Reset the SSVP. If XX is other than 14, please do the following action. (a) Close Maintenance screen, After being for a while, open Maintenance screen again.

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ID	Kind	Description
2237	**W**	SSVP Dump is being performed (Phase %d/15). Environment status can't be read.
	[Contents]	SSVP Dump is being performed (Phase %d/15). Environment status can't be read.
	[Action]	It closes Maintenance screen. After being for a while, open Maintenance screen once again.
2238	**W**	BATCTR LED ON error has occurred.
	[Contents]	Communication error has occurred in BATCTR LED ON procedure.
	[Action]	Please confirm the location of the target PCB again.
2239	**W**	BATCTR LED OFF error has occurred.
	[Contents]	Communication error has occurred in BATCTR LED OFF procedure.
	[Action]	Please reboot SVP and retry. (But you need not replace the BATCTR PCB.)
2240	**W**	SVPPS power off procedure has failed.
	[Contents]	SVPPS power off procedure has failed.
	[Action]	Please press OK, and continue.
2241	**E**	SVPPS power on error has occurred.
	[Contents]	SVPPS power off procedure has failed.
	[Action]	Please reboot SVP and retry. Still this error has occurred, replace SVPPS again.
2242	**E**	Please detach the jumper plug of replaced PCBs.
	[Contents]	Detach the jumper plug.
	[Action]	Please detach the jumper plug and press Yes.
2243	**E**	M-BUS/H blockade error has occurred. (error code = %1x)
	[Contents]	Procedure of blocking M-BUS/High has failed.
	[Action]	Refer to the following table by error code. Please refer to SVPMSG06-10.
2244	**W**	M-BUS/H restore error has occurred. (error code = %1x)
	[Contents]	Procedure of restoring M-BUS/High has failed.
	[Action]	Refer to the following table by error code. Please refer to SVPMSG06-10.
2245	**E**	M-BUS/L blockade error has occurred. (error code = %1x)
	[Contents]	Procedure of blocking M-BUS/Low has failed.
	[Action]	Refer to the following table by error code. Please refer to SVPMSG06-10.

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ID	Kind	Description
2246	**W**	M-BUS/L restore error has occurred. (error code = %1x)
	[Contents]	Procedure of restoring M-BUS/Low has failed.
	[Action]	Refer to the following table by error code. Please refer to SVPMSG06-10.
2247	**E**	The number of cylinders is too much.
	[Contents]	The number of cylinders is too much.
	[Action]	Enter correct number.
2248	**E**	The number of volumes is too much.
	[Contents]	The number of volumes is too much.
	[Action]	Enter correct number.
2249	**I**	Please check the location of the target PCB.
	[Contents]	Please confirm the location of the target PCB again.
	[Action]	Please confirm the location of the target PCB again.
2250	**I**	Please replace the target PCB. After replacement, press OK.
	[Contents]	Please replace the target PCB.
	[Action]	Please replace the target PCB. after replacement, press OK.
2251	**I**	The replacement of HUB has completed.
	[Contents]	The replacement of HUB has completed.
	[Action]	Please select [OK].
2252	**E**	The replacement of HUB has failed.
	[Contents]	The replacement of HUB has failed.
	[Action]	Please select [OK].
2253	**I**	HUB hardware change start.
	[Contents]	The replacement procedure of HUB will start.
	[Action]	Please select [OK].
2253	**I**	HUB hardware change start.
	[Contents]	The replacement procedure of HUB will start.
	[Action]	Please select [OK].
2254	**E**	SSVP is not ready now. Please check SSVP communication status.
	[Contents]	SSVP is not ready (during IMPL).
	[Action]	Please execute replacement procedure, after IMPL finish.

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ID	Kind	Description
2255	**I**	Are you sure you want to delete the volume pair?
	[Contents]	Are you sure you want to delete the volume pair?
	[Action]	Select Button
2256	**I**	Are you sure you want to suspend the volume pair?
	[Contents]	Are you sure you want to suspend the volume pair?
	[Action]	Select Button
2257	**I**	Are you sure you want to split the volume pair?
	[Contents]	Are you sure you want to split the volume pair?
	[Action]	Select Button
2258	**I**	Are you sure you want to resynchronize the volume pair?
	[Contents]	Are you sure you want to resynchronize the volume pair?
	[Action]	Select Button
2259	**W**	You can not change the emulation type to 3390-3R. In the next window, unavailable logical device group will be indicated. Please check the current configuration in this subsystem.
	[Contents]	This configuration has logical device group (block of 32 logical device ID) which is set as 3390-3 and other device emulation type. 3390-3R can not exist with other device emulation types in the same logical device group. So you can not change the
	[Action]	Please call technical support center. In this case, if you want to change emulation type, you have to de-install logical device. But, logical device and data in it will be erased when you de-install. Please consult with technical support center about
2260	**W**	3390-3 and 3390-3R can not exist in the same subsystem. Please change the emulation type to either 3390-3 or 3390-3R.
	[Contents]	In this subsystem, 3390-3 and 3390-3R can not exist in the same time. you should select which device emulation type you want to use, 3390-3 3390-3R.
	[Action]	You should change all 3390-3 logical devices in subsystem to 3390-3R. Or you should change all 3390-3R logical devices in subsystem to 3390-3.
2261	**W**	Are you sure you want to delete the specified SSIDs?
	[Contents]	Warning message before SSIDs are deleted.
	[Action]	Press OK button.

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ID	Kind	Description
2262	**I**	SCSI paths for making passive paths don't exist in this port.
	[Contents]	Passive path is made to the SCSI paths which have even SCSI ID.
	[Action]	Passive paths are made only for the SCSI paths which have even SCSI ID. Please set SCSI paths which have even SCSI ID for this port.
2263	**I**	Some invalid modes exist (MODE xx).\nPlease modify these modes.
	[Contents]	One or more modes are invalid.
	[Action]	Please modify the invalid mode on "Set Mode" screen.
2264	**I**	Passive path already exists.
	[Contents]	Passive path already exists.
	[Action]	Do nothing because passive path which you want to make already exists.
2265	**I**	Please select one SCSI path for the Cluster-1.
	[Contents]	Selected SCSI path is defined for the Cluster-2. Please select a SCSI path for the Cluster-1.
	[Action]	Please select one SCSI path for he Cluster-1 and then click [Passive path copy] button.
2266	**I**	Some modes are not pair between Cluster-1 and Cluster-2.\nPlease modify these modes.
	[Contents]	Some modes are not pair between Cluster-1 and cluster-2.
	[Action]	Please make pair of mode on "Set Mode" screen.
2267	**W**	Specified RCU or SSID may be deleted by HOST. Please close the current window, then try again.
	[Contents]	Same as the message.
	[Action]	Please close the current window, then try again.
2268	**W**	Exclusive task (Install, Diagnosis, Replace, etc.) is already running on SVP. Please try this operation after finishing the task.
	[Contents]	SVP can run only one of the exclusive tasks (Install, Diagnosis, Replace, etc.) at a time. this operation is rejected because of another exclusive task.
	[Action]	Press OK, and wait for the finish of the exclusive task. If any exclusive task is not running, this message is still displayed because of a remote console operation or a remote maintenance operation. Confirm that remote operations has done. Then, retry
2269	**E**	Too many SSIDs. (Allowed Four SSIDs.)
	[Contents]	Four SSIDs are already entered.
	[Action]	Confirm the SSIDs of the RCU. If invalid SSIDs are entered, delete them and retry the operation.

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ID	Kind	Description
2270	**W**	There is no consecutive empty space only to install CV.
	[Contents]	There was no consecutive empty space only to install CV of the specified size though CV was installed to a consecutive empty space.
	[Action]	Please install CV of the size which can be installed in a smaller, more consecutive empty space.
2271	**I**	Are you sure you want to add the volume pair?
	[Contents]	Are you sure you want to add the volume pair?
	[Action]	Select Button.
2272	**I**	No Value in %s area. \nPlease input a value.
	[Contents]	There is no value in xx area.
	[Action]	Please input a value.
2273	**I**	Invalid %s No. \nPlease input a valid %s No. (01-FF).
	[Contents]	The input xx No, is invalid.
	[Action]	Please input a valid value (range : 01-FF).
2274	**I**	Invalid character in %s area. \nPlease input a valid value.
	[Contents]	The input character in xx area is invalid.
	[Action]	Please input a valid value.
2275	**I**	This Entry No, already exists. \nPlease input another Entry No.
	[Contents]	The input Entry No, already exists.
	[Action]	Please input an another Entry No.
2276	**I**	Internal error (%2.2x).
	[Contents]	Error code: 01:Motive parameter error. 02:Making patch data list-box failed. 03:Memorry allocate error. 04:Internal parameter error.
	[Action]	Error Code: 01:Please input the valid parameter. (pathedit -l or pathedit -n) 02-04:Please retry.
2277	**I**	Are you sure you want to delete current entry group (%2.2x) ?
	[Contents]	This message confirms deletion of patch data.
	[Action]	[Yes]:All of the patch data in this entry group is deleted. [No]:Quits deletion.

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ID	Kind	Description
2278	**I**	No %3d data was changed. \nDo you update altered data?
	[Contents]	There is a patch data which is not registered.
	[Action]	[Yes]: The patch data is registered. [No] : The patch data is not registered.
2279	**I**	Sum data error !! \nPlease check input data. \nCalcuated sum data value is %2.2x.
	[Contents]	The input sum data is invalid.
	[Action]	Please check input data. If all input data except for sum data valid. Please input a sum value which is in this message.
2280	**I**	Too many patch data ! \nThe number of patch data in one entry should not exceed %3d. \nPlease change Entry No.
	[Contents]	This entry has the maximum number of patch data.
	[Action]	Please change Entry No.
2281	**I**	ORM Value is initialized.
	[Contents]	ORM Value is initialized.
	[Action]	Please select [OK].
2282	**I**	Are you sure you want to initialize ORM Value?
	[Contents]	Are you sure you want to initialize ORM Value?
	[Action]	If you want to initialize ORM Value, please select [Yes]. If you don't want to initialize it, please select [No].
2283	**I**	Are you sure you want to cancel this function?
	[Contents]	When you select "Cancel" to exit Define Configuration window, this message will appear to confirm your operation.
	[Action]	If you select "YES", Define Configuration Operation will stop. If you select "NO", Define Configuration Operation will continue.
2284	**I**	You can not install shared memory module more. \nPlease change shared memory module type to 64MByte.
	[Contents]	You need more shared memory module for this configuration you want to install. But you can not install shared memory module more. You should to change shared memory module type to 64MByte.
	[Action]	If Define Configuration & Install, you should change share memory (SM) module type to 64MB. If Installation, cancel once, change SM Module to 64MByte, install again.
2285	**W**	This function can not executed, because SSVP initializing yet.
	[Contents]	SSVP initializing now.
	[Action]	Please wait until SSVP finish initializing.

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ID	Kind	Description
2286	**W**	Pre-Check error has occurred. \nDo you want to stop this process?
	[Contents]	Before execution, SVP detected some error.
	[Action]	[Yes]:SVP will stop the process. [No]:SVP will continue the process.
2287	**W**	Subsystem is now under P/S off process.
	[Contents]	This operation was rejected, because the subsystem is under P/S off process.
	[Action]	Please wait and retry after P/S on.
2288	**W**	Configuration set up job is now running at subsystem processor. Please retry again.
	[Contents]	This operation was rejected because DKC subsystem is busy.
	[Action]	Please retry after a few minutes.
2289	**W**	Data may be lost or channel pass to the host CPU may be lost du to this operation.
	[Contents]	This operation was rejected because data lost or channel pass will be lost.
	[Action]	Please repair other blocked parts before this operation.
2290	**E**	Data in the logical device will be lost due to this operation.
	[Contents]	This operation was rejected because data will be lost.
	[Action]	Please repair other blocked parts before this operation.
2291	**E**	You should not restore logical devices, because data will be lost due to this operation.
	[Contents]	This operation was rejected, because data will be lost.
	[Action]	You should repair other blocked parts before this operation.
2292	**E**	This operation will cause fatal damage to subsystem data. Another redundant cache memory has been already blocked. Please maintain the blocked cache memory first.
	[Contents]	Another side of cache memory has been already blocked. This operation was restrained.
	[Action]	Please repair the blocked cache memory before this operation.
2293	**I**	SCSI path overflow (Over %d paths).
	[Contents]	SCSI Path will overflow by one of the following reasons. 1.adding new SCSI paths. 2.making passive paths.
	[Action]	case1. Please adjust selecting parameters on "Set SCSI Path Parameter" screen or adjust the number of defined SCSI paths. case2. Please adjust the number of defined SCSI paths.

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ID	Kind	Description
2294	**I**	LDEV ID overflow. \nPlease adjust LDEV ID or other.
	[Contents]	LDEV ID will overflow by sequential assignment of LDEV ID.
	[Action]	Please adjust LDEV ID or other.
2295	**I**	%s. \nPlease input a valid address.
	[Contents]	The input address is invalid. • No value : Address is not input. • Invalid character : The input address is not hexadecimal. • Invalid value : The input address is not on address table.
	[Action]	Please input a valid address.
2296	**I**	Are you sure you want to exit SCSI path configuration?
	[Contents]	SCSI path configuration will be finished.
	[Action]	[OK] : Exits SCSI path configuration. [Cancel] : Returns to "SCSI Path-LDEV Configuration" screen.
2297	**I**	Do you cancel SCSI path configuration?
	[Contents]	SCSI path configuration will be finished.
	[Action]	[Yes] : Quits SCSI path configuration. [No] : Returns to "SCSI Path-LDEV Configuration" screen.
2298	**I**	Already existing setting (%s). \nPlease adjust setting.
	[Contents]	(PORT, LDEV ID) : Multiple SCSI paths will be defined between 1 port and 1 LDEV. (Port, SCSI ID LUN) : 1 SCSI path will have multiple LDEVs.
	[Action]	Please adjust parameters in "Set SCSI Path Parameter" screen.
2299	**I**	Not math !! \n\n\t SCSI ID * LUN : %d \n\tCU-LDEV ID : %d \n\nPlease adjust the number of selecting parameters.
	[Contents]	The number of combinations of SCSI Ids and LUNs is not equal to the number of selecting CU-LDEV Ids.
	[Action]	Please adjust the number of selecting parameters.
2300	**W**	Some SCSI paths to the physical device are abnormal. \nPlease check the diagnosis Log of Information.
	[Contents]	Some SCSI paths to the physical device are abnormal. \nPlease check the diagnosis Log of Information.
	[Action]	Check the diagnosis Log and please select OK.
2301	**I**	Do you want to restore the DKA and normal SCSI path?
	[Contents]	Do you want to restore the DKA and normal SCSI path?
	[Action]	Please select Yes or No. If you select [Yes], DKA and normal SCSI path will be restored. But obstacle SCSI path will be blocked.

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ID	Kind	Description
2302	**W**	All SCSI paths to the physical device are abnormal. \nPlease check the diagnosis Log of Information.
	[Contents]	All SCSI paths to the physical device are abnormal. \nPlease check the diagnosis Log of Information.
	[Action]	Check the diagnosis Log and please select OK.
2303	**E**	Too many kind of DKC Emulation Types are defined.
	[Contents]	Too many kind of DKC Emulation Types are defined.
	[Action]	Check the DKC Emulation Types which you selected.
2304	**I**	Data in the physical device has been started correcting.
	[Contents]	Data in the physical device has been started correcting.
	[Action]	Please select OK.
2305	**I**	Data in the physical device could not be corrected.
	[Contents]	Data in the physical device could not be corrected.
	[Action]	Please refer to SSB logs.
2306	**I**	Correction was canceled.
	[Contents]	Correction was canceled.
	[Action]	Please select OK.
2307	**I**	Are you sure you want to cancel correcting?
	[Contents]	This message means confirming to cancel correcting data.
	[Action]	Select Yes to cancel correcting data. Select No to continue correcting data.
2308	**E**	Some error was detected by diagnosing the replaced physical device.
	[Contents]	Diagnosing the replaced physical device found a error.
	[Action]	Please refer Diagnosis log and repair the physical device or retry another physical device.
2309	**W**	The specified physical device could not spin down, but SVP can continue this process.
	[Contents]	The specified physical device was failed to spin down. But, SVP can ignore the error and continue this process.
	[Action]	Please select OK.
2310	**E**	The replaced physical device could not spin up.
	[Contents]	The replaced physical device could not spin up.
	[Action]	You should retry another maintenance device. Please select [OK] and finish this operation. After, please retry the some operation by using another maintenance device.

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ID	Kind	Description
2311	**I**	Are you sure you want to replace the physical device? **[Contents]** This message means confirming to replace a physical device. **[Action]** Please select Yes to continue. If you select No, SVP will stop this process.
2312	**I**	Are you sure you want to block the physical device? **[Contents]** This message means confirming to block a physical device. **[Action]** Please select Yes to continue. If you select No, SVP will stop this process.
2313	**I**	Are you sure you want to pull out the physical device? **[Contents]** This message means confirming to pull out a physical device. **[Action]** Please select Yes to continue. If you select No, SVP will stop this process.
2314	**I**	Please replace the physical device, and then select OK. **[Contents]** The physical device can be pulled out. **[Action]** Please replace the device. After inserting a new device, then select OK.
2315	**I**	Are you sure you want to diagnose the physical device? **[Contents]** This message means confirming to diagnose a physical device. **[Action]** Please select Yes to continue. If you select No, SVP will stop this process.
2316	**I**	Are you sure you want to update a microprogram of the physical device? **[Contents]** This message means confirming to update a microprogram of a physical device. **[Action]** Please select Yes to continue. If you select No, SVP will stop this process.
2317	**I**	Are you sure you want to restore the physical device? **[Contents]** This message means confirming to restore a physical device. **[Action]** Please select Yes to continue. If you select No, SVP will stop this process.
2318	**I**	Please insert a dump FD and select [OK]. If you don't have any dump FD, please select [Cancel]. **[Contents]** A dump FD for gathering information of the device is required. **[Action]** Select OK for saving the information to a FD. Select Cancel for saving the information to a HD.

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ID	Kind	Description
2319	**I**	Please remove the FD.
	[Contents]	SVP finished copying the information to FD. Please remove the FD.
	[Action]	Remove the FD and select OK.
2320	**I**	Are you sure you want to copy data from spare device to the physical device?
	[Contents]	This message means confirming to copy back data into a physical device.
	[Action]	Select Yes to copy back data into the physical device. Select No to remain data in the spare device.
2321	**I**	SVP will start copying data in spare device to the physical device.
	[Contents]	SVP will start copying data in spare device to the physical device.
	[Action]	Please select OK.
2322	**I**	First of all, you should copy data in the physical device to spare device. Would you continue to do?
	[Contents]	Data in the specified physical device is not copied to spare device. If process is continued, redundancy will be lost.
	[Action]	Please select [OK] to stop this operation, and you should copy data I the device to spare device, then retry again.
2323	**W**	The LED of the specified physical device could not turn on. \nPlease pull out the target device and select [OK].
	[Contents]	The LED of the specified physical device was failed to turn on. But SVP can ignore the error and continue this process.
	[Action]	Please pull out the target device, and select [OK].
2324	**W**	Data in spare device could not be copied to the physical device.
	[Contents]	Data in spare device could not be copied to the physical device.
	[Action]	Please select OK to stop this process and refer to SSB logs.
2325	**I**	Are you sure you want to copy data from the physical device to spare?
	[Contents]	This message means confirming to copy data from a physical device to spare.
	[Action]	Please select Yes to copy data in the physical device to a spare device. If cancel., please select No.
2326	**I**	Data copy from the physical device to spare will be started.
	[Contents]	Data copy from the physical device to spare will be started.
	[Action]	Please select OK.

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ID	Kind	Description
2327	**I**	Data in the physical device could not be copied to spare.
	[Contents]	Data in the physical device could not be copied to spare.
	[Action]	Please confirm existence of spare device and retry again.
2328	**I**	Are you sure you want to cancel copying?
	[Contents]	This message means confirming to cancel copying data.
	[Action]	Please select Yes to cancel copying data. If you want to continue, please select No.
2329	**I**	Copy was canceled.
	[Contents]	Copy was canceled.
	[Action]	Please select OK.
2330	**E**	This operation is not available for the specified physical device.
	[Contents]	This operation is not available for the specified physical device.
	[Action]	Please check which device you select.
2331	**I**	Please move ""CE PANEL INH"" jumper plugs to replacement position. Then press OK.
	[Contents]	Please move ""CE PANEL INH"" jumper plugs to replacement position.
	[Action]	Please move ""CE PANEL INH"" jumper plugs to replacement position, and select [OK]. If you want to terminate replacement procedure, select [Cancel].
2332	**I**	Please move ""CE PANEL INH"" jumper plugs to normal position. Then press OK.
	[Contents]	Please move ""CE PANEL INH"" jumper plugs to normal position.
	[Action]	Please move ""CE PANEL INH"" jumper plugs to normal position, and select [OK].
2333	**W**	""CE PANEL INH"" jumper plugs are not on replacement position. If you want to abort the replacement of the ""%s, " press Cancel.
	[Contents]	"CE PANEL INH" jumper plugs are not on replacement position.
	[Action]	Please move ""CE PANEL INH"" jumper plugs to replacement position, and select [OK]. If you want to terminate replacement procedure, select [Cancel].
2334	**W**	""CE PANEL INH"" jumper plugs are not on normal position. Please move them. Then press OK.
	[Contents]	"CE PANEL INH" jumper plugs are not on normal position.
	[Action]	Please move ""CE PANEL INH"" jumper plugs to normal position, and select [OK].

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ID	Kind	Description
2335	**W**	Please Check following. \n1.The AC BOX is turned on. \n2.Turn to ""CHK RST"" the ""CHK RST/IND TEST"" Switch on ""CE panel."" \n3.LED of PSs are lit on. \nPress Retry to recover.
	[Contents]	SVP detect some failure in electric power system.
	[Action]	Please check terms in message, and press Retry.
2336	**I**	Are you sure you want to correct data in the physical device?
	[Contents]	This message means confirming to correct data in a physical device.
	[Action]	Please select Yes to correct data in the physical device. Select No to remain redundancy lost.
2337	**W**	You should maintain this parity group by maintaining logical devices. Do you continue this process?
	[Contents]	You should maintain this parity group by maintaining logical devices.
	[Action]	Maintain this parity group by maintaining logical devices.
2339	**E**	Cannot open a file by 'Memo' command. \nError Code = %04X
	[Contents]	Memo' command will open a file with 'Write application, but cannot run 'Write'.
	[Action]	Please make sure that file 'Write.exe' exists in the Windows commands directory (ex. C:\windows\command)
2340	**E**	Invalid command line parameter. \nError Code = %04X
	[Contents]	There is a invalid parameter in the script monitor.
	[Action]	Please reboot and retry again. If the same phenomenon is occurred, please re-install this program.
2341	**E**	File I/O error (%s). \nError Code = %04X
	[Contents]	The program could not open the specified file.
	[Action]	Please reboot and retry again. If the same phenomenon is occurred, please re-install this program.
2342	**E**	Too long line \nLine = %04d \nError Code = %04X
	[Contents]	There are more than 240 number of characters in one line.
	[Action]	Please check the line (line no is displayed) and modify it by separating into two lines. And retry again.
2343	**E**	Illegal 'If' and 'EndIf' pair. \nLine = %04d. \nError Code = %04X
	[Contents]	If' and 'Endif' sentences are not corresponded.
	[Action]	Please check the line (line no is displayed) and modify them.
2344	**E**	End' is required. \nLine = %04d. \nError Code = %04X
	[Contents]	There is no 'End' statement at the end of this script.
	[Action]	Please add 'End' statement in this script and retry again.

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ID	Kind	Description
2345	**E**	Start' is required. \nLine = %04d. \nError Code = %04X
	[Contents]	There is no 'Start' statement at the beginning of this script. The first sentence of this script is not 'Start' statement.
	[Action]	Please check the first sentence in this script and add the 'Start' statement. After, retry again.
2346	**E**	Illegal word is found. \nLine = %04d. \nError Code = %04X
	[Contents]	There is an illegal word in this script.
	[Action]	Please check the line if the first item is a one of macros or already defined variables and modify them.
2347	**E**	List type variable is unexpected. \nLine = %04d. \nError Code = %04X
	[Contents]	There is an unexpected list type variable in this script.
	[Action]	Please check the line if the list type variable is available and modify them.
2348	**E**	Illegal quotation \nLine = %04d. \nError Code = %04X
	[Contents]	There is no quotation at the end of the strings.
	[Action]	Please check the line if the quotation is specified and modify them.
2349	**E**	Required value is not found. \nLine = %04d. \nError Code = %04X
	[Contents]	The actual value is not specified in the right side of the equation.
	[Action]	Please add the actual value in the right side of the equation.
2350	**E**	Illegal '(' and ')' pair. \nLine = %04d. \nError Code = %04X
	[Contents]	(' and ')' are not corresponded.
	[Action]	Please check the line (line no is displayed) and modify them.
2351	**E**	Syntax error \nLine = %04d. \nError Code = %04X
	[Contents]	Syntax error was detected. The detail is below according to the error code.(1) 220b/2303: Illegal words (2) 27xx: parameter error(2) 29xx:macro error (4) 2axx:comma is used illegally.
	[Action]	Please check the line (line no is displayed) and modify them.
2352	**E**	Illegal expression. \nLine = %04d. \nError Code = %04X
	[Contents]	There is a wrong expression in the If statement.
	[Action]	Please check the line (line no is displayed) and modify them.
2353	**E**	Illegal parameter \nLine = %04d. \nError Code = %04X
	[Contents]	Illegal parameter was detected. The detail is following according to the error code.
	[Action]	Please check the line and modify them.

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ID	Kind	Description
2354	**E**	Unknown parameter \nLine = %04d. \nError Code = %04X
	[Contents]	Unknown parameter was detected.
	[Action]	The word which the first character is '$' is a parameter. You cannot use other words than defined. Please check the parameter and modify them.
2355	**E**	Unknown identifier. \nLine = %04d. \nError Code = %04X
	[Contents]	Unknown identifier was detected.
	[Action]	The word which the first character is '_' is identifier.You cannot use other identifier than defined. Please check the line and modify them.
2356	**E**	Same parameter appears again. \nLine = %04d. \nError Code = %04X
	[Contents]	Same parameters are defined in one line.
	[Action]	Please check the line if the same parameters are described, and modify them.
2357	**E**	Required parameter is not found. \nLine = %04d. \nError Code = %04X
	[Contents]	A necessary parameter is not described in this line.
	[Action]	Please check the line and add the appropriate parameter.
2358	**E**	Value type mismatch. \nLine = %04d. \nError Code = %04X
	[Contents]	The program could not transfer the value from the right side of the equation to the left side.
	[Action]	This message will be displayed as the following reasons. Please check them and modify.The data type or kind is not matched. The illegal value was defined in the right side. The value is constant but not available (Over the limited).
2359	**E**	Internal error. \nError Code = %04X
	[Contents]	Program detected an internal error.
	[Action]	Please reboot and retry again. If the phenomenon is occurred after rebooting, please re-install this program.
2360	**E**	Mismatch script type. \nError Code = %04X
	[Contents]	The script types are not corresponded between the script which is set in the Start macro and the script which is set in the execution environment file.
	[Action]	Please check relationship between Start macro and the execution environment file.
2361	**E**	Mismatch controller name. \nError Code = %04X
	[Contents]	The controller names defined in the Start macro and execution environment file are not same.
	[Action]	Please check if the both names are same, and modify them.

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ID	Kind	Description
2362	**E**	Parameter value error (%s) \nError Code = %04X
	[Contents]	Parameter in the function macro is illegal.
	[Action]	Please check the line if the function macro is available and modify them.
2363	**I**	Invalid SCSI ID is defined to Fibre channel port. \nPlease define SCSI paths with only one SCSI ID : F to it.
	[Contents]	Multiple SCSI IDs are defined to one Fibre channel port. The permitted SCSI ID for Fibre channel port is only F.
	[Action]	Please modify SCSI paths for Fibre channel port on 'set SCSI Path Parameter' screen.
2364	**W**	Please reboot PC and reset SSVP.
	[Contents]	Please reboot PC and reset SSVP.
	[Action]	Please reboot PC and reset SSVP.
2365	**W**	DCR size is over the limit. Please check DCR configuration.
	[Contents]	If you de-install Cache memory, percentage of DCR size in out of range. Please check DCR Configuration before de-installing Cache memory.
	[Action]	First, please check DCR Configuration and cancel some DCR setting to adjust the DCR size within the limitation. After, please de-install Cache memory.
2366	**I**	You can restore the replaced physical device by restoring logical devices. Do you continue to this operation?
	[Contents]	You can restore the replaced physical device by restoring logical devices. Do you continue to this operation?
	[Action]	If you want to continue this operation, select [YES] If not, select [NO].
2367	**W**	DCR size is over the limit. Please check DCR configuration.
	[Contents]	If you de-install Cache memory, percentage of DCR size in out of range. Please check DCR Configuration before de-installing Cache memory.
	[Action]	First, please check DCR Configuration and cancel some DCR setting to adjust the DCR size within the limitation. After, please de-install Cache memory.
2368	**I**	Please confirm all the Physical Devices have been restored, and format all the blocked Logical Devices.
	[Contents]	This is a configuration message. Please follow this message.
	[Action]	After the configuration, please select OK to continue.

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ID	Kind	Description
2369	**W**	The physical devices or the redundant power supply has been completed the de-installation of DKA press OK. **[Contents]** This message is a guidance. **[Action]** Please select OK to finish this press.
2370	**W**	Are you sure you want to renew subsystem? **[Contents]** This is a configuration message. **[Action]** If you want to renew, please select OK. If not, please select No to stop this process.
2371	**W**	De-installation of the CHA has been completed, press OK. **[Contents]** This is a configuration. **[Action]** Please select OK.
2372	**I**	Insert the Battery assembly. When completed, please press OK. **[Contents]** This is a assemble guidance. **[Action]** After inserting, please select OK.
2373	**I**	Pull out the Battery assembly. When completed, please press OK. **[Contents]** This is an assembly guidance. **[Action]** After pulling out the Battery, please select OK.
2374	**I**	Replace or insert the Memory PCB(s) of cluster-1. When completed, please press OK. **[Contents]** This is a replacement guidance. **[Action]** After replacing or inserting, please select OK.
2375	**I**	Replace or insert the Memory PCB(s) of cluster-2. When completed, please OK. **[Contents]** This is a replacement guidance. **[Action]** After replacing or inserting, please select OK.
2376	**I**	Replace or pull out the Memory PCB(s) of cluster-1. When completed, please press OK. **[Contents]** This is a replacement message. **[Action]** After replacing, please select OK.
2377	**I**	Replace or pull out the Memory PCB(s) of cluster-2. When completed, please press OK. **[Contents]** This is a replacement guidance. **[Action]** After replacing, please select OK.

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ID	Kind	Description
2378	**W**	Replaced or insert PCB is abnormal. Are you sure you want to perform INLINE CUDG, once more?
	[Contents]	This is a configuration.
	[Action]	If you want to execute INLINE CUDG, please select OK. If not, please select ×10.
2379	**W**	Please confirm you have already shutdown concerned connecting SCSI channel path(s). \n Do you want to continue this process?
	[Contents]	This is a configuration to continue.
	[Action]	If you want to continue, please select OK. If not, please select No.
2380	**E**	It is possible that host I/O of following ports does not stop. Please shutdown concerned connecting SCSI host(s) or change port one by one. \nPORT#:%s
	[Contents]	SVP detected the error.Please follow this message.
	[Action]	Please check the PORT and shutdown concerned connecting SCSI host, or change port.
2381	**E**	Initiate process has failed.
	[Contents]	SVP could not initialize the process.
	[Action]	Please select OK to stop this process.
2382	**I**	SCSI I/F Configuration finished.
	[Contents]	This is a guidance.
	[Action]	Please select OK to finish this process.
2383	**E**	SCSI I/F Configuration has failed.
	[Contents]	SVP could not execute SCSI I/F Configuration.
	[Action]	Please select OK to stop this process.
2384	**E**	Can't continue this process because no PCB to replace.
	[Contents]	Can't continue this process because no PCB to replace.
	[Action]	Select [OK], and then stop this process.
2385	**E**	Error has occurred. Do you stop this process?
	[Contents]	Error has occurred. Do you stop this process?
	[Action]	If you want to stop this process, select [YES] Else, select [NO].

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ID	Kind	Description
2386	**I**	Please confirm you have already varied off the concerned Channel path. If OK, please press OK. \nWDCP information will be lost by following operation. Please cancel WDCP pair. DO you want to continue?
	[Contents]	Please confirm you have already varied off the concerned Channel path. If OK, please press OK. \nWDCP information will be lost by following operation. Please cancel WDCP pair. DO you want to continue?
	[Action]	If you cancel Vary off and WDCP Pair, select [OK]. If you stop this process, select [CANCEL].
2387	**W**	Correcting data in the physical device could not be done.
	[Contents]	Correcting data in the physical device could not be done.
	[Action]	Select [OK](CL) in response to "Correcting data in the physical device could not be done.".
2388	**W**	Copying data in the physical device to spare could not be done.
	[Contents]	Copying data in the physical device to spare could not be done.
	[Action]	Select [OK](CL) in response to "Copying data in the physical device to spare could not be done.".
2389	**W**	Copying data in spare device to the physical device could not be done.
	[Contents]	Copying data in spare device to the physical device could not be done.
	[Action]	Select [OK](CL) in response to "Copying data in spare device to the physical device could not be done.".
2390	**I**	Do you want to restore the CHA now?
	[Contents]	Do you want to restore the CHA now?
	[Action]	If you want restore the CHA, select [YES]. Else, select [NO].
2391	**I**	The CHA-PCB type was not available so that SVP could not restore.
	[Contents]	The CHA-PCB type was not available so that SVP could not restore.
	[Action]	Select [OK].
2392	**I**	Please replace the PCB, and then select OK.
	[Contents]	Please replace the PCB, and then select OK.
	[Action]	After replacing the PCB, please select [OK].

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ID	Kind	Description
2393	**I**	Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). \n Do you want to continue this process?
	[Contents]	Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). \n Do you want to continue this process?
	[Action]	If you want to continue this process, select [YES] If not, select [NO].
2394	**I**	Are you sure you want to block the Shared Memory and Cache Memory? \nIf you select [YES], physically pulling off and putting in of PCB will be unavoidable.
	[Contents]	Are you sure you want to block the Shared Memory and Cache Memory? \nIf you select [YES], physically pulling off and putting in of PCB will be unavoidable.
	[Action]	If you want to block the Shared Memory and Cache Memory, select [YES]. If not, please select [NO].
2395	**I**	WDCP information was lost. please set WDCP pair.
	[Contents]	WDCP information was lost. please set WDCP pair.
	[Action]	Please select [OK] to stop this process.
2396	**I**	Please replace the SCSI Buffer which connected by same SCSI Information cable, and then select OK.
	[Contents]	Please replace the SCSI Buffer which connected by same SCSI Information cable, and then select OK.
	[Action]	After replacing the SCSI Buffer, please select OK.
2397	**I**	Please replace the SCSI Buffer, and then select OK.
	[Contents]	Please replace the SCSI Buffer, and then select OK.
	[Action]	After replacing the SCSI Buffer, please select OK.
2398	**I**	Are you sure you want to copy data in spare device to the physical device?
	[Contents]	Are you sure you want to copy data in spare device to the physical device?
	[Action]	If you want to copy data in spare device to the physical device?
2399	**I**	Copying data in spare device to the physical device has been started.
	[Contents]	Copying data in spare device to the physical device has been started.
	[Action]	Please [OK](CL) in response to "Copying data in spare device to the physical device has been started.".

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ID	Kind	Description
2400	**I**	Correcting data in the physical device has been started.
	[Contents]	Correcting data in the physical device has been started.
	[Action]	Please select [OK](CL) in response to "Correcting data in the physical device has been started.".
2401	**I**	Are you sure you want to copy data in the physical device to spare?
	[Contents]	Are you sure you want to copy data in the physical device to spare?
	[Action]	If you want to copy data in the physical device to spare, select[YES]. If not, please select [NO].
2402	**I**	Copying data in the physical device to spare has been started.
	[Contents]	Copying data in the physical device to spare has been started.
	[Action]	Please [OK](CL) in response to "Copying data in the physical device to spare has been started.".
2403	**I**	Copying was canceled.
	[Contents]	Copying was canceled.
	[Action]	Please select [OK](CL) in response to "Copying was canceled.".
2404	**I**	Correcting was canceled.
	[Contents]	Correcting was canceled.
	[Action]	Please select [OK](CL) in response to "Correcting was canceled.".
2405	**I**	Is the LED of the target PCB(s) lit?
	[Contents]	Is the LED of the target PCB(s) lit?
	[Action]	If the LED of the target PCB(s) is lit, select [YES]. If not, please select [NO].
2406	**I**	Please insert the jumper into the target PCB(s), then pull it out without considering the status of the LED.
	[Contents]	Please insert the jumper into the target PCB(s), then pull it out without considering the status of the LED.
	[Action]	After inserting jumper into the target PCB(s), please select [OK].
2407	**I**	Please replace the PCB(s), and then select OK.
	[Contents]	Please replace the PCB(s), and then select OK.
	[Action]	After replacing the PCB(s), please select [OK].

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ID	Kind	Description
2408	**I**	SVP is gathering statistical information now. Please wait a moment (about 5 minutes).
	[Contents]	SVP is gathering statistical information for Change LDEV Attribution now. So, you can't execute this function.
	[Action]	Press [OK], and wait about 5 minutes. Then please retry again.
2409	**I**	Do you want to gather statistical information from DKC now? \n(It need about 5 minutes).
	[Contents]	Do you want to gather information from DKC now?
	[Action]	If you want to gather information, press [OK]. If you not, Press [CANCEL].
2410	**W**	If Cache_MemoryAllGroup or Shared_MemoryAllGroup test is executed, Cache Memory data or Shared Memory data will be lost. Do you want to continue this process?
	[Contents]	If Cache_MemoryAllGroup or Shared_MemoryAllGroup test is executed, Cache Memory data or Shared Memory data will be lost. Do you want to continue this process?
	[Action]	If you continue this process, please select [Yes]. If you stop this process, select [No].
2411	**I**	Replace finished.
	[Contents]	Replace finished.
	[Action]	Please select [OK].
2412	**I**	Replace process has failed.
	[Contents]	Replace process has failed.
	[Action]	Please select [OK].
2413	**I**	Blockade finished.
	[Contents]	Blockade finished.
	[Action]	Please select [OK].
2414	**I**	Blockade process has failed.
	[Contents]	Blockade process has failed.
	[Action]	Please select [OK].
2415	**I**	Restore finished.
	[Contents]	Restore finished.
	[Action]	Please select [OK].

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ID	Kind	Description
2416	**I**	Restore process has failed.
	[Contents]	Restore process has failed.
	[Action]	Please select [OK].
2417	**W**	Keylock history could not be written to the file. But the program will continue executing this process.
	[Contents]	File access error has occurred, when Keylock history had be written.
	[Action]	Please select [OK], and continue operation.
2418	**E**	File access error has occurred.
	[Contents]	File access error has occurred.
	[Action]	Please press [OK] to finish procedure, and retry after you reboot Remote Console.
2419	**W**	This file already exists. Replace existing file? \n Do you want to overwrite to existing file?
	[Contents]	This file already exists.
	[Action]	Please select [Yes], if you want to overwrite to existing file. Please select [No], if you want to terminate saving procedure.
2420	**E**	Not changed emulation type.
	[Contents]	There is no LDEV to change emulation type.
	[Action]	Please select [OK] to interrupt procedure.
2421	**I**	HORC is not supported under the controller type of the RCU.
	[Contents]	Same as the message.
	[Action]	Confirm the controller type of the specified RCU.
2422	**W**	One side of Cache on RCU is blocked.
	[Contents]	Invalid Cache status on RCU.
	[Action]	Confirm the Cache of RCU and recover it. Then retry the operation.
2423	**E**	Some LDEV IDs do not match Mnemonic symbols.
	[Contents]	Some LDEV IDs do not match Mnemonic symbols.
	[Action]	Please define the Mnemonic symbols.

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ID	Kind	Description
2424	**W**	Mnemonic file name is not defined in Keylock file. Mnemonic code will not be displayed.
	[Contents]	Mnemonic file name is not defined in Keylock file. Mnemonic code will not be displayed.
	[Action]	Please [OK] and continue.
2425	**E**	CU_NAME is different from CU in Mnemonic file. \n Connected\t: %s\n In file\t\t: %s
	[Contents]	CU_NAME which is defined Mnemonic file does not CU match connected CU name, or CU_NAME is not defined in Mnemonic file. Connected : (connected CU name) In file : (CU name defined in Keylock file).
	[Action]	Please select [OK] to interrupt operation, and confirm CU_NAME in Mnemonic and connected CU name.
2426	**E**	CU_NAME is different from CU in Keylock file. \n Connected\t: %s \n In file\t\t: %s
	[Contents]	CU_NAME which is defined in Keylock file does not match connected CU name. Connected : (connected CU name) In file : (CU name defined in Keylock file).
	[Action]	Please select [OK] to interrupt operation, and confirm CU_NAME in Keylock file and connected CU name.
2427	**E**	Syntax error exists in Mnemonic file. \n Code\t: %03u%s
	[Contents]	Syntax error exists in Mnemonic file. Code:(Factor code)
	[Action]	Please correct Mnemonic file.
2428	**E**	Syntax error exists in Keylock file. \n Code\t: %03u%s
	[Contents]	Syntax error exists in Keylock file. Code:(Factor code)
	[Action]	Please correct Keylock file.
2429	**E**	CU_INF is different from CU. \n Connected\t: %s \n In file\t\t: %s
	[Contents]	CU_INF which is defined in Keylock file does not match serial No. of connected CU. Connected : (connected CU name) In file : (CU name defined in Keylock file).
	[Action]	Please select [OK] to interrupt operation, and confirm CU_INF in Keylock file and Serial No. of controller.
2430	**I**	Are you sure you want to change the CVS Configuration?
	[Contents]	Are you sure you want to change the CVS Configuration?
	[Action]	Are you sure you want to change the CVS Configuration?
2431	**I**	This process has completed.
	[Contents]	This process has completed.
	[Action]	This process has completed.

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ID	Kind	Description
2432	**I**	An exchange of a microprogram finished.
	[Contents]	An exchange of a microprogram finished.
	[Action]	Please select [OK].
2433	**E**	On exchanging a microprogram. An error has occurred. \n Processing is stopped.
	[Contents]	On exchanging a microprogram. An error has occurred. Processing is stopped.
	[Action]	Please select [OK].
2434	**I**	An exchange of a microprogram finished. ¥n Please check subsystem status and microprogram version with MAINTENANCE.
	[Contents]	An exchange of a microprogram finished.
	[Action]	Select [OK] and then check subsystem status and micro-program version.
2435	**E**	On exchanging a microprogram, an error has occurred.
	[Contents]	On exchanging a microprogram. An error has occurred. Processing is stopped.
	[Action]	Please select [OK].
2436	**0**	This process will format all logical devices. \n Are you sure you want to continue this process?
	[Contents]	This process will format all logical devices. Are you sure you want to continue this process?
	[Action]	If you want to format all logical devices, please press [YES].
2437	**E**	Correcting data has failed.
	[Contents]	Correcting data has failed.
	[Action]	Please select [OK].
2438	**E**	Data in a spare device could not copy to the physical device.
	[Contents]	Data in a spare device could not copy to the physical device.
	[Action]	Please select [OK].
2439	**E**	Data in the physical device could not copy to a spare device.
	[Contents]	Data in the physical device could not copy to a spare device.
	[Action]	Please select [OK].

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ID	Kind	Description
2440	**E**	Interruption has failed.
	[Contents]	Interruption has failed.
	[Action]	Please select [OK].
2441	**I**	HODM function is not installed in specified controller.
	[Contents]	HODM function is provided by means of program product and must be installed in MCU before creating HODM pair.
	[Action]	None
2442	**I**	HRC function is not installed in specified controller.
	[Contents]	HRC function is provided by means of program product and must be installed in MCU and RCU before creating HRC volume pair.
	[Action]	None
2447	**I**	Are you sure you want to download LCP micro-program?
	[Contents]	Are you sure you want to download LCP micro-program?
	[Action]	If you want to download LCP micro-program, please select [Yes]. If not, please select [No].
2448	**I**	Are you sure you want to download MCP micro-program?
	[Contents]	Are you sure you want to download MCP micro-program?
	[Action]	If you want to download MCP micro-program, please select [Yes]. If not, please select [No].
2449	**E**	Communication error has accrued between SVP and DKC during CUDG process.
	[Contents]	Communication error has accrued between SVP and DKC during CUDG process.
	[Action]	Please select [OK] to stop this process and execute FDCOPY. After, please execute PS OFF and ON. And execute CUDG again.
2450	**E**	Previous PDEV or LDEV installation (de-installation) has not finished yet. Please install (de-install) the same PDEV or LDEV at first.
	[Contents]	Previous PDEV or LDEV installation (de-installation) has not finished yet. Please install (de-install) the same PDEV or LDEV at first.
	[Action]	Please select [OK], and then install (de-install) previous PDEV or LDEV.

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ID	Kind	Description
2451	**E**	Windows error has occurred.
	[Contents]	Windows error has occurred.
	[Action]	Please select [OK].
2452	**E**	Change Configuration was failed.
	[Contents]	Change Configuration was failed.
	[Action]	Please select [OK].
2453	**E**	Change Configuration was completed.
	[Contents]	Change Configuration was completed.
	[Action]	Please select [OK].
2454	**E**	Reading Configuration was failed.
	[Contents]	Reading Configuration was failed.
	[Action]	Please select [OK].
2455	**E**	SSD Configuration was finished.
	[Contents]	SSD Configuration was finished.
	[Action]	Please select [OK].
2456	**E**	SSD Configuration was failed.
	[Contents]	SSD Configuration was failed.
	[Action]	Please select [OK].
2457	**E**	Refer Configuration was failed.
	[Contents]	Refer Configuration was failed.
	[Action]	Please select [OK].
2458	**E**	Refer Configuration was completed.
	[Contents]	Refer Configuration was completed.
	[Action]	Please select [OK].
2459	**E**	Are you sure you want to install the defined SSD configuration?
	[Contents]	Are you sure you want to install the defined SSD configuration?
	[Action]	If you install defined configuration, select [Yes]. If you cancel the install operation, select [NO].
2460	**E**	System Tuning was finished. \n Wait until power is down. \n (PS-ON LED at CE Panel is off.)
	[Contents]	System Tuning was finished. Wait until power is down. (PS-ON LED at CE Panel is off.)
	[Action]	After making sure that PS-ON LED or CE Panel is off, select [OK].

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ID	Kind	Description
2461	**I**	Please confirm the drives whose emulation type will be changed have been already varied off-line. \nPlease confirm you have been already shutdown concerned connecting SCSI host(s).
	[Contents]	Please confirm the drives whose emulation type will be changed have been already varied off-line. Please confirm you have been already shutdown concerned connecting SCSI host(s).
	[Action]	Set [OK] after checking the drives whose emulation type will be changed have been already varied off-line and have already shutdown concerned connecting SCSI host(s). If you select [Cancel], terminate the change emulation procedure.
2462	**I**	Change emulation type is normal end. Please vary the drives on-line.
	[Contents]	Change emulation type is normal end. Please vary the drives on-line.
	[Action]	Change emulation processing is complete. Please vary the on-line, select [OK].
2463	**I**	Replace or insert the %s. When completed, please select OK.
	[Contents]	Replace or insert the %s. When completed, please select OK.
	[Action]	Replace or insert the PCB. When completed, please select OK.
2464	**I**	Please confirm you have already varied off the concerned Channel paths. Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to continue this process?
	[Contents]	Please confirm you have already varied off the concerned Channel paths. Please confirm you have already shutdown concerned connecting SCSI host(s) or switched to the alternate SCSI channel path(s). Do you want to continue this process?
	[Action]	If you want to continue this process, please select [YES]. If not, please select [NO].
2465	**I**	Cache size is different between cluster-1 and cluster-2. Please redefine configuration by cache installation (de-installation).
	[Contents]	Cache size is different between cluster-1 and cluster-2. Please redefine configuration by cache installation (de-installation).
	[Action]	Please select [OK] and install (de-install) Cache.

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ID	Kind	Description
2466	**W**	Remote Copy operation in CU could not be executed because information of all entry devices in CU are deleted by this operation.
	[Contents]	Remote Copy operation in CU could not be executed because information of all entry devices in CU are deleted by this operation.
	[Action]	Please select [OK] to operation. Check the RCU start and delete unnecessary RCU.
2467	**E**	Operation was rejected by DKU.
	[Contents]	Operation was rejected by DKU.
	[Action]	Please select [OK].
2468	**W**	Shared memory size is different between cluster-1 and cluster-2. cluster-1 : SMM = %d MB Size = %d MB cluster-2 : SMM = %d MB Size = %d MB
	[Contents]	Shared memory module type or number of shared memory module is deferent between cluster-1 and cluster-2.
	[Action]	(1)In case that module type is different, please adjust module size between cluster-1 and cluster-2. (2)In case that size is different, please redefine configuration by shared memory installation (de-installation).
2469	**W**	Cache memory size is different between cluster-1 and cluster-2. cluster-1 : CMG = %d MB Size = %d MB cluster-2 : CMG = %d MB Size = %d MB
	[Contents]	Cache memory module type or number of cache memory module is deferent between cluster-1 and cluster-2.
	[Action]	(1)In case that module type is different, please adjust module size between cluster-1 and cluster-2. (2)In case that size is different, please redefine configuration by shared memory installation (de-installation).
2470	**I**	Are you installing DKU? Yes : Installation of DKU. No : De-installation of DKU.
	[Contents]	SVP need to determine whether the process is under DKU installation or de-installation.
	[Action]	If DKU installation, please select [Yes] , if DKU de-installation, please select [No].
2471	**I**	Please format all blocked Logical Devices.
	[Contents]	Please format all blocked Logical Devices.
	[Action]	Please format all blocked Logical Devices.

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ID	Kind	Description
2472	**W**	""Load Configuration information from FD"" is completed. Please vary online the connected channel paths. Please check status with MAINTENANCE and log with INFORMATION. Please execute DKU path INLINE.
	[Contents]	"FD to DKC" has been completed. Vary online the connected channel paths. Check the status and log with MAINTENANCE and INFORMATION, respectively.
	[Action]	Please select [OK] and vary online the connected channel paths then check status and log. After execute, Please DKU Path INLINE.
2473	**I**	Proceed the following sequences by order. Step1. Recover blocked Physical Devices, if any. Step2. Exchange DKU microprogram. (Select ""NO"" at [ONL0732W] message, and input password.) Step3. Format Logical Devices.
	[Contents]	There might be some PDEVs which revisions of DKU micro-program are old. Please execute DKU micro-program exchange. After, execute LDEV format against the installed LDEVs.
	[Action]	Select [OK] , then please execute DKU micro-program exchange and execute LDEV format against the installed LDEVs.
2474	**W**	Please confirm all the Physical Devices have been restored.
	[Contents]	There are some abnormal PDEVs. Please restore abnormal PDEVs.
	[Action]	Select [OK] and then please restore abnormal PDEVs.
2475	**I**	Are you sure you want to execute INLINE CUDG for Cache Memory?
	[Contents]	Are you sure you want to execute INLINE CUDG for Cache Memory?
	[Action]	If you sure you want to execute INLINE CUDG Cache Memory, select [Yes]. Else, select [No].
2476	**E**	Destaging process has failed.
	[Contents]	Destaging process has failed.
	[Action]	Confirm the subsystem status and replace target PCB again.

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ID	Kind	Description
2477	**E**	There are some logical devices which were failed the LDEV format.
	[Contents]	There are some logical devices which were failed the LDEV format.
	[Action]	Confirm the Status /log and recover the problem.
2478	**E**	It cannot set because CU number is different. Please, set in the same CU number.
	[Contents]	It cannot set because CU number is different. Please, set in the same CU number.
	[Action]	Please select OK and set again.
2479	**E**	It cannot set because LDEV number isn't sequential. Please, set in sequential LDEV number.
	[Contents]	It cannot set because LDEV number isn't sequential. Please, set in sequential LDEV number.
	[Action]	Please select OK and set again.
2480	**E**	It cannot set because LU number is defined. Please, set after releasing LU.
	[Contents]	It cannot set because LU number is defined. Please, set after releasing LU.
	[Action]	Please select OK and set again after releasing LU.
2481	**E**	It cannot set because CU number is different. Please, set after releasing SCSI paths.
	[Contents]	It cannot set because CU number is different. Please, set after releasing SCSI paths.
	[Action]	Please select OK and set again after releasing SCSI paths.
2482	**E**	It cannot set because Emulation type is different. Please, set in the same Emulation type.
	[Contents]	It cannot set because Emulation type is different. Please, set in the same Emulation type.
	[Action]	Please select OK and set again.
2483	**W**	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair.
	[Contents]	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair.

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ID	Kind	Description
2484	**W**	Maintenance object included the reserved volume for HMRCF/HOMRCF. You should remove the reserved volume.
	[Contents]	Maintenance object included the reserved volume for HMRCF/HOMRCF. You should remove the reserved volume.
	[Action]	Maintenance object included the reserved volume for HMRCF/HOMRCF. You should remove the reserved volume.
2485	**W**	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair and reset reserve.
	[Contents]	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair and reset reserve.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair and reset reserve.
2486	**W**	HMRCF/HOMRCF data copy in progress. Please wait for end of copy or you should delete or suspend the HMRCF/HOMRCF volume pair. Do you want to stop this process?
	[Contents]	HMRCF/HOMRCF data copy in progress. Please wait for end of copy or you should delete or suspend the HMRCF/HOMRCF volume pair. Do you want to stop this process?
	[Action]	If you select [Yes], please wait until the process. SVP will stop the process so that you should end or suspend the HMRCF/HOMRCF volume pair. If you select [No], you can continue this process.
2487	**W**	HMRCF/HOMRCF data copy in progress. Please wait for end of copy or you should delete or suspend the HMRCF/HOMRCF volume pair.
	[Contents]	HMRCF/HOMRCF data copy in progress. Please wait for end of copy or you should delete or suspend the HMRCF/HOMRCF volume pair.
	[Action]	HMRCF/HOMRCF data copy in progress. Please wait for end of copy or you should end or suspend the pair.
2488	**W**	Maintenance object included the HMRCF/HOMRCF pair. You should suspend the HMRCF/HOMRCF volume pair.
	[Contents]	Maintenance object included the HMRCF/HOMRCF pair. You should suspend the HMRCF/HOMRCF volume pair.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair. You should suspend the HMRCF/HOMRCF volume pair.
2489	**W**	Maintenance object included the HMRCF/HOMRCF pair. You should split the HMRCF/HOMRCF volume pair.
	[Contents]	Maintenance object included the HMRCF/HOMRCF pair. You should split the HMRCF/HOMRCF volume pair.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair. You should split the HMRCF/HOMRCF volume pair.

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ID	Kind	Description
2490	**W**	Maintenance object included the HMRCF/HOMRCF pair. You should resynchronize the HMRCF/HOMRCF volume pair.
	[Contents]	Maintenance object included the HMRCF/HOMRCF pair. You should resynchronize the HMRCF/HOMRCF volume pair.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair. You should resynchronize the HMRCF/HOMRCF volume pair.
2491	**W**	A last DRR which support HMRCF/HOMRCF/HIHSM is included. This operation will be impossible to support the HMRCF/HOMRCF/HIHSM.
	[Contents]	A last DRR which support HMRCF/HOMRCF/HIHSM is included. This operation will be impossible to support the HMRCF/HOMRCF/HIHSM.
	[Action]	A last DRR which support HMRCF/HOMRCF/HIHSM is included. This operation will be impossible to support the HMRCF/HOMRCF/HIHSM.
2492	**W**	Maintenance object included the volume which is running backup. You should stop the backup server.
	[Contents]	Maintenance object included the volume which is running backup. You should stop the backup server.
	[Action]	Maintenance object included the volume which is running backup. You should stop the backup server.
2493	**W**	Maintenance object included the HMRCF/HOMRCF pair which was required from the host. You should change volume to the simplex.
	[Contents]	Maintenance object included the HMRCF/HOMRCF pair which was required from the host. You should change volume to the simplex.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair which was required from the host. You should change volume to the simplex.
2494	**I**	CU:LDEV ID 3:FF is a reserved device. SCSI path can't be defined.
	[Contents]	SCSI path can't be defined, because CU:LDEV ID 3:FF is a reserved device.
	[Action]	Before SVP version : 51-34-xx SCSI path can't be defined. After SVP version : 51-35-xx If you define SCSI path to this logical device, please set Command Device at first.

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ID	Kind	Description
2495	**E**	The following ports could not be changed. Please check those port status by MAINTENANCE. PORT#:%s
	[Contents]	The following ports could not be changed. Please check those port status by MAINTENANCE.
	[Action]	Confirm the port status and try again.
2496	**E**	The OPEN Volume(s) could not be changed. Please check those OPEN Volume(s) status by MAINTENANCE.
	[Contents]	The OPEN Volume(s) could not be changed. Please check those OPEN Volume(s) status by MAINTENANCE.
	[Action]	Confirm the OPEN Volume(s) status and try again.
2497	**E**	CU registration data is illegal.
	[Contents]	CU registration data is illegal.
	[Action]	Please reboot Remote Console by using backup CU list.
2498	**E**	Memory lock error has occurred.
	[Contents]	Memory lock error has occurred.
	[Action]	Please reboot Remote Console, and operate again.
2499	**E**	The CU List cannot be saved.
	[Contents]	The CU List cannot be saved.
	[Action]	Check HD of Remote Console, and get over on obstacle.
2500	**I**	Command Device has no SCSI path. Please set SCSI path(s) to the command Device.
	[Contents]	SCSI path is not defined to command Device.
	[Action]	Please set SCSI path(s) to the Command Device.
2501	**W**	The option cache PCB is mounted. Please de-Install it.
	[Contents]	Please follow this message.
	[Action]	Please follow this message.
2502	**W**	Cache memory Module Group size can be changed only from ""128MB * 8Module to 512MB * 2Module"". \nChange Cache memory size to ""1GB * 2"" by Cache memory Installation/De-installation.
	[Contents]	Cache memory Module Group size can be changed only from "128MB * 8Module to 512MB * 2Module". Change Cache memory size to "1GB * 2" by Cache memory Installation/De-installation.
	[Action]	Change Cache memory size to "1GB * 2" by Cache memory Installation/De-installation.
2503	**W**	It is not the new PCB. Please replace it for the New PCB.
	[Contents]	Please follow this message.
	[Action]	Please follow this message.

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ID	Kind	Description
2504	**W**	Mainframe volume can't be installed or de-installed. Because CHA(for Mainframe) isn't equipped on the subsystem.
	[Contents]	Please follow this message.
	[Action]	Please follow this message.
2505	**W**	Open volume can't be installed or de-installed. Because CHA(for Open system) isn't equipped on the subsystem.
	[Contents]	Please follow this message.
	[Action]	Please follow this message.
2506	**I**	Please confirm you have already varied off all channel paths. Please cancel WDCP pair. Do you want to continue this process?
	[Contents]	Please confirm you have already varied off all channel paths. Please cancel WDCP pair. Do you want to continue this process?
	[Action]	Please confirm you have already varied off all channel paths and WDCP pair.
2507	**E**	Replacement of the ""%s"" may cause fatal damage to subsystem. Please replace failure parts at first.
	[Contents]	In current state. replacement procedure may cause fatal damage to subsystem.
	[Action]	At first, please exclude other failure. then replace again.
2508	**E**	Reading information is failed.
	[Contents]	Reading information for checking status is failed.
	[Action]	Please select [OK] to terminate procedure. And reboot SVP and SSVP, then retry.
2509	**E**	This function was canceled by SVP.
	[Contents]	This function was canceled by SVP.
	[Action]	none
2510	**I**	Reduce the number of choice Pair.
	[Contents]	Reduce the number of choice Pair.
	[Action]	Please reduce the number of choice Pair, and execute again.
2511	**E**	It failed in CVS processing starting.
	[Contents]	It failed in CVS processing starting.
	[Action]	none

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ID	Kind	Description
2512	**E**	This processing failed when updating CVS configuration.
	[Contents]	This processing failed when updating CVS configuration.
	[Action]	none
2513	**E**	Reading information is failed. If you want to continue, confirm PSs are in normal. Do you want to continue?
	[Contents]	Reading information for checking status is failed.
	[Action]	If MPSs in one Cluster are down, please select [Yes] to continue procedure with caution that you do not switch normal MPSs to DISABLE.Other case, select [No] to terminate. And reboot SVP and SSVP, then retry.
2514	**I**	No setting of CVS was changed. May it execute as this?
	[Contents]	No setting of CVS was changed. May it execute as this?
	[Action]	none
2515	**E**	Configuration are different between DKC and SVP. Please call Technical Support Center.
	[Contents]	Configuration are different between DKC and SVP. Please call Technical Support Center.
	[Action]	Call Technical Support Center.
2516	**I**	These device(s) which you select will be de-installed. \nAre you sure?
	[Contents]	This operation, logical device(s) (CVS) which you select from List Box will be de-inst.
	[Action]	If OK, click [YES] button to de-install logical device(s). If not OK, click [NO] and select logical device(s) which you want to de-install again.
2517	**E**	Changing DCR configuration is failed.
	[Contents]	Changing DCR configuration instruction is failed.
	[Action]	Please reboot SVP/Remote Console PC.
2518	**E**	Reading DCR configuration is failed.
	[Contents]	Reading DCR configuration from DKC is failed.
	[Action]	Please reboot SVP/Remote Console PC.
2519	**E**	Changing DCR configuration is refused.
	[Contents]	Changing DCR configuration instruction is refused by DKC.
	[Action]	Cache might be blocked. Please call TSC to recover.
2520	**W**	Same type already use this area.
	[Contents]	DCR area which you entered already use with same DCR type.
	[Action]	Please check DCR configuration and enter correct DCR area.

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ID	Kind	Description
2521	**W**	You can't change SVP mode to Modify because Remote Console has connected to the SVP.
	[Contents]	You can't change SVP mode to Modify because Remote Console has connected to the SVP.
	[Action]	Please disconnect the SVP from Remote Console.
2522	**W**	Are you want to delete selected user?
	[Contents]	Do you want to delete selected user?
	[Action]	If you want to delete the select item, press [OK]. If you don't select [cancel].
2523	**W**	Are you want to delete selected controller?
	[Contents]	Do you want to delete selected controller?
	[Action]	If you want to delete the select item, press [OK]. If you don't select [cancel].
2524	**W**	Depending on the kind of OS of the host computer, the number of cylinders is invalid. \nAre you sure you confirm the number which has no problem on this system?
	[Contents]	If you confirm the number which has no problem, select (CL) [Yes]. If the number is invalid, select (CL) [No] to cancel.
	[Action]	If you confirm the number which has no problem, select (CL) [Yes]. If the number is invalid, select (CL) [No] to cancel.
2525	**I**	Are you sure you want to delete the selected patch data?
	[Contents]	Are you sure you want to delete the selected patch data?
	[Action]	[Yes]:Selected patch data will be the selected. [No] :Do nothing.
2526	**I**	Turn off the breaker. (CB102 on AC BOX-1)
	[Contents]	Turn off the breaker. (CB102 on AC BOX-1)
	[Action]	Turn off the breaker.
2527	**I**	Turn off the breaker. (AC BOX-2)
	[Contents]	Turn off the breaker. (AC BOX-2)
	[Action]	Turn off the breaker.
2528	**I**	Please de-install AC BOX-2, and turn on the breaker. (CB102 on AC BOX-1)
	[Contents]	Please de-install AC BOX-2, and turn on the breaker. (CB102 on AC BOX-1)
	[Action]	Please de-install AC BOX-2, and turn on the breaker. (CB102 on AC BOX-1)

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ID	Kind	Description
2529	**I**	Please install AC BOX-2, and turn on the breaker. (AC BOX-2) **[Contents]** Please install AC BOX-2, and turn on the breaker. (AC BOX-2) **[Action]** Please install AC BOX-2, and turn on the breaker. (AC BOX-2)
2530	**W**	Pre-Check error has occurred. (Error Code = %lx) \nPlease try again. **[Contents]** logic contradiction occurred in the Pre-Check by the Configuration data injustice. **[Action]** Refer to the Maintenance, and retry.
2531	**W**	The logical devices are not blockade. **[Contents]** The logical devices are not blockade. **[Action]** Specify only blockade logical device, and retry.
2532	**W**	The logical devices are not normal. **[Contents]** The logical devices are not normal. **[Action]** Specify only blockade logical device, and retry.
2533	**W**	The logical devices are not equip. **[Contents]** The logical devices are not equip. **[Action]** Refer to the Maintenance, and retry.
2534	**W**	The Shared memory Type is different between cluster-1 and cluster-2. **[Contents]** The Shared memory Type is different between cluster-1 and cluster-2. **[Action]** Change cluster-1 and cluster-2 to the Same Shared memory Type by Cache PCB Replace.
2535	**W**	Operation Terminated, Redundancy is lost and blocking this part stops subsystem functionality. **[Contents]** Do you continue the maintenance though the redundancy is lost by blockade this part? **[Action]** Confirm the maintenance/log, and recover the problem or continue the maintenance depending on the case.
2536	**W**	It cannot execute because there are some PCB which dose not support Archival Function. **[Contents]** It cannot execute because there are some PCB which dose not support Archival Function. **[Action]** Please exchange micro program of DKCMAIN.

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ID	Kind	Description
2537	**I**	The M-VOL is defined as the expansion volume.
	[Contents]	The M-VOL is defined as the expansion volume.
	[Action]	Please check again
2538	**I**	The R-VOL is defined as the expansion volume.
	[Contents]	The R-VOL is defined as the expansion volume.
	[Action]	Please check again
2539	**I**	HRCE function is not installed in specified controller(s).
	[Contents]	HRCE function is provided by means of program product and must be installed in both MCU and RCU before creating HRC volume pair.
	[Action]	Install HRCE function then try the operation again.
2540	**I**	It is necessary for Open VOL composed by multiple LDEVs to define SCSI path.
	[Contents]	It is necessary for Open VOL composed by multiple LDEVs to define SCSI path.
	[Action]	Please confirm the number of combined LDEVs of each Open VOL in 'LU Expansion Define' screen and define SCSI path(s).
2541	**E**	HMRCF/HOMRCF failed in the status acquisition. Please retry later.
	[Contents]	HMRCF/HOMRCF failed in the status acquisition. Please retry later.
	[Action]	none
2542	**E**	Can't read tuning parameters. \nPlease execute this process again after exchanging threshold information.
	[Contents]	Can't read tuning parameters. Please execute this process again after exchanging threshold information.
	[Action]	Exchange threshold information and execute this process.
2543	**I**	This operation can't be done. \nHORC volume pair is created.
	[Contents]	This operation can't be done. Because HORC volume pair is created.
	[Action]	It is necessary for this operation to delete HORC pair. But, please call Technical Support Center whether you can delete HORC pair.
2544	**I**	There is no end of patch data. \nPlease set an end of patch data (Ctl = 0x40).
	[Contents]	There is no end of patch data. Please set an end of patch data (Ctl = 0x40).
	[Action]	Please set Ctl = 0x40 to an end of patch data.

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ID	Kind	Description
2545	**W**	This procedure should be selected only for BUS access check without micro program exchange in PCB. \nIn the case of PCB replacement, press the Cancel button in the following password input screen, and select the [Replace] menu.
	[Contents]	This procedure should be selected only for BUS access check without micro program exchange in PCB. In the case of PCB replacement, press the Cancel button in the following password input screen, and select the [Replace] menu.
	[Action]	Confirm maintenance procedure.
2546	**W**	An inserted PCB has wrong micro version, so it does not admit to the system. Please confirm maintenance procedure.
	[Contents]	An inserted PCB has wrong micro version, so it does not admit to the system. Please confirm maintenance procedure.
	[Action]	Confirm maintenance procedure.
2547	**E**	There is no DKC Replacement data in the FD.
	[Contents]	There is no DKC Replacement data in the FD.
	[Action]	Insert the correct FD. Execute this process again.
2548	**E**	The disk is write-protected. Remove the write-protection.
	[Contents]	The disk is write-protected. Remove the write-protection.
	[Action]	Remove the write-protection.
2549	**W**	Maintenance of the unit may cause fatal damage to subsystem. Do you want to stop this process?
	[Contents]	Maintenance of the unit may cause fatal damage to subsystem. Do you want to stop this process?
	[Action]	Please select "Yes" to stop this process. If you want to continue, please select "Cancel".
2550	**E**	Your selected devices are defined as Open VOL so that you can not maintain them from this screen. \nYou should maintain all volumes from 'Open Vol' in the Maintenance screen.
	[Contents]	Your selected devices are defined as Open VOL so that you can not maintain them from this screen. \nYou should maintain all volumes from 'Open Vol' in the Maintenance screen.
	[Action]	You should maintain all volumes from 'Open Vol' in the Maintenance screen.
2551	**W**	The size of History Log files are too large. Please delete them later.
	[Contents]	The History Log files are too large. If you need these files, please save them as backup and delete.
	[Action]	Please save the summary log and detail log files as backup and delete them.

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ID	Kind	Description
2552	**W**	This function cannot be executed. Please confirm subsystem configuration.
	[Contents]	This function cannot be executed. Please confirm subsystem configuration.
	[Action]	Confirm subsystem configuration with Install / Maintenance.
2553	**W**	The logical path of SCSI remains. This definition cannot be transferred. \nDo you want to continue this process ?
	[Contents]	The logical path of SCSI remains. This definition cannot be transferred. Do you want to continue this process ?
	[Action]	If you select [Yes], please define the logical path of SCSI again after the DKC exchange treatment completion.
2554	**W**	If the logical path of HRC/HODM remains, that configuration cannot be transferred. \nDo you want to continue this process ?
	[Contents]	If the logical path of HRC/HODM remains, that configuration cannot be transferred. Do you want to continue this process ?
	[Action]	If you select [Yes], Please define the logical path of HRC/HODM again after the DKC exchange treatment completion.
2555	**E**	Remote Console failed to enter the Remote Console information to the following controller because connection error occurred between Remote Console and the controller. (Controller: %s)
	[Contents]	Remote Console failed to connect to the DKC. So that Remote Console could not enter the information in order for SVP to send the R-SIM.
	[Action]	Please check the connection and retry the same operation.
2556	**W**	Protected Status has already changed by host. Do you want to continue setting ?
	[Contents]	Protected Status has already changed by host.
	[Action]	If you want to setting volume press [YES], if not press [NO]
2557	**I**	%s pair volume is selected. \nCommand Device can't be set.
	[Contents]	HORC or HOMRCF pair volume is selected. Command Device can't be set.
	[Action]	Please select another volume or delete HORC/HOMRCF pair.
2558	**I**	Invalid emulation type for Command Device is selected. \nCommand Device can't be set.
	[Contents]	Invalid emulation type for Command Device is selected. Command Device can't be set.
	[Action]	Please select valid emulation type for Command Device.

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ID	Kind	Description
2559	**I**	A selected volume includes HORC pair. \nSCSI path(s) can't be added.
	[Contents]	A selected volume which you to add SCSI path(s) includes HORC pair volume. SCSI path(s) can't be added.
	[Action]	Please free concerned Open VOL or delete HORC pair.
2560	**I**	HORC pair volume is selected. \nAre you sure you want to add SCSI path(s)?
	[Contents]	HORC pair volume is selected. Are you sure you want to add SCSI path(s)?
	[Action]	[Yes]:SCSI path(s) will be added. [No]:SCSI path(s) won't be added.
2561	**I**	HORC pair volume is selected. \nAnd the last SCSI path to this volume will be deleted. \nAre you sure you want to delete SCSI path(s).
	[Contents]	HORC pair volume is selected. And the last SCSI path to this volume will be deleted. Are you sure you want to delete SCSI path(s).
	[Action]	[Yes]:SCSI path(s) will be deleted. [No]:SCSI path(s) won't be deleted.
2562	**I**	%s pair volume is selected. \nAre you sure you want to delete SCSI path(s)?
	[Contents]	HORC or HOMRCF pair volume is selected. Are you sure you want to delete SCSI path(s)?
	[Action]	[Yes]:SCSI path(s) will be deleted. [No]:SCSI path(s) won't be deleted.
2563	**I**	Reduce the number of choice Volume.
	[Contents]	Please reduce the number of choice Volume.
	[Action]	Please the number of choice Volume. Then, retry again.
2564	**W**	Please confirm you have already varied off the concerned Volume. If OK, please press OK.
	[Contents]	Please confirm you have already varied off the concerned Volume. If OK, please press OK.
	[Action]	If you have already varied off, please press OK.

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ID	Kind	Description
2565	**W**	Installation data of option product in the Configuration table will be initialized by this operation table. \nAfter finishing this procedure, please set the product installation again.
	[Contents]	Installation data of option product in the Configuration table will be initialized by this operation table. \nAfter finishing this procedure, please set the product installation again.
	[Action]	After operation "Define & Install", you should set the option product again.
2566	**I**	SM size is different between cluster-1 and cluster-2. Please redefine configuration by SM installation (de-installation).
	[Contents]	SM size is different between cluster-1 and cluster-2. Please redefine configuration by SM installation (de-installation).
	[Action]	Please redefine configuration by SM installation (de-installation).
2567	**E**	This subsystem is installed HMRCF or HOMRCF program product, but inserted PCB does not support HMRCF and HOMRCF. So, it does not admit to the system.
	[Contents]	This subsystem is installed MRCF or HOMRCF program product, but inserted PCB does not support MRCF and HOMRCF. So, it does not admit to the system.
	[Action]	In case of DKA replacement, retry with WP102B PCB. In case of DKA installation, de-install the PCBs, and then retry with WP102B PCBs.
2568	**W**	Error has occurred at INLINE CUDG.
	[Contents]	Error has occurred at INLINE CUDG.
	[Action]	Select [OK] to continue recovering of Cluster. After Recovering of Cluster has finished, follow the message displayed when INLINE CUDG was running or DIAG LOG.
2569	**W**	Executing INLINE CUDG task is failed.
	[Contents]	Executing INLINE CUDG task is failed.
	[Action]	Select [OK] to continue recovering of Cluster. After Recovering of Cluster has finished, isolate problems according to the following procedure. 1. Reboot the SVP. 2. Exchange the SVP micro-program. 3. Replace the SVP.

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ID	Kind	Description
2570	**E**	Time out error has occurred in transferring micro-program. \nPlease execute micro-program exchange again after taking dump and FD Copy.
	[Contents]	Time out error has occurred in transferring micro-program. Please execute micro-program exchange again after taking dump and FD Copy.
	[Action]	Execute micro-program exchange again after taking dump and FD Copy.
2571	**I**	Refer to DIAG LOG in SVP for maintenance Action Code.
	[Contents]	Refer DIAG LOG and Action Code (ACC).
	[Action]	Refer DIAG LOG and Action Code (ACC).
2572	**I**	CUDG is Running.
	[Contents]	CUDG is running now.
	[Action]	If you want to start CUDG test, please stop CUDG and start again.
2573	**E**	There is no response from %s within the time limit.
	[Contents]	Communication with the Processor (%s) resulted in the time limit.
	[Action]	After selecting 'OK', please executing FD copy and call the TSC.
2574	**I**	Are %s interrupted?
	[Contents]	Do you want to interrupt the LCDG?
	[Action]	If you want to interrupt the LCDG, please select 'YES'.
2575	**I**	Are %s restarted?
	[Contents]	Do you want to restart the LCDG?
	[Action]	If you want to restart the LCDG, please select 'YES'.
2576	**I**	Are %s stopped?
	[Contents]	Do you want to stop the LCDG?
	[Action]	If you want to stop the LCDG, please select 'YES'.
2577	**W**	The Logical device formatting cannot be executed. Because an error occurred at DKU PATH INLINE. \nPlease check connection of the SCSI I/F Cable.
	[Contents]	The Logical device formatting cannot be executed. Because an error occurred at DKU PATH INLINE. Please check connection of the SCSI I/F Cable.
	[Action]	Confirm connection of the SCSI I/F Cable.

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ID	Kind	Description
2578	**I**	Combination of the specified expansion volume is not valid.
	[Contents]	Combination of the specified expansion volume is not valid. For example number of the device in the specified expansion volume is not equal.
	[Action]	Check the composition of the specified expansion volume.
2579	**I**	Parameter specified by Remote Copy operation for expansion volume is not valid.
	[Contents]	Parameter specified by Remote Copy operation for expansion volume is not valid. For example, specified Port /ID/LUN of the R-VOL is not valid.
	[Action]	Check the Port /ID/LUN is the RCU. Please establish the correct parameter and retry the operation..
2580	**I**	The specified RCU doesn't support the Remote Copy for the expansion volume.
	[Contents]	The Controller type or the microprogram version of the specified RCU doesn't support the Remote Copy for the expansion volume.
	[Action]	Check the Controller type and the microprogram version of the specified RCU.
2581	**I**	The specified expansion volume (Port/ID/LUN) isn't defined in the RCU.
	[Contents]	The specified expansion volume (Port/ID/LUN) isn't defined in the RCU.
	[Action]	Check the Port /ID/LUN is the RCU.
2582	**I**	The pair status of the specified expansion volume is not valid.
	[Contents]	The pair status is not permissible status for the operation.
	[Action]	Renew and confirm the HORC screen. If it is permissible status please retry the operation.
2583	**W**	<Important CAUTION> \nThis operation is new installation. If you want to Non-disruptive Install or Non-disruptive de-install, terminate this procedure by [CANCEL] button and select INSTALL-CHANGE CONFIGURATION menu.
	[Contents]	<Important CAUTION> \nThis operation is New INSTALL procedure. If you want to Non-disruptive Install or Non-disruptive de-install, terminate this procedure by [CANCEL] button and select INSTALL-CHANGE CONFIGURATION menu.
	[Action]	Confirm maintenance procedure at Maintenance Manual.

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ID	Kind	Description
2584	**W**	<Important CAUTION> \nWhen you continue this operation, finally you need DKC PS OFF. Are you sure you want to continue this operation?
	[Contents]	<Important CAUTION> \nWhen you continue this operation, finally you need DKC PS OFF. Are you sure want to continue this operation.
	[Action]	Confirm maintenance procedure at Maintenance Manual.
2585	**W**	<Important CAUTION> \nWhen you continue this operation, customer's DATA is LOST. Are you sure you want to continue this operation?
	[Contents]	<Important CAUTION> \nWhen you continue this operation, customer's DATA is LOST. Are you sure want to continue this operation.
	[Action]	Confirm maintenance procedure at Maintenance Manual.
2586	**W**	<Important CAUTION> \nWhen you continue this operation, configuration data will be changed. Are you sure you want to continue this operation?
	[Contents]	<Important CAUTION> \nWhen you continue this operation, configuration data will be changed. Are you sure want to continue this operation.
	[Action]	Confirm maintenance procedure at Maintenance Manual.
2587	**W**	<Important CAUTION> \nWhen you select [OK] button, you can't cancel this operation. Are you sure you want to continue this operation? \rIf you terminate this operation by some forcible method, the subsystem be in UNRECOVERABLE SERIOUSLY DAMAGE.
	[Contents]	<Important CAUTION> \nWhen you select [OK] button, you can't cancel this operation. Are you sure you want to continue this operation? \rIf you terminate this operation by some forcible method, the subsystem be in UNRECOVERABLE SERIOUSLY DAMAGE.
	[Action]	Confirm maintenance procedure at Maintenance Manual.
2588	**W**	<Important CAUTION> \nYou must not RE-BOOT SVP(PC).
	[Contents]	<Important CAUTION> \nYou must not RE-BOOT SVP(PC).
	[Action]	Don't re-boot SVP(PC).

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ID	Kind	Description
2589	**W**	<Important CAUTION> \nWhen you continue this operation, finally you need DKC PS OFF, so customer can not use the volume in this subsystem continuously.
	[Contents]	<Important CAUTION> \nWhen you continue this operation, finally you need DKC PS OFF, so customer can not use the volume in this subsystem continuously.
	[Action]	Confirm maintenance procedure at Maintenance Manual.
2590	**W**	<Important CAUTION> \nThis MODE is INITIAL SETUP MODE. You must not execute NON-DISRUPTIVE INSTALL and NON-DISRUPTIVE DE-INSTALL!
	[Contents]	<Important CAUTION> \nThis MODE is INITIAL SETUP MODE. You must not execute NON-DISRUPTIVE INSTALL and NON-DISRUPTIVE DE-INSTALL!
	[Action]	Confirm maintenance procedure at Maintenance Manual.
2591	**W**	Verifying the logical devices. \nNo maintenance can be performed now.
	[Contents]	Verifying the logical devices. No maintenance can be performed now.
	[Action]	Wait for the completion of Verify.
2592	**I**	When SCSI paths are defined to Open VOLs composed of multiple LDEVs, \nthe number of them and LDEVs is limited respectively less than or equal %d per port (%s).
	[Contents]	When SCSI paths are defined to Open VOLs composed of multiple LDEVs, the number of them and LDEVs is limited respectively less than or equal %d per port (%s).
	[Action]	Please confirm the number of Open VOLs and LDEVs per port which are target
2593	**E**	FC target file not found.
	[Contents]	FC target file not found.
	[Action]	FC target files are not sent from Maintenance Center. Please call your TSC.
2594	**E**	A submaster is double defined.
	[Contents]	A submaster is double defined.
	[Action]	After selecting OK, please change the SVP's attribution.
2595	**E**	File open error has occurred. \n(Error Code = %04x)
	[Contents]	File open error has occurred.
	[Action]	Reboot the PC. If the error cannot be recovered, replace the PC.

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ID	Kind	Description
2596	**E**	File write error has occurred. \n(Error Code = %04x) **[Contents]** File write error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2597	**E**	File read error has occurred. \n(Error Code = %04x) **[Contents]** File read error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2598	**E**	Memory Allocate error has occurred. \n(Error Code = %04x) **[Contents]** Memory Allocate error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2599	**E**	Memory lock error has occurred. \n(Error Code = %04x) **[Contents]** Memory lock error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2600	**I**	Select file not found. \n(Error Code = %04x) **[Contents]** Select file not found. **[Action]** Please select [OK].
2601	**E**	Time out error has occurred. \n(Error Code = %04x) **[Contents]** Time out error has occurred. **[Action]** Please confirm the LAN and retry.
2602	**E**	DDE connection error has occurred. \n(Error Code = %04x) **[Contents]** DDE connection error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2603	**E**	DDE initialization error has occurred. \n(Error Code = %04x) **[Contents]** DDE initialization error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2604	**E**	DDE transaction error has occurred. \n(Error Code = %04x) **[Contents]** DDE transaction error has occurred. **[Action]** Reboot the PC. If the error cannot be recovered, replace the PC.
2605	**E**	Internal error has occurred. \n(Error Code = %04x) **[Contents]** Internal error has occurred. **[Action]** Gather the dump, and reboot PC.

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ID	Kind	Description
2606	**W**	Communication busy. Please retry later. \n(Error Code = %04x)
	[Contents]	Communication busy. Please retry later.
	[Action]	Please wait for a moment and retry.
2607	**E**	Windows error has occurred. \n(Error Code = %04x)
	[Contents]	Windows error has occurred.
	[Action]	Please select [OK].
2608	**E**	Sequence error has occurred. \n(Error Code = %04x)
	[Contents]	Sequence error has occurred.
	[Action]	Please reboot the PC and retry.
2609	**E**	Unknown error code. \n(Error Code = %04x)
	[Contents]	Unknown error has code.
	[Action]	Gather the dump, and reboot PC.
2610	**I**	You can't change this program product for some reason (%s) .
	[Contents]	You can't change this program product because of some reason.
	[Action]	Please call Technical Support Center.
2611	**E**	This program product needs another DKC type (%s) .
	[Contents]	This program product need different DKC type.
	[Action]	Please call Technical Support Center.
2612	**E**	Before you install/de-install this program product (%s) , you should de-install another program product.
	[Contents]	De-installation of this program product needs to de-installation of other program product.
	[Action]	At first, de-install the related program product.
2613	**E**	This program product is already used, you can't de-install this.
	[Contents]	This program product is already used.
	[Action]	Stop using this program product function.
2614	**E**	Configuration related to this program product remains (%s) .
	[Contents]	De-installation of this program product needs to change the sub system configuration..
	[Action]	Please call Technical Support Center.
2615	**E**	This program product needs another configuration (%s) .
	[Contents]	This program product need different configuration.
	[Action]	Please call Technical Support Center.

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ID	Kind	Description
2616	**E**	This program product needs the upper version Micro-Program (%s). **[Contents]** This program product needs the upper version Micro-Program **[Action]** Please call Technical Support Center.
2617	**E**	This program product needs the upper version hardware (%s) . **[Contents]** This program product needs the upper version hardware. **[Action]** Please call Technical Support Center.
2618	**W**	4RCUs are already registered. Some RCUs are used by another type of Remote Copy. **[Contents]** Cannot add a RCU more, because 4 RCUs are already registered. **[Action]** After deleting some RCUs, try again.
2619	**I**	There is no valid volumes. **[Contents]** Same as the message. **[Action]** Confirm the volumes type on SVP screen, then try again.
2620	**I**	Please confirm that system configuration returned the original condition. \nThen, press OK. **[Contents]** Please confirm that system configuration returned the original condition. Then, press OK. **[Action]** Please return system configuration to the original condition. Then, press OK.
2621	**I**	Please switch SCSI channel path, which is connecting under cluster2. \nThen, press OK. **[Contents]** Please switch SCSI channel path, which is connecting under cluster2. Then, press OK. **[Action]** Please switch SCSI channel path, which is connecting under cluster2 to alternate path. Then, press OK.
2622	**I**	Please switch SCSI channel path, which is connecting under cluster1. \nThen, press OK. **[Contents]** Please switch SCSI channel path, which is connecting under cluster1. Then, press OK. **[Action]** Please switch SCSI channel path, which is connecting under cluster1 to alternate path. Then, press OK.

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ID	Kind	Description
2623	**I**	Please confirm you have already shutdown all connecting SCSI hosts. \nDo you want to continue this process?
	[Contents]	Please confirm you have already shutdown all connecting SCSI hosts. \nDo you want to continue this process?
	[Action]	Please confirm you have already shutdown all connecting SCSI hosts. After that if you want to continue this process then please select YES button, otherwise please select NO button.
2624	**I**	Please confirm you have already varied off all channel paths. \nDo you want to continue this process?
	[Contents]	Please confirm you have already varied off all channel paths. Do you want to continue this process?
	[Action]	Please confirm you have already shutdown all connecting hosts. After that if you want to continue this process then please select YES button, otherwise please select NO button.
2626	**I**	Please confirm you have already varied off all channel paths. \nPlease confirm you have already shutdown all connecting SCSI hosts. \nDo you want to continue this process?
	[Contents]	Please confirm you have already varied off all channel paths. Please confirm you have already shutdown all connecting SCSI hosts. Do you want to continue this process?
	[Action]	Please confirm you have already shutdown all connecting all kinds of hosts. After that if you want to continue this process then please select YES button, otherwise please select NO button.
2627	**I**	Archival function is not installed in specified controller(s).
	[Contents]	Archival function is provided by means of program product and must be installed in both MCU and RCU before creating HRC volume pair.
	[Action]	Install Archival function then try the operation again.
2629	**I**	Please stop Raid Manager.
	[Contents]	Please stop Raid Manager.
	[Action]	Please stop Raid Manager.
2630	**I**	HORC function is not installed in specified controller(s).
	[Contents]	HORC function is provided by means of program product and must be installed in both MCU and RCU before creating HORC volume pair.
	[Action]	Install HORC function then try the operation again.

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ID	Kind	Description
2631	**E**	SVP logical error has occurred. %s \nPlease retry operation after PC reboot. \n(See recovery procedure for PC Failure, M.M. TRBL03-70.)
	[Contents]	SVP logical error has occurred. %s Please retry operation after PC reboot. (See recovery procedure for PC Failure, M.M. TRBL03-70.)
	[Action]	Please select OK, and retry operation after PC reboot. (See recovery procedure for PC Failure, M.M. TRBL03-70.)
2632	**I**	Are you expanding SCSI cables to the 2nd or 4th DKU?
	[Contents]	Are you expanding SCSI cables to the 2nd or 4th DKU?
	[Action]	In case of expanding, select YES. In case of not expanding, select NO.
2633	**I**	This will end the DKU PATH INLINE.
	[Contents]	This will end the DKU PATH INLINE.
	[Action]	In case of ending, select OK. In case of not ending, select CANCEL.
2634	**W**	HDU Not Blockade!
	[Contents]	HDU Not Blockade!
	[Action]	Please select OK, and select blocking HDU.
2635	**W**	Illegal Routine ID!
	[Contents]	Illegal Routine Id!
	[Action]	Please select OK, and input correct Routine ID.
2636	**W**	Please block the concerned drive(s) before running Inline.
	[Contents]	Please block the concerned drive(s) before running Inline.
	[Action]	Please select OK, and block the concerned drive(s) before running Inline.
2637	**W**	The Logical device formatting cannot be executed. Because an error occurred at DKU PATH INLINE. \nPlease check connection of the SCSI I/F Cable. \nDo you want to stop this process?
	[Contents]	The Logical device formatting cannot be executed. Because an error occurred at DKU PATH INLINE. Please check connection of the SCSI I/F Cable. Do you want to stop this process?
	[Action]	If you select [Yes], Please check the connection of the SCSI I/F Cable. If you select [No], you can continue this process.

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ID	Kind	Description
2638	**E**	This is not the special FD. Please check it and insert correct FD (%s) . **[Contents]** This is not a special FD or file is failure. Please insert correct FD. **[Action]** Check the FD. If it is correct FD, but this message is displayed, some files in the FD might be broken, so please call technical support center.
2639	**E**	The kind of special FD is different ! Please check it and insert correct FD (%s) . **[Contents]** This is deferent special FD. Check the FD and insert correct FD. **[Action]** If you have a correct FD, insert it and press [OK]. If you don't, press [Cancel].
2640	**E**	This FD is already used so that you can't install. Please check it and insert correct FD (%s) . **[Contents]** This FD is already used. Check the FD and insert correct FD. **[Action]** If you have a correct FD, insert it and press [OK]. If you don't, press [Cancel].
2641	**E**	This FD is not used so that you can't de-install. Please check it and insert correct FD (%s) . **[Contents]** This FD is not used. Check the FD and insert correct FD. **[Action]** Insert the used FD and press [OK]. If you don't have it, press [Cancel].
2642	**E**	This FD is already used by another DKC. Please check it and insert correct FD (%s) . **[Contents]** This FD is already used. Please insert not used FD. **[Action]** Insert none used FD and press [OK]. If you don't have it, press [Cancel].
2643	**E**	This FD may be write protected. Please check it and release the protection. **[Contents]** This FD may be write protected. Please check it and release the protection. **[Action]** Release the protection of FD and press [OK].
2644	**W**	Did you save your data for backup before you install/de-install Cache, Pdev(etc.) in the SSD. **[Contents]** Did you save your data for backup before you install/de-install Cache, Pdev(etc.) in the SSD. **[Action]** If you have saved data, please select [Yes].

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ID	Kind	Description
2645	**W**	Some HMRCF/HOMRCF Pairs are Split Pending. These pairs will be suspended by OFFLINE FC. \nDo you want to stop this process?
	[Contents]	Some HMRCF/HOMRCF Pairs are Split Pending. These pairs will be suspended by OFFLINE FC. Do you want to stop this process?
	[Action]	If you select [Yes], please wait Split Pending end. If you select [No], you can continue this process.
2646	**I**	Force reset was finished.
	[Contents]	Force reset for the specified port(s) was finished normally.
	[Action]	Select [OK].
2647	**E**	Force reset was failed.
	[Contents]	Force reset for the specified port(s) was failed.
	[Action]	Check LAN or file system or remain of system resource, then try again.
2648	**I**	Pinned track does not exist.
	[Contents]	Pinned track does not exist.
	[Action]	Select [OK].
2649	**E**	This Program Product (%s) need the de-installation of another Program Product (%s).
	[Contents]	De-installation of this program product needs the de-installation of other program product.
	[Action]	Please de-install the related program product at first.
2650	**E**	This Program Product (%s) need the installation of another Program Product (%s).
	[Contents]	Installation of this program product needs the installation of other program product.
	[Action]	Please install the related program product at first.
2651	**E**	The selected SCSI path is for Command Device. \nAnd the last SCSI path to this device will be deleted. \nIf the SCSI path want to be deleted, please reset Command Device at first.
	[Contents]	The selected SCSI path is for Command Device. And the last SCSI path to this device will be deleted. If the SCSI path want to be deleted, please reset Command Device at first.
	[Action]	If the last SCSI path for Command Device want to be deleted, please reset Command Device at first.

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ID	Kind	Description
2652	**I**	The specified expansion volume (Port/ID/LUN) of the RCU is not usable. **[Contents]** The specified expansion volume (Port/ID/LUN) of the RCU is not usable. For example, 1. Specified expansion volume of the RCU is blocked. 2. Specified expansion volume of the RCU is CC=3 condition. 3. Specified expansion volume of the RCU is intervention required. 4. Specified RCU doesn't support the Remote Copy for the expansion volume. **[Action]** Confirm the status of the specified expansion volume or microprogram version of the RCU.
2653	**I**	Specified M-VOL is still online from other HOST. **[Contents]** Specified M-VOL is still online from other HOST. **[Action]** Please vary offline the concerned path from the other HOST once, then retry the operation.
2654	**I**	Registration of Mnemonic file will be erased. Do you want to continue. **[Contents]** Registration of Mnemonic file will be erased. **[Action]** Erase registration :Select [Yes]. Cancel operation :Select [No].
2655	**I**	Registration of Mnemonic file will be changed. Do you want to continue. **[Contents]** Registration of Mnemonic file will be changed. **[Action]** Change registration :Select [Yes]. Cancel operation :Select [No].
2656	**E**	The Mnemonic List cannot be saved. **[Contents]** The Mnemonic List cannot be saved. **[Action]** Check HD of Remote Console, and get over on obstacle.
2657	**E**	Windows error has occurred. **[Contents]** Windows error has occurred. **[Action]** Please reboot Remote Console, and operate again. And yet this message has been displayed, install Remote Console again.
2658	**E**	Logical error has occurred. **[Contents]** Logical error has occurred. **[Action]** Please reboot Remote Console, and operate again. And yet this message has been displayed, install Remote Console again.

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ID	Kind	Description
2659	**W**	If you continue this process, please shutdown all connecting SCSI hosts. \nThen, press OK.
	[Contents]	If you continue this process, please shutdown all connecting SCSI hosts. Then, press OK.
	[Action]	If you continue this process, please shutdown all connecting SCSI hosts. Then, press OK.
2660	**W**	If you continue this process, you have to switch to the alternate SCSI channel path. \nDo you want to continue this process?
	[Contents]	If you continue this process, you have to switch to the alternate SCSI channel path. Do you want to continue this process?
	[Action]	If you exchange micro-program for alternate SCSI channel path mode, Select[Yes].
2661	**W**	This process will not exchange the micro-program of SCSI channel adapters. \nPlease exchange it later.
	[Contents]	This process will not exchange the micro-program of SCSI channel adapters. Please exchange it later.
	[Action]	If you exchange micro-program by skipping SCSI channel adapter mode, Select[Yes].
2662	**E**	DKC busy, please retry later.
	[Contents]	DKC busy, please retry later.
	[Action]	Please retry this operation. If this message is displayed again, retry after lowering the load of DKC.
2663	**W**	Renewal process has failed. Please check subsystem status.
	[Contents]	Renewal process has failed. Please check subsystem status.
	[Action]	Check subsystem Status with the Maintenance screen.
2664		Error has occurred. Do you stop this process?
	[Contents]	Error has occurred. Do you stop this process?
	[Action]	Select Button.
2665	**I**	No HDD is over the rate.
	[Contents]	There is no HDD whose error rate is over the specified rate.
	[Action]	Press OK, and input the lower rate.
2666	**I**	No ORM Log is existing on this ID.
	[Contents]	There is no ORM Log information for the selected error ID.
	[Action]	Press OK and close ORM screen, then retry the operation.
2667	**W**	Are you sure you want to reset Threshold Counter of all ID?
	[Contents]	Are you sure you want to reset Threshold Counter of all ID?
	[Action]	Press OK to reset counters.

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ID	Kind	Description
2668	**W**	Are you sure you want to alter the threshold value of HDD you selected? **[Contents]** Are you sure you want to alter the threshold value of HDD you selected? **[Action]** Press OK to alter the threshold value.
2669	**I**	Rate must be form 0 to 100(%). **[Contents]** Error rate is invalid. The valid value is from 0 to 100(%). **[Action]** Press OK, and correct the rate.
2670	**I**	Select HDD(s). **[Contents]** Select HDD(s) in the HDD List. **[Action]** Press OK, and select HDD(s).
2671	**I**	Enter correct threshold value. **[Contents]** Threshold value is invalid. Correct the value **[Action]** Press OK, and correct the threshold value.
2672	**E**	Allocating local memory object failed. **[Contents]** Memory object allocation failed on PC. **[Action]** Reboot PC, and retry the operation.
2673	**E**	File opening failed. **[Contents]** File operation error has occurred. **[Action]** Reboot PC, and retry the operation.
2674	**E**	Any processor are not selected. **[Contents]** Any processor are not selected. **[Action]** Select(CL) any processor and select(CL) [OK].
2675	**E**	Micro-Program or configuration is not selected. **[Contents]** Micro-Program or configuration is not selected. **[Action]** Select(CL) Micro-program or configuration and select(CL) [OK].
2676	**E**	The version of special FD is different ! \nPlease check it and insert correct FD (%s). **[Contents]** This special FD is different version. Please check it and insert correct FD. **[Action]** Please check the version of FD and Remote Console.

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ID	Kind	Description
2677	**I**	The AC BOX that you will replace is %s-Phase type. Please confirm type of maintenance part. Do you want to continue. **[Contents]** The AC BOX that you will replace is %s-Phase type. Please confirm type of maintenance part. **[Action]** If you want to continue replacement, select [Yes]. If you want to interrupt, select [No].
2678	**I**	Installed AC BOX is 1-Phase type. Turn off the DKC AC BOX which supplies power source for %s, when you replace it. **[Contents]** Installed AC BOX is 1-Phase type. Turn off the DKC AC BOX which supplies power source for %s, when you replace it. **[Action]** Please read message carefully, and select [OK].
2679	**W**	The version of Micro Program Code installed to this PCB is too old. Please write current Micro Program Code using MP Install. **[Contents]** The version of Micro Program Code installed to this PCB is too old. Please write current Micro Program Code using MP Install. **[Action]** Write current Micro Program Code to the PCB using MP Install.
2680	**W**	Verifying the logical devices. \nNo maintenance can be performed now. \nDo you want to stop this process? **[Contents]** Verifying the logical devices. No maintenance can be performed now. Do you want to stop this process? **[Action]** Select [Yes] to cancel the process, or select [No] to continue the process.
2681	**W**	[Cancel] was selected, Do you want to stop microprogram exchange? **[Contents]** [Cancel] was selected, Do you want to stop microprogram exchange? **[Action]** [Yes] : Stop microprogram exchange. [No] : Continue microprogram exchange.
2682	**E**	DKC serial number is invalid. \nPlease input correct DKC serial number between 1 and 65535. **[Contents]** DKC serial number is invalid. \nPlease input correct DKC serial number between 1 and 65535. **[Action]** Input correct IP address.

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ID	Kind	Description
2683	**W**	DCR available size is too large. \nPlease check CACHE/DCR size configuration. **[Contents]** DCR available size is too large. If you want to use DCR function with this DCR available size. You have to install more CACHE memory. If you do not want to use it, please reduce DCR available size. **[Action]** Please check CACHE/DCR size configuration. Then, you have to install CACHE memory, or reduce DCR available size (de-install DCR memory, and install CACHE memory)
2684	**I**	SCSI path is defined to volume 3:FF. \nBut this volume is not Command Device. \nIf you want to define SCSI path to the volume, please set Command Device to it. **[Contents]** SCSI path is defined to volume 3:FF. But this volume is not Command Device. If you want to define SCSI path to the volume, please set Command Device to it. **[Action]** If you want to define SCSI path to the volume, please set Command Device to it. If you don't set Command Device to the volume, please delete all SCSI paths defined to the volume.
2685	**E**	Connection error occurred between Remote Console and Controller.(Controller:%s) **[Contents]** Remote Console could not connect to the DKC. **[Action]** Please check the connection and retry the same operation.
2686	**E**	Remote Console detected internal error.(Controller:%s) **[Contents]** The program detected internal error. **[Action]** Please select [OK] to stop the process. And retry again. If the message is displayed, please restart the same programs after closing it, or you should reboot this PC.
2687	**E**	The target controller is being maintained now. After maintaining, please retry again.(Controller:%s) **[Contents]** The target controller might been maintained. **[Action]** Please select [OK] to stop this process. After finishing maintained, please retry again.
2688	**I**	Are you sure you want to output pair status into a snapshot file? (Warning:Snapshot file will be overwritten.) **[Contents]** Are you sure you want to output pair status into a snapshot file? (Warning:Snapshot file will be overwritten.) **[Action]** If you want to output pair status into a snapshot file, press "Yes" button. If not, press "No" button to abort.

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ID	Kind	Description
2689	**I**	Snapshot has failed. **[Contents]** Snapshot has failed. **[Action]** Press "OK" button, then try again.
2690	**I**	Snapshot is done. **[Contents]** Snapshot is done. **[Action]** Press "OK" button.
2691	**I**	Please insert config FD in FDD. **[Contents]** Please insert config FD in FDD. **[Action]** Insert config FD in FDD.
2692	**I**	Do you want to stop the file transfer process? **[Contents]** Do you want to stop the file transfer process? **[Action]** Select Yes button to stop the transfer process.
2693	**W**	DCR limit size is to large. Please check Cache configuration. **[Contents]** DCR limit size (maximum size) is too large to keep enough Cache size. **[Action]** (1)Please install more Cache memory. (2)Please de-install DCR Cache memory. Then, please install more Cache memory.
2694	**I**	The R-VOL should not be HMRCF/HOMRCF T-VOL, Reserve VOL, nor HMRCF/HOMRCF Reserve Copy status. (Error Code = %04x) **[Contents]** The R-VOL should not be HMRCF/HOMRCF T-VOL, Reserve VOL, nor HMRCF/HOMRCF Reserve Copy status. **[Action]** Confirm the status of the specified R-VOL from HOST or SVP.
2695	**I**	The M-VOL should have HMRCF/HOMRCF Split pair status when defined as T-VOL, not be Reserve VOL, and not be HMRCF/HOMRCF Reverse Copy status. (Error Code = %04x) **[Contents]** The M-VOL should have HMRCF/HOMRCF Split pair status when defined as T-VOL, not be Reserve VOL, and not be HMRCF/HOMRCF Reverse Copy status. **[Action]** Confirm the status of the specified M-VOL from HOST or SVP.
2696	**I**	The M-VOL should be HMRCF/HOMRCF T-VOL of the pair established with one S-VOL to one T-VOL. (Error Code = %04x) **[Contents]** The M-VOL should be HMRCF/HOMRCF T-VOL of the pair established with one S-VOL to one T-VOL. **[Action]** Confirm the status of the specified M-VOL from HOST or SVP.
2697	**W**	The target volume has connected SCSI channel port. \nPlease delete the connected SCSI Path at first. **[Contents]** The target volume has connected SCSI channel port. Please delete the connected SCSI Path at first. **[Action]** Please erase SCSI path set and change the target.

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ID	Kind	Description
2698	**I**	The MCU is already used by HMRCF/HOMRCF. (Error Code = %04x)
	[Contents]	Add Pair operation was failed because MCU is already used by HMRCF/HOMRCF.
	[Action]	Confirm the HMRCF/HOMRCF status of MCU from HOST or SVP.
2699	**E**	Invalid configuration file was read. \nPlease stop this operation and reboot SVP.
	[Contents]	Invalid configuration file was read. Please stop this operation and reboot SVP.
	[Action]	After selecting OK, please reboot SVP. Next, please open the Maintenance screen and close to read the correct configuration file.
2700	**W**	There is no statistical information in the SVP. Select ""Switch"" button and execute gathering statistical information from DKC.
	[Contents]	There is no statistical information in the SVP. Select "Switch" button and execute gathering statistical information from DKC for once. If SVP displays the same message, please wait for an hour at least. And please retry again.
	[Action]	Press [OK], select [Switch] button and confirm that "ON" is selected in the "Data gathering" screen. And then, finish the HIHSM function, execute it again, and SVP execute the gathering information from DKC.
2701	**I**	Please insert a DOS formatted. \nFD (No.%d)
	[Contents]	Please insert a DOS formatted FD whose number is "No.xx"
	[Action]	Please insert a DOS formatted FD whose number is "No.xx".
2702	**E**	This subsystem needs the CL Additional Power Supply. \nPlease install CL Additional Power Supply.
	[Contents]	This subsystem needs the CL Additional Power Supply. (Probably, three or more channel options are installed).
	[Action]	To install three or more channel options, please install CL Additional Power Supply before.
2703	**E**	This subsystem needs the CL Additional Power Supply. Please de-install the channel options before de-install the CL Additional Power Supply.
	[Contents]	This subsystem needs the CL Additional Power Supply. (Probably, three or more channel options are installed) .
	[Action]	Before de-installing the CL Additional Power Supply, please de-install channel options
2704	**E**	Backup is failed.
	[Contents]	Backup is failed.
	[Action]	Select [Copy config Files] from [Install] Dialog and select [Create Configuration Backup] from [Copy Config Files] Dialog.

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ID	Kind	Description
2705	**E**	The Keylock List cannot be saved. **[Contents]** The Keylock List cannot be saved. **[Action]** Check HD of Remote console, and get over on obstacle.
2706	**I**	Registration of Keylock file will be erased. Do you want to continue? **[Contents]** Registration of Keylock file will be erased. **[Action]** Erase registration :Select [Yes]. Cancel operation :Select [No].
2707	**I**	Registration of Keylock file will be changed. Do you want to continue? **[Contents]** Registration of Keylock file will be changed. **[Action]** Erase registration :Select [Yes]. Cancel operation :Select [No].
2708	**E**	MS-DOS error has occurred. **[Contents]** MS-DOS error has occurred. **[Action]** Please reboot Remote console, and operate again. But it this message has been displayed again, install Remote console again.
2709	**E**	The Open Keylock List cannot be saved. **[Contents]** The Open Keylock List cannot be saved. **[Action]** Check HD in the Remote console, and recover.
2710	**W**	Selected device is not ready, or adapted file is not exists. **[Contents]** Selected device is not ready, or adapted file is not exists. **[Action]** Select [OK], and make selected device to be usable, or copy files to specified directory if you need, and execute again.
2711	**E**	The operation was rejected because of the state of FREEZE. **[Contents]** The operation was rejected because of the state of FREEZE. **[Action]** 1.Case of path operation. Please retry the operation after state of FREEZE is recovered. 2.Case of pair operation. (1)Please refer to the “SCP time” into the RCU status screen at the SVP or the RMC, after this time passed. Please retry again. (2)Please retry the operation after recovering path. Two means of recvering paths are specified as follows. a)executing ESTPATH from HOST console. b)Adding paths after deleting paths form the SVP or the RMC.
2712	**W**	Please confirm you have already unmounted the concerned Volume. If OK, please press OK. **[Contents]** Please confirm you have already unmounted the concerned Volume. When system is WindowsNT, shutdown. If OK, please press OK. **[Action]** Select button.
2713	**I**	Do you want to make backup files for SCSI path information? **[Contents]** Do you want to make backup files for SCSI path information? **[Action]** [Yes]:Backup files will be made. [NO]:Backup files won't be made.

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ID	Kind	Description
2714	**E**	Keylock definition file read error has occurred. **[Contents]** Keylock definition file could not read. **[Action]** After selecting [OK], please check if the Keylock definition file is broken.
2715	**E**	Keylock definition file access error has occurred (Open error). **[Contents]** Keylock definition file could not open. **[Action]** After selecting [OK], please check if the Keylock definition file exists in the directory (C:\Rmtcnsl\com).
2716	**E**	Mnemonic definition file read error has occurred. **[Contents]** Mnemonic definition file could not read. **[Action]** After selecting [OK], please check if the Mnemonic definition file is broken.
2717	**E**	Mnemonic definition file access error has occurred (Open error). **[Contents]** Mnemonic definition file could not open. **[Action]** After selecting [OK], please check if the Mnemonic definition file exists in the directory (C:\Rmtcnsl\com).
2718	**E**	CU definition file access error has occurred (Open error). **[Contents]** CU definition file could not open. **[Action]** After selecting [OK], please check if the CU definition file exists in the directory (C:\Rmtcnsl\com).
2719	**E**	Binary data file access error has occurred (Open error). **[Contents]** Binary data file could not open. **[Action]** Please start the main application again and push Disk key button (You do not need operate 'Key Open' or 'Key Close'.
2720	**E**	Binary data file read error has occurred. **[Contents]** Binary data file could not read. **[Action]** Please start the main application again and push Disk key button (You do not need operate 'Key Open' or 'Key Close'.
2721	**E**	Binary data file write error has occurred. **[Contents]** Binary data file could not write. **[Action]** Please check your disk capacity. Binary Data file size is about 16 Kbytes.
2722	**E**	Keylock data file access error has occurred (Open error). **[Contents]** Keylock data file could not open. **[Action]** After selecting [OK], please check if the Keylock data file exists in the directory (C:\Rmtcnsl\Data).
2723	**E**	Mnemonic data file access error has occurred (Open error). **[Contents]** Mnemonic data file could not open. **[Action]** After selecting [OK], please check if the Mnemonic data file exists in the directory (C:\Rmtcnsl\Data).

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ID	Kind	Description
2724	**E**	Invalid configuration data is generated. \nPlease reboot PC, and open Maintenance window. \nAfter close Maintenance window, please define configuration again. **[Contents]** Invalid configuration data is generated for unknown cause. **[Action]** Please reboot PC, and open Maintenance window for read correct configuration data from DKC. After close Maintenance Window, please define configuration again.
2725	**I**	Are you sure you want to execute data setting to all CUs? **[Contents]** Are you sure you want to execute data setting to all CUs? **[Action]** Please confirm of file name, and continue.
2726	**I**	Making backup files for SCSI path information was %s. **[Contents]** Making backup files for SCSI path information was completed or failed. **[Action]** "completed" : Do nothing. "failed" : Please retry your operation.
2727	**E**	Communication error has occurred when reading the Configuration data from DKC. Reboot the SVP. \nDo you want to stop this process? **[Contents]** Communication error has occurred when reading the Configuration data from DKC. Reboot the SVP. Do you want to stop this process? **[Action]** If [Yes], Reboot the SVP, but same error has occurred, gather the dump used the Fd Copy function. If [No], SVP will continue the process, but you must be careful to operate.
2728	**E**	Communication error has occurred when checking the Remote Copy status. Reboot the SVP. \nDo you want to stop this process? **[Contents]** Communication error has occurred when checking the Remote Copy status. Reboot the SVP. Do you want to stop this process? **[Action]** If [Yes], Reboot the SVP, but same error has occurred, gather the dump used the Fd Copy function. If [No], SVP will continue the process, but you must be careful to operate.
2729	**E**	Communication error has occurred when checking the HMRCF/HOMRCF status. Reboot the SVP. \nDo you want to stop this process? **[Contents]** Communication error has occurred when checking the HMRCF/HOMRCF status. Reboot the SVP. Do you want to stop this process? **[Action]** If [Yes], Reboot the SVP, but same error has occurred, gather the dump used the Fd Copy function. If [No], SVP will continue the process, but you must be careful to operate.
2730	**E**	Communication error has occurred when checking the PIN data. Reboot the SVP. \nDo you want to stop this process? **[Contents]** Communication error has occurred when checking the PIN data. Reboot the SVP. Do you want to stop this process? **[Action]** If [Yes], Reboot the SVP, but same error has occurred, gather the dump used the Fd Copy function. If [No], SVP will continue the process, but you must be careful to operate.

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ID	Kind	Description
2731	**E**	Communication error has occurred when checking the S-SVP status. Reboot the SVP. \nDo you want to stop this process ? **[Contents]** Communication error has occurred when checking the S-SVP status. Reboot the SVP. Do you want to stop this process ? **[Action]** If [Yes], Reboot the SVP, but same error has occurred, Replace the S-SVP. If [No], SVP will continue the process, but you must be careful to operate.
2732	**I**	Do you want to add SCSI path WITHOUT SHUTDOWN? **[Contents]** Do you want to add SCSI path WITHOUT SHUTDOWN? **[Action]** If you want to add path without shutdown, select [Yes] button.
2733	**I**	There is no change in configuration data. **[Contents]** There is no change in configuration data. **[Action]** Please change configuration data and try again.
2734	**I**	SCSI path(s) can't be added. \nHost Mode of the selected port is not for ""WITHOUT SHUTDOWN"" mode. **[Contents]** SCSI path(s) can't be added. Host Mode of the selected port is not for "WITHOUT SHUTDOWN" mode. **[Action]** Please confirm Host Mode by selecting [Host Mode...] button on "SCSI Path-LDEV Configuration" screen.
2735	**W**	Are you sure you want to delete the C/T group? **[Contents]** The confirmation message before the specified C/T group is deleted. **[Action]** If you want to delete specified C/T group, press "Yes" button. If not, press "No" button.
2736	**E**	C/T group is not active. **[Contents]** ADD PAIR operation is failed because the C/T Group is not active. **[Action]** Please execute ADD GROUP operation, and retry operation.
2737	**I**	Too many RCUs in this C/T Group. **[Contents]** ADD PAIR operation is failed. If Timer Type is System, 4 RCU are already entered. If Timer Type is Local or None, 1 RCU are already entered. **[Action]** None
2738	**I**	Copy mode can not be changed. **[Contents]** RESUME PAIR operation is failed. 1.The volume is HRC Asynchronous pair but specified Copy Mode is not Asynchronous. 2.The volume is not HRC Asynchronous pair but specified Copy Mode is Asynchronous. **[Action]** Renew and confirm the HRC screen and retry the operation.

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ID	Kind	Description
2739	**I**	C/T Group is not active in the RCU.
	[Contents]	RESUME PAIR operation is failed. C/T Group is not active in the RCU. There are no R-VOL in the C/T Group.
	[Action]	Renew and confirm the C/T Group in the MCU/RCU. If M-VOL exists, please DELETE and retry ADD PAIR operation.
2740	**I**	C/T Group Option can not be changed unless deleting all asynchronous pairs in the group.
	[Contents]	ADD/RESUME PAIR operation failed. C/T Group was already exist in RCU by other MCU. C/T Group Option(Timer Type/Time Out) can not be altered unless deleting all asynchronous pairs in the group.
	[Action]	Renew and confirm the RCU C/T Group option and set same option as the MCU.
2741	**I**	Too many MCUs in this C/T Group.
	[Contents]	ADD PAIR operation failed. 4 MCU's already exist in same C/T Group.
	[Action]	None
2742	**I**	Please retry Add pair/Resume pair operation a few minutes later.
	[Contents]	ADD/RESUME PAIR operation failed. Specified volume or other volume in the same group is being changed to SIMPLEX/SUSPEND status in MCU.
	[Action]	A few minute later, please renew and confirm the HRC screen and if specified volume is permissible status please retry the operation.
2743	**I**	HRC Asynchronous function is not installed in specified RCU.
	[Contents]	ADD PAIR operation failed. HRC Asynchronous function is provided by means of program product and must be installed in the RCU before creating HRC asynchronous volume pair.
	[Action]	Please install HRC Asynchronous function in the RCU.
2744	**I**	This version does not support multi C/T Groups in the RCU.
	[Contents]	ADD PAIR operation failed. This version does not support multi C/T Groups in the RCU.
	[Action]	Renew and confirm the C/T Group in the RCU.
2745	**I**	This version does not support intermix of HRC Asynchronous pair and Sync/Semi-Sync pairs in the DKC(s).
	[Contents]	ADD PAIR operation failed. This version does not support HRC Asynchronous pair and Sync/Semi-Sync pairs in the same DKC.
	[Action]	Renew and confirm the Copy Mode(Sync/Semi-Sync) in the MCU and RCU.
2746	**I**	Specified M-VOL is an HMRCF/HOMRCF volume. This version does not support it.
	[Contents]	ADD PAIR operation failed. Specified M-VOL is HMRCF volume. This version does not support it.
	[Action]	Renew and confirm the HMRCF status in the M-VOL.

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ID	Kind	Description
2747	**I**	Specified R-VOL is an HMRCF/HOMRCF volume. This version does not support it.
	[Contents]	ADD PAIR operation failed. Specified R-VOL is an HMRCF volume. This version does not support it.
	[Action]	Renew and confirm the HMRCF status in the R-VOL.
2748	**I**	Suspend operation failed because specified volume or other volume in the same group is not in permissible status.
	[Contents]	The pair status of the specified volume or other volume in the same group is not permissible status for the operation. (In case of group option) 1.Specified volumes is SIMPLEX. 2.There is no DUPLEX or DUPLEX-PENDING volume in the group. (In case of group option) 1.Specified volumes is SIMPLEX. 2.Specified volumes is SUSPEND.
	[Action]	Renew and confirm the HRC screen. If specified volume or other volume in the same group is permissible status, please retry the operation.
2749	**I**	Suspend operation failed because specified volume or other volume in the same group is in status transition.
	[Contents]	Specified volume or other volume in the same group is in status transition. (In case of group/volume option) 1.Specified volumes is DELETING. 2.Specified volumes is SUSPENDING.
	[Action]	A few minute later, please renew and confirm the HRC screen and if specified volume is permissible status please retry the operation.
2750	**I**	Delete pair operation failed because M-VOL is in Simples status.
	[Contents]	The pair status of the M-VOL is not permissible status for the operation. (In case of group option) 1.Specified volumes is SIMPLEX. 2.There is no DUPLEX or DUPLEX-PENDING or SUSPEND volume in the group. (In case of group option) 1.Specified volumes is no DUPLEX or DUPLEX-PENDING or SUSPEND.
	[Action]	Renew and confirm the HRC screen. If M-VOL is permissible status, please retry the operation.

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ID	Kind	Description
2751	**I**	Delete operation failed because specified volume or other volume in the same group is in status transition. **[Contents]** Specified volume or other volume in the same group is in status transition. (In case of group/volume option) 1.Specified volumes is DELETING. 2.Specified volumes is SUSPENDING. **[Action]** A few minute later, please renew and confirm the HRC screen and if specified volume is permissible status please retry the operation.
2752	**I**	Delete pair operation failed because Consistency Time of C/T Group is not determined by SEQCHK. **[Contents]** Delete pair operation with C/T option failed. The status of the C/T Group is SEQCHK. **[Action]** Please retry the Delete Pair operation with VOLUME or GROUP option.
2753	**I**	Some volumes were not deleted by the Delete pair operation. **[Contents]** The pair status of the volume is SEQCHK or Consistency Time of volume is not in accord with Consistency Time of C/T group. **[Action]** Please renew HRC screen and confirm failed volumes. And if necessary, please retry the Delete Pair operation with VOLUME or GROUP option.
2754	**I**	All volumes were not deleted by the Delete pair operation. **[Contents]** Delete pair operation with C/T option failed. The pair status of the volumes is SEQCHK or Consistency Time of volumes is not in accord with Consistency Time of C/T group. **[Action]** Please retry the Delete Pair operation with VOLUME or GROUP option.
2755	**E**	Duplicate C/T Group#(A C/T Group has been already active in MCU). **[Contents]** Duplicate C/T Group#(A C/T Group has been already active in MCU). **[Action]** Confirm the C/T group in the MCU.
2756	**E**	C/T Group is not active. **[Contents]** C/T Group is not active. **[Action]** Confirm the C/T group in the MCU.
2757	**I**	At least one asynchronous pair is active in this group. **[Contents]** GROUP OPTION operation failed because the specified group has asynchronous pair. **[Action]** Renew and confirm the HRC screen.
2758	**I**	HRC Asynchronous function is not installed in specified MCU. **[Contents]** ADD GROUP operation failed. HRC Asynchronous function is provided by means of program product and must be installed in both MCU before creating HRC Asynchronous volume pair. **[Action]** Renew and confirm the HRC screen.

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ID	Kind	Description
2759	**I**	This version does not support multi C/T Groups in the MCU.
	[Contents]	ADD GROUP operation failed. This version does not support multi C/T Groups in the MCU.
	[Action]	Renew and confirm the C/T Group in the MCU.
2760	**I**	At least one asynchronous pair is active in this group.
	[Contents]	Delete Group operation failed : At least one asynchronous pair is active in this group.
	[Action]	Please renew and confirm the HRC screen.
2761	**I**	Please retry Delete Group operation a few minutes later.
	[Contents]	Delete Group operation failed. This pair is being changed to SIMPLEX status in this group.
	[Action]	Please retry Delete Group operation a few minutes later.
2762	**I**	%s pair volume exists. \nRestoring process can't be executed.
	[Contents]	HORC or HOMRCF pair volume exists. Restoring process can't be executed.
	[Action]	Select [OK].
2763	**I**	Restoring process can't be executed. \n%s configuration of backup doesn't correspond with the current subsystem configuration.
	[Contents]	Restoring process can't be executed. PCB or logical device configuration of backup doesn't correspond with the current subsystem configuration.
	[Action]	Select [OK].
2764	**W**	<Important CAUTION> \nThis operation is addition of SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts.
	[Contents]	<Important CAUTION> This operation is addition of SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts.
	[Action]	Select [OK].
2765	**W**	<Important CAUTION> \nWhen you continue this operation, please confirm the OS of the connected SCSI hosts. \nFile system may be in UNRECOVERABLE SERIOUS DAMAGE.
	[Contents]	<Important CAUTION> When you continue this operation, please confirm the OS of the connected SCSI hosts. \nFile system may be in UNRECOVERABLE SERIOUS DAMAGE.
	[Action]	[OK] : This operation will be continued. [Cancel] : This operation will be terminated.

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ID	Kind	Description
2766	**W**	<Important CAUTION> \nIf you need shutdown of the connected SCSI hosts, terminate this procedure by [Cancel] button and select INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION menu. **[Contents]** <Important CAUTION> If you need shutdown of the connected SCSI hosts, terminate this procedure by [Cancel] button and select INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION menu. **[Action]** [OK] : This operation will be continued. [Cancel] : This operation will be terminated.
2767	**W**	<Important CAUTION> \nAre you sure you want to define SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts? **[Contents]** <Important CAUTION> \nAre you sure you want to define SCSI I/F configuration WITHOUT SHUTDOWN of the connected SCSI hosts? **[Action]** [OK] : This operation will be continued. [Cancel] : This operation will be terminated.
2768	**I**	If you want to add OPEN CVS volume, please enter 35MByte or more size. **[Contents]** If you want to add OPEN CVS volume, please enter 35MByte or more size. **[Action]** Please enter 35Byte or more size.
2769	**I**	Please retry Add pair/Resume Pair operation a few minutes later. **[Contents]** ADD/RESUME PAIR operation failed. Specified volume or other volume in the same group being changed to SIMPLEX/SUSPEND status in RCU. **[Action]** A few minute later, please renew and confirm the HRC screen and if specified volume is permissible status please retry the operation.
2770	**I**	The DKU emulation type of this normal volume will be defined to %s. \nAre you sure you want to define with this DKU emulation type? **[Contents]** The DKU emulation type of normal volume which create with CVS TO NORMAL VOLUME operation is displayed. If this emulation type can not coexist, you need to change the DKU emulation type. **[Action]** If you want to change DKU emulation type, select NO. If not, select YES.
2771	**I**	The DKU emulation type will CHANGE TO %s. \nAre you sure you want to change? **[Contents]** The DKU emulation type of normal volume which create with CVS TO NORMAL VOLUME operation will be changed to the DKU emulation type which displayed in this message. **[Action]** If you want to change DKU emulation type, select NO. If not, select YES.

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ID	Kind	Description
2772	**I**	SCSI path(s) will be added to the port(s) with no SCSI path. \nDo you want to add the path(s)? \n [Yes] : Host Mode of the concerned port must be changed. \n [No] : This operation will be canceled. **[Contents]** SCSI path(s) will be added to the port(s) with no SCSI path. Do you wan to add the path(s)? **[Action]** [Yes] : Host Mode of the concerned port must be changed. [No] : This operation will be canceled.
2773	**I**	Host Mode of the selected port(s) can't be changed. \nIf you want to change Host Mode of the concerned port(s), please select %s menu. **[Contents]** Host Mode of the selected port(s) can't be changed. If you want to change Host Mode of the concerned port(s), please select menu. SVP:INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION. RMC:PATH-DEFINE(OFFLINE). **[Action]** If you want to change Host Mode of the concerned port(s), please select menu. SVP:INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION. RMC:PATH-DEFINE(OFFLINE).
2774	**E**	3390-3 and 33903R can not exist in the same subsystem. \nPlease choice the emulation type to either 3390-3 or 3390-3R. **[Contents]** 3390-3 and 3390-3R can not exist in the same subsystem. Please choice the emulation type to either 3390-3 or 3390-3R. **[Action]** Please change all 3390-3 DKU emulation type to 3390-3R, or change all 3390-3R DKU emulation type to 3390-3.
2775	**E**	3390-3 and 33903R can not coexist. \nPlease solve DKU emulation type coexistence problem with DKU emulation type change function. **[Contents]** 3390-3 and 3390-3R can not coexist in the same subsystem. Please solve DKU emulation type coexistence problem with DKU emulation type change function. **[Action]** Please change all 3390-3 DKU emulation type to 3390-3R, or change all 3390-3R DKU emulation type to 3390-3 with DKU emulation type change function.
2776	**E**	3390-3 and 33903R can not coexist. \nPlease call your maintenance support center to solve DKU emulation type coexistence problem. **[Contents]** 3390-3 and 3390-3R can not coexist in the same subsystem. Please call your maintenance support center to solve DKU emulation type coexistence problem. **[Action]** Please call your maintenance support center.
2777	**I**	SCSI path is added to port which has no SCSI path. \nPlease set Host Mode to the concerned port again. **[Contents]** SCSI path is added to port which has no SCSI path. Please set Host Mode to the concerned port again. **[Action]** Please set Host Mode to the concerned port again.

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ID	Kind	Description
2778	**I**	Invalid %s exists. \nPlease modify it.
	[Contents]	Invalid Fibre port information exists. Please modify it.
	[Action]	Please modify the invalid Fibre information
2779	**E**	<Important CAUTION> \nIf you need shutdown of the connected SCSI hosts, terminate this procedure by [Cancel] button and select %s menu.
	[Contents]	<Important CAUTION> If you need shutdown of the connected SCSI hosts, terminate this procedure by [Cancel] button and displayed menu.
	[Action]	[OK] : This operation will be continued. [Cancel] : This operation will be terminated.
2780	**I**	Please select one of the Pair Mode from the Display Filter before pair operation.
	[Contents]	Please select one of the Pair Mode from the Display Filter before pair operation.
	[Action]	Select one of the Pair Mode from the Display Filter.
2781	**I**	It will take %s minutes to finish this process usually (maximum %d minutes). Do you want to continue?
	[Contents]	This is standard and maximum time to finish this process. Do you want to continue?
	[Action]	If you want to continue, select [Yes]. If you want to select, select [No].
2782	**I**	Are you sure you want to %s %s?
	[Contents]	Are you sure you want to complete function? Are you sure you want to cancel the function?
	[Action]	[Yes] : This function will be completed or canceled. [No] : Do Nothing.
2783	**I**	Grouping process has failed. \nThe selected %s have a different LUN security information.
	[Contents]	Grouping process has failed. The selected WWNs have a different LUN security information. The selected LUNs have a different LUN security information.
	[Action]	Select [OK].
2784	**I**	The maximum group number %s is %d per port.
	[Contents]	The maximum group number of WWN is 8 per port. The maximum group number of LUN is 16 per port.
	[Action]	Select [OK].
2785	**I**	Are you sure you want to change the selected WWN or the nickname?
	[Contents]	Are you sure you want to change the selected WWN or the nickname?
	[Action]	[Yes] : The selected WWN or the nickname will be changed. [No] : The selected WWN or the nickname won't be changed.

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ID	Kind	Description
2786	**I**	The input %s has already existed. **[Contents]** The input %s has already existed. **[Action]** Please input another WWN or nickname.
2787	**I**	Are you sure you want to delete the selected WWN? \nIf you select [Yes], LUN security information of the WWN will be deleted too. **[Contents]** Are you sure you want to delete the selected WWN? If you select [Yes], LUN security information of the WWN will be deleted too. **[Action]** [Yes] : Registration of the WWN and LUN security information of the WWN will be deleted. [No] : Do noting.
2788	**I**	Error response from DKC. **[Contents]** An error was reported from the DKC. **[Action]** Retry again.
2789	**I**	The maximum number of %s is %d per port. **[Contents]** The maximum number of WWNs is 15 per port. **[Action]** Select [OK].
2790	**I**	The registration of the input WWN has completed. **[Contents]** The registration of the input WWN has completed. **[Action]** Select [OK].
2791	**I**	%s has a number which is not hexadecimal. **[Contents]** WWN has a number which is not hexadecimal. **[Action]** Select [OK].
2792	**I**	%s has a character which is not permitted. **[Contents]** Nickname has a character which is not permitted. **[Action]** Select [OK].
2793	**W**	The Remote Copy volume pair may be suspended. No maintenance operations are possible during Remote initial copy. Are you sure you want to continue this process? **[Contents]** SVP detects the warning that Remote Copy pair will be suspended or you could not operate more. **[Action]** If [Yes] is selected, SVP will continue the process, but if [No] is selected, SVP will stop the process.

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ID	Kind	Description
2794	**I**	%s of selected port(s) can't be changed. \nIf you want to change it of the concerned port(s), please select %s menu.
	[Contents]	Host Mode, Fibre port address or Fibre port topology of selected port(s) can't be changed. If you want to change it of the concerned port(s), please select %s menu. SVP : INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION. RMC : PATH-DEFINE(OFFLINE)
	[Action]	If you want to change it of the concerned port(s), please select the following menu. SVP : INSTALL-CHANGE CONFIGURATION-SCSI I/F CONFIGURATION. RMC : PATH-DEFINE(OFFLINE)
2795	**I**	%s can't be set or reset. \nThe selected %s has SCSI path(s) using now.
	[Contents]	Command Device can't be set or reset. The selected volume has SCSI path(s) using now.
	[Action]	Select [OK].
2796	**E**	It is possible that host I/O of concerned LUN may not stop or concerned LUN may be reserved. \nPlease stop host I/O of it or release the reserve.
	[Contents]	It is possible that host I/O of concerned LUN may not stop or concerned LUN may be reserved. Please stop host I/O of it or release the reserve.
	[Action]	Please stop host I/O of concerned LUN or release the reserve.
2797	**W**	CONFIG is inconsistent with option product. \nPlease install CONFIG of version %d-xx-xx/10 by INSTALL-COPY CONFIG FILES-INITIAL INFORMATION FILES menu.
	[Contents]	CONFIG is inconsistent with option product. Please install CONFIG of version %d-xx-xx/10 by INSTALL-COPY CONFIG FILES-INITIAL INFORMATION FILES menu.
	[Action]	Install-Copy Config of version %d-xx-xx/10 by INSTALL-COPY CONFIG FILES-INSTALL INFORMATION FILES menu.
2798	**W**	The number of selected LDEVs exceeds maximum value (%d).
	[Contents]	The number of selected LDEVs exceeds maximum value. The LDEV selected last time is canceled automatically.
	[Action]	Please execute LU expansion less than maximum value.
2799	**I**	Delete pair operation failed because R-VOL is in Duplex or Duplex Pending status.
	[Contents]	Delete Pair operation with C/T option failed. The pair status of the R-VOL is not permissible status for the operation. There is some DUPLEX or DUPLEX-PENDING volume(s) in the group.
	[Action]	Renew and confirm the HRC screen. If a R-VOL is in permissible status, please retry operation.

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ID	Kind	Description
2805	**E**	The R-VOL is already used by HIHSM.
	[Contents]	The R-VOL is already used by HIHSM.
	[Action]	Confirm the status of the specified R-VOL from HOST or SVP.
2806	**E**	The M-VOL is already used by HIHSM.
	[Contents]	The M-VOL is already used by HIHSM.
	[Action]	Confirm the status of the specified R-VOL from HOST or SVP.
2807	**W**	The controller is busy now. Please retry a little later.
	[Contents]	The controller detected the internal time out.(You can retry same operation several seconds .)
	[Action]	Wait for a moment. And please retry again.
2808	**E**	Option Product(HIHSM) is not Installed.
	[Contents]	Option Product(HIHSM) is not Installed.
	[Action]	Install the Program Product HIHSM.
2809	**E**	The controller is received invalid command.
	[Contents]	Controller receives the invalid command.
	[Action]	Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2810	**E**	There is no allocated reserved volume.
	[Contents]	There is no allocated reserved volume.
	[Action]	Make the reserved volumes, and please retry again.
2811	**E**	Track format is unmatched.
	[Contents]	Track format is unmatched.
	[Action]	Confirm the track format of selected volume, And please try again.
2812	**E**	Number of Cylinders is unmatched.
	[Contents]	Number of Cylinders is unmatched.
	[Action]	Confirm the number of cylinder. And please try again.
2813	**E**	Volume type is unmatched.
	[Contents]	Volume type is unmatched.
	[Action]	Confirm the volume type. And try again.
2814	**E**	Volume pairs are over Max. counts.
	[Contents]	Volume pairs are over Max. counts.
	[Action]	Cancel the volume pair or wait for finishing the migration. And please try again.
2815	**E**	The controller detected the blockade location.
	[Contents]	The controller detected the blockade location.
	[Action]	Please call Technical Support Center.

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ID	Kind	Description
2816	**E**	Data transfer failure detected. **[Contents]** Data transfer failure detected. **[Action]** Please call Technical Support Center.
2817	**E**	The target volume(s) is not equipped. **[Contents]** The target volume(s) is not equipped. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2818	**E**	The target volume(s) can not be used. **[Contents]** The target volume(s) can not be used. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2819	**E**	The target volume(s) has already reserved. **[Contents]** The target volume(s) has already reserved. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2820	**E**	The target volume(s) has already used by HMRCF or HOMRCF. **[Contents]** The target volume(s) has already used by HMRCF or HOMRCF. **[Action]** Confirm the Selected Volume status.
2821	**E**	The target volume(s) has already used by HIHSM. **[Contents]** The target volume(s) has already used by HIHSM. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2822	**E**	The target volume is not a Reserved Volume. **[Contents]** The target volume is not a Reserved Volume. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2823	**E**	The number of volume is over Max. count. **[Contents]** The number of volume is over Max. count. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2824	**E**	RAID level of target volume is not supported. **[Contents]** RAID level of target volume is not supported. **[Action]** Check the DKCMAIN microprogram version. And call Technical Support Center.
2825	**E**	The target volume(s) has already set the reserved volume. **[Contents]** The target volume(s) has already set the reserved volume. **[Action]** Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.

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ID	Kind	Description
2826	**E**	The target volume(s) is over the Max. pair.
	[Contents]	The target volume(s) is over the Max. pair.
	[Action]	Wait the finishing the migration or cancel it. And please try again.
2827	**E**	The target volume is not the Source volume.
	[Contents]	The target volume is not the Source volume.
	[Action]	Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2828	**E**	The target volume has already set the Source volume.
	[Contents]	The target volume has already set the Source volume.
	[Action]	Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2829	**I**	The R-VOL is reserved, or the RCU or the path between MCU-RCU is heavy load condition.
	[Contents]	The R-VOL is reserved, or the RCU or the path between MCU-RCU is heavy load condition.
	[Action]	Confirm the status of the specified R-VOL from HOST. If the device is not reserved, retry the same operation.
2830	**W**	The target volume(s) has already used by HODM.
	[Contents]	The target volume(s) has already used by HODM.
	[Action]	Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2831	**W**	The target volume(s) has already used by Remote Copy.
	[Contents]	The target volume(s) has already used by Remote Copy.
	[Action]	Refresh the HIHSM screen, and retry again. If it is the same result, please call Technical Support Center.
2832	**E**	The target volume(s) has already used by HOST or Remote Copy.
	[Contents]	The target volume(s) has already used by HOST or Remote Copy.
	[Action]	Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2833	**W**	Reverse copy can't be executed, because this function isn't supported for L2-pair.
	[Contents]	Reverse copy can't be executed, because this function isn't supported for L2-pair.
	[Action]	Please select only L1-pair and execute Reverse copy.
2834	**W**	Maintenance object included the HIHSM pair. You should delete pair.
	[Contents]	Maintenance object included the HIHSM pair. You should delete pair.
	[Action]	Maintenance object included the HMRCF/HOMRCF pair. You should delete pair.

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ID	Kind	Description
2835	**W**	Maintenance object included the reserved volume for HIHSM. You should remove the reserved volume.
	[Contents]	Maintenance object included the reserved volume for HIHSM. You should remove the reserved volume.
	[Action]	Maintenance object included the reserved volume for HIHSM. You should remove the reserved volume.
2836	**W**	Maintenance object included the HIHSM pair. You should delete pair and reset reserve.
	[Contents]	Maintenance object included the HIHSM pair. You should delete pair and reset reserve.
	[Action]	Maintenance object included the HIHSM pair. You should delete pair and reset reserve.
2837	**E**	The target Volume(s) is not supported by HIHSM.
	[Contents]	The target Volume or the pair is not supported by HIHSM.
	[Action]	Refresh the HIHSM screen, and retry again. If it is same result, call Technical Support Center.
2838	**E**	The target volume is being formatted.
	[Contents]	Target volume is being formatted.
	[Action]	Wait until the target volume as formatted completely.
2839	**E**	The target volume(s) is Command Device.
	[Contents]	The target volume(s) is Command Device.
	[Action]	Please select another Volume(s).
2840	**E**	The selected source volume and destination volume are the same.
	[Contents]	The selected source volume and destination volume are the same.
	[Action]	Refresh the HIHSM screen, and retry again. If it is the same result, call Technical Support Center.
2852	**W**	Failed to get information from hihsmatm.ini. \n\rPlease generate parameter file by [Default] button.
	[Contents]	Failed to get information from hihsmatm.ini.
	[Action]	Please generate parameter file by [Default] button.
2853	**W**	Failed to get information from hihsmpln.ini. \n\rPlease generate parameter file by [Default] button.
	[Contents]	Failed to get information from hihsmpln.ini.
	[Action]	Please generate parameter file by [Default] button.
2854	**W**	Failed to get information from hihsmfpg.ini. \n\rPlease generate parameter file by [Default] button.
	[Contents]	Failed to get information from hihsmfpg.ini.
	[Action]	Please generate parameter file by [Default] button.

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ID	Kind	Description
2855	**W**	Failed to get information from hihsmcls.ini. \n\rPlease generate parameter file by [Default] button.
	[Contents]	Failed to get information from hihsmcls.ini.
	[Action]	Please generate parameter file by [Default] button.
2856	**W**	Failed to get information from hihsmpgr.ini. \n\rPlease generate parameter file by [Default] button.
	[Contents]	Failed to get information from hihsmpgr.ini.
	[Action]	Please generate parameter file by [Default] button.
2857	**W**	Failed to get information from hihsmldv.ini. \n\rPlease generate parameter file by [Default] button.
	[Contents]	Failed to get information from hihsmldv.ini.
	[Action]	Please generate parameter file by [Default] button.
2858	**W**	Failed to get configuration information. \n\r
	[Contents]	Failed to get configuration information.
	[Action]	Push [Refresh] button at HIHSM Main screen.
2859	**W**	Failed to write to hihsmpln.ini.
	[Contents]	Failed to write to hihsmpln.ini.
	[Action]	Please Check HDD.
2860	**W**	Failed to write to hihsmpgr.ini.
	[Contents]	Failed to write to hihsmpgr.ini.
	[Action]	Please Check HDD.
2861	**W**	Failed to write to hihsmldv.ini.
	[Contents]	Failed to write to hihsmldv.ini.
	[Action]	Please Check HDD.
2862	**W**	Invalid data from hihsmatm.ini.
	[Contents]	Invalid data from hihsmatm.ini.
	[Action]	Please generate parameter file by [Default] button.
2863	**W**	Invalid data from hihsmpln.ini.
	[Contents]	Invalid data from hihsmpln.ini.
	[Action]	Please generate parameter file by [Default] button.
2864	**W**	Invalid data from hihsmcls.ini.
	[Contents]	Invalid data from hihsmcls.ini.
	[Action]	Please generate parameter file by [Default] button.
2865	**W**	Invalid data from hihsmpgr.ini.
	[Contents]	Invalid data from hihsmpgr.ini.
	[Action]	Please generate parameter file by [Default] button.

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ID	Kind	Description
2866	**W**	Invalid data from hihsmldv.ini.
	[Contents]	Invalid data from hihsmldv.ini.
	[Action]	Please generate parameter file by [Default] button.
2867	**W**	Invalid configuration information.
	[Contents]	Invalid configuration information.
	[Action]	Push [Refresh] button at HIHSM Main screen.
2868	**W**	Invalid reserve volume information.
	[Contents]	Invalid reserve volume information.
	[Action]	Push [Refresh] button at HIHSM Main screen.
2869	**W**	No enough valid HIHSM data exist in the specified term. \n\rPlease check following items. \n\r(1)Auto Workload Check [Data term] \n\r(2)HIHSIM data term.
	[Contents]	No enough valid HIHSM data exist in the specified term.
	[Action]	Please check following items. (1)Auto Workload Check [Data term] (2)HIHSIM data term.
2870	**W**	Cannot make proper migration plan by this function. \n\rPlease check following items. \n\r(1)Reserve volume location. \n\r(2)Auto migration Max disk utilization.
	[Contents]	Cannot make proper migration plan by this function.
	[Action]	Please check following items. (1)Reserve volume location. (2)Auto migration Max disk utilization.
2871	**W**	Memory allocation error occurred.
	[Contents]	Memory allocation error occurred.
	[Action]	Please Reboot PC.
2872	**W**	Internal error occurred.
	[Contents]	Internal error occurred.
	[Action]	(1)Please retry again. (2)Please Reboot PC.
2873	**W**	Specified volume as reserve volume has DCR setting.
	[Contents]	Specified volume as reserve volume has DCR setting.
	[Action]	Remove DCR setting.
2874	**W**	Specified volume as migration source volume has DCR setting.
	[Contents]	Specified volume as migration source volume has DCR setting.
	[Action]	Remove DCR setting.

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ID	Kind	Description
2875	**W**	Specified volume as migration destination volume has DCR setting. **[Contents]** Specified volume as migration destination volume has DCR setting. **[Action]** Remove DCR setting.
2876	**W**	Changing the Reserved attribute of a device that is currently assigned a path in LUN Management could lead to data corruption. **[Contents]** Are you sure change to volume attribute. Please cut off access pass from host. **[Action]** Please cut off access pass from host.
2877	**W**	Are you sure you want to set the maximum disk utilization? **[Contents]** Are you sure you want to set the maximum disk utilization? **[Action]** If you want to set maximum disk utilization, select [OK]. If not, select [Cancel].
2878	**W**	Target volume is LUSE volume. Cannot change to reserve volume. **[Contents]** Target volume is LUSE volume. Cannot change to reserve volume. **[Action]** Please make sure your selection.
2879	**I**	ADDPAIR operation failed because intermixture of HRC Asynchronous pairs and HORC Asynchronous pairs is not allowed in the same CT Group. **[Contents]** ADDPAIR operation failed. Intermixture of HRC Asynchronous pairs and HORC Asynchronous pairs is not allowed in the same CT Group. **[Action]** Renew and confirm the HRC screen and HORC screen and retry the operation.
2880	**I**	Preset Suspension is effective in the CT Group. **[Contents]** ADDPAIR operation failed. Preset Suspension is effective in the CT Group. **[Action]** Please cancel Preset Suspension in the CT Group.
2881	**I**	Preset Suspension is effective in the CT Group. **[Contents]** RESUME operation failed. Preset Suspension is effective in the CT Group. **[Action]** Please cancel Preset Suspension in the CT Group.
2882	**I**	Preset Suspension is effective in the CT Group. \n(Error Code = %04x) **[Contents]** Suspend operation failed. Preset Suspension is effective in the CT Group. **[Action]** Please cancel Preset Suspension in the CT Group.
2883	**I**	HORC Asynchronous function is not installed in specified MCU. \n(Error Code = %04x) **[Contents]** ADD GROUP operation failed. HORC Asynchronous function is provided by means of program product and must be installed in the MCU before creating HORC Asynchronous volume pair. **[Action]** Please install HORC Asynchronous function in the MCU.

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ID	Kind	Description
2884	**I**	HORC Asynchronous function is not installed in specified RCU. \n(Error Code = %04x) **[Contents]** ADDPAIR operation failed. HORC Asynchronous function is provided by means of program product and must be installed in the MCU before creating HORC Asynchronous volume pair. **[Action]** Please install HORC Asynchronous function in the MCU.
2885	**I**	Invalid Timer Type option. \n(Error Code = %04x) **[Contents]** ADD GROUP operation failed. Timer Type option is "System" on HORC screen. **[Action]** Please specify Local or None for Timer Type.
2886	**I**	PK or Parts information was changed. \nAre you sure you want to rewrite PK or Parts information? **[Contents]** PK or Parts information was changed. Are you sure you want to rewrite PK or Parts information? **[Action]** If you rewrite PK or Parts information select [Yes].
2887	**E**	I/O Error occurred on the R-VOL. \n(Error Code = %04x) **[Contents]** I/O Error occurred on the R-VOL. **[Action]** See SSB LOG, and call technical support center to report them with the error code.
2888	**W**	The specified R-VOL is not recognizable from the connection port. \n(Error Code = %04x) **[Contents]** The specified R-VOL is not recognizable from the connection port. **[Action]** Confirm the configuration of the specified R-VOL.
2889	**W**	The specified R-VOL is not permissible condition of Remote Copy. \n(Error Code = %04x) **[Contents]** The R-VOL should not be condition of the following. 1.The volume is blocked. 2.The volume is under maintenance. 3.The volume is copying data (correction copy or drive copy) 4.The volume is correction access condition. **[Action]** Confirm the logical device status of the specified R-VOL. If the R-VOL is under maintenance or copying data, retry the operation after the process will be complete.
2890	**W**	The specified R-VOL is Intervention required condition. **[Contents]** The R-VOL should not be intervention required condition. **[Action]** Confirm the status of the specified R-VOL.
2891	**E**	System error has occurred. \n%s **[Contents]** System error has occurred in %s. **[Action]** After selecting [OK], please reboot the PC.

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ID	Kind	Description
2892	**E**	A read file failed to open. \nFile = %s
	[Contents]	A read file failed to open. File = %s
	[Action]	After selecting [OK], please do the same operation again.
2893	**E**	A write file failed to open. \nPlease check if the ""C"" drive has some empty area.
	[Contents]	A write file failed to open. Please check if the "C" drive has some empty area.
	[Action]	After selecting [OK], please check the "C" drive some empty area.
2894	**E**	A file was failed to read. \nFile = %s
	[Contents]	A read file failed to data read. File = %s
	[Action]	0
2895	**E**	A file was failed to write. \nPlease check if the ""C"" drive has some empty area.
	[Contents]	A write file failed to data write .Please check if the "C" drive has some empty area.
	[Action]	After selecting [OK], please check the "C" drive some empty area.
2896	**E**	The program could not make the directory. \nDirectory = %s
	[Contents]	The program could not make the directory. Directory = %s
	[Action]	After selecting [OK], please check the "C" drive some empty area.
2897	**E**	Remote Console program was failed to install.
	[Contents]	Remote Console installed failed.
	[Action]	After selecting [OK], please install the Remote Console program again.
2898	**E**	Remote Console was failed to de-installed.
	[Contents]	Remote Console de-installed failed.
	[Action]	After selecting [OK], please de-install the Remote Console program again.
2899	**I**	Are you sure you want to install your Remote Console program forcibly?
	[Contents]	Are you sure you want to install your Remote Console program forcibly?
	[Action]	If you want to install forcibly select [Yes], If you want to stop select [NO].
2900	**I**	Are you sure you want to de-install the Remote Console program?
	[Contents]	Are you sure you want to de-install the Remote Console program?
	[Action]	If you want to de-install the Remote Console program select [Yes], If you want to stop select [No].

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ID	Kind	Description
2901	**I**	Cancel button was selected. \nAre you sure you want to cancel the copy?
	[Contents]	Cancel button was selected. Are you sure you want to cancel the copy?
	[Action]	If you want to stop the copy, select [Yes], If you want to continue the copy, select [No].
2902	**I**	Please insert the Setup media #%d into the drive. \nAnd select ""OK"" button.
	[Contents]	Please insert the Setup media #%d into the drive. And select "OK" button.
	[Action]	Please insert the appropriate media into the drive and select [OK]. If you want to stop, select [Cancel].
2903	**I**	The Setup media of the Remote Console was invalid. \nPlease insert Setup media #%d into the drive. \nAnd select ""OK"" button.
	[Contents]	The Setup media of the Remote Console was different. Please insert Setup media #%d into the drive. And select "OK" button.
	[Action]	Please check the media and insert the appropriate media again and select [OK], If you want to stop select [Cancel].
2904	**I**	Remote Console installation was complete.
	[Contents]	Remote Console installation was complete.
	[Action]	Select [OK] and end the program.
2905	**I**	Remote Console de-installation was complete.
	[Contents]	Remote Console de-installation was complete.
	[Action]	Select [OK] and end the program.
2906	**E**	Remote Console Installer execution error(id = %d) has occurred.
	[Contents]	Remote Console Installer could not start.
	[Action]	After selecting [OK], please do the same operations.
2907	**E**	System error has occurred. \n%s
	[Contents]	System error has occurred. %s
	[Action]	After selecting [OK], please reboot the PC.
2908	**I**	Are you sure you want to download the Remote Console programs from the connected SVP?
	[Contents]	Are you sure you want to download of the Remote Console programs from the connected SVP?
	[Action]	If you want to start download, select [Yes], If you want to stop, select [No].
2909	**I**	This function is not supported.
	[Contents]	Remote Console download function is not supported.
	[Action]	Please select [OK].

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ID	Kind	Description
2910	**I**	Your Remote Console should execute version up, but SVP dose not have an appropriate version of Remote Console. \nPlease call your technical support center. **[Contents]** Your Remote Console should execute version up, but SVP dose not have an appropriate version of Remote Console. Please call your technical support center. **[Action]** Please call your technical support center to get the appropriate version.
2911	**E**	Version information file was not found. \nPlease check your Setup Media. **[Contents]** Version information file was not found. Please check your Setup Media. **[Action]** Please check the media and insert the appropriate media again and select [OK]. If you want to stop select [Cancel].
2912	**E**	The version of the Remote Console was invalid. \nPlease check your Setup Media. **[Contents]** The version of the Remote Console was invalid. Please check your Setup Media. **[Action]** Please check the media and insert the appropriate media again and select [OK].If you want to stop select [Cancel].
2913	**E**	Version information file was not found. **[Contents]** Version information file was not found. **[Action]** After selecting [OK], please install the Remote Console program again.
2914	**E**	Version information file was invalid. **[Contents]** Version information file was invalid. **[Action]** After selecting [OK], please install the Remote Console program again.
2915	**I**	This FD has "read-only" file(s). FD Copy will be terminated. **[Contents]** This FD has "read-only" file(s). FD Copy will be terminated. **[Action]** Please select OK and confirm the files in FD. You should change the attribute of the files or insert another FD.
2916	**I**	%s was canceled. **[Contents]** The concerned process was canceled. **[Action]** Please select OK.
2917	**I**	File access error has occurred. **[Contents]** File access error has occurred. **[Action]** Please reboot PC. If the error cannot be recovered, replace the PC.
2918	**I**	FD Copy was %s. **[Contents]** FD Copy was completed canceled. **[Action]** Please select OK.

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ID	Kind	Description
2919	**I**	Async Option (Current Pending Update Data Rate) can not be changed. Because HORC C/T group is active. \n(Error Code %04x)
	[Contents]	Async Option (Current Pending Update Data Rate) can not be changed. Because HORC C/T group is active. (Error Code %04x)
	[Action]	Delete of all the HORC C/T groups.
2920	**W**	There is no statistic data.
	[Contents]	There is no statistic data for HIHSM.
	[Action]	If you need statistic data, turn on the gathering S/W. And wait for 30 minutes over.
2921	**I**	Do you want to make plans?
	[Contents]	Do you want to make plans?
	[Action]	If you want to make plan, select [OK].
2922	**I**	Making plan is Normal End.
	[Contents]	Making plan is Normal End.
	[Action]	Select [OK], and continue operation.
2923	**I**	Are you want to cancel all plans?
	[Contents]	Are you want to cancel all plans?
	[Action]	If you want to delete all plans, select [OK].
2924	**I**	Deleting all plans was failed.
	[Contents]	Deleting all plans was failed.
	[Action]	Select [OK], and reboot PC. Please retry again.
2925	**,h**	Do you want to cancel selected and following plan(s)?
	[Contents]	Do you want to cancel selected and following plan(s)?
	[Action]	If you want to delete selected plan and following, select [OK].
2926	**I**	Setting plan was failed.
	[Contents]	Setting plan was failed.
	[Action]	Select [OK], and reboot PC. Please retry again.
2927	**I**	Deleting plan was failed.
	[Contents]	Deleting plan was failed.
	[Action]	Select [OK], and reboot PC. Please retry again.
2928	**I**	Do you want to make default setting?
	[Contents]	Do you want to make default setting?
	[Action]	If you want to make default setting, select [OK].
2929	**E**	Making default setting was failed. (Information Get Error)
	[Contents]	Making default setting was failed because getting information was failed.
	[Action]	Close the HIHSM Screen and retry again.

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ID	Kind	Description
2930	**E**	Making default setting was failed. (File Open Error)
	[Contents]	Making default setting was failed because of opening file is failed.
	[Action]	Select [OK], and reboot PC. Please retry again.
2931	**E**	Making default setting was failed.
	[Contents]	Making default setting was failed.
	[Action]	Select [OK], and reboot PC. Please retry again.
2932	**I**	Making default setting is Normal End.
	[Contents]	Making default setting is Normal End.
	[Action]	Select [OK] and continue operation.
2933	**I**	Are you sure you erase history log?
	[Contents]	Are you sure you erase history log?
	[Action]	If you want to delete the history log, select [OK].
2934	**E**	Setting Fixed Group was failed.
	[Contents]	Setting Fixed Group was failed.
	[Action]	Select [OK], and reboot PC. Please retry again.
2935	**E**	Saving data was abnormal end.
	[Contents]	Saving data was abnormal end.
	[Action]	Select [OK], and reboot PC. Please retry again.
2936	**E**	Compress file open error.
	[Contents]	Compress file open error.
	[Action]	Select [OK], and reboot PC. Please retry again.
2937	**W**	Do you want to move data file to FD?
	[Contents]	Are you sure you want to move data file to FD?
	[Action]	Select [OK], and reboot PC. Please retry again.
2938	**W**	Moving data file is started. Set 1st FD.
	[Contents]	It starts the moving data. Insert the 1st FD.
	[Action]	Insert the FD and press [OK].
2939	**W**	The file A:\\ARTLOG.LZH already exists. \nDo you overwrite?
	[Contents]	The file A:\ARTLOG.LZH already exists. Do you overwrite?
	[Action]	You want to overwrite the artlog.lzh Select [OK].
2940	**I**	Do you want to load the data to HD?
	[Contents]	Do you want to load the data to HD?
	[Action]	If you want to load data, select [OK].
2941	**I**	Data loading ended normally.
	[Contents]	Data loading ended normally.
	[Action]	Select [OK] and continue operation.

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ID	Kind	Description
2942	**W**	Data Loading ended abnormally.
	[Contents]	Data Loading ended abnormally.
	[Action]	Select [OK], and reboot PC. Please retry again.
2943	**E**	File open error has occurred.
	[Contents]	File open error has occurred.
	[Action]	Select [OK], and reboot PC. Please retry again.
2975	**W**	RMSV(CLIENT) is selected on Remote Console Server. Please change the mode to ""Not used"" or RMSV(SERVER), because RMSV(CLIENT) of Remote Console Server and SNMP Agent can't be used together.
	[Contents]	RMSV(CLIENT) is selected on Remote Console Server. Please change the mode to ""Not used"" or RMSV(SERVER), because RMSV(CLIENT) of Remote Console Server and SNMP Agent can't be used together.
	[Action]	Please select [OK].
2976	**W**	You have to select a mode.
	[Contents]	You have to select a mode.
	[Action]	Please select [OK].
2977	**E**	At least one asynchronous pair is active in this group. (Error Code = %04x)
	[Contents]	GROUP OPTION operation to change Timer Type failed because the specified group has asynchronous pair
	[Action]	Renew and confirm the HRC/HORC screen.
2978	**E**	This password is invalid. \nPlease call Technical Support Center to get valid password.
	[Contents]	This password is invalid. \nPlease call Technical Support Center to get valid password.
	[Action]	Contact the Technical Support Center(TSC).
2979	**E**	The data of the selected term does not exist.
	[Contents]	The data of the selected term does not exist.
	[Action]	Please set the term that can display the use rate normally.
2980	**I**	SIMs of Remote Copy are cleared.
	[Contents]	It cleared SIMs of Remote Copy.
	[Action]	Select [OK] to continue.
2981	**W**	Are you sure you want to clear SIMs of Remote Copy?
	[Contents]	It will clear SIMs of Remote Copy.
	[Action]	Select [OK] if you clear SIMs of Remote Copy to a host for the disaster recovery.

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ID	Kind	Description
2982	**E**	Port type exchange operation is rejected because the host(s) is(are) processing the port type exchange. \n (Error Code = %04x)
	[Contents]	Port type exchange operation is rejected because the host(s) is(are) processing the port type exchange. \n (Error Code = %04x)
	[Action]	Confirm the port status. If the port type has never exchanged yet, try again.
2995	**E**	Illegal combination(%s and %s). \nLine = %04d. \nError Code = %04x.
	[Contents]	Combination of the parameters specified as "%s"(left side) and "%s"(right side) is illegal.
	[Action]	Please check the line(line no is displayed) and modify them.
2996	**E**	$CTG not found. \nLine = %04d. \nError Code = %04x.
	[Contents]	$CTG is indispensable when create asynchronous copy pairs.
	[Action]	Please check the line(line no is displayed) and modify them.

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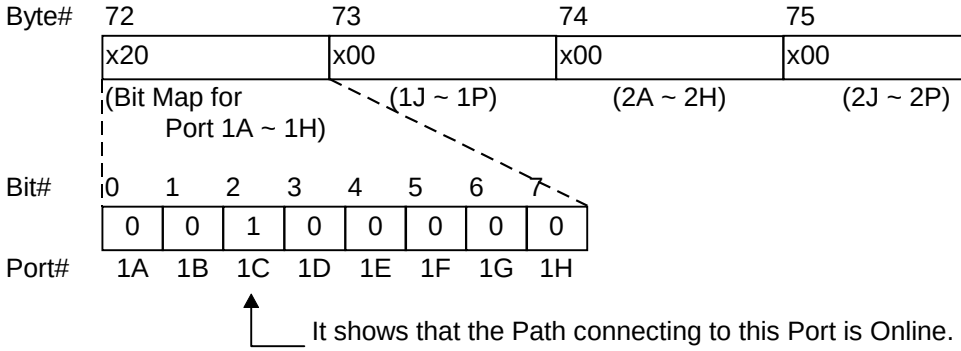
5. Error when operating HRC & HODM & HORC

Refer to chapter 4 on SVPMSG section for error codes.

[Procedure to trace the Online CHL route]

1. Analyze the SSB.LOG
   HRC2080I;The Specified R-VOL of HRC is still Online from the HOST.
   Check the SSB.LOG on SVP of the specified RCU. SSB containing F/M=0F, EC=C0CA on the specified R-VOL number should be logged.
   HRC2070W; The M-VOL of HODM is Online from the HOST.
   Check the SSB.LOG on SVP of the MCU. SSB containing F/M=0F, EC=C0A6 on the specified M-VOL should be logged.

   Both SSB are same format, from SSB byte72(0x48) though byte75(0x4B) show the Bit Map of Port indicating Online from the HOST. Each one bit corresponds to each port. It indicates the LCP Port on which the valid Path Group is established for this device.



2. Run DSF/ANALYZE-ALLCHPID to trace the Path Group ID of the Online route.
   2.1 In case that DKC Emulation Type is 3990-6 or 3990-6E.
   Run DSF/ANALYZE with ALLCHPID. The output shows the Path Group ID which is Online to the subsystem.

LOGICAL PATH		SYSTEM	FULL	SP FENCES	HOST PATH GROUP ID		
NUMBER	type	ADAPTER ID	ESCON LINK ADDRESS	0 1 2 3	CPU SERIAL#	CPU TYPE	CPU TIME STAMP
1	E	00	0101		XXXXXXX	YYYY	ZZZZZZZZ
2 - 32	N/E	00 - 01					
33	E	02	0200		XXXXXXX	YYYY	ZZZZZZZZ

   "SYSTEM ADAPTER ID" corresponds to the number of the CHL adapter port.
   (Ex; Port#1C is "02".)
   Trace the Path Group ID indicated the SYSTEM ADAPTER ID corresponding to the value on SSB LOG of EC=C0CA or C0A6.

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Note; Reference of Port ID & SAID

CL1								CL2							
CHA-1P		CHA-1Q		CHA-1R		CHA-1S		CHA-2V		CHA-2W		CHA-2X		CHA-2Y	
Port#	SAID#	Port#	SAID#	Port#	SAID#	Port#	SAID#	Port#	SAID#	Port#	SAID#	Port#	SAID#	Port#	SAID#
A	00	E	04	I	00	M	04	A	10	E	14	I	10	M	14
B	01	F	05	J	01	N	05	B	11	F	15	J	11	N	15
C	02	G	06	K	02	O	06	C	12	G	16	K	12	O	16
D	03	H	07	L	03	P	07	D	13	H	17	L	13	P	17

2.2 In case that DKC Emulation Type is 3990-3 DSF/ANALYZE-ALLCHPID is not available for 3990-3. Therefore, trace the Path Online Route of the LCP.

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[Action of the time out error “HRC2019W”]

When time out error “HRC2019W” may occur on remote copy operation, try to fined the cause of the time out and execute a recovery procedure.

(1) Hardware error
(2) Discontinuous of the pair status change procedure in the cause of high traffic condition

1. Recovery procedure for the hardware error
   When time out error occurs in the cause of the hardware error, the SIM and SSB has be created and reported to the HOST.
   In that case, repairing the failure part according to the Trouble Shooting Section, and please execute a remote copy operation again.

2. Recovery procedure for the discontinuous of the pair status change procedure
   When you does not fined out the SIM, please check the specified volume pair status on the Main Control Screen of the SVP.
   When pair status change to “Duplex” or “Pending Duplex”, you need not to execute a remote copy operation again. The operation has completed correctly.
   When pair status does not change to “Duplex” or “Pending Duplex”, it means that DCK discontinue the pair status change procedure in the cause of high traffic condition. You should be confirmed in it by SSBLOG (EC=C828, C410, C519) on SVP of the MCU. In that case, please execute a remote copy operation in the low traffic condition again.

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6 Action according to the error code.

6.1 Abstract

There are three tables in this section, Table A, B, C.
Table A: Message ID and the table which you have to refer to. (Table B, C).
Table B: Detailed action by error codes which are displayed in the message box of SVP.
Table C: Detailed action by error codes which are displayed in the message box of SVP.
First, please refer to “First Action”.

6.2 First Action

Please check the message ID by referring to the table A. The table A is described the next table which you have to refer to(Table B, Table C.).
If you determine the one of the table, please refer to the next table to determine how to act.

Table A.

Message ID	Next table.
1115	Table B
1127	Table C
1128	Table C
1141	Table C
1142	Table C
1168	Table C
1169	Table C
1170	Table C
1171	Table C
1174	Table C
1175	Table C
1176	Table C
1177	Table C
2243	Table C
2244	Table C
2245	Table C
2246	Table C

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6.3 Second Action

(1) Table B.

Table B.

Error code [vv]	Means	Action
1	Processing maintenance	Execute maintenance again after a few minutes.
2	Processing another maintenance	Execute maintenance again about 5 minutes.
3	Waiting master job time out	Execute maintenance again a few minutes.
7	Impossible to synchronize	Execute maintenance again after a few minutes. Still this error has occurred, then follow the “Recovery procedure when an error code is reported during bus maintenance” (TRBL05-440).
8	Some processor is transferring data	Execute maintenance again after a few minutes. If same message is displayed three time, execute the maintenance when the load of subsystem is low. Still this error has occurred, then follow the “Recovery procedure when an error code is reported during bus maintenance” (TRBL05-440).

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(2) Table C.

Table C.

Error code [vv]	Means	Action
4	Bus no redundancy	Restore redundant bus. (SVP02-790) Execute maintenance again.
5	Waiting maintenance job time out	Power on subsystem, and maintenance again.
6	Impossible to maintenance from selected processor	Confirm the selected processor has blocked or not on status display. (SVP03-80, 85) If that has blocked, replace the PCB and maintenance again.
9	Impossible to hot line on	Follow the “Recovery procedure when an error code is reported during bus maintenance” (TRBL05-440).
a	Impossible to hot line off	Follow the “Recovery procedure when an error code is reported during bus maintenance” (TRBL05-440).
b	Impossible to change bus setting	Follow the “Recovery procedure when an error code is reported during bus maintenance” (TRBL05-440).
c	Some processor has NG at bus access test	Follow the “Recovery procedure when an error code is reported during bus maintenance” (TRBL05-440).
1000000	You cannot execute the maintenance operation because the collision of access to shared memory occurred during configuration change.	Please retry the maintenance operation after a while.
1000008	You cannot execute the maintenance operation because the process concerning configuration change is working	Please retry the maintenance operation after a while. • When you find “executing” status of “Copy Status” or “Logical Device Status” at Maintenance display (Status display), please confirm the end of the “executing” process and retry the maintenance operation. • Even if the process concerning cache or shared memory is working, the status is not displayed. So when there is no “executing” status at Maintenance display, please retry the maintenance operation after a while.
fffffffe	SVP logical error	Restore SVP (TRBL03-70), and maintenance again.
ffffffff	Communication time out	Check LAN cable. (TRBL05-70)

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MULTIPLATFORM SECTION

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1 GENERAL

1.1 Product Outline and Features

The multiplatform optional feature can assign a partial or full of disk volume area of the DKC disk subsystem for the Open system hosts by installing SCSI channel adapter (CHS) packages and/or FIBRE channel adapter (CHF) packages to the disk controller (hereinafter called DKC). This function enables a use of high reliable and high performance disk subsystem realized by the DKC for a multiplatform or SCSI/FIBRE system environment. This also provides the customers with a flexible and optimized system construction capability for their system expansion and migration.

Some of the major features of this SCSI attachment option and FIBRE attachment option are listed below.

(1) HMRS (Hitachi Multiplatform Resource Sharing) function and SCSI and FIBRE interface connectivity

In addition to the conventional Channel interface (synchronous (METAL) or asynchronous (ESCON) channels), the SCSI-2, standard interface in the open systems, can be mounted in one controller.
At the same time fibre channel interface can be mounted in one controller. This enables multiplatform system users to share the high reliable and high performance resource realized by the DKC disk subsystem.

The SCSI interface is complied with ANSI SCSI-2, a standard interface for various peripheral devices for open systems. Thus, the DKC can be easily connected to various open-market SCSI host systems (e.g. Workstation servers and PC servers). The DKC can be also connected to open-market FIBRE host systems.

DKC310 can be connected to open system via SCSI interface and FIBRE interface by installing SCSI 8-port Adapter (DKC-F310I-8C) and Fibre 4-port Adapter (DKC-F310I-4F/DKC-F310I-4FE).
SCSI connectivity and FIBRE connectivity are provided as channel option of DKC310.
SCSI Adapter and FIBRE Adapter can be installed any CHA location of DKC310 and can be co-exist with any other channel adapters.

(2) Fast and concurrent data transmission
Data can be read and written at a maximum speed of 20M bytes/second with use of a WIDE SCSI and the Synchronous transfer. All of the SCSI ports can transfer data concurrently between the host.
Additionally, a maximum speed of 40MB/sec with use of a Ultra/WIDE SCSI transfer and all of the SCSI ports can transfer data concurrently too.
Data can be read and written at a maximum speed of 100M bytes/second with use of FIBRE interface.

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All of the FIBRE ports can transfer data concurrently too.

(3) All SCSI / All FIBRE / SCSI+FIBRE configuration
All SCSI configuration is allowed either with one CHS pair or two, three or full of four CHS pairs configuration.
All FIBRE configuration is also allowed either with one CHF pair or two, three or full of four CHF pairs configuration.
SCSI+FIBRE configuration is also allowed either with one CHS pair and one CHF pair or more than CHS or CHF.
These will provide more flexible use of the subsystem for open system environment.

(4) HMDE (Hitachi Multiplatform Data Exchange) support
By installing HMDE mto optional feature, data in the mainframe volumes can be read from open systems and write it into the open system volumes. Another way, by installing HMDE otm optional feature, data can be transferred from open system to mainframe.
This enables faster data transmission of data base files between mainframe and open systems than currently used means such as network transfer.
HMDE mto/otm feature is available through both SCSI and FIBRE adapters.

(5) HMBR (Hitachi Multiplatform Backup/Restore) support
By using HMBR optional feature, data in the open system can be managed by the backup systems and utilities provided in the mainframe systems. This enables a use of rich and high reliable and high performance backup systems of mainframe world to the open system environment.
HMBR feature is available through both SCSI and FIBRE adapters.

(6) Customer assets guarantee (Upgrading paths)
The SCSI and FIBRE attachment options allows on-site upgrading of already installed channel-type DKC systems owned by customers.

(7) High performance
The DKC has two independent areas of nonvolatile cache memory and this mechanism also applies to the SCSI and FIBRE attachment option. Thus, compared with a conventional disk array controller used for open systems and not having a cache, this disk subsystem has the following outstanding characteristics:

① Cache data management by LRU control
② Adoption of DFW (DASD Fast Write)
③ Write data duplexing
④ Nonvolatile cache

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(8) High availability

The DKC is fault-tolerant against even single point of failure in its components and can successively read and write data without stopping the system. This concept is also taken over to the SCSI and FIBRE attachment option, which ensures fault-tolerance against even single point of failure in its components, except the CHS and the CHF. Fault-tolerance against CHS and SCSI bus failures depends on the multi-path configuration support of the host system. Fault-tolerance against CHF and FIBRE cable failures depends on the multi-path configuration support of the host system too.

(9) High data reliability

The SCSI attachment option automatically creates and adds to host data a unique data guarantee code of eight bytes, which is then written together with the data onto the disk. The data guarantee code is checked automatically on the internal data bus of the DKC to prevent the occurrence of data errors due to array-specific data distribution or integration control. Thus, the reliability of the data improves.

The FIBRE attachment is just same.

(10) HORC (Hitachi Open Remote Copy) Support

HORC is a function to realize the duplication of open system data by connecting the two RAID300 subsystems or inside parts of a single RAID300 using the ESCON.

This function enables the construction of a backup system against disasters by means of the duplication of data including those of the host system or the two volumes containing identical data to be used for different purposes.

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1.2 Basic Specifications

The basic specifications of the SCSI and FIBRE attachment are shown in Table 1-1.

Table 1-1 Basic specifications

Item		Specification
Host Channel	Max. # of Channels	32 (SCSI)
		16(FIBRE)
	Max. # of concurrent paths	32 (SCSI)
		16(FIBRE)
Data transfer		20MB/sec (Fast Wide SCSI)
		40MB/sec (Ultra SCSI)
		100MB/sec (Fibre)
RAID level		RAID5/RAID1
RAID configuration		RAID5 (6D+1P:9GB)
		RAID5 (3D+1P:18GB, 6GB,9GB,15GB,36GB)
		RAID1 (2D+2D:9GB, 18GB,6GB,15GB,36GB)
HDD		DK308/309/30A-90 (9GB)
		DK309/30A-180 (18GB)
		DK3F1/3F2-60 (6GB)
		DK3F2-90 (9GB)
		DK3F2-150 (15GB)
		DK30A-360 (36GB)
Max. disk capacity	DK308-90	1540GB (224Vol, OPEN-9)
	DK309-18	2888GB (420Vol, OPEN-9)
Cache capacity	minimum	256MB/1GB*1
	maximum	4GB/16GB*1
	additional unit	256MB/1GB*1

*1 : 64MB DRAM

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1.3 Terminology

(1) Arbitrated Loop
A configuration that allows multiple ports to be connected serially.

(2) CHA
CHannel Adapter. A hardware package to connect with a channel interface.

(3) CHS
CHannel adapter for SCSI. A hardware package to connect with SCSI interface.

(4) CHF
CHannel adapter for FIBRE. A hardware package to connect with FIBRE interface.

(5) Command descriptor block (CDB)
A command block in SCSI interface used to send requests from the initiator to a target.

(6) Connect
A function that selects and connects the SCSI target device to be activated by the initiator.

(7) Disconnect
A function that causes the SCSI target device to release its SCSI bus. Execution of this function enters the SCSI bus into a BUS FREE phase.

(8) DKA
DisK Adapter. A hardware package which controls disk drives within a DKC.

(9) DKC
DisK Controller. A disk controller unit consisting of CHA, CHS, CHF, DKA, Cache and other components except DKU.

(10) DKU
DisK Unit. Disk drives units.

(11) Fabric
The entity which interconnects various N-Ports attached to it and is capable of routing frames.

(12) FAL
File Access Library: A program package and provided as a program product for HMDE.

(13) FCU
File Conversion Utility: A program package and provided together with FAL for HMDE.

(14) HMBR
Hitachi Multiplatform Backup/Restore.

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(15) HMDE
Hitachi Multiplatform Data Exchange.

(16) HMRS
Hitachi Multiplatform Resource Sharing.

(17) HA configuration
High Availability configuration

(18) Initiator
The SCSI device (usually, a host computer) that requests another SCSI device to operate.

(19) Logical unit (LU)
The logical unit of division of the subsystem data area accessible from SCSI interface.

(20) Logical unit number (LUN)
A three-bit code identifier for a logical unit. LUN0-7 can be assigned.

(21) Logical volume or logical device (LDEV)
The disk pack image, formed on an array disk, that is compatible with that of a 3390-3 in terms of cylinder and track quantities and the track capacity.

(22) PERFORMANCE FIBRE
DKC-F310I-4FE (Fibre 4-Port Adapter for Optical Cable). This package may be confirmed by Maintenance screen on SVP.

(23) Point-to-Point
A configuration that allows two ports to be connected serially.

(24) Reconnect
A function that the SCSI target device selects an initiator to continue operating after execution of the disconnect function.

(25) SCP
SCSI Control Processor. A SCSI interface protocol controller. Four SCPs are mounted on a CHS.

(26) SCSI device
Collectively refers to the host computer, peripheral control units, and intelligent peripherals that are connected to one SCSI bus.

(27) SCSI address
A unique address assigned to an SCSI device. Eight addresses 0 to 7 (for a WIDE SCSI, 0 to 15) can be assigned.

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(28) SCSI ID
A bit definition address for an SCSI address. This bit address is keyed to a data bus bit number.

(29) SCSI port
Means the hardware (connector) used to connect an SCSI bus to the DKC. The SCSI ports and SCPs mounted in the DKC will provided, one for one, and the quantity is four per CHS.

(30) Target
An SCSI device (usually, the DKC) that operates at the request of the initiator.

(31) VENDOR UNIQUE or VU
A manufacturer- or device-unique definable bit, byte, field, or code value.

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1.4 Notice about maintenance operations

1.4.1 Notice about SCSI maintenance operations

There are some notices about SCSI maintenance operations.

(1) When SCSI path configuration will be changed, SCSI I/O on the related SCSI port must be stopped before.
(2) When SCSI channel adapter or LDEV will be de-installed, the related SCSI path must be de-installed before.
(3) When SCSI channel adapter will be replaced, the related SCSI I/O must be stopped before.
(4) When micro-program will be changed, all SCSI I/O on the DKC must be stopped before, excepting another operation is instructed with HA configuration or CHS skip mode microprogram exchanging.

1.4.2 Notice about FIBRE maintenance operations

FIBRE maintenance operations should be done same as SCSI.

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2 Interface Specification

2.1 SCSI Physical Interface Specification

The physical interface specification supported for SCSI is shown in Table 2-1.

Table 2-1 SCSI Physical specification

No	Item	Specification
1	Interface type	- SCSI-2
2	Physical interface	- 68pin differential (single-end is not supported)
3	Transfer mode	- Fast/Wide SCSI - Ultra/Wide SCSI
4	External cable length *1	- Max. 20 m
5	Data transfer rate	- Max. 20 MB/s (Fast/Wide) - Max. 40 MB/s (Ultra/Wide)
6	Number of SCSI ports	- 4 ports per CHS *2
7	Parallel transfer	- Concurrent transfer for all SCSI ports

*1 : From the SCSI I/F connector on the DKC to other SCSI devices. Internal cable length within DKC (5 m) is excluded.

*2 : CHS pair packages must be installed regardless of an actually using number of SCSI ports.

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2.2 FIBRE Physical Interface Specification

The physical interface specification supported for FIBRE is shown in Table 2-2 and Table 2-3.

Table 2-2 FIBRE Physical specification

No.	Item		Specification	Remark
1	Host interface	Physical interface	Fibre Channel	FC-PH,FC-AL
		Logical interface	SCSI-3	FCP,FC-PLDA
			Fibre(Arbitrated Loop)	FC-AL
2	data transfer rate	optic fibre cable	100MB/S	-
3	cable length	optic single mode fibre	10km	Longwave laser
		optic multi mode fibre	500m	Shortwave laser
4	topology		FC-AL	-
5	service class		3	-
6	protocol		FCP	-
7	transfer code		8B/10B translate	-
8	# of hosts		31/Path	-
9	# of maximum LU		*1	-

*1 # of maximum LU depends on host's operating system. Refer 3.5.5 LU number expansion.

Table 2-3 FC I/F support level

No.	Item	I/F type	DKC310 support level
1	Optic cable type	Optical Type (Longwave)	supported
2		Optical Type(Shortwave)	supported
3		Copper Type	not supported
4	Optic I/F	OFC (Open Fibre Control)	not supported
5		Non-OFC	supported

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3 CONFIGURATION

3.1 System Configurations

3.1.1 Multiplatform Configuration

The DKC can be connected to the SCSI bus as one of the target SCSI devices and can exchange data with a host via the SCSI bus. The DKC can be connected to the FIBRE cable as one of the devices and can exchange data with host via the FIBRE cable. The conventional Channel host systems can also be connected simultaneously with an SCSI bus and FIBRE cable. The possible system configurations with the SCSI attachment and FIBRE attachment are shown below.

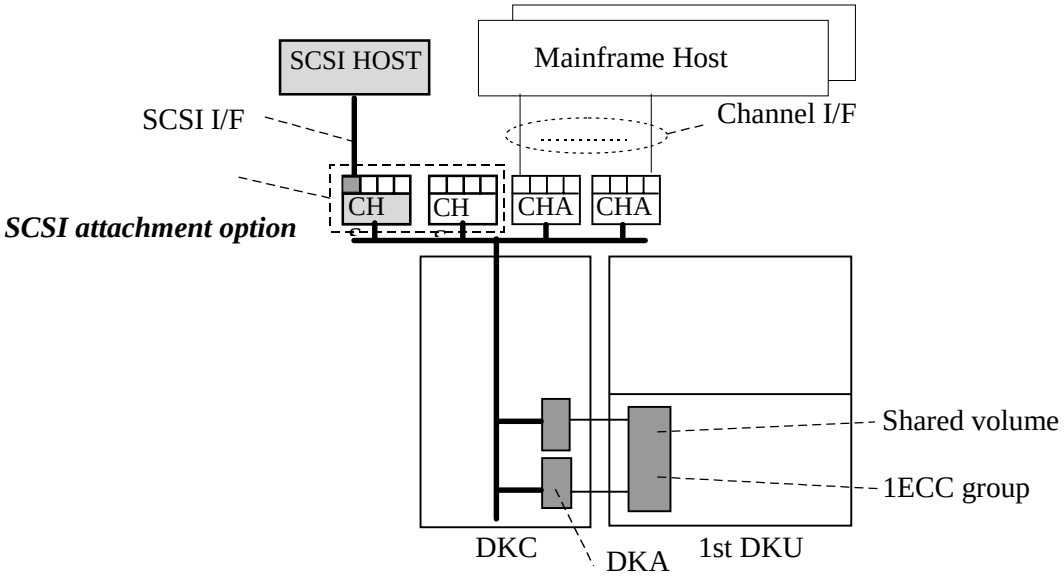

Figure 3-1 multiplatform configuration example

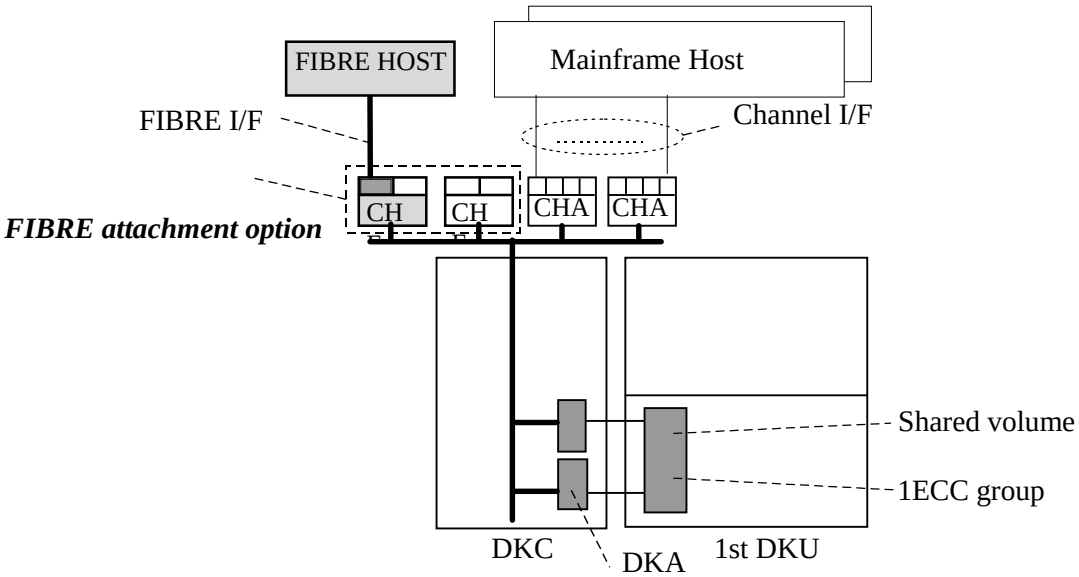

Figure 3-2 multiplatform configuration example

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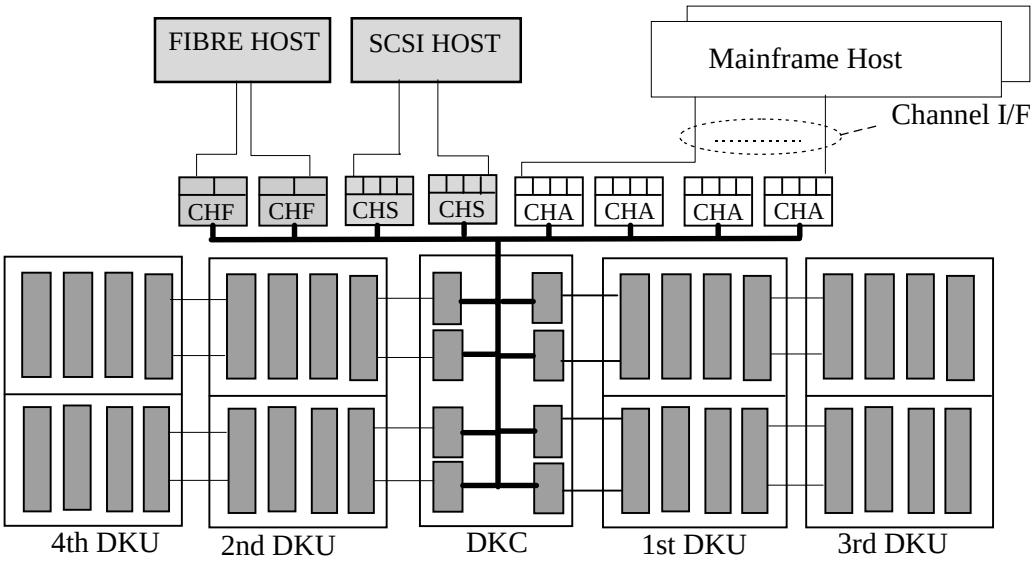

Figure 3-3 multiplatform configuration example

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3.1.2 All SCSI Configuration

The DKC can also be configured as the all SCSI interface equipment by installing only CHS adapters on it. The possible system configurations for the all SCSI configuration are shown below.

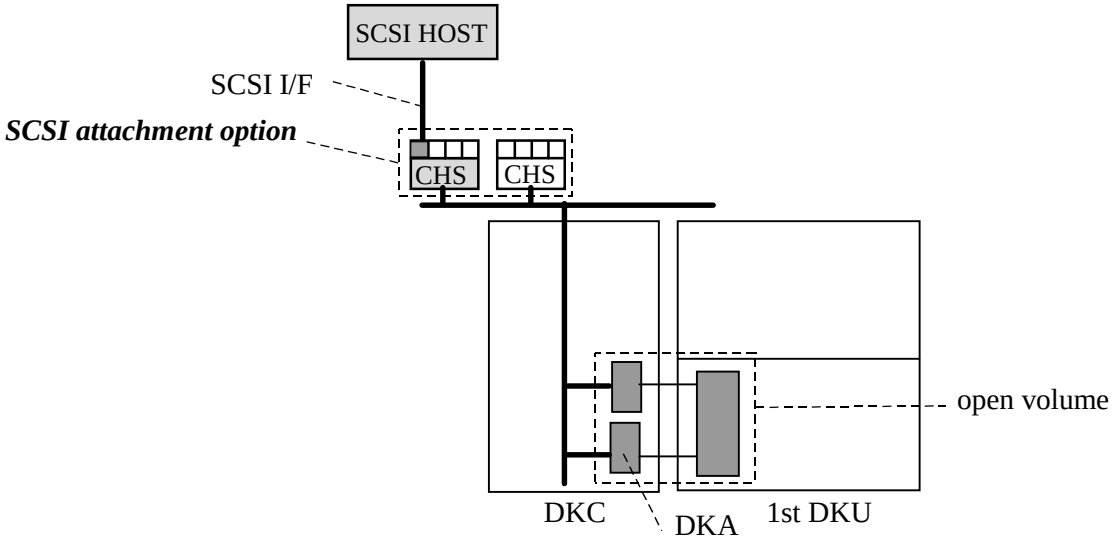

Figure 3-4 Minimum system configuration for All SCSI

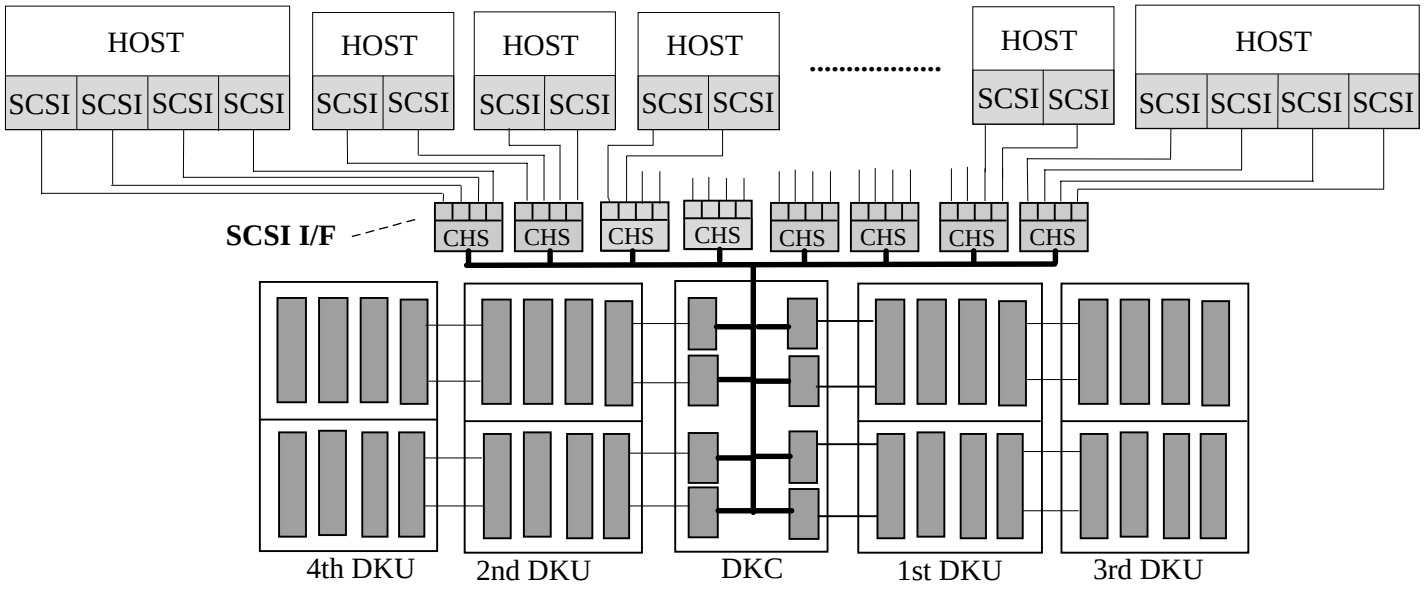

Figure 3-5 Maximum system configuration example for All SCSI

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3.1.3 All FIBRE Configuration

The DKC can also be configured as the all FIBRE interface equipment by installing only CHF adapters on it. The possible system configurations for the all FIBRE configuration are shown below.

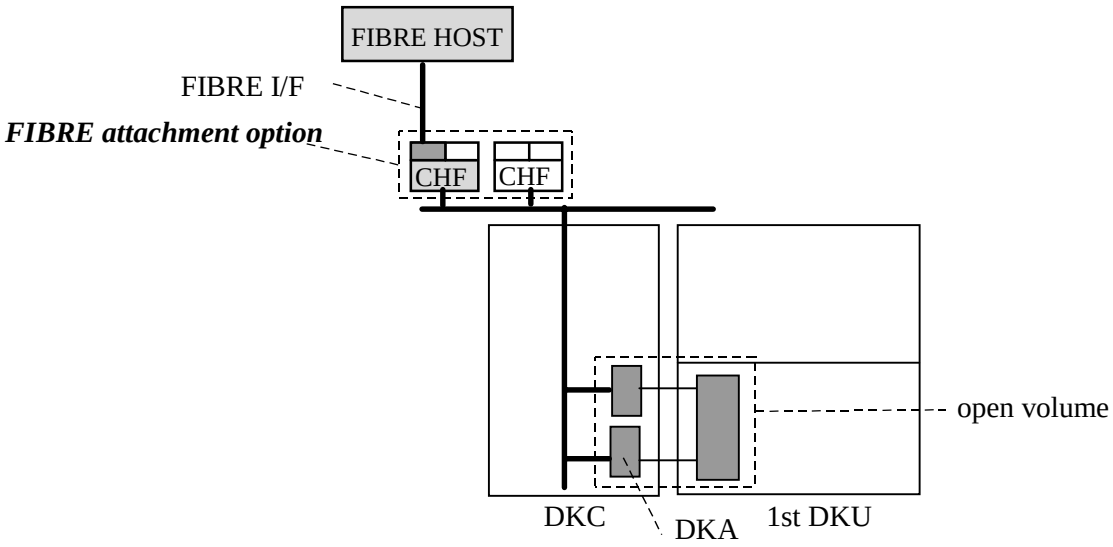

Figure 3-6 Minimum system configuration for All FIBRE

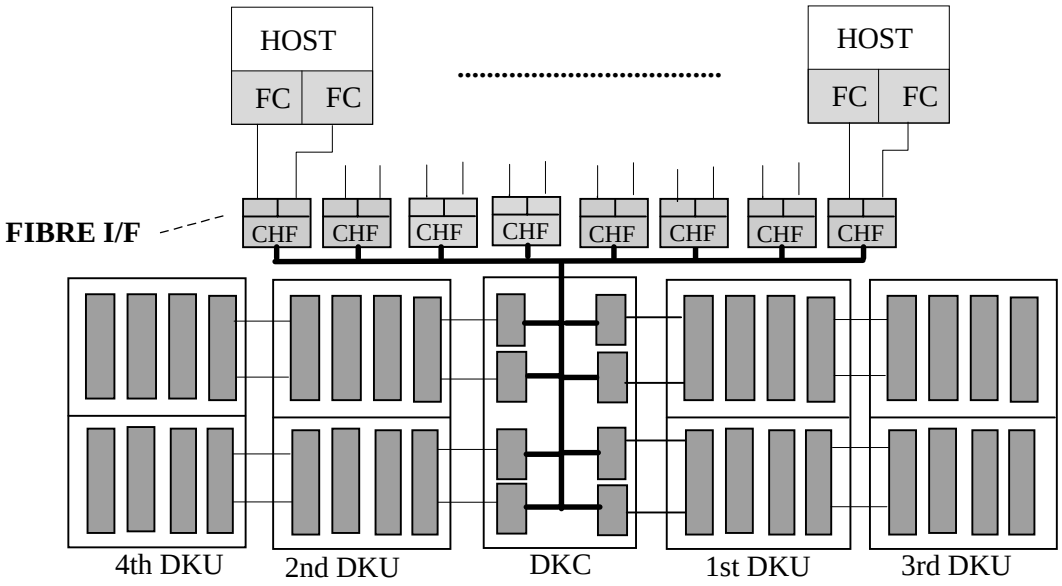

Figure 3-7 Maximum system configuration example for All FIBRE

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3.1.4 SCSI+FIBRE Configuration

The DKC can also be configured as the SCSI and FIBRE interface equipment by installing CHS and CHF adapters on it. The possible system configurations are shown below.

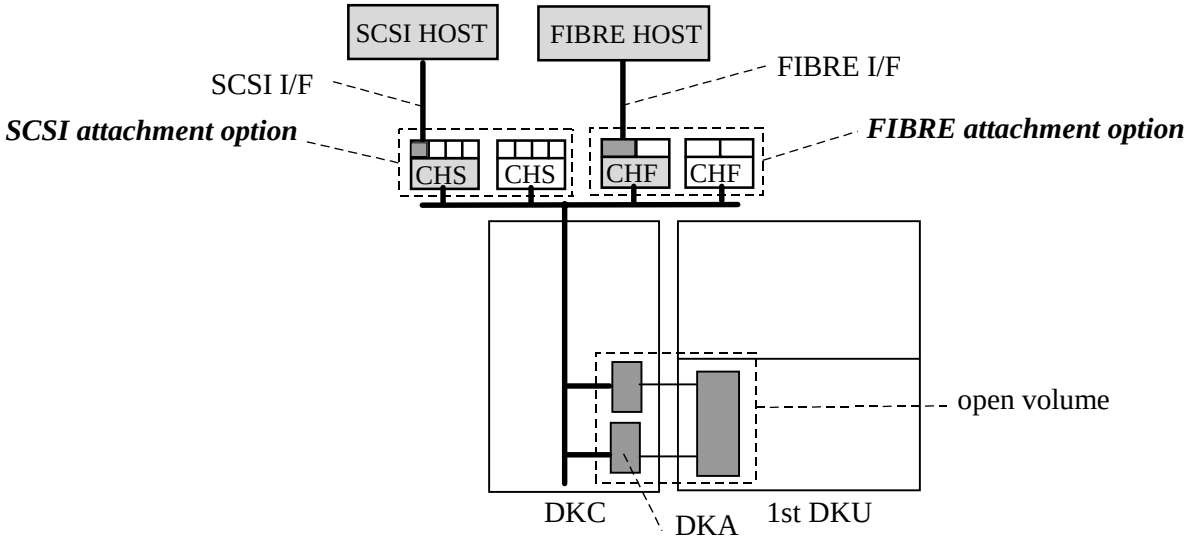

Figure 3-8 Minimum system configuration for SCSI+FIBRE

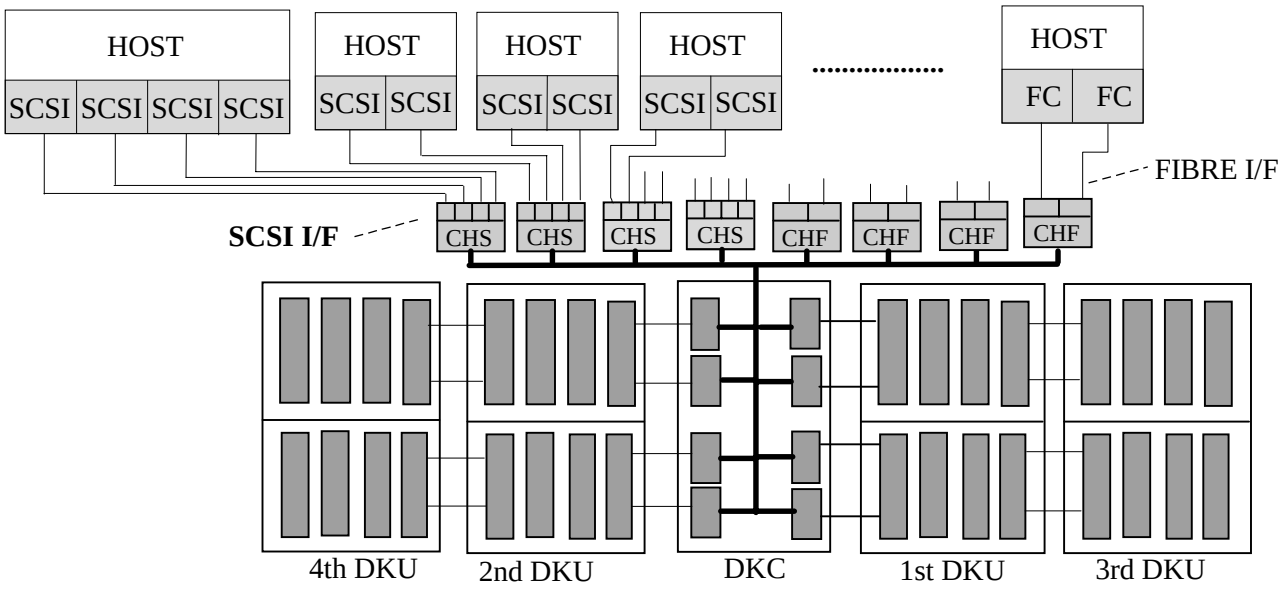

Figure 3-9 Maximum system configuration for SCSI+FIBRE

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3.2 Channel Configuration

The SCSI attachment adapter (CHS) package must be mounted in two-package unit.
The FIBRE attachment adapter (CHF) package must be mounted in two-package unit too.
A maximum eight packages including CHA and CHS and CHF can be installed in the DKC.
All CHS (I.e. all SCSI) configuration is also allowed.
All CHF (I.e. all FIBRE) configuration is also allowed.
Mix of CHS and CHF without CHA (I.e. SCSI + FIBRE) configuration is also allowed.
Four SCSI ports are mounted on a single CHS package.
Two FIBRE ports are mounted on a single CHF package.
The Example of available channel configuration is shown in Table 3-1.

Table 3-1 Example of available channel configuration

No.	Basic	Additional 1	Additional 2	Additional 3	Remark
1	CHA	CHS	-	-	Minimum multiplatform (SCSI)
2	CHA	CHF	-	-	Minimum multiplatform (FIBRE)
3	CHA	CHS	CHF	-	Multiplatform (SCSI+FIBRE)
4	CHS	-	-	-	Minimum All SCSI
5	CHF	-	-	-	Minimum All FIBRE
6	CHS	CHF	-	-	Minimum SCSI+FIBRE
7	CHS	CHS	CHS	CHS	Maximum All SCSI
8	CHF	CHF	CHF	CHF	Maximum All FIBRE
9	CHS	CHS	CHF	CHF	SCSI+FIBRE

CHS:SCSI adapter,CHF:FIBRE adapter,CHA:ESCON or METAL,-:empty

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3.3 SCSI Addressing

Each SCSI device connected to a SCSI BUS can set a unique SCSI-ID number within the range from 0 to 15 because a WIDE SCSI is supported in the DKC.

An addressing from the SCSI host to the SCSI volume in the DKC can be uniquely defined with a nexus between them. The nexus through the Initiator (host) SCSI-ID, the Target (CHS port) SCSI-ID, and LUN (Logical Unit Number) define the addressing and access path. Although the maximum number of LUNs assigned to a single Target SCSI-ID is limited to maximum eight in the SCSI, the DKC supports Multi-Target SCSI IDs in each CHS port so that the host can expand its addressing space by using its function.

The addressing configuration using the Multi-Target ID function is shown in the Figure 1-3-10.

3.3.1 Number of Hosts

The number of SCSI hosts (Initiator), i.e. a command issuing host per SCSI port, is limited to one in the DKC excepting HA configuration.
When the multiple hosts need to be connected to the DKC, they can use the multiple SCSI ports on the DKC.

3.3.2 Multi-Target ID

Each SCSI port on each CHS can independently set the Target SCSI-ID number. And, each SCSI port can have multiple SCSI ID numbers within the range from 0 to 15. It is also allowed that the different SCSI ports assign the same SCSI ID number, if not on the same SCSI cable.

3.3.3 LUN (Logical Unit Number)

Maximum eight LUNs from LUN0 to LUN7 can be assigned to each Target ID.

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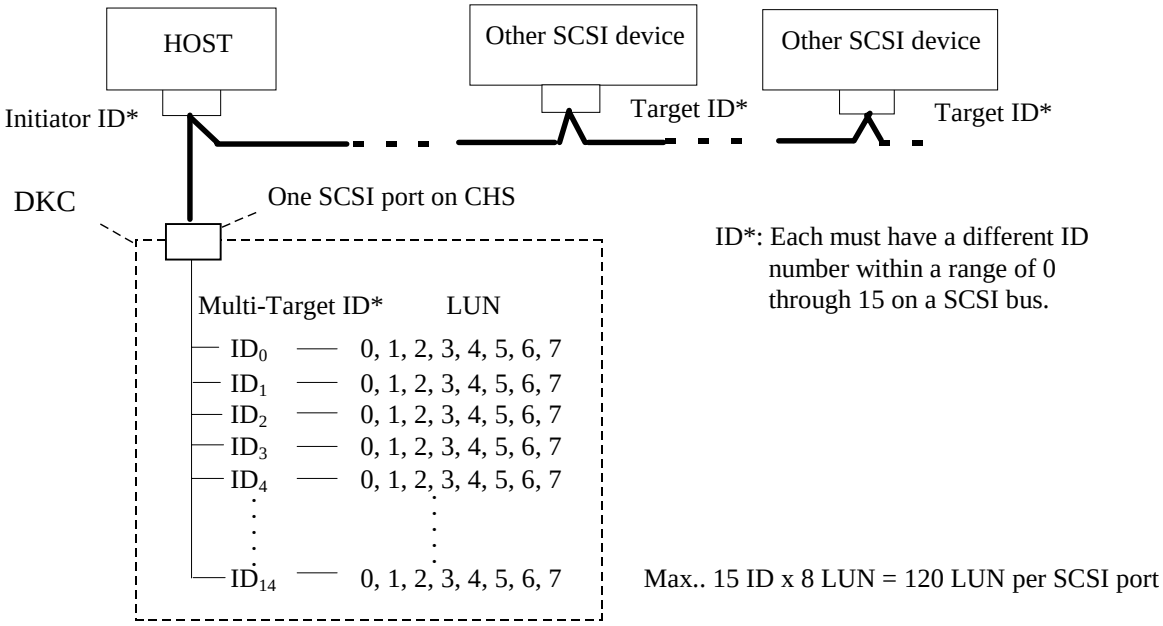

Figure 3-10 SCSI addressing configuration from Host

3.4 FIBRE Addressing

Each FIBRE device can be set a unique Port-ID number within the range from 1 to EF.

An addressing from the FIBRE host to the FIBRE volume in the DKC can be uniquely defined with a nexus between them. The nexus through the Initiator (host) ID, the Target (CHF port) ID, and LUN (Logical Unit Number) define the addressing and access path. The maximum number of LUNs assigned to a single Target SCSI-ID is limited to maximum eight.

The addressing configuration is shown in the Figure 3-11.

3.4.1 Number of Hosts

The number of FIBRE hosts (Initiator), i.e. a command issuing host per FIBRE port, is limited to one in the DKC excepting HA configuration.
When the multiple hosts need to be connected to the DKC, they can use the multiple FIBRE ports on the DKC.

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3.4.2 LUN (Logical Unit Number)

Maximum eight LUNs from LUN0 to LUN7 can be assigned to each FIBRE Port.

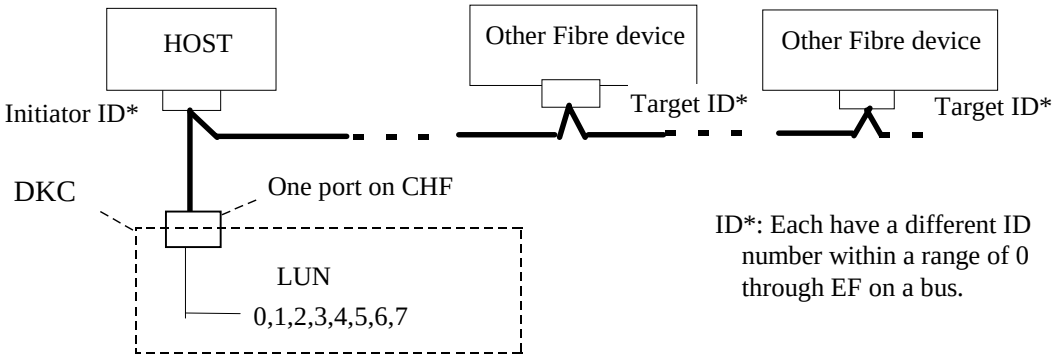

Figure 3-11 FIBRE addressing configuration from Host

3.4.3 PORT INFORMATION

A PORT address and the Topology can be set as PORT INFORMATION. The value of PORT address is EF and can be changed by user. Topology information is selected from “Fabric”, “FC-AL” or “Point to point”.

CAUTION

On the CHF, Host Mode must be set to “MODE 00”.

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3.5 Logical Unit

3.5.1 Logical Unit Specification

The specifications of Logical Units supported and accessible from Open system hosts are defined in the Table 3-2.

Table 3-2 LU specification (1/3)

No	Item		Specification				
1	Volume name		OPEN-3	OPEN-8	OPEN-9	3390-3A	3390-3B
2	Volume attribute		- SCSI volume - HMBR volume	- SCSI volume - HMBR volume	- SCSI volume - HMBR volume	- M/F volume - HMDE volume	- M/F volume - HMDE volume
3	Access right	SCSI host	Read/Write	Read/Write	Read/Write	Read/Write (need HMDE otm option)	Read only (need HMDE mto option)
		FIBRE host	Read/Write	Read/Write	Read/Write	Read/Write (need HMDE otm option)	Read only (need HMDE mto option)
		M/F host	Read/Write (need HMBR option)	Read/Write (need HMBR option)	Read/Write (need HMBR option)	Read/Write	Read/Write
4	Logical Unit (LU) size	GB (10^9)	2.4 GB	7.3 GB	7.3 GB	—	—
		GB ($1,024^3$)	2.29 GB	6.84 GB	6.88 GB	—	—
5	Block size		512 Bytes	512 Bytes	512 Bytes	512 Bytes	512 Bytes
6	# of blocks		4,806,720	14,351,040	14,423,040	5,825,520	5,822,040
7	LDEV emulation name		OPEN-3	OPEN-8	OPEN-9	3390-3A	3390-3B
8	LDEV size : LU size		1 : 1	1 : 1	1 : 1	1 : 1	1 : 1

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Table 3-2 LU specification (2/3)

No	Item		Specification				
1	Volume name		3380-KA	3380-KB	OPEN-3×n (n=2 to 36)	OPEN-8×n (n=2 to 36)	OPEN-9×n (n=2 to 36)
2	Volume attribute		- M/F volume - HMDE volume	- M/F volume - HMDE volume	- LU size expansion	- LU size expansion	- LU size expansion
3	Access right	SCSI host	Read/Write (need HMDE otm option)	Read only (need HMDE mto option)	Read/Write	Read/Write	Read/Write
		FIBRE host	Read/Write (need HMDE otm option)	Read only (need HMDE mto option)	Read/Write	Read/Write	Read/Write
		M/F host	Read/Write	Read/Write	Read/Write (need HMBR option)	Read/Write (need HMBR option)	Read/Write (need HMBR option)
4	Logical Unit (LU) size	GB (10^9)	—	—	OPEN-3×n	OPEN-8×n	OPEN-9×n
		GB ($1,024^3$)	—	—			
5	Block size		512 Bytes	512 Bytes	512 Bytes	512 Bytes	512 Bytes
6	# of blocks		3,836,160	3,833,280	4,806,720×n	14,351,040×n	14,423,040×n
7	LDEV emulation name		3380-KA	3380-KB	—	—	—
8	LDEV size : LU size		1 : 1	1 : 1	1 : n	1 : n	1 : n

Table 3-2 LU specification (3/3)

No	Item		Specification			
1	Volume name		3390-3C	3380-KC	OPEN-K	OPEN-K × n (n = 2 to 36)
2	Volume attribute		- M/F volume - HMDE volume	- M/F volume - HMDE volume	- SCSI volume - HMBR volume	- LU size expansion
3	Access right	SCSI host	Read/Write (need HMDE otm option)	Read/Write (need HMDE otm option)	Read/Write	Read/Write
		FIBRE host	Read/Write (need HMDE otm option)	Read/Write (need HMDE otm option)	Read/Write	Read/Write
		M/F host	Read only	Read only	Read/Write (need HMDE option)	Read/Write (need HMBR option)
4	Logical Unit (LU) size	GB (10^9)	—	—	1.87 GB	OPEN-K × n
		GB($1,024^3$)	—	—	1.74GB	
5	Block size		512 Bytes	512 Bytes	512 Bytes	512 Bytes
6	# of blocks		5,825,520	3,836,160	3,661,920	3,661,920 × n
7	LDEV emulation name		3390-3C	3380-KC	OPEN-K	—
8	LDEV size : LU size		1 : 1	1 : 1	1 : 1	1 : n

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3.5.2 Logical Unit Mapping of SCSI

Each volume name, such as OPEN-3, OPEN-8, OPEN-9, OPEN-K, 3390-3A, 3390-3B, 3390-3C, 3380-KA, 3380-KB or 3380-KC is also used as an emulation type name to be specified for each ECC group. When the emulation type is defined on an ECC group, Logical volumes (LDEVs) are automatically allocated on the ECC group from the specified LDEV#. After creating LDEVs, each SCSI address consisting of SCSI port address, SCSI ID# and LUNs can be mapped on any location of LDEV within DKC. This setting is performed by SVP operation or Remote Console operation (option).

This flexible LU and LDEV mapping scheme enables multiple paths setting to the same logical volume, so that the host system can configure a shared volume configuration such as a High Availability (HA) configuration. In the shared volume environment, however, some lock mechanism need to be provided by the host systems.

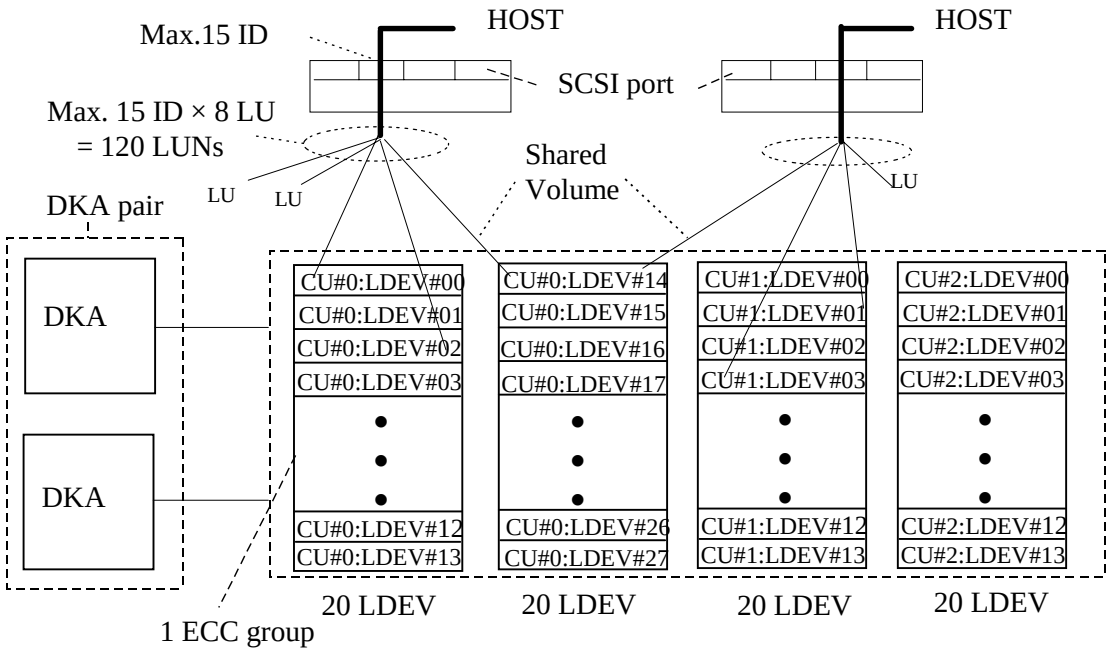

Figure 3-12 LDEV and LU mapping for SCSI volume

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3.5.3 Logical Unit Mapping of FIBRE

Each volume name, such as OPEN-3, OPEN-8, OPEN-9, OPEN-K, 3390-3A, 3390-3B, 3390-3C, 3380-KA, 3380-KB or 3380-KC is also used as an emulation type name to be specified for each ECC group. When the emulation type is defined on an ECC group, Logical volumes (LDEVs) are automatically allocated on the ECC group from the specified LDEV#. After creating LDEVs, each LUN of FIBRE port can be mapped on any location of LDEV within DKC. This setting is performed by SVP operation or Remote Console operation (option).

This flexible LU and LDEV mapping scheme enables multiple paths setting to the same logical volume, so that the host system can configure a shared volume configuration such as a High Availability (HA) configuration. In the shared volume environment, however, some lock mechanism need to be provided by the host systems.

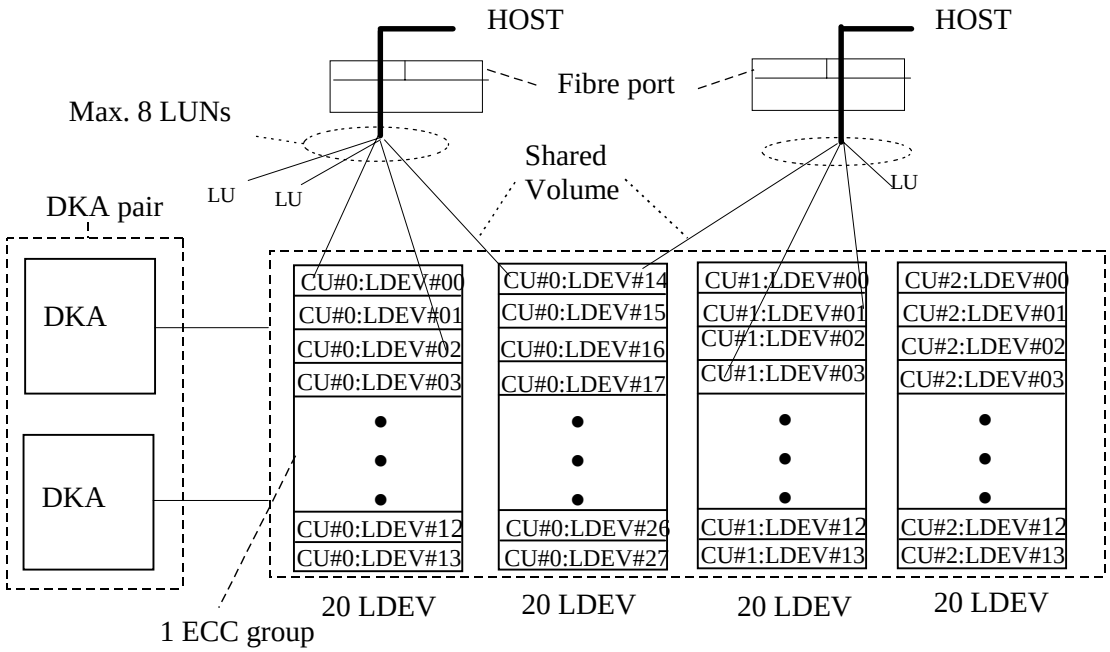

Figure 3-13 LDEV and LU mapping for FIBRE volume

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3.5.4 LU size expansion

(1) Outline

This is a function to show the host the continuous LDEV of a volume exclusive for open system as a virtually large LU.

In the former configuration, one LU is one LDEV, but this expanding function can enlarge the LU size up to 265 GB by showing the host two or more continuous LDEVs as a single LU.

It was necessary to create many LUs to cover the entire capacity of a disk subsystem before, this function enables a small number of LUs to cover it from the viewpoint of host interface.

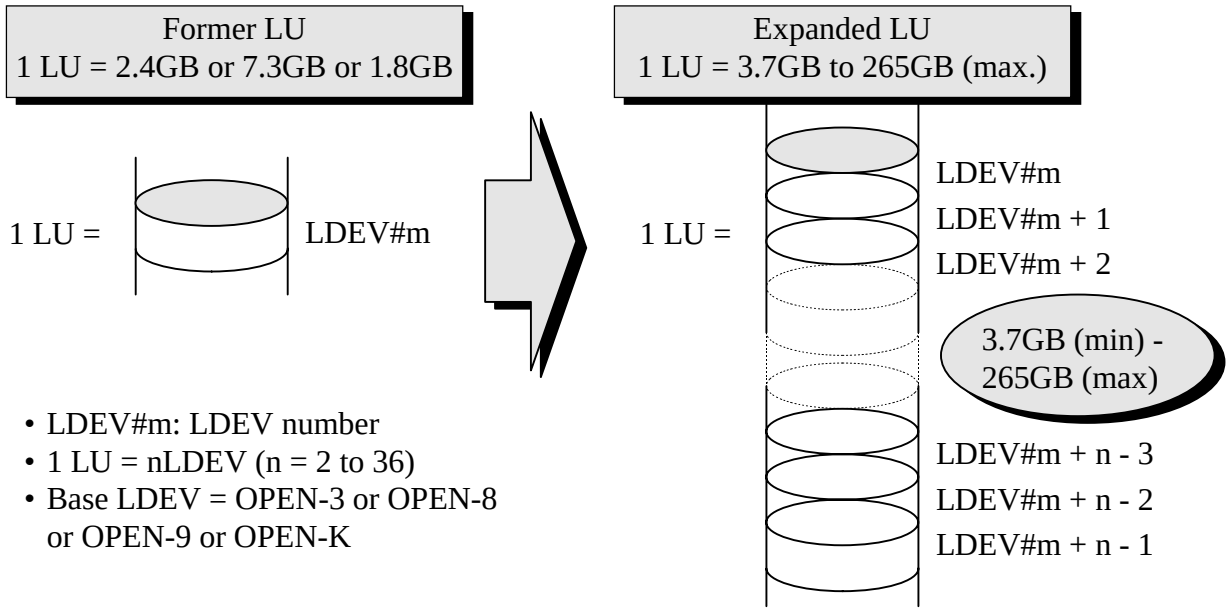

Figure 3-13-1 LU Size Expansion

(2) Specifications

Table 3-2-1 shows specifications for the LU expansion.

Table 3-2-1 LU Size Expansion Specification(1/2)

Base volume		OPEN-3	OPEN-8	OPEN-9	OPEN-K
LDEV Capacity		2.4GB	7.3GB	7.3GB	1.8GB
Number of connectable LDEVs		2 to 36 LDEV			
LU Capacity		4.9GB~88.5GB	14.7GB~264.4GB	14.7GB~265.8GB	3.7GB~67.7GB
Product name for responding to INQUIRY		OPEN-3×n	OPEN-8×n	OPEN-9×n	OPEN-K×n
Restrictions of connecting LDEV	Before 52-42-0X	• Connection is possible only when the LDEV numbers are arranged in order. If the LDEV numbers are not sequential, it cannot be specified as the same LU. • Connection of LDEVs with different CU numbers are impossible. • Connection of the LU size expansion with CV are impossible. • Connection of OPEN-8 volumes are impossible.			
	52-42-3X or later	• Connection of LDEVs with different CU numbers are impossible. • Connection of CV with different capacity are impossible. • Connection of OPEN-8 volumes are possible.			

n: Number of connected LDEVs

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Table 3-2-1 LU Size Expansion Specification(2/2)

Base volume		OPEN-3-CVS	OPEN-8-CVS	OPEN-9-CVS	OPEN-K-CVS
LDEV Capacity		35MB~2.3GB	35MB~6.9GB	35MB~7.0GB	35MB~1.7GB
Number of connectable LDEVs		2 to 36 LDEV			
LU Capacity		70MB~84.2GB	70MB~250.2GB	70MB~252.6GB	70MB~64.1GB
Product name for responding to INQUIRY		OPEN-3×n-CVS	OPEN-8×n-CVS	OPEN-9×n-CVS	OPEN-K×n-CVS
Restrictions of connecting LDEV	Before 52-42-0X	• Connection is possible only when the LDEV numbers are arranged in order. If the LDEV numbers are not sequential, it cannot be specified as the same LU. • Connection of LDEVs with different CU numbers are impossible. • Connection of the LU size expansion with CV are impossible. • Connection of OPEN-8-CVS volumes are impossible.			
	52-42-3X or later	• Connection of LDEVs with different CU numbers are impossible. • Connection of CV with different capacity are impossible. • Connection of OPEN-8-CVS volumes are possible.			

n: Number of connected LDEVs

(3) Effect and restrictions of LU expanding function

1) Effect

- The disk subsystem capacity can be covered with the fibre channel 2 paths.
- Restrictions of usable capacity owing to the number of the usable hosts is released.
  -Restriction of the host capacity (for example, up to 32 LUs for Windows NT)
  -Restriction of capacity owing to restriction of the number of LUs of the HA software
- The disk connection function on the host side such as VxVM becomes unnecessary.
- Effect of LU size extending with CV.
  -LU of optional size can be composed.
  -The load of PDEV can be dispersed by making CV which dispersed around ECC LUSE.
  -Performance can be improved by the multiplex frequency of LDEV increasing.

2) Restrictions

- Some OSs are slow in disk accesses handling large data and may not be usable depending on environment. (Example: AIX is slow in accesses handling data larger than 2GB.)
- The capacity need to be determined when necessary in a system designed to achieve a high-speed operation by making the LUs perform multiple operation.

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(4) Notes on use

When the LU is expanded, the following restrictions are added to a case where no expansion is made, such as a change in capacity seen from the open host owing to the specification of the expansion.

1) The LU size cannot be changed while the LU is being used by the host. When you want to change the LU size, the host must be rebooted once. If the LU size once set is to be changed, after shutting down the host, change the LU size, then start up the host again.
2) If an LU to being used or expanded LU is reconfigured in a new configuration or as a expanded LU, data used so far is lost.
   Perform physical replacement work of the disk including data backup, separation of the former LU, LU connection after the configuration change, and restoration of backup data.
3) When an LDEV in the LU is blocked, an LU blocking error does not occur unless an access is made to the blocked LDEV. When the access to the blocked LDEV is made, a blocking error occurs in the expanded LU.
4) The HMRS can use the LU whose LU size has been expanded. A volume with an expanded LU can be used by the HMBR, however, all the volumes need to be backed up and restored.
5) The maintenance procedure when an error such as an LDEV blocking occurs is the same as before. Check the LDEV status from the SVP and perform the maintenance considering the relation between the LDEV and the LU.

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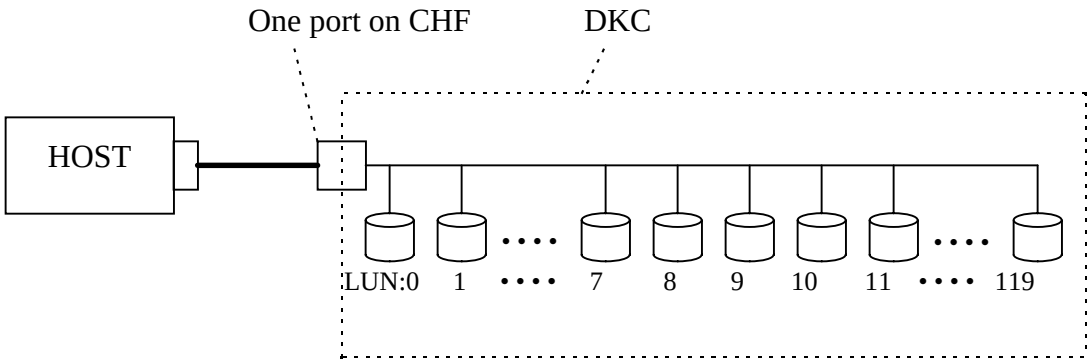
3.5.5 LU number expansion

(1) Outline

In this function, LUNs per one port of CHF can be identified until 119 in addition to usual LUN = 0 to 7 by a HOST.



(2) Notes on use

- This functionality is not available on the HOST that does not support numbers of LUN more than eight.
- LU number expansion and LU size expansion are exclusive to use on same port.

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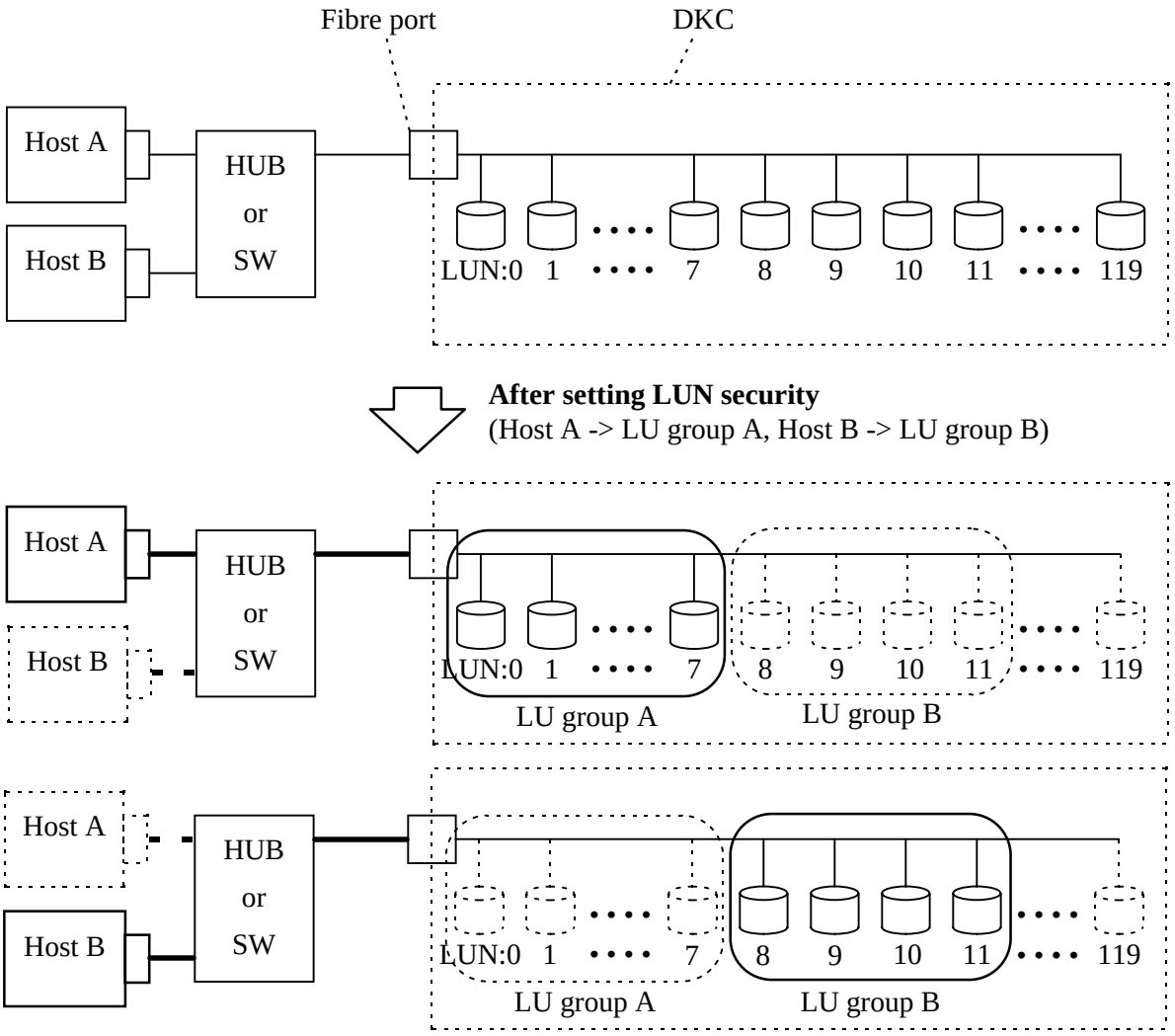
3.5.6 LUN Security

(1) Outline

This function can protect to access by the host server which are prohibited to access a LUN/LUNs which is assigned to SCSI path in Fibre port. Each port of host servers are distinguished by World Wide Name that is belong to each port. In the following example, the LU group A are accessible from the host server A and the LU group B are accessible from the host server B



(2) Notes on use

Different kind of platforms cannot connect to same port via switch or HUB. Because of the DKC cannot distinguish the a kind of the server.

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3.5.7 Heterogeneous Platform support

(1) Outline

This function support SAN environment of Fibre connection via fabric switch.

(2) Supported Port

Platform	Solaris	Windows NT	
HBA	Jaycor	Emulex	Q-Logic
F-Port	OK	OK	NG
FL-Port	NG	NG	OK

(3) Supported HBA(Host Bus Adapter)

Supported HBA			
Platform	Solaris	Windows NT	
FC card	JAYCOR FC1063	Emulex	Q-Logic
Protocol chip	Tachyon	SuperFly	ISP2100
Specification	LUN 0-119 Fabric supported	LUN 0-31 Fabric supported	LUN 0-7 Fabric supported
Note	*1	—	—

*1) DKC310 do not support current SUN standard Fibre HBA.

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3.6 Volume Specification

3.6.1 Volume Specification

The SCSI volume specification is summarized in Table 3-3.

Table 3-3 Volume Specification summary

No	RAID level	Disk Drive		Support level and P:L					
				OPEN-9	OPEN-8	OPEN-3	OPEN-K	3390-3A 3390-3B 3390-3C	3380-KA 3380-KB 3380-KC
1	RAID5	DK308/309/30A-90	6D+1P	7:7	—	7:20	7:20,7:28	7:16	7:24
2		DK309/30A-180	3D+1P	4:7	—	4:20,4:21	4:20,4:28	4:18, 4:16	4:16,4:18, 4:24,4:27
3		DK3F1/3F2-60	3D+1P	4:2	—	4:7	4:9	4:6	4:8
4		DK3F2-90	3D+1P	4:3	—	4:10,4:11	4:14	4:9	4:12
5		DK3F2-150	3D+1P	4:6	4:6	4:18	4:22,4:23	4:15	4:22
6		DK30A-360	3D+1P	4:14	4:15	4:26,4:36, 4:44	4:26,4:36, 4:48,4:58	4:32,4:36	4:32,4:36, 4:48,4:56
7	RAID1	DK308/309/30A-90	2D+2D	4:2	—	4:6	4:8	4:6	4:8
8		DK309/30A-180	2D+2D	4:4	—	4:14	4:18	4:12	4:16
9		DK3F1/3F2-60	2D+2D	-	—	4:4	4:6	4:4	4:6
10		DK3F2-90	2D+2D	4:2	—	4:6	4:8	4:6	4:8
11		DK3F2-150	2D+2D	4:4	4:4	4:12	4:14	4:10	4:14
12		DK30A-360	2D+2D	4:8	4:10	4:28	4:26,4:36, 4:38	4:24	4:36

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3.6.2 Intermix Specification

Table 3-4 Intermix specification

No	Item	Intermix unit	Remark
1	LDEV intermix	ECC group	-
2	MF/OPEN LDEV intermix	ECC group	-
3	RAID1/RAID5 intermix	DKA pair	-
4	Same parity group PDEV intermix	ECC group	DK309-18(3D+1P) and DK3F1-6(3D+1P) can coexist under same DKA pair with ECC unit.
5	Different parity group PDEV intermix	DKA pair	DK308-90(6D+1P) and DK309-18(3D+1P) can not coexist under same DKA pair. DK308-90(6D+1P) and DK309-18(3D+1P) can coexist under the DKC with DKA pair unit.

(1) M/F and SCSI volume intermix
ECC group
It is allowed to allocate the mainframe volumes and SCSI volumes together under a same DKA pair.

(2) LDEV emulation type intermix
ECC group

(3) Drive intermix
Same parity group (3D+1P or 6D+1P) can coexist under same DKA pair by ECC group unit.
Different parity group such as 3D+1P and 6D+1P can coexist in one DKC by DKA pair unit.
Different parity group such as 3D+1P and 6D+1P cannot coexist under same DKA pair.

(4) RAID5/RAID1 intermix
DKA pair

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3.6.3 HMDE volume intermix within ECC group

3.6.3.1 HMDE volume intermix within ECC group

(1) The four types, 3390-3A/-3B/-3C/-3 (or 3390-3A/-3B/-3C/-3R), of emulated disk drives can coexist within one ECC group.
(2) The four types, 3380-KA/-KB/-KC/-K, of emulated disk drives can coexist within one ECC group.
(3) The type can be changed for each one volume within an ECC group.
(4) The type can be changed by the emulation type change function of the SVP.
(5) The emulation type change function allows any change of types among 3A, 3B, 3C, 3, and 3R (or among KA, KB, KC, and K).
(6) At "define configuration and install" or installation of disk drives, device definition and LDEV-FMT are performed in units of ECC group with any type of 3A, 3B, 3C, 3, and 3R (or any type of KA, KB, KC, and K). Afterwards the type is changed for each one volume if necessary.
When the type change is completed, all volumes are initialized (a VTOC is created for volumes) from the mainframe system.
(7) After the type change, data before the change is not assured.
After the type change, all volumes must be initialized (a VTOC must be created) from the mainframe system.
However, data is assured as before for type change between 3390-3 and 3390-3R, and if you want to assure the data, all volumes must not be initialized (a VTOC must not be created).
For type changes other than that between 3390-3 and 3390-3R, data is not assured.

3.6.3.2 Intermix with 3390-3R

(1) The 3390-3/-3A/-3B/-3C types can coexist within a subsystem.
Intermixing is allowed both within and beyond a 32-LDEV address boundary.
(2) The 3390-3R/-3A/-3B/-3C can coexist within a subsystem.
- An intermixture of the 3390-3R and any of 3390-3A/-3B/-3C is allowed in units of 32-LDEV address boundary (with the same type within each boundary). It is not allowed within a 32-LDEV address boundary because of the restriction on the mainframe system.
- An intermixture of the 3390-3A/-3B/-3C is allowed both within and in units of 32-LDEV address boundary.

(3) The 3390-3 and 3390-3R cannot coexist within a subsystem.
- When changing the type from 3390-3 to 3390-R and vice versa by the emulation type change function, since the 3390-3 and 3390-3R cannot coexist within a subsystem, the type must be changed not partially but totally.
The SVP reject partial change.
- The intermixture can be changed from that of the 3390-3/-3A/-3B/-3C to that of the 3390-3R/-3A/-3B/-3C (with an intermixture part of the 3390-3A/-3B/-3C remaining unchanged) and vice versa by the emulation type change function between 3390-3 and 3390-3R.

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3.7 Volume Configuration

3.7.1 Volume Configuration

(1) Minimum Volume Configuration

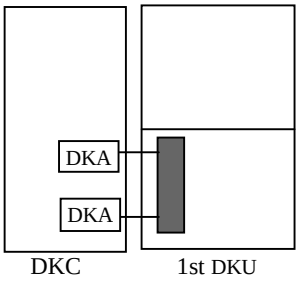

Figure 3-14 Minimum volume configuration

(2) Maximum Volume Configuration

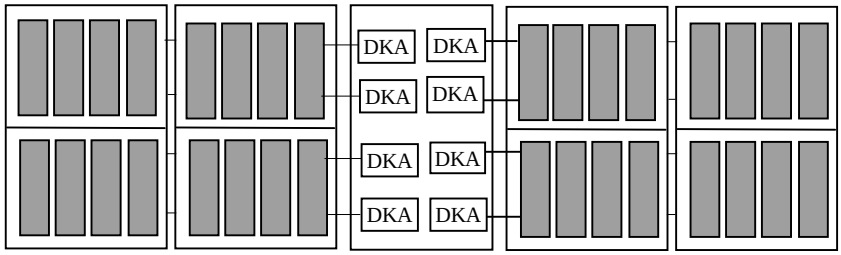

Figure 3-15 Maximum volume configuration

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3.7.2 Intermix Volume Configuration

PDEV intermix of same parity group : ECC group
PDEV intermix of different parity group : DKA pair
RAID intermix : DKA pair
LDEV intermix : ECC group
MF/OPEN volume intermix : ECC group

(1) Typical LDEV intermix configuration

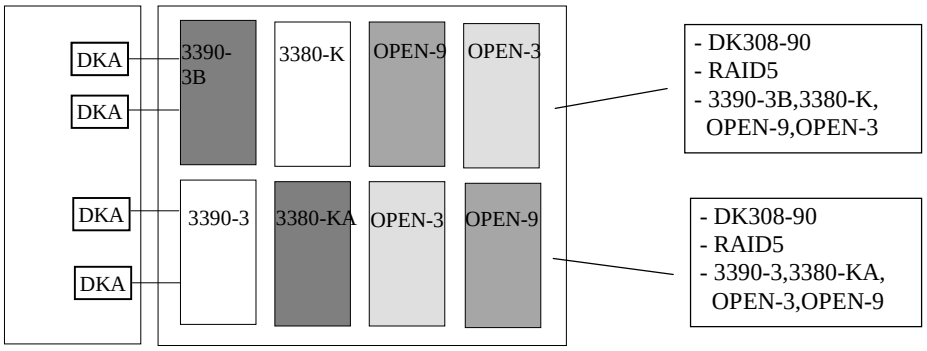

Figure 3-16 Typical LDEV intermix configuration example

(2) Typical RAID intermix configuration

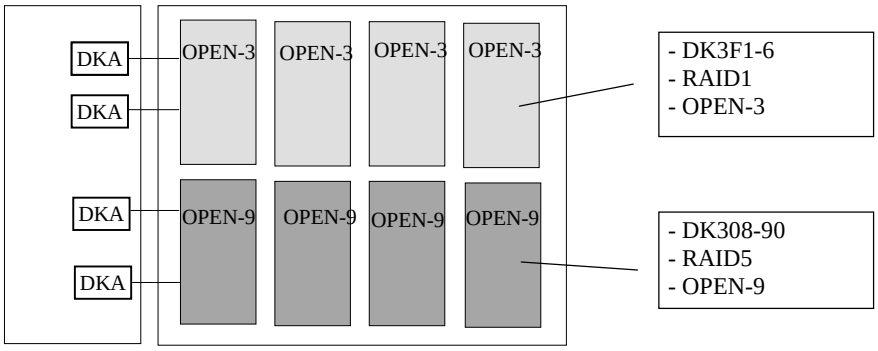

Figure 3-17 Typical RAID intermix configuration example

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(3) Typical PDEV intermix configuration

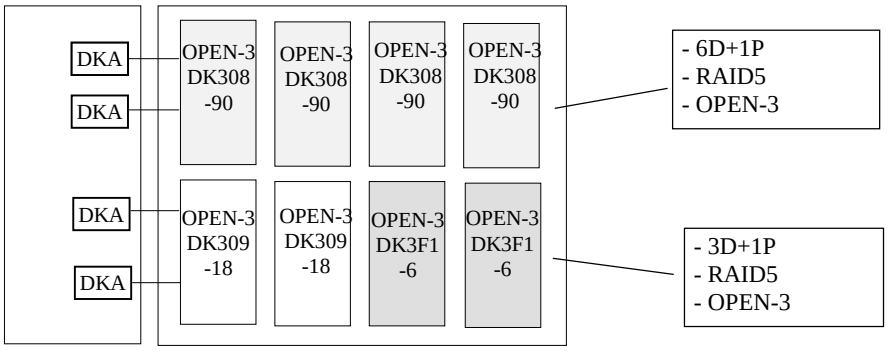

Figure 3-18 Typical PDEV intermix configuration example

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3.7.3 HMDE Volume Configuration

(1) Typical volume configuration for HMDE

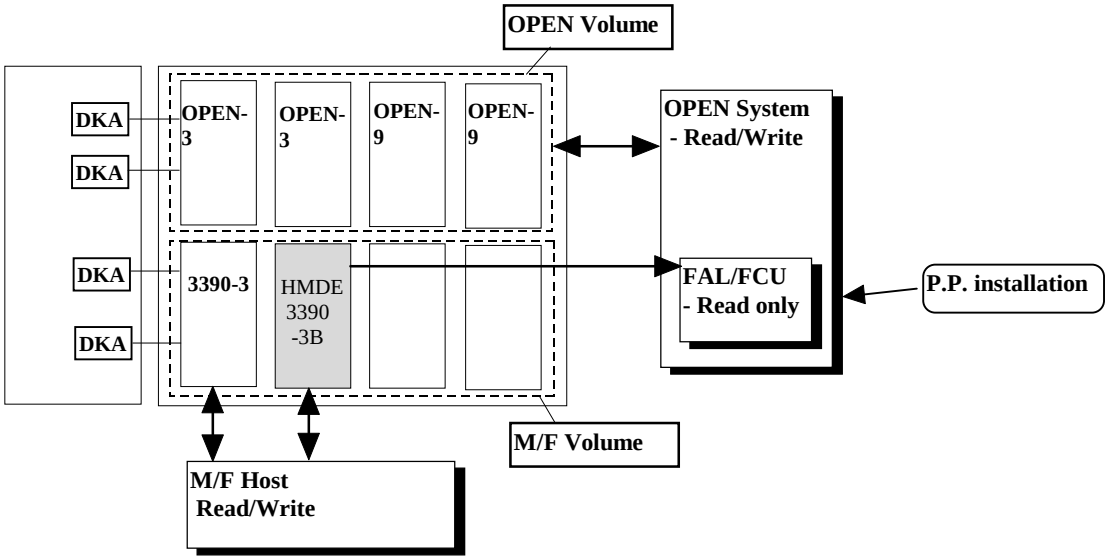

Figure 3-19 Typical volume configuration for HMDE

(2) Valid volume configuration

The configuration shown in Fig. 3-20 is valid.

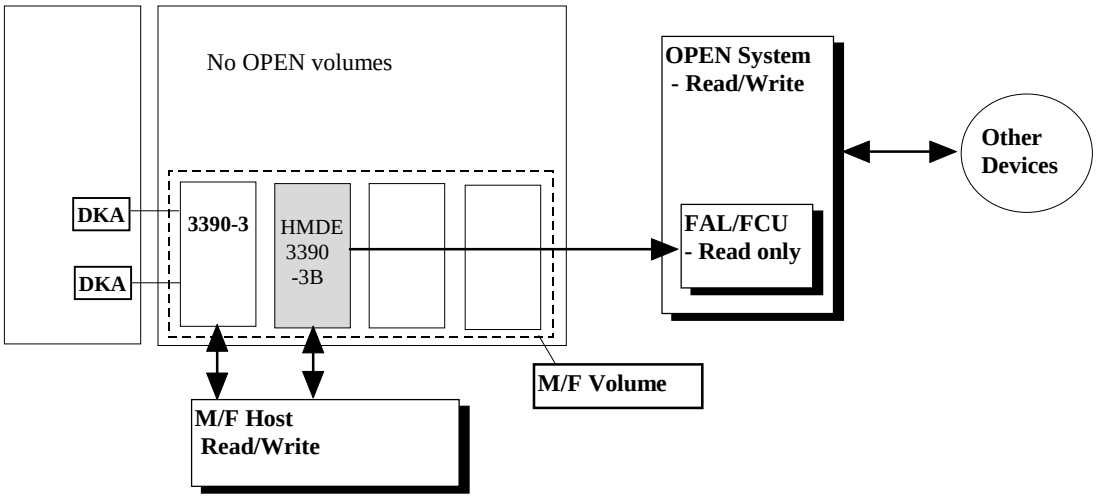

Figure 3-20 Valid volume configuration for HMDE

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3.7.4 HMBR Volume Configuration

(1) Typical volume configuration example for HMBR

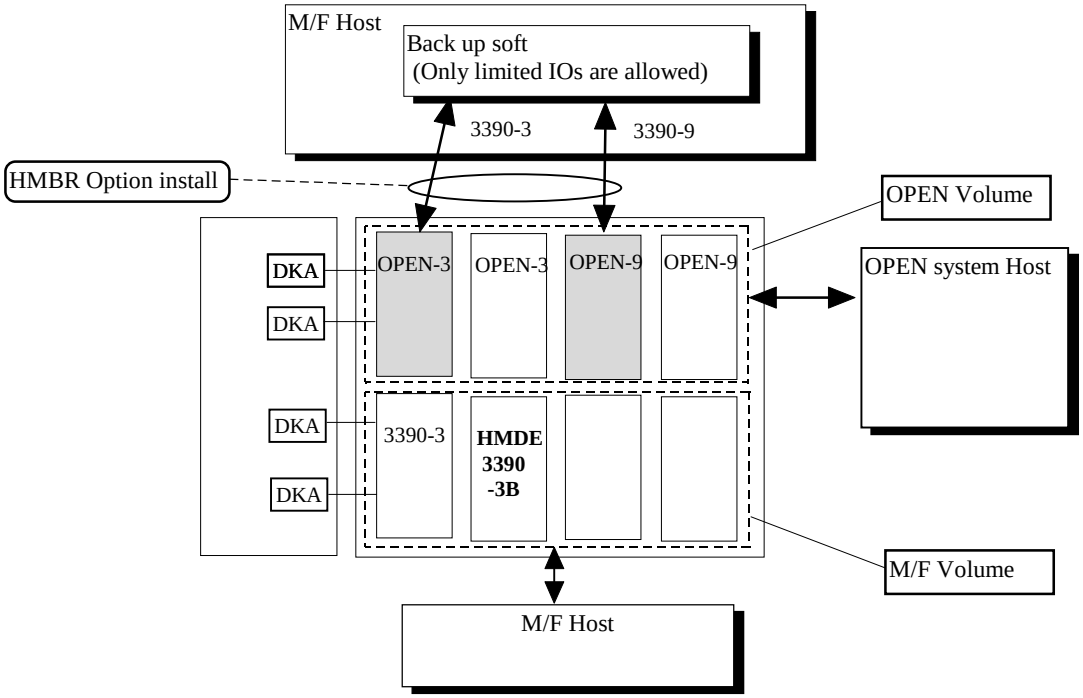

Figure 3-21 Typical volume configuration for HMBR

(2) Valid volume configuration example for HMBR

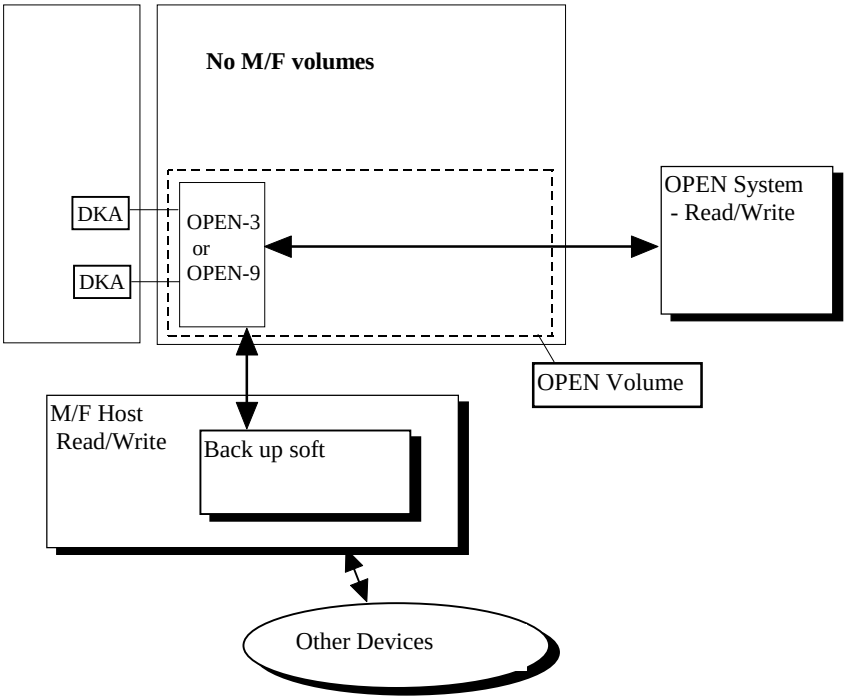

Figure 3-22 Valid volume configuration for HMBR

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3.8 SCSI Volume Setting

3.8.1 Setting of SCSI Volume space

The SCSI volume setting is performed according to the following procedure either by using the SVP or Remote Console function (optional feature).

- SCSI logical volume (LDEV) space setting:

- Specify the disk area for the SCSI volume.
- Specify the RAID level.
- Select the LDEV type and P:L.
- LDEVs are assigned automatically.

3.8.2 SCSI ID and LUN setting

The SCSI IDs and LUNs can be set with the following procedure by using the SVP.

Refer to the INSTALLATION SECTION for more detailed procedures.

- SCSI ID and LUN setting:

- Select the CHS and SCSI port, and select the target SCSI ID to the port.
- Select the LUN for the selected ID, and select the CU# and LDEV# to be assigned to the LUN
- Repeat the above procedure as needed.

Note 1 : It is possible to refer to the setting contents of already being set on the SVP display.
Note 2 : The above setting can be done during on-line.
Note 3 : Duplicated access paths' setting from the different hosts to the same LDEV is allowed. This will provide a means to share the same volume among host computers. It is, however, the host responsibility to manage an exclusive control on the shared volume.

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3.9 FIBRE Volume Setting

3.9.1 Setting of FIBRE volume space

The procedure of FIBRE volume setting is same as SCSI LDEV space setting and performed either by using the SVP or Remote Console function (optional feature).

3.9.2 LUN setting

- LUN setting:

- Select the CHF, FIBRE port and the LUN, and select the CU# and LDEV# to be assigned to the LUN
- Repeat the above procedure as needed.

Note 1 : It is possible to refer to the setting contents of already being set on the SVP display.
Note 2 : The above setting can be done during on-line.
Note 3 : Duplicated access paths' setting from the different hosts to the same LDEV is allowed. This will provide a means to share the same volume among host computers. It is, however, the host responsibility to manage an exclusive control on the shared volume.

Refer to the INSTALLATION SECTION for more detailed procedures.

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4 CONTROL FUNCTION

4.1 Cache Usage

The DKC has two independent areas of non-volatile cache memory for the mainframe volumes. This mechanism also commonly applies to the SCSI volumes without any distinction. Thus, the high reliability and high performance realized by the following features can be commonly applied to the SCSI volumes.

① Cache data management by LRU control

Data that has been read out is stored into the cache and managed under LRU control. For upright transaction processing, therefore, a high cache hit ratio can be anticipated and a data-writing time reduced for improved system throughput.

② Adoption of DFW (DASD Fast Write)

At the same time that it writes data into the cache, the normal write command reports the end of the write operations to a host. Disk writing of the data is asynchronous with host access. The host, therefore, can execute the next process without waiting for the end of disk writing.

③ Write data duplexing

The same write data is stored into the two areas of cache provided in the DKC. Thus, loss of DFW data due to even one failure in the cache can be avoided.

④ Nonvolatile cache

The cache in the DKC is non-volatile by battery backup. Once data has been written into the cache, its non-volatility will maintain the data, even if a power interruption occurs. Under a standard system configuration having a fully charged battery pack, data is guaranteed for at least 48 hours.

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4.2 SCSI Command Multi-processing

4.2.1 Command Tag Queuing

The Command Tag Queuing function defined in SCSI specification is supported. This function allows each SCSI port on CHS to accept a multiple SCSI commands even for the same LUN. The DKC can process those queued commands in parallel because a LUN is composed of a multiple physical disk drives.

4.2.2 Concurrent data transfer

The four SCSI ports on a CHS can perform the host I/Os and data transfer with maximum 20 MB/sec by FAST/WIDE transfer and with maximum 40MB/sec by Ultra/WIDE transfer concurrently. This is also applied among the different CHSs.

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5 SCSI Commands

The DASD commands defined under the SCSI-2 standards and those supported by the DKC are listed in Table 5-1.

Table 5-1 SCSI-2 DASD commands and DKC-supported commands

Group	Op Code	Name of Command	Type	×:Supported	Remarks
0 (00_H -$1F_H$)	00_H	Test Unit Ready	CTL/SNS	×	
	01_H	Rezero Unit	CTL/SNS	Nop	
	03_H	Request Sense	CTL/SNS	×	
	04_H	Format Unit	DIAG	Nop	
	07_H	Reassign Blocks	DIAG	×	For RAID5, Nop
	08_H	Read	RD/WR	×	
	$0A_H$	Write	RD/WR	×	
	$0B_H$	Seek	CTL/SNS	Nop	
	12_H	Inquiry	CTL/SNS	×	
	15_H	Mode Select	CTL/SNS	×	
	16_H	Reserve	CTL/SNS	×	
	17_H	Release	CTL/SNS	×	
	18_H	Copy	–	–	
	$1A_H$	Mode Sense	CTL/SNS	×	
	$1B_H$	Start/Stop Unit	CTL/SNS	Nop	
	$1C_H$	Receive Diagnostic Results	DIAG	–	
	$1D_H$	Send Diagnostic	DIAG	Nop	Only self-test supported.
	$1E_H$	Prevent Allow Medium Removal	–	–	
	$1F_H$	Reserved code	–	–	
	Other	Vendor–unique	–	–	
1 (20_H -$3F_H$)	25_H	Read Capacity	CTL/SNS	×	
	28_H	Read (Extend)	RD/WR	×	
	$2A_H$	Write (Extend)	RD/WR	×	
	$2B_H$	Seek (Extend)	CTL/SNS	Nop	
	$2E_H$	Write And Verify	RD/WR	×	DKC310I supports only Write.
	$2F_H$	Verify	RD/WR	×	
	30_H	Search Data High	–	–	
	31_H	Search Data Equal	–	–	
	32_H	Search Data Low	–	–	
	33_H	Set Limits	–	–	
	34_H	Pre-Fetch	–	–	
	35_H	Synchronize Cache	CTL/SNS	×	
	36_H	Lock-Unlock Cache	–	–	
	37_H	Read Defect Data	DIAG	×	No defect always reported.
	38_H	Reserved code	–	–	
	39_H	Compare	–	–	
	$3A_H$	Copy And Verify	–	–	
	$3B_H$	Write Buffer	DIAG	×	
	$3C_H$	Read Buffer	DIAG	×	
	$3D_H$	Reserved code	–	–	
	$3E_H$	Read Long	–	–	

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Table 5-1 SCSI-2 DASD commands and DKC-supported commands (Continued)

Group	Op Code	Name of Command	Type	×: Supported	Remarks
1 (20_H -$3F_H$)	$3F_H$	Write Long	–	–	
	Other	Vendor-unique	–	–	
2	40_H	Change Definition	–	–	
	41_H	Write Same	–	–	
	$4C_H$	Log Select	–	–	
	$4D_H$	Log Sense	–	–	
	55_H	Mode Select (10)	CTL/SNS	×	
	$5A_H$	Mode Sense (10)	CTL/SNS	×	
	Other	Reserved code	–	–	
3, 4, 5	60_H~BF_H	Reserved code	–	–	
6	$C0_H$~$D0_H$	Vendor-unique	–	–	
7 ($E0_H$ -FF_H)	$E8_H$	Read With Skip Mask ((IBM-unique)	CTL/SNS	–	
	EA_H	Write With Skip Mask (IBM-unique)	CTL/SNS	–	
	Other	Vendor-unique	–	–	

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6 HMDE (Hitachi Multiplatform Data Exchange)

6.1 Overview

The Hitachi Multiplatform Data Exchange (HMDE) optional feature provides a function to enable the SAM files of the mainframe to be accessed by the open system host by executing the File Access Library (FAL) program or File Conversion Utility (FCU) program installed in the open system host. Main frame files which can be accessed are limited to the SAM files only.
The FCU program has code conversion function between EBCDIC and ASCII.
The FAL has disclosed API and users can incorporate the FAL program directly into a user program.
This optional feature is supplied as a program product (P.P.) that consists of the following programs:

1) File Access Library program
- C language functions and a Header file for incorporation into a user program

2) File Conversion Utility program
- An execution-format utility program that contains the access library

The program product is supplied separately for each platform of the open system. Table 6-1 lists platforms supported for using the HMDE.

Table 6-1 Platforms supported

#	Platform supported	OS	Window System
1	SUN	Solaris 2.5, 2.6, 7	Motif 1.2
2	HP	HP-UX 10.2, 11.x	Motif 1.2
3	IBM	AIX 4.1.4 or 4.2 or 4.3	Motif 1.2
4	(Not specified)	WindowsNT4.0	MFC
5	DEC	Digital UNIX V4.0	Motif 1.2
6	NCR	UNIX SVR4 3.01	Motif 1.2
7	SEQUENT	DYNIX/ptx v 4.4.4	Motif 1.2

Note : Solaris 7 is available in DKCMAIN 52-42-45 or later.

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6.2 Installation

(1) Installation of P.P.
For the method of installing the P.P. (containing FAL and FCU) and its detailed specifications, refer to the manual attached to the P.P.

(2) HMDE volume setting
Volumes whose emulation type is 3390-3A, 3390-3B, 3390-3C, 3380-KA, 3380-KB and 3380-KC can be used for the HMDE operations. In addition to being accessible as 3390-3 type volumes from the mainframe host in the same manner as before, the 3390-3B type volumes permit read-only access from the open system host.
The 3390-3A type volumes can be accessible as 3390-3 from the mainframe host and permit read and write access from the open system host. The 3390-3C can be read only accessible as 3390-3 from mainframe host and permit read and write access from the open system host. The 3390-3C permit create and update of VTOC.
The 3380-KB can be accessible as 3380-K from the mainframe host and permit read-only access from the open system host. The 3380-KA can be accessible as 3380-K from the mainframe host and permit read and write access from the open system host. The 3380-KC can be read-only accessible as 3380-K from mainframe host and permit read and write access from the open system host. The 3380-KC permit create and update of VTOC.

Table 6-2 HMDE volume specifications

#	Volume attribute	Emulation Type	Access right		Remarks
			Mainframe	Open system	
1	Mainframe volume	3390-3A	R/W	R/W	HMDE volume
2		3390-3B	R/W	R	HMDE volume
3		3390-3C	R	R/W	HMDE volume
4		3380-KA	R/W	R/W	HMDE volume
5		3380-KB	R/W	R	HMDE volume
6		3380-KC	R	R/W	HMDE volume
7	SCSI volume	OPEN-3	(Backup/Restore)	R/W	-
8		OPEN-8	(Backup/Restore)	R/W	-
9		OPEN-9	(Backup/Restore)	R/W	-
10		OPEN-K	(Backup/Restore)	R/W	-

The 3390-3A, 3390-3B, 3390-3C, 3380-KA, 3380-KB and 3380-KC type HMDE volumes can be set during initial installation or LDEV addition. To use volumes used by the mainframe and/or SCSI as the HMDE volumes they must be set as the HMDE volumes by removing the corresponding ECC group once and then adding them again.
This procedure is the same as the ordinary one for setting emulation type of another drive.

The drive emulation type can be changed between 3390-3 and 3390-3A and 3390-3B and 3390-3C by change emulation operation. It is same for 3380-K and 3380-KA and 3380-KB and 3380-KC.

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(3) Setting from the open system host

- To access the HMDE volumes from the open system host, it is necessary to define connection to the open system host and to set an SCSI path. The method of defining the SCSI path for the open system host is the same as that of the ordinary SCSI path definition with the SVP.
- Refer to the manual attached to the P.P. for the method of setting the open system host to enable it to access the HMDE volumes. This setting operation requires labeling of the HMDE volumes, for example.

6.3 Notes on Use

Alike the ordinary mainframe volumes, the 3390-3B, 3390-3A, 3380-KB and 3380-KA type HMDE volumes can be accessed from the mainframe. The 3390-3C and 3380-KC type HMDE volumes can be read only accessed without VTOC area from the mainframe.
If the SCSI path are not defined for 3390-3A/B or 3380-KA/B, the volume can not be accessed from the open system host.

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7 HMBR (Hitachi Multiplatform Backup/Restore)

7.1 Overview

The Hitachi Multiplatform Backup/Restore (HMBR) optional feature provides a function to enable a mainframe host to backup a open system volume on the DKC disk subsystem by reading it by a volume unit. It also enables a mainframe host to restore the backup data onto the open system volume.

Any special additional software packages are not required to perform these functions on both mainframe host and open system host. Because, the DKC disk subsystem can convert the different data block format between open system (fixed block length data) and mainframe system (CKD format data).
The HMBR has the following features:

(1) Enabling mainframe host to backup open system data under the DKC Multiplatform disk subsystem by utilizing backup/restore programs, such as “DFHSM and DFDSS” or “DFSMShsm and DFSMSdss”, with a Logical Unit volume unit, and to restore it from the mainframe to the Logical Unit.

(2) Performing backup and restore with high data transfer rate of ESCON 17 MB/s between mainframe host and the DKC disk subsystem.

(3) Providing the open systems with powerful backup functions being used on mainframe systems, such as backup generation management, primary/secondary duplication management, and automatic backup control.

(4) Offering various backup media to the system, such as disk drives, magnetic tapes, or magnetic tape libraries.

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7.2 System Configuration

A system configuration example and functional overview are shown in the Fig. 7-1.

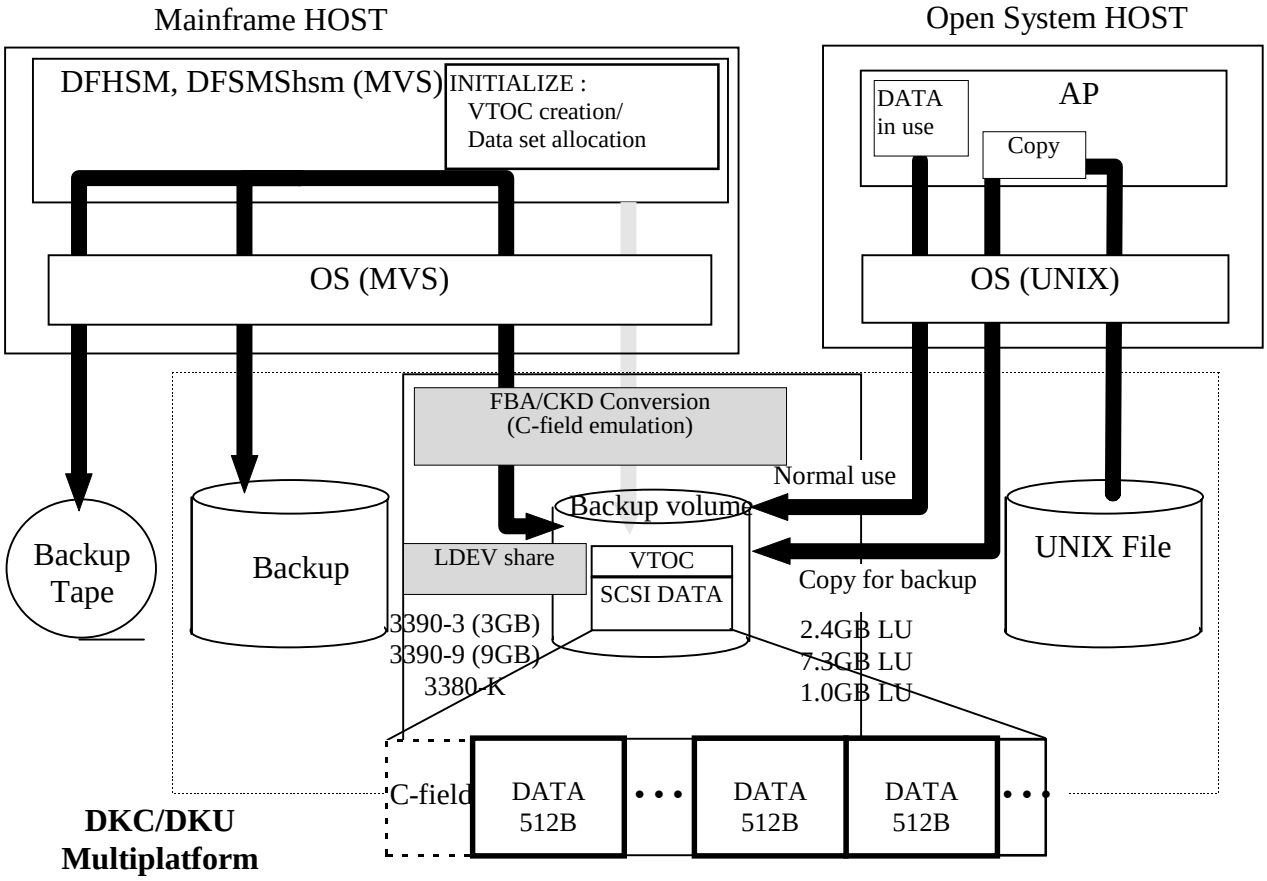

Fig. 7-1 System configuration example

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7.3 Basic Specification

The basic specification of HMBR is shown in the Table 7-1.

Table 7-1 Basic specification of HMBR

No	Item		Specification			Remarks
1	Attached system	Mainframe	MVS/ESA			
2		Open system	SUN (Solaris 2.5) or later HP (HP-UX 10.x) or later IBM (AIX 4.1.4) or later WindowsNT4.0 DEC (Digital UNIX V4.0) NCR (UNIX SVR4 3.01)			
3	Backup software	Mainframe	DFHSM, DFDSS DFSMShsm, DFSMSdss			
4	Device type	Mainframe	3390-3	3390-9	3380-K	
5		Open system	OPEN-3 (LUN=2.4GB)	OPEN-8/9 (LUN=7.3GB)	OPEN-K (LU=1.9GB)	
6	Maximum number of volumes for backup/restore		- As many Logical Units as specified for OPEN-3/9/K for Open system.			
7	Setup for backup volume		- By installing HMBR option (on SVP), all Logical Units defined as OPEN-3/8/9/K can be accessed from MVS - Refer to item #16 for restrictions to the access from MVS.			
8	Preparation before taking backup	VSN, VTOC creation	- DSF (INIT)			
9		Dataset allocation	- IEFBR14			
10	Backup method		- Volume full tracks dump by using DFDSS and DFSMSdss.			
11	VTOC format		- Standard VTOC. Note: Do not use SMS for backup volumes since Index VTOC is used in SMS.			
12	VTOC allocation		- Cylinder 0, Head 1 to 14 (fixed location)			
13	Data set allocated	# of data sets	- One/VOL	- Three/VOL	- One/VOL	
14		Extent	- Cylinder 1, Head 0 to User cylinder MAX.			
15	Restrictions for mainframe side utility programs		- Other utility programs than listed above are not allowed. - For Write type commands, other than those used by the above listed utility programs are rejected. (Only FORMAT WR with 16KB data length is allowed for write type command.) Read or Control type commands can be used. - Verify option is not allowed.			

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7.4 Backup Volume Specification

1) Setup for Backup Volume
   Step-1 : Install the HMBR option to the DKC by using SVP. Refer to the option install procedure described in SVP section. (SVP05-10)
   Step-2 : By installing the option above, all the SCSI Logical Units (OPEN-3, OPEN-8, OPEN-9 and OPEN-K type), already installed or newly installed, will be ready to be used for backup/restore from the mainframe host.

   Note-1 Immediately after the HMBR option is de-installed, an access from the mainframe to OPEN-3, OPEN-8, OPEN-9 or OPEN-K will be rejected.
   Note-2 The Logical Unit and data stored on it, which has been used before installing HMBR option, can be used continuously for its original use and/or for backup/restore purpose.

2) Access to Backup Volume
   The specification applied to accessing the backup volume is shown in the Table 7-2.

Table 7-2 Specification of accessing the backup volume

No	Items	Specification
1	Volume type	- OPEN-3 (2.4GB), OPEN-8 (7.3GB), OPEN-9 (7.3GB), OPEN-K (1.9GB)
2	Access from Open system	- No restriction.
3	Access from mainframe host	- Possible to Read/Write as 3390-3 for OPEN-3 as 3390-9 for OPEN-8/9 and as 3380-K for OPEN-K. - For Write type commands, only the following command is allowed: - Format Write with data length of 16 KB. - Other write type commands are rejected.

7.5 Restriction

A method of backup and restore for WindowsNT system data is shown in the following.

(1) Backup
   (a) Delete drive letter to the Logical Units by Disk Administrator.
   (b) Re-allocate drive letter to the Logical Units by Disk Administrator.
   (c) Backup WindowsNT system data by mainframe host.
(2) Restore
   (a) Delete drive letter to the Logical Units by Disk Administrator.
   (b) Restore it from mainframe host to the Logical Units.
   (c) Re-allocate drive letter to the Logical Units by Disk Administrator.

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8 SCSI HA Software Linkage Configuration in a Cluster Server Environment

When this subsystem is linked to High-Availability software (HA software) which implements dual-system operation for improved total system fault-tolerance and availability, the open system side can also achieve higher reliability on the system scale.

8.1 Example of System Configurations

(1) Hot-standby system configuration
The HA software minimizes system down time in the event of hardware or software failures and allows processing to be restarted or continued. The basic system takes a hot-standby (asymmetric) configuration, in which, as shown in the figure below, two hosts (an active host and a standby host) are connected via a monitoring communication line. In the hot-standby configuration, a complete dual system can be built by connecting the SCSI buses of the active and standby hosts to different CHS SCSI ports.

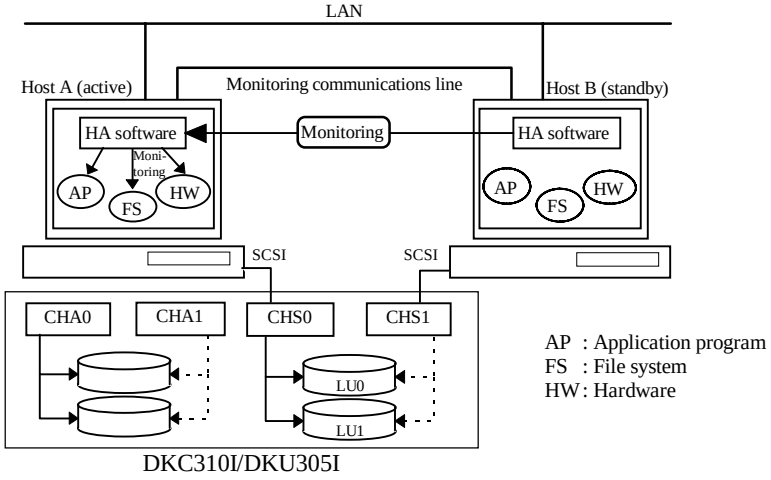

Figure 8-1 Hot-standby configuration

• The HA software under the hot-standby configuration operates in the following sequence:

a. The HA software within the active host monitors the operational status of own system by using a monitoring agent and sends the results to the standby host through the monitoring communication line (this process is referred to as "heart beat transmission"). The HA software within the standby host monitors the operational status of the active host based on the received information.
b. If an error message is received from the active host or no message is received, the HA software of the standby host judges that a failure has occurred in the active host. As a result, it transfers management of the IP addresses, disks, and other common resources, to the standby host (this process is referred to as "fail-over").
c. The HA software starts the application program concerned within the standby host to take over the processing on behalf of the active host.

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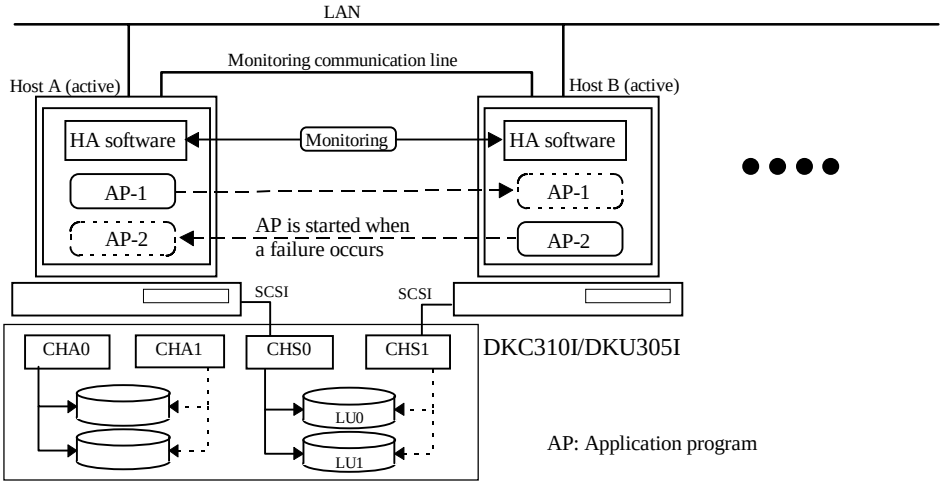
- Use of the HA software allows a processing request from a client to be taken over. In the case of some specific application programs, however, it appears to the client as if the host that was processing the task has been rebooted due to the host switching. To ensure continued processing, therefore, a login to the application program within the host or sending of the processing request may need to be executed once again.

(2) Mutual standby system configuration

In addition to the hot-standby configuration described above, a mutual standby (symmetric) configuration can be used to allow two or more hosts to monitor each other. Since this subsystem has eight SCSI ports, it can, in particular, be applied to a large-scale cluster environment in which more than two hosts exist.



- In the mutual standby configuration, since both hosts operate as the active hosts, no resources exist that become unnecessary during normal processing. On the other hand, however, during a backup operation the disadvantages are caused that performance deteriorated and that the software configuration becomes complex.
- This subsystem is scheduled to support VERITAS Software FirstWatch, Hewlett-Packard MC/ServiceGuard, and IBM HACMP.

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8.2 HA Software

This subsection describes about HA configuration with SCSI I/F and FIBRE I/F.
The following list shows alternate link and HA software for each hosts. It is necessary to set Host Mode by using SVP, when changing a host system.
The meaning of each mode are follows.

MODE 00 : standard mode (FAST)	MODE 10 : standard mode (ULTRA)
MODE 01 : I-7135 host mode (FAST)	MODE 11 : I-7135 host mode (ULTRA)
MODE 02 : NCR host mode (FAST)	MODE 12 : NCR host mode (ULTRA)
MODE 03 : Do not use.	MODE 13 : Do not use.
MODE 04 : Page 80h, 83h (FAST)	MODE 14 : Page 80h, 83h (ULTRA)
MODE 08 : HP host mode (FAST)	MODE 18 : HP host mode (ULTRA)
MODE 09 : VxVM-DMP mode (FAST)	MODE 19 : VxVM-DMP mode (ULTRA)

MODE 0C : PC Server host (Microsoft Cluster Server) mode (FAST)
MODE 1C : PC Server host (Microsoft Cluster Server) mode (ULTRA)
MODE 0A : Netware host mode (FAST)
MODE 1A : Netware host mode (ULTRA)
others : Reserved

Please see “SCSI I/F Configuration” (INST05-591 to INST05-599). Also see the operational manual for more detailed information about the alternate link and HA software.

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Table 8-1 Features of HA software (SCSI)

Host system	Sun	HP	IBM
OS	Solaris 2.5/2.6	HP-UX 10.2/11.0	AIX 4.1.4/4.2
Server	Ultra Enterprise series SPARC series	HP9000 server HITACHI9000V server	RS/6000
Maximum LUNs without I/O Path Switch	120LUN/path 1024LUN/RAID	120LUN/path 1024LUN/RAID	120LUN/path 1024LUN/RAID
Maximum LUNs with I/O Path Switch	120LUN/path 1024LUN/RAID	120LUN/path 1024LUN/RAID	21LUN/path 762LUN/RAID
Maximum concurrent active LUNs without LUSE volume	64LUN/path	64LUN/path	64LUN/path
Maximum concurrent active LUNs with LUSE volume	16LUSE LUN + 16nonLUSE LUN/path	16LUSE LUN + 16nonLUSE LUN/path	16LUSE LUN + 16nonLUSE LUN/path
Alternate Link (Host Mode)	—	Alternate-Link (MODE : 00/10 or 08/18) *2	I-7135 emulation (MODE : 01/11)
HA software	First Watch *1	MC/Service Guard *1 (MODE : 08/18) *2	HACMP *1

NCR	Sequent	PC server
SVR4	Dynix PTX	Windows NT 4.0
World Mark server	NUMA-Q	PC server
—	120LUN/path 1024LUN/RAID	120LUN/path 1024LUN/RAID
12LUN/path 192LUN/RAID	56LUN/path 168LUN/RAID 21LUN/server	120LUN/path 1024LUN/RAID
12LUN/path	64LUN/path	64LUN/path
12LUN/path	16LUSE LUN + 16nonLUSE LUN/path	16LUSE LUN + 16nonLUSE LUN/path
RDAC *1 *3 (MODE : 02/12)	MULTIPASS (MODE : 04/14)	—
—	Cluster Control S/W *1	Microsoft Cluster Server (MODE : 0C/1C) *4

*1 It is necessary to purchase these software in addition to the operating system.
*2 HOSTMODE 08 or 18 is available in DKCMAIN 52-40-xx or higher.
*3 RDAC must be installed to NCR server and HOSTMODE of related port must be set to 02 or 12 when DKC310 is connected to NCR.
Maximum concurrent active LUNs : Maximum number of LUNs which I/O jobs can be executed concurrently
*4 Apply this mode from DKCMAIN version of 52-42.

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Table 8-2 Features of HA software (Fibre)

Host system	Sun	HP	PC server
OS	Solaris 2.6	HP-UX 10.2/11.0	Windows NT 4.0
Server	Ultra Enterprise series SPARC series	HP9000 server HITACHI9000V server	PC server
Maximum LUNs without I/O Path Switch	120LUN/path 1024LUN/RAID	8LUN/path 128LUN/RAID	32LUN/path 512LUN/RAID
Maximum LUNs with I/O Path Switch	120LUN/path 1024LUN/RAID	8LUN/path 128LUN/RAID	8LUN/path 512LUN/RAID
Maximum concurrent active LUNs without LUSE volume	64LUN/path	64LUN/path	64LUN/path
Maximum concurrent active LUNs with LUSE volume	16LUSE LUN + 16nonLUSE LUN/path	16LUSE LUN + 16nonLUSE LUN/path	16LUSE LUN + 16nonLUSE LUN/path
Alternate Link (Host Mode)	—	Alternate-Link (MODE : 08/18) *2	—
HA software	First Watch *1	MC/Service Guard *1 (MODE : 08/18) *2	Microsoft Cluster Server (MODE : 0C/1C) *3

*1 It is necessary to purchase these software in addition to the operating system.
*2 HOSTMODE 08 or 18 is available in DKCMAIN 52-40-xx or higher.
*3 Apply this mode from DKCMAIN version of 52-42.

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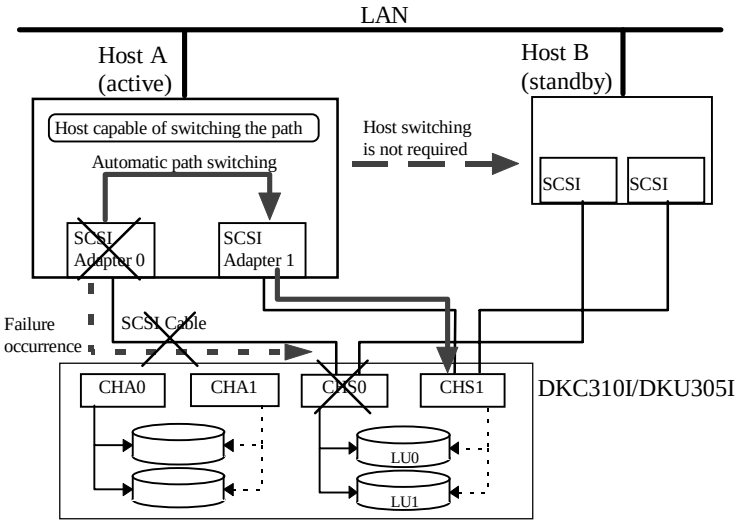
8.3 Configuration Using Host Path Switching Function

When the host is interlocked with the HA software and has a path switching capability, if a failure occurs in the SCSI adapter, SCSI cable, or DKC (SCSI ports and the CHS) that is being used, automatic path switching will take place as shown below.



The path switching function enables processing to be continued without host switching in the event of a failure in the SCSI adapter, SCSI cable, array controller, or other components.

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8.4 Procedures for online microprogram exchange and CHS/CHF replacement using alternate path

8.4.1 Outline

The alternate path function enables a microprogram exchange and a CHS/CHF replacement without stopping an I/O operation of the host connected to the CHS and CHF (that is, online exchange/replacement).

8.4.2 Prior confirmation of alternate path

An alternate path must be correctly established and the path switching must function at the time of exchange/replacement in order to exchange a microprogram or replace the CHS/CHF during online operation. Confirm the path state by asking an SE concerned or a customer.
See "Procedures for Confirming Alternate Path State and Recovering It" shown in Table 1.

8.4.3 Types of microprogram exchange

For HP-UX, Solaris, and Windows NT:	STOP SCSI mode
For AIX:	Alternate SCSI Path mode

8.4.4 Notes on the exchange/replacement executed on AIX

Concerning the microprogram exchange:	Manual transfer (host operation) of LDEV owner's right is required.
Concerning the CHS/CHF replacement:	Manual transfer (host operation) of LDEV owner's right may be required.

8.4.5 Restrictions

(1) Online exchange/replacement is possible only when the alternate path is correctly set.
(2) Online exchange/replacement is possible when both primary and alternate paths are normal. If the path state is abnormal, recover it to be normal, then perform the online exchange/replacement.
(3) An alternate path function cannot be used with respect to HMDE volume.
Disable I/Os to the HMDE volume concerned when exchanging a microprogram or replacing the CHS/CHF.
(4) Disable I/Os to the LDEV for which the alternate path is not set.
(5) The microprogram exchange on HP, SUN, or Windows NT is executed in the Stop SCSI mode and on AIX, in the Alternate SCSI Path mode. When HP, SUN, or Windows NT and AIX coexist on the same DKC, determine the mode to be either the Stop SCSI mode or the Alternate SCSI Path mode in which to exchange a microprogram, and disable I/Os of a platform in the other mode before exchanging a microprogram.
(6) In the case of the Dual Active configuration, a load may concentrate on one of the two paths during the microprogram exchange or CHS/CHF replacement. Take preventive measures against it such as to choose a period (time zone) when the host load is low to perform the online exchange/replacement.
(7) In the 7135 emulation mode, when the DKC power was turned off and then on, confirm the status of the 7135 controller using the "smit" command. If it is not ACTIVE, the "diag" command must be executed.

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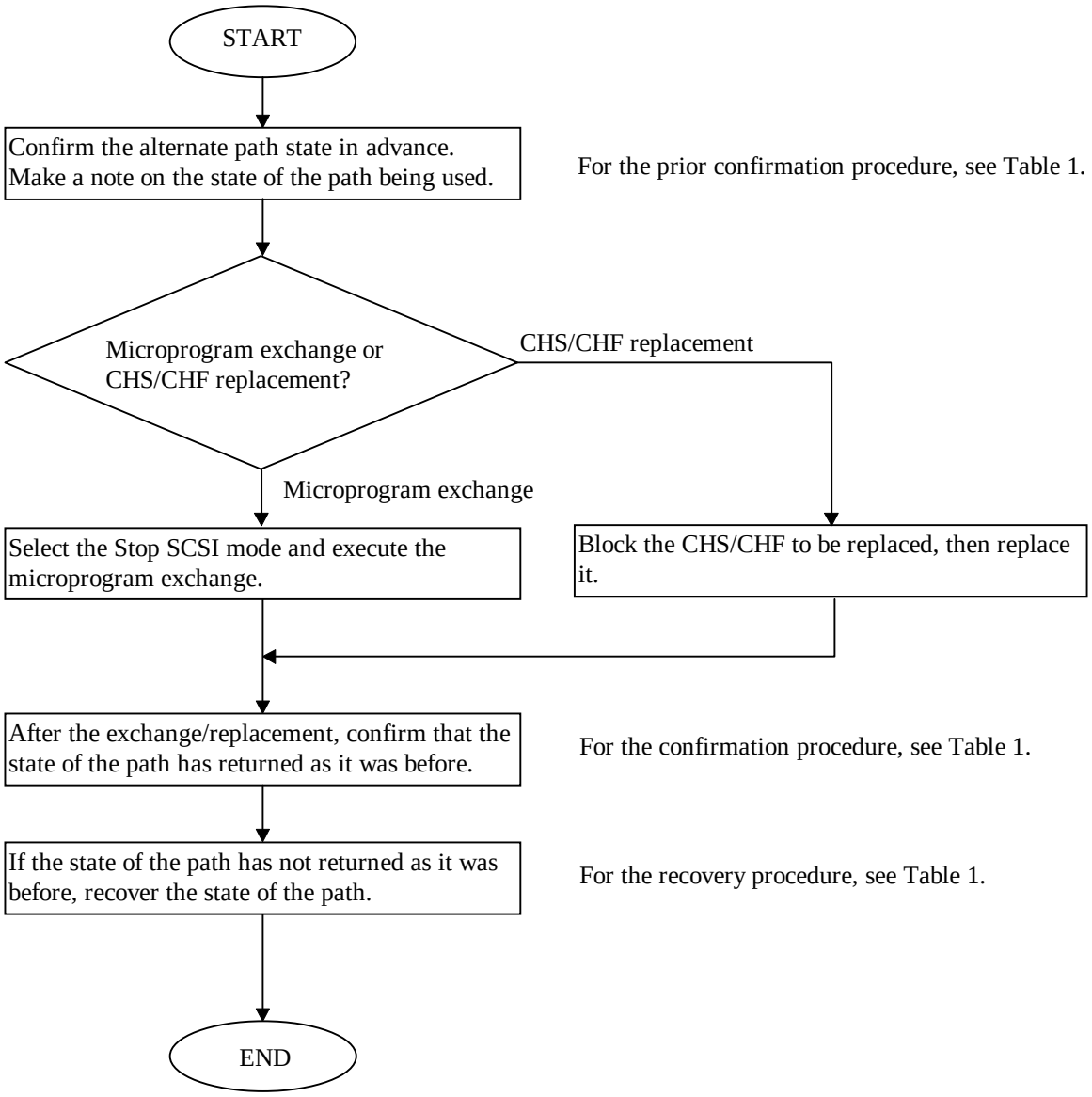
8.4.6 Procedures for online microprogram exchange and CHS/CHF replacement

(1) Procedures for microprogram exchange or CHS/CHF replacement executed on HP-UX, Solaris, or Windows NT



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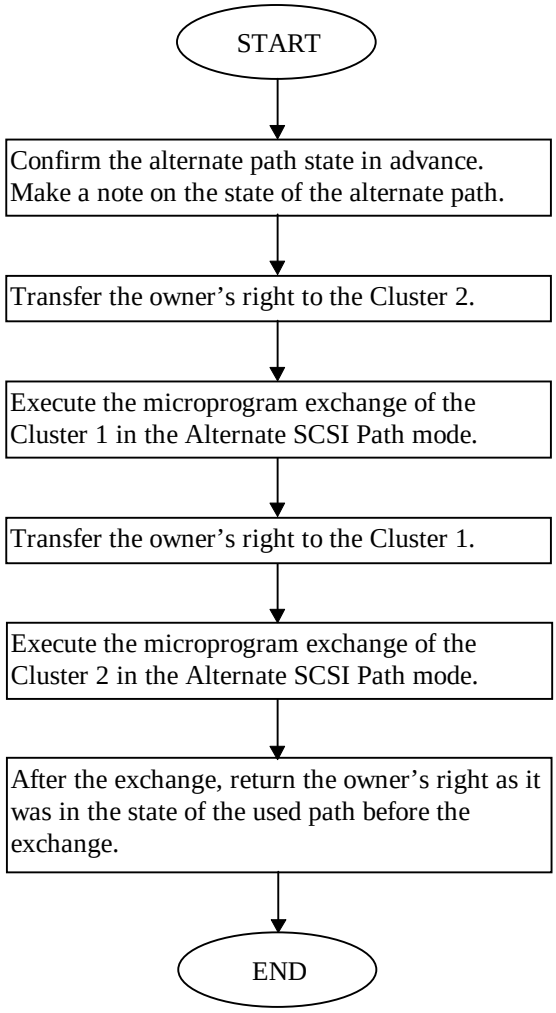
(2) Procedure for microprogram exchange executed on AIX



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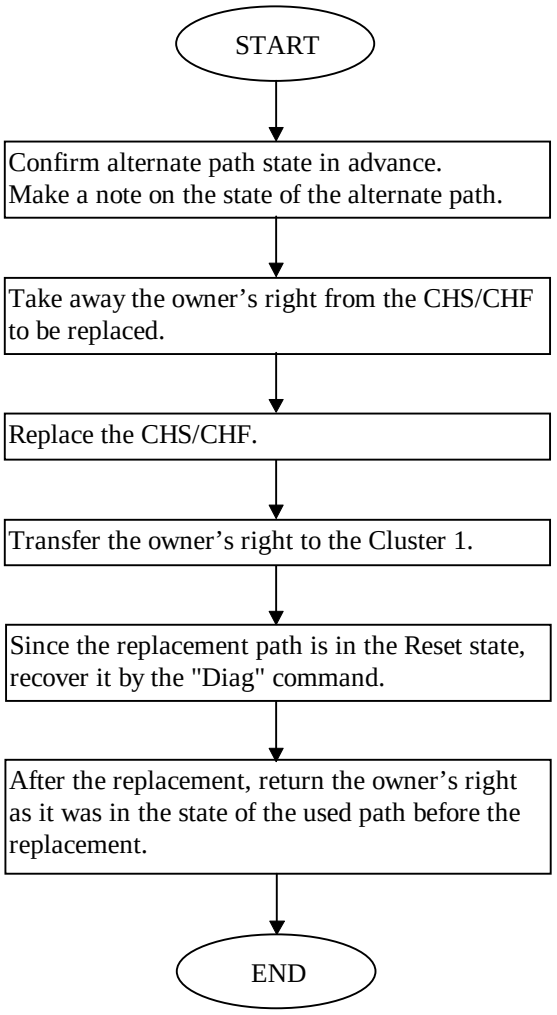
(3) Procedure for CHS/CHF replacement executed on AIX



In the case of the Cluster 1,
transfer the owner's right to the Cluster 2.
In the case of the Cluster 2,
transfer the owner's right to the Cluster 1.

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Table 1 Procedures for Confirming Alternate Path State and Recovering It (1 of 2)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
1	HP	Display and confirm the path states (Pstates) of all the devices (LUs) by the "vgdisplay-v" command. If "PV Name" is displayed as Alternate Link, the path has been switched to the alternate path.	Automatic recovery Display and confirm the path states (Pstates) of all the devices (LUs) by the "vgdisplay-v" command.
2	Sun	Display and confirm the path states (Pstates) of all the devices (LUs) by the "safemt-d all" command of SafePath. Perform one of the following operations depending on the path state. • Failed: The path is faulty. (Or, after the microprogram exchange or CHS/CHF replacement, the path concerned has not been recovered yet.) After recovery from the failure, check it again according to this procedure. • Other states (Active and Standby, or Downed): After recording this state, execute the microprogram exchange or CHS/CHF replacement. Note: If there is at least one failed path, do not execute the online microprogram exchange or CHS/CHF replacement. Be sure to execute the exchange or replacement after recovering the failure.	Step ①: Display and confirm the path state (Pstate) of each device (LU) by the "safemt-d all" command of SafePath. Perform one of the following operations depending on the path state. • Downed: The path has been recovered but is not used. Go to steps ② and ③ to make the path usable. • Active and Standby: The state is normal. Steps ② and ③ are not required (that is, end of the procedure). • Failed: The path is faulty. After the microprogram exchange or CHS/CHF replacement, execute the procedure again from step ① after the path is recovered. Or, recover the path failure, then execute the procedure again from step ①. Step ②: Make the path in the Downed state usable by the "safemt - r *n*" command. Format: safemt -r *n* *n* is the channel number (a number which follows "c" of the target "cnt0d0s0" in the Downed state). It is enough if the above is executed once for the same *n*. Step ③: Confirm that all the paths are in the Active or Standby state (initial state) by the "safemt -d all" command. If the path in the Downed state remains, execute the procedure again from step ②.

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Table 1 Procedures for Confirming Alternate Path State and Recovering It (2 of 2)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
3	Windows NT	Open the "SafePath Administrator" and confirm the path states of all the devices (LUs). Perform one of the following operations depending on the path state. • Active and Standby: The state is normal. After recording this state, execute the microprogram exchange or CHS/CHF replacement. • Failed: The path is faulty. (Or, the path concerned has not been recovered yet after the microprogram exchange or CHS/CHF replacement.) After recovering the failure, confirm the state again according to this procedure. • Other states: After returning the state to the Active and Standby, record the state, and execute the microprogram exchange or CHS/CHF replacement. Note: If there is at least one failed path, do not execute the online microprogram exchange or CHS/CHF replacement. Be sure to execute the exchange or replacement after recovering the failure.	Open the "SafePath Administrator" and perform the operation according to the following procedures. Step ①: Confirm the state of each path. Perform one of the following operations depending on the path state. • Active and Standby: The path has been recovered. Go to step ②. • Failed: The path is faulty. After the microprogram exchange or CHS/CHF replacement, execute the procedure again from step ① after the path is recovered. Or, recover the path failure, then execute the procedure again from step ①. Step ②: Select the Rebalance command (Rebalance in the Tools menu). With this, confirm that the state has returned as it was before the microprogram exchange or CHS/CHF replacement.
4	AIX	Confirm by the "smit" command using the "Device" - "Disk array" - "RAIDiant disk array" - "Disk array rooter configuration" - "List disk array rooter configuration" menu. If the state has been changed from "Active" to "Reset" and "Passive", a failure has occurred in the path.	Issue the "Diag" command, select resources which is in the Reset and Passive state from "Diagnostic Routines" - "System Verification" - "Diagnostic Selection" by the commands on the left and commit them.

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8.4.7 Exchange CHF for CHT

Procedure to exchange CHF for CHT in DKC is shown in the following.

<SUMMARY>
It is possible to exchange CHF for CHT by doing De-install of CHF in DKC, and doing Install CHT for the equal location.

Note
Because definition information of HORC, HOMRCF and LUN Security can not be collected backup data, write it down in a notes and so on.

<DETAILED PROCEDURE>
STEP1. Verify microprogram version and perform microprogram version up to 52-38-77 or later.
STEP2. Take the backup data of SCSI path definition information in HD of SVP.
Select the [OK] button in SCSI Path-LDEV Configuration window.
Select [OK] in response to the confirmation message “Do you want to make backup files SCSI path information?”

STEP3. Because definition information of HORC, HOMRCF and LUN Security can not be collected backup data, write it down in a notes and so on.

STEP4. Delete SCSI path definition of CHF that is exchanged for CHT. And you must not collect backup data of SCSI path definition information in HD and FD.

Note **The reason for not colecting the back-up in HD and FD.**
At this step backup data of SCSI path definition Information of STEP 2 is collected in HD and FD. And the substitute saving backup data in HD and FD would not be performed in order to preserve backup data in HD and FD. When you collect backup data, backup data of SCSI path definition Information in point of time which collect backup data.

Note **How to avoid to collect backup data**
1. Select [OK] in response to the confirmation message “Please insert config FD in FDD”.
2. Select [Cancel] in response to the confirmation message “Back up is failed. Please insert correct FD” without inserting config FD in FDD.

STEP5. Perform De-install for the CHF with leaving more than a pair of PCB (CHA, CHS, CHF, CHT). Because All PCB in DKC310 can not be performed De-install for. And you must not collect backup data of SCSI path definition information in HD and FD.

STEP6. Install the CHT to the location that the De-installed CHF was installed to. And you must not collect backup data of SCSI path definition information.

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STEP7. Restore SCSI path definition information in SCSI Path-LDEV Configuration window. And collect backup data in HD and FD.

STEP8. If definition information of HORC, HOMRCF and LUN Security are written down in a notes and so on, set up definitions of that by descriptions that definition information of HORC, HOMRCF and LUN Security are written down in.

<Example of exchanging CHF for CHT is following>

1. The case in which more than a pair of CHF and more than a pair of PCB (CHA, CHS, CHT) are installed in DKC310
   ① Performed De-install for more than two pair of CHF at once.
   ② Install number CHT equal to De-installed CHF to the location that the De-installed CHF was installed to at once.
2. The case in which more than two pair of CHF are installed in DKC310.
   ① Execute STEP1, STEP2 and STEP3.
   ② By leaving a pair of CHF, delete SCSI path definition of all other CHF. And perform De-install for that.
   ③ Install number CHT equal to De-installed CHF in ② to the location that the De-installed CHF was installed to at once.
   ④ Delete SCSI path definition of leaving a pair of CHF in ② and perform De-install for that.
   ⑤ Install a pair of CHT to the location that the pair of De-installed CHF in ④ was installed to.
   ⑥ Execute STEP7 and STEP8.

Note You must not collect backup data of SCSI path definition information in ② to ⑤.

3. The case in which only a pair of CHF is installed in DKC310, procedure is shown as following.
   ① Prepare a pair of dummy PCB (CHA, CHS, CHF, CHT).
   ② Execute STEP1, STEP2 and STEP3.
   ③ Install a pair of dummy PCB that is prepared in ① to empty location.
   ④ Delete SCSI path definition of the pair of CHF that is installed form beginning and perform De-install for it.
   ⑤ Install a pair of CHT to the location that the pair of De-installed CHF in ④ was installed to.
   ⑥ Perform De-installation for the pair of dummy PCB.
   ⑦ Execute STEP7 and STEP8.

Note You must not collect backup data of SCSI path definition information in ③ to ⑥.

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9. Multiplatform installation procedure

9.1 Product category

(1) Multiplatform : any configuration permitted.
CHA only,CHA+CHS,CHA+CHF,CHA+CHS+CHF,CHS only,CHF only,CHS+CHF

(2) Open only : open configuration permitted, mainframe configuration not permitted.
CHS only,CHF only,CHS+CHF

Table 9-1 Multiplatform product category

No	Product category	Configuration
1	Multiplatform	Channel only
2		CHA+CHS
3		CHA+CHF
4		CHA+CHS+CHF
5		SCSI only
6		FIBRE only
7		SCSI+FIBRE
8	Open only	SCSI only
9		FIBRE only
10		SCSI+FIBRE

(3) FD configuration

Table 9-2 FD configuration of Multiplatoform and Open only product

FD Kind	Multiplatform		Open only		
	# of FD	FD No.	difference	# of FD	FD No.
Setup installer	1	1	←	1	1
DKCMAIN	12	2-13	←	12	2-13
SVP	3	14-16	←	3	14-16
LCP/MCP/LCDG	1	17	←	1	17
CUDG4	1	18	←	1	18
DKU306/DKU308 /DKU309/DKU3F1	3	19-21	←	3	19-21
SSVP	1	22	←	1	22
RAM BOOT	1	23	←	1	23
CONFIG	1	24	Open only configuration support	1	24

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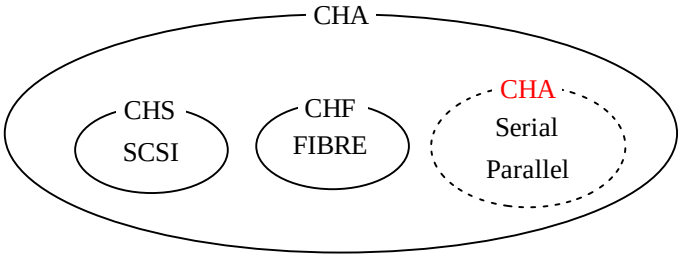
(4) Terminology

-CHS is abbreviation of CHA for SCSI and CHF is abbreviation of CHA for FIBRE.
-8 port SCSI adapter DKC-F310I-8C is one kind of channel option of DKC310.
-4 port FIBRE adapter DKC-F310I-4F is one kind of channel option of DKC310.
-8 port SCSI adapter is called as “CHA” or “CHS”.
-4 port FIBRE adapter is called as “CHA” or CHF“.
-“CHS” is used in this manual to point SCSI adapter especially.
-“CHF” is used in this manual to point FIBRE adapter especially.
-“CHA” is used for general term for channel adapter in this manual.
-“CHA” could be used to point ESCON or METAL mainframe channel adapter.



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(5) Note

(a) In most case, CHS and CHF will be blocked.
But if power events are reported for all installed PCBs, ignore and proceed with this procedure.
In new installation, the Disk Subsystem starts up with the configuration data stored on the FM of one representative MP. In this case, the configuration data of the representative MP may not equal to the physical configuration of the Disk Subsystem and some MPs might be blocked by PCB type unmatch and SIM Reference Code=ffe800 might be reported.
It is not problem but expected in Multiplatform new installation. If power events of all installed MPs are reported and SUB-SYSTEM ALARM LED is not lit, ignore MP being blocked and SIM Reference Code 3073xx, ffe800, ffe700 and proceed the procedure. The Define Configuration and Install procedure at step(34) will successfully complete and all installed MPs will become normal status.

(b) Don't forget to install RAID5 booster.
If RAID5 booster is not installed, WCHK1 might occer.
SSB EC=0008 will be reported one times per each blocked MP and SIM Reference Code=3992xx will be reported once per Disk Subsystem when RAID5 booster is not installed.

(c) DKC ready lamp control for CHS and/or CHF only configuration
-DKC ready lamp is lit at P/S on timing when all LDEV status become normal or correction access.
-DKC ready lamp will be lit after LDEV formatting for new installation.
-If some LDEV is blocked by some reason, DKC ready lamp will not be lit. Please recover the blocked LDEV at this case.
-DKC ready lamp turning off control is same as before. DKC ready lamp will not be off when LDEV become blocked.

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9.2 Multiplatform installation general flow

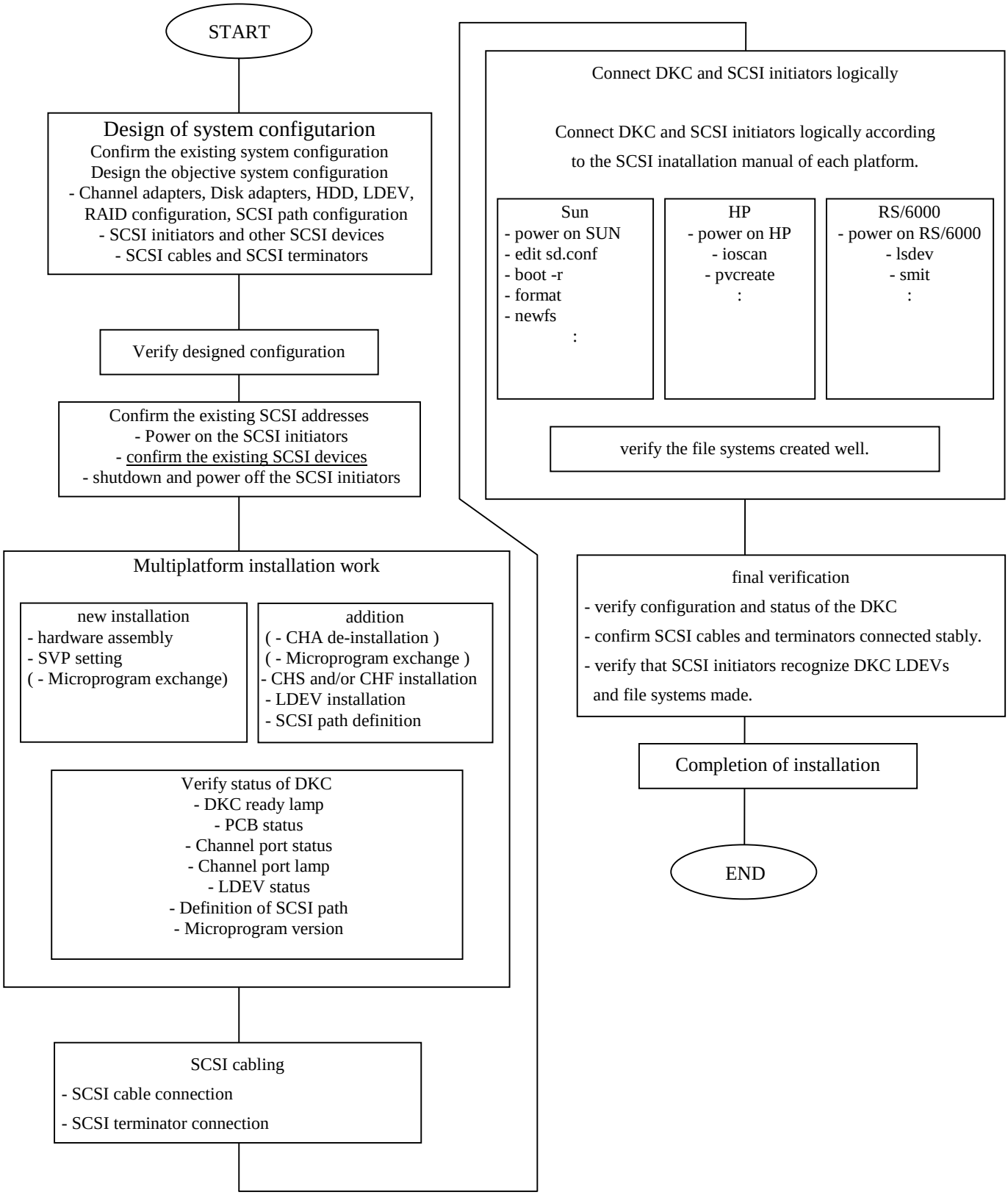

Fig. 9-1 Multiplatform installation general flow

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9.3 Installation procedure

9.3.1 Kinds of installation

Table 9-3 Installation procedure

No	install category	product category	Base system	Target system	Procedure
	New installation	Multiplatform	-	CHA+CHS	See 9.3.3
			-	CHA+CHS+CHF	See 9.3.3
			-	CHA+CHF	See 9.3.3
		Open only	-	CHS	See 9.3.3
			-	CHF	See 9.3.3
			-	CHS+CHF	See 9.3.3
	Addition	Multiplatform	Mainframe only	CHS addition	See 9.3.2
			Mainframe only	CHF addition	See 9.3.2
			Mainframe only	CHS+CHF addition	See 9.3.2
			CHA+CHS	CHF addition	See 9.3.2
		Open only	CHS only	CHF addition	See 9.3.2

9.3.2 Addition of CHS or CHF

Installation procedure of CHS or CHF to existing Disk subsystem is shown below.

Step 1: Verify current microprogram version of the target Disk subsystem.
Step 2: Confirm correct microprogram version to be installed that supports CHS or CHF.
Step 3: Execute microprogram exchange according to the correct ECN.
Step 4: Install CHS or CHF.
Step 5: Install LDEV.
Step 6: Add SCSI path definition for CHS or CHF.
Step 7: Check the configuration, status and microprogram version of the Disk subsystem.
Step 8: Completion of work

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9.3.3 Multiplatform new installation

Multiplatform and Open only Subsystem can be installed by ordinary new installation procedure.
Go to page INST02-10 2.1 New Installation Procedure General Flow.

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10 Note on ULTRA SCSI

DKC310 support ULTRA SCSI 40MB/sec data transfer. This section describes specification about ULTRA SCSI and how to use ULTRA SCSI transfer feature.

10.1 Condition

- DKC micro-program should support ULTRA SCSI. If not, micro-program should be changed.
- HOST MODE of SCSI port should be set to 0x1X by SVP to work the port in ULTRA mode.
- SCSI host should support ULTRA mode. Platform, operating system, SCSI host adapter, or some other setting should be suitable for ULTRA mode.

10.2 Micro-program level

DKCMAIN version	ULTRA SCSI
52-34-xx or lower	not supported
52-35-xx or higher	supported

10.3 Transfer mode by host and DKC SCSI port mode

host	DKC SCSI port	transfer mode
FAST	FAST	FAST
ULTRA	FAST	FAST
FAST	ULTRA	FAST
ULTRA	ULTRA	ULTRA

10.4 HOST MODE

- HOST MODE 0X : FAST transfer and emulation mode X
- HOST MODE 1X : ULTRA transfer and emulation mode X

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10.5 How to use ULTRA SCSI transfer feature

10.5.1 Procedure to use ULTRA SCSI

Step 1 : Confirm micro-program support ULTRA SCSI. If not, execute micro-program exchange to ULTRA SCSI support micro-program version.
Step 2 : Set HOST MODE of the SCSI port to ULTRA support mode 1X.
X should be determined by emulation mode.
Step 3 : Setup SCSI host for ULTRA transfer if necessary.

10.5.2 Example of ULTRA SCSI installation

(Example of Windows NT)

DKC	PC (Windows NT)
	Stop I/O and shutdown the PC.
Micro-program exchange HOST MODE set	
	Reboot PC. Set ULTRA mode by SCSI board utility. Restart I/O.

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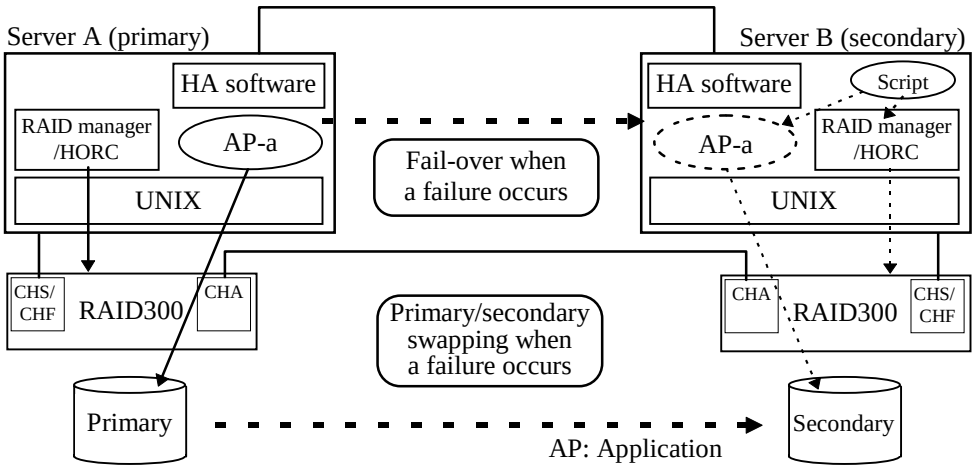
11 HORC (Hitachi Open Remote Copy)

11.1 Overview

The Hitachi Open Remote Copy function can remotely duplicate data (volumes) under the control of the subsystem by directly connecting the two RAID300s. A backup system against disasters can be constructed by installing one of the two RAID300s at the main site and the other at the recovery site and configuring the HA cluster on the server side by means of the HA (High Availability) software. This function also enables the two volumes containing identical data to be used for different purposes by duplicating data (volumes) within the same RAID300 or between the two RAID300s and separating the volumes in a primary-and-secondary relation at any time.
An online database can be backed up or batch programs can be executed while the database is being accessed.
The HORC makes various settings and it controls operations by means of the RAID manager/HORC, which runs on the open system. The RAID manager/HORC provides various commands for user applications to control the HORC functions. Creation of a user shell script using these commands enables the HORC control being interlocked with server's fail-over executed by the HA software.

Outline of HORC Function and Example of Application to HA Configuration
(Hot Standby Configuration)



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11.2 Basic Specifications

Basic HORC specifications are shown below.

Basic Specifications of HORC

No.	Item	Description	Remarks
1	Host interface on open system side	Fast/Wide SCSI	
		Ultra/Wide SCSI	supporting for Win/NT only
		Fibre Channel	supporting for HP-UX, Solaris, Win/NT and AIX4.2
2	Supporting platform	HP-UX10.20, HP-UX11.0, Solaris2.5/2.6, AIX4.2, AIX4.3, Windows/NT 4.0, Digital UNIX V4.0 Dynix 4.4.4 Netware 4.11	
3	Connection between the CUs	ESCON	
4	Means for setting the paired LU	Command instruction from the RAID Manager/HORC	RAID Manager does not support for Netware
		Remote console	
		SVP	
5	Number of LUs capable of the duplicated writing	Maximum 1023 pairs	
6	LU size capable of the duplicated writing (The paired VOL must be the same DEV type.)	OPEN-3 (2.4GB)	
		OPEN-8 (7.3GB)	
		OPEN-9 (7.3GB)	
		LUSE	
		OPEN-K (1.8GB)	
		CVS Volume	
7	Duplicated writing mode	Synchronized	
8	Combination of the CUs	One-to-one correspondence N-to-one correspondence one-to-N correspondence	
9	Fence level	Data, Status, Never	Supports a function equivalent to the MF HRC.
10	Number of ESCON paths between the CUs	Maximum 4 paths per CU	
11	Multiple CUs support	Yes	For CU#0 through CU#3, HORC pairs can be created.
12	Control of the MF HRC and the open HRC in DKC mixture	Can be mixed	

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(1) Means for setting the paired LU:
The following three means are provided.
- Command instruction from the RAID Manager/HORC
- Instruction from the remote console
- Instruction from the SVP

Not only the pairing but also a series of pair state changes are possible by using these three means. However, the user can use two means only: the command instruction from the RAID Manager/HORC and the instruction from the remote console.

(2) LU size capable of the duplicated writing:
OPEN-3, OPEN-8, OPEN-9 and LUSE are supported as the LU sizes capable of the duplicated writing. Provided that the paired VOL must be the same track format and same capacity.

(3) Fence level:
The HORC, alike the HRC, supports three types of fence level: Data, Status, and Never.

(4) Control of the HRC pairs and the HORC pairs mixture:
Control of the mixture of the HRC pairs and the HORC pairs is possible within the one DKC.

(5) R-VOL (secondary VOL) access:
① An RD access to the secondary VOL is permitted to accept the RD command issued to the label when the secondary server is started.
② In order to support the DataPlex function, write access to the secondary VOL is permitted on condition that the pair is being suspended.
Using the RAID Manager/HORC or SVP, you can indicate the permission of write operation to R-VOL. After this indication, if the server performs any write operation to R-VOL, in Pair Resync (Resume) operation all tracks on M-VOL will be copied to R-VOL.
If using SVP, the permission of write operation to R-VOL is executed by setting “R-VOL write Enable” on Suspend Pair display in the indication of R-VOL Suspend on MCU.
Also, you can confirm using RAID manager/HORC or SVP whether “R-VOL write Enable” on R-VOL is permitted or not.

(6) HMBR function for the HORC paired VOL
The HMBR function for the HORC pair is supported.
Note that restore from the mainframe for the HORC pair must be done after putting the pair state into the simplex state.
(This is because duplicated writing function on the main frame side for the OPEN VOL, which is in the pair state, does not exist)

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◆Restrictions:

(1) Command device:

① The HORC provides users with a command to enable a state change and status display of the HORC pair from the server.

② Assign a special LUN called a command device so that the RAID300 can receive this pair state change and pair status display commands.

③ Users cannot use the command device. A command device with a capacity of 2.4GB within the subsystem cannot be used (when the OPEN3 is assigned as a command device). If you install the micro version supporting CVS function for Open volume, you can specify CVS volume as command device. In this case, the minimum capacity of command device is 36MB.

④ Use the SVP to specify the command device.

(2) Flashing updated data in the server

When the HORC is used as a DataPlex function, split the primary/secondary paired VOL. A Sync command or the like must be issued before splitting it and a file system buffer must be flashed when acquiring a backup from the secondary VOL. Thus, the latest backup can be acquired.

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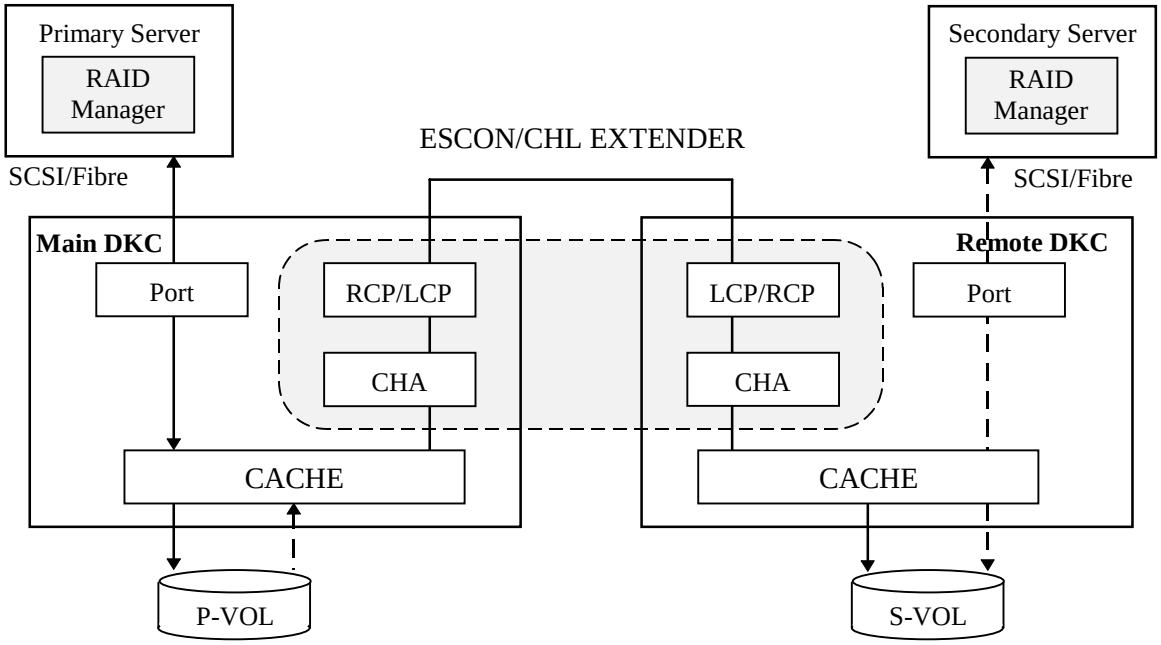
11.3 HORC Asynchronous

11.3.1 The outline of HORC ASYNC

- The asynchronous copy mode of HORC (HORC ASYNC) is supported in addition to HORC synchronous copy mode (HORC SYNC).
- The hardware for HORC ASYNC is the same as that for the existing HORC SYNC. Figure 1 shows the hardware for HORC ASYNC.
- In the same way as that of the HORC SYNC, various copying control is performed by use of the control logic micro-program of the MF ASYNC and the hardware configuration.
- To realize the asynchronous copying, a constituent element called consistency group is defined in the same way as that of the MF ASYNC.



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11.3.2 Product Specifications

Table 1 shows the product specifications summary.

Table11.3.2-1 Product Specifications

No.	Items	Contents	Remarks
1	Supported platforms	HP-UX WindowsNT Solaris AIX NetWare	RAID Manager is not supported for NetWare.
2	Host interface	SCSI/Fibre	Only Tachyon is available for Fibre interface.
3	Connection between MCU and RCU	ESCON, Channel extender	
4	The means of HORC pairs control	RAID Manager	
		Remote console	
		SVP	
5	The number of HORC pairs	Up to 1023 pairs	
6	Supported emulation types	OPEN-3	
		OPEN-9	
		OPEN-8	
		LUSE	
		OPEN-K	
		CVS	
7	Copy mode	SYNC, ASYNC	
8	Coexistence of M-VOL and R-VOL within a DKC	Yes	
9	The relation of MCU and RCU	1:1	
10	The number of connecting paths between MCU and RCU	up to 4 per CU	

(1) Consistency Group

- In the cases of the HORC and ASYNC, although a copying into the R-VOL is performed asynchronously with the host I/O, the consistency of the writing sequence extending over the multiple M-VOLs is assured (data written later will not be copied earlier). Further, a function for multiple pairs, such as that to suspend the multiple pairs retaining the consistency of the writing sequence when a failure occurs, is provided. A group of pairs which is an object to be controlled by the HORC and ASYNC like this is called a consistency group.
- The MCU and RCU support the multiple consistency groups. All the HORC and ASYNC pairs belong to one consistency group.
- The number of consistency groups is up to 16.

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(2) MCU and RCU
- The relation between the MCU and RCU is specified as 1:1. The relation of 1:1 means that one consistency group does not extend over the multiple MCUs or RCUs.
- Both the MCU and RCU must be the RAID300.

(3) The connections between MCU and RCU
- As the connection between the MCU and RCU, the ESCON direct connection (not longer than 43 km) and the extender connection (CNT Extender + communication line) are supported.
- The number of connecting paths between the MCU and RCU is up to four per CU.

(4) Host interface
- SCSI and fibre channel are supported. Concerning the fibre, Tachyon is supported.

(5) Supported emulation types
- The HORC ASYNC pairs can be created for OPEN-3, OPEN-9, OPEN-k, OPEN-8, LUSE, and CVS.
- Capacities of the M-VOL and R-VOL must be the same in the same way as that of the SYNC pairs.
- Any RAID level and the PDEV type are allowed.

(6) The number of pairs
- Up to 1023 pairs can be formed.

(7) Fence level
- The fence level existing in the current SYNC function does not exist in the ASYNC.
- In the case of the HORC ASYNC pair suspension, the same operation as that in the existing case of “Fence level = Never” is performed.

(8) Coexistence with the HORC SYNC functions
- The HORC SYNC function and the HORC ASYNC function can coexist in the MCU and RCU.
- The HORC ASYNC and SYNC cannot coexist for the same VOL.

(9) Coexistence with HOMRCF function
- Setting of the HOMRCF pair for the HORC ASYNC pair is possible on the conditions shown below.
- The main VOL of the HOMRCF can be set for the M-VOL and R-VOL of the HORC ASYNC pairs.
- When the HOMRCF is splitted, the M-VOL of the HORC ASYNC pair can be set for the remote VOL of the HOMRCF.

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(10) Coexistence with HRC ASYNC function

- Coexistence with the HRC ASYNC in the MCU and RCU is supported.
- However, it is necessary to use different consistency group for the HRC ASYNC pair and the HORC ASYNC pair respectively.
- The HRC ASYNC and HORC ASYNC can share the CU connection path in the same way as that of the current HORC SYNC. The side file is also shared.

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12 Online LUN installation

12.1 Overview

Online LUN installation feature makes it enable to add LUNs to DKC310 SCSI ports or FIBRE ports while I/Os are still running.
Some host operations are required before the added volumes are recognized and become usable from SCSI or FIBRE host operating systems.

12.2 Specifications

(1) General

1) Onine LUN installation feature is supported for SCSI interface and FIBRE interface.
   Firefly, Superfly and Tachyon fibre adapter are available.
2) Online LUN installation is supported. Online LUN de-installation is not supported.
3) Online LUN installation can be used only for SCSI ports and FIBRE ports on which SCSI paths are already existing.
   Use normal disruptive SCSI path configuration change feature when SCSI port or FIBRE ports do not have any existing SCSI paths.
4) HOSTMODE of SCSI ports or FIBRE ports can not be changed by Online LUN installation feature.
   Use normal disruptive SCSI path configuration change feature to change or set HOSTMODE.
5) Online LUN installation can not be used for SCSI or FIBRE ports which have 04(SEQUENT HOST MODE) or 14(SEQUENT HOST MODE + Ultra SCSI) for their HOSTMODE.
6) Online LUN installation can be executed by SVP or by Remote Console.
7) Some operating systems require reboot operation to recognize the newly added volumes.
8) It may take about 30 seconds to complete Online LUN installation.
9) When new LDEVs should be installed for Online LUN installation, install the LDEVs by SVP first. Then add SCSI paths by Online LUN installation from SVP or Remote Console.

(2) Supported feature

Online LUN installation feature provides the next two features.

1) Add new LUNs under existing target ID. (for SCSI ports and FIBRE ports)
2) Add new target IDs and new LUNs. (for SCSI ports)

(3) Volume type support

Volume types supported Online LUN installation are the same as already supported ones.
In case of IBM-7135, there are next two restrictions.

1) Add only new target IDs. (Target ID=0, 1, 2, 3, 4, 5)
2) Do not add new LUNs under existing target ID.

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(4) Platform support
Host Platforms supported for Online LUN installation are shown in Table 12-2.

Table 12-2 Platform support level.

Support level	SCSI	FIBRE
(A) Online LUN installation and Online LUN recognition.	Solaris, HP-UX, AIX, Digital UNIX, IBM-7135, UNIX SVR4	Solaris, HP-UX, AIX
(B) Online LUN installation only. Reboot is required before new LUN are recognized.	WindowsNT, OS/2, LINUX	WindowsNT, LINUX
(C) Online LUN installation is not supported. Host must be shutdown before installing LUNs and then must be rebooted.	—	—

12.3 Operations

(1) Operations

Step 1: If there is not existing SCSI path on the ports, use normal disruptive operation.

Step 2: Confirm whether or not the initiator platform of the SCSI port or FIBRE port supports Online LUN installation with Table 12-2.
Support (A),(B) -> Go to Step 3.
Not support (C) -> Use normal disruptive SCSI path configuration change.

Step 3: If HOSTMODE must be change, then use normal disruptive operation.
If not go to Step 4.

Step 4: If HOSTMODE of the SCSI or FIBRE port is 04 or 14, use normal disruptive operation. If not, go to Step 5.

Step 5: Execute Online LUN installation from SVP or from Remote Console.

Step 6: Confirm whether or not the initiator platform of the SCSI port or FIBRE port supports Online LUN recognition with Table 12-2.
Support (A) -> Execute online LUN recognition procedures in Table 12-3.
Not support (B) -> Reboot host and execute normal install procedure.

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(2) Host operations
Host operations for Online LUN recognition are shown in Table 12-3.

Table 12-3 Online LUN recognition procedures outline for each platform

Platform	Online LUN recognition procedures
HP-UX	(1) **ioscan** (check device added after IPL) (2) **insf -e** (create device files)
Solaris	(1) **/usr/sbin/drvconfig** (2) **/usr/sbin/devlinks** (3) **/usr/sbin/disks** (4) **/usr/ucb/ucblinks**
AIX	(1) **Devices-Install/Configure Devices Added After IPL** By SMIT
Digital Unix	(1) **scsimgr -scan_all** (2) **sizer -n test** (test,test.devs. will be made on /tmp) (3) **cd /tmp** (change tmp directory) (4) **vi test.devs** (add /dev/ to head of test.devs file) (5) **chmod +x test.devs** (add executable attribute to test.devs file) (6) **cd /dev** (change dev directory) (7) **/tmp/test.devs**
UNIX SVR4	(1) **/user/sadm/sysadm/bin/mktable** (create device files) (2) **Start sysadm** (3) **Select Raid Manager** (4) **Select Redundant Path Manager** (5) **Select Maintain Path Configuration Tables** (6) **Select Rebuild RADC Configuration Tables**

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13 Online LUN de-installation

13.1 Overview

Online LUN de-installation feature makes it enable to delete LUNs to DKC310 SCSI ports or FIBRE ports while I/Os are still running.

13.2 Specifications

(1) General

1) Online LUN de-installation feature is supported for SCSI interface and FIBRE interface. Firefly, Superfly and Tachyon fibre adapter are available.
2) Online LUN de-installation can be used only for SCSI ports or FIBRE ports on which SCSI paths are already existing.
3) HOST MODE of SCSI ports or FIBRE ports can not be changed by online LUN de-installation feature.
4) Online LUN de-installation can not be used for SCSI or FIBRE ports which have 04(SEQUENT HOST MODE), 14(SEQUENT HOST MODE+Ultra SCSI) for their HOST MODE.
5) Online LUN de-installation can be executed by SVP or by Remote Console.
6) It may takes about 30 seconds to complete Online LUN de-installation.
7) When LUNs should be de-installed for Online LUN de-installation,stop Host I/O of concerned LUNs.
8) If necessary , execute backup of concerned LUNs.
9) De-install concerned LUNs from HOST.
10) In case of AIX, release the reserve of concerned LUNs.
11) In case of HP-UX and UNIX SVR4, do not delete LUN=0 under existing target ID.

(Note)
If Online LUN de-installation should be done without stopping Host I/O, or releasing the reserve, it would have failed. Then stop HOST I/O or release the reserve of concerned LUNs and try again. If Online LUN de-installation would have failed after stopping Host I/O or releasing the reserve, there is possibility that health check command from HOST is issued. At that time, wait about three minutes and try again.

(2) Supported feature

Online LUN de-installation feature provides the next two features.

1) Delete LUNs under existing target ID. (for SCSI ports and FIBRE ports)
2) Delete existing target ID. (for SCSI ports)

In case of IBM-7135, there are next two restrictions.

1) Do not delete LUNs under existing target ID.
2) Delete a pair of target ID.

(3) Volume type support

Volume types supported for Online LUN de-installation are the same as already supported ones.

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(4) Platform support
Host platforms supported for Online LUN de-installation are shown in Table 13-1.

Table 13-1 Support platform

Platform	OS	SCSI	Fibre
HP	HP-UX	○	○
SUN	Solaris	○	○
RS/6000	AIX	○	○
PC	WindowsNT	×	×
DEC	Digital UNIX	○	×
NCR	UNIX SVR4	○	×
IBM-7135	AIX	○	○
SEQUENT	DYNIX/ptx	×	×
OS/2	WARP (Ver.4)	×	×
LINUX	Redhat	×	×

(example) ○: support, ×: not support

13.3 Operations

(1) Operations

Step 1: Confirm whether or not the initiator platform of the SCSI port or FIBRE port supports Online LUN de-installation with Table 13.
Support :Go to Step 2.
Not support :Use normal disruptive SCSI path configuration change.

Step 2: If HOST MODE must be changed, then use normal disruptive operation.
If not, go to Step 3.

Step 3: If HOST MODE of the SCSI or FIBRE port is 04 or 14 use normal disruptive operation. If not, go to Step 4.

Step 4: Stop Host I/O of concerned LUNs.

Step 5: If necessary, execute backup of concerned LUNs.

Step 6: De-install concerned LUNs form HOST.

Step 7: In case AIX, release the reserve of concerned LUNs.
If not, go to Step 8.

Step:8 Execute Online LUN de-installation from SVP or from Remote Console.

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(2) Host operations
Host operations for LUN de-installation procedures are shown in Table 13-2.

Table 13-2 LUN de-installation procedures outline for each platform

Platform	LUN de-installation procedures
HP-UX	mount point:/01, volume group name:vg01 (1) **umount /01** (umount) (2) **vgchange -a n vg01** (deactive volume groups) (3) **vgexport /dev/vg01** (export volume groups)
Solaris	mount point:/01 (1) **umount /01** (unmout)
AIX	mount point:/01, volume group name:vg01, device file name:hdisk1 (1) **umount /01** (umount) (2) **rmfs -r" /01** (delete file systems) (3) **varyoffvg vg01** (vary off) (4) **exportvg vg01** (export volume groups) (5) **rmdev -I 'hdisk1' '-d'** (delete devime files)
Digital Unix	mount point:/01 (1) **umount /01** (umount)
IBM-7135	mount point:/01, volume group name:vg01, device file name:hdisk1 disk array controller name:dac0,dac1, disk array rooter name:dar0 (1) **umount /01** (umount) (2) **rmfs -r" /01** (delete file systems) (3) **varyoffvg vg01** (vary off) (4) **exportvg vg01** (export volume groups) (5) **rmdev -I 'hdisk1' '-d'** (delete devime files) (6) **rmdev -I** (delete disk controller) **rmdev -I 'dac1' '-d'** (7) **rmdev -I 'dar0' '-d'** (delete disk array rooter)
UNIX SVR4	mount point:/01 (1) **umount /01** (umount) (2) **Start sysadm** (3) **Select Raid Manager** (4) **Select Redundant Path Manager** (5) **Select Maintain Path Configuration Tables** (6) **Select Remove RDAC Pair from the Configuration tables**

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SSD OPTIONAL FUNCTION SECTION

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SSD Optional Function

Two SSD options explained below are provided. The respective options can be set and used independently, and naturally, when both options are used together, the performance can be improved much more.

- Customized Volume Size (CVS) option which allows to set a free volume size and reducing occurrences of waiting for host I/O issues
- Dynamic Cache Residence (DCR) option which improves the data access performance by making data at addresses in the specified area resident in the DKC cache

Contents

1. Customized Volume Size (CVS) Option

1.1 Outline ---------- SSDOPT01-10
1.2 Features ---------- SSDOPT01-10
1.3 Specifications ---------- SSDOPT01-30
1.4 Maintenance functions ---------- SSDOPT01-40

2. Dynamic Cache Residence (DCR) Option

2.1 Outline ---------- SSDOPT02-10
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2.3 Specifications ---------- SSDOPT02-40
2.4 Maintenance functions ---------- SSDOPT02-50
2.5 Notes on maintenance when DCR is used ---------- SSDOPT02-60
2.6 Effects of DKC failures on DCR ---------- SSDOPT02-60
2.7 Automatic cancellation of DCR ---------- SSDOPT02-60
2.8 Explanation of DCR cache and procedure for setting operation ---------- SSDOPT02-100

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1. Customized Volume Size (CVS) Option

1.1 Outline

As regards the main frame host, the multiplicity of an I/O request is restricted to one per volume because UCBs are mutually exclusive.
Therefore, when two or more files to which I/Os are applied frequently exist in the same volume, a contention for the logical volume occurs. If this occurs, the files mentioned above are stored separately in different logical volumes and an action is taken to avoid contention for access. (Or means to prevent I/Os from generation is required.)
However, the work for adjusting the file arrangement giving consideration to the accessing characteristic of the file will be a burden on users of the DKC and it is not welcomed by them.
To solve this problem, the Customized Volume Size (CVS) option is provided. (Hereinafter, it is abbreviated to CVS.)
The CVS provides a function for freely defining the logical volume size. By doing this, even in a storage system with the same capacity, the number of volumes can be increased easily. As a result, a file with a high I/O frequency can be easily allocated to an independent volume. That is to say, the trouble to consider a combination of stored files in a volume can be saved.

1.2 Features

- The contention for UCB in the main frame host can be avoided and the IOSQ time can be reduced.
- The capacity of the HDD can be fully used.
- By combining with the Dynamic Cache Residence (DCR) option, high performance equivalent to that of a semiconductor storage device can be realized.

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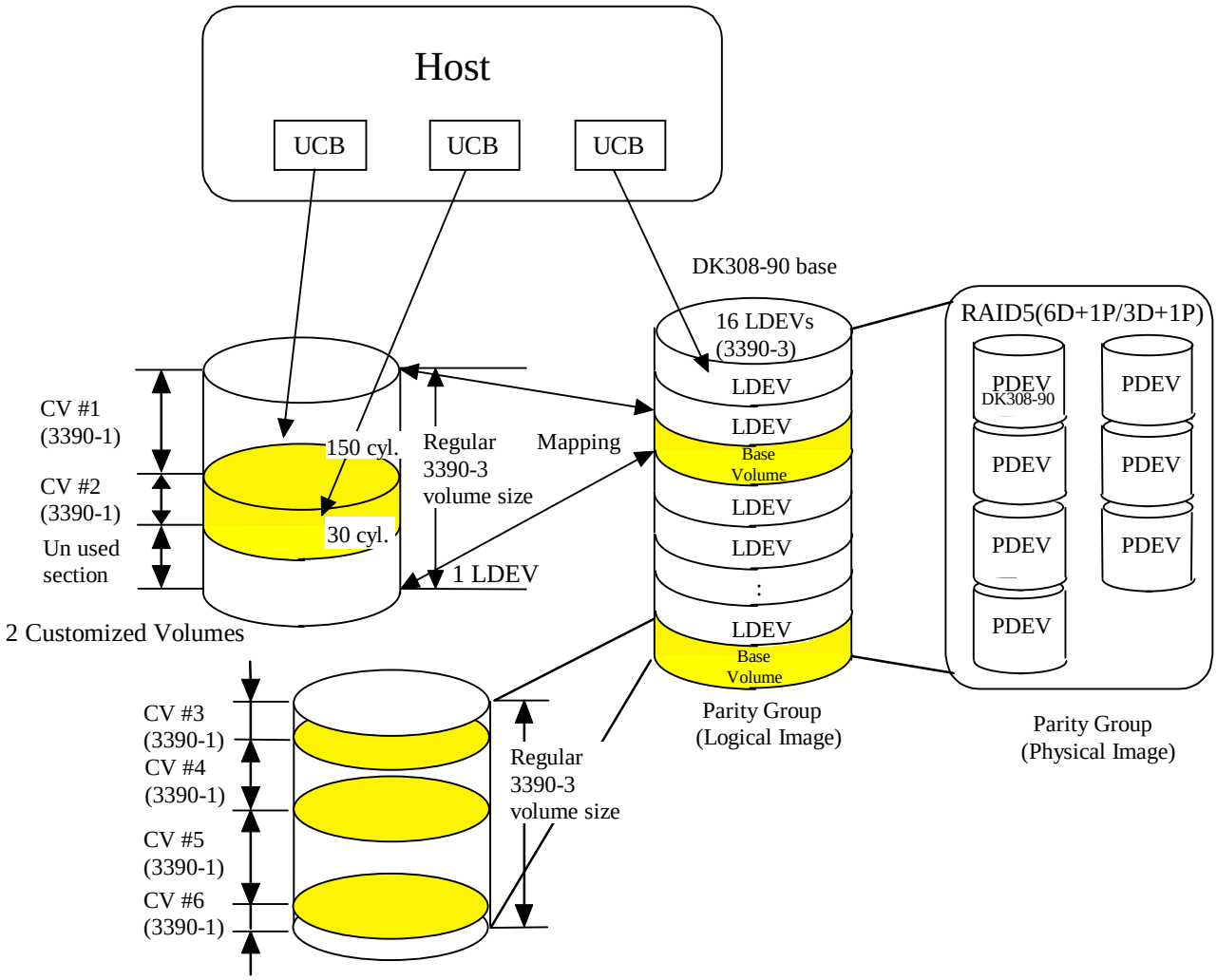

Fig. 1.1 Conceptual Diagram

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1.3 Specifications

The CVS option consists of a function to provide variable capacity volumes and a function to provide free arrangement of volumes on the HDD.

(a) Function to provide variable capacity volumes
This is a function for determining the capacity as specified by users in the same track format as that of a conventional volume.

(b) Emulation type intermix on the HDD
As regard the RAID200, the logical volume type in the parity group is restricted to the same type only. However, the CVS option enables different logical volume types to coexist.

Table 1.1 Specifications of the Function for Providing Variable Capacity Volumes

Item No.	Item	Description
1	Track format	3390 or 3380 track format
2	CV emulation type	3390-1/2/3/3R/9/3A/3B, 3380-K/J/E/KA/KB, OPEN-3/8/9/K
3	Maximum number of CVs on one HDD	64 CVs
4	Minimum size of CV	See note1
5	Maximum size of CV	9982 Cylinders(See note1)
6	Position on the disk where the CVs can be placed	Any position is allowable.
7	Emulation type intermix	Intermix of 3390-1/2/3/3A/3B and 9 is allowable. Intermix of 3380-K/J/E/KA and KB is allowable. Intermix of OPEN-3 and 8 and 9 is allowable. Intermix of OPEN-K is not allowable. Intermix of 3380-* and 3390-* is not allowable.

Note1:
(1) Mainframe volume
Number of physical cylinder allocated on HDD is calculated by following formula.
Physical mapping onto HDD =
User logical cylinders(A) + Additional control cylinder(B) + Adjustment(C)
where, (A) is specified value through SVP/RC, (B) is defined from below chart depending on emulation type.
Also (C) is adjustment so as to make (A) +(B)+(C) be even number.(either 1 or 0)

emulation type	3380-J	3380-E	3380-K	3390-1	3390-2	3390-3	3390-3R	3390-9
Minimum size of CV in cylinders	1	1	1	1	1	1	1	1
(B)	7	8	9	9	8	9	9	34

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emulation type	3390-3A	3390-3B	3380-KA	3380-KB	OPEN-3	OPEN-8	OPEN-9	OPEN-K
Minimum size of CV in cylinders	11	1	1	1	50	50	50	50
(B)	9	9	9	9	10 (7.2 MByte)	36 (25.9 MByte)	36 (25.9 MByte)	9 (6.48 MByte)

Example: Physically allocated number of cylinders in case of 100 cylinders specified with 3390-3 is calculated below:

Physical mapping onto HDD = 100 (A) + 9 (B) + 1(C)

So number of cylinders physically allocated on HDD is equal 110.

(2) Open volume

You can set the data by Mbytes. And the Program will assign the actual value as the following expression. The typical values will be described in the table 1.2.

X = (your setting size) $\times$ 1024 $\div$ 720 (if there is remainder, add 1.)

Y = (X $\times$ 96 $\times$ 15 $\times$ 512) $\div$ 1024 $\div$ 1024

(note) X is a value of converting capacity specified by SVP or Remote Console into number of cylinders. Y is a value of converting value B into capacity (mega byte).

Table 1.2 CV capacity

Setting Size (Mbyte)	Actual size (Mbyte)	Note
35	35.15625	Minimum CV capacity
500	500.625	
1000	1000.546875	
1781	1781.015625	Maximum size of CV for OPEN-K
2000	2000.390625	
2340	2340	Maximum size of CV for OPEN-3
6982	6982.03125	Maximum size of CV for OPEN-8
7017	7017.1875	Maximum size of CV for OPEN-9

NOTICE

When you set HMDE volumes to customized volumes and reset them to the normal volume again, these volumes could not be set as HMDE volumes. Please refer to the following table.

Emulation Types for HMDE volumes	Emulation types after changing from Customized volume to normal volume
3390-3A	3390-3
3390-3B	
3380-KA	3380-K
3380-KB	

If you want to reset these volumes as HMDE, please call technical support center to set them to HMDE volumes by SVP.

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Table 1.3 Starting and ending for 96 logical blocks

Starting LBA	Ending LBA	Remarks
0	95	
96	191	
192	287	
288	383	
384	479	
480	575	
576	671	
672	767	
768	863	
864	959	
860	1055	
1920	2015	
2880	2975	
3840	3935	
4800	4895	
5760	5855	
6720	6815	
7680	7775	
8640	8735	
9600	9695	
19200	19295	
28800	28895	
38400	38495	
48000	48095	
57600	57695	
67200	67295	
71904	71999	
72000	72095	
76800	76895	
86400	86495	
96000	96095	
192000	192095	
288000	288095	
384000	384095	
480000	480095	
576000	576095	
672000	672095	
768000	768095	
864000	864095	
960000	960095	
1920000	1920095	
2880000	2880095	
3647424	3647519	OPEN-K Maximum LBA
3840000	3840095	
4800000	4800095	
4806624	4806719	OPEN-3 Maximum LBA
4806720	4806815	
5760000	5760095	
6720000	6720095	
7680000	7680095	
8640000	8640095	
9600000	9600095	
10560000	10560095	
11520000	11520095	
12480000	12480095	
13440000	13440095	
14350944	14351039	OPEN-8 Maximum LBA
14371104	14371199	
14422944	14423039	OPEN-9 Maximum LBA
14423040	14423135	

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1.4 Maintenance functions

Features of the maintenance functions of the CVS option is that they allow execution of not only the conventional maintenance operations instructed by the SVP but also the maintenance operations instructed from the remote console. (See Item Nos. 2 to 5 in Table 1.2.)
Unlike the conventional LDEV addition or reduction, the operation for the HDD is made unnecessary, so that the volumes can be operated from the remote console.

Table 1.4 Maintenance Function List

Item No.	Maintenance function	TSC	CE	User	Remarks
1	Concurrent addition or deletion of CVs at the time of addition or deinstallation of HDDs	—	✓	—	Same as the conventional addition or deinstallation of LDEVs
2	Addition of CVs only	✓	✓	✓	Addition of CVs in the free area
3	Conversion of normal volumes to CV	✓	✓	✓	
4	Conversion of CV to normal volumes	✓	✓	✓	
5	Deletion of CVs only	✓	✓	✓	Only the optional CVs are deleted and incorporated into the free area. No deinstallation of HDDs is involved.

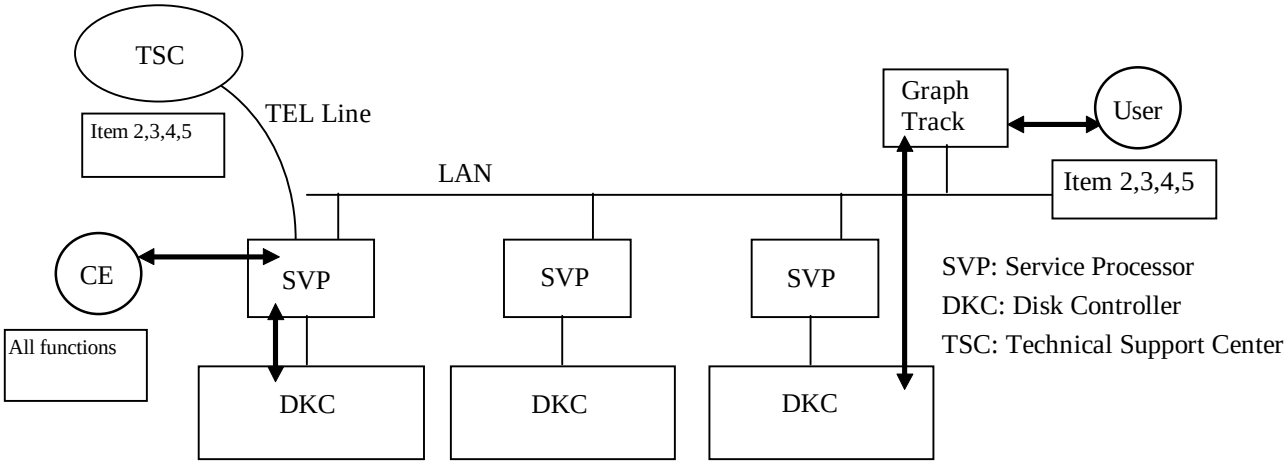

Fig. 1.2 Maintenance Execution Route when CVS Is Used

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2. Dynamic Cache Residence (DCR) Option

2.1 Outline

Because cache capacity is usually smaller than the total HDD capacity in RAID subsystem, cache cannot be keep all data at the same time which is stored whole HDDs in the subsystem.
Cache management control cache extent so as to be allocate more capacity to more frequently accessed data to enbed this gap by LRU algorithm.
By this control, data with a low access frequency is hard to remain in the cache, de-staged into HDDs, therefore the more frequent accesses to physical HDDs occur, decrease the access performance and unpredictable response time appear.
The DCR option provides a function for making data being resident on the cache and realize high access performance.

2.2 Features

- Feature of the DCR consist of two modes, one is called “PRIOrity mode(hereinafter,it is abbreviated to PRIO)” and the other “BIND mode(hereinafter,it is abbreviate to BIND)”.
PRIO is a basic mode(100% Read Hit) of this feature, which fits typical user needs and BIND is supplementary for special customer(100% Read/Write Hit. Replace SSD) needs.
- To use the DCR, addition of the cache memory is required for the service as a "DCR cache".

2.2.1 PRIO

[Processing]
- When a read command to the data which is assigned as DCR extent is issued and first meet “miss” in cache, the data is staged into cache by usual staging mechanism.
The data remains in the DCR cache permanently for future access to guarantee read-hit performance even after data is transferred to the host, regardless usually cache LRU management.
If a write command is issued to the data remaining in the cache in the way above, the data is updated with an out-of-DCR cache segment provided for write data duplication, and the data is de-staged into the HDD. Then the cache segment for write data duplication is returned to the out-of-DCR cache segment group.
In this case, new data is left in the cache extent together with old data.

[Performance impact]
- Theoretically, because above de-staging into HDD is processed by usual asynchronous de-staging mechanism, succeeding host access has a possibility to meet the same cache slot collision by locking both the host access and asynchronous de-staging process.
However in that case, by minimizing the collision time implemented in micro-code, performance impact will be neglectably small for usual customer jobs.
- In the case the subsystem cache becomes overloaded, a responding performance degradation occurs because the non-DCR cache segment must be used for the data assurance during a period between write data reception and de-staging operation completion.

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[Maximum DCR capacity]

- Addition of the "DCR cache" is required for the DCR, and a number of disk trucks equivalent to the capacity of the added "DCR cache" is the maximum number definable for the DCR. Besides, STR recommends to keep the standard cache capacity for the non-DCR portion as a minimum out-of-DCR cache, for example, 1.5GB for 360GB configuration or 2GB for 450GB configuration (see **"Disk capacity and number of necessary options" on page INST01-60**), to avoid considerable performance degradation for original data because of the newly installed DCR.
  To keep this rule, when the customer want to install DCR feature for the subsystem, he need to install additional cache capacity as a DCR area out of pre-defined standard cache capacity.
  On the other hand, maximum available cache capacity is 10GB, the maximum cache capacity for DCR should be 10GB minus standard cache capacity for that configuration,ex. Max. 8.5GB for DCR for 360GB configuration(85%), Max. 8GB for 540GB configuration(80%), etc..

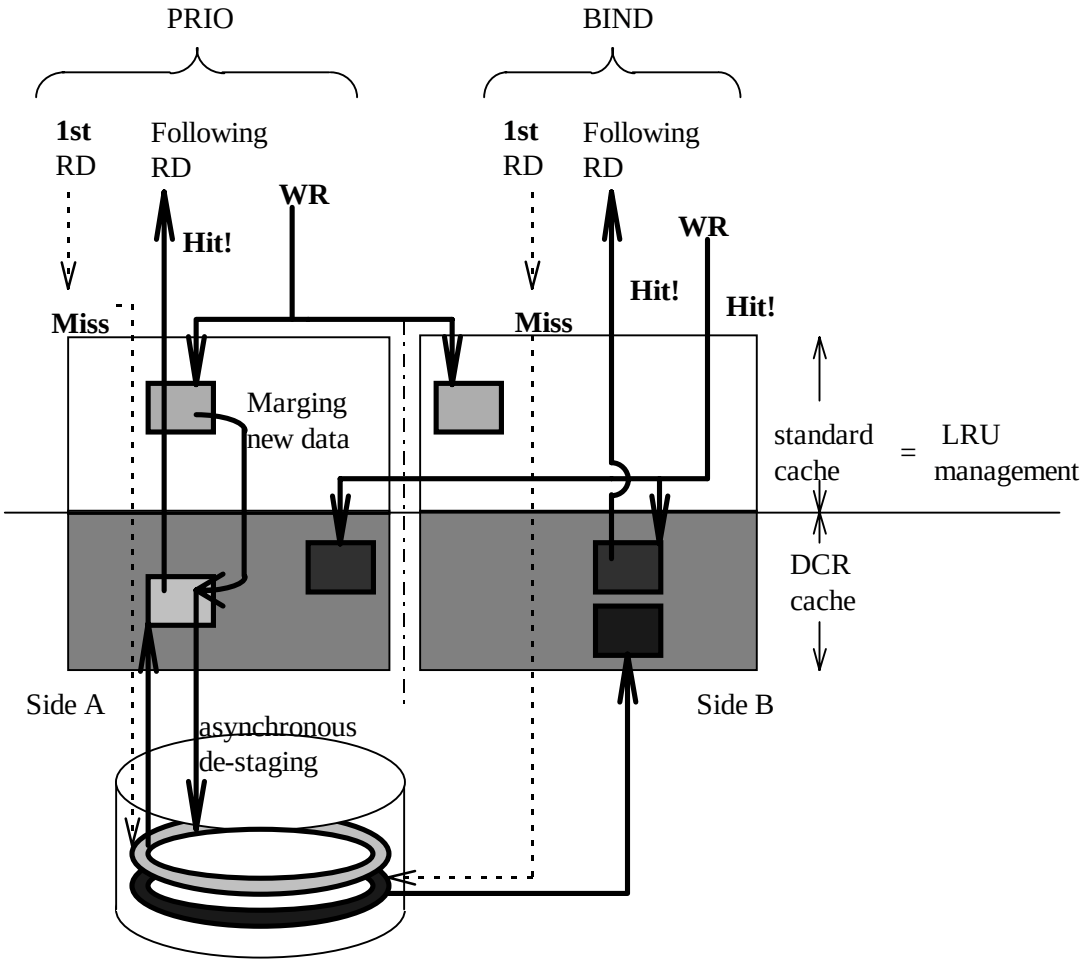

Fig. 2.1 Processing for DCR Extent

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2.2.2 BIND

[Processing]

- As described above, there is a possibility that a responding performance degradation occurs in the PRIO mode because of a collide slot lock between the host access and asynchronous de-staging process or a waiting for the cache segment to be empty caused by an overload of the subsystem cache.
  This is a negligibly small impact on the performance in the typical user environment, however, in some environments, if any, in which the performance is very critical and the maximum response time must be assured, the above factors to degrade the response may be the issues.

[Performance impact]

- In BIND, the difference for PRIO, not only read data but also being all write data for the assigned DCR extent are resident in cache, no de-stage process occurred by any write command. Thus, by protecting any asynchronous de-stage process for the DCR data, read operation become a perfectly hit process.
- However, as a compensation for the perfect hit performance, additional cache element is necessary in the DCR cache area in the BIND mode three times larger than (for RAID1, as large as) that in the PRIO mode.

[Maximum DCR capacity]

- To keep this rule, when the customer want to install DCR feature for the subsystem and install additional cache capacity as a DCR area out of pre-defined standard cache capacity, maximum available cache capacity is 33% of “10GB minus standard cache capacity for that configuration”, ex. Max. 8GB for DCR, 33% comes to 2GB for user data for 540GB configuration(20%), etc.. The rest 67% is reserved for following write operation.
  Further, this percentage of user area within total DCR area is depend on RAID configuration, 33% for RAID5 or 50% for RAID1 due to the cache allocate algorithm deference.

2.2.3 Assignment of DCR extent and guard logic

- Above two modes can be assigned for each DCR extent individually.
  For example, the user want to assign 1GB cache for PRIO and 256MB cache for BIND, Raid300 allocate the extents in additional cache area by 1GB for PRIO and 256MB times 3 equals 0.75GB for BIND. Total 1.75GB cache should be additionally installed. The user can assign repeatedly many DCR extents with choosing each mode for each extent. Say, 1GB for PRIO + 512MB for PRIO + 256MB for BIND + 128 for BIND comes to 2.6GB total DCR area necessary.
- SVP micro-code accept many extents allocation until the cumulative capacity for DCR does not allow the rest is over 512MB.
  In other words, RAID300 check that the rest cache capacity out of DCR is over 512MB by each DCR extent allocation, if the addition of DCR break the rest 512 MB boundary, SVP reject the allocation of DCR extents with an error message.
- From that point, the user theoretically can assign all cache capacity except 512MB for DCR regardless their configurations, STR strongly recommend the user should keep standard cache capacity out of DCR depend on the configuration according to the manuals by operation. Guard boundary by SVP is only 512MB for all configurations.
- For the outline and the setting operation procedure of the DCR cache, see page SSDOPT02-100.

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2.3 Specifications

Table 2.1 Specifications of the Function

Item No.	Item	Description
1	Maximum number of areas to be made resident	For the PRIO and BIND modes together: 16 areas/logical volume 1024 areas/subsystem
2	Unit of area specified to be resident	Mainframe : 1 track, Open : logical block*2
3	Minimum/Maximum size of extent	1 track/logical volume size
4	Online change of resident area	Allowable (from the SVP and remote console)
5	Addition of cache capacity	Mandatory(Program Product: Charged with cache)
6	Maximum usable cache capacity*1 as DCR	Capacity of the cache memory added as the DCR cache The “standard cache capacity” must be ensured by the rule.

*1: Convert as follows:
For the 3390 emulation: 1 track = 64KB
For the 3380 emulation: 1 track = 48KB
For the OPEN-3/8/9/K emulation: 1 track = 48KB

*2: The case of open volume, the RMCMAIN program treats 96 blocks unit so that the input address will be changed as 96 blocks unit.

- Recommendation about DCR for OPEN volume OPEN-3, OPEN-9, OPEN-K:
  If DCR function is used for OPEN-3 or OPEN-8 or OPEN-9 or OPEN-K, whole volume should be specified for DCR.
  It is because file of open system does not correspond to RAID track structure.

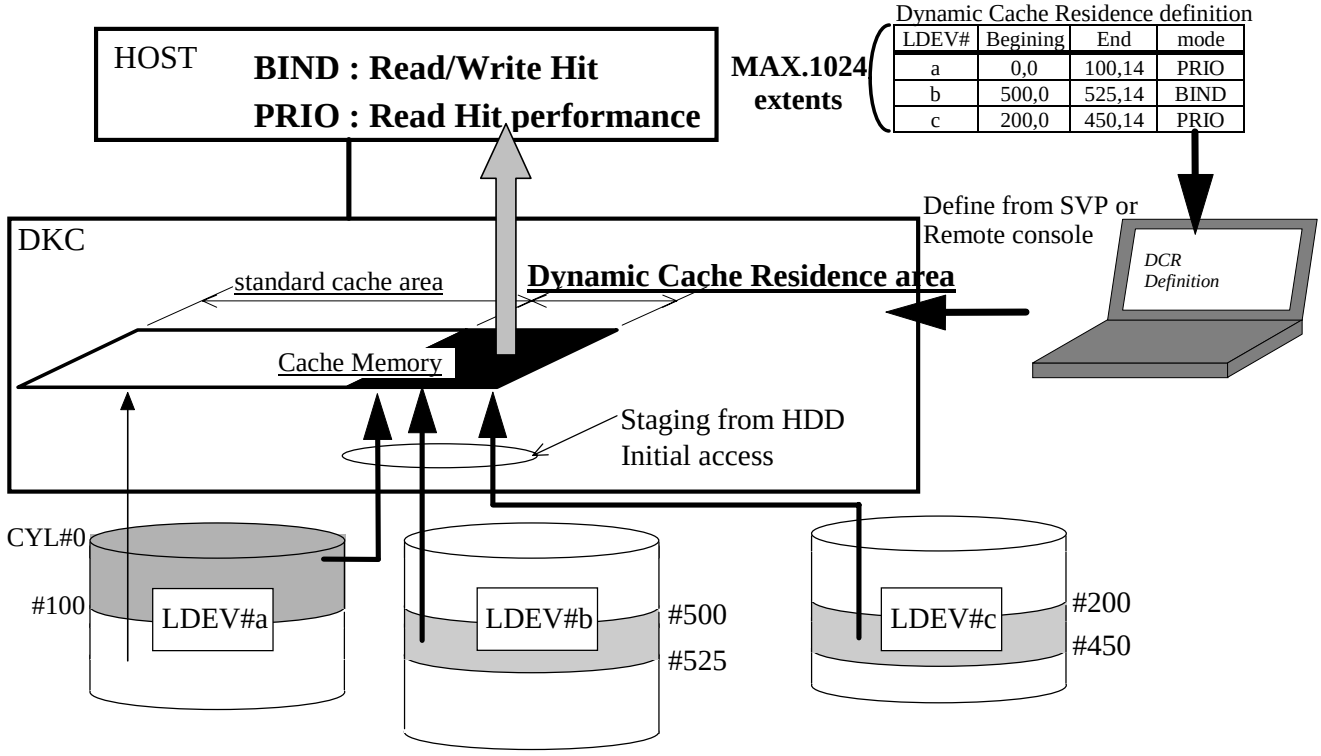

Fig. 2.2 Conceptual Diagram of DCR

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2.4 Maintenance functions

Table 2.2 Maintenance Function List

Item No.	Maintenance operation	TSC	CE	User	Description
1	Addition of the DCR area	✓	✓	✓	• Adds the DCR area. • Unit of the area to be specified by the SVP is a track.
2	Deletion of the DCR area	✓	✓	✓	• Deletes the continuous DCR area.
3	Change of the DCR area	✓	✓	✓	• Changes the DCR area size.
4	Status display of the DCR area	✓	✓	✓	• Displays the specifications of the DCR area.
5	Addition and de-installation of the DCR cache	—	✓	—	• Because insertion and pulling off of the cache module into/from the DKC is required

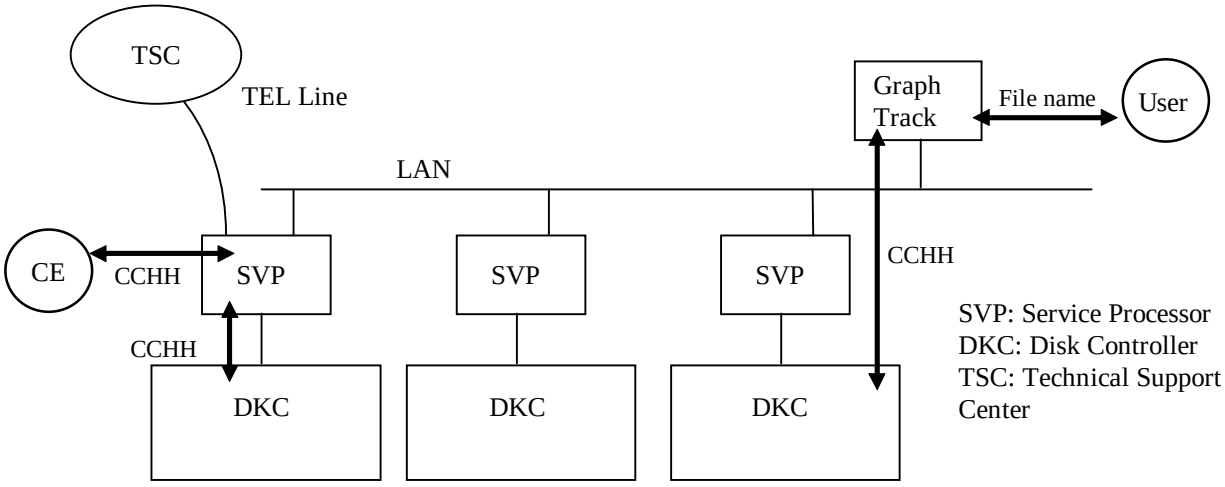

Figure 2.3 Maintenance Execution Route when DCR Is Used

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2.5 Notes on maintenance when DCR is used

When performing the following maintenance, it is attended with a temporary regression of the cache memory or shared memory. Since this regression disables retention of the cache capacity required for the DCR, the DCR function is automatically suppressed for a while until the maintenance is completed.
A service person is required to obtain an approval of a user before starting the maintenance because there is a high possibility that the DCR function suppression may result in a degradation of responding performance.

(1) Cache replacement
(2) Addition and de-installation of the cache (including addition and de-installation of the DCR cache)
(3) De-installation of the ECC Gr.
(4) Addition of the ECC Gr. and LDEV requiring addition of the SM because of the addition of the CU
(5) Addition and de-installation of the SM
(6) Cluster maintenance

2.6 Effects of DKC failures on DCR

The DCR function is automatically suppressed when any of the following failures occurs. The suppression continues until the regressed operation owning to the maintenance is canceled in the cases of Items (1) to (3) or continues until an automatic recovery of the shared memory by the microprogram is terminated normally in the case of Item (4).

(1) Cache failure
(2) Shared memory failure
(3) One-side cluster down
(4) One-side shared memory blockade (SIMRC = FFEE)

2.7 Automatic cancellation of DCR

The DCR setting of a volume to be de-installed by the functions of Deletion of CVs (LDEV), Conversion of CV to normal volume, and Conversion of normal volume to CV is automatically canceled as a part of the de-installation processing by the SVP microprogram.

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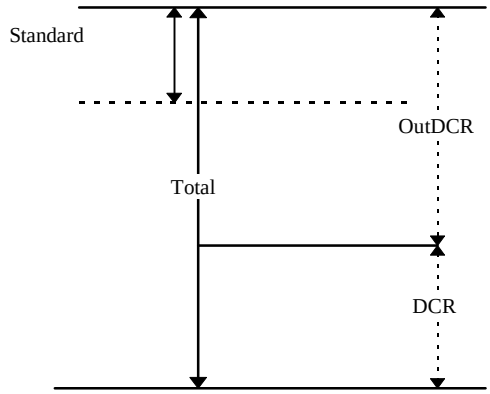
2.8 Explanation of DCR cache and procedure for setting operation

2.8.1 Explanation

- A cache module must be defined and installed for the DCR before using the DCR.
- The DCR extent can be set only for the defined "DCR cache capacity."
- The "out-of-DCR cache capacity" must be retained more than "standard cache capacity" which is defined in accordance with the disk capacity in order to assure the performance in the non-DCR area.
- Therefore, DCR extent definition more than "DCR cache capacity" is rejected according to the SVP guarding logic. Also, the "DCR cache capacity" definition lower than the minimum "standard cache capacity" (256 MB × 2) is also rejected.



Total : Equipment Cache capacity

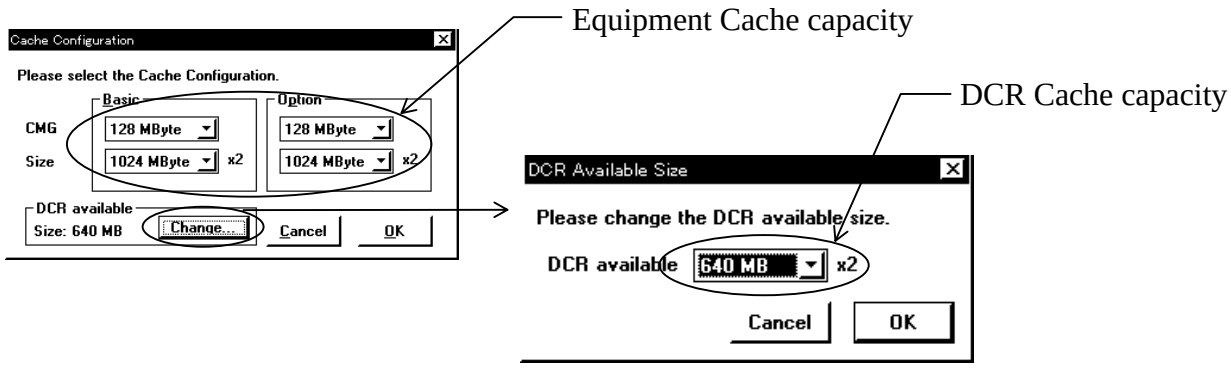
OutDCR : Out-Of-DCR Cache capacity

DCR : DCR cache capacity

Standard : Standard Cache capacity
(See:INST01-60 “Disk capacity and number of necessary options”)

2.8.2 Setting operation procedure

(1) Setting DCR cache capacity in Define Config & Install sequence
Set the DCR cache capacity in the equipment cache capacity.



Note :
- Set the DCR cache capacity so that it is less than the "equipment cache capacity minus standard cache capacity."

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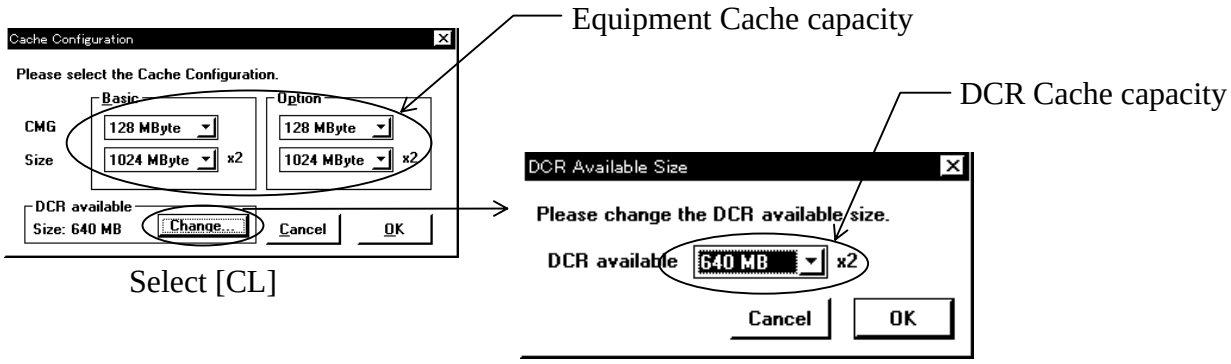
(2) Adding operation of DCR cache capacity in cache addition sequence
When adding the cache, set the DCR cache capacity in the equipment cache capacity after the addition.

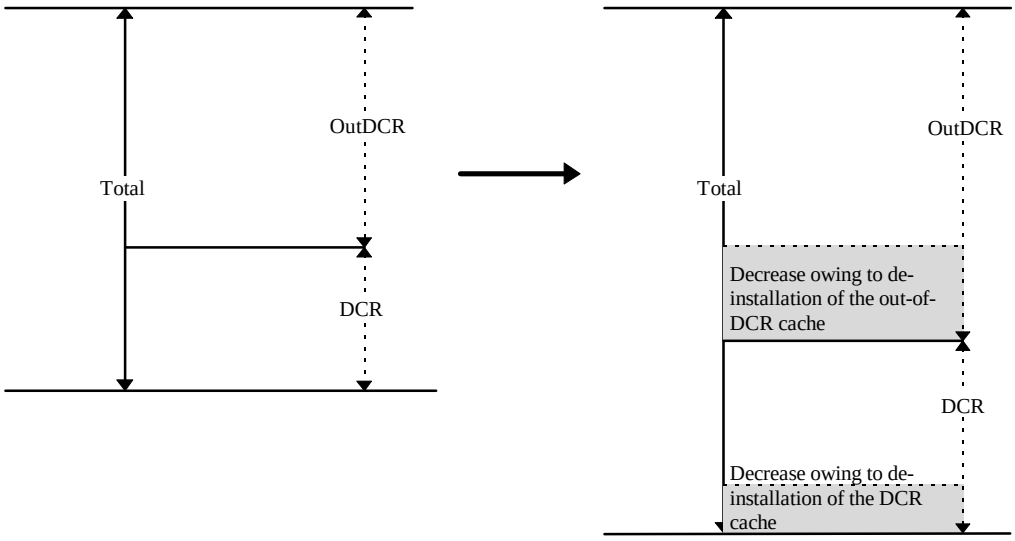


For example, to change a status with the cache of 512 MB × 2 installed and 256 MB × 2 of it set to the DCR cache to a status with the cache of 1.0 GB × 2 installed and 512 MB × 2 of it set to the DCR cache by adding the cache of 512 MB × 2,

① set the equipment cache capacity to 1.0 GB × 2 in the "Cache Configuration" dialog box, and

② press the "Change..." button to open the "DCR Available Size" dialog box and set the DCR cache capacity to 512 MB × 2.

The DCR cache capacity can be set up to the cache capacity to be added. In the above example, the DCR cache capacity can be set up to 768 MB × 2 by adding 512 MB × 2.



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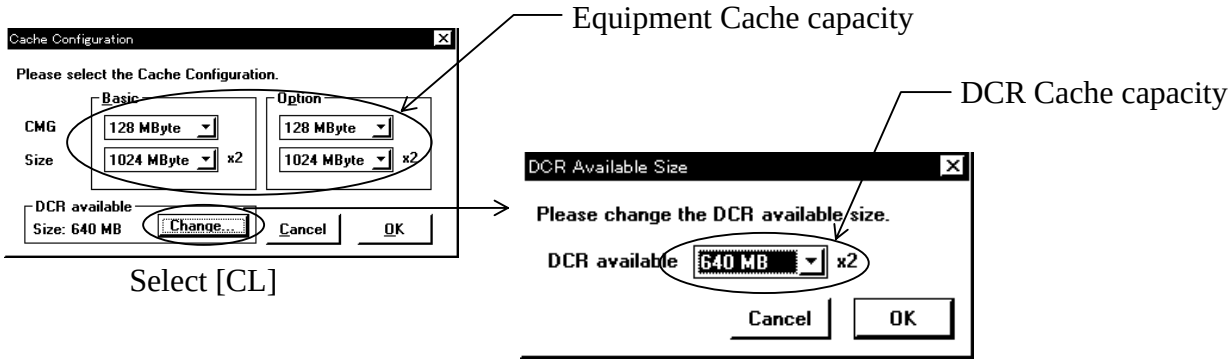
(3) DCR cache capacity decreasing operation in cache de-installation sequence
When de-installing the cache, set a capacity to be left as the DCR cache in the equipment cache capacity.



For example, to change a status with the cache of 1.0 GB × 2 installed and 512 MB × 2 of it set to the DCR cache to a status with the cache of 512 MB × 2 installed and 256 MB × 2 of it set to the DCR cache by de-installing the cache of 512 MB × 2,

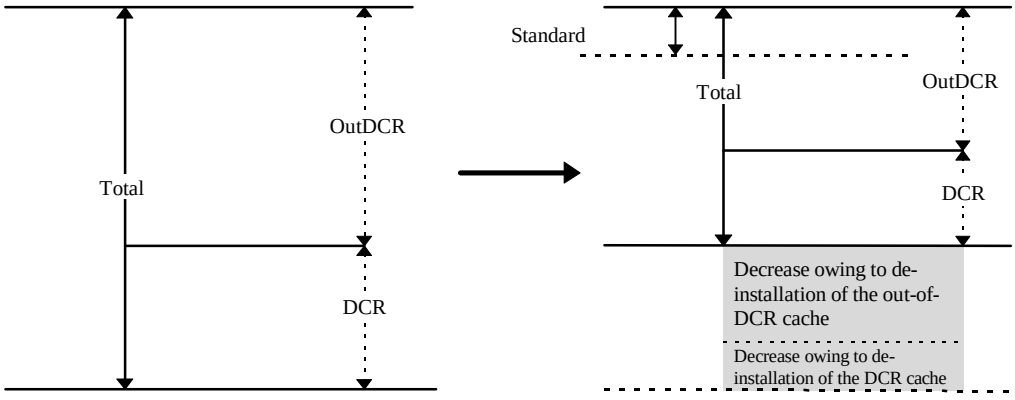
① set the equipment cache capacity to 512 MB × 2 in the "Cache Configuration" dialog box, and

② Press the "Change..." button to open the "DCR Available Size" dialog box and set the DCR cache capacity to 256 MB × 2.

The maximum decreasable capacity of the DCR cache is equal to the capacity of the installed cache to be de-installed. The maximum decreasable capacity of the DCR cache capacity in the above example is 512 MB × 2. As a result, the DCR cache capacity after the de-installation becomes 0 MB × 2.

Notes :

- In the case in which the de-installation of the DCR cache causes the capacity used by the DCR (see (i) on page SSDOPT02-130) actually defined as the DCR extent to be above the DCR cache capacity, the cache de-installing process is suspended by the SVP guarding logic. Before executing the DCR cache de-installation, cancel the DCR setting to decrease the actual capacity used by the DCR.
- It is required to avoid de-installation of the out-of-DCR cache which causes its capacity to be below the standard cache capacity.



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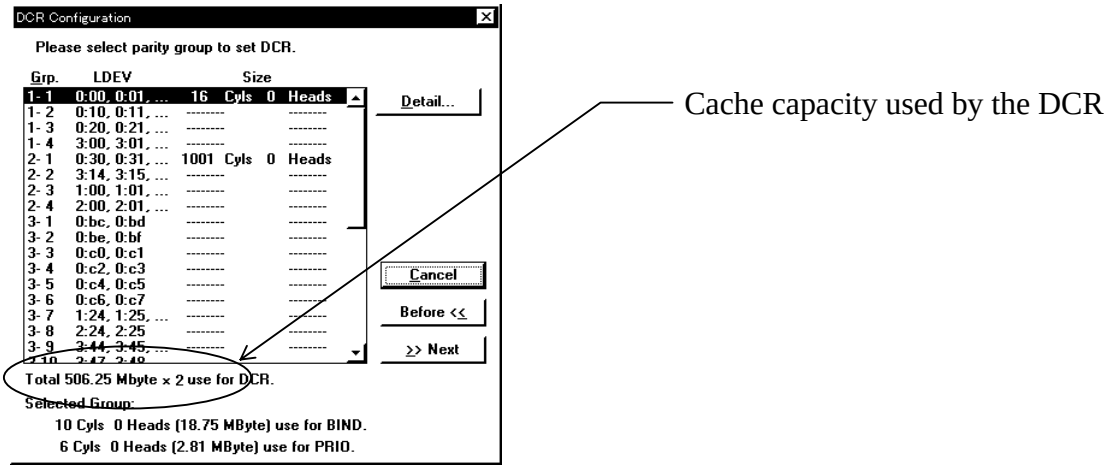
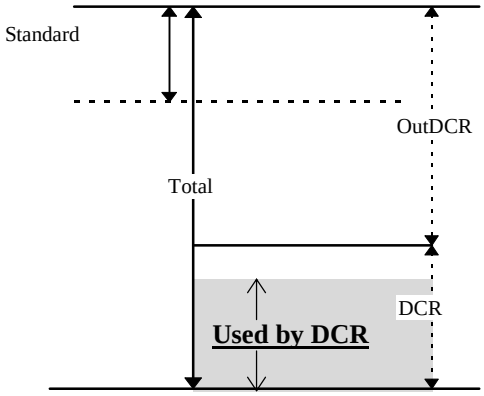
(i) The "cache capacity used by the DCR" actually used as the DCR extent is displayed on the DCR Configuration screen in [SVP] - [Install] - [Refer Configuration] for confirmation.





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DKC REPLACEMENT PROCEDURE SECTION

ATTENTION!
When swapping DKC210I with two DKC-F210I-8P and DKC310I with parallel channel option, following model is required.

- DKC-F310I-8P × 1 + DKC-F310I-8PS × 1
- DKC-F310I-8PS × 2

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DKC REPLACEMENT

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1 Outline

1.1 Abstract

Purpose of DKC swapping program is to enable user's LDEV/PDEV resources to be continuously used when the subsystem is switched from the RAID 200 to the RAID 300.
The DKCMAIN and the SVP provide functions to make the LDEV/PDEV information be handed over.

1.2 Measures to attain the purpose

Principle: DKC replacement procedures shall be used as basic procedures.
→ Information to be handed over is saved on an FD by the SVP of the former subsystem and installed by the SVP of the new subsystem.
However, since formats of the configuration information differ each other between those of the RAID 200 and the RAID 300, conversion is performed when powering on the subsystem.
<The point>

(a) The form used to hand over the configuration information is not the conventional one used for the DKC replacement but the one of the FM image.
The FM image is saved on an FD using the SVP.
→ The FD can be prepared using the RAID 200 version for the switching.

(b) The conversion of the configuration information is automatically performed when powering on the subsystem.

1.3 Old subsystem (RAID200) configuration restrictions.

No	Condition/restriction	Detail	Restriction guard
1	Subsystem configuration	Following system can perform DKCSWAP. • Mainframe (HA subsystem) • multi-platform • ALL SCSI * Cannot SWAP SC subsystem	Technical support operation.
2	STATUS of the RAID200	• All normal status. * The switching is not allowed if a failed part or a PIN exist.	If restriction is violated, DKCSWAP FD is not supported. SVP pre-check error will occur.
3	micro code level	• Micro code version must be changed to DKCSWAP version.	
4	HDD type	• HDD type must be DK308-90,DK309-90. * Switching is not allowed if DK306-45,DK308-45 exist.	
5	RAID level	• RAID level must be RAID-5,RAID-1,RAID-1/5 intermix. * Switching is not allowed if RAID0 exist.	
6	Cache configuration	• Cache capacity must be under 4GB. * Switching is not allowed if CPC exist.	
7	Emulation type	• Emulation type must be all 3390-3,all 3390-3R. * Switching is not allowed if 3390-3 and 33903R intermix exist.	

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1.4 NEW subsystem (RAID300) configuration restrictions

No	Condition/restriction	Detail	Restriction guard
1	A failed part, a Blocked Part status.	• CHA/DKA/Cache/Terminator/SM etc. must be all normal status. * LDEV/PDEV/SCSI can be Blocked.	Restriction is violated, SVP pre-check error will occur.
2	Cache capacity	• Cache capacity must be same as RAID200. • SH024-A must be installed.	
3	SM capacity	• SM capacity must be 256MB. • SH100-B must be installed.	
4	Number of CHA/DKA PCB and location	• Number of CHA/DKA PCB and location must be same as RAID200.	
5	Number of Channel and location	• Number of channel and location must be same as RAID200.	Restriction is violated, configuration information error will occur (SSB,SIM or blocked parts) . Configuration information must be checked by technical support.
6	Number of Cache PCB and location	• Number of Cache PCB and location must be same as RAID200.	

1.5 Restrictions of configuration expansion.[after swap RAID300 (DKC310+DKU205)]

No	Item	Restriction	reason
1	Connection of HDD	Can not connect DK3F1-60	DK3F1-60 is not allowed. (DK308-90,DK309-90 and DK309-18 is allowed)
2	HDD individual reset function	Not used	HDD individual reset function is allowed for DKU305 only.
3	Installation of DKU Box	Can connect DKU205 only	-

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1.6 DKCSWAP Logical devices combination specification

DKC SWAP can be done for following Logical devices combination Table as shown below except underlined Logical device numbers.

Logical devices Combination Table (LDEVs/parity group) [DK30*-90]

			RAID-1		RAID-5	
			RAID200	RAID300	RAID200	RAID300
DKU Emulation Type	Main/ Frame Type	3390-1	8	8	**16**/24	24
		3390-2	4	4	**16**/24	24
		3390-3	**1/2**/3	3	16	16
		3390-3R	**1/2**/3	3	16	16
		3390-9	-	1	6	6
		3380-J	8	8	**16/24**/32	32
		3380-E	6	6	**16**/24	24
		3380-K	4	4	**16**/24	24
	SCSI Type	OPEN-3	-	7	20	20
		OPEN-9	-	2	7	7
		OPEN-K	-	9	-	20/28
		3390-3A	-	6	16	16
		3390-3B	-	6	16	16
		3390-3C	-	6	-	16
		3380-KA	-	8	**16**/24	24
		3380-KB	-	8	**16**/24	24
		3380-KC	-	8	-	24

ATTENTION: For Boldface LDEVs, DKC SWAP can not be done.

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1.7 Re-establishment item

The configuration information that re-establishment becomes necessary is as the following by "DKCSWAP".

No.	Item	Restriction
1	DKC serial No	"DKCSWAP" Before doing, a serial number is defined by "Define configuration & Installation".
2	RCP Definition	After "DKCSWAP" is carried out, all the channel adapters become "LCPs". Set it up again by "Change configuration".
3	SCSI path Definition	SCSI configuration information is initialized by DKCSWAP. A warning message is outputted when "Procedure of loading Configuration information to FD" is completed. Set it up again by "Change configuration".
4	HRC Definition	HRC configuration information is initialized by DKCSWAP. A warning message is outputted when "Procedure of loading Configuration information to FD" is completed. Set it up again by "Change configuration".
5	Additional Power Supply	The specification that "additional power supply" are increased is different with RAID200 and RAID300. Convert it into the proper establishment by "Change configuration".

1.8 The kind of reported SSB and SIM (Only when a SCSI cable and an environment monitor cable don't connect it.)

SIM CODE	contents	Note
ac50	HDU power off.	An influence by the un-connection of the SCSI cable.
bfxx	Environmental Error.	An influence by the un-connection of the environment monitor cable.
ffe7	Shared memory is volatilized.	An influence due to breaker Off/on.

Error Code	contents	Note
001d	From FM, to SM, micro-transfer practice	At the time of the Shared Memory volatile mode.
32cc	HDU power off.	An influence due to breaker Off/on.
a47c	A SCSI Cable cutout is removed.	
aec9	The status injustice of SPC interrupts.	
ae57	BUS DEVICE RESET	
ae5c	DRIVE LED NG.	

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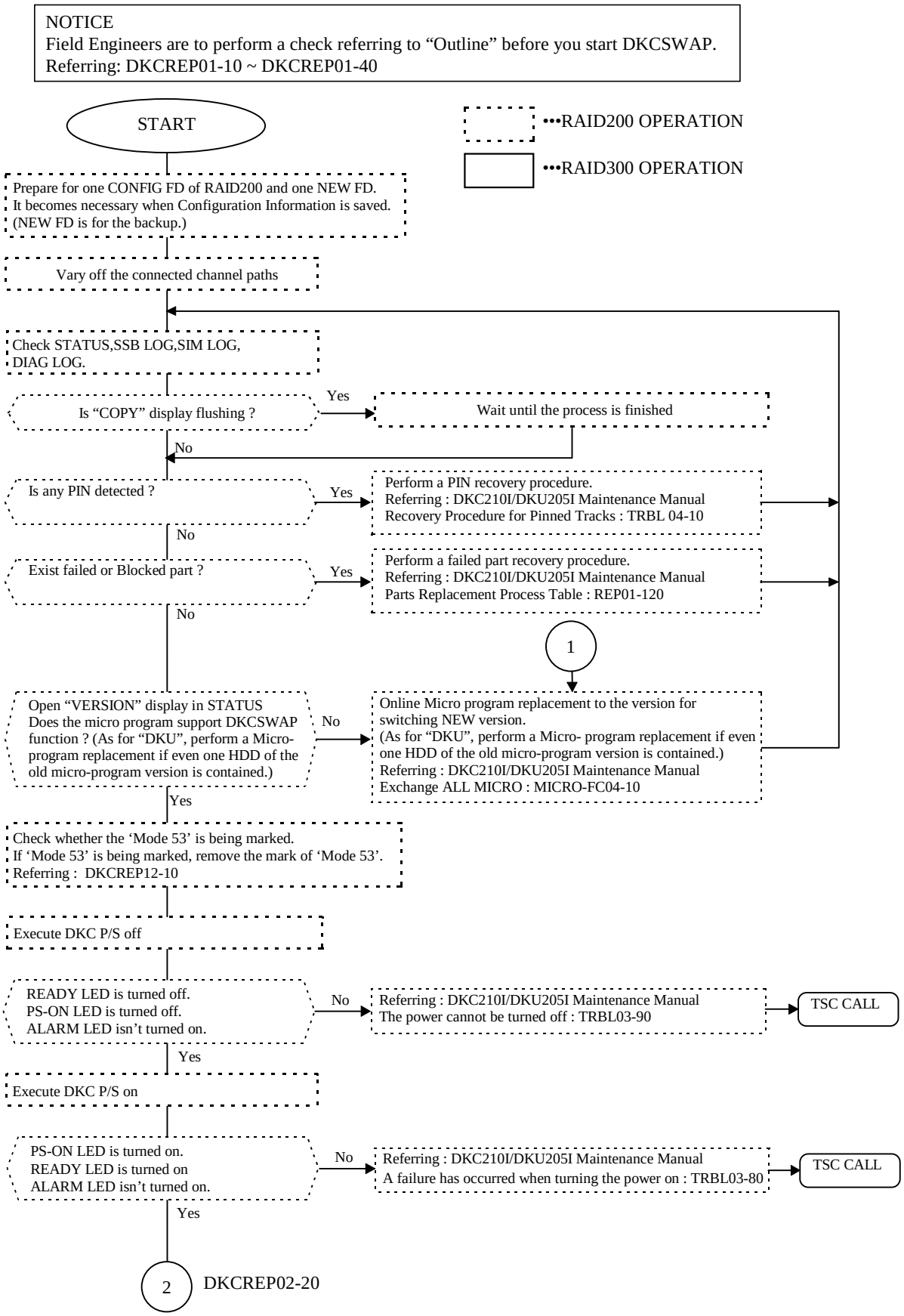
2 DKCSWAP Flowchart



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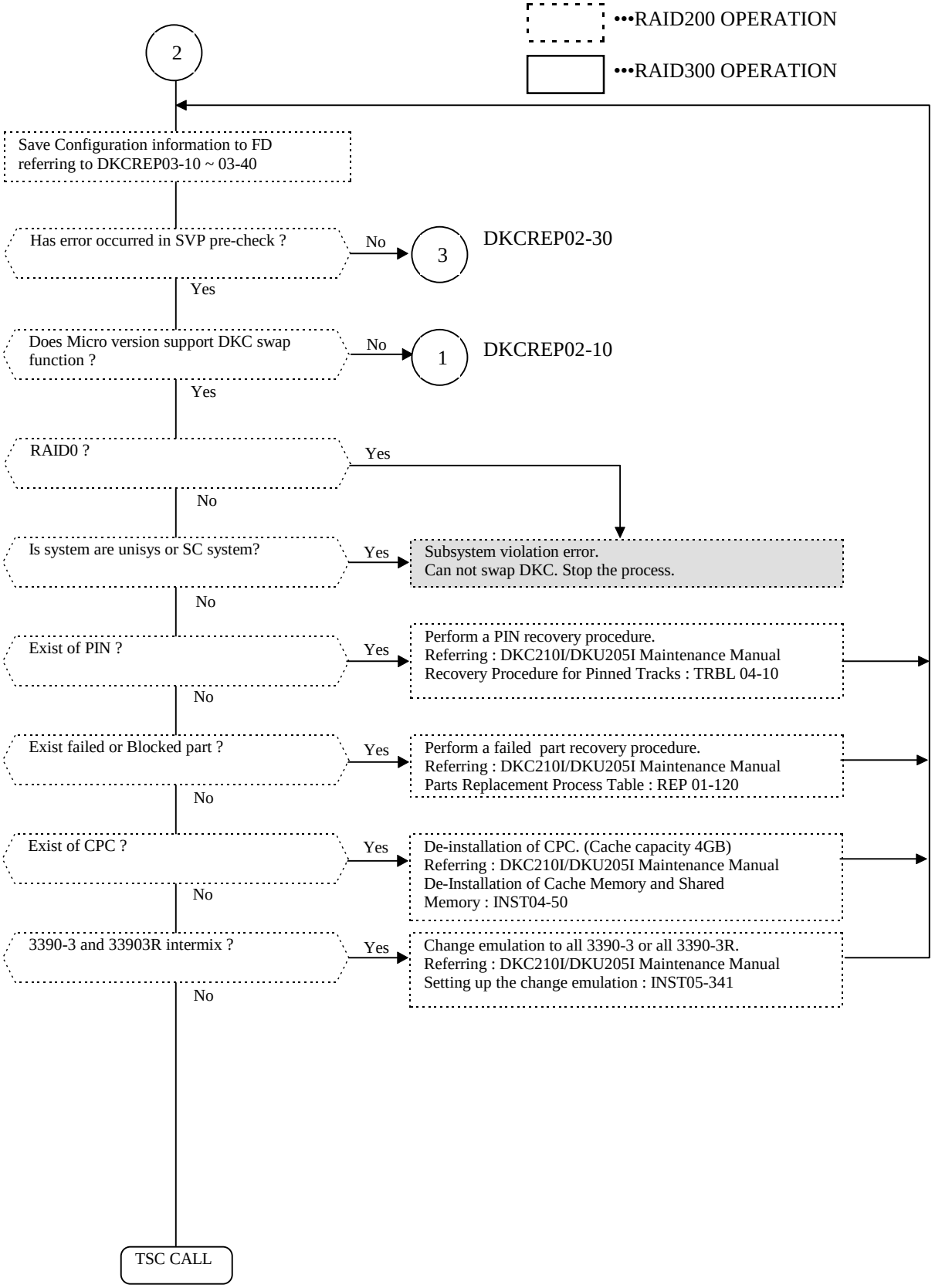

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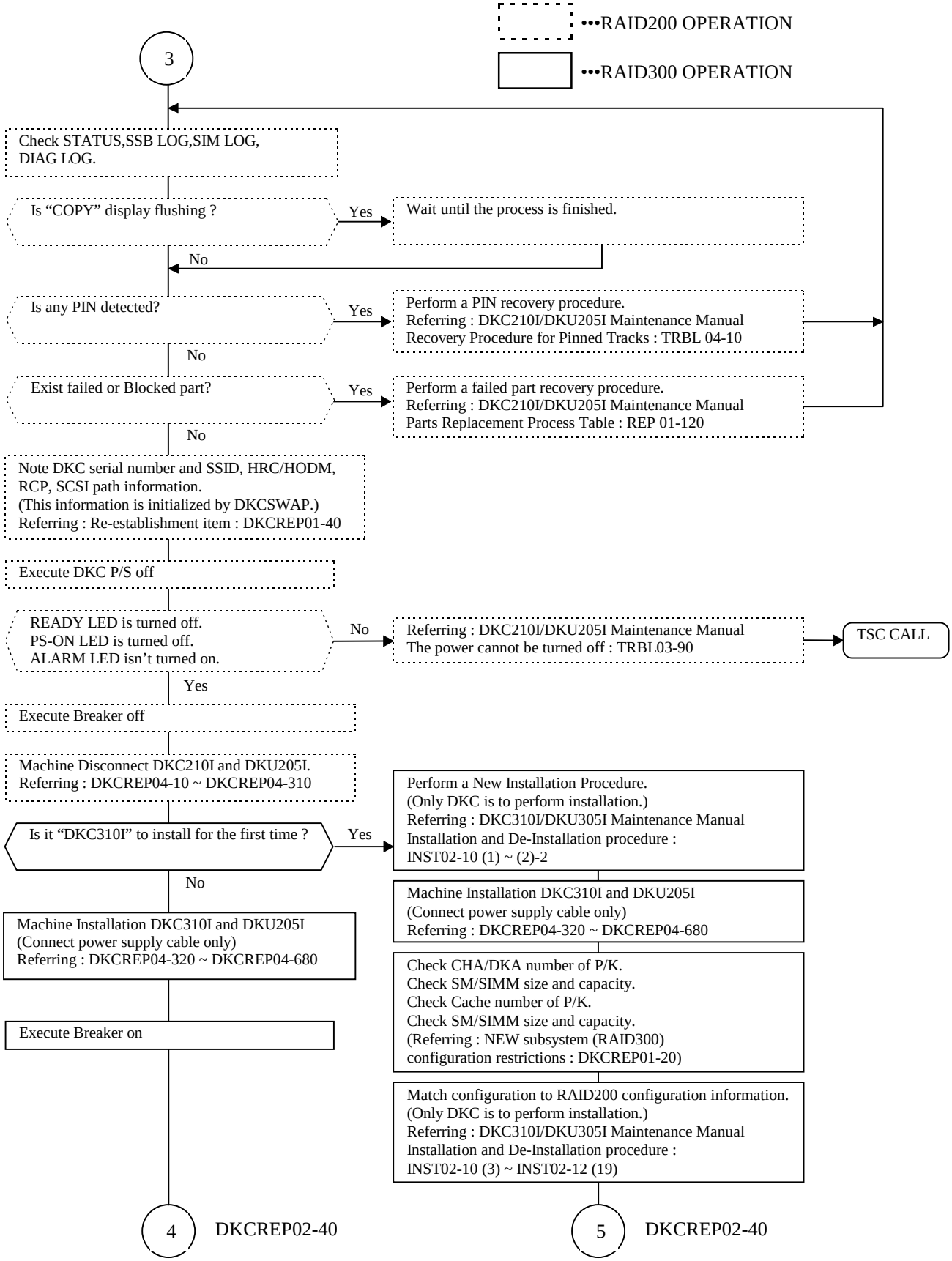

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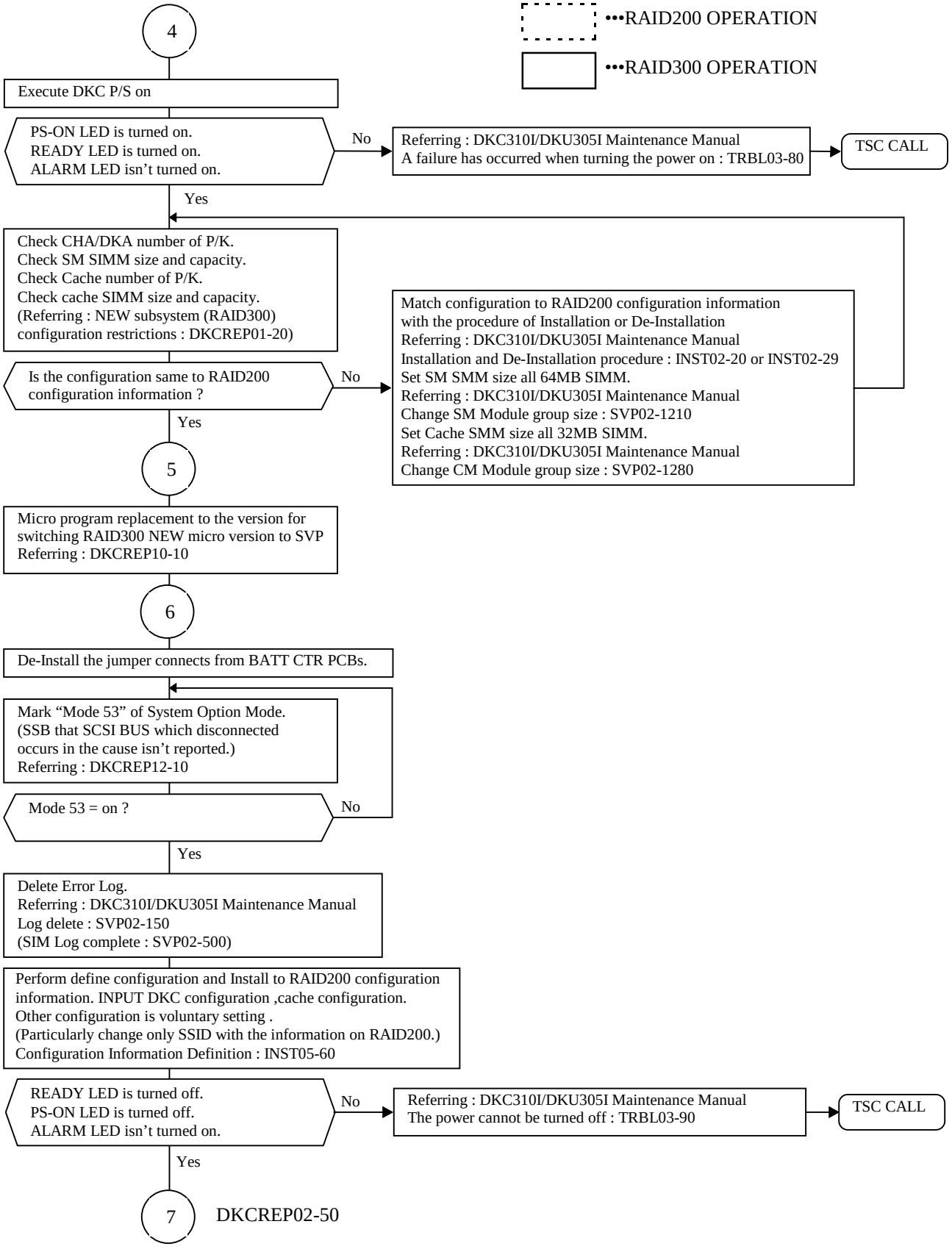

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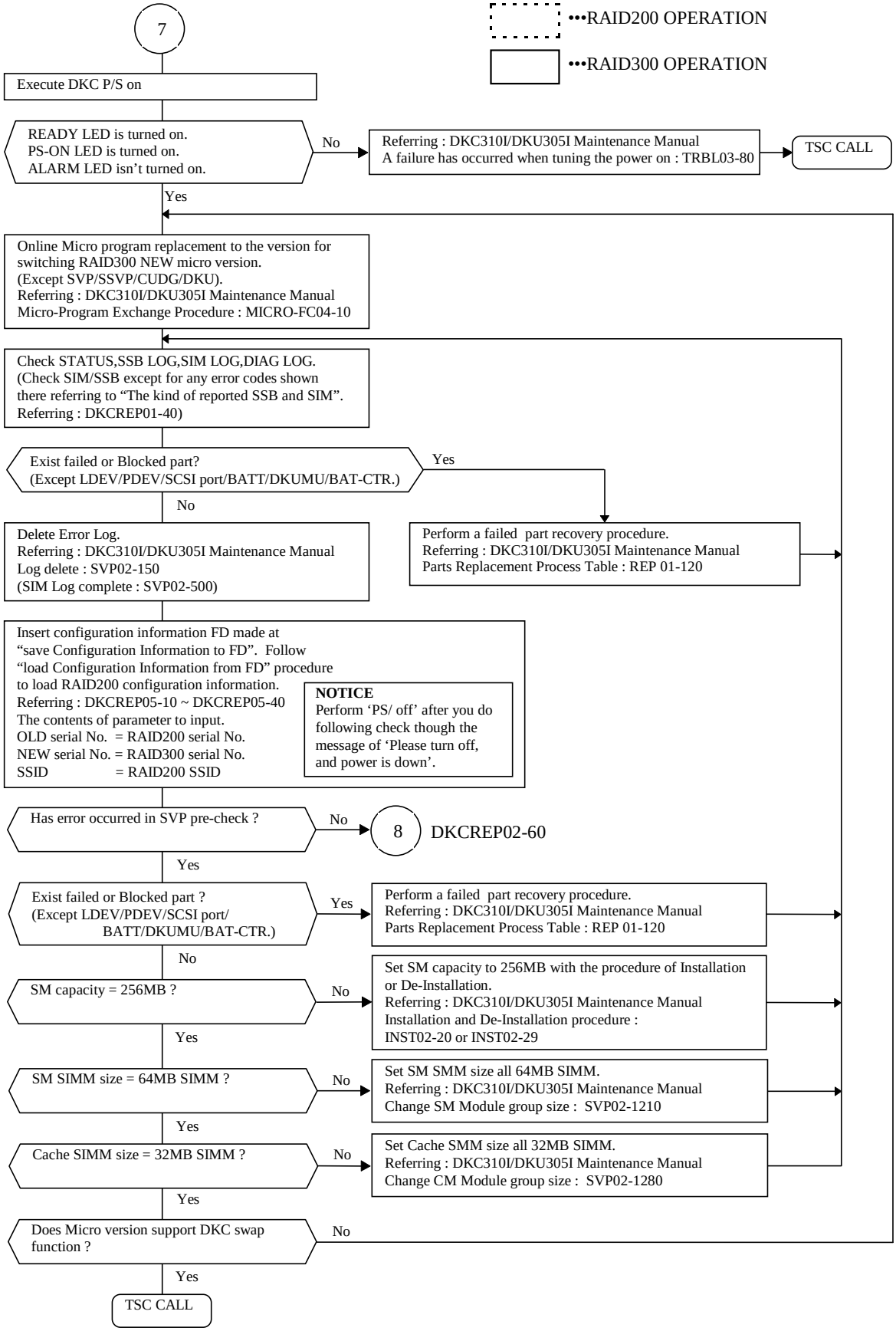

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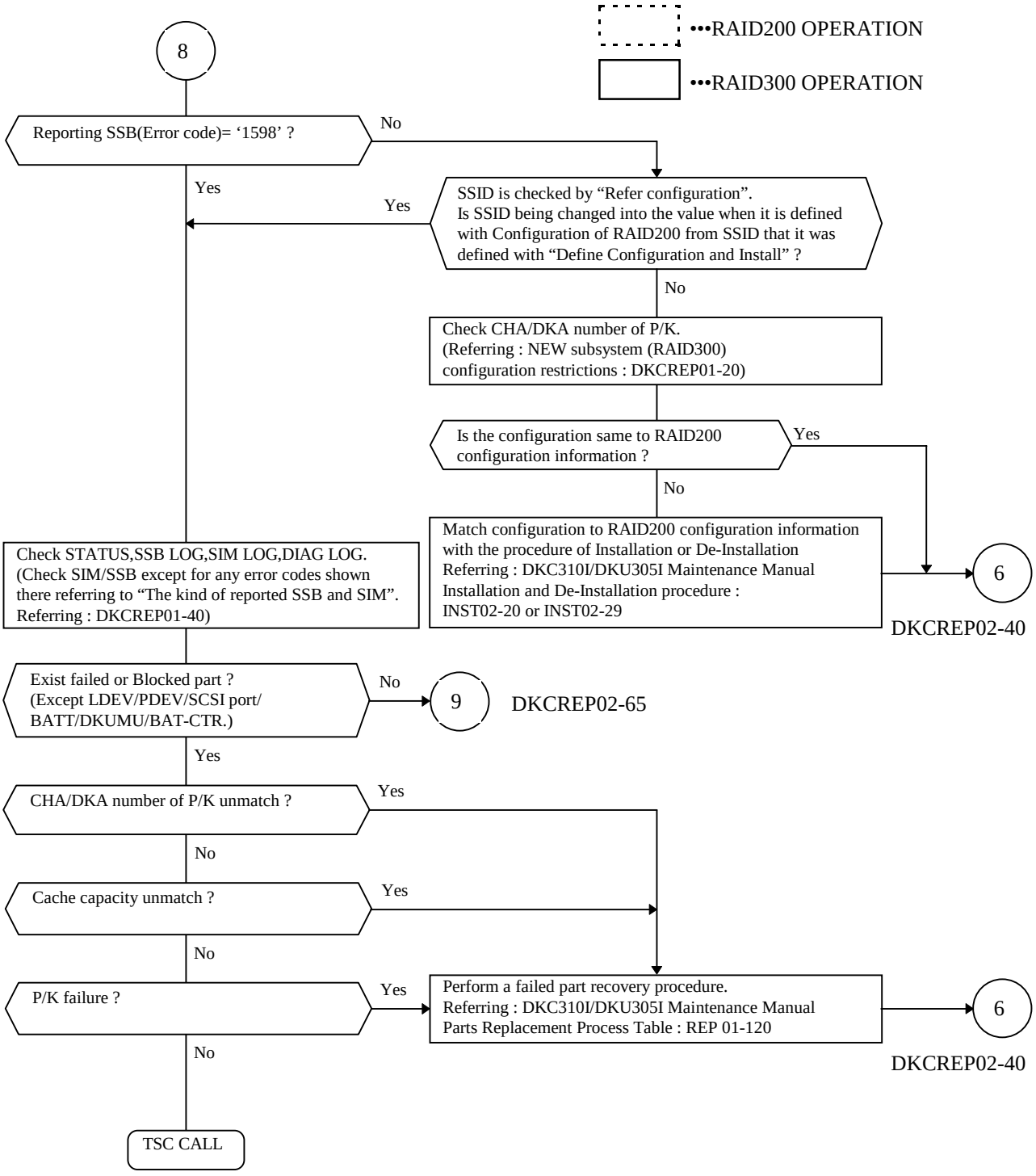

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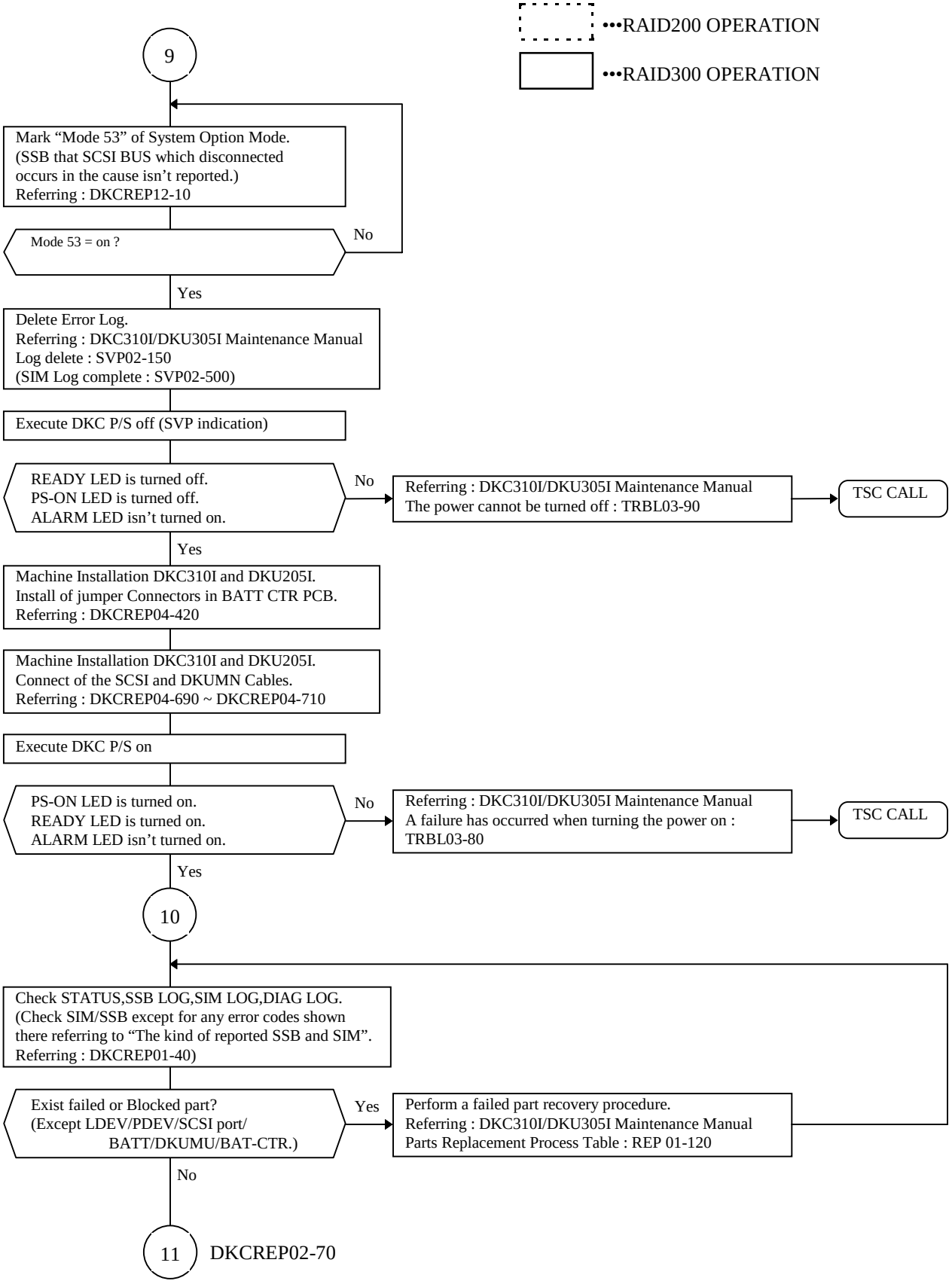

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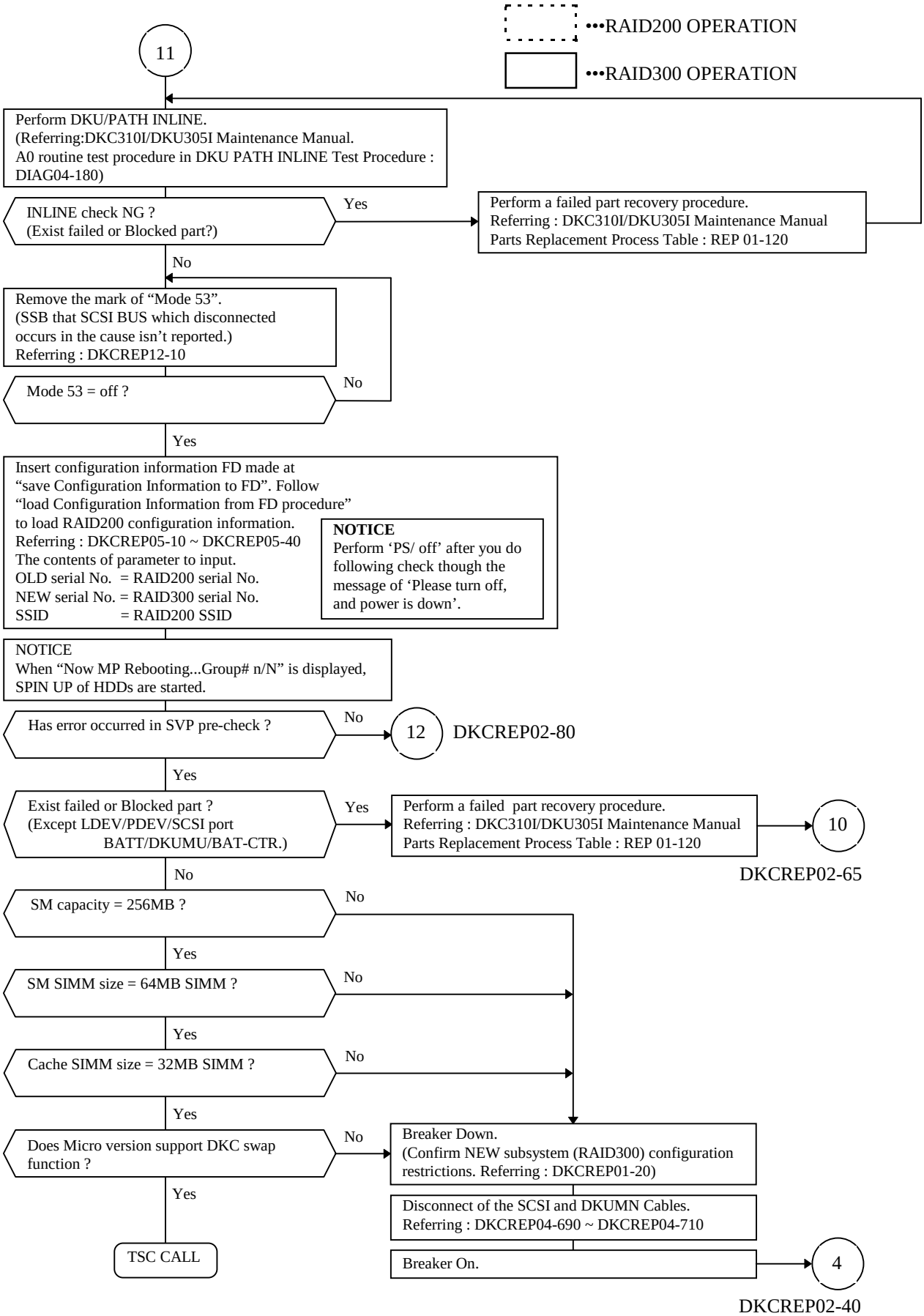

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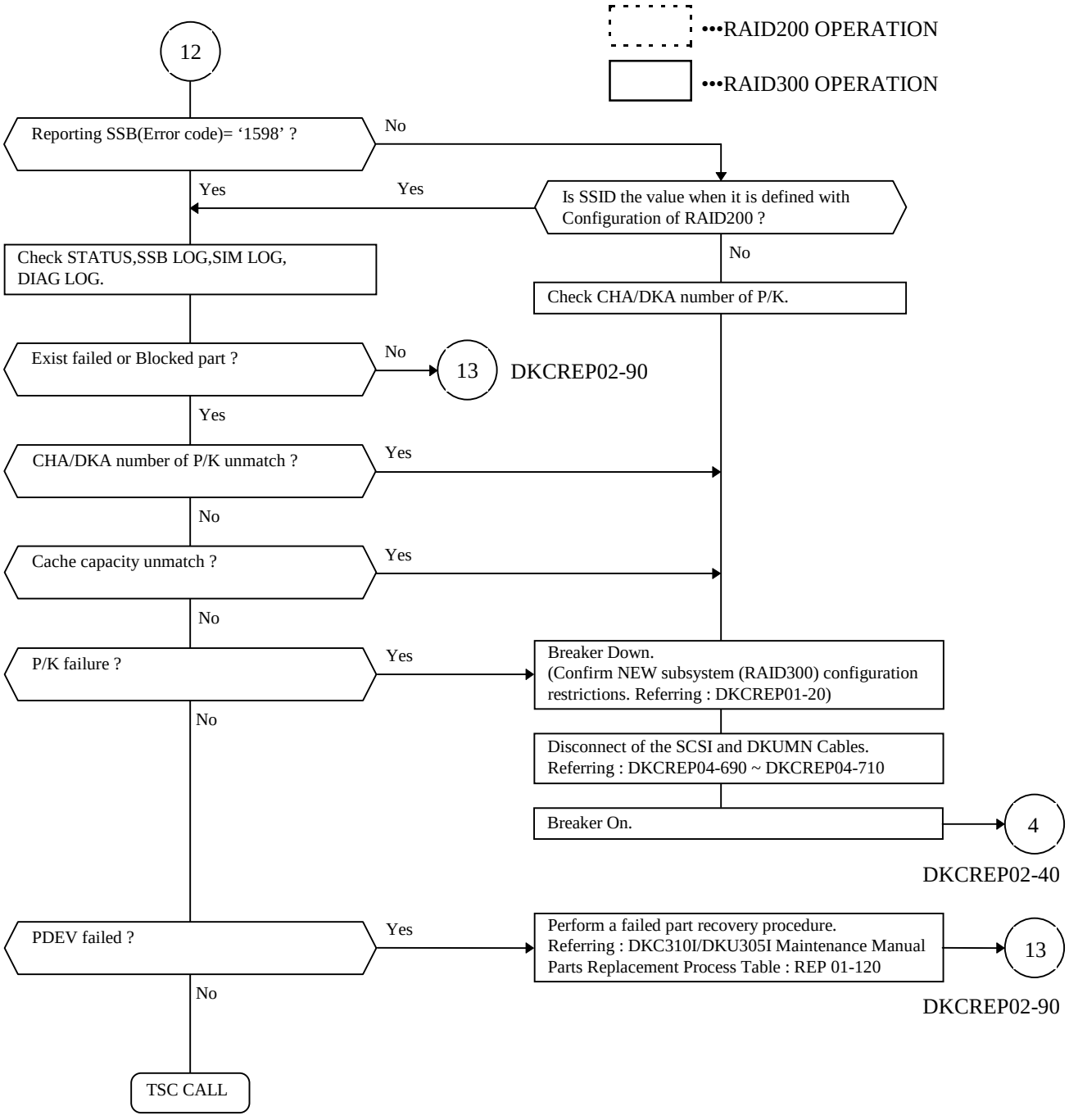

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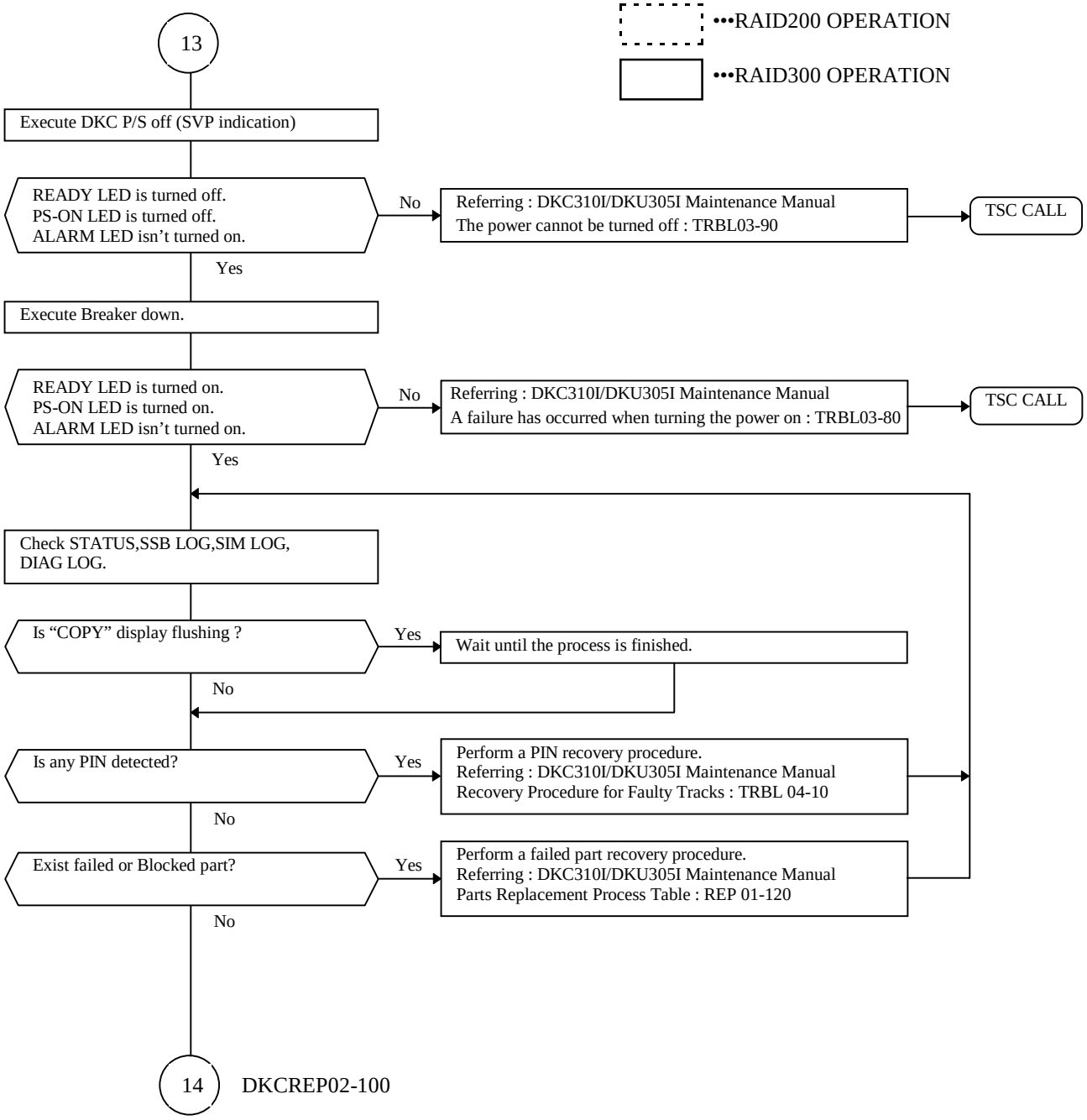

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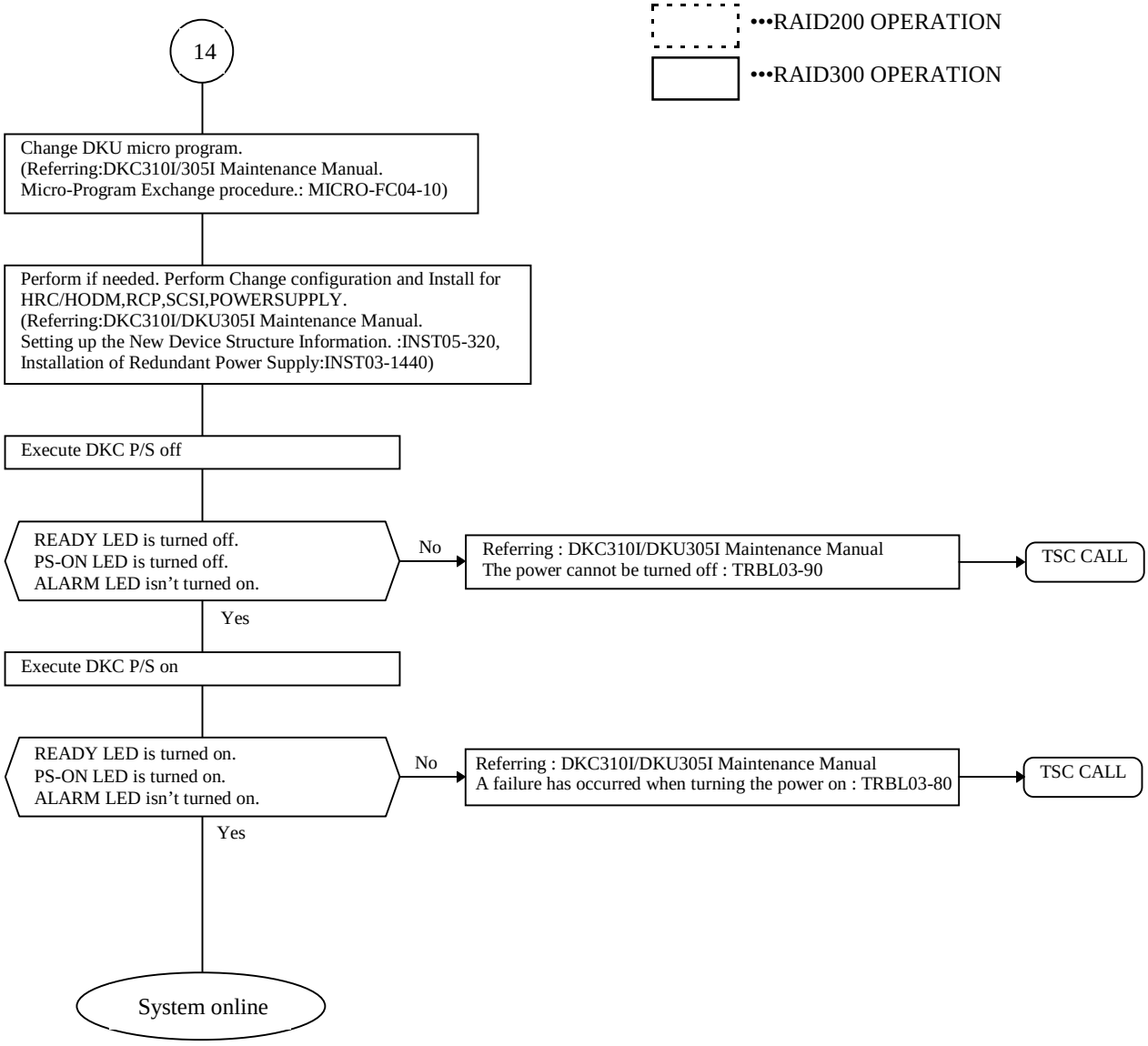

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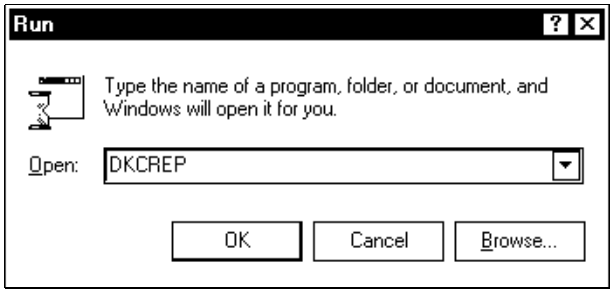
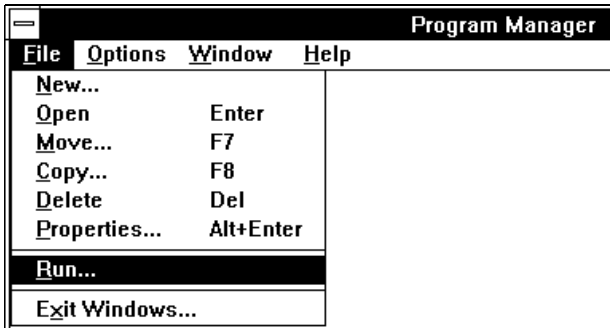
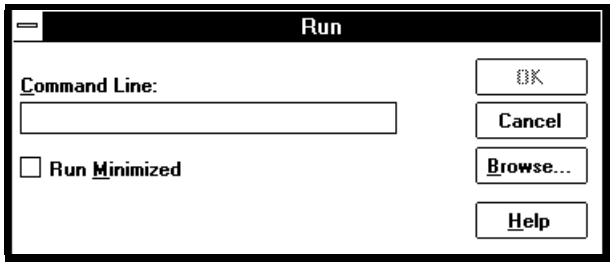
3 Procedure of saving Configuration Information to FD (used in old DKC)

(1) <Select the [Run] (in case of windows95)>
Select (CL) the [Run...] in the [Start button].
Input “c:\dkc200\mp\pc\DKCREP.EXE” in “OPEN” and select (CL) [OK].



<in case of windows ver 3.1>
Select (CL) the [File] in the “Program Manager” window and select (DR) [Run...].
Input “c:\dkc200\mp\pc\DKCREP.EXE” in “Command Line” and select (CL) [OK].





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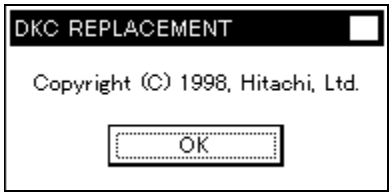
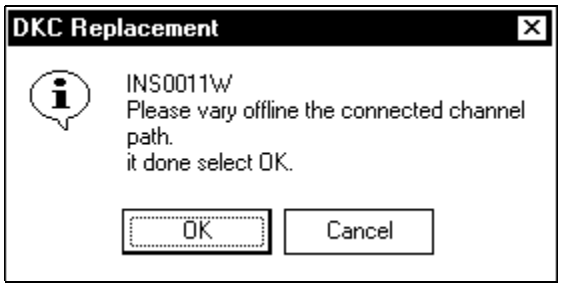
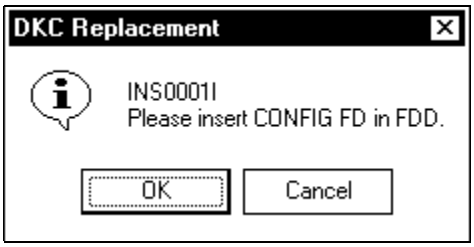
(2) Select (CL) [OK] in the “DKC REPLACEMENT” dialog box.



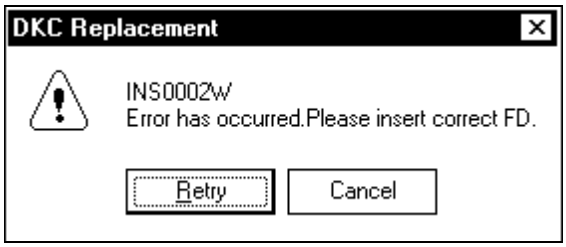
(3) Please vary offline the connected channel paths.
After you have done this operation, select (CL) [OK].



(4) Please insert CONFIG FD in FDD.
After select (CL) [OK].



<Error Case>
Please insert correct FD.
After select (CL) [Retry].



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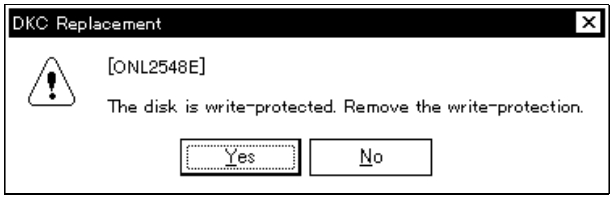
<Error Case>
Remove the write-protection of FD.
After select (CL) [Yes].

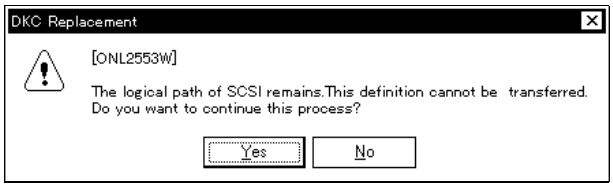


(5) “Checking subsystem...” is displayed.

<Error Case>
The function cannot be executed. Please subsystem configuration.

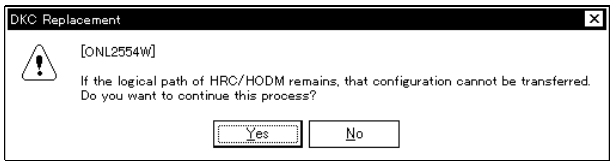
<Error Case>
The logical path of SCSI remains. This definition cannot be transferred.

If continue this process, the logical path of SCSI would be canceled.



(6)

If the logical path of HRC/HODM remains, that configuration cannot be transferred.



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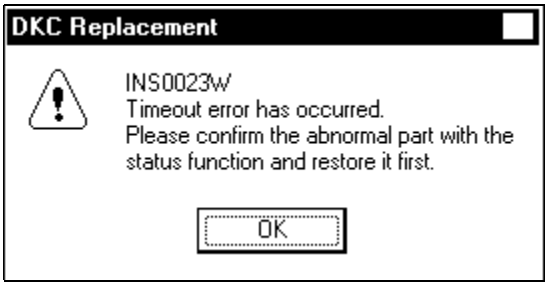
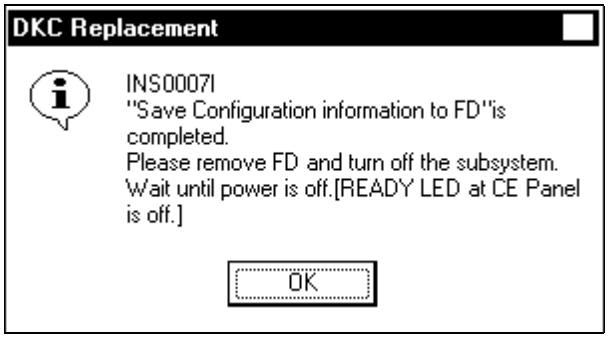
(7) “Reading the subsystem configuration data...” is displayed.

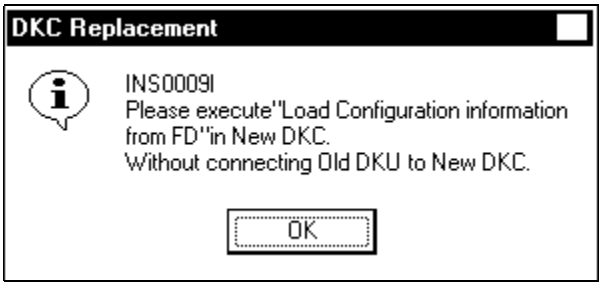
<Error Case>
Select (CL) [OK].
Please confirm the status function.



(8) Please remove FD and turn off the subsystem.
Wait until power is off.
After select (CL) [OK].



(9) Select (CL) [OK].
Note : Without connecting old DKU to new DKC.



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(10) Making a backup FD of Configuration information

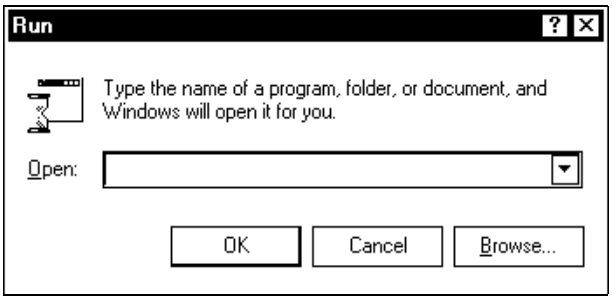
<In case of Windows95>

Select (CL) the [Run...] in the [Start] button.
Input “diskcopy a: a: /v” in “OPEN” and select (CL) [OK].

“Insert SOURCE diskette in drive A:
Press any key to continue...” is displayed.
Insert CONFIG FD in FDD and press any key.
Then, “Reading from source diskette...” will be displayed.

“Insert TARGET diskette in drive A:
Press any key to continue...” is displayed.
Then, insert a new FD in FDD and press any key.

“writing to target diskette...” is displayed.
When configuration copying is finished,
“Do you wish to another duplicate of this disk (Y/N)?” is displayed.
Press [n] key.



Then, “Copy another diskette (Y/N)?” is displayed.
Press [n] key.

Close diskcopy window.

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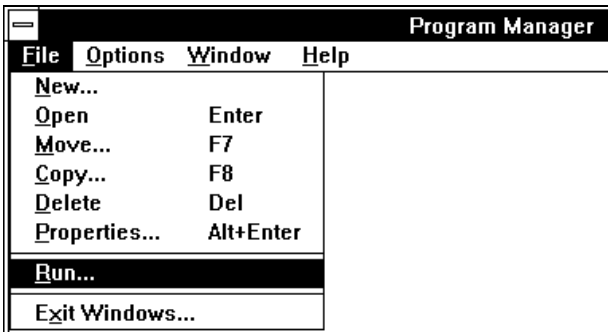
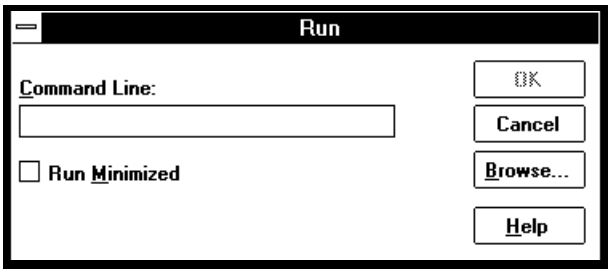
<In case of Windows3.1>
Select (CL) the [File] in the 'Program Manager' window and select (DR) [Run...].
Input "diskcopy a: a: /v" in "Command Line" and select (CL) [OK].



"Insert SOURCE diskette in drive A:
Press any key to continue..." is displayed.
Insert CONFIG FD in FDD and press any key.
Then, "Reading from source diskette..." will be displayed.



"Insert TARGET diskette in drive A:
Press any key to continue..." is displayed.
Then, insert a new FD in FDD and press any key.

"writing to target diskette..." is displayed.
When configuration copying is finished,
"Do you wish to another duplicate of this disk (Y/N)?" is displayed.
Press [n] key.

Then, "Copy another diskette (Y/N)?" is displayed.
Press [n] key.

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4 Machine Installation/De-installation Procedure

Flowchart

1. Power OFF of Disk Subsystem ---------- [DKCREP04-20 through 30]

↓

2. Disconnection of External Cable ---------- [DKCREP04-40 through 100]

↓

3. Disconnection of DKC
   - 3.1 Disconnection between DKC and First DKU -------- [DKCREP04-110 through 210]
   - 3.2 Disconnection between DKC and Second DKU----- [DKCREP04-220 through 310]

↓

4. Connection of New DKC
   - 4.1 Connection between DKC and First DKU ---------- [DKCREP04-320 through 460]
   - 4.2 Connection between DKC and Second DKU-------- [DKCREP04-470 through 550]

↓

5. Connection of External Cable---------- [DKCREP04-560 through 650]

↓

6. Power ON of Disk Subsystem ---------- [DKCREP04-660 through 680]

↓

7. Connection of SCSI and DKUMN Cables ---------- [DKCREP04-690 through 710]

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4.1 Power OFF of Disk Subsystem

(1) Power off procedures are shown below. Refer to the details and start the operation.

a. [Case as custom engineer operates]

Turn the "REMOTE/LOCAL" switch on the CE panel PCB to "LOCAL".
Turn the "POWER ON/OFF" switch on the CE panel PCB to "OFF".

[Case as that operate from CPU]

Turn the "REMOTE/LOCAL" switch on the CE panel PCB to " REMOTE ".
Turn off the power supply from CPU.

Note : CE Panel has three types in difference of appearance.

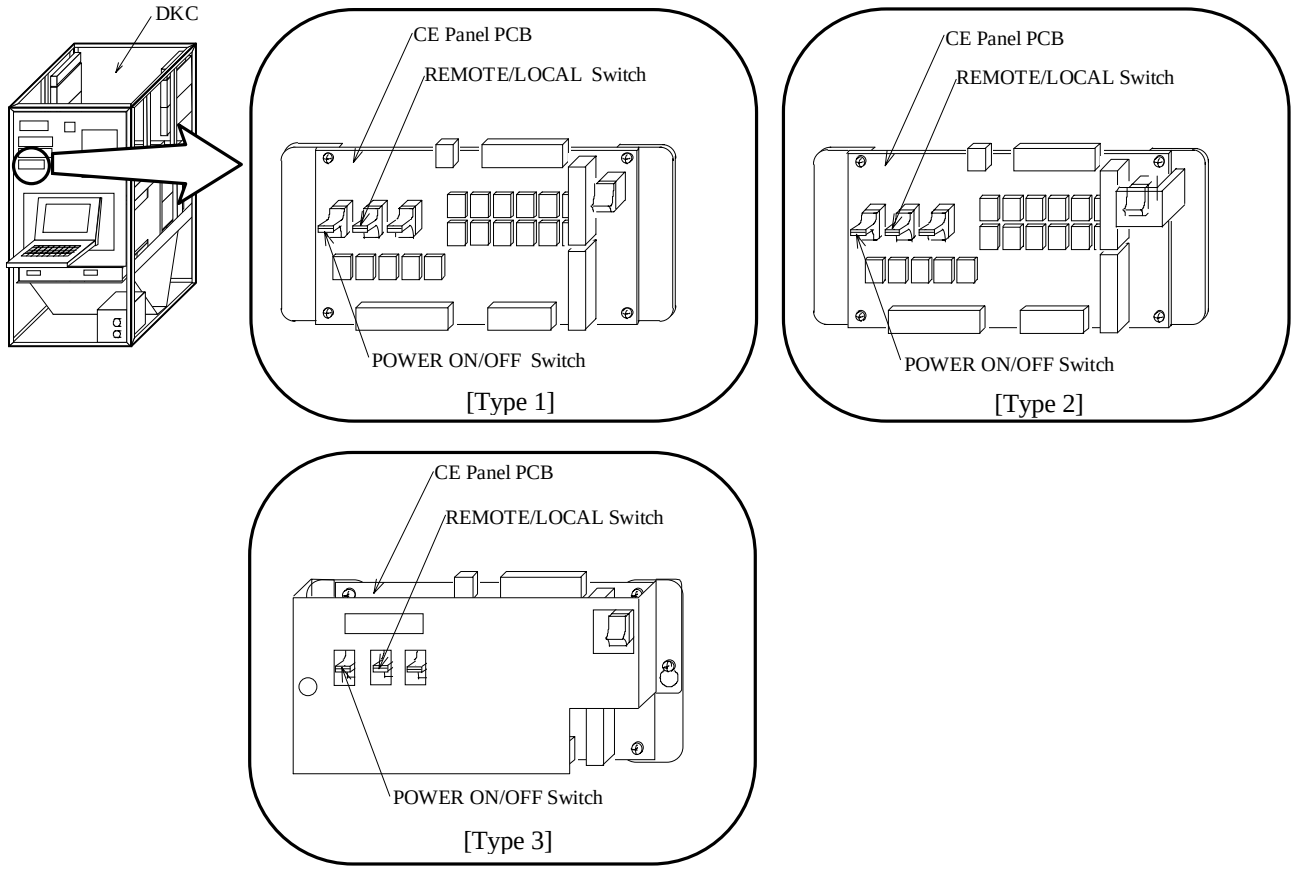

Fig. 4-1 CE Panel PCB

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b. Turn off the main circuit breaker at the AC Box on the Disk Unit.

Notice : Stop the SVP before turning off the circuit breaker in the location of AC BOX-R10. (See the SVP section)

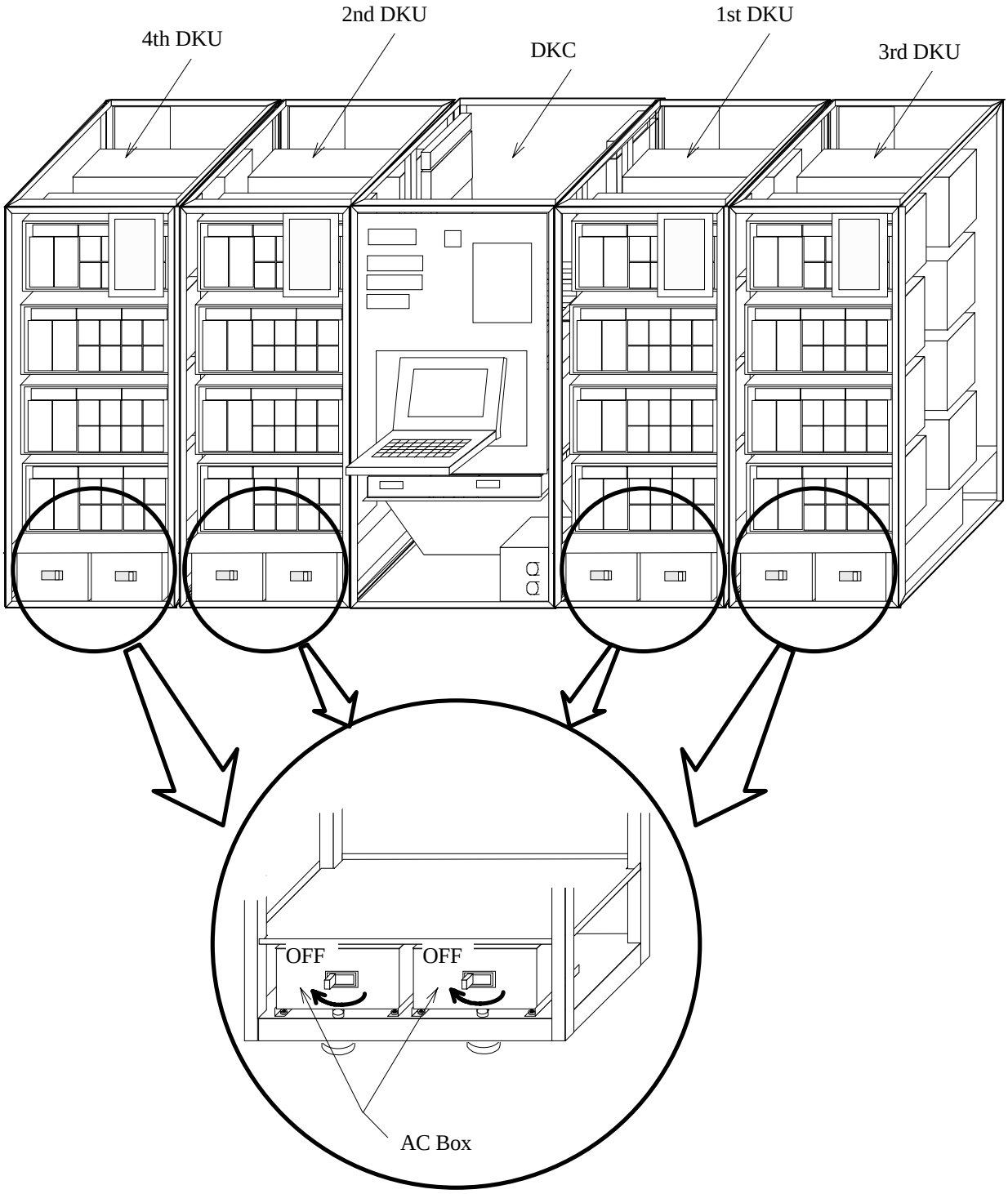

Fig. 4-2 Main Circuit Breaker on AC Box

c. Turn off the main circuit breaker at the distribution board that supplies DKU with a power.

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4.2 Disconnection of External Cable

4.2.1 Disconnection of AC Cable

4.2.1.1 DKC210IU/DKU205IU

⚠ DANGER

The DKC and the first DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU and, the 4th DKU also has Two Main Disconnect Devices.
Observe all instructions described in this manual before connecting the equipment to the power source and before servicing.

A. Connection of Power Supply Cord
The unit has two power supply cords with attachment plug type R&S 3760 or 3760PDG. Be sure to prepare the following socket receptacles and power cords between the power distribution board of the building and the attachment plugs for the unit.

Socket Receptacle : R&S 3754 or 3934
Power Cord : Type ST or equivalent, shielded type, with four min. #8 AWG conductors. Terminated at one end with an assembled on above socket receptacle cap.

B. Requirements to Branch Circuit
This unit relies on the building installation for protection of the internal components of the equipment. Each line (R/S/T line) should be protected by a short circuit protective device and by an overcurrent protective device rated 30 amp on building installation.
The protective device on building installation shall comply with the NEC requirements (or CEC requirements when installed in Canada), and if a protective device interrupts a conductor, it shall also interrupt all other supply conductors.
This protection is not required for the neutral line of this unit.

C. Disconnection from Power Supply
Each unit has Two Main Disconnect Device (Two Main Breaker CB101s for Dual Power Lines).
To remove all utility power from the unit, turn off both main disconnect device CB101s at the same time.

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a. Refer to Fig. 4.2-1. Disconnect the AC cables.

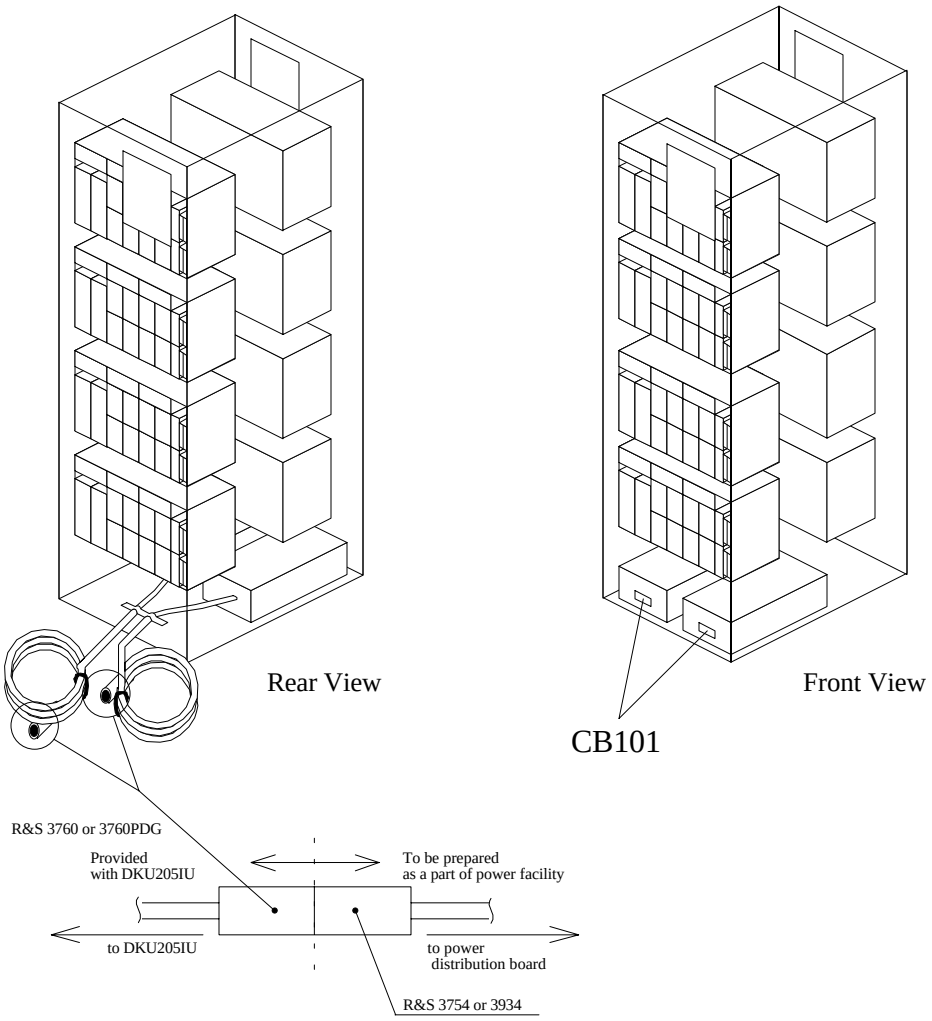

Fig. 4.2-1 Disconnection of the AC cables

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4.2.1.2 DKC210IE/DKU205IE

⚠ DANGER

The DKC and the first DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU, and the 4th DKU also has Two Main Disconnect Devices.
Observe all instructions described in this manual before connecting the equipment to the power source and before servicing.

A. Connection of Power Supply Cord

The unit has two power supply cords. Be sure to prepare the following socket receptacles and power cords between the power distribution board of the building and the power cords for the unit.

Socket Receptacle : As shown in the following figure.
Power Cord : Type H07RN-F or equivalent, with five 6.0 mm 2 conductors. Terminated at one end with an assembled on above socket receptacle cap.

Be sure to connect a power cord to the distribution box as illustrated in the following figure. The wrong connection of neutral line may cause damages or fire of the equipment.
To reduce the risk of wrong connection, you should use approved type attachment plug and socket for power cord connection.
High leakage current may be caused between the power supply and this unit. To avoid an electric shock by high leakage current, perform the protective earth connection before the supply connections and disconnect it after the supply connections.

B. Requirements to Branch Circuit

This unit relies on the building installation for protection of the internal components of the equipment.
Each line (R/S/T line) should be protected by a short circuit protective device and by an overcurrent protective device rated 30 amp on building installation.
The protective device on building installation shall be comply with National Standards of the country where the units shall be installed, and if a protective device interrupts a conductor, it shall also interrupt all other supply conductors.
This protection is also required for the neutral line of this unit.

C. Disconnection from Power Supply

Each unit has Two Main Disconnect Device (Two Main Breaker CB101s for Dual Power Lines).
To remove all utility power from the unit, turn off both main disconnect device CB101s at the same time.

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a. Refer to Fig. 4.2-2. Disconnect the AC cables.

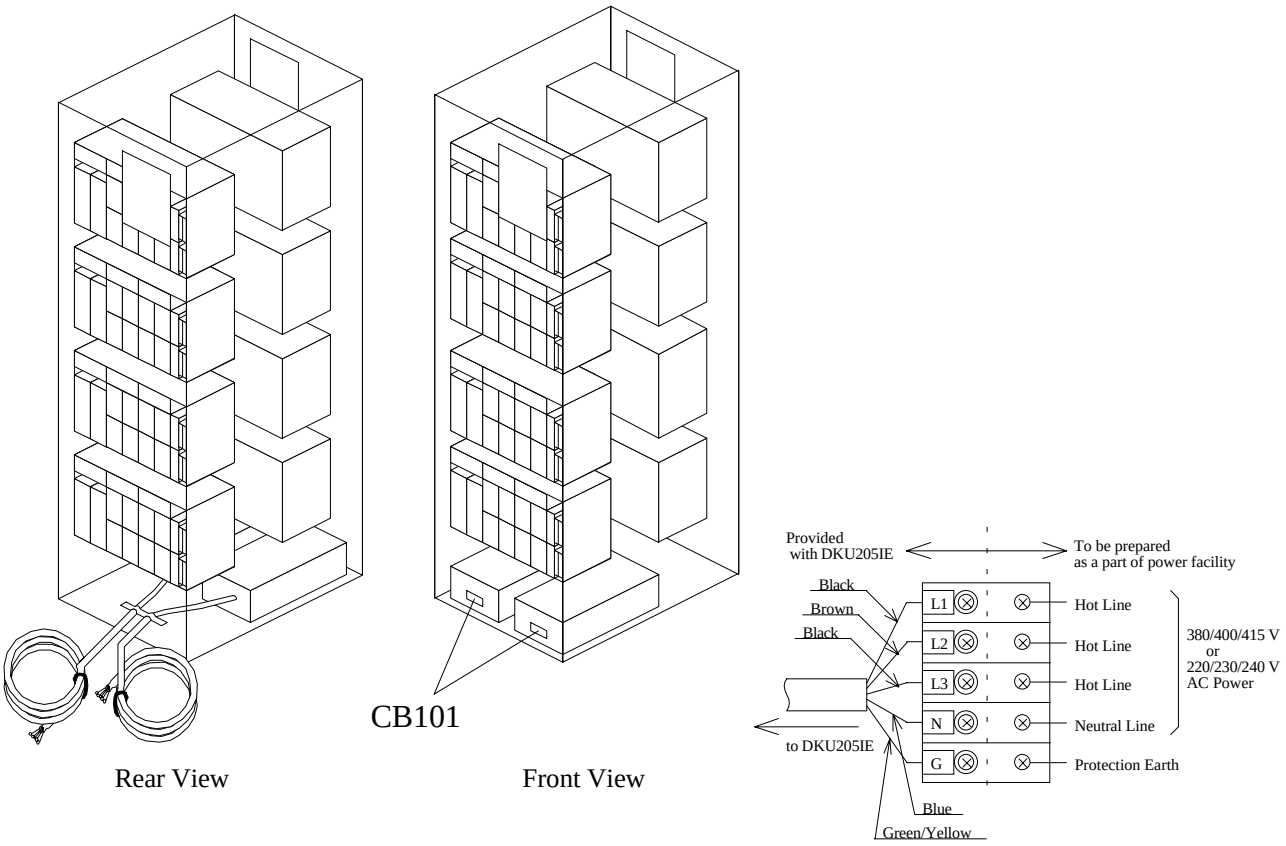

Fig. 1.4.2-2 Disconnection of the AC cables

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4.2.2 Disconnection of Channel Interface Cable

4.2.2.1 Disconnection of Parallel Channel Interface Cable

a. Refer to Fig. 4.2-3. Disconnect the Parallel Channel Interface cables.

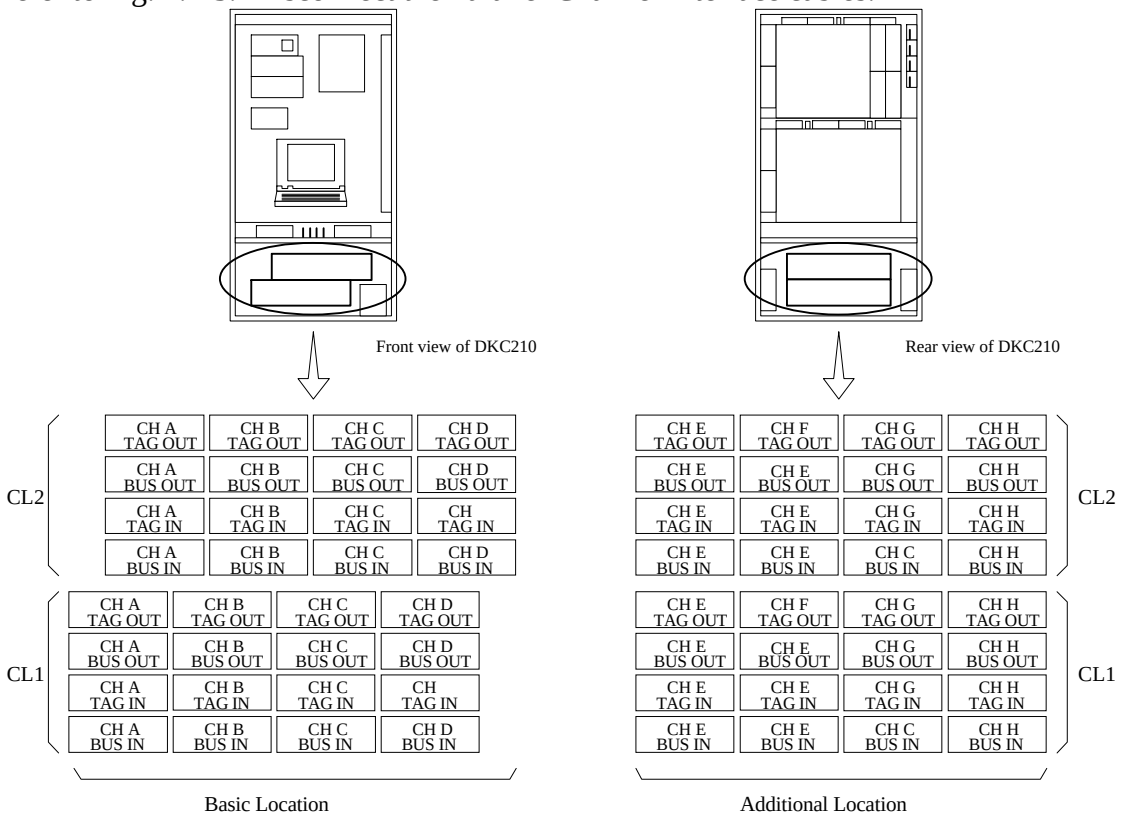

Fig. 4.2-3 Disconnection of the Parallel Channel Interface cables

4.2.2.2 Disconnection of Serial Channel Interface Cable

a. Refer to Fig. 4.2-4. Disconnect the Serial Channel Interface cables.

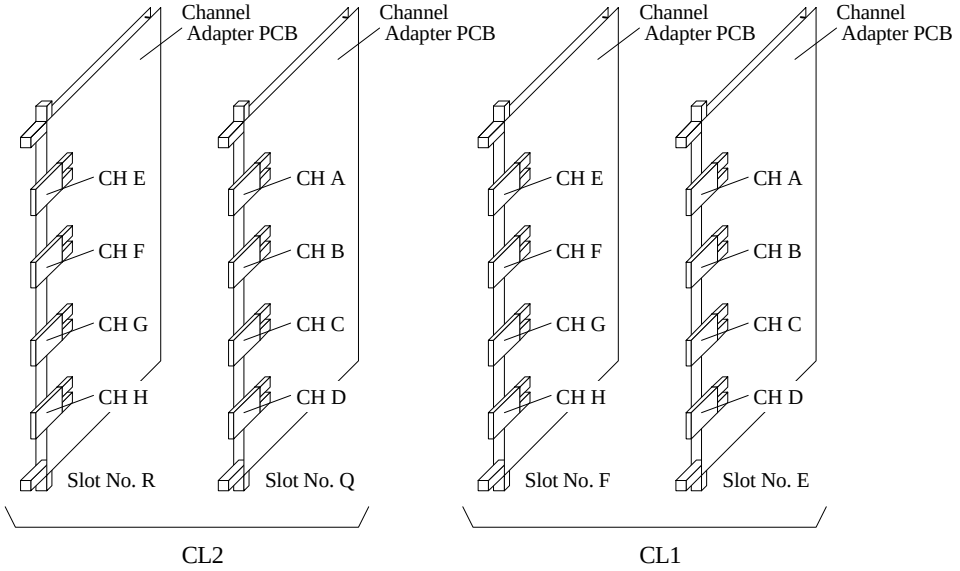

Fig. 4.2-4 Disconnection of the Serial Channel Interface cable

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4.2.2.3 SCSI Channel Interface Cable

a. refer to Fig. 4.2-5. Disconnect the SCSI Channel Interface cables.

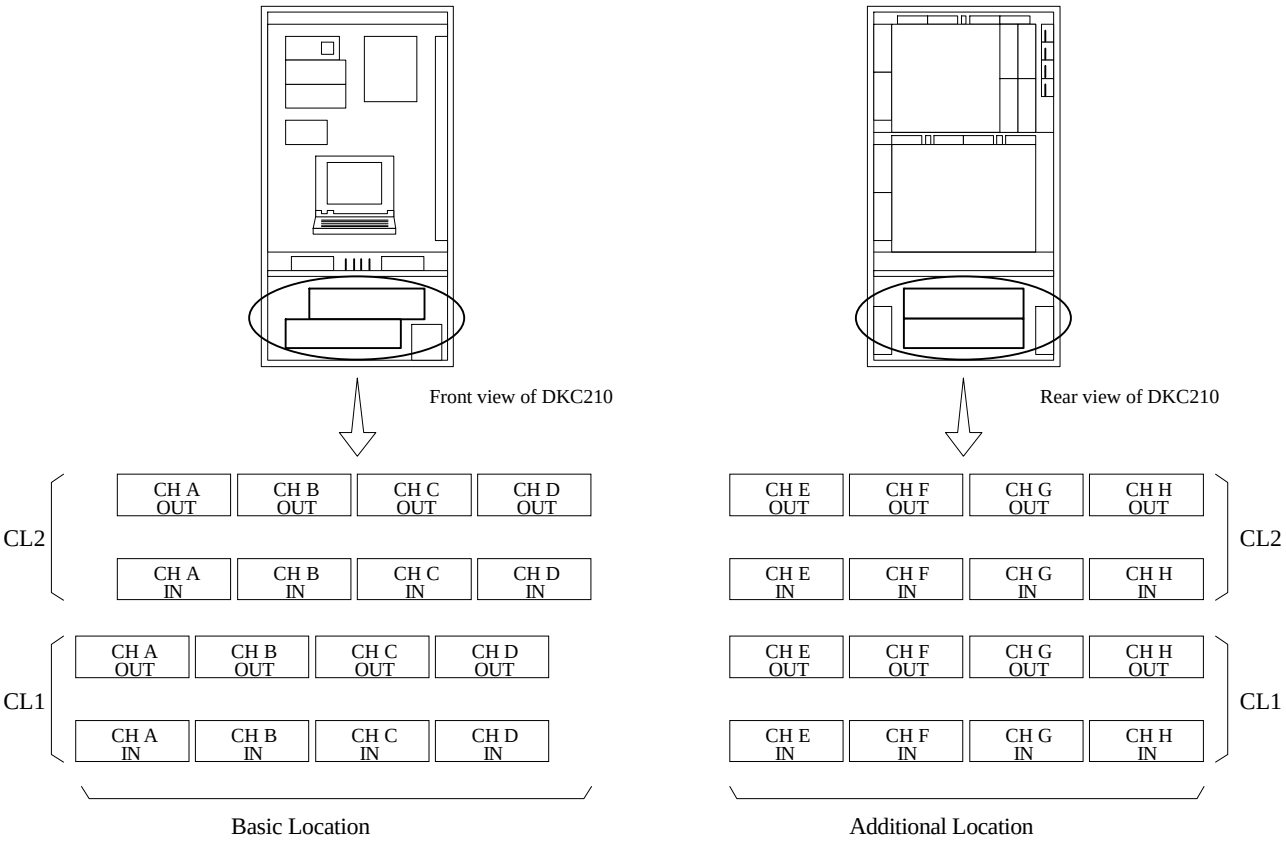

Fig. 4.2-5 Disconnection of the SCSI Channel Interface cables

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4.2.3 Disconnection of PCI Cable

a. Refer to Fig. 4.2-6. Disconnect the PCI cables.

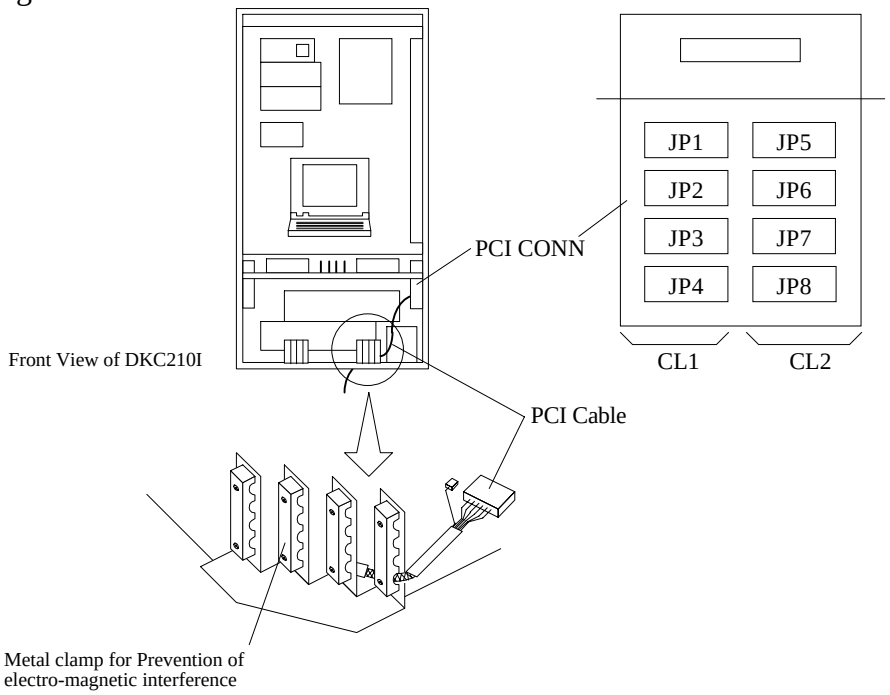
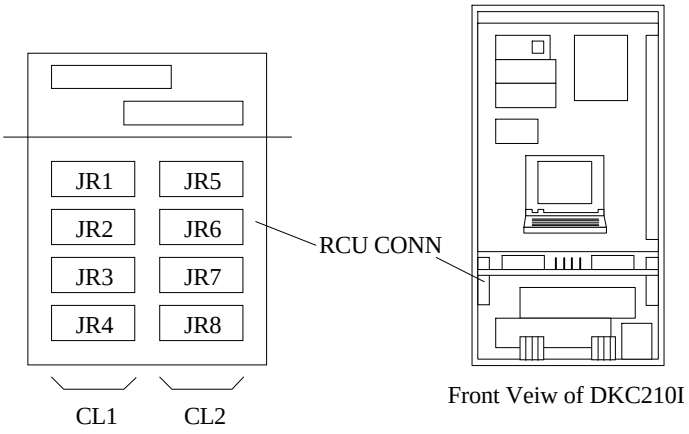


Fig. 4.2-6 Disconnection of the PCI cables

4.2.4 Disconnection of RCU Cable

a. Refer to Fig. 4.2-7. Disconnect the RCU cables.



Connector No.	Enable/Disable Route
JR1	CL1 CH A,B
JR2	CL1 CH C,D
JR3	CL1 CH E,F
JR4	CL1 CH G,H
JR5	CL2 CH A,B
JR6	CL2 CH C,D
JR7	CL2 CH E,F
JR8	CL2 CH G,H

Fig. 4.2-7 Disconnection of the RCU cables

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4.3 Disconnection of DKC

4.3.1 Disconnection between DKC and 1st DKU

(1) Disconnect the AC cables from the AC boxes.

a. Loosen the two screws.

b. Remove the plate.

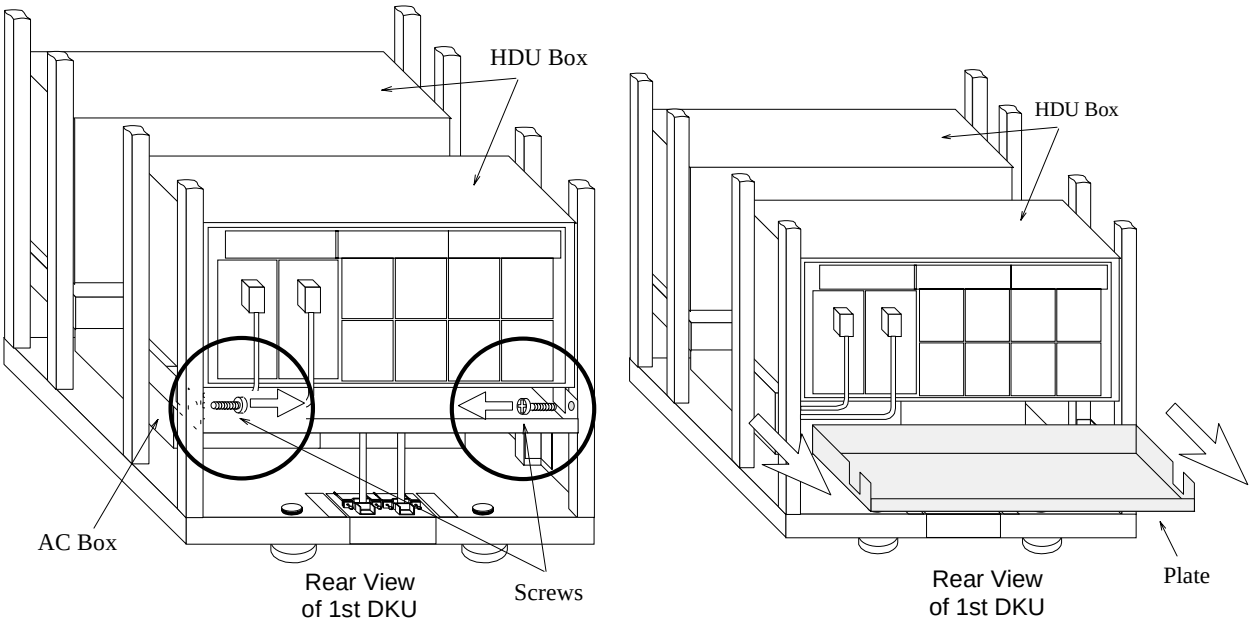

Fig. 4.3.1-1 Removal of the plate

c. Remove the repeat binders.

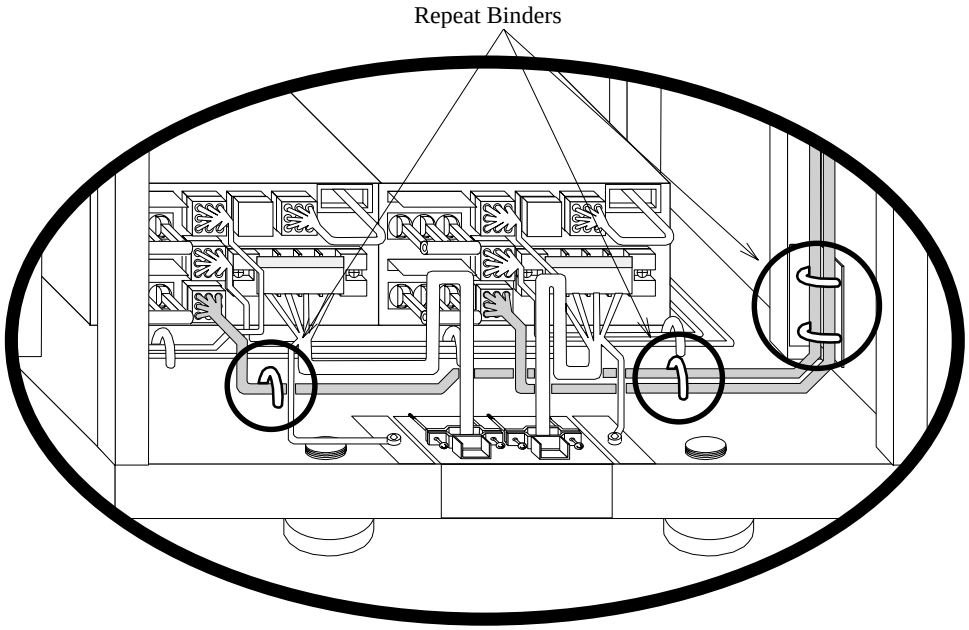

Fig. 4.3.1-2 Removal of the repeat binders

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d. Disconnect the AC cables from the AC boxes.

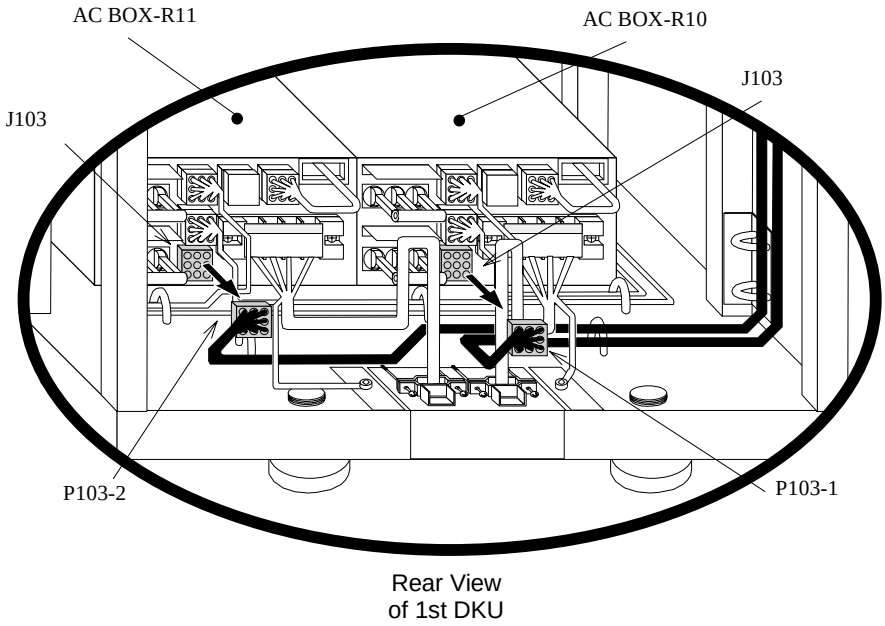

Fig. 4.3.1-3 Disconnection of the AC cables

e. Re-Install the plate.

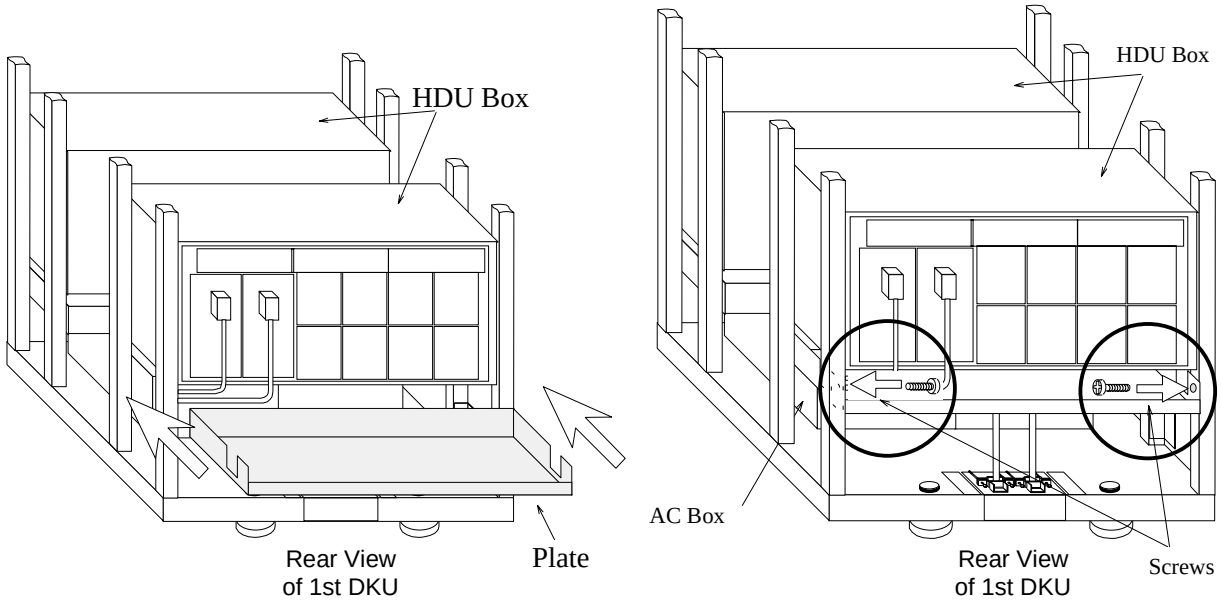

Fig. 4.3.1-4 Re-Installation of the plate

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(2) Disconnect the DKUMN cables from the DKUMN PCBs.

a. Disconnect the DKUMN cables from the DKUMN PCBs.

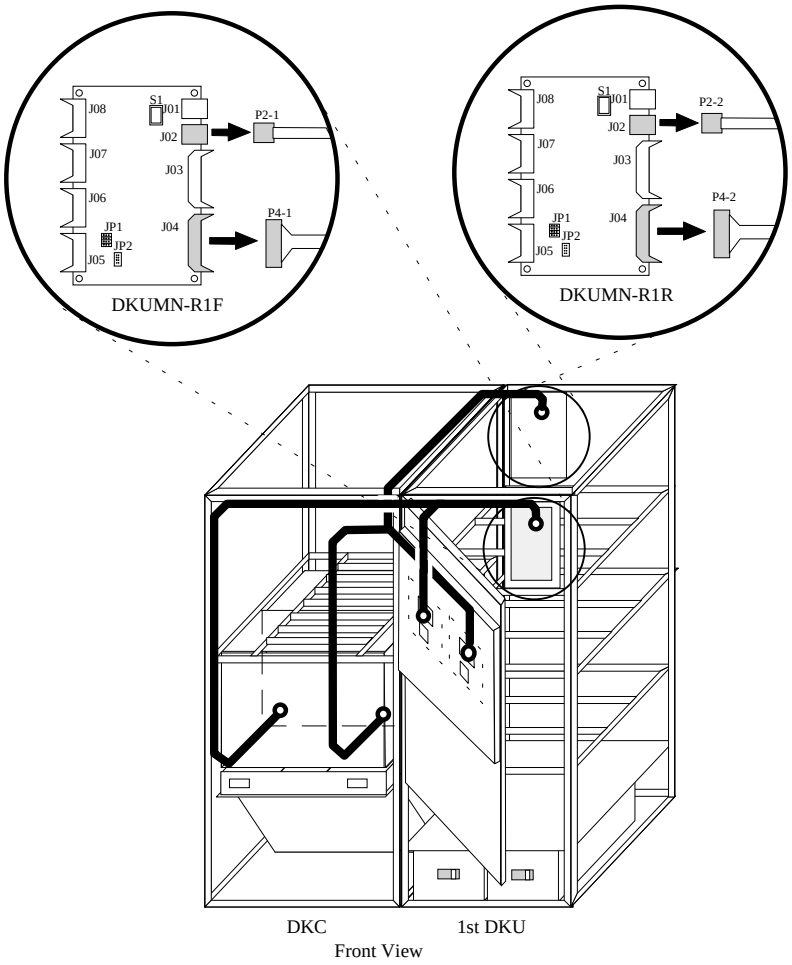

Fig. 4.3.1-5 Disconnection of DKUMN cables

b. Loosen the four screws.

c. Lift the DKUMN PCBs.

d. Slide and secure the DKUMN PCBs.

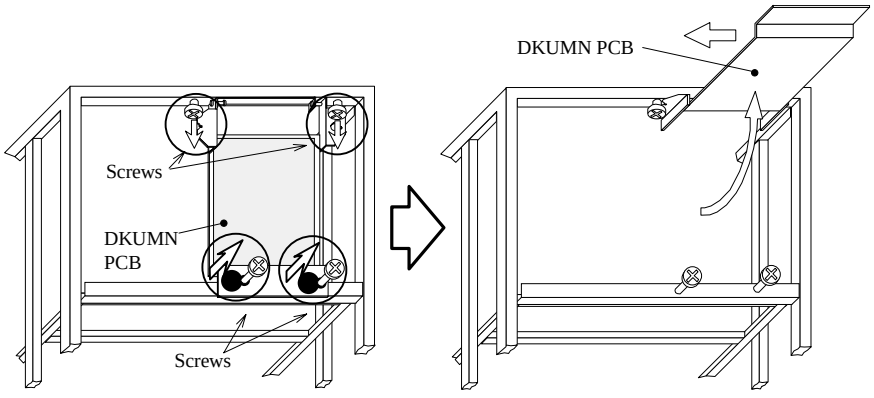

Fig. 4.3.1-6 Lift of DKUMN PCBs

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e. Remove the repeat binders.

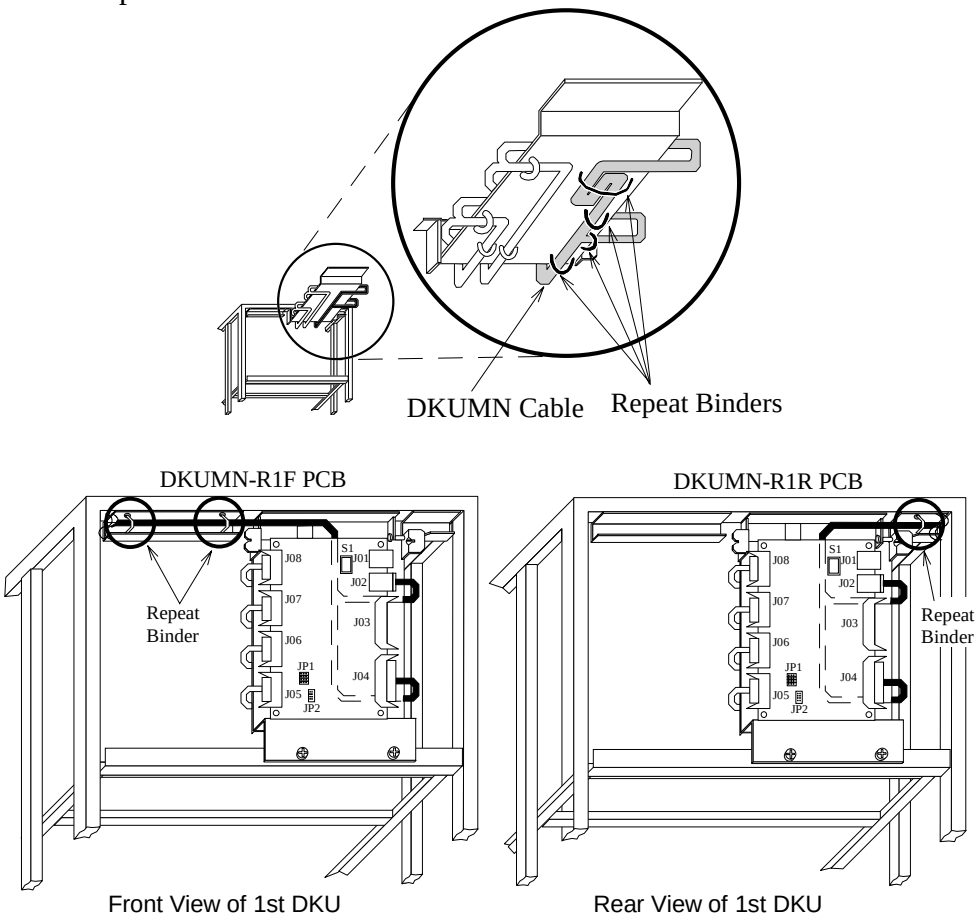

Fig. 4.3.1-7 Removal of repeat binders

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(3) Disconnect the SCSI interface cables from the SCSI BFR PCBs.

a. Disconnect the SCSI interface cables from the SCSI BFR PCBs.

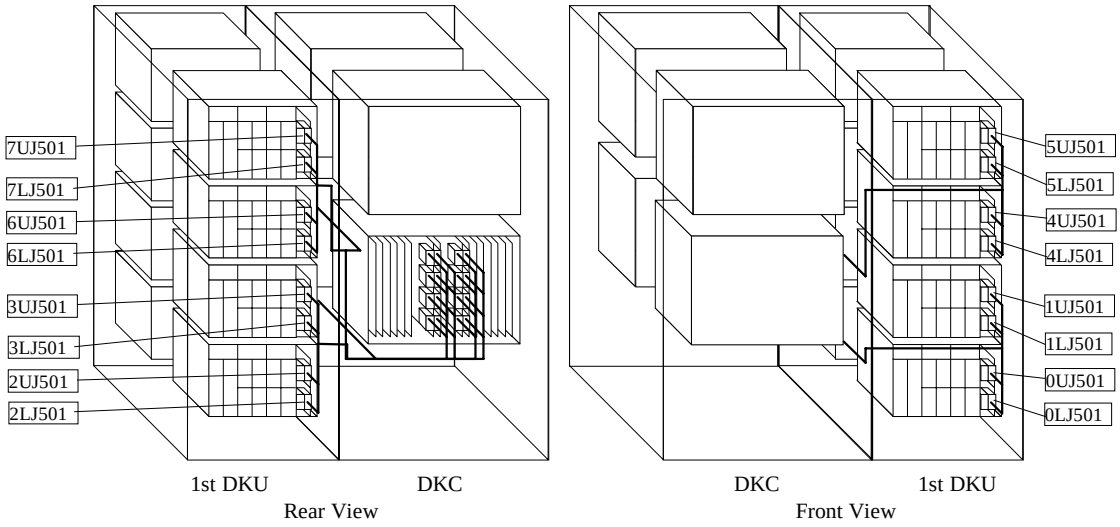

Fig. 4.3.1-8 Disconnection of SCSI Interface Cables

b. Remove the cable fixing wires and repeat binders.

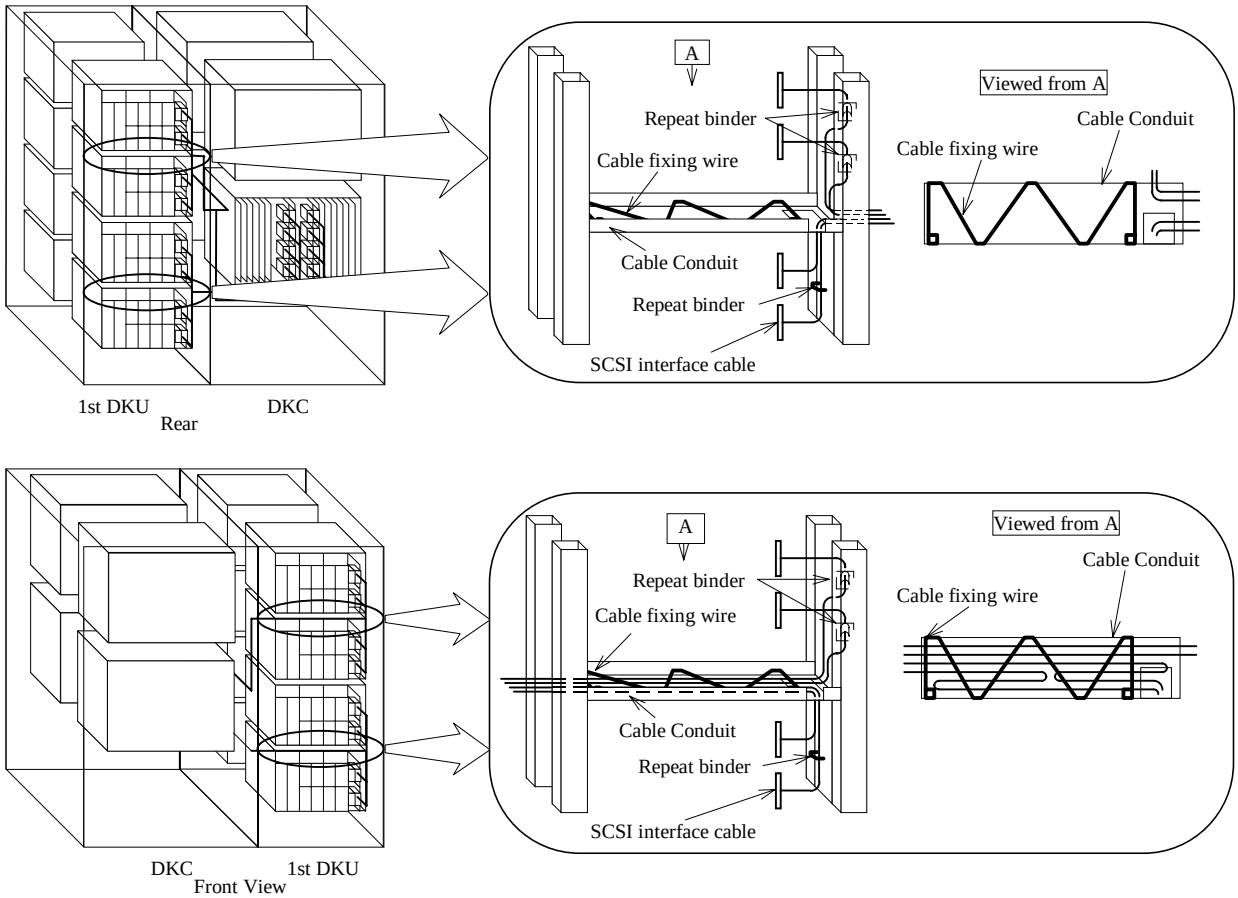

Fig. 4.3.1-9 Removal of the cable fixing wire and repeat binder

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(4) Remove the frame ground cable.

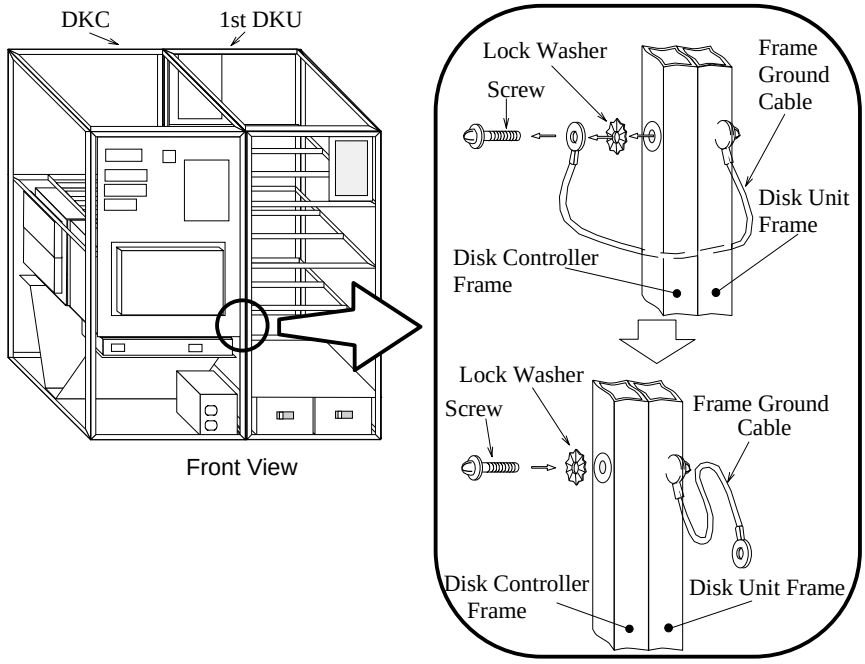

Fig. 4.3.1-10 Removal the frame ground cable

(5) Remove the kick plates.

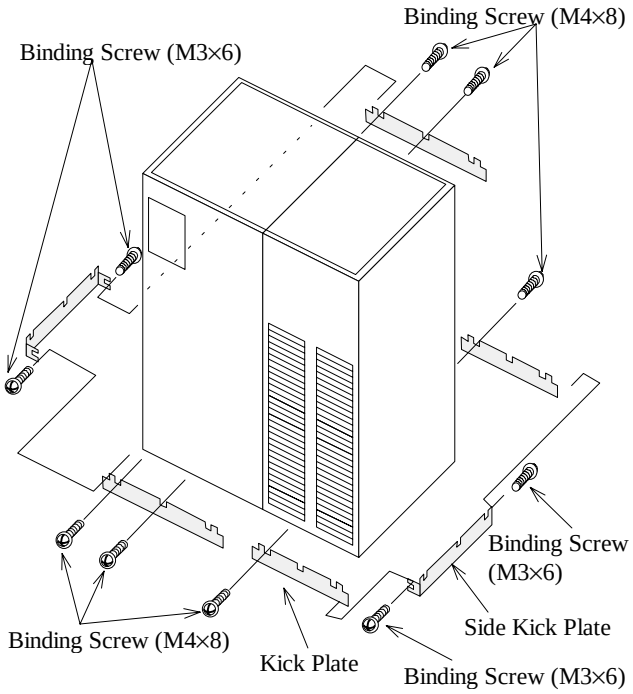

Fig. 4.3.1-11 Removal of the kick plates

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(6) Exchange the fixed plate.
   a. Loosen the screws.
   b. Exchange the fixed plate.
   c. Fix the fixed plate with the screws.

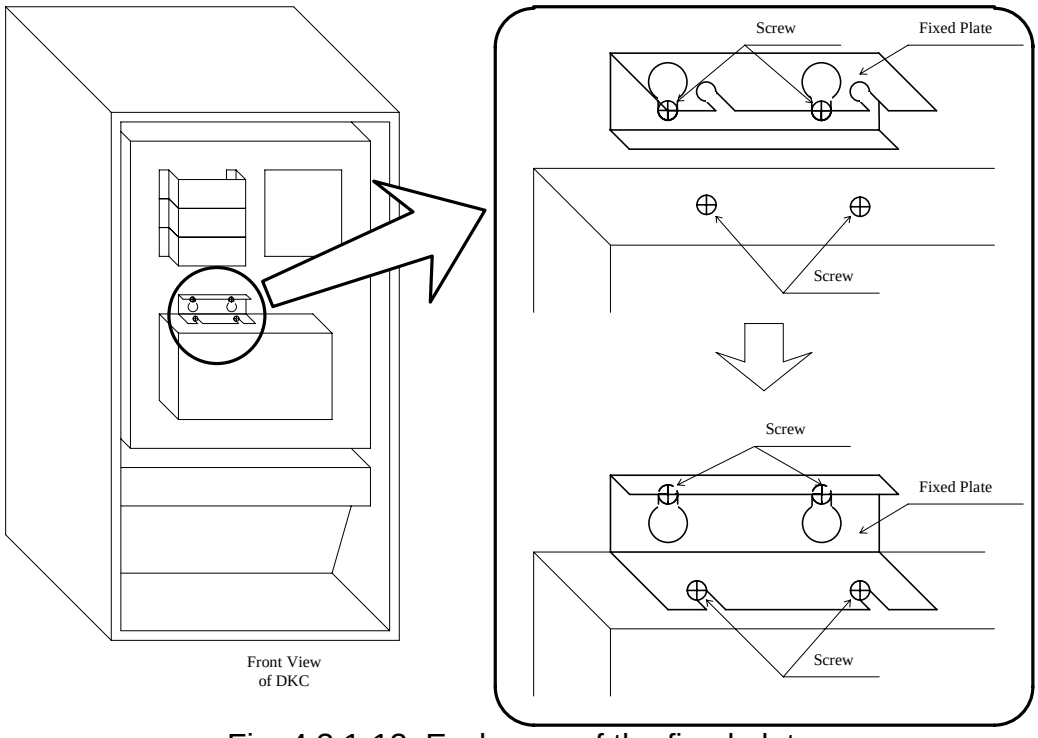

Fig. 4.3.1-12 Exchange of the fixed plate

(7) Fix the movable rack with the screws.

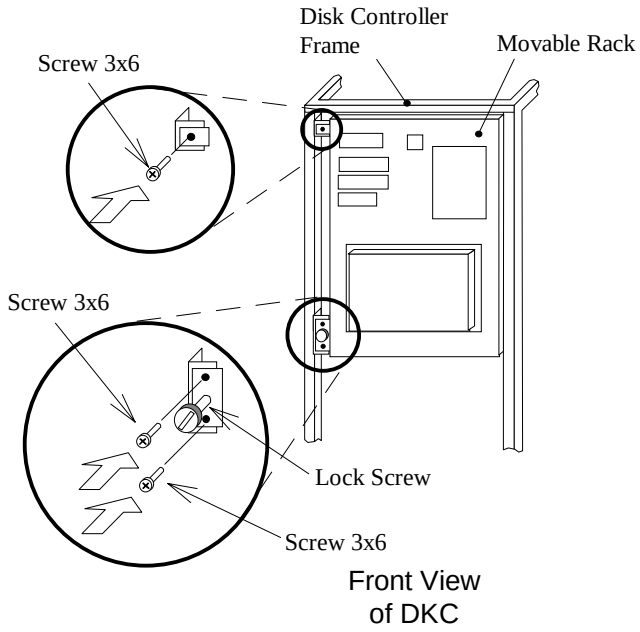

Fig. 4.3.1-13 Fixing the movable rack

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(8) Disconnect the connecting bolts.

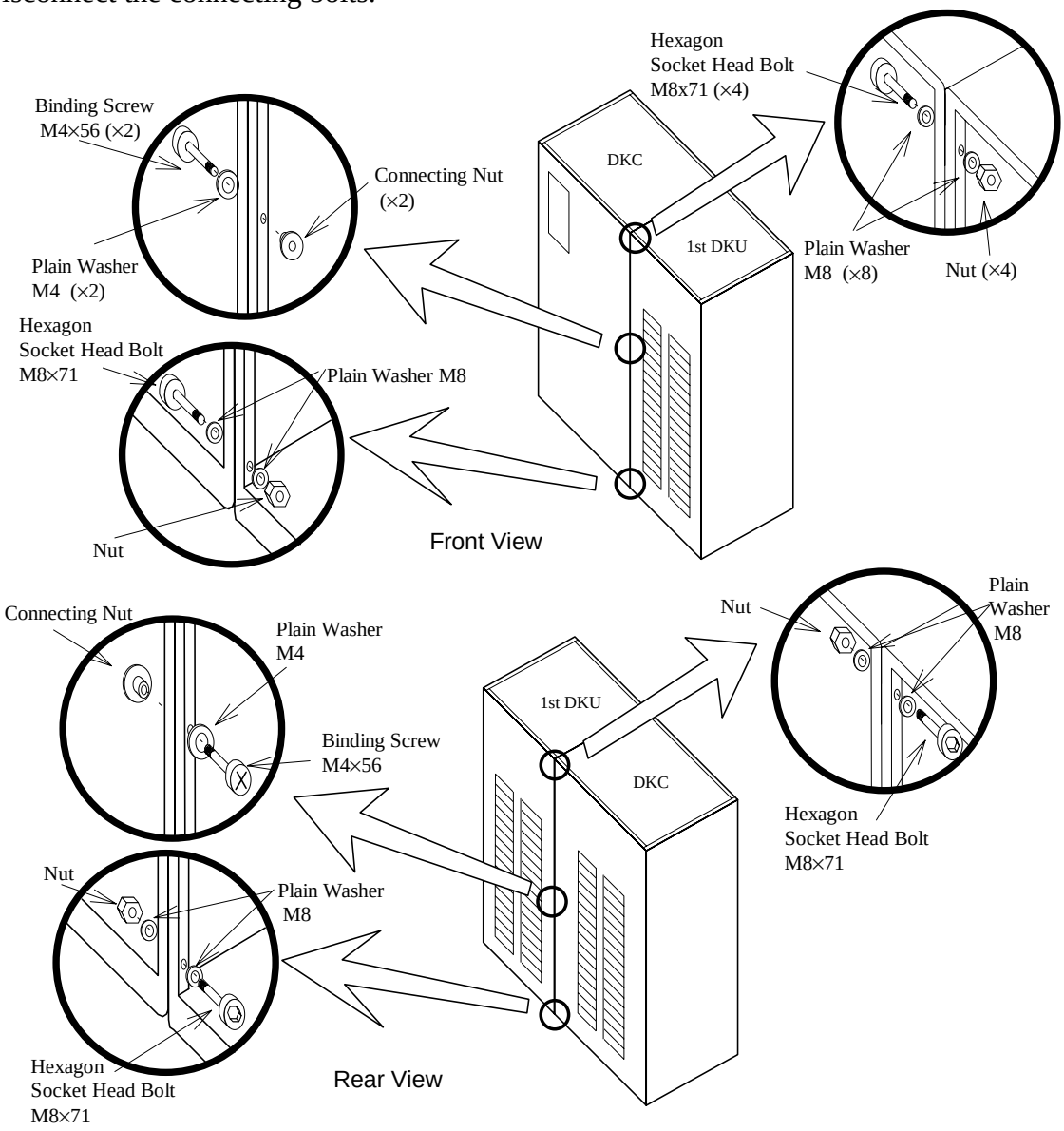

Fig. 4.3.1-14 Disconnection of the connecting bolts.

(9) Loosen the screw jack of First DKU.

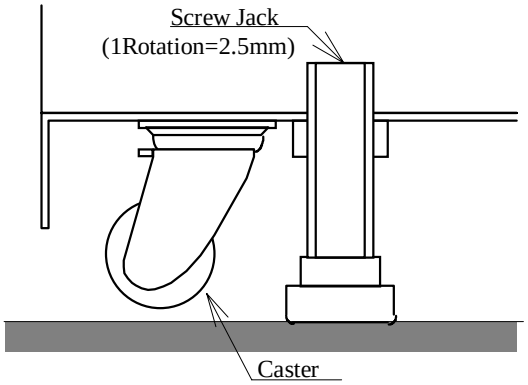

Fig. 4.3.1-15 Loosening the screw jack

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(10) Secure the power cable assy.

a. Loosen the four screws.

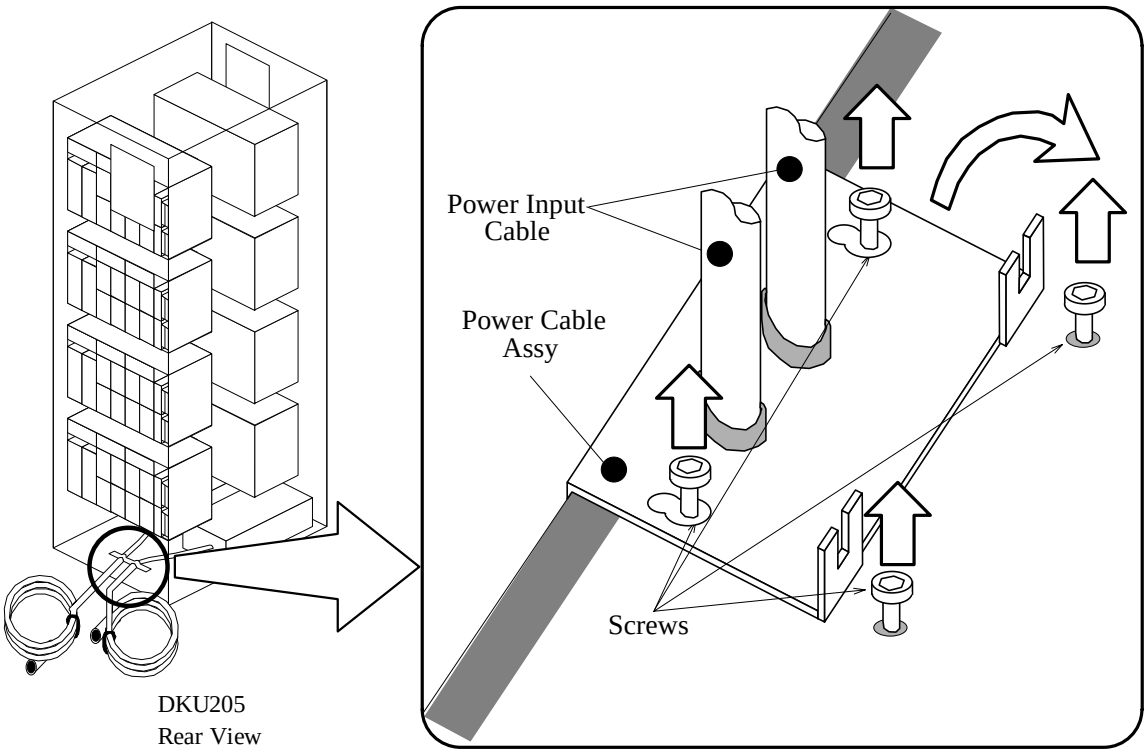

Fig. 4.3.1-16 Fixing of the power cable assy

b. Secure the power cable assy with the screws.

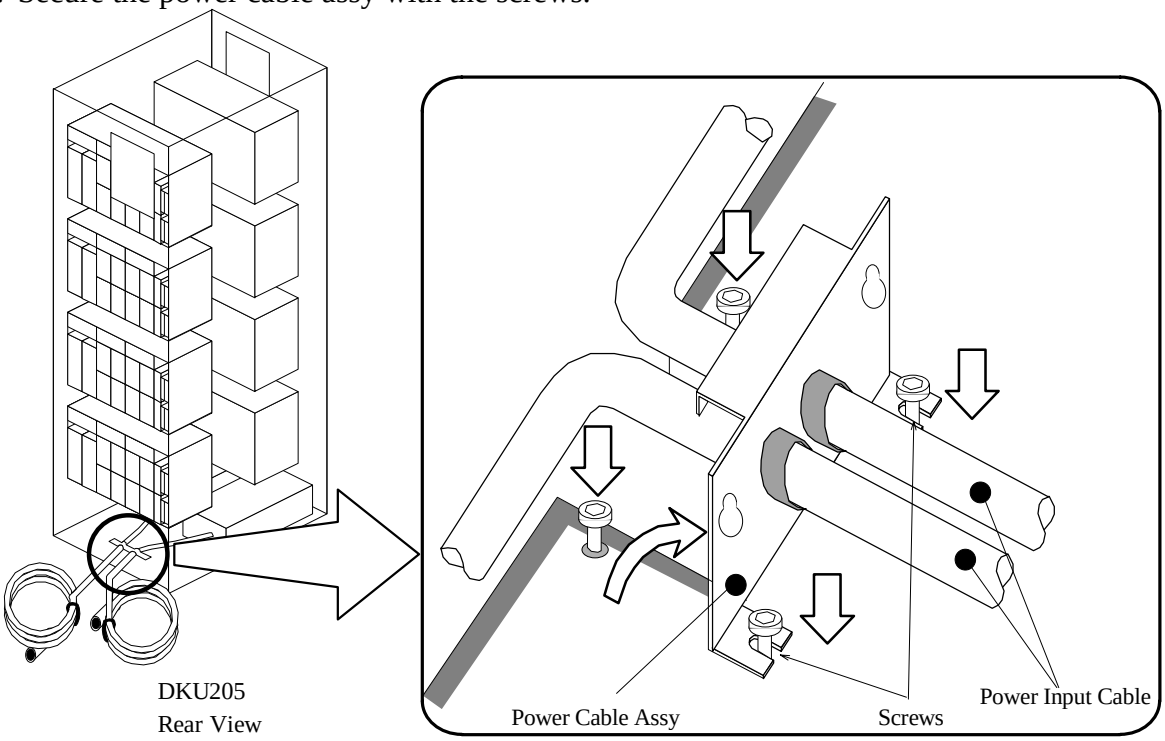

Fig. 4.3.1-17 Fixing of the power cable assy

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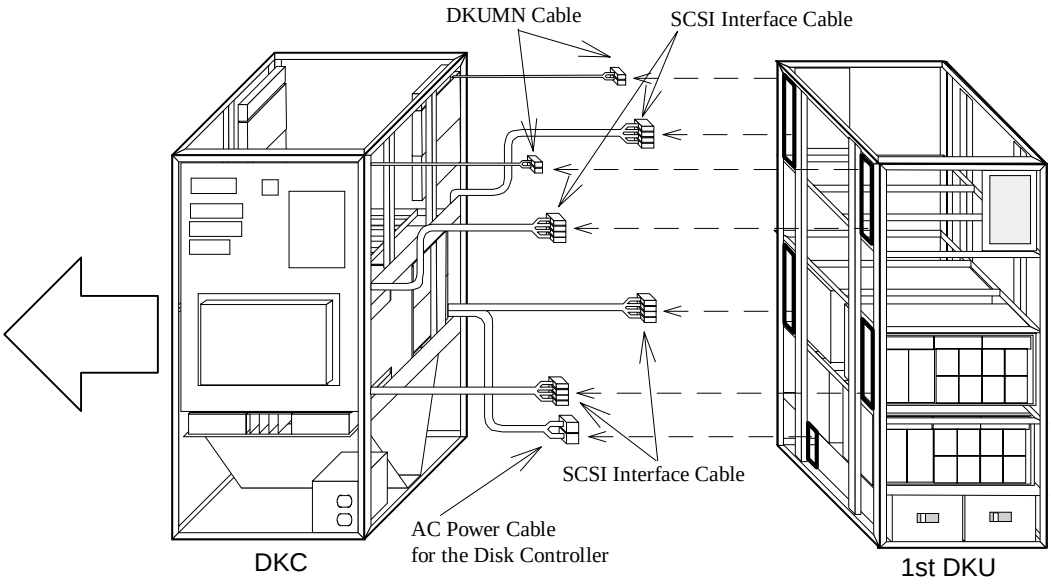
(11) Remove the DKC.

Notice : Move the DKC and the DKU as being careful of floor cut.

[In case that there isn't second DKU.]

a. In case that there isn't second DKU, remove the DKC from basic DKU.

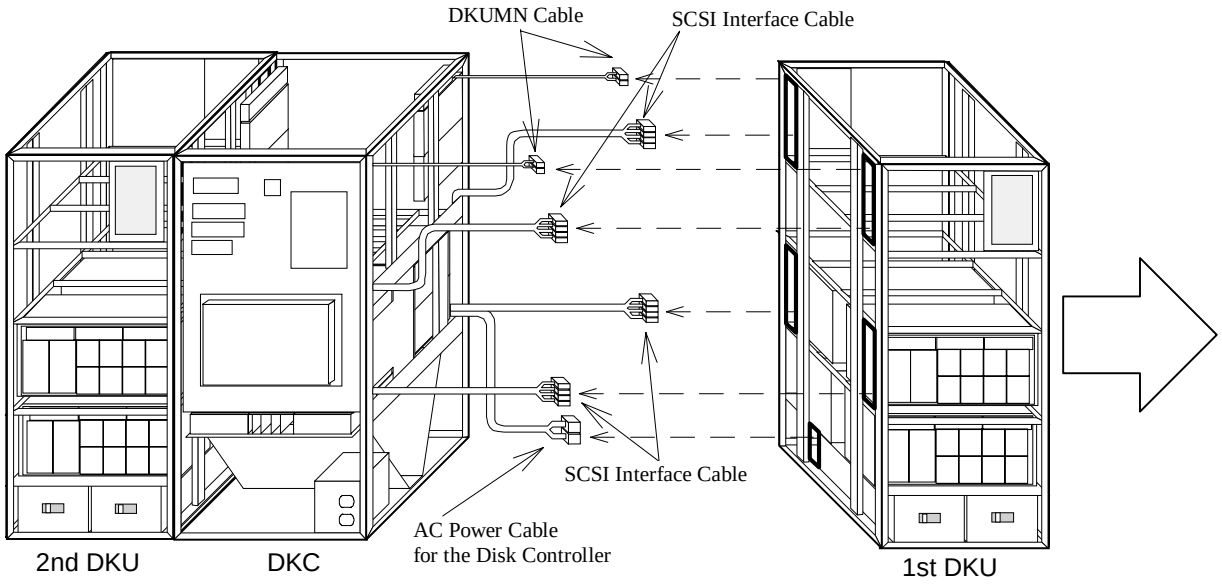


Front View

Fig. 4.3.1-18 Removal of the DKC

[In case that there is second DKU.]

a. In case that there is second DKU, remove the basic DKU from DKC.



Front View

Fig. 4.3.1-19 Removal of the basic DKU

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(12) Fix the DKUMN cables, the SCSI interface cables and the AC power cables.

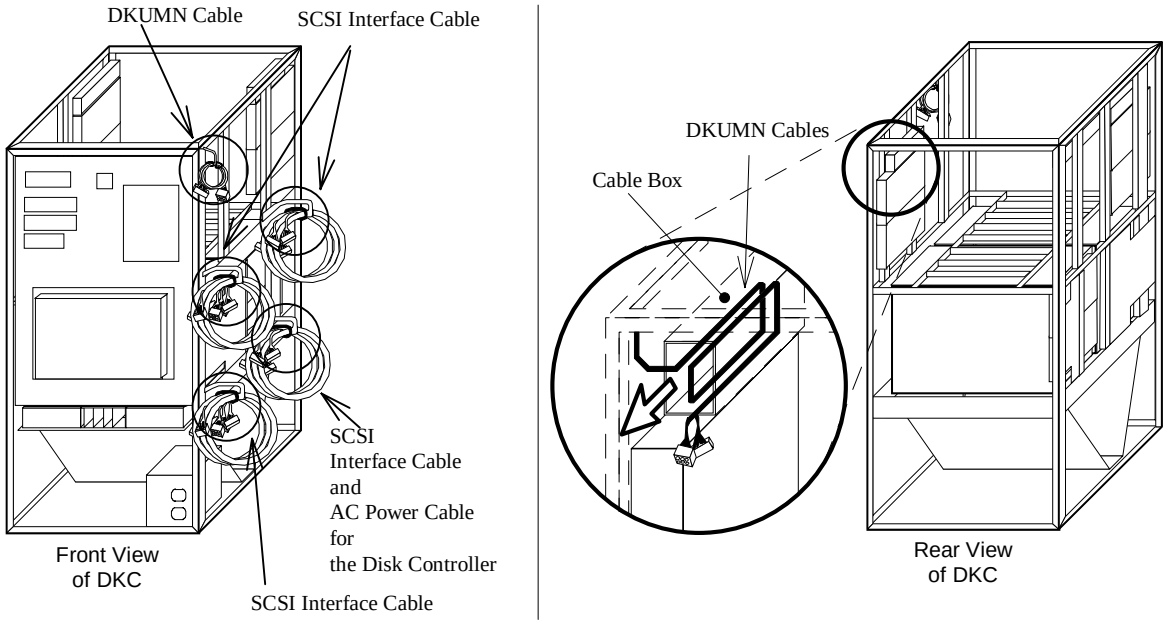

Fig. 4.3.1-20 Fixation of the cables

(13) Replace the New DKC.
In case that there is second DKU, go to “Disconnection between DKC and second DKU” [DKCREP04-220].

Go to “Connection of New DKC” [DKCREP04-320].

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4.3.2 Disconnection between DKC and Second DKU

(1) Disconnect the DKUMN cables from the DKUMN PCBs.
   a. Disconnect the DKUMN cables from the DKUMN PCBs.

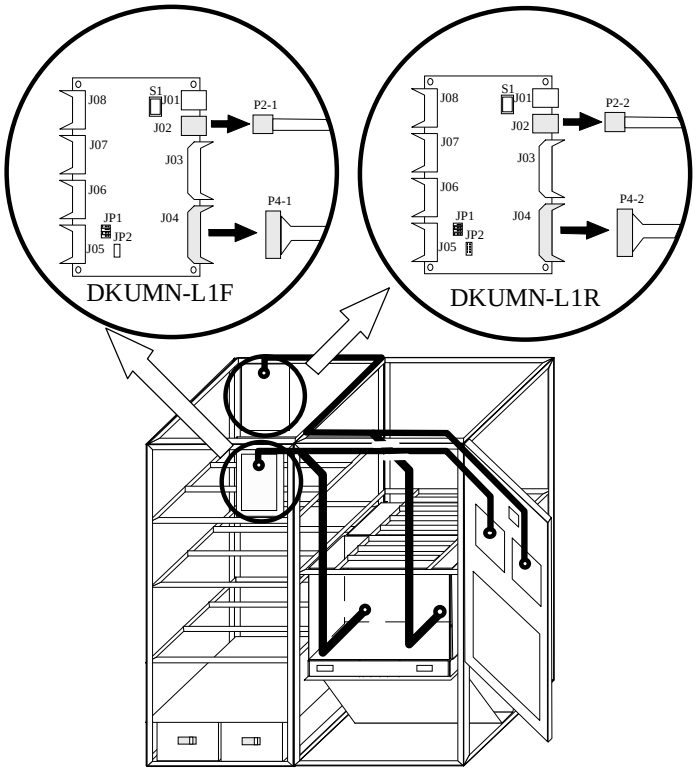

Fig. 4.3.2-1 Disconnection of DKUMN cables

   b. Loosen the four screws.
   c. Lift the DKUMN PCBs.
   d. Slide and secure the DKUMN PCBs.

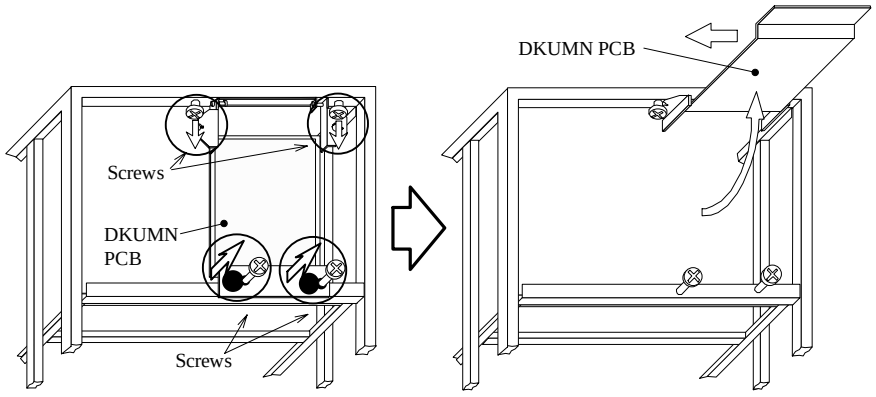

Fig. 4.3.2-2 Lift of DKUMN PCBs

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e. Remove the repeat binders.

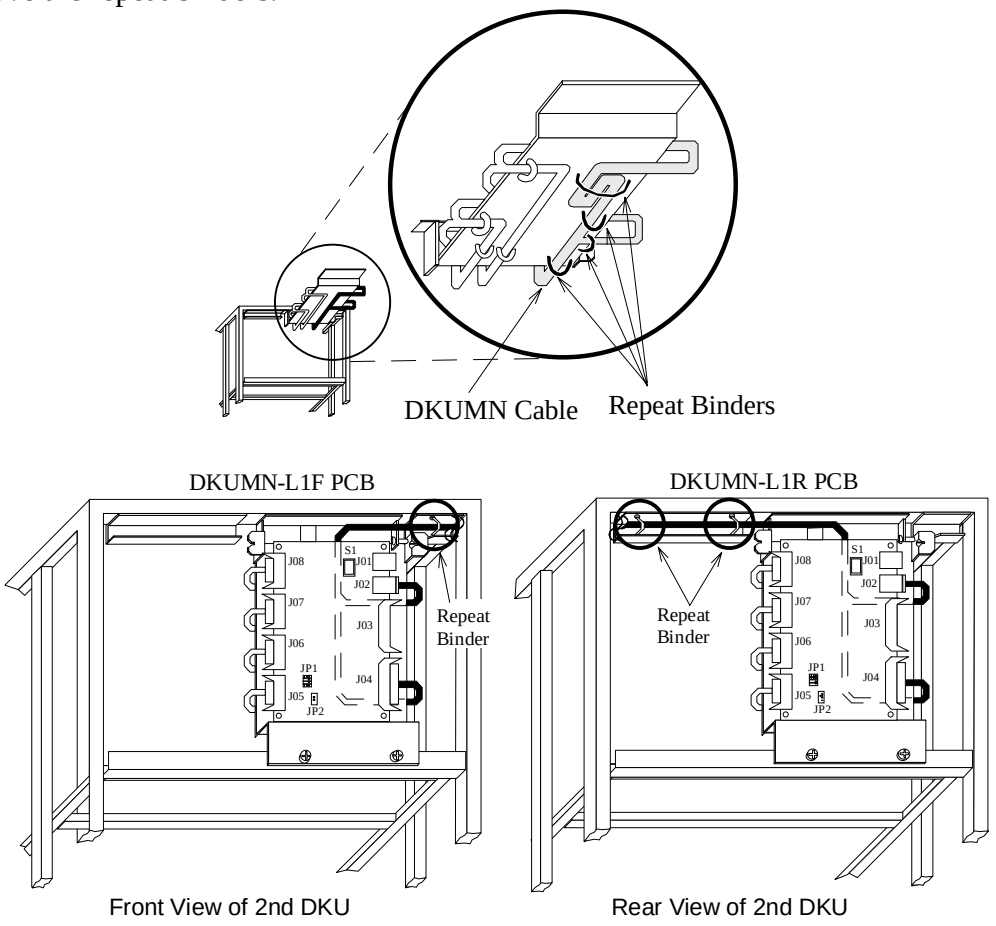

Fig. 4.3.2-3 Removal of repeat binders

f. Fix the DKUMN cables with repeat binders.
g. Insert the DKUMN cables into cable boxes.

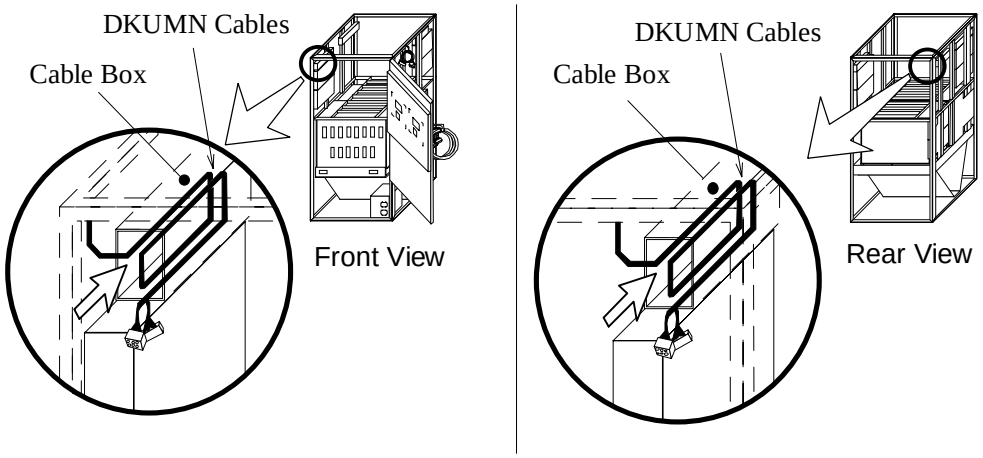

Fig. 4.3.2-4 Binding of DKUMN Cables

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(2) Disconnect the SCSI interface cables from the SCSI BFR PCBs.

a. Disconnect the SCSI interface cables from the SCSI BFR PCBs.

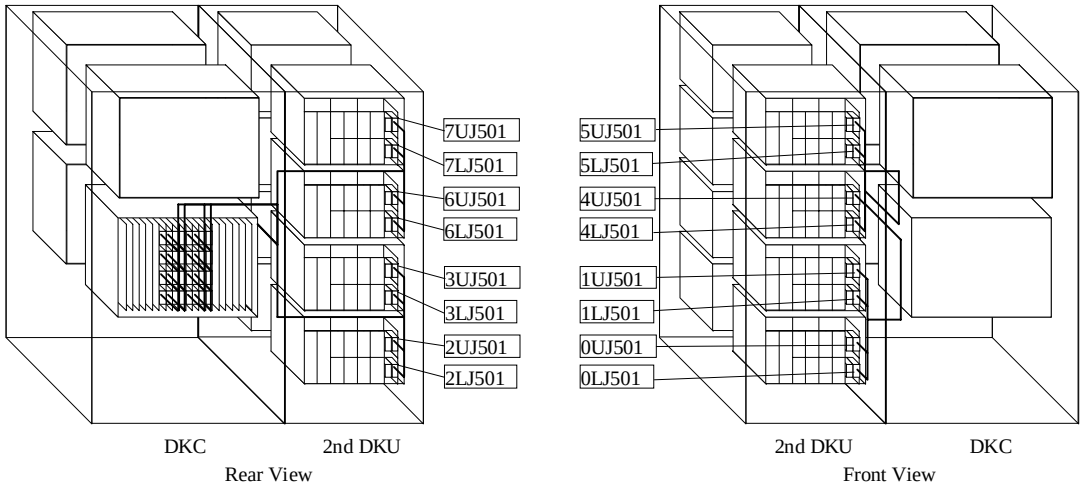

Fig. 4.3.2-5 Disconnection of the SCSI interface cables

b. Remove the cable fixing wires and repeat binders.

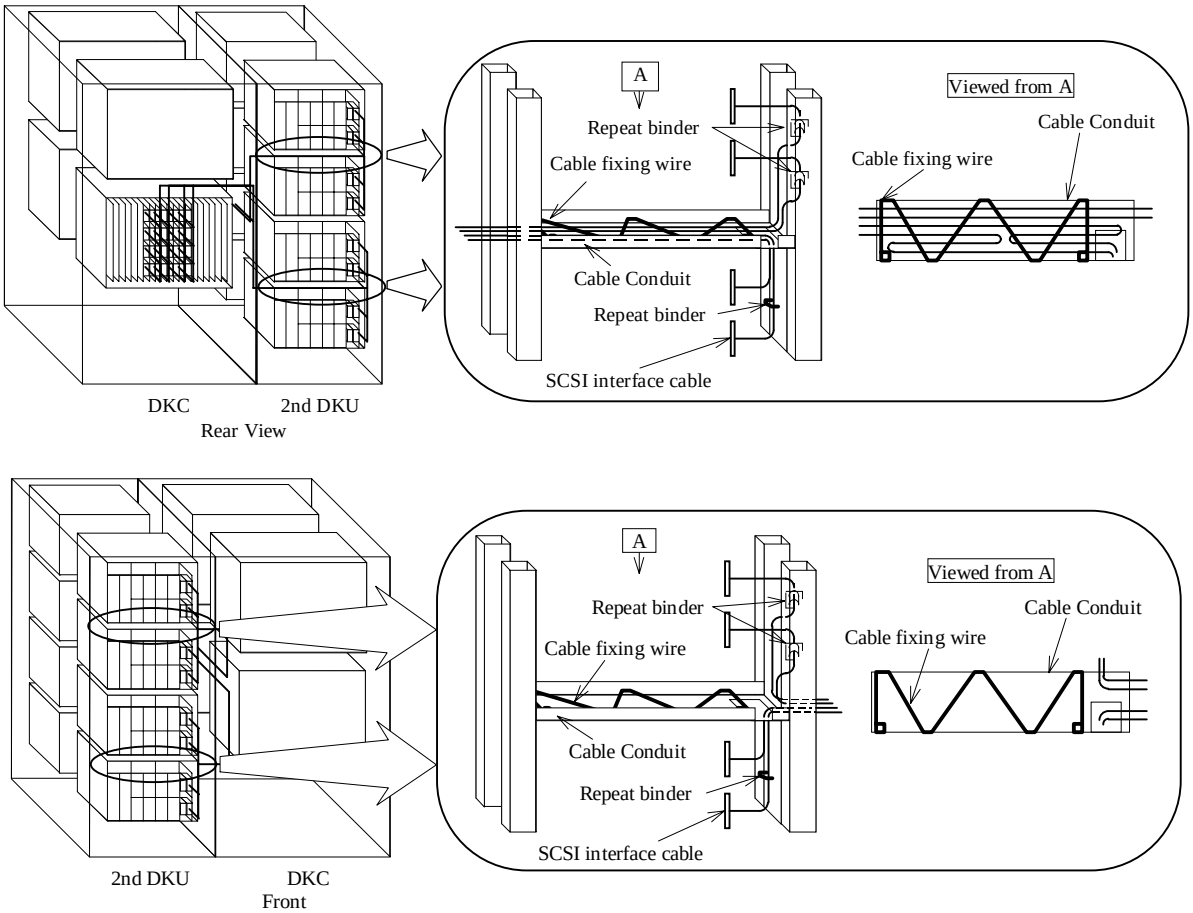

Fig. 4.3.2-6 Removal of cable fixing wires and repeat binders

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(3) Remove the name plate (DKU-F205I-2C).

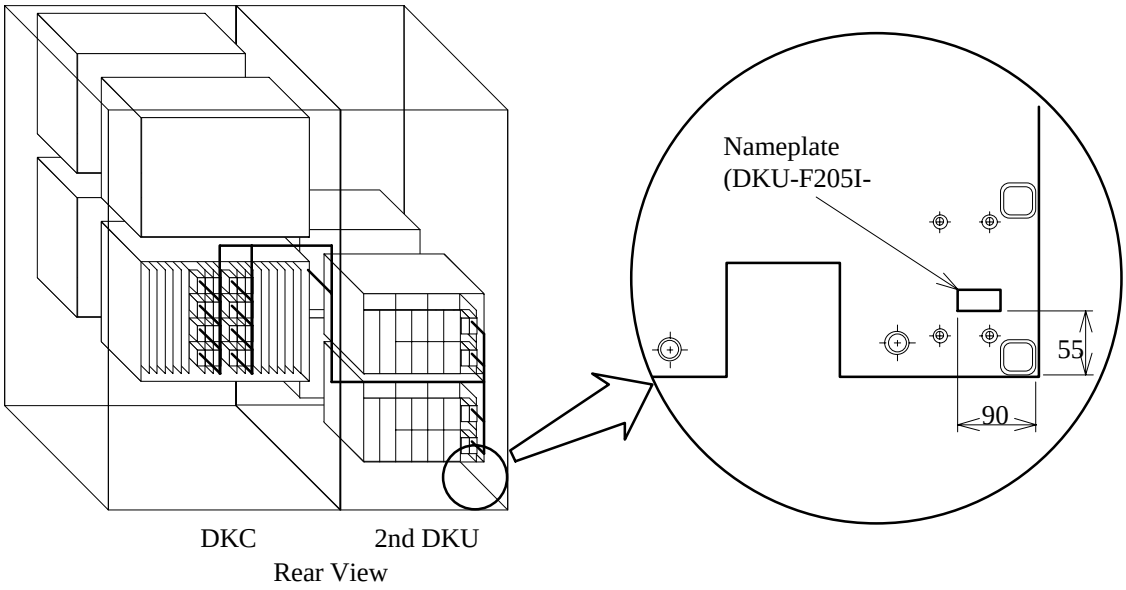

Fig. 4.3.2-7 Removal of the nameplate

(4) Remove the frame ground cable.

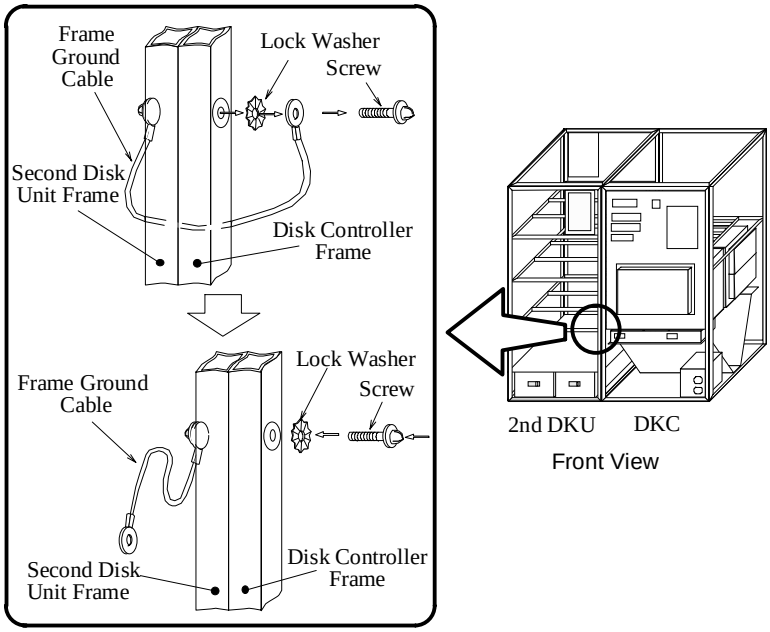

Fig. 4.3.2-8 Removal of the frame ground cable

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(5) Remove the kick plates.

a. In case that there is second DKU.

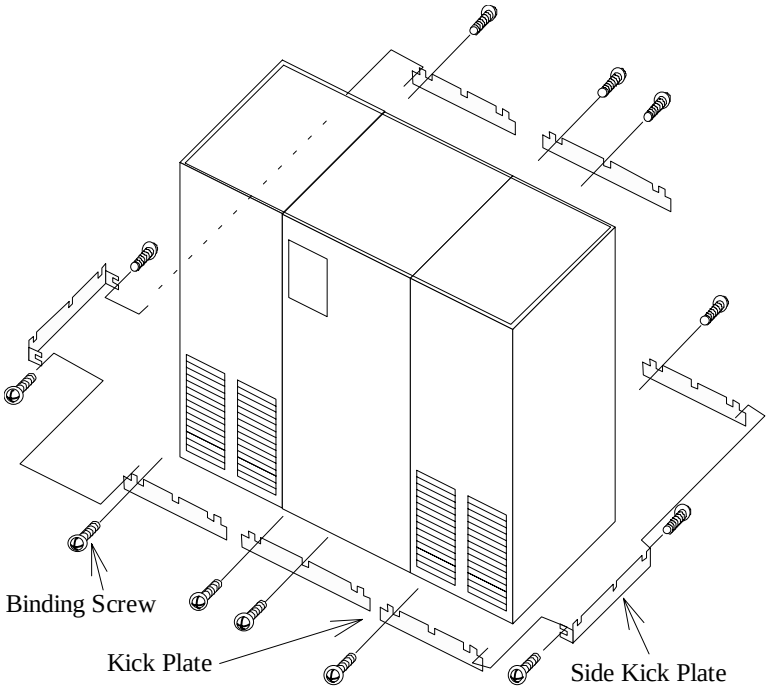

Fig. 4.3.2-9 Removal of the kick plates

b. In case that there is third DKU.

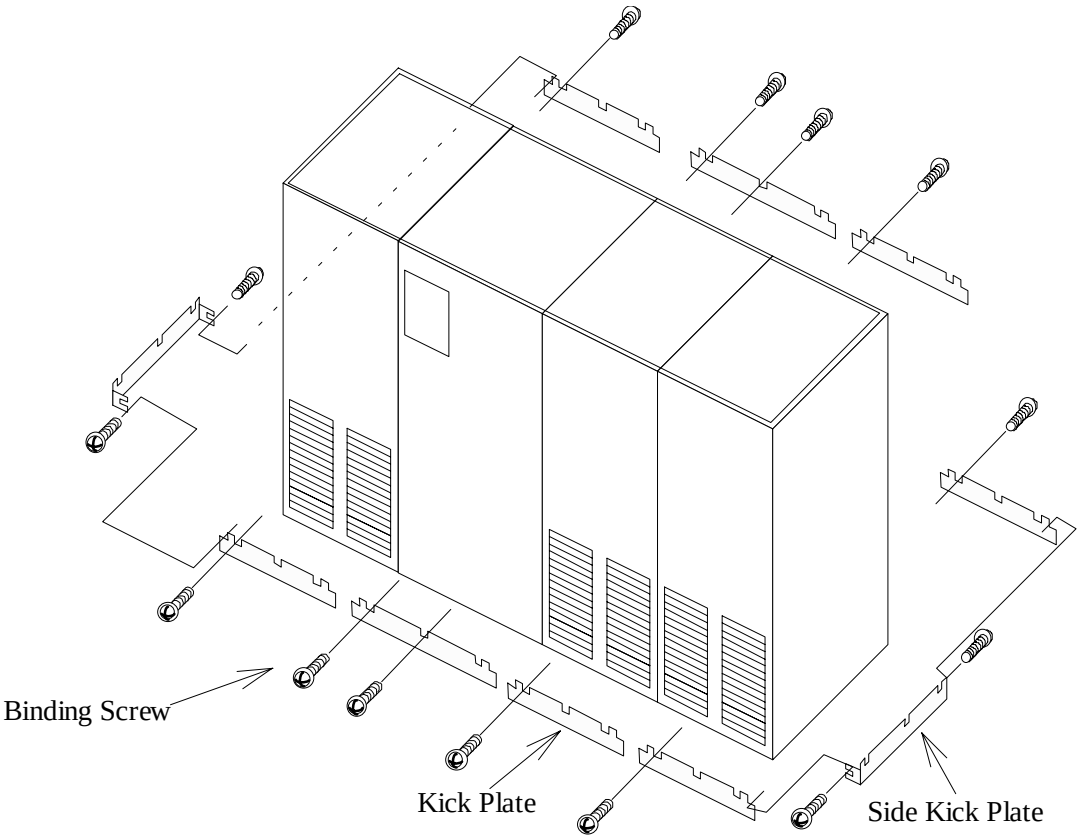

Fig. 4.3.2-10 Removal of the kick plates (Three DKUs)

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c. In case that there is fourth DKU.

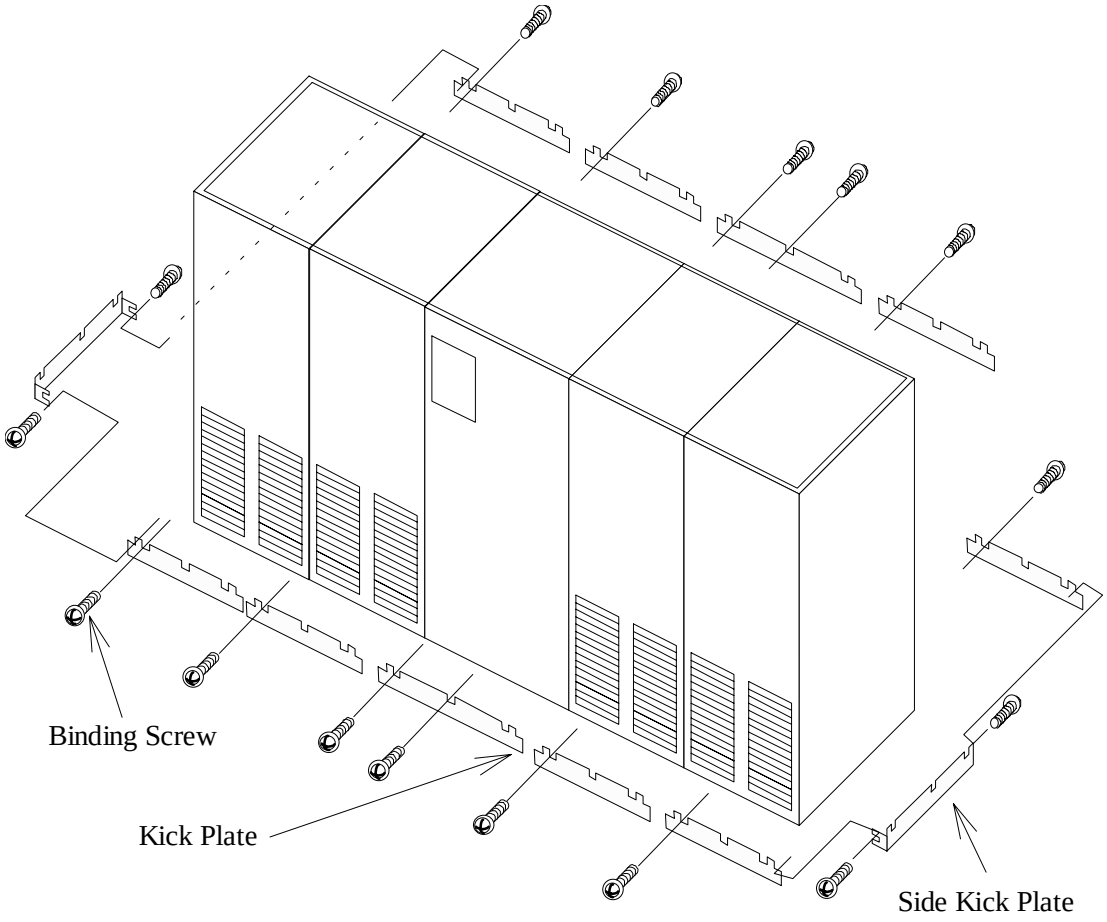

Fig. 4.3.2-11 Removal of the kick plates (Four DKUs)

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(6) Disconnect the connecting bolts.

Notice : Don't disconnect the connecting bolts for the first DKU and the third DKU.
Don't disconnect the connecting bolts for the second DKU and the fourth DKU.
Remove the power cable assy of the third DKU and the fourth DKU however.

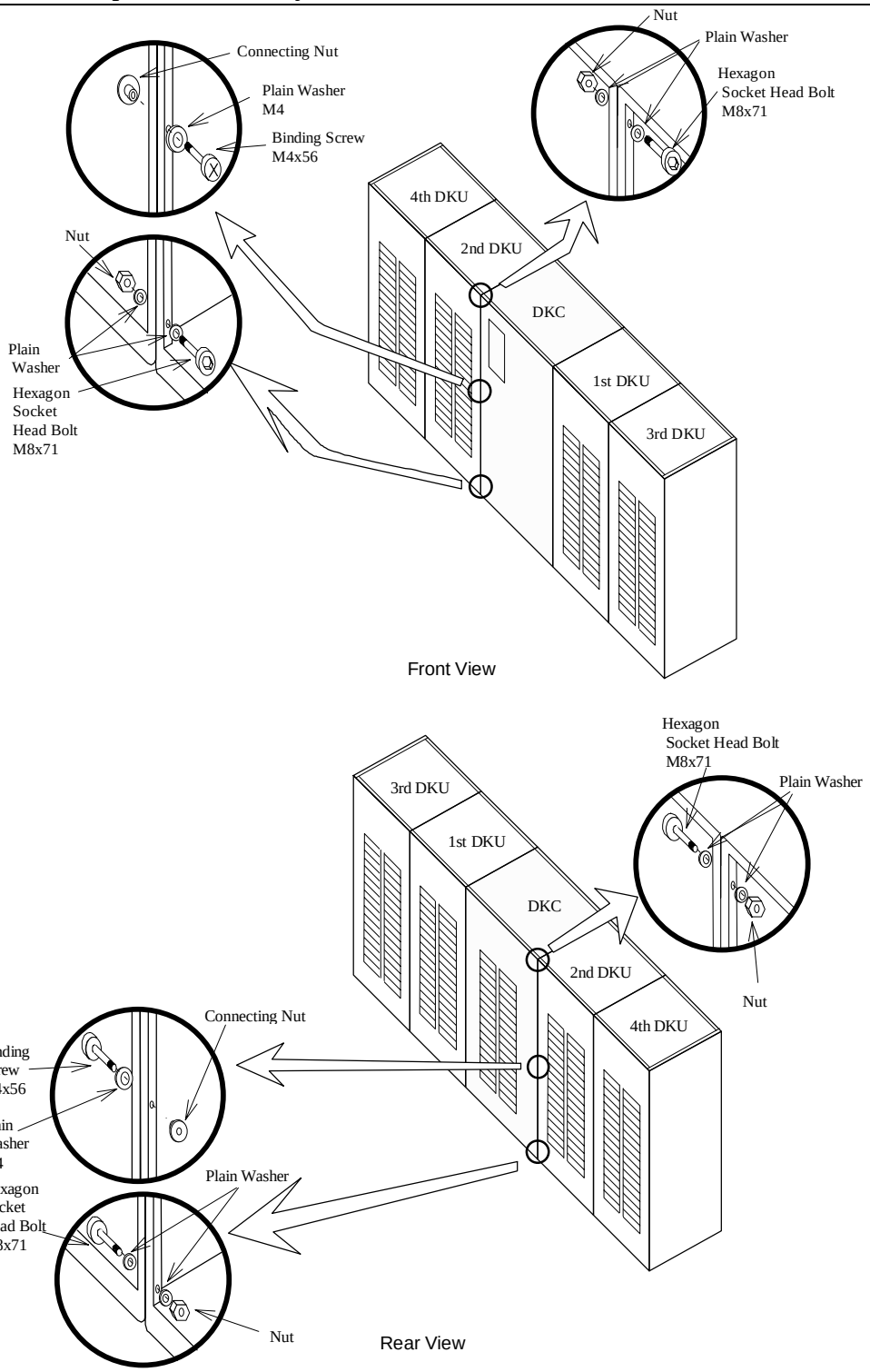

Fig. 4.3.2-12 Disconnection of connecting bolts

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(7) Secure the power cable assy.

a. Loosen the four screws.

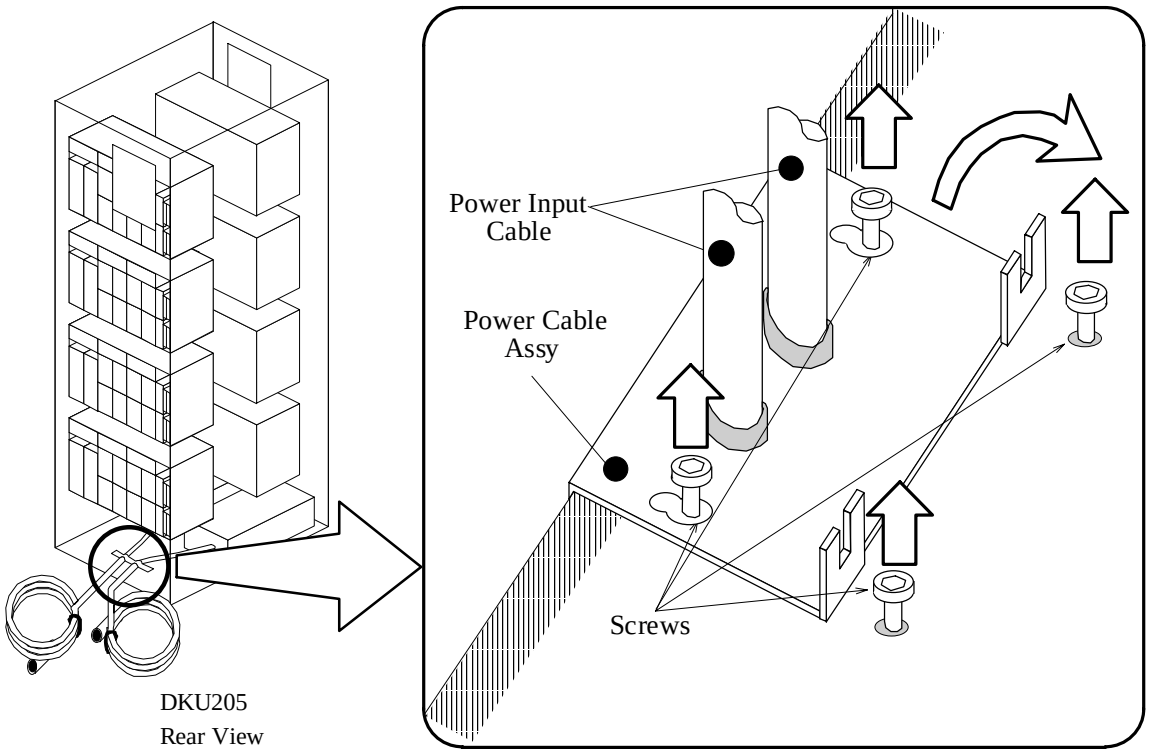

Fig. 4.3.2-13 Fixing of the power cable assy

b. Secure the power cable assy with the screws.

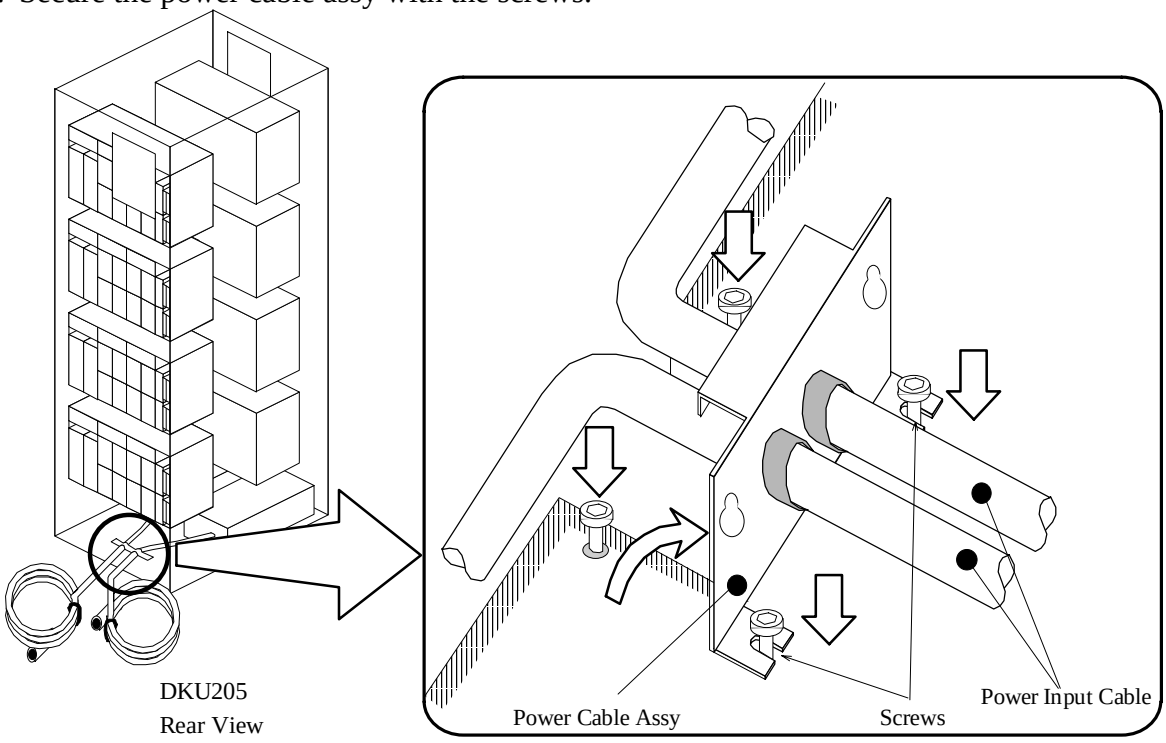

Fig. 4.3.2-14 Fixing of the power cable assy

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(8) Loosen the screw jack.

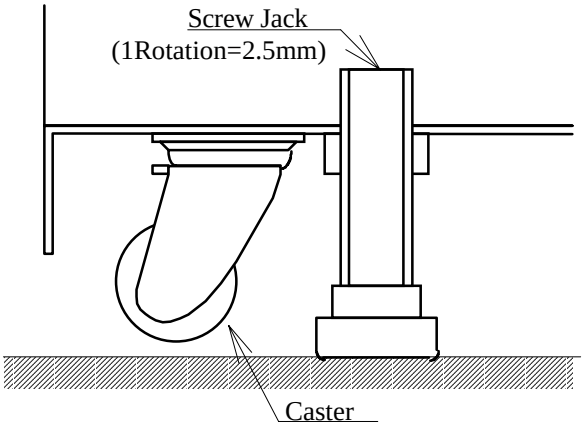

Fig. 4.3.2-15 Loosening the screw jack

(9) Remove the second DKU from DKC.

Notice : Move the DKC and the DKU as being careful of floor cut.

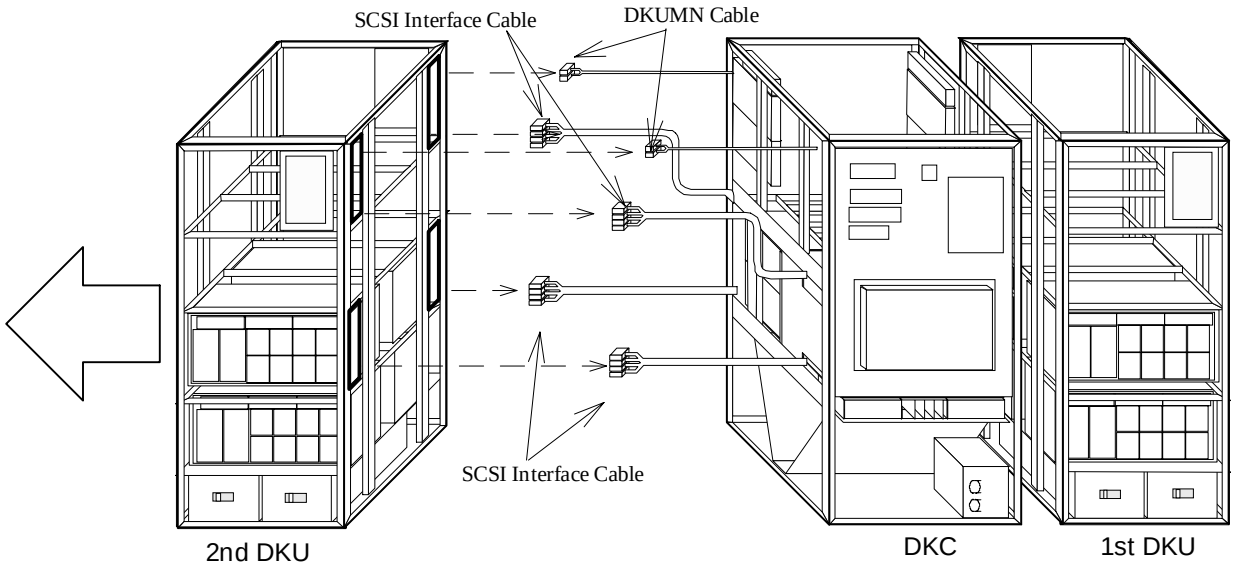

Fig. 4.3.2-16 Removal of the second DKU

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(10) Fix the SCSI interface cables with the repeat binders.

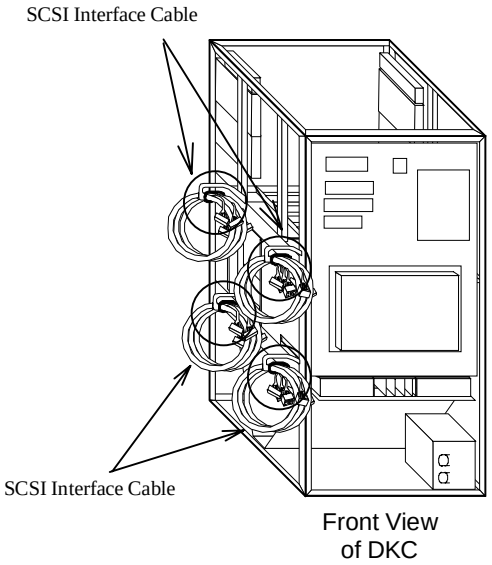

Fig. 4.3.2-17 Loose of repeat binders

(11) Replace the New DKC.

Go to “Connection of New DKC” [DKCREP04-320].

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4.4 Connection of New DKC

4.4.1 Connection between DKC and First DKU

(1) Loosen the repeat binders which secure the DKUMN cables, the SCSI interface cables and the AC power cables for the Disk Controller.

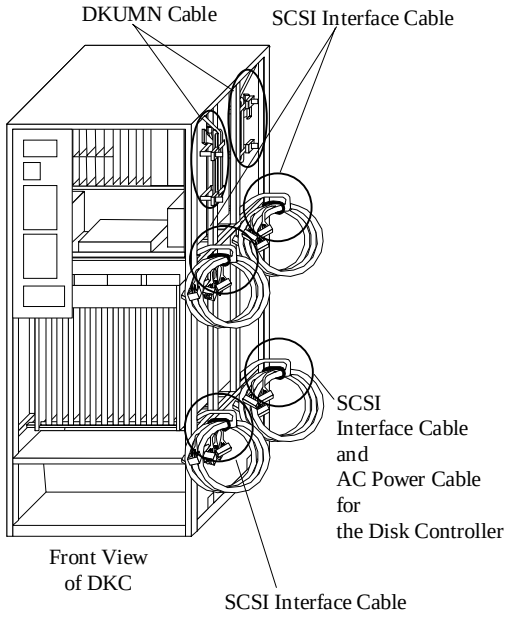

Fig. 4.4.1-1 Loose of repeat binders

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(2) Pass the DKUMN cables, the SCSI interface cables and the AC power cables for the Disk Controller through the First DKU frame. Refer to Fig. 4.4.1-2. Be extremely careful not to pinch the inter-frame cable when coupling the frames to each other.

Notice : Move the DKC and the DKU as being careful of floor cut.

a. Attach the DKC to First DKU.

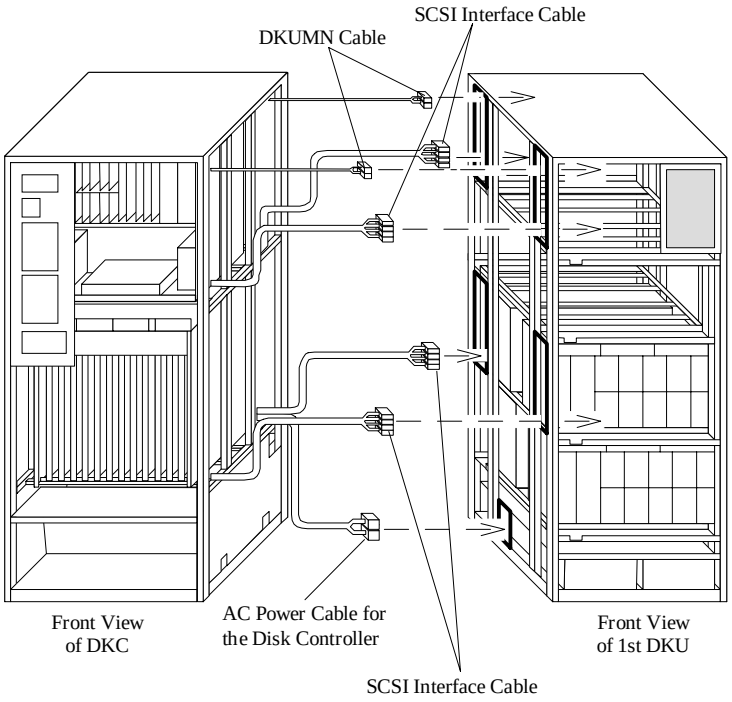

Fig. 4.4.1-2 Attachment of DKC

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(3) Install the DKC.

a. Lower the screw jacks until the frame is 57 mm (2.25 in.) from the floor before connecting the frames.

b. Level the device as shown on Fig. 4.4.1-3.

c. When adjusting the cabinet height, make sure that there is a clearance of approximately 2.5 mm (0.1 in.) between the casters and the floor.

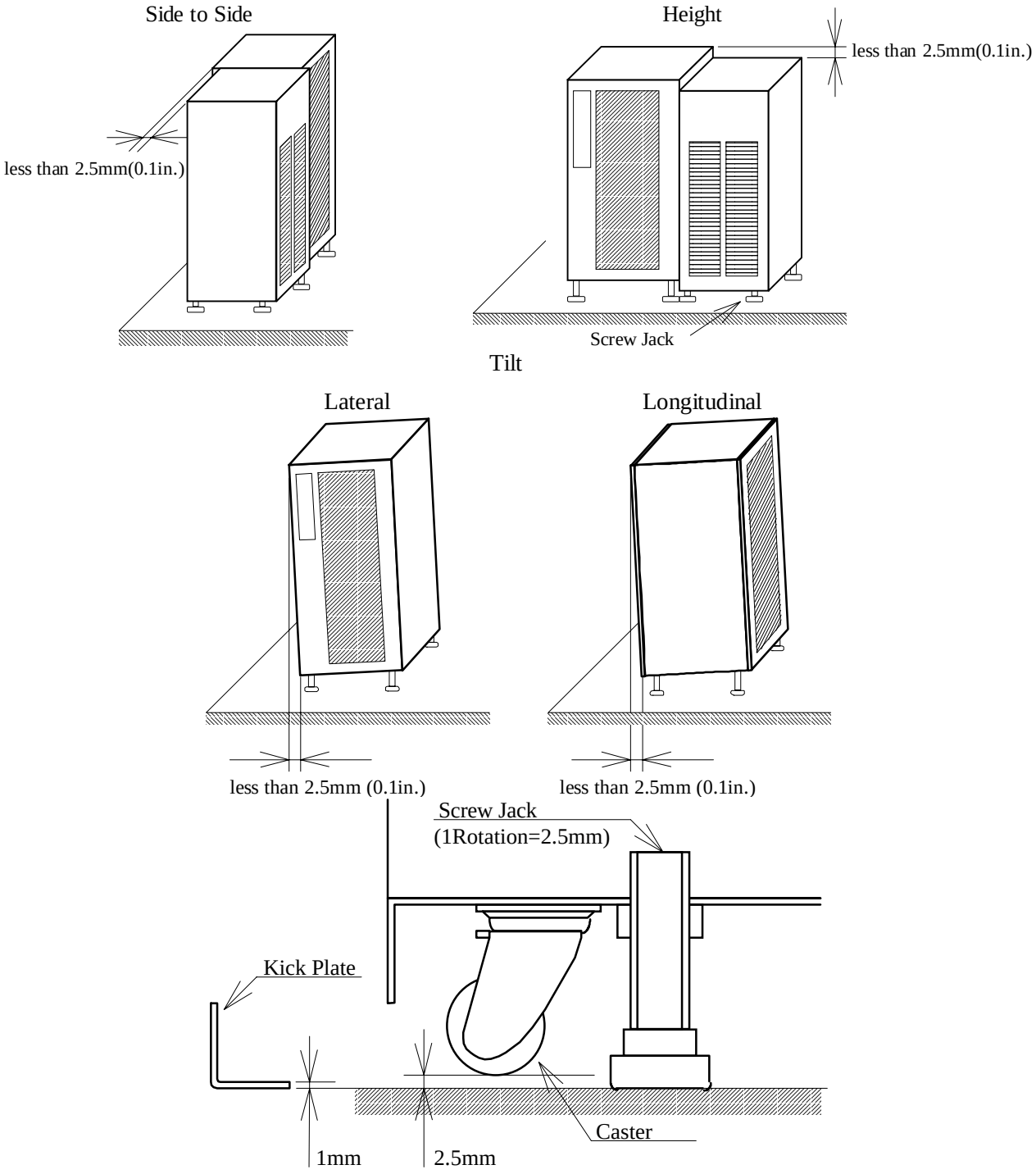

Fig. 4.4.1-3 Unit layout, Height, and Tilt

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(4) Connect the Connecting Bolt.

a. Loosen the four screws (M3) and the two screws (M4), remove the Front Logic Box Cover from the Disk Controller Unit.

b. Loosen the two screws (M3) and remove the cover (frame) 2.

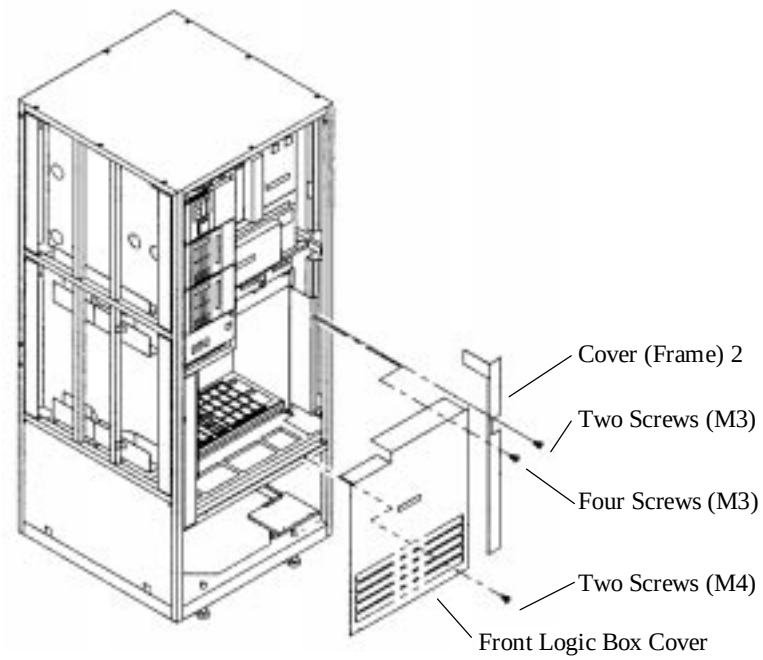

Fig. 4.4.1-4 Removal of Covers (DKC front side)

c. Loosen the four screws (M3) and the two screws (M4), remove the Rear Logic Box Cover.

d. Loosen the two screws (M3) and remove the cover (frame) 1.

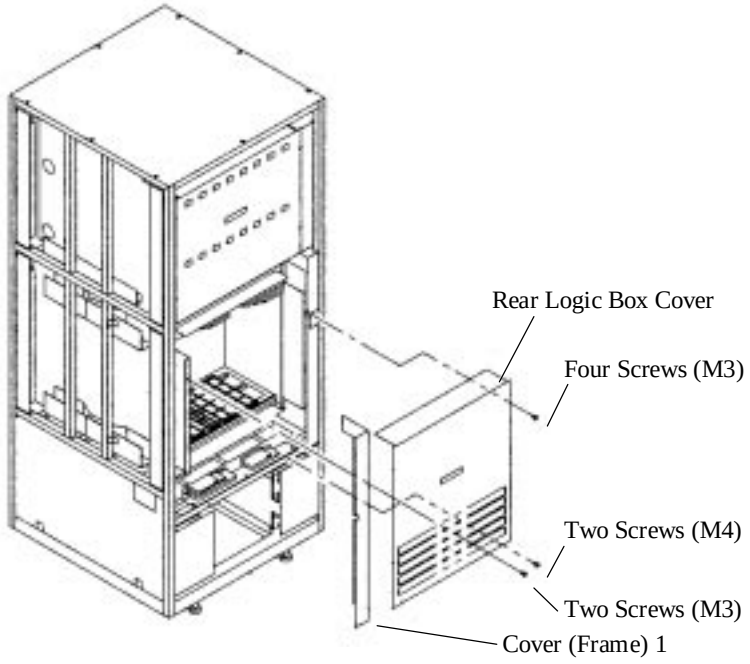

Fig. 4.4.1-5 Removal of Covers (DKC rear side)

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e. Connect the devices together using six of Connecting Bolt assemblies, three in front and three in rear.

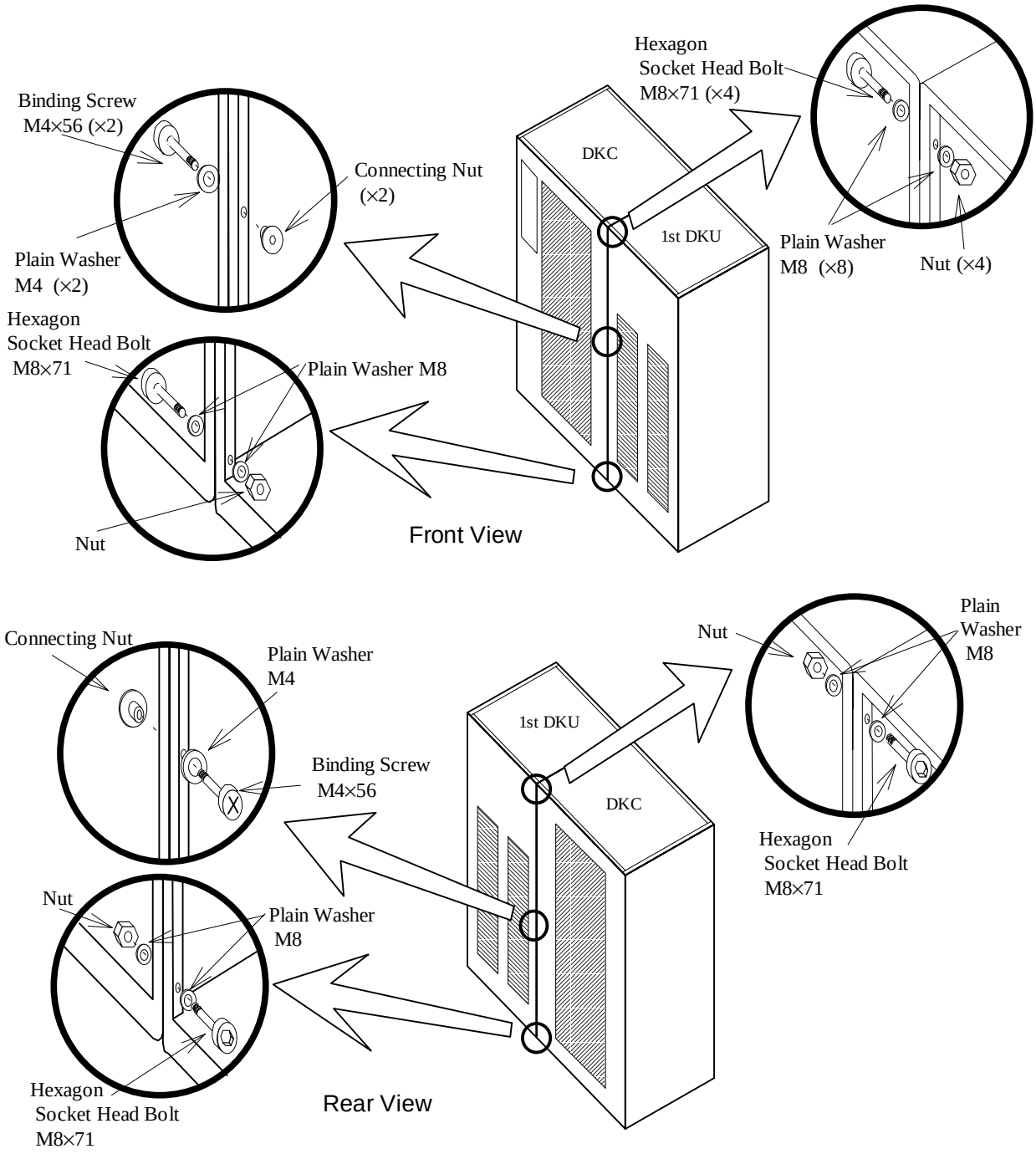

Fig. 4.4.1-6 Frame Connection

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(5) Secure the power cable assy.

a. Loose the four screws.

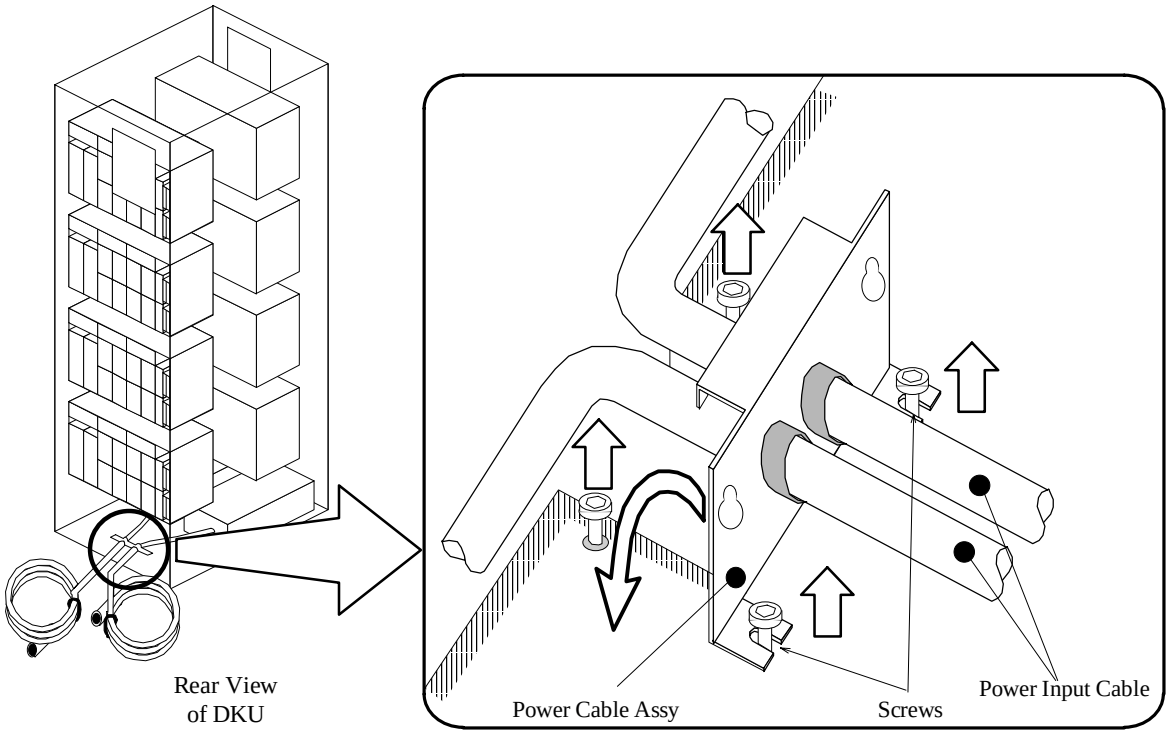

Fig. 4.4.1-7 Fixing of the power cable assy

b. Secure the power cable assy with screws.

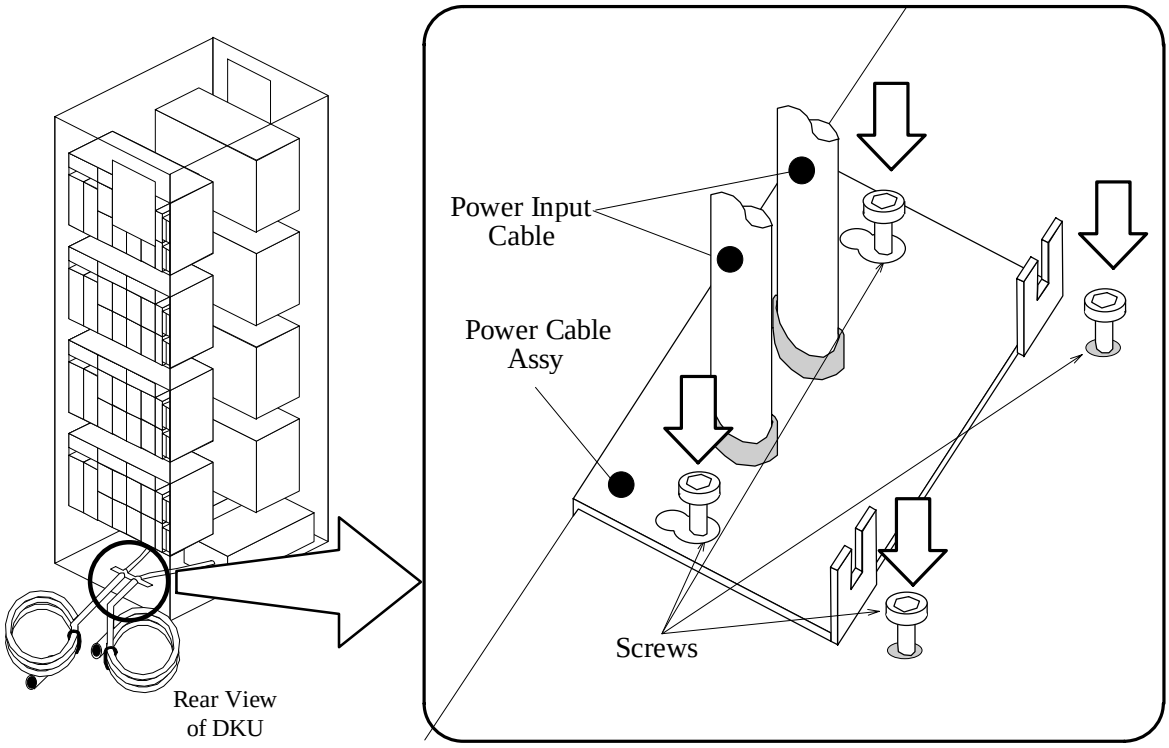

Fig. 4.4.1-8 Fixing of the power cable assy

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(6) Attach the frame ground cable.

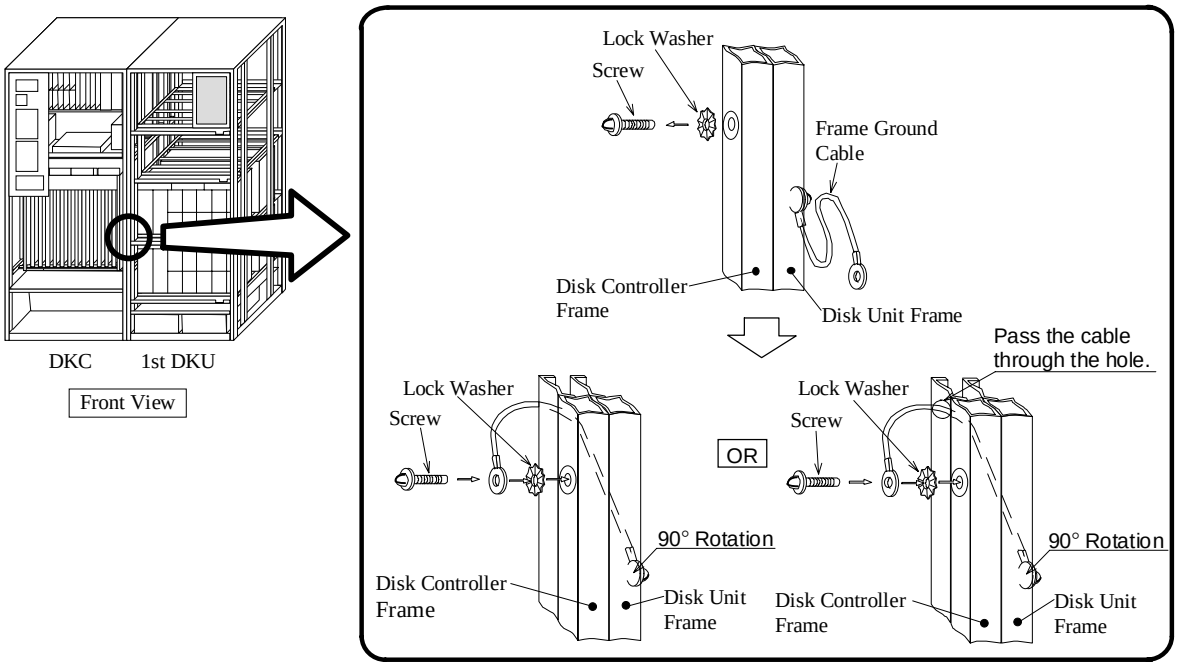

Fig. 4.4.1-9 Attachment of Frame Ground Cable

(7) Install the kick plate.

Notice : Contact the Kick Plate to the floor to prevent static electricity.

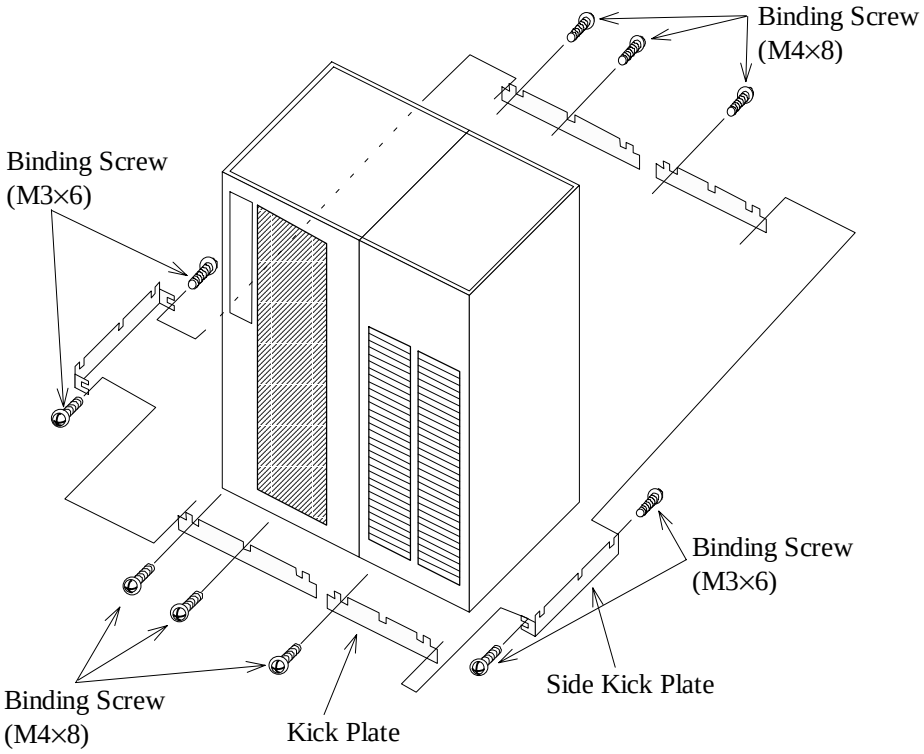

Fig. 4.4.1-10 Installation of Kick Plate

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(8) Remove the screw for transporting the movable rack.

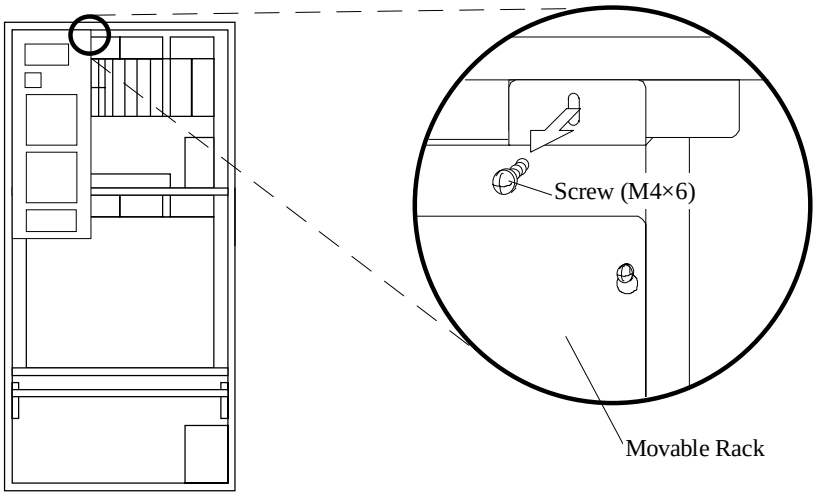

Fig. 4.4.1-11 Removal of Screw for Transporting the Movable Rack

Note : The screw for transporting the movable rack (screw M4×6) should be stored in the place of installation for future use in taking out and transporting the unit.

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(9) Installation of Switches and Jumper Plugs

Be sure to wear your wrist strap and attach to ground prior to performing the following work. This will insure that the IC and LSI on the PCB are protected from static electricity.

a. Install the jumper plugs in the CE PANEL PCB as indicated in the table below.

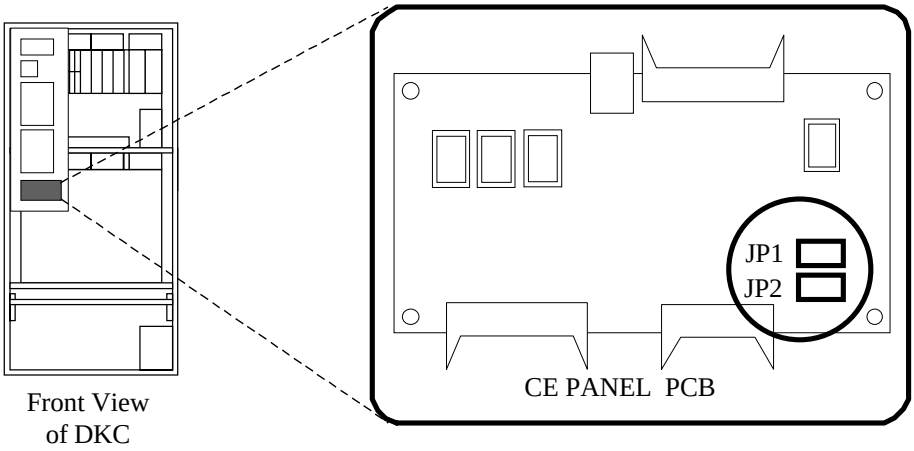
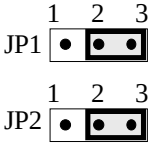
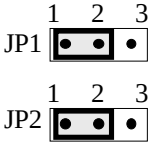


Fig. 4.4.1-12 Installation of Jumper Plugs in CE PANEL PCB

Table 4.4.1-1 Installation of Jumper Plugs in CE PANEL PCB

No.	Description	Installing status JP1 and JP2
1	When power is controlled from the host(at least one PCI cable attached to JP1-JP8 on PCI CONN PCB), set the jumpers as shown.	
2	When power is not controlled from the host, no PCI cable attached to JP1-JP8 PCI CONN PCB or to disable the EPO of host, set the jumpers as shown.	

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b. Install the jumper plugs in the RS CONN PCB as indicated in the table below.

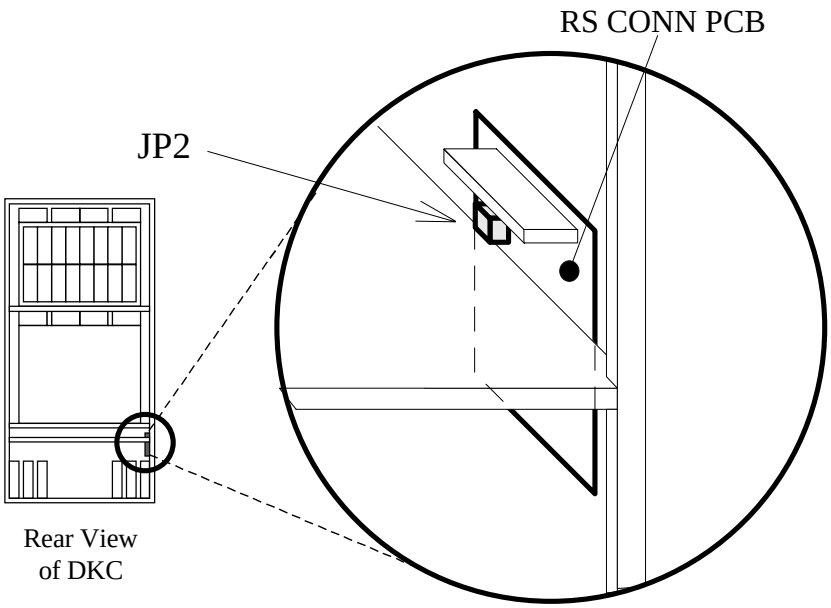

Fig. 4.4.1-13 Installation of Jumper Plugs in RS CONN PCB

Table 4.4.1-2 Installation of Jumper Plugs in RS CONN PCB

No.	Description	Installing status JP2
1	This setting attaches terminator to RS-422	JP2 1 2 3 4
2	This setting detaches terminator to RS-422	JP2 1 2 3 4

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c. Installation of Jumper Connectors in BATT CTR PCB.

① Open the four locking clamps on the Front PS Box Cover 2 and remove the four jumper connectors.

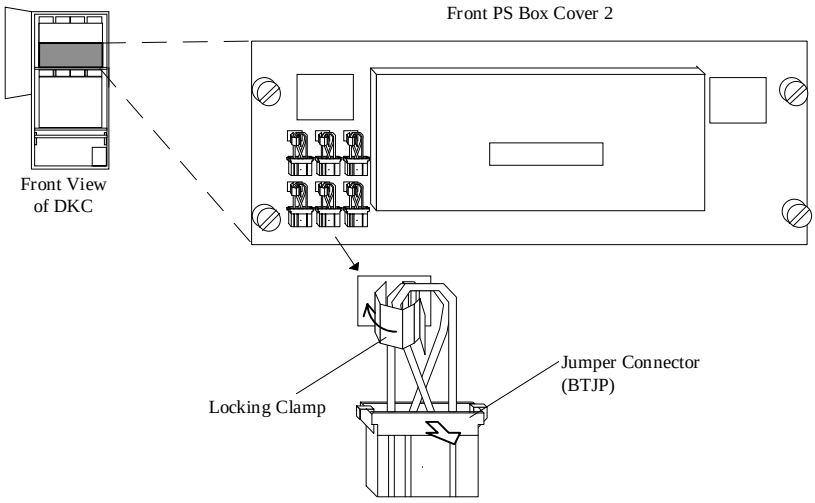

Fig. 4.4.1-14 Removal of Jumper Connectors

② Install the jumper connectors in the BATT CTR PCBs as indicated in the figure below.

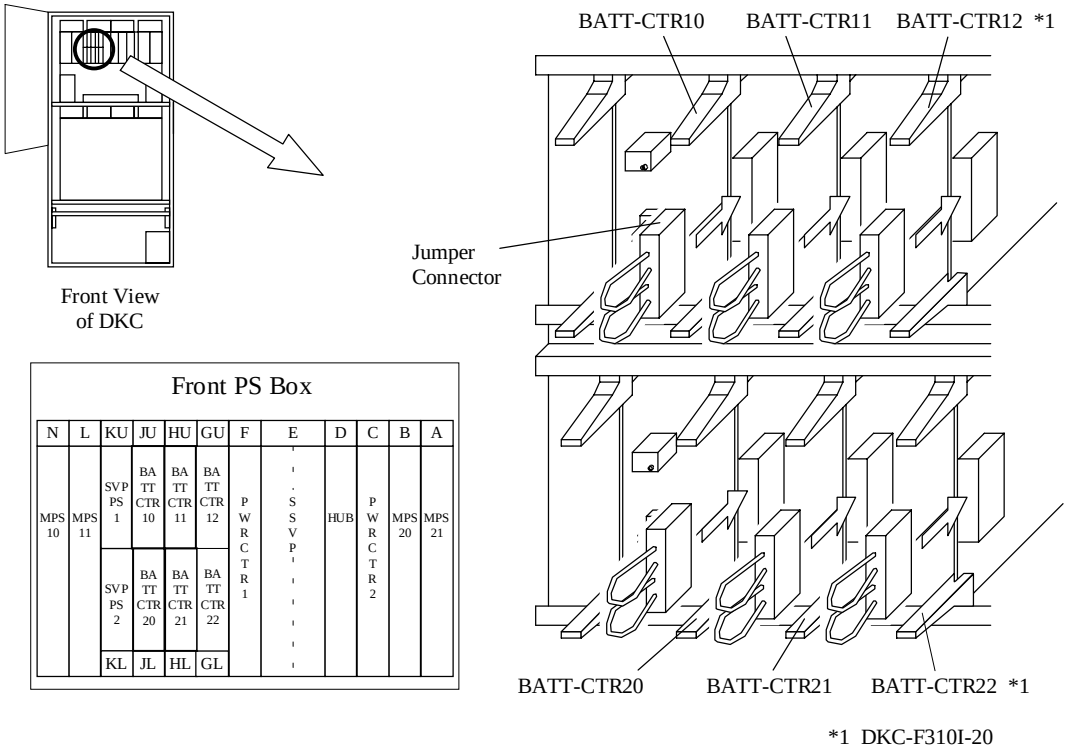

Fig. 4.4.1-15 Installation of Jumper Connectors in BATT CTR PCB

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(10) Connect the AC cables to the AC boxes.

a. Loosen the two screws.

b. Remove the plate.

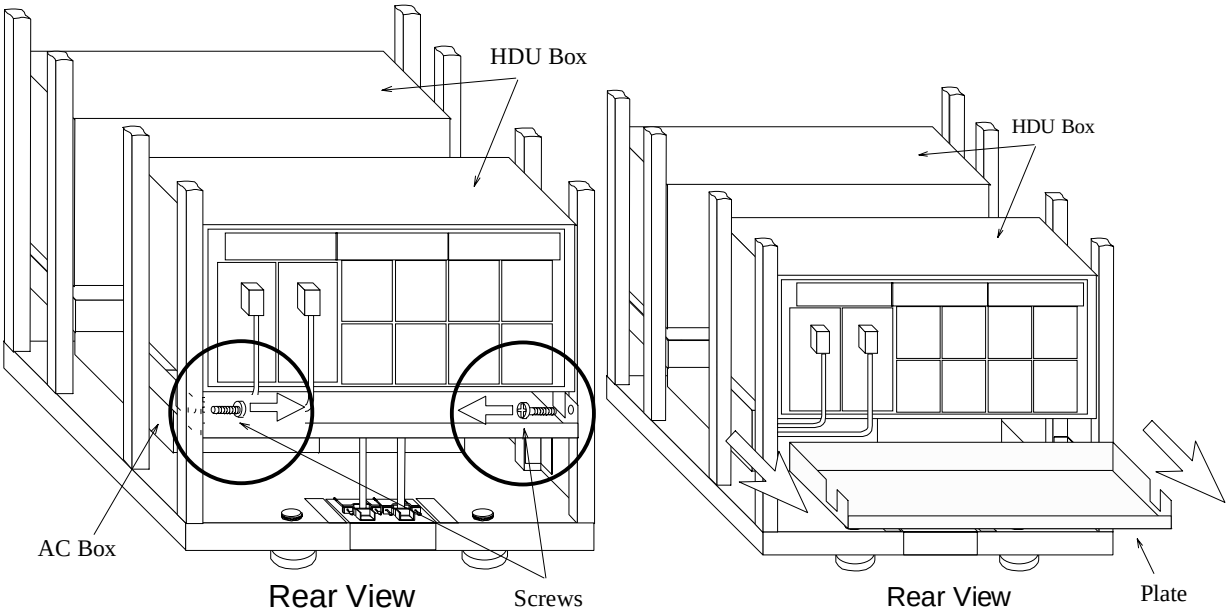

Fig. 4.4.1-16 Removal of the plate

c. Connect the AC cables to the AC boxes.

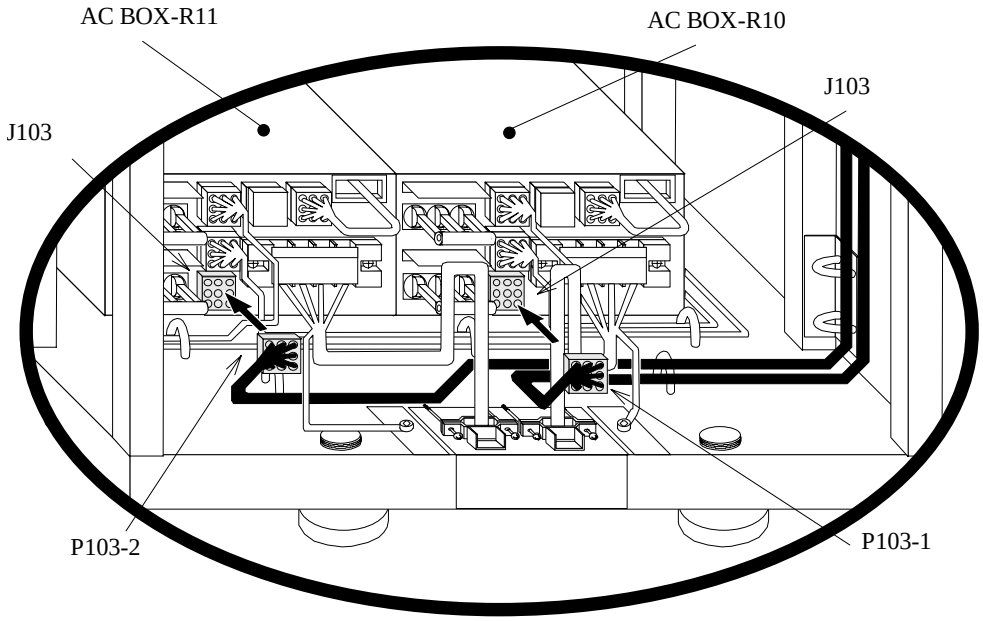

Fig. 4.4.1-17 Connection of the AC cables

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d. Fix the cables with the repeat binders.

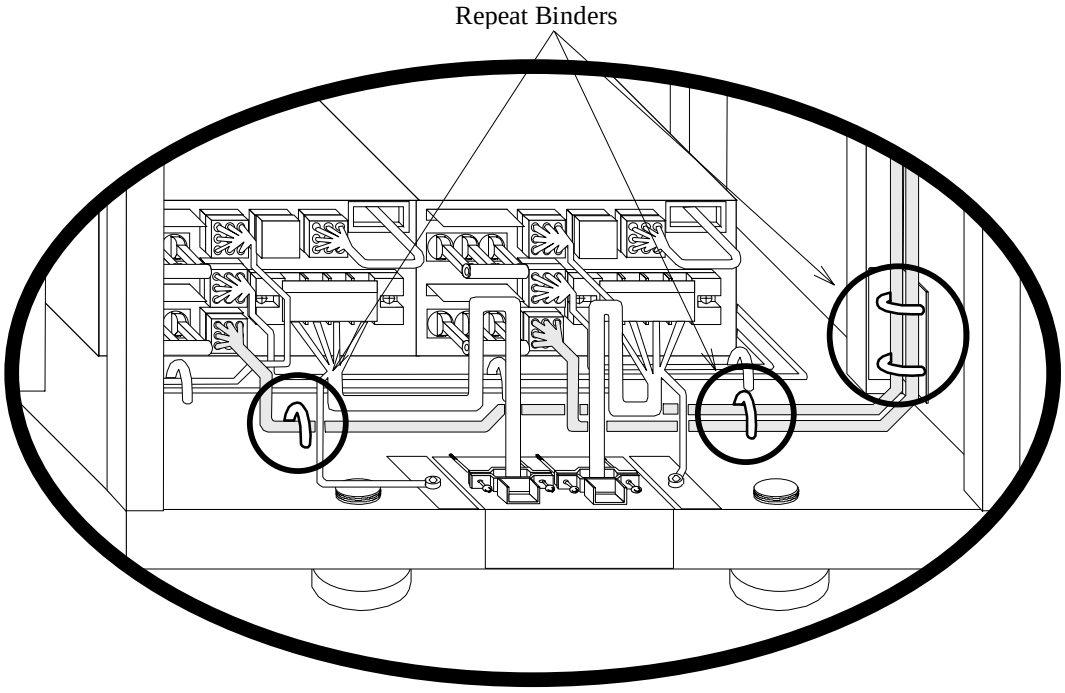

Fig. 4.4.1-18 Fixing of the AC cables

e. Re-Install the plate.

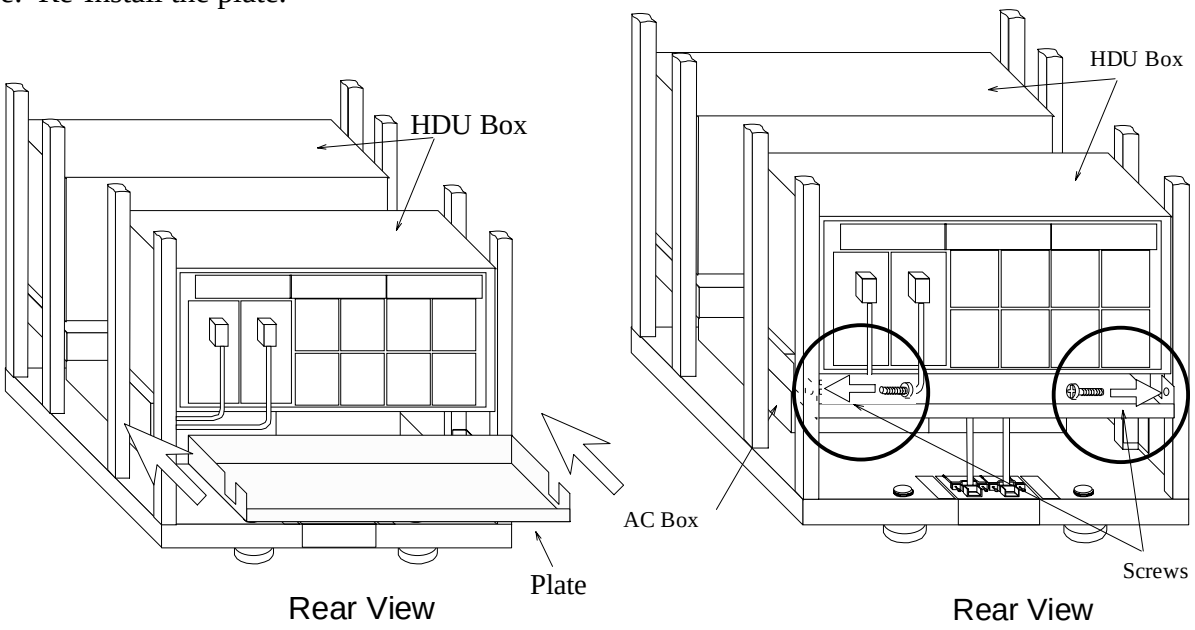

Fig. 4.4.1-19 Re-Installation of the plate

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(11) Bind the DKUMN cables with repeat binders.

a. Loosen the four screws.

b. Lift the DKUMN PCB.

c. Slide and secure the DKUMN PCB.

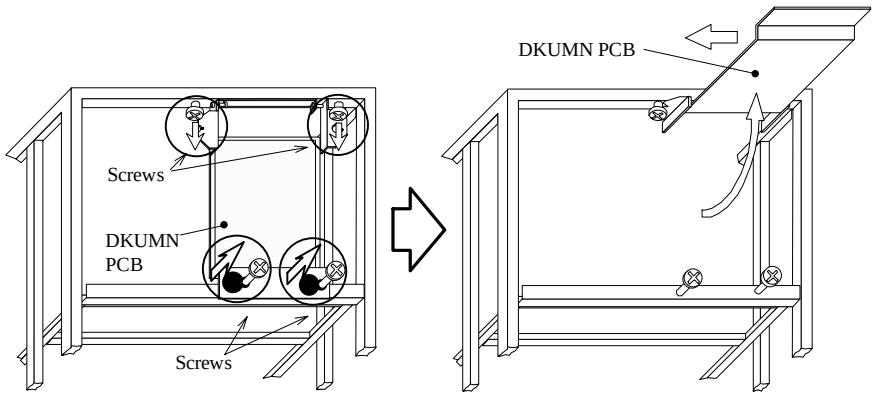

Fig. 4.4.1-20 Lift of DKUMN PCBs

d. Bind the DKUMN cables with repeat binders.

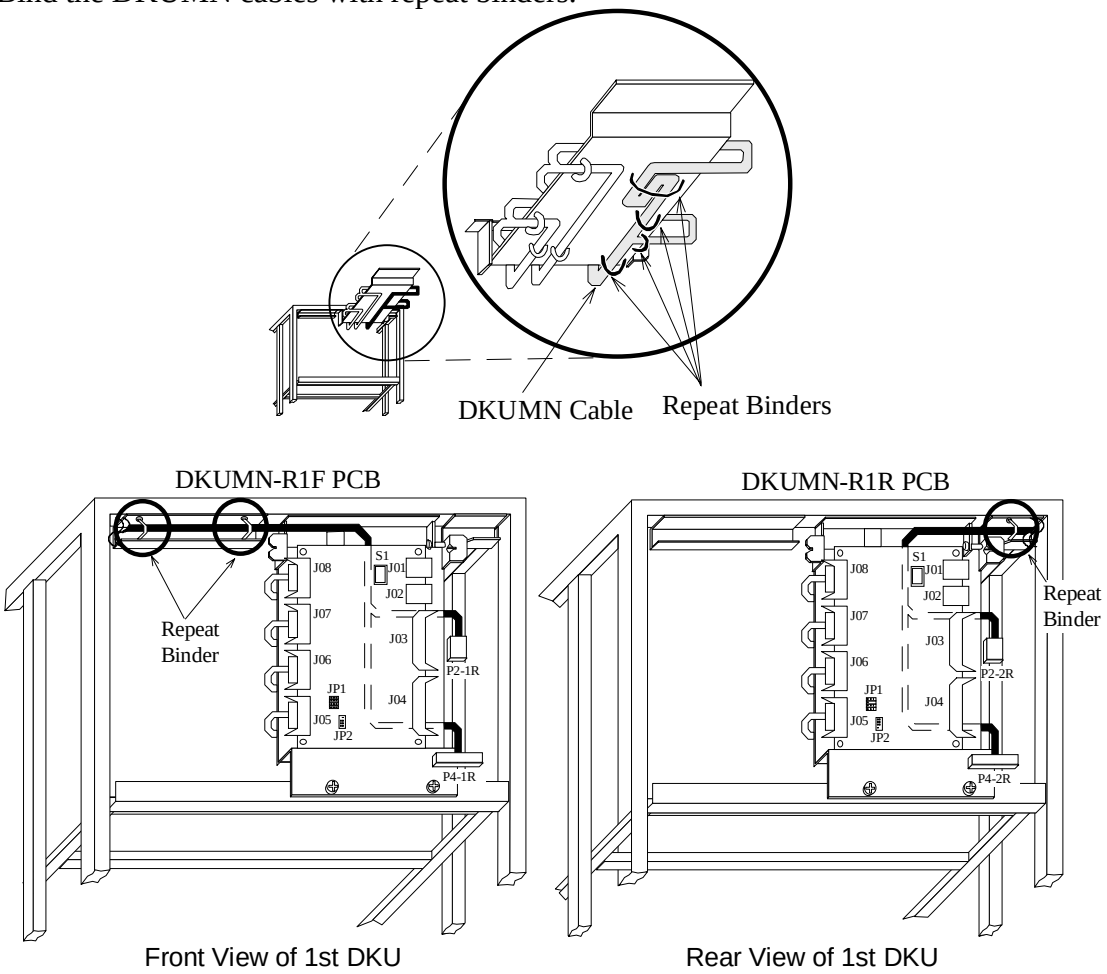

Fig. 4.4.1-21 Binding of DKUMN cables

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(12) Bind the SCSI interface cables.

a. Bind the SCSI interface cables with cable fixing wires and repeat binders.

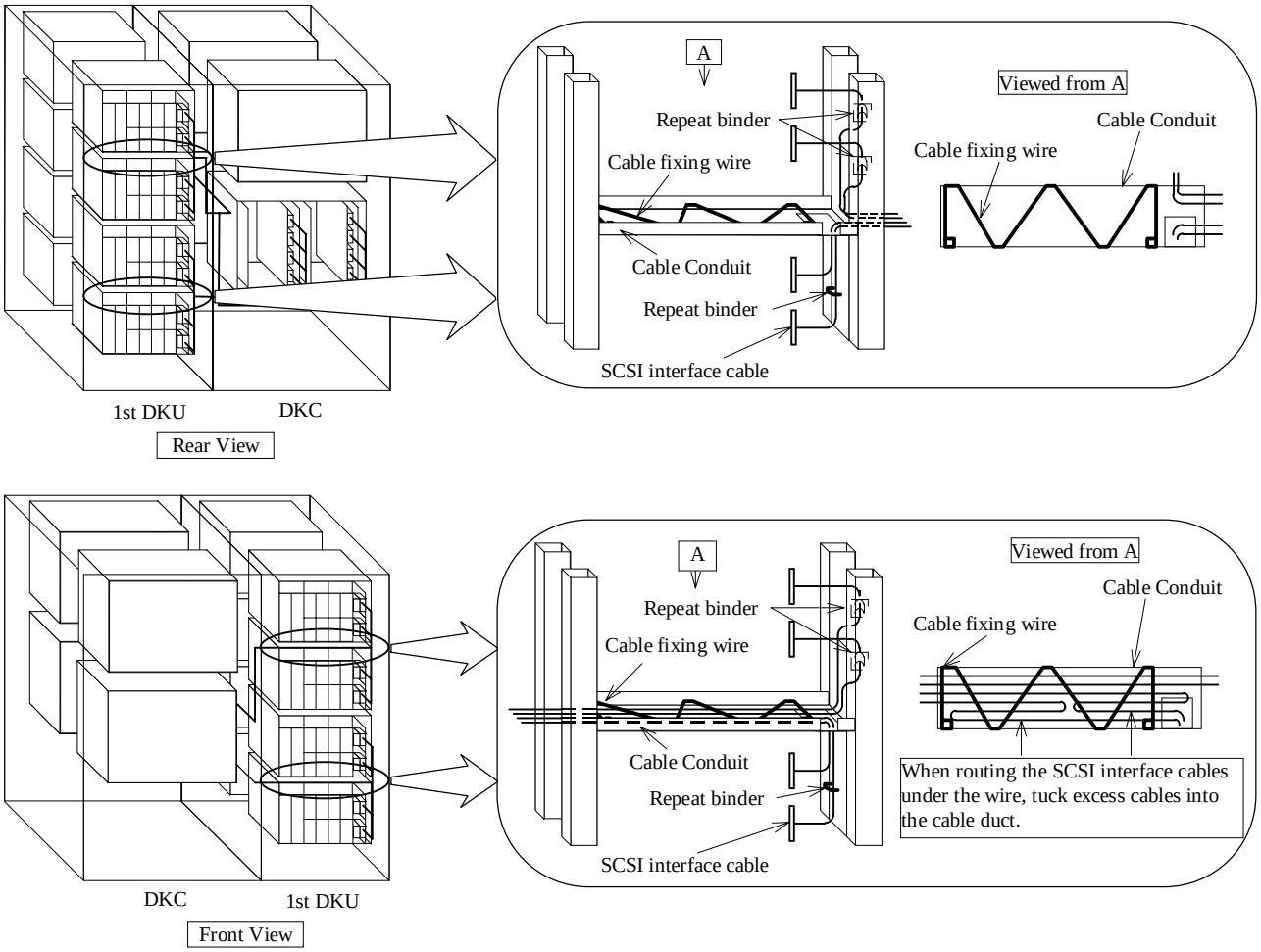

Fig. 4.4.1-22 Binding of SCSI interface cables

(13) In case that there is second DKU, go to “Connection between DKC and second DKU” [DKCREP04-470].
In case that there isn’t second DKU, go to “Connection of external cable” [DKCREP04-560].

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4.4.2 Connection between DKC and Second DKU

(1) Loosen the repeat binders which secure the SCSI interface cables for the Disk Controller.

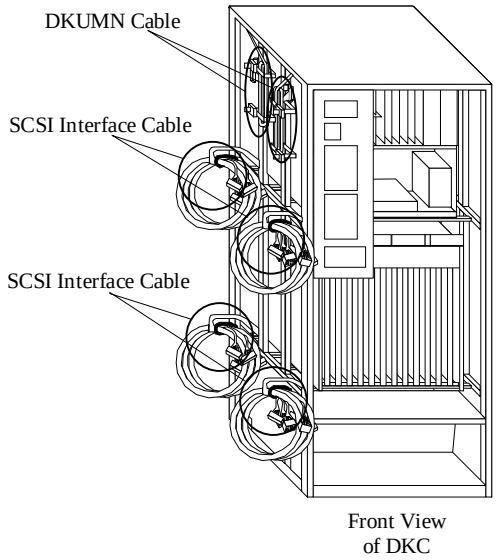

Fig. 4.4.2-1 Loose of repeat binders

(2) Pass the SCSI interface cables for the Disk Controller through the second DKU frame. Be extremely careful not to pinch the inter-frame cable when coupling the frames to each other.

Notice : Move the DKC and the DKU as being careful of floor cut.

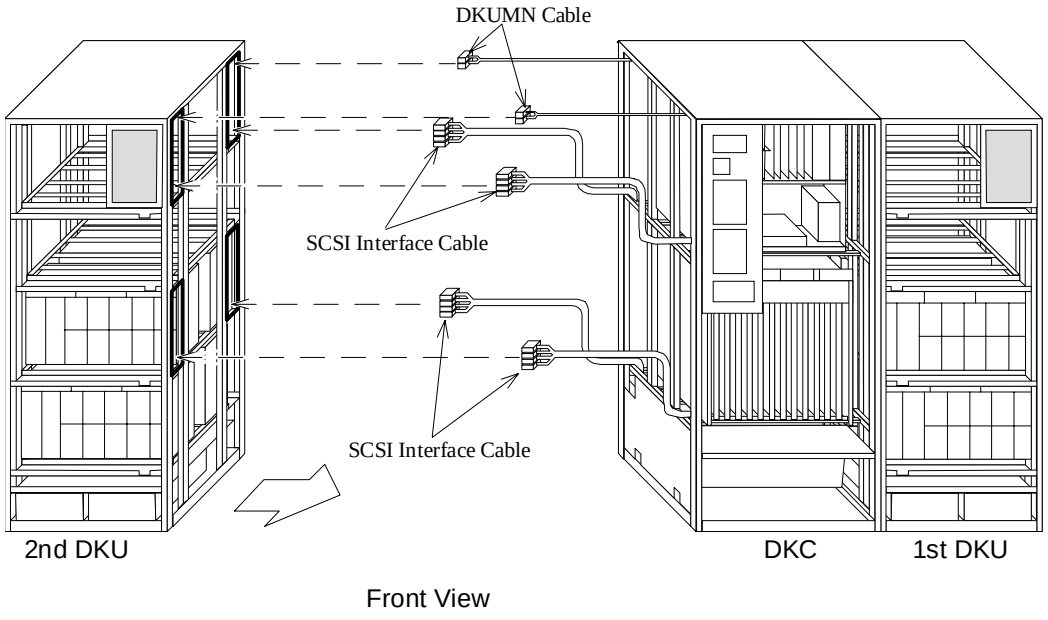

Fig. 4.4.2-2 Attachment of the second DKU

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(3) Install the Second DKU.

a. Lower the screw jacks until the frame is 57 mm (2.25 in.) from the floor before connecting the frames.

b. Level the device as shown on Fig. 4.4.2-3.

c. When adjusting the cabinet height, make sure that there is a clearance of approximately 2.5 mm (0.1 in.) between the casters and the floor.

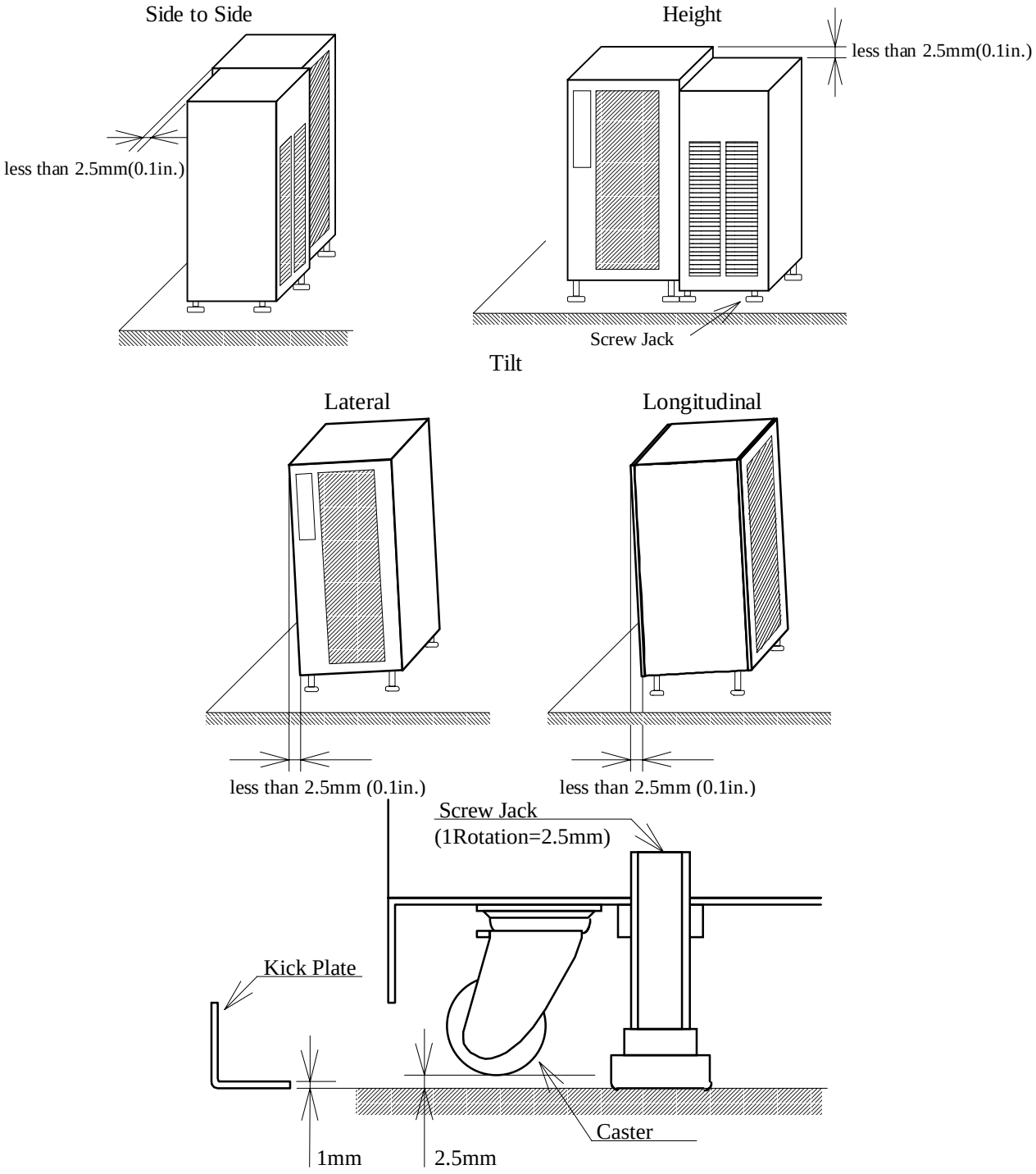

Fig. 4.4.2-3 Cabinet Setting

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(4) Connect the connecting bolt.

a. Loosen the four screws (M3) and the two screws (M4), remove the Front Logic Box Cover from the Disk Controller Unit.

b. Loosen the two screws (M3) and remove the cover (frame) 4.

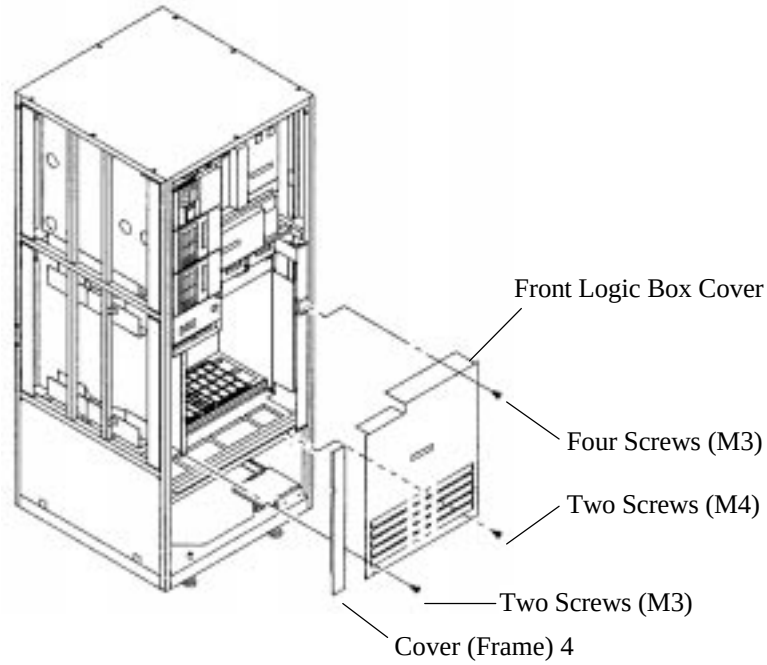

Fig. 4.4.2-4 Removal of Covers (DKC front side)

c. Loosen the four screws (M3) and the two screws (M4), remove the Rear Logic Box Cover.

d. Loosen the two screws (M3) and remove the cover (frame) 1.

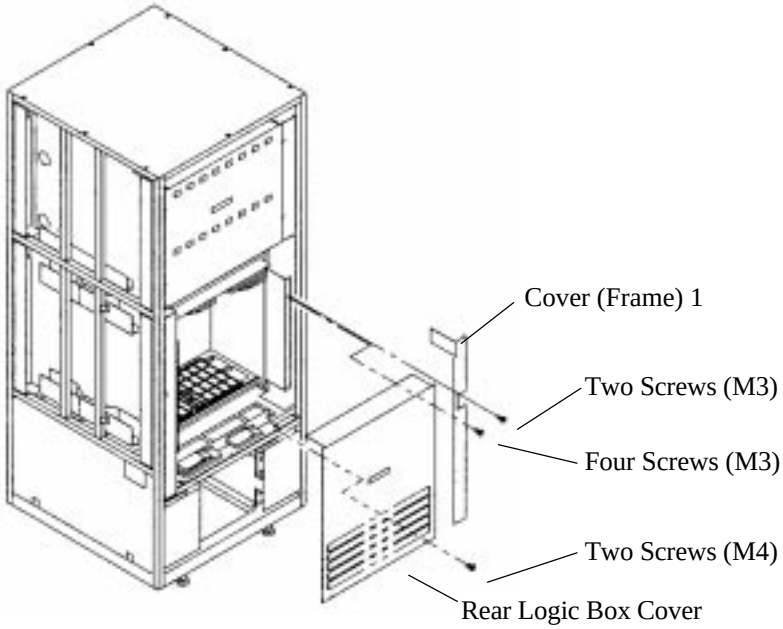

Fig. 4.4.2-5 Removal of Covers (DKC rear side)

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e. Connect the devices together using six of Connecting Bolt assemblies, three in front and three in rear.

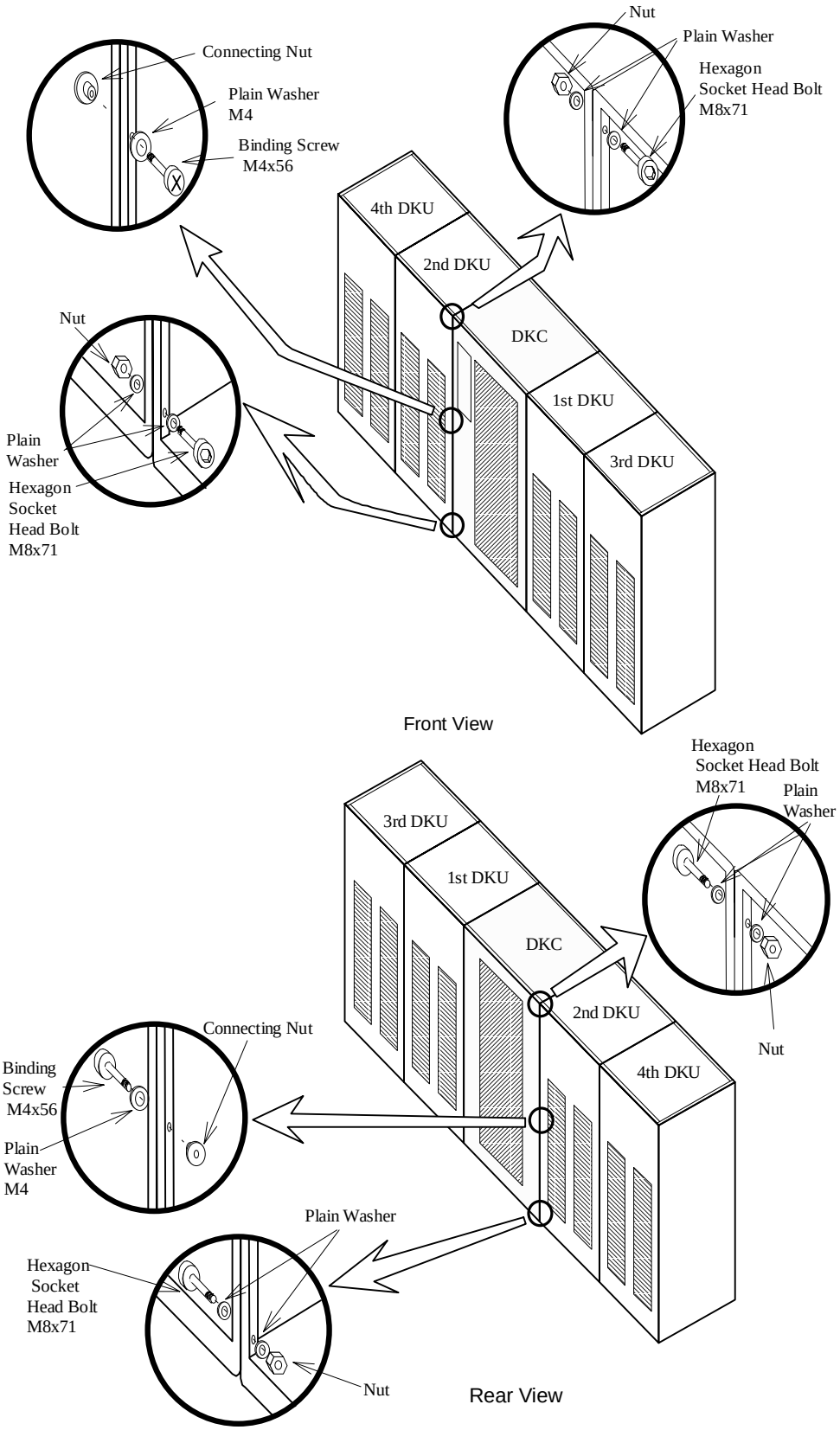

Fig. 4.4.2-6 Connection of Frame

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(5) Secure the power cable assy.

a. Loose the four screws.

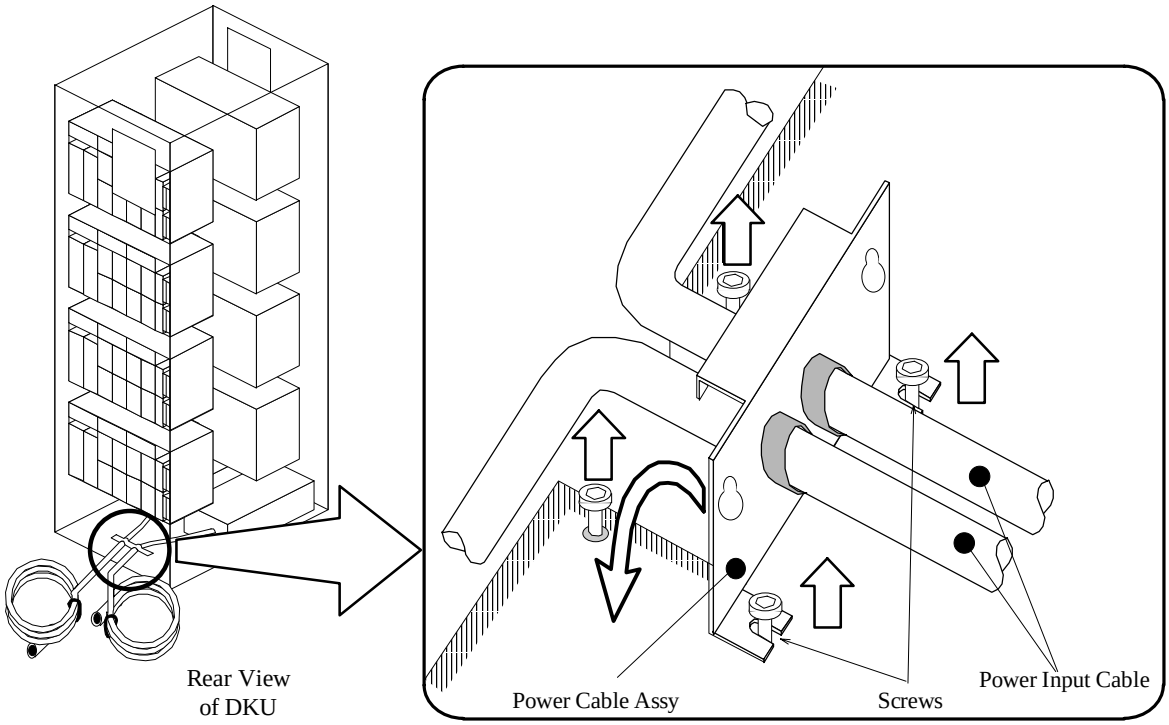

Fig. 4.4.2-7 Fixing of the power cable assy

b. Secure the power cable assy with screws.

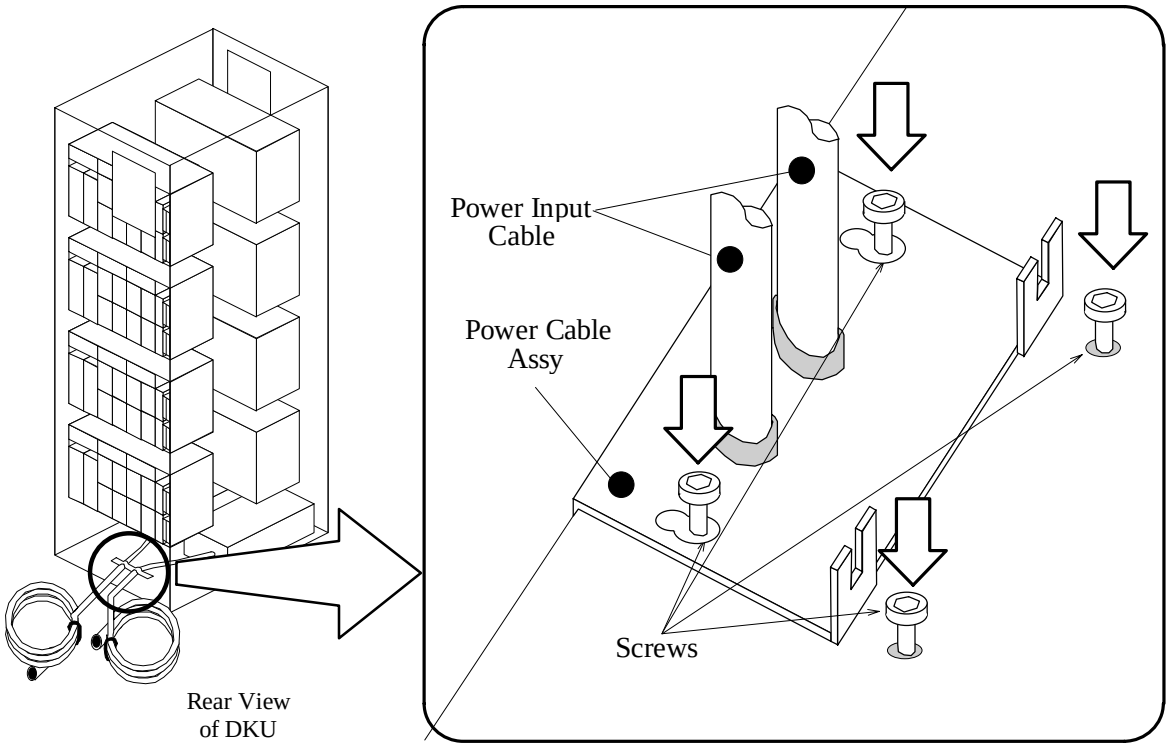

Fig. 4.4.2-8 Fixing of the power cable assy

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(6) Attach the frame ground cable.

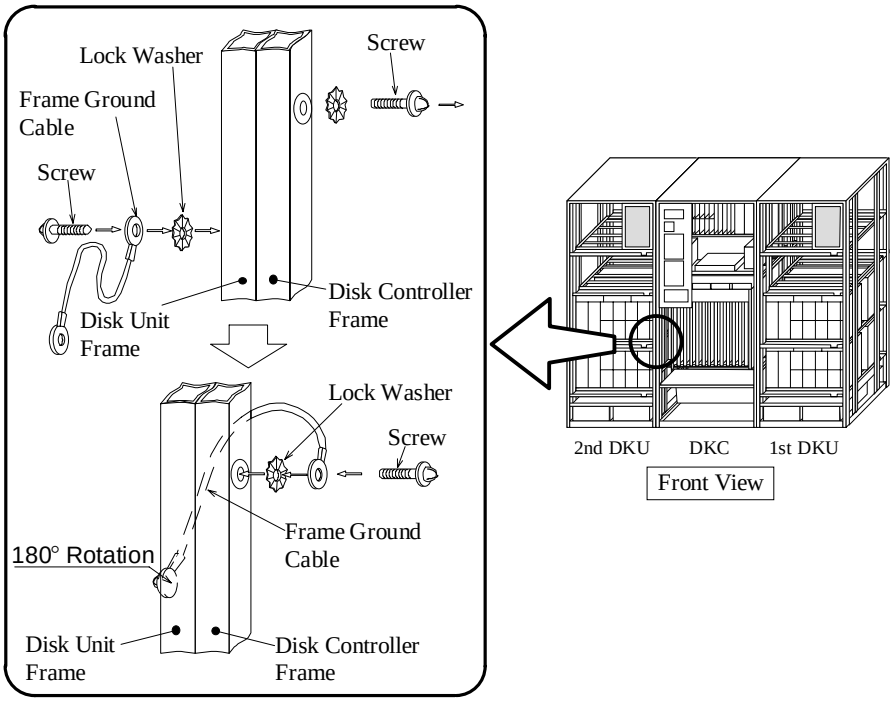

Fig. 4.4.2-9 Attachment of Frame Ground Cable

(7) Secure the kick plates with screws.

Notice : Contact the Kick Plate to the floor to prevent static electricity.

a. In case that there is second DKU.

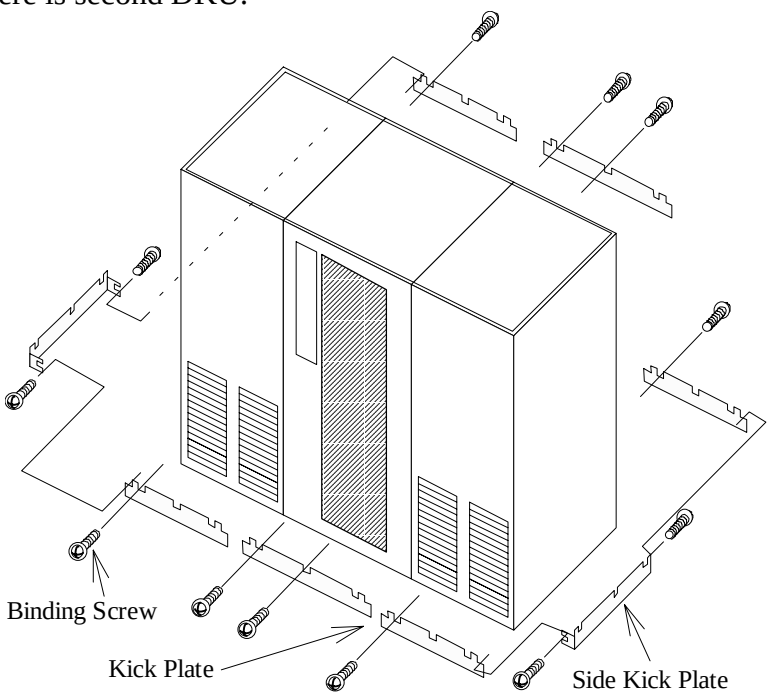

Fig. 4.4.2-10 Installation of Kick Plate (Two DKUs)

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b. In case that there is third DKU.

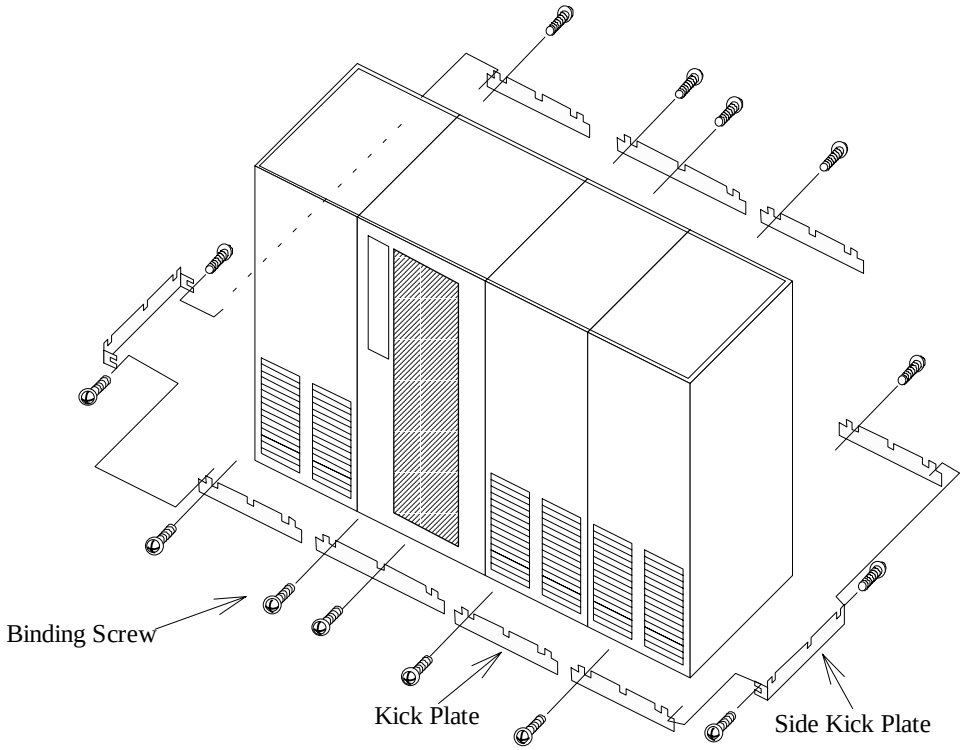

Fig. 4.4.2-11 Installation of Kick Plate (Three DKUs)

c. In case that there is fourth DKU.

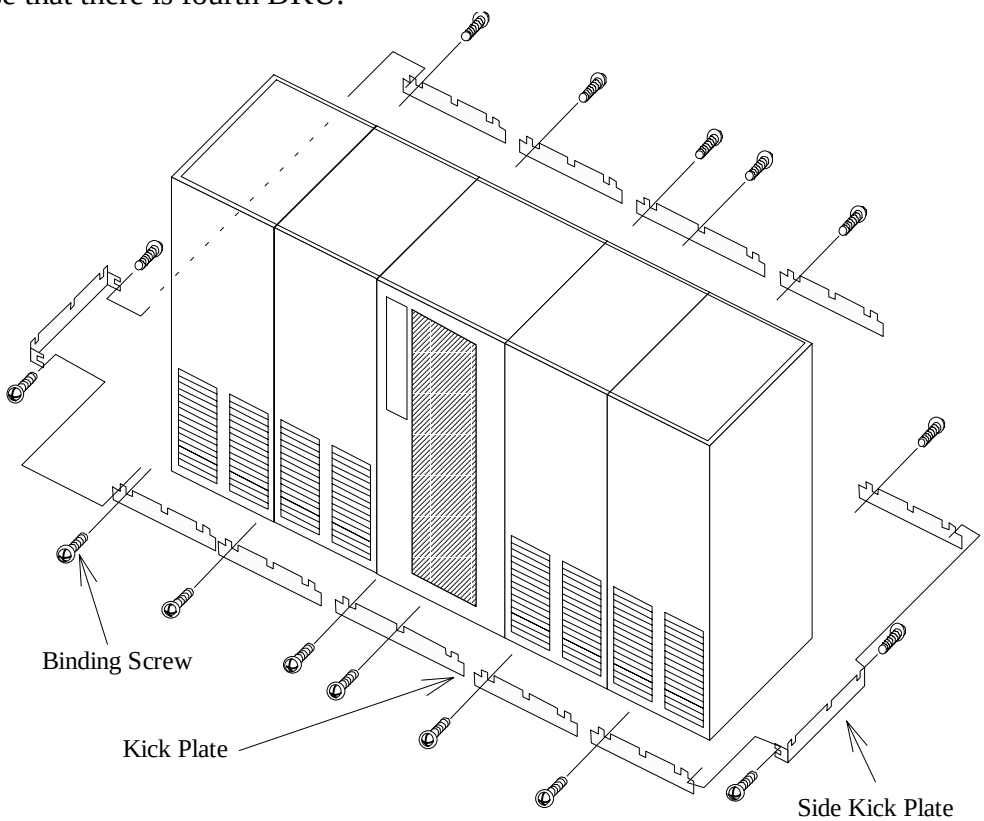

Fig. 4.4.2-12 Installation of Kick Plate (Four DKUs)

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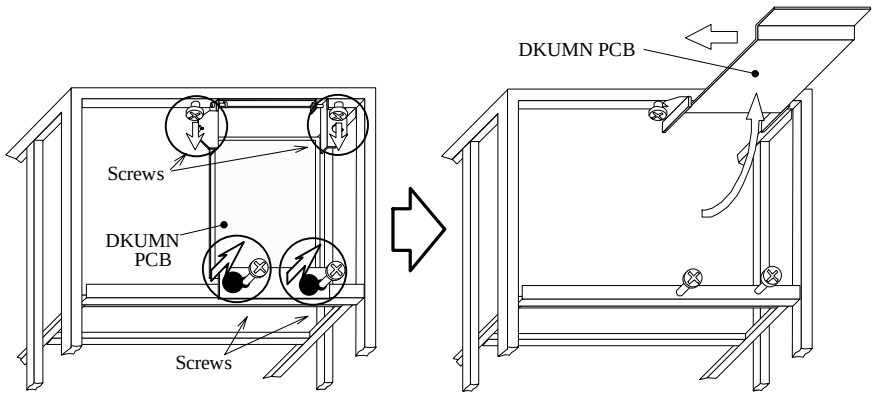
(8) Bind the DKUMN cables with repeat binders.

a. Loosen the screws.

b. Lift the DKUMN PCB.

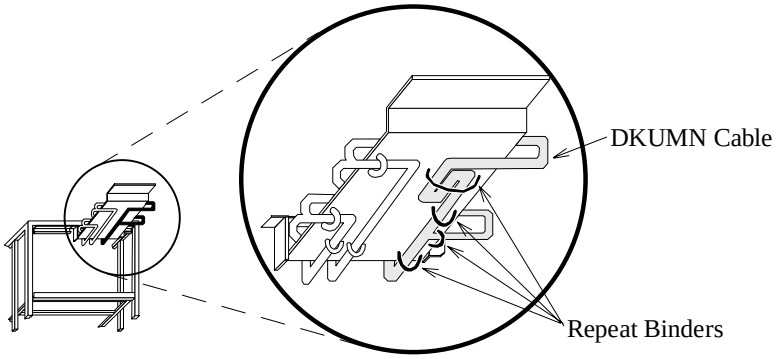
c. Slide and secure the DKUMN PCB.

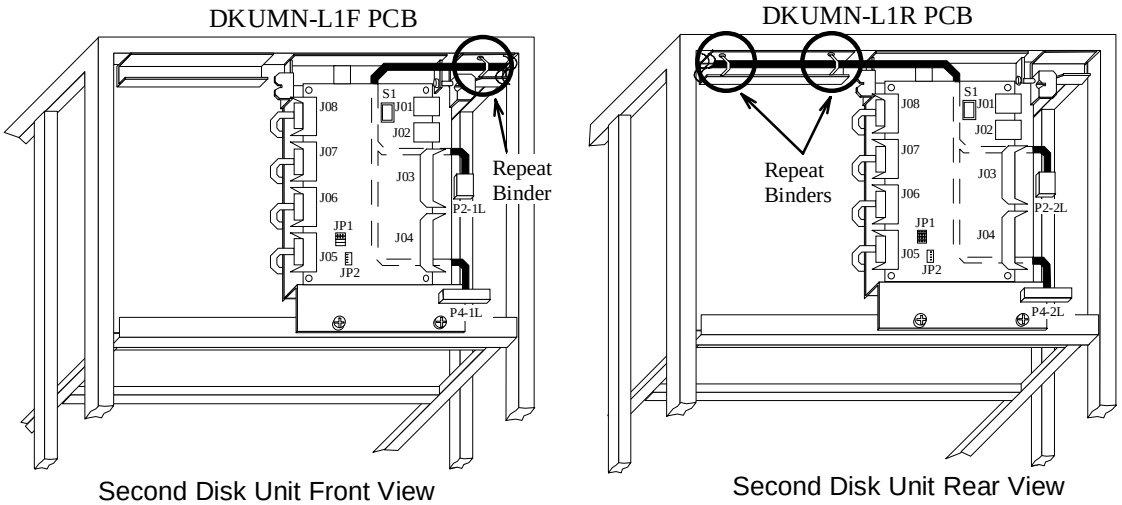


Disk Unit Front View

Fig. 4.4.2-13 Lift of DKUMN PCBs

d. Bind the DKUMN cables with repeat binders.





Second Disk Unit Front View

Second Disk Unit Rear View

Fig. 4.4.2-14 Binding of DKUMN cables

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(9) Bind the SCSI interface cables.

a. Bind the SCSI interface cables with cable fixing wires and repeat binders.

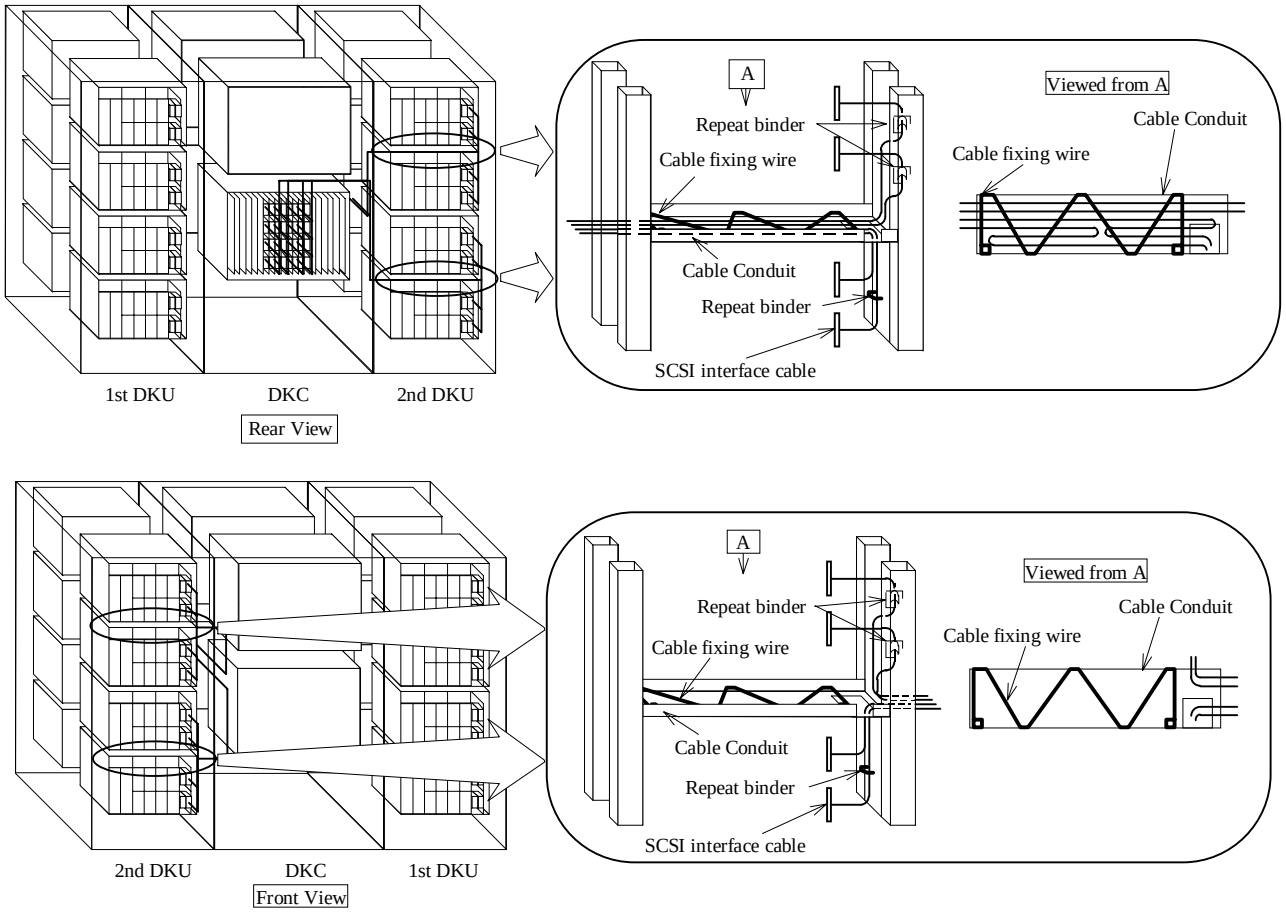

Fig. 4.4.2-15 Binding of SCSI interface cables

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4.5 Connection of External Cable

4.5.1 Connection of AC Cable

4.5.1.1 DKC310IU/DKU205IU

⚠ DANGER

The DKC and the first DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU and, the 4th DKU also has Two Main Disconnect Devices.
Observe all instructions described in this manual before connecting the equipment to the power source and before servicing.

A. Connection of Power Supply Cord

The unit has two power supply cords with attachment plug type R&S 3760 or 3760PDG. Be sure to prepare the following socket receptacles and power cords between the power distribution board of the building and the attachment plugs for the unit.

Socket Receptacle : R&S 3754 or 3934
Power Cord : Type ST or equivalent, shielded type, with four min. #8 AWG conductors. Terminated at one end with an assembled on above socket receptacle cap.

B. Requirements to Branch Circuit

This unit relies on the building installation for protection of the internal components of the equipment. Each line (R/S/T line) should be protected by a short circuit protective device and by an overcurrent protective device rated 30 amp on building installation.
The protective device on building installation shall comply with the NEC requirements (or CEC requirements when installed in Canada), and if a protective device interrupts a conductor, it shall also interrupt all other supply conductors.
This protection is not required for the neutral line of this unit.

C. Disconnection from Power Supply

Each unit has Two Main Disconnect Device (Two Main Breaker CB101s for Dual Power Lines).
To remove all utility power from the unit, turn off both main disconnect device CB101s at the same time.

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a. Refer to Fig. 4.5-1. Connect the AC cables.

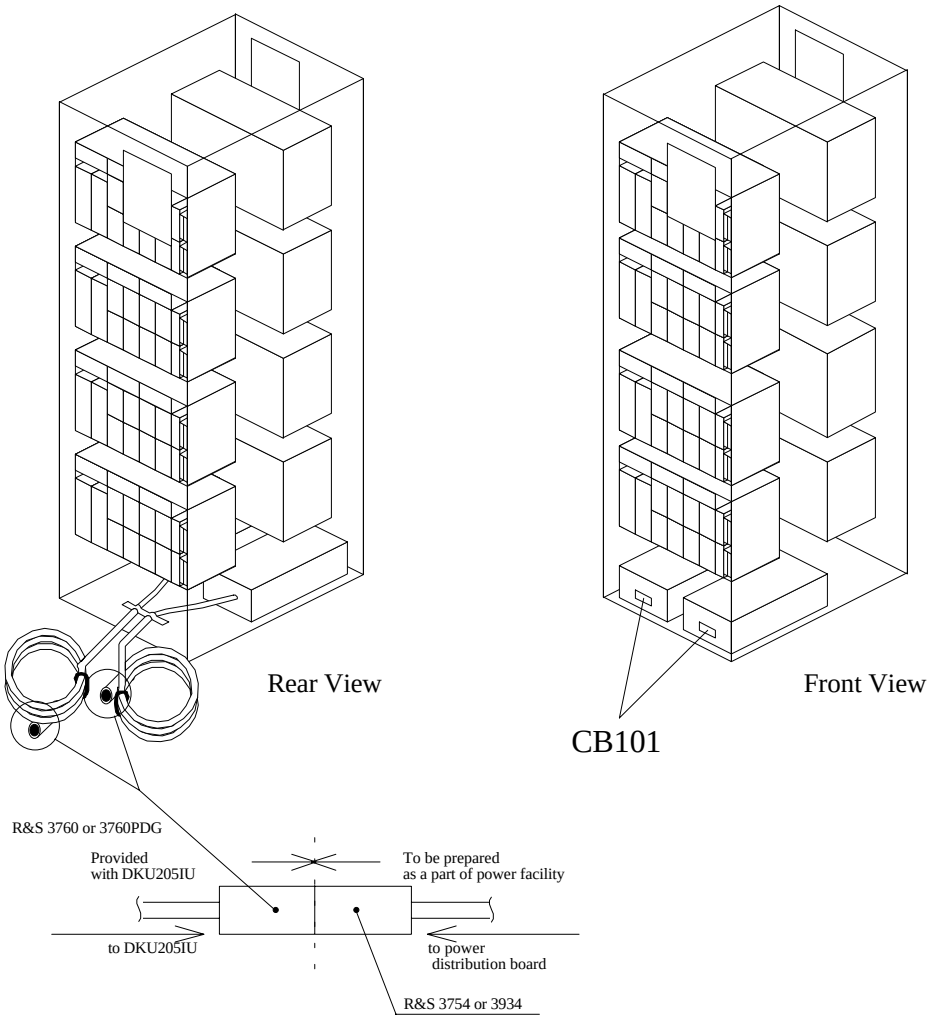

Fig. 4.5-1 Connection of the AC cables

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4.5.1.2 DKC310IE/DKU205IE

⚠ DANGER

The DKC and the first DKU commonly have Two Main Disconnect Devices (Two Main Breaker CB101s for Dual Power Lines) so that AC Power of the unit can be supplied from the separate power distribution board with Two Power Supply Cords. Similarly, each of the 2nd DKU, the 3rd DKU, and the 4th DKU also has Two Main Disconnect Devices.
Observe all instructions described in this manual before connecting the equipment to the power source and before servicing.

A. Connection of Power Supply Cord

The unit has two power supply cords. Be sure to prepare the following socket receptacles and power cords between the power distribution board of the building and the power cords for the unit.

Socket Receptacle : As shown in the following figure.
Power Cord : Type H07RN-F or equivalent, with five 6.0 mm 2 conductors. Terminated at one end with an assembled on above socket receptacle cap.

Be sure to connect a power cord to the distribution box as illustrated in the following figure. The wrong connection of neutral line may cause damages or fire of the equipment.
To reduce the risk of wrong connection, you should use approved type attachment plug and socket for power cord connection.
High leakage current may be caused between the power supply and this unit. To avoid an electric shock by high leakage current, perform the protective earth connection before the supply connections and disconnect it after the supply connections.

B. Requirements to Branch Circuit

This unit relies on the building installation for protection of the internal components of the equipment. Each line (R/S/T line) should be protected by a short circuit protective device and by an overcurrent protective device rated 30 amp on building installation.
The protective device on building installation shall be comply with National Standards of the country where the units shall be installed, and if a protective device interrupts a conductor, it shall also interrupt all other supply conductors.
This protection is also required for the neutral line of this unit.

C. Disconnection from Power Supply

Each unit has Two Main Disconnect Device (Two Main Breaker CB101s for Dual Power Lines).
To remove all utility power from the unit, turn off both main disconnect device CB101s at the same time.

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a. Refer to Fig. 4.5-2. Connect the AC cables.

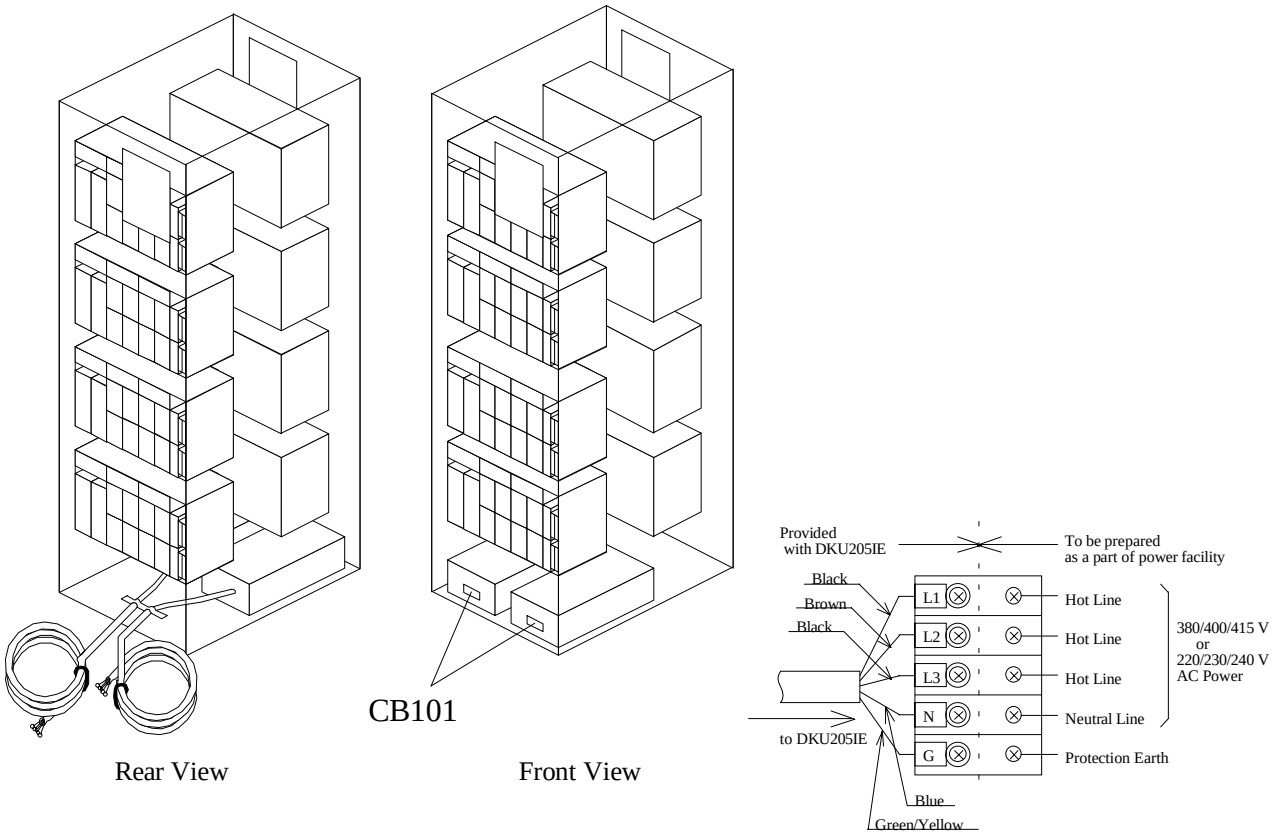

Fig. 4.5-2 Connection of the AC cables

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4.5.2 Connection of Channel Interface Cable

Table 4.5.2-1 shows the mounting limitations of channel options and the corresponding interface connector panel locations.

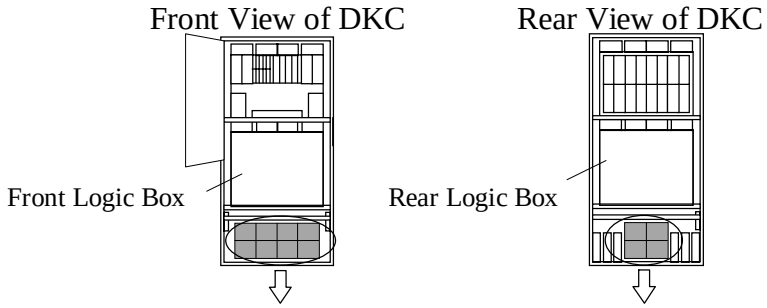

Table 1.4.5.2-1 The Mounting Limitation of Channel Options

Case	Location				Number of Channel Ports	I/F Connector Panel Location and Channel No.	
	Basic	Add.1	Add.2	Add.3		Front View of DKC	Rear View of DKC
1	8P	×	—	—	16	CL1 CL1 CL2 E F / G H | A | B | E F / G H | C | D |	CL2 A | B C | D
2	8P	8PS	—	—	16	CL1 CL1 CL2 E F | A | B | E F G H | C | D | G H	CL2 A | B C | D
3	8P	×	×	—	24	CL1 CL1 CL2 E F / G H | A | B | E F / G H J K / L M | C | D | J K / L M	CL2 A | B C | D
4	8PS	×	×	×	32	A B C D | E F / G H | J K / L M — CL1 A B C D | E F / G H | J K / L M — CL2	N P / Q R | — CL1 N P / Q R | — CL2
5	8PS	8PS	×	×	32	A B C D | E F | G H — CL1 A B C D | E F | G H — CL2	J K / L M | N P / Q R — CL1 J K / L M | N P / Q R — CL2
6	×	×	×	×	32	A B / C D | E F / G H | J K / L M | N P / Q R — CL1 A B / C D | E F / G H | J K / L M | N P / Q R — CL2	—

— : Uninstallable
× : F8S/4S/8C/4F
A-R : Channel No.

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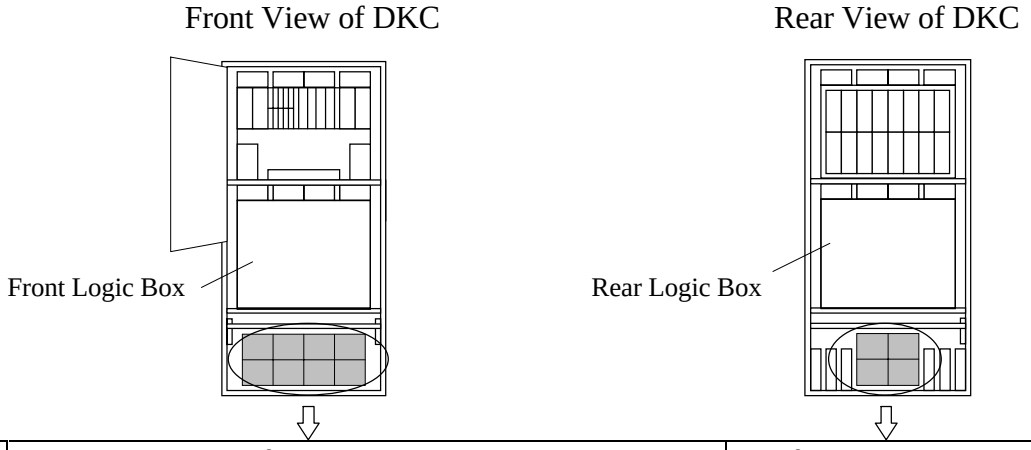
4.5.2.1 Connection of Parallel Channel Interface Cables

a. Connect the Parallel Channel Interface cables.



Location		Interface Connector Panel (Front View of DKC)	Interface Connector Panel (Rear View of DKC)
Basic	Add.1		
8P	-	CL1: CH A, CH B, CH C, CH D (TAG OUT, BUS OUT, TAG IN, BUS IN)	CL2: CH A, CH B, CH C, CH D (TAG OUT, BUS OUT, TAG IN, BUS IN)
8P	8PS	CL1: CH E, CH F (T OUT, B OUT, T IN, B IN); CL1: CH A, CH B, CH C, CH D (TAG OUT, BUS OUT, TAG IN, BUS IN); CL2: CH E, CH F (T OUT, B OUT, T IN, B IN); CH G, CH H (T OUT, B OUT, T IN, B IN)	CL2: CH A, CH B, CH C, CH D (TAG OUT, BUS OUT, TAG IN, BUS IN)
8PS	8PS	CH A, CH B, CH C, CH D, CH E, CH F, CH G, CH H (T OUT, B OUT, T IN, B IN) — CL1 and CL2	

Note T OUT : TAG OUT B OUT : BUS OUT
T IN : TAG IN B IN : BUS IN

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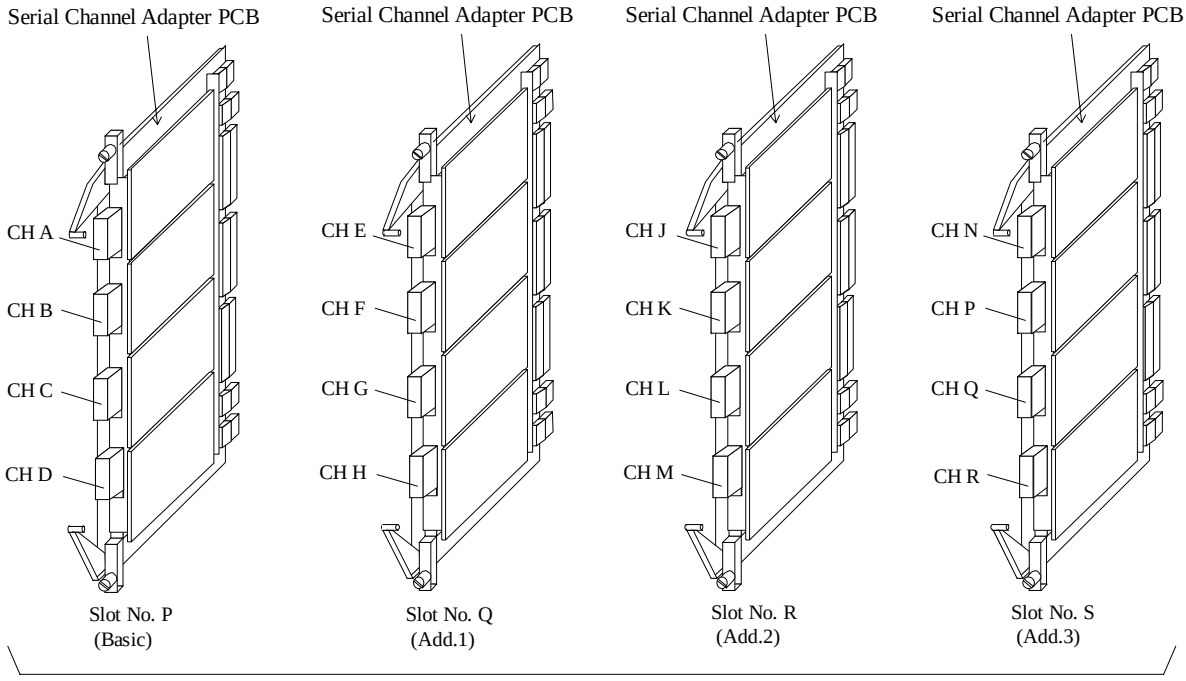
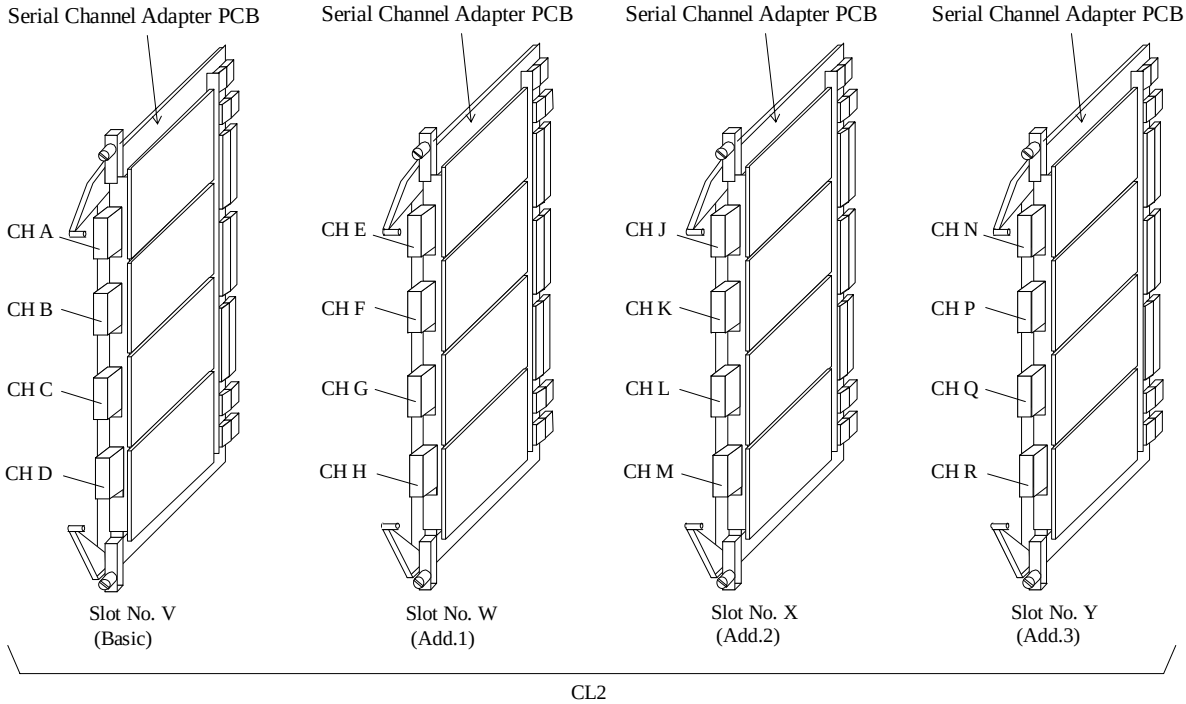
4.5.2.2 Connection of Serial Channel Interface Cables

a. Connect the Serial Channel Interface cables.





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4.5.2.3 Connection of SCSI Channel Interface Cables

a. Connection the SCSI Channel Interface cables.

	Basic	Add. 1	Add. 2	Add. 3
CL1	CH A OUT / CH B OUT CH A IN / CH B IN CH C OUT / CH D OUT CH C IN / CH D IN	CH E OUT / CH F OUT CH E IN / CH F IN CH G OUT / CH H OUT CH G IN / CH H IN	CH J OUT / CH K OUT CH J IN / CH K IN CH L OUT / CH M OUT CH L IN / CH M IN	CH N OUT / CH P OUT CH N IN / CH P IN CH Q OUT / CH R OUT CH Q IN / CH R IN
CL2	CH A OUT / CH B OUT CH A IN / CH B IN CH C OUT / CH D OUT CH C IN / CH D IN	CH E OUT / CH F OUT CH E IN / CH F IN CH G OUT / CH H OUT CH G IN / CH H IN	CH J OUT / CH K OUT CH J IN / CH K IN CH L OUT / CH M OUT CH L IN / CH M IN	CH N OUT / CH P OUT CH N IN / CH P IN CH Q OUT / CH R OUT CH Q IN / CH R IN

The location of the SCSI channel interface panels are shown in the Table 4.5.2-1. Refer to DKCREP04-600.

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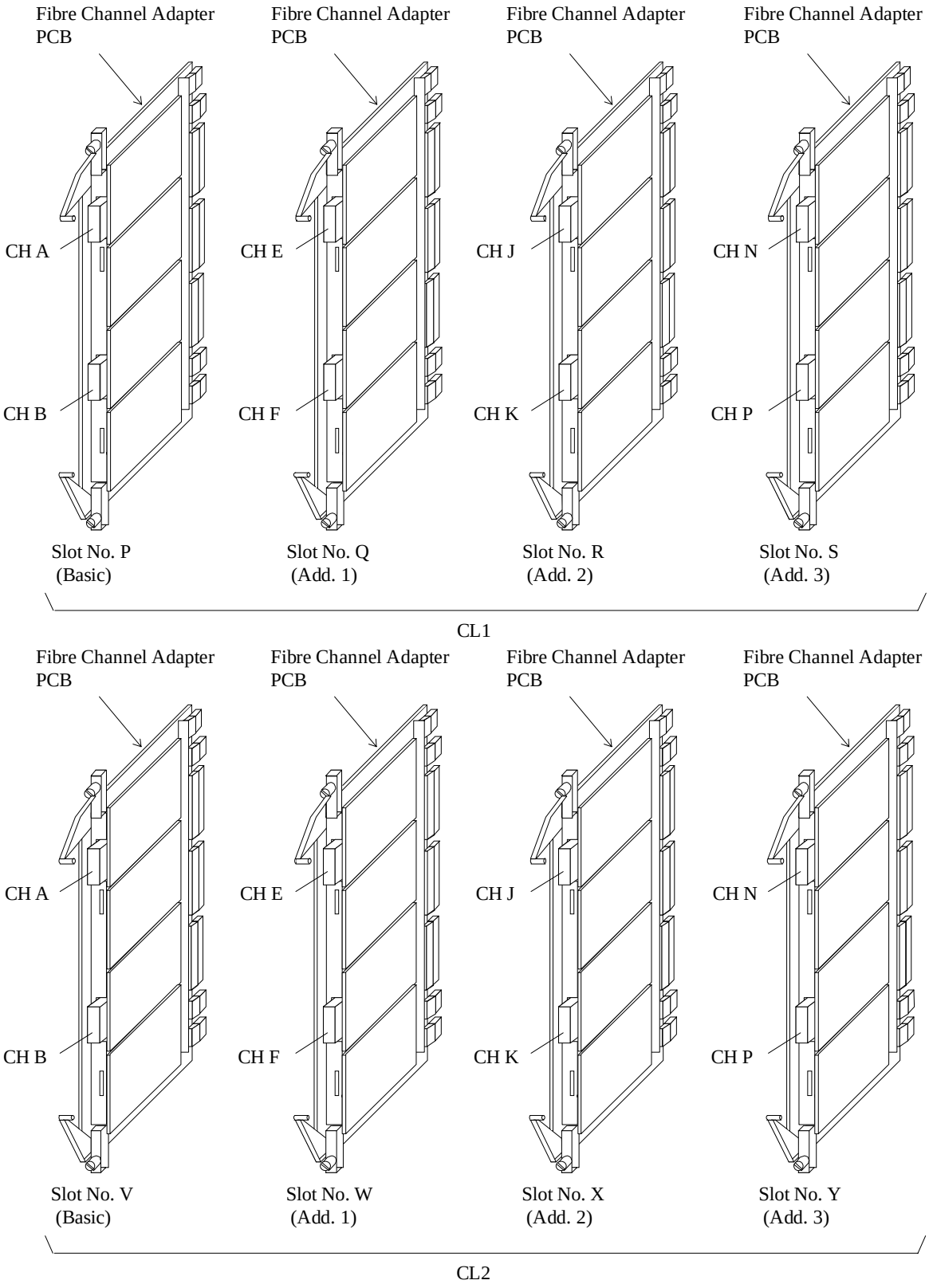
4.5.2.4 Connection of Fibre Channel Interface Cables

a. Connect the Fibre Channel Interface cables.



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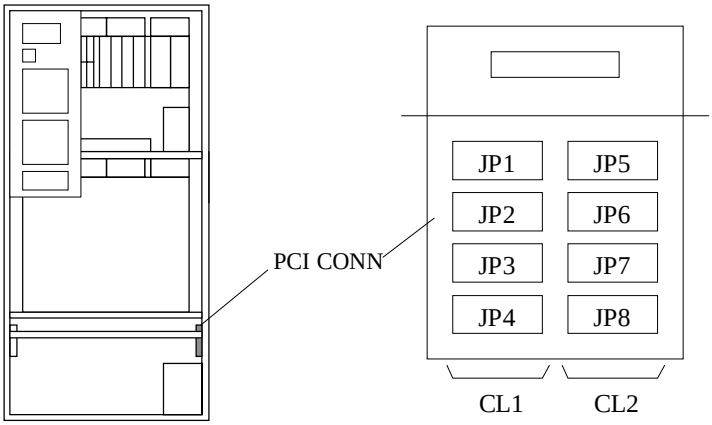
4.5.3 PCI Cabling

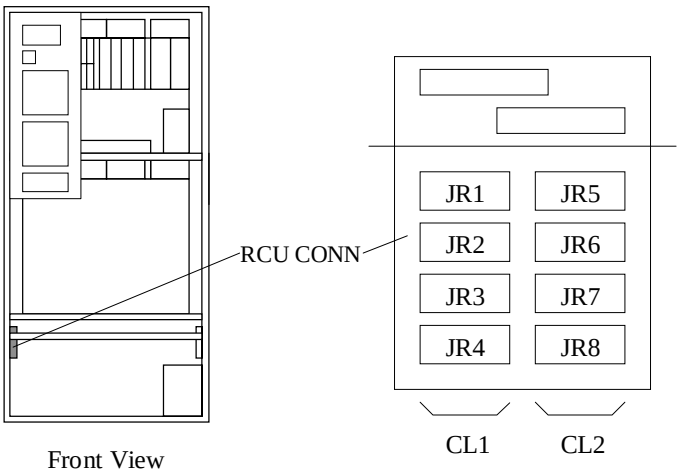
a. Connect the PCI cables



Front View
of DKC

4.5.4 RCU Cabling

a. Connect the RCU cables.



Front View
of DKC

Connector No.	Enable/Disable Route
JR1	CL1 CH A, B
JR2	CL1 CH C, D
JR3	CL1 CH E, F
JR4	CL1 CH G, H
JR5	CL2 CH A, B
JR6	CL2 CH C, D
JR7	CL2 CH E, F
JR8	CL2 CH G, H

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4.6 Power ON of Disk Subsystem

(1) Power on procedures are shown below. Refer to the details and start the operation.
   a. Turn on the main circuit breaker at the distribution board.
   b. Turn on the main circuit breaker at the AC Box on the Disk Unit.

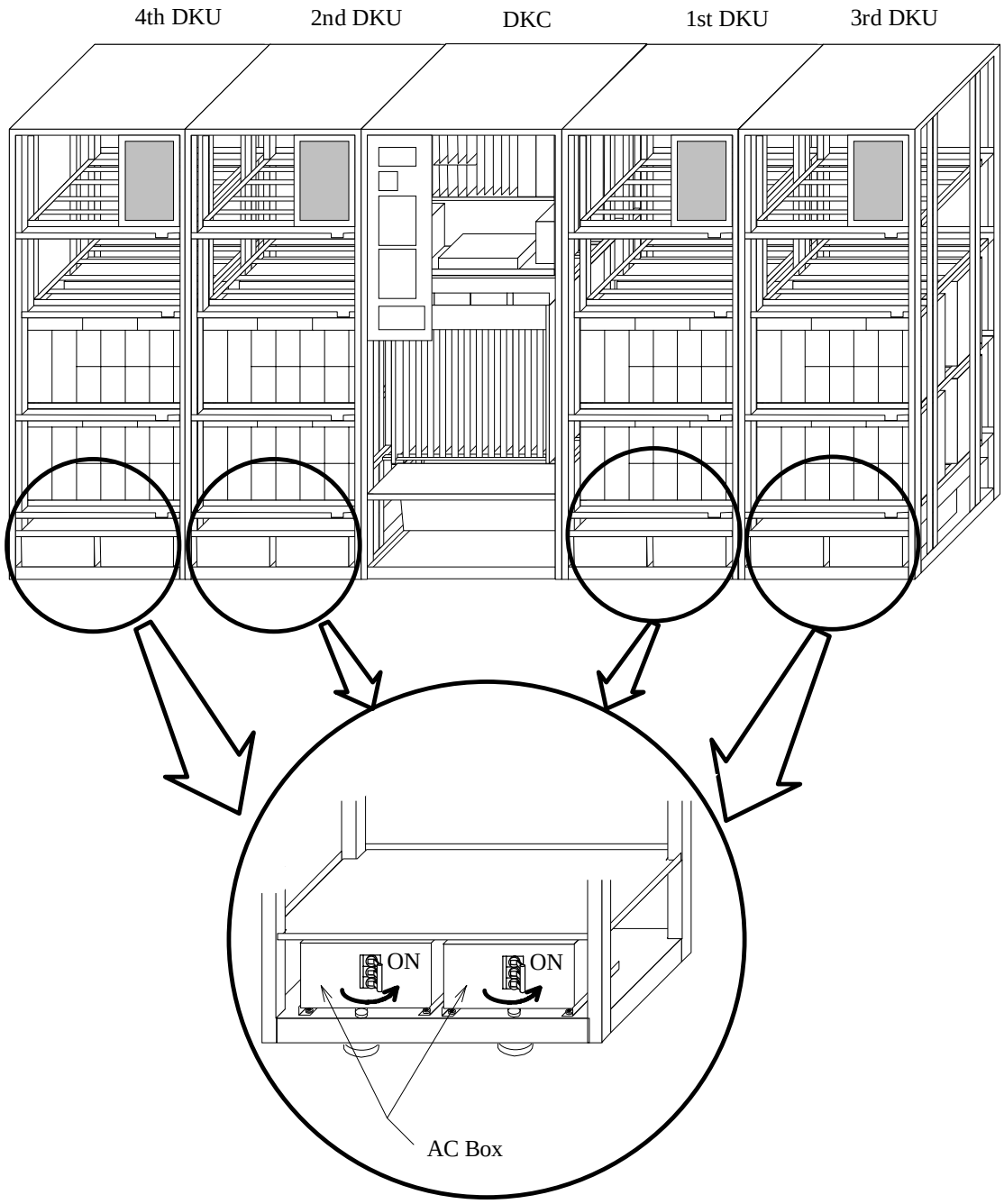

Fig. 4.6-1 Main Circuit Breaker on AC Box

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c. Turn on the circuit breaker at the Breaker Box-1 and 2 in the Disk Controller.

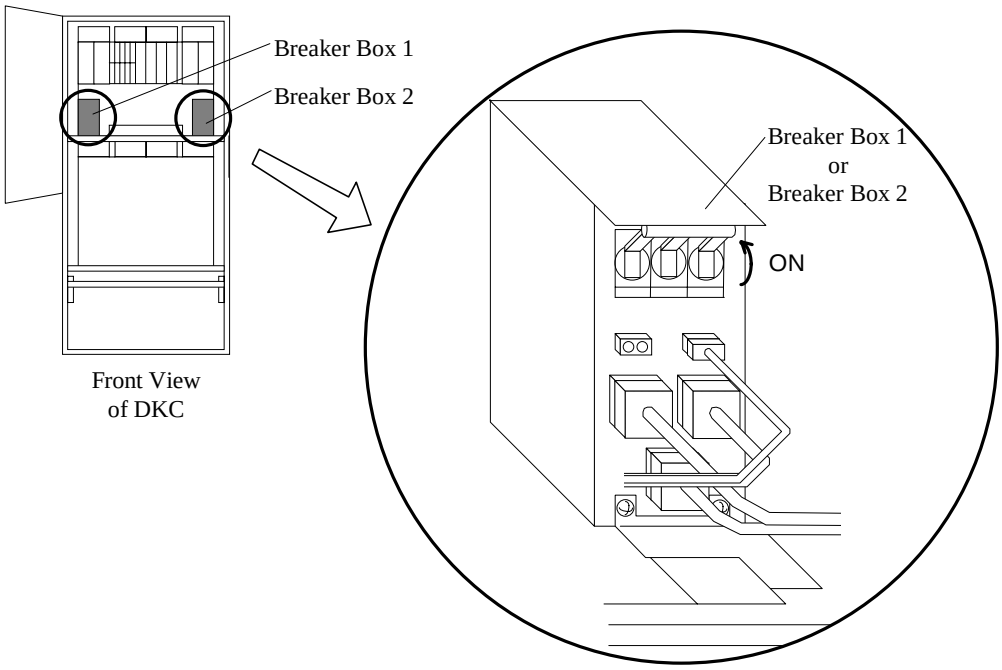

Fig. 4.6-2 Circuit Breaker in Breaker Box-1 and 2

d. Turn on the circuit breaker at the Outlet Box in the Disk Controller.

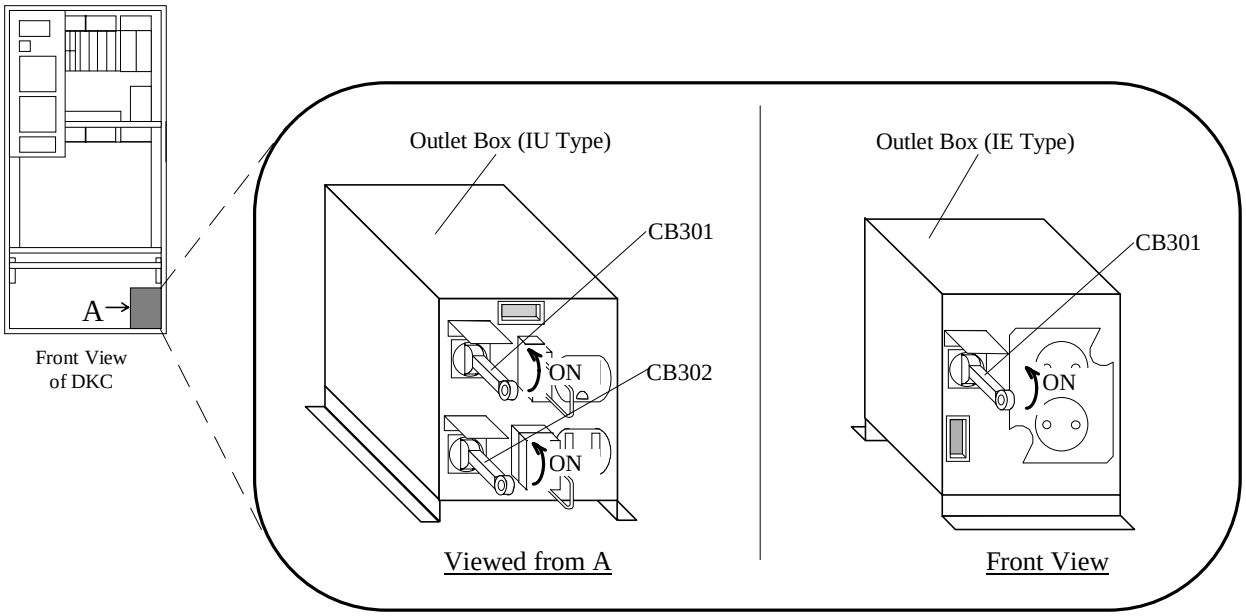

Fig. 4.6-3 Circuit Breaker in Outlet Box

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e. Turn the “ENABLE/DISABLE” switch on the DKUMN PCB’s to “ENABLE”.

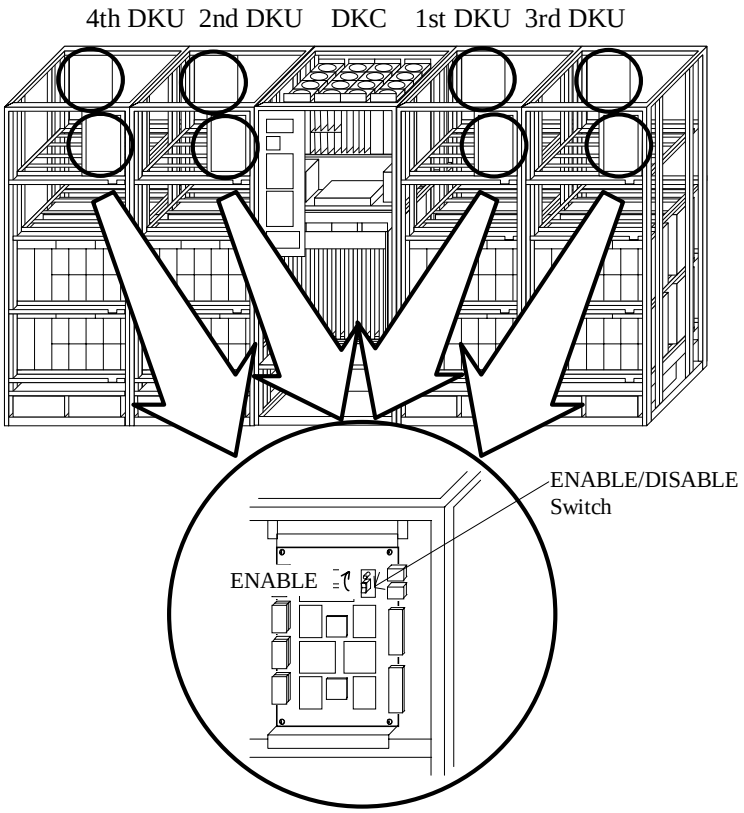

Fig. .4.6-4 ENABLE/DISABLE Switch on DKUMN PCBs

f. Turn “ENABLE/DISABLE” switch on the CE panel PCB to “ENABLE”.

g. [Case as custom engineer operates]

Turn the “REMOTE/LOCAL” switch on the CE panel PCB to “LOCAL”.
Turn the “POWER ON/OFF” switch on the CE panel PCB to “ON”.

[Case as operate from CPU]

Turn the “REMOTE/LOCAL” switch on the CE panel PCB to “REMOTE”.
Turn on the power supply from CPU.

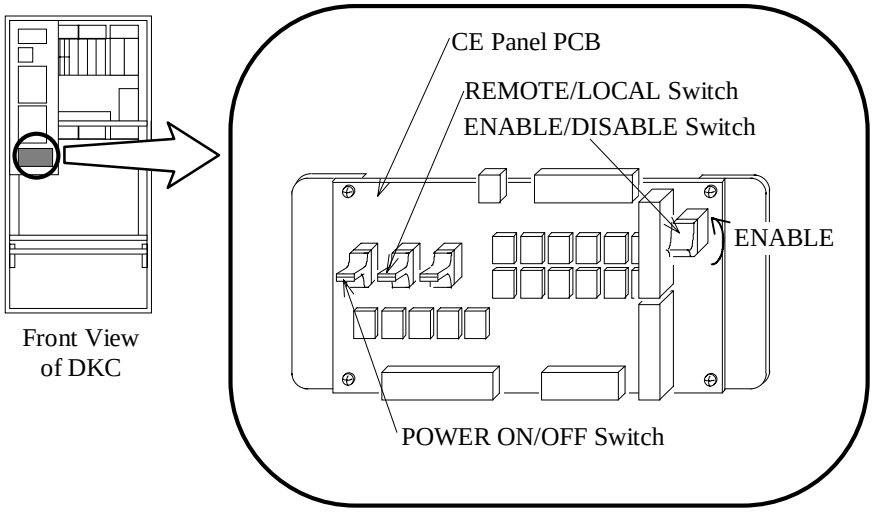

Fig. 4.6-5 Switches on CE Panel PCB

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4.7 Connect of the SCSI and DKUMN Cables

(1) Connection the DKUMN cables to the DKUMN PCBs. Refer to Figs. 4.7-1 and 4.7-2.

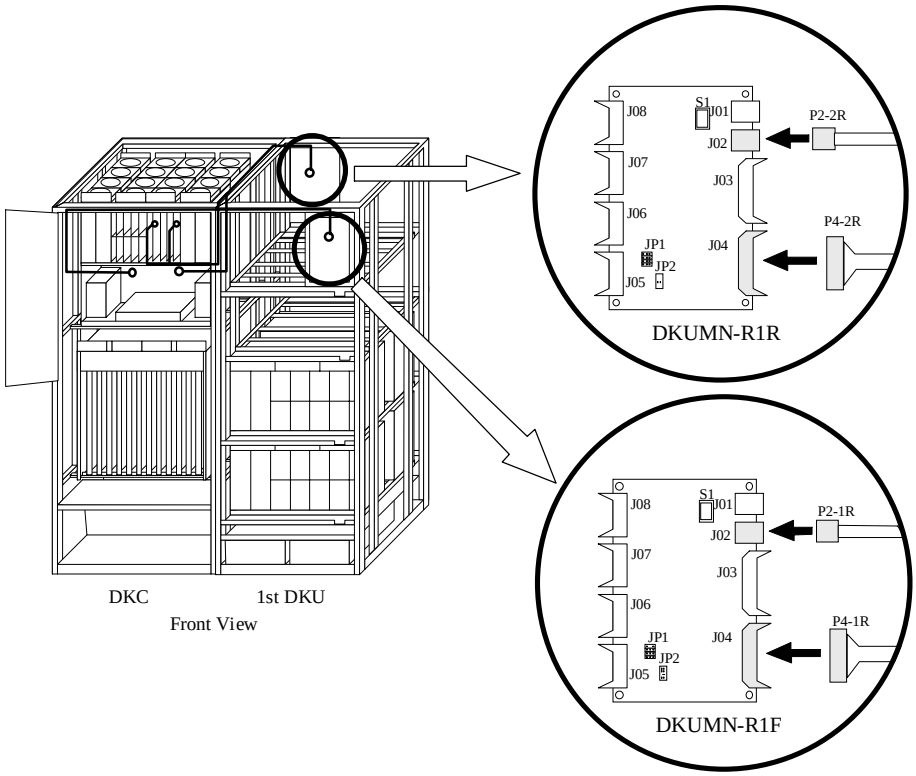

Fig. 4.7-1 Connection of DKUMN cables (Between DKC and 1st DKU)

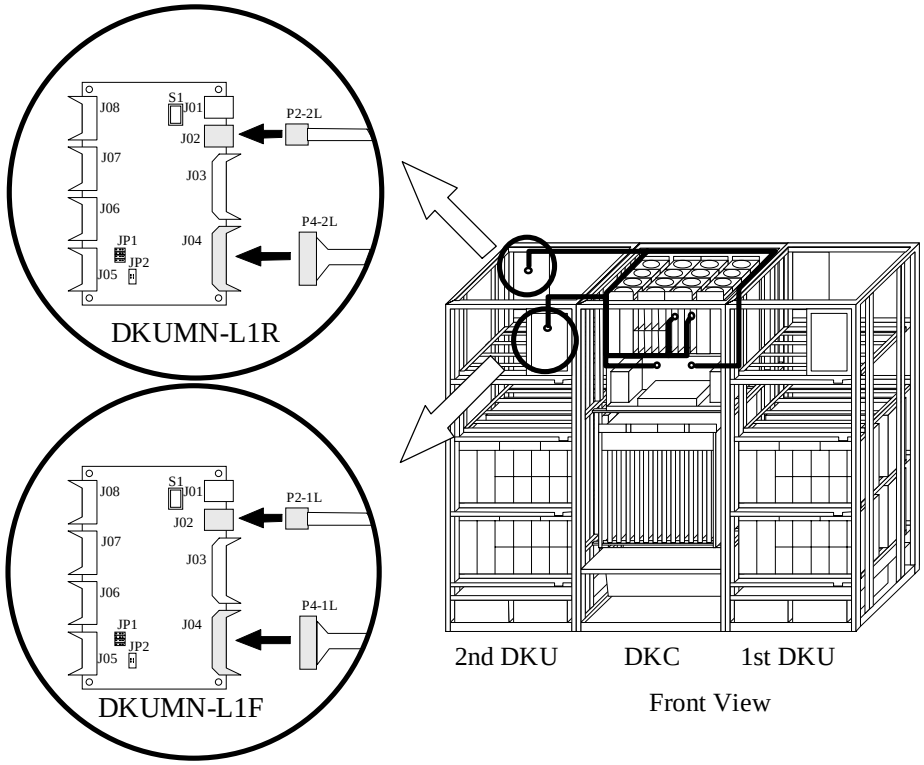

Fig. 4.7-2 Connection of DKUMN cables (Between DKC and 2nd DKU)

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(2) Connect the SCSI interface cables to the sub-edges on the SCSI BFR PCBs. Refer to Figs. 4.7-3 and 4.7-4.

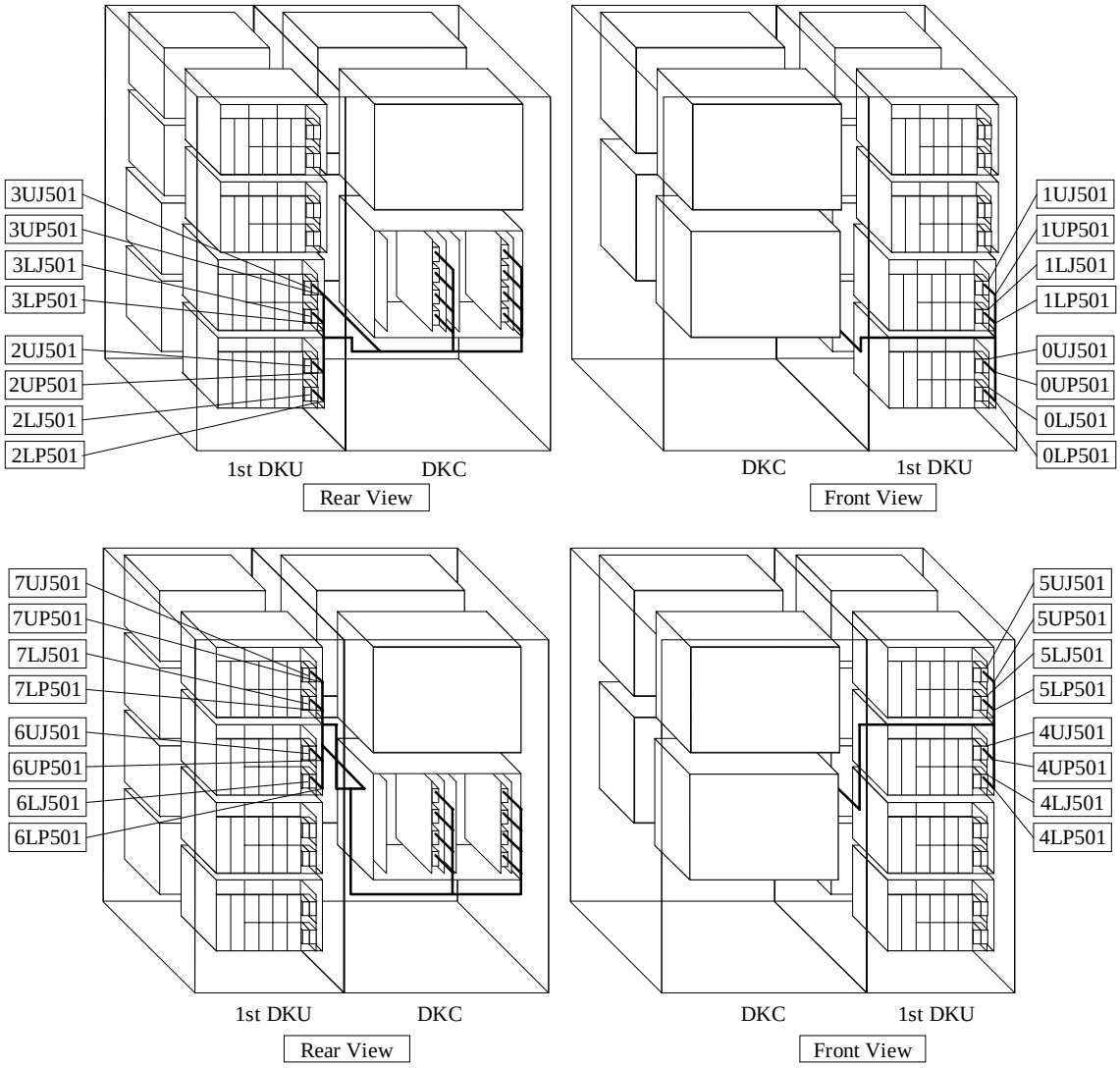

Fig. 4.7-3 Connection of SCSI Interface Cables (Between DKC and 1st DKU)

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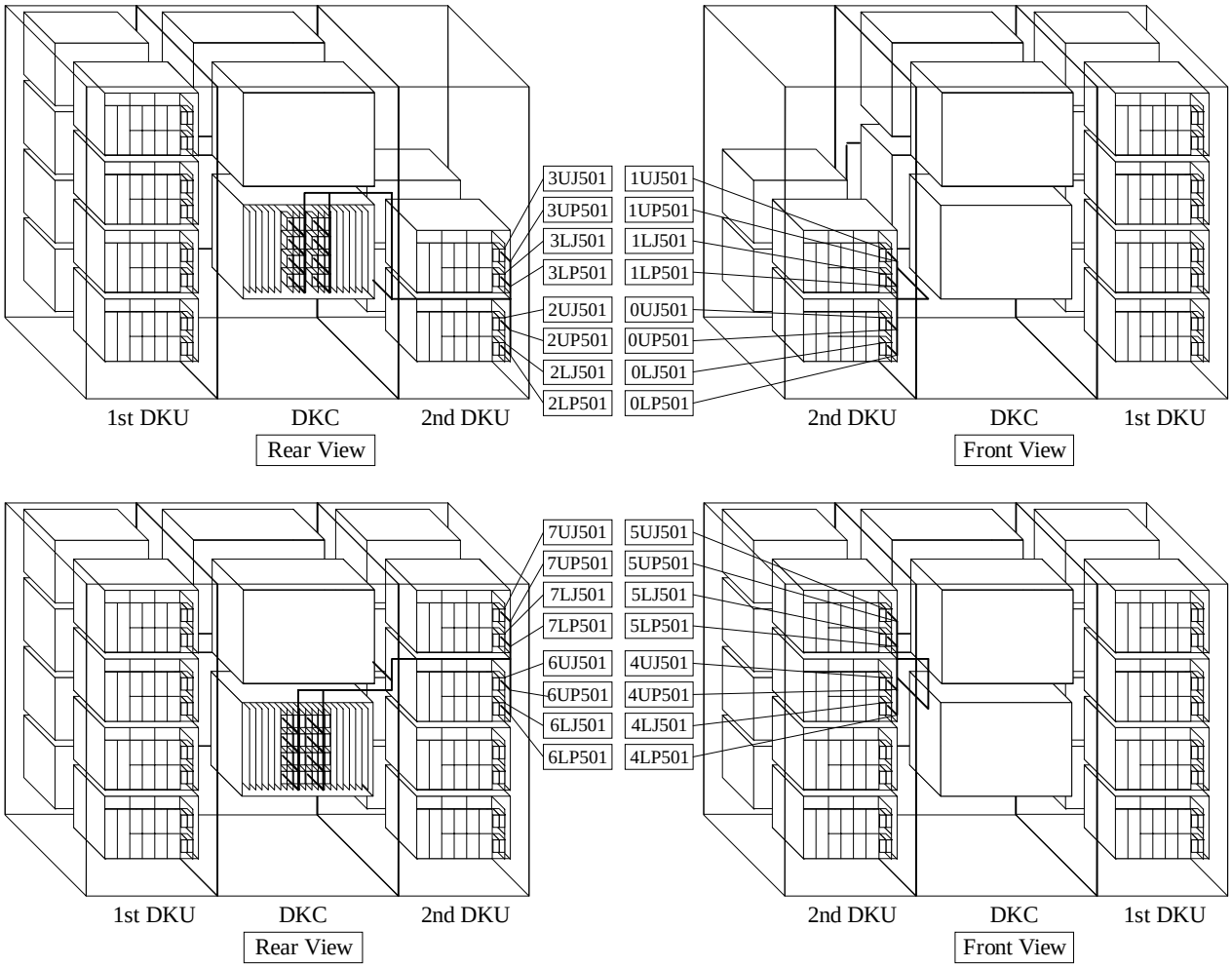

Fig. 4.7-4 Connection of SCSI interface Cables (Between DKC and 2nd DKU)

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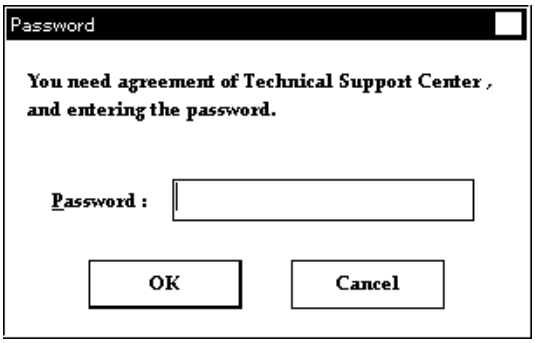
5 Procedure of loading Configuration information to FD (used in new DKC)

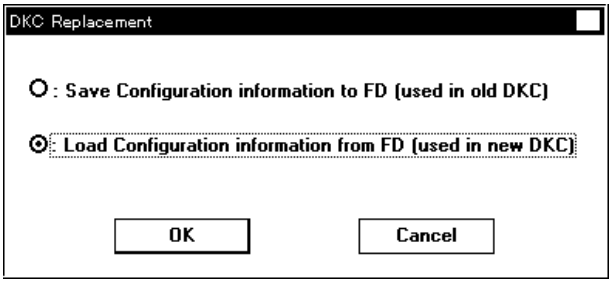
(1) Change the mode to [Swap Mode]
- Select “Shift” + “Ctrl” + “Alt” + “P”.
- Enter the password and select (CL) [OK].
- Select (CL) [Install].

(2) <DKC REPLACEMENT>
Select (CL) [DKC REPLACEMENT].

(3) Enter the password and select (CL) [OK].
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.



(4) Select (CL)
“Load Configuration information from FD (used in new DKC)” and select (CL) [OK] in the ‘DKC Replacement’ window.



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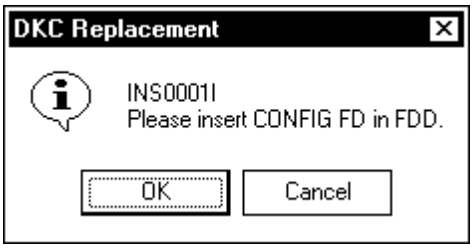
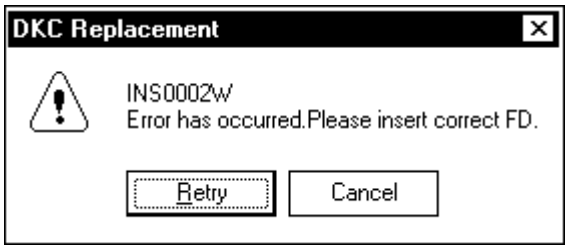
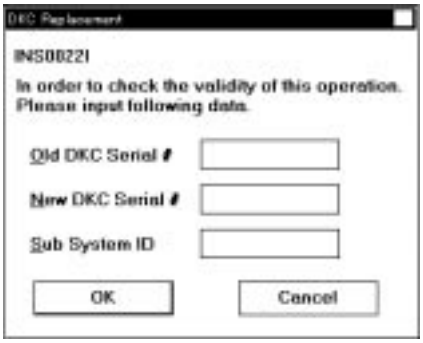
(5) Please insert CONFIG FD in FDD.
After select (CL) [OK].



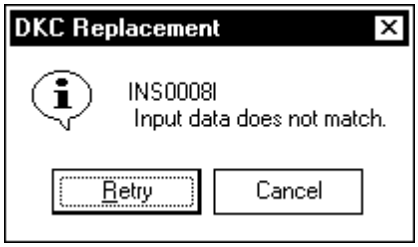
<Error case>
Please insert correct FD.
After select (CL) [Retry].



(6) Please input DKC serial# and SSID.
After select (CL) [OK].



<Error case>
Input data does not match.
Select (CL) [Retry].



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(7) “Checking Subsystem...” is displayed.

(8) <Micro program exchange>
“Now Reading subsystem configuration...” is displayed.

<Error case>
“ON exchanging a micro-program, An error has occurred. Processing is stopped.”

(9) “Executing internal P/S OFF and ON automatically...” is displayed.

(10) “Now Down Loading...[***]” (*** : PCB location) is displayed.

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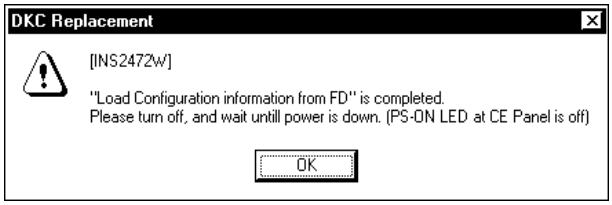
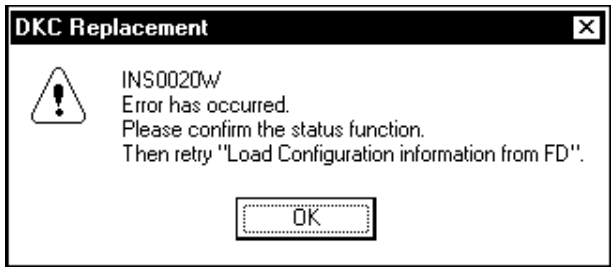
(11) “Now MP Rebooting... Group# n/N” is displayed.
All processors are recovered.

(12) “Reading subsystem configuration...” is displayed.

(13) Please turn off, and until power is down.
(PS-ON LED at CE Panel is off)
After you have done this operation, select (CL) [OK].



<Error case>
Select (CL) [OK].
Please confirm the status function.



(14) Close the ‘Install’ window.

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6 Notice for Maintenance procedure after performing DKCSWAP

- **For maintenance, basically refer DKC310I/DKU305I Maintenance Manual procedure.**
- **For DKC310I maintenance and parts, refer DKC310I/DKU305I Maintenance Manual procedure.**
- **For DKC210I maintenance and parts, refer DKC210I/DKU205I Maintenance Manual procedure.**

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7 DKC Change (DKC300 to DKC300)

7.1 Abstract

Purpose of DKC change is to enable user's LDEV/PDEV resources to be continuously used when the DKC is exchanged.

7.2 Measures to attain the purpose

Information to be handed over is saved on an FD by the SVP of the former subsystem and installed by the SVP of the new subsystem.

7.3 Old subsystem configuration restrictions

No.	Condition/restriction	Detail	Restriction guard
1	Subsystem configuration	Only for RAID300 subsystem	
2	STATUS of subsystem	• The switching is allowed even if a failed part or a PIN exist. • The switching is not allowed if a Correction copy or Drive copy is running. • The switching is not allowed if a Verify function is running. • Micro-code version must be changed to supported version.	If the restriction is violated, the FD is not supported. An SVP pre-check error will occur.
3	HDD type	• There is no restriction.	
4	RAID level	• There is no restriction.	
5	Cache configuration	• There is no restriction.	
6	Emulation type	• There is no restriction.	

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7.4 New subsystem configuration restrictions

No	Condition/restriction	Detail	Restriction guard
1	A failed part or a blocked part status.	• CHA/DKA/Cache/Terminator/SM, etc. must be all normal status. • LDEV/PDEV/SCSI can be Blocked.	If the restriction is violated, the FD is not supported. An SVP pre-check error will occur.
2	Cache configuration	• Cache capacity must be the same as that of the old subsystem. • Cache SIMM size and its location must be the same as those of the old subsystem.	Restriction is violated, configuration information error will occur (SSB, SIM or blocked parts). Configuration information must be checked by technical support.
3	SM configuration	• SM capacity must be the same as that of the old subsystem. • SM SIMM size and its location must be the same as those of the old subsystem.	
4	Number of CHA/DKA PCBs and their locations	• Number of CHA/DKA PCBs and their locations must be the same as those of the old subsystem.	
5	Number of Channels and their locations	• Number of channels and their locations must be the same as those of the old subsystem.	
6	Number of Cache PCBs and their locations	• Number of Cache PCBs and their locations must be the same as those of the old subsystem.	

7.5 Restrictions of configuration expansion

There are no restrictions.

7.6 The kind of reported SSB and SIM (Only when a SCSI cable and an environment monitor cable don't connect it.)

SIM CODE	contents	Note
ac50	HDU power off.	An influence by the un-connection of the SCSI cable.
bfxx	Environmental Error.	An influence by the un-connection of the environment monitor cable.
ffe7	Shared memory is volatilized.	An influence due to breaker Off/on.

Error Code	contents	Note
001d	From FM, to SM, micro-transfer practice	At the time of the Shared Memory volatile mode.
32cc	HDU power off.	An influence due to breaker Off/on.
a47c	A SCSI Cable cutout is removed.	
aec9	The status injustice of SPC interrupts.	
ae57	BUS DEVICE RESET	
ae5c	DRIVE LED NG.	

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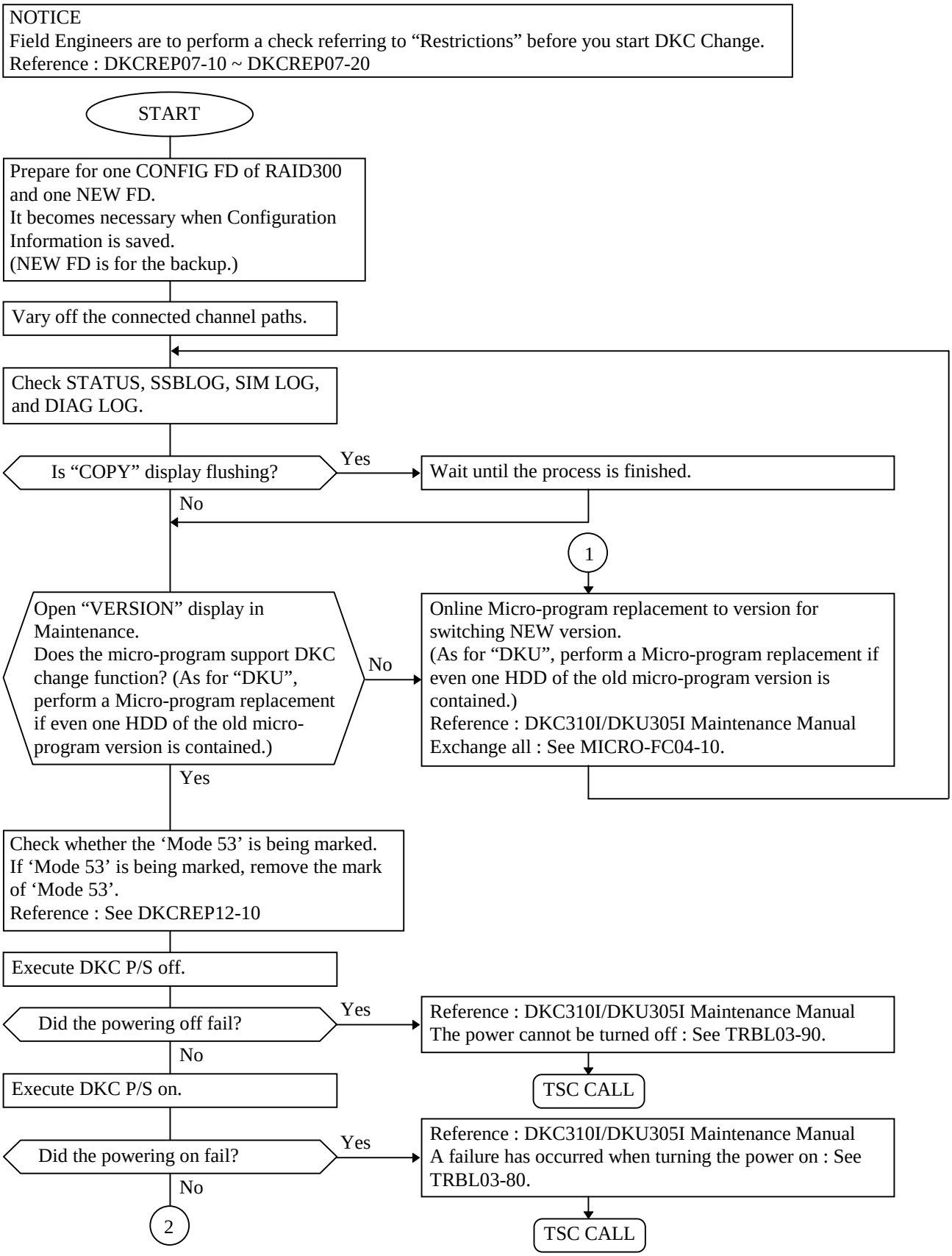
8 DKC Change flowchart



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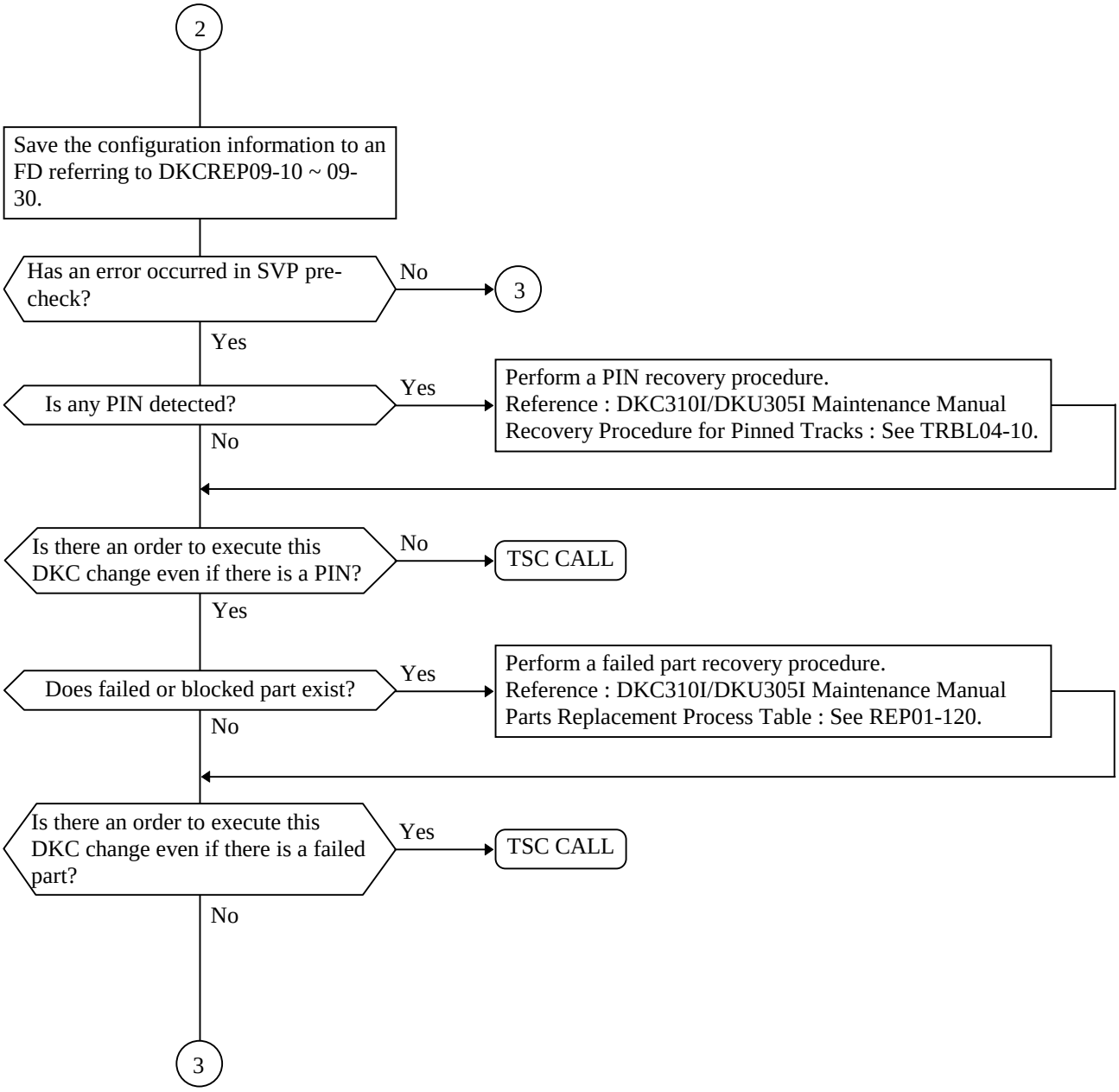

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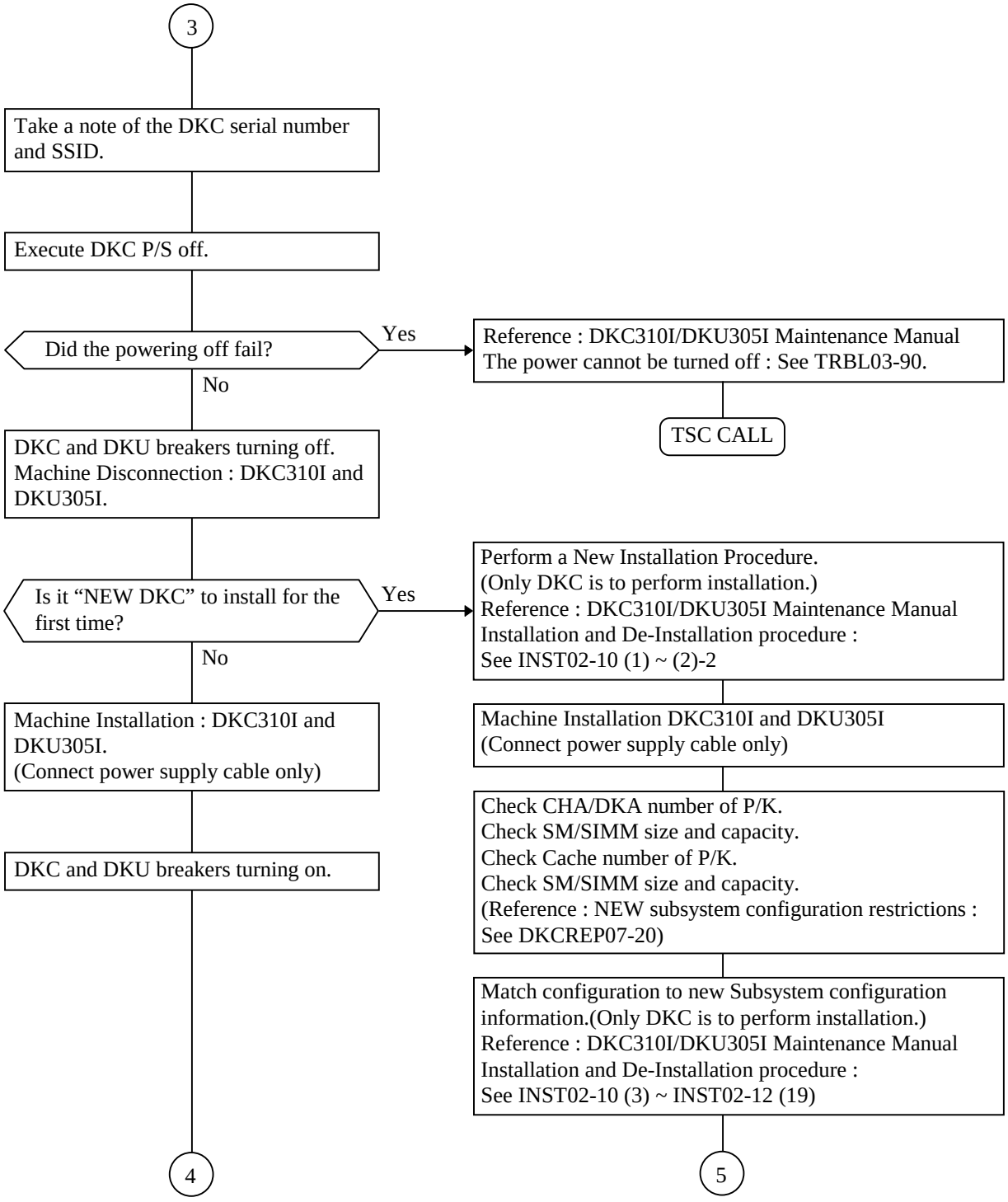

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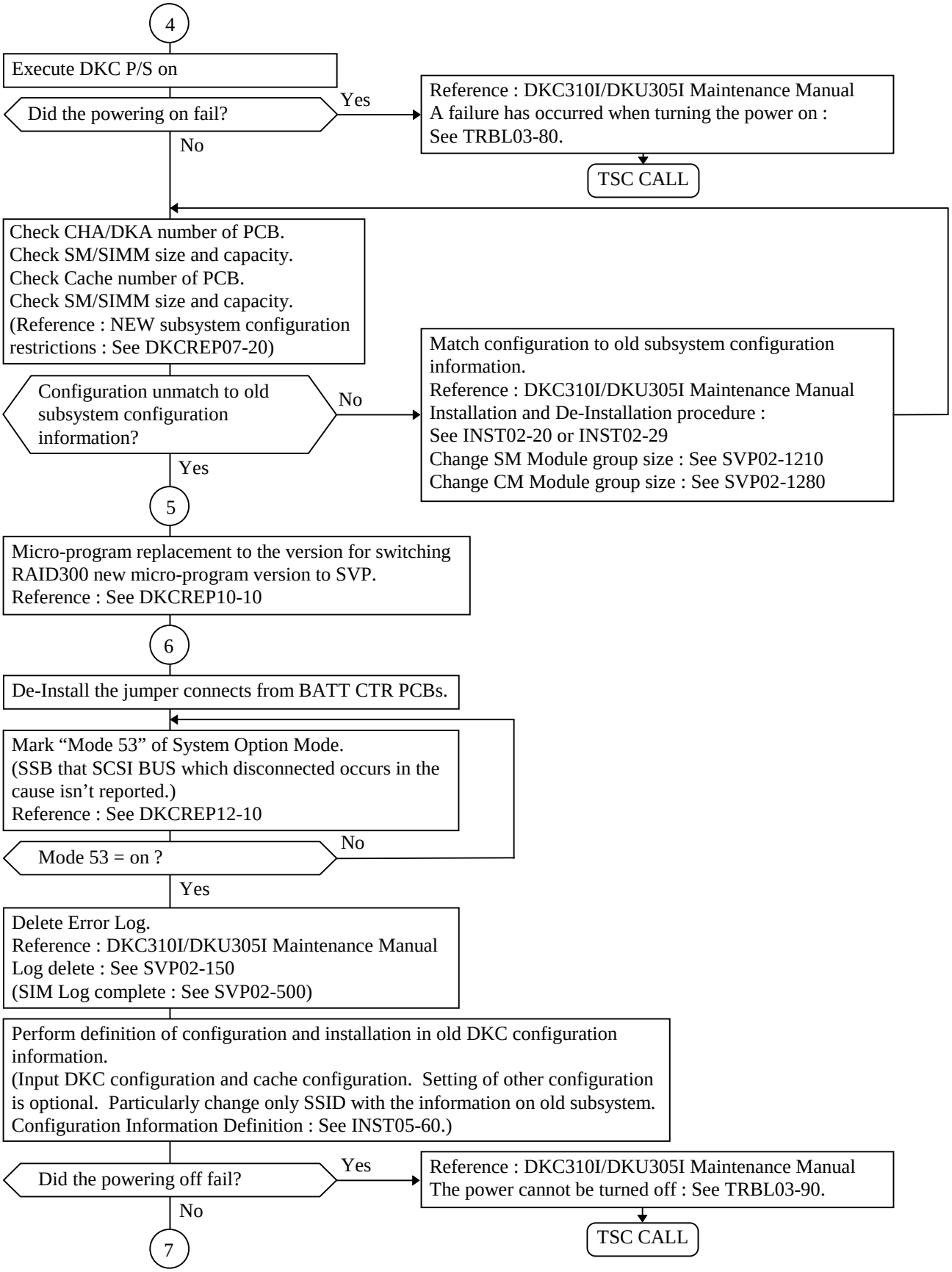

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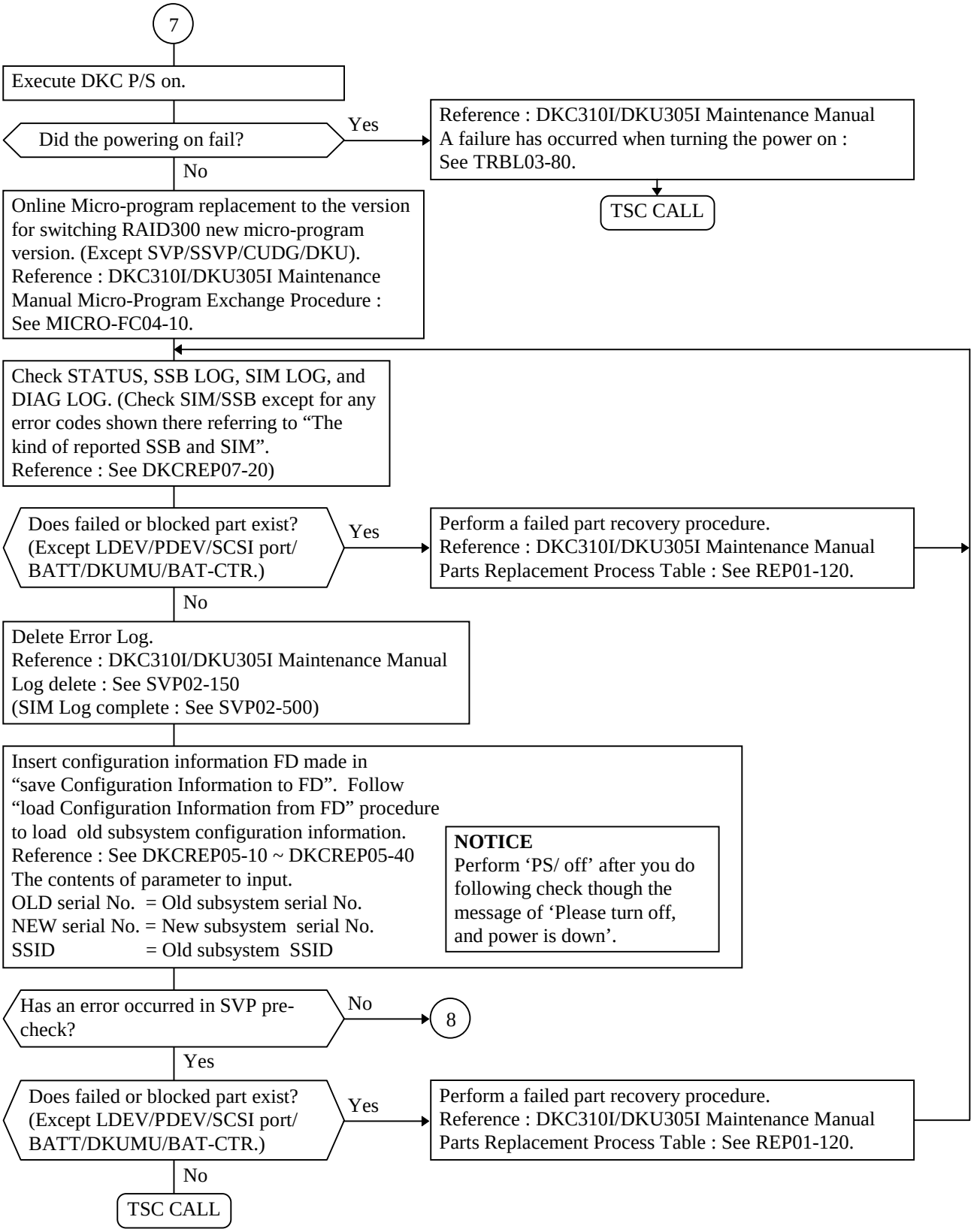

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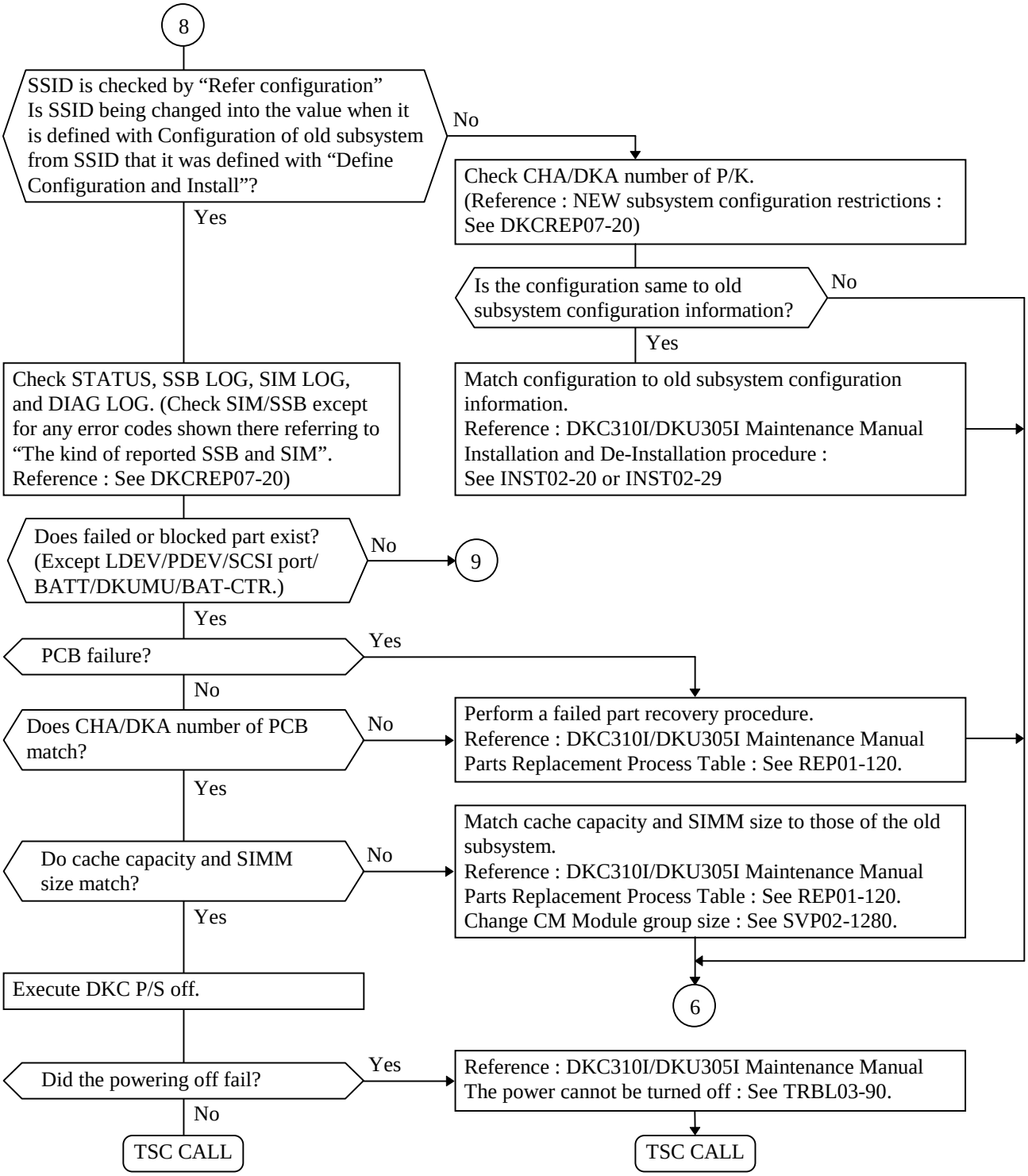

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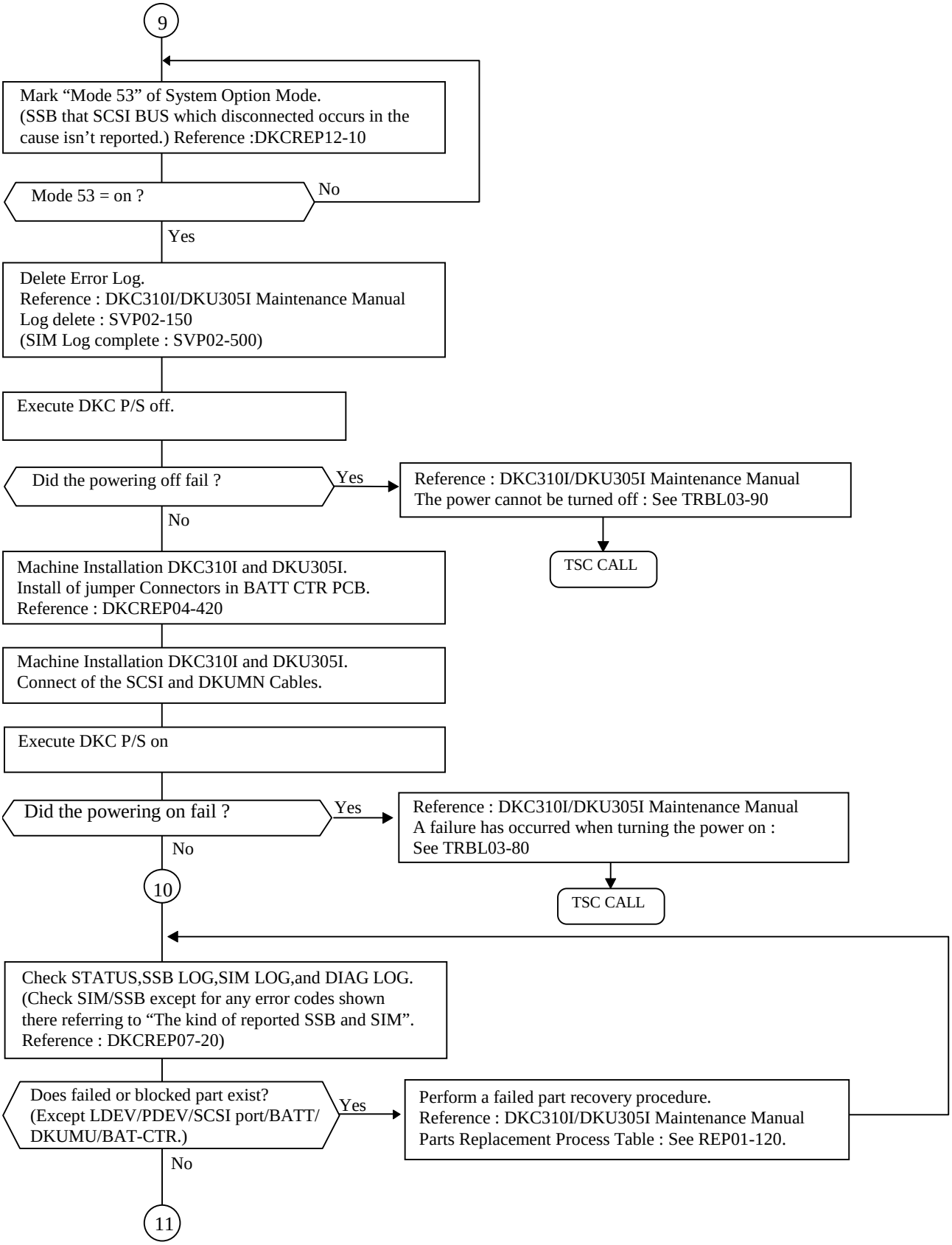

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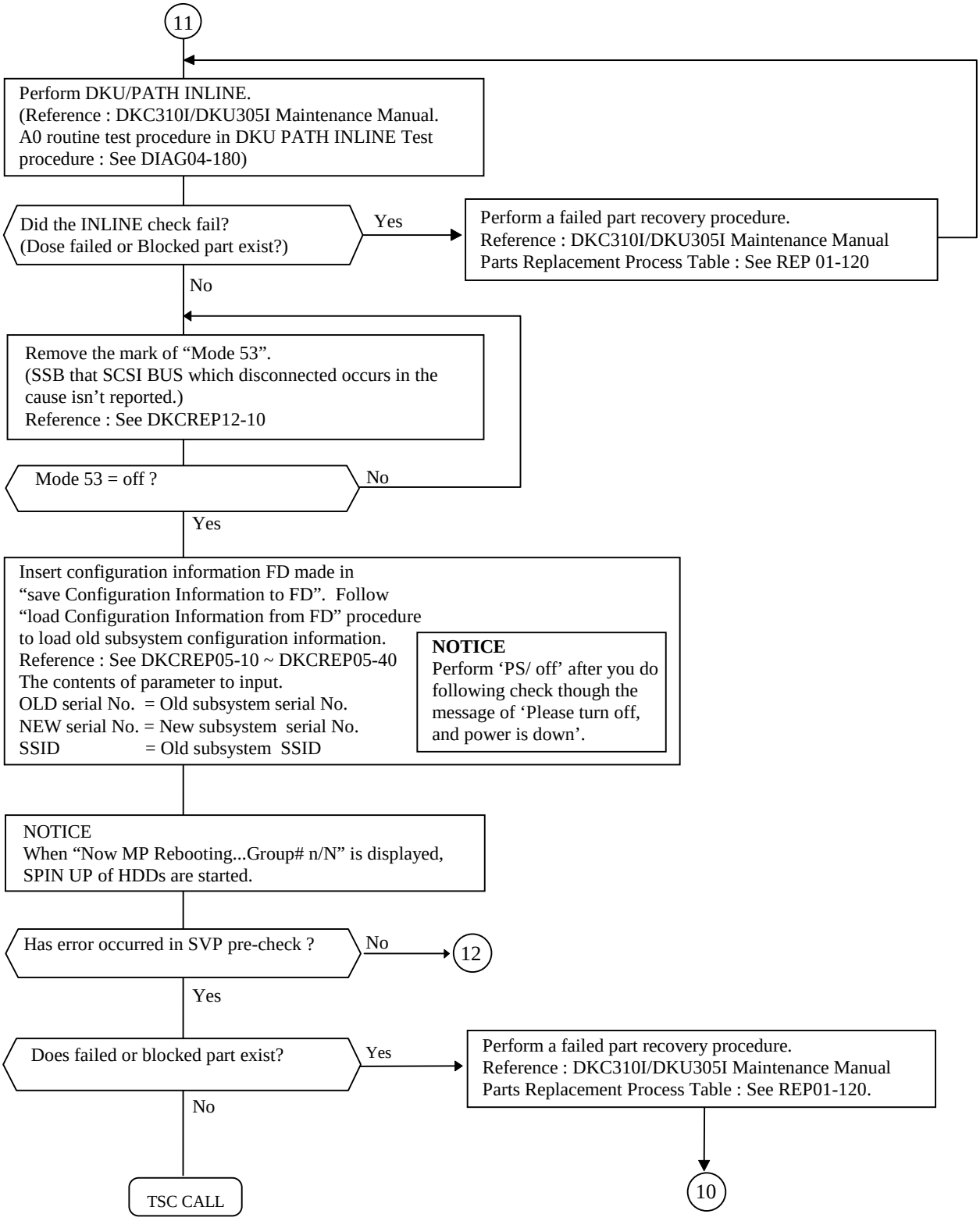

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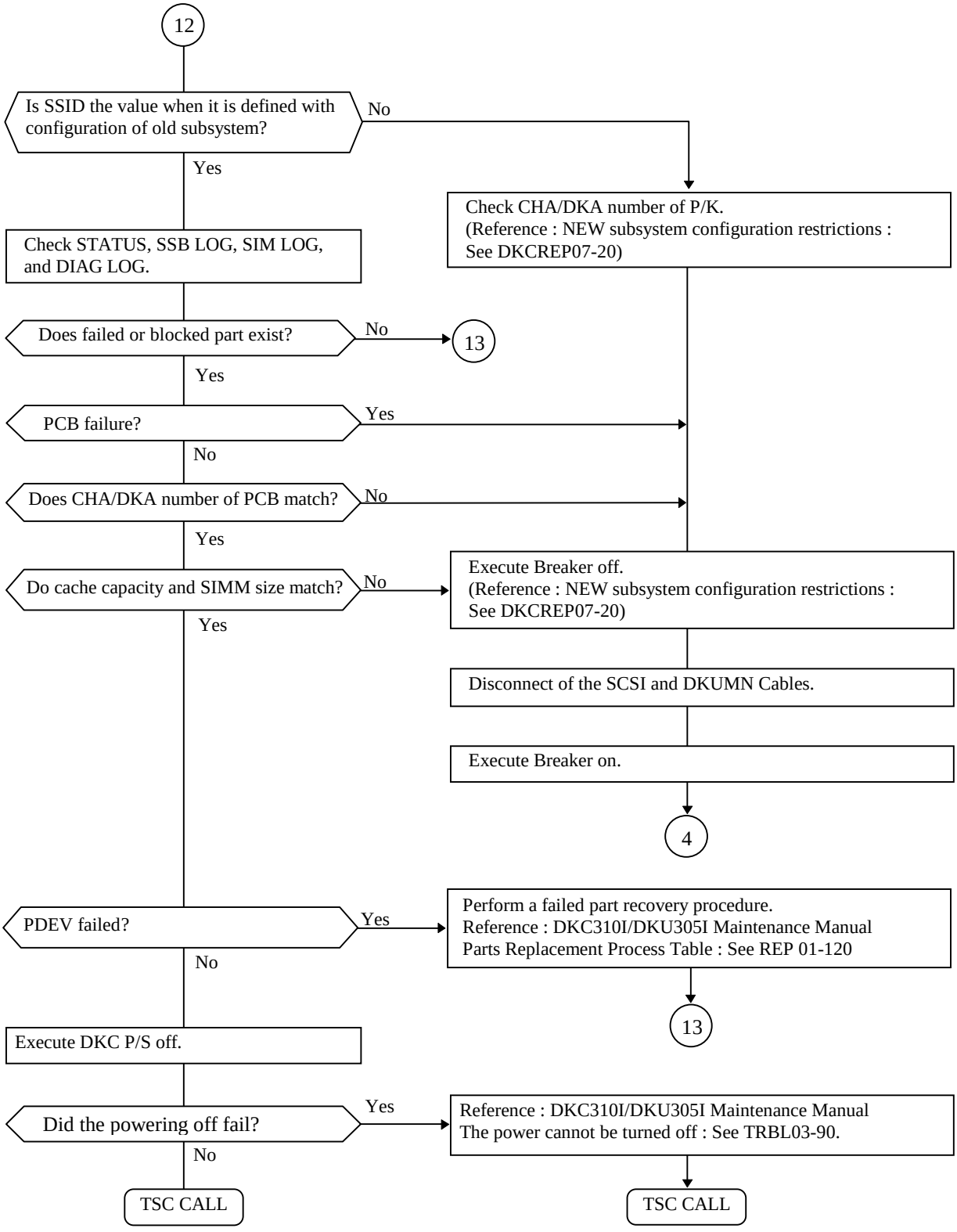

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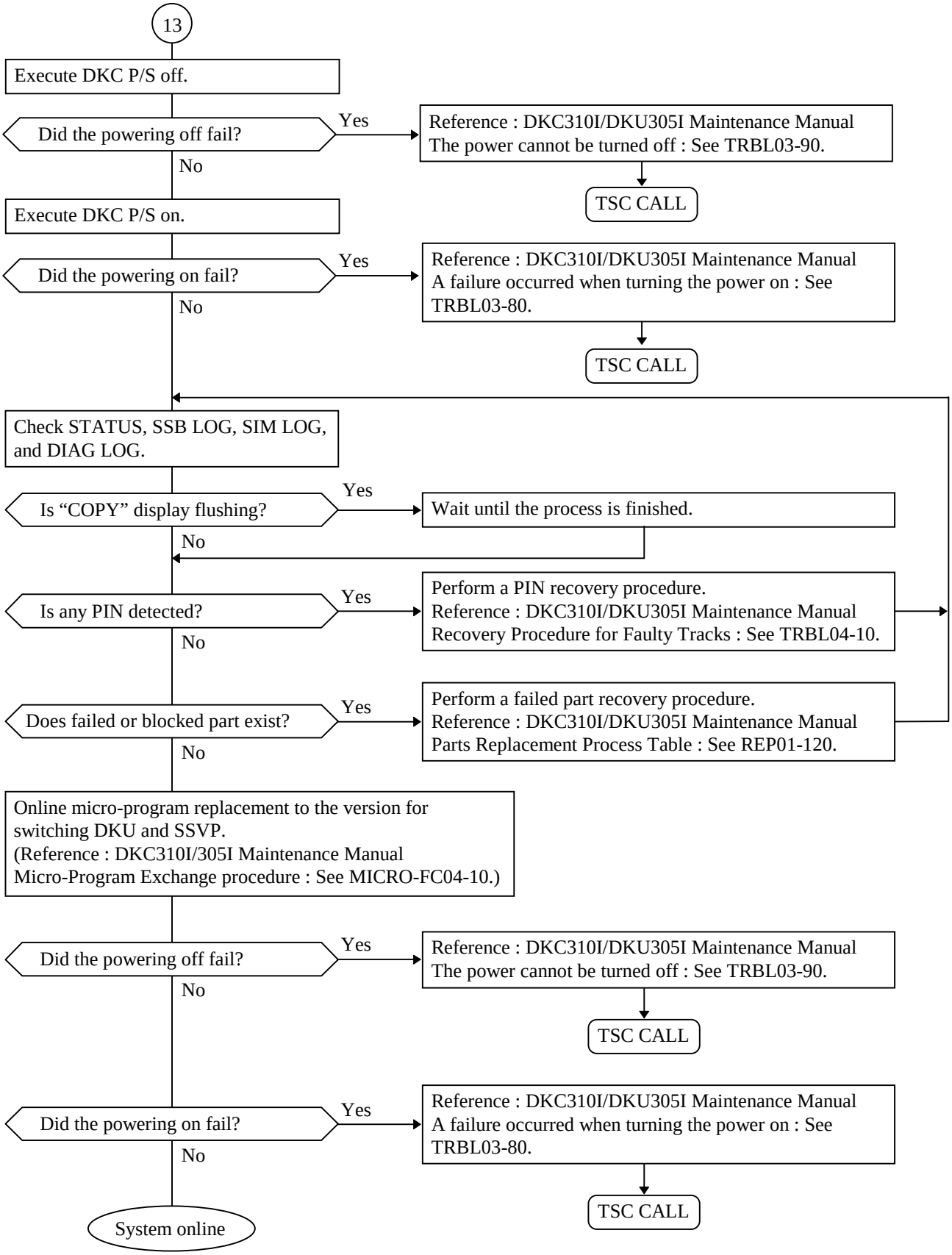

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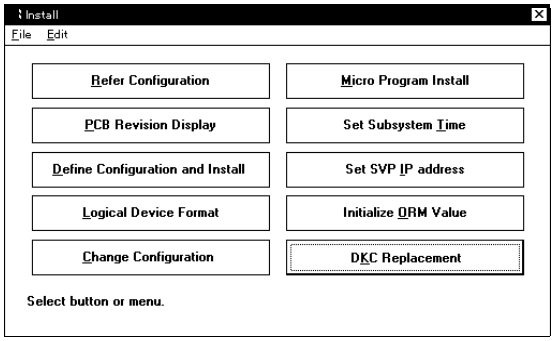
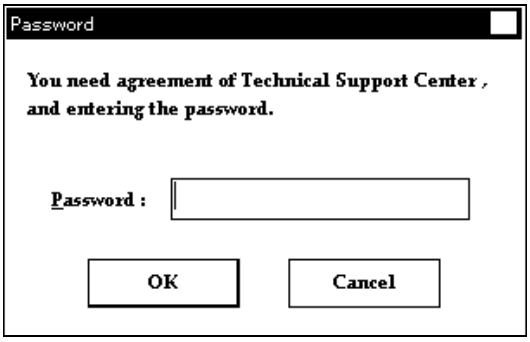
9 Procedure of saving configuration information to FD for DKC Change

(1) Change the mode to [Swap Mode].
- Select “Shift”+“Ctrl”+“Alt”+“P”.
- Enter the password and select [OK] (CL).
- Select [Install] (CL).

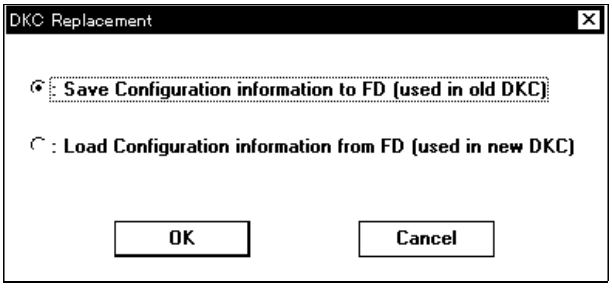
(2) <DKC REPLACEMENT>
Select (CL) [DKC REPLACEMENT].



(3) Enter the password and select [OK] (CL).
Password is needed for this operation.
Please call Technical Support Center to obtain password and authorization.



(4) Select (CL) “Save Configuration information to FD (used in old DKC)” and select (CL) [OK] in the [DKC Replacement] window.



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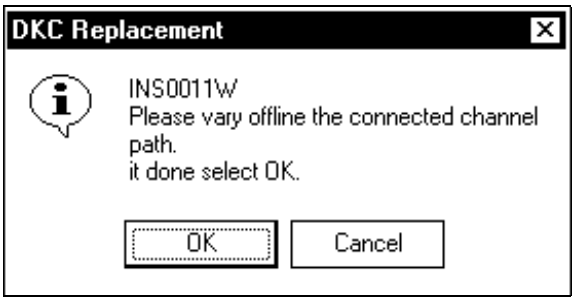
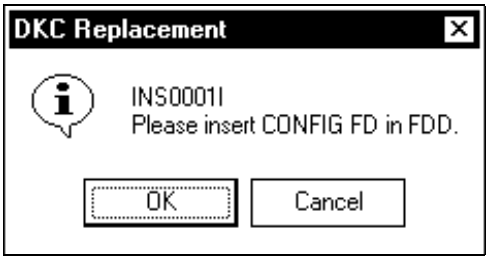
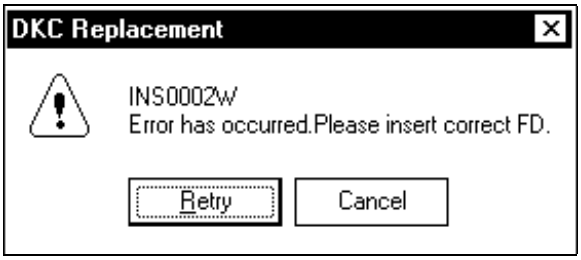
(5) Please vary connected channel paths offline.
After you have done this operation, select(CL) [OK].



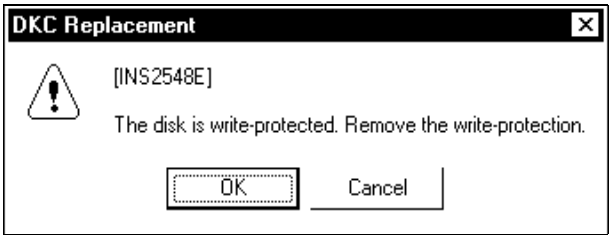
(6) Insert CONFIG FD in FDD.
Then select(CL) [OK].



<Error case>
Insert correct FD.
Then select(CL) [Retry].



<Error case>
Remove the write-protection.
Then select(CL) [OK].



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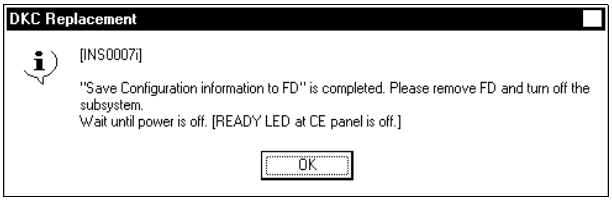
(7) “Checking Subsystem...” is displayed.

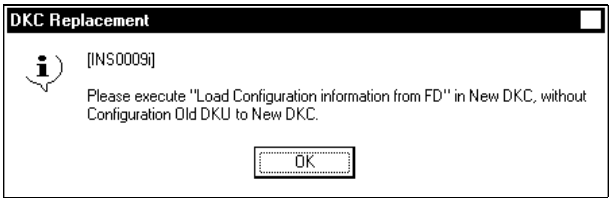
(8) “Reading the subsystem configuration data...”is displayed.

<Error case>
“Communication error has occurred.”
“Operation is rejected by DKC.”

(9) Remove FD and turn off the subsystem.
Wait until power is off.
Then select(CL) [OK].



(10) Select(CL) [OK].
Note: Do not connect the old DKU to the new DKC.



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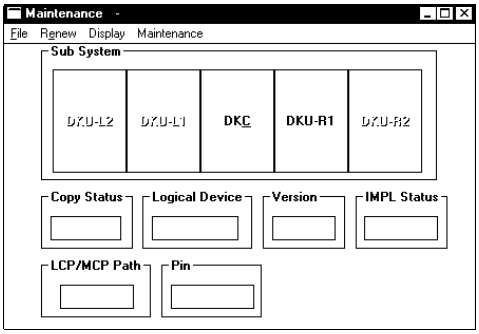
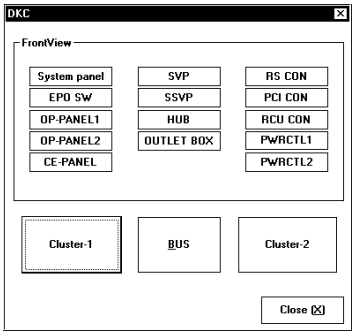
10 Procedure of Micro-program replacement to SVP

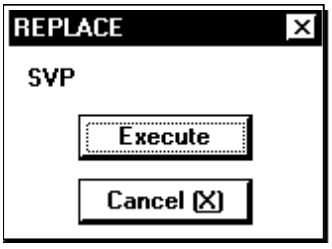
(1) <Maintenance window>
'Maintenance' window is displayed by 'Modify Mode'.
In the 'Maintenance' window, check and select (CL) [DKC] to be replaced.



(2) <Select [SVP] >
Select (CL) part [SVP] to be replaced from 'DKC'.

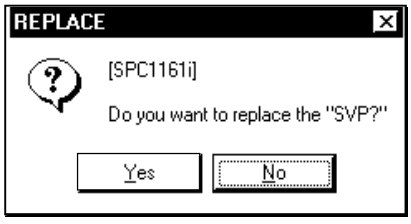


(3) <Execute>
Select (CL) [Execute].



NOTICE
When the screen prompting an operator to input a password in order to prevent a multiple maintenance, contact the technical support center to ask for an instruction.

(4) <Check beginning of [SVP] Replacement>
Select (CL) [Yes] in response to "Do you want to replace the "SVP? "".



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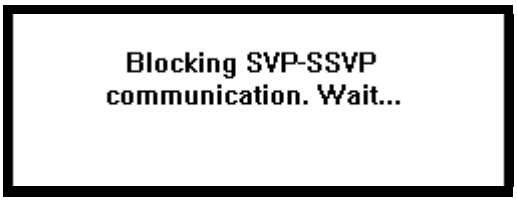
(5) <Check the starting of [SVP] Replacement>
Select (CL) [OK] in response to the message shown on the right.

(6) The message “Blocking SVP-SSVP communication. Wait...” is displayed.



The message “Blocking DKC-SVP communication. Wait...” is displayed.

(7) The message “This will end SVP operation. Replace SVP after turning off.” is displayed. Select (CL) [OK], so SVP is turned off automatically.

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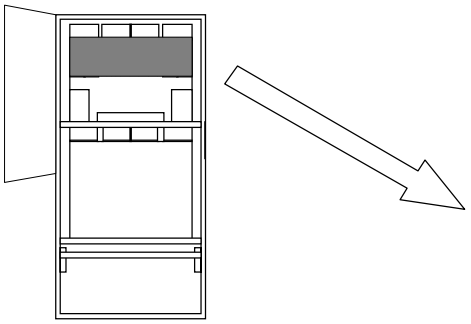
(8) <Disconnect the RS232C cable>

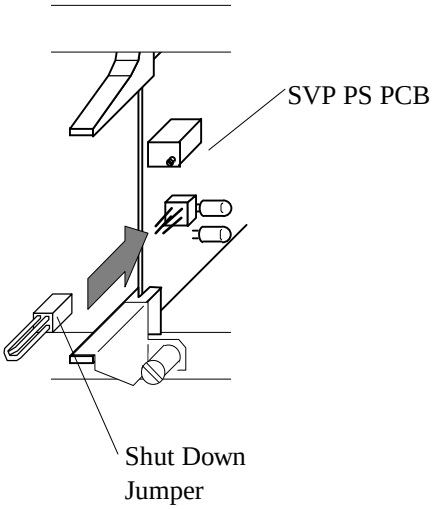
(8-1) Power Off SVP

① Insert the Shut Down Jumpers in SVPPS1 and SVPPS2.

② Wait for one minute.



Front View of DKC

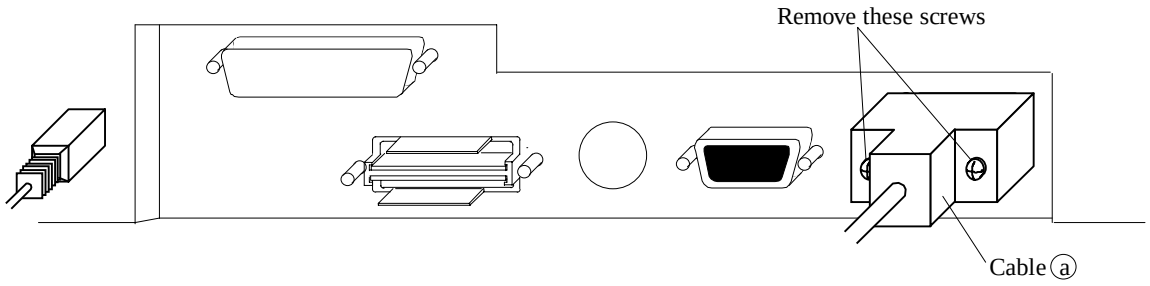


Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

(8-2) Disconnect the RS232C cable from the SVP

① Disconnect the ⓐ (RS232C cable) from the SVP



Rear View of SVP

(8-3) Remove the Shut Down Jumpers in SVPPS1 and SVPPS2.
(Power on SVP)

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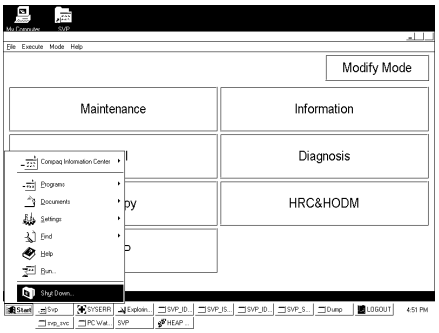
(9) <Restart the computer in MS-DOS mode>

(9-1) <Shut Down Windows>

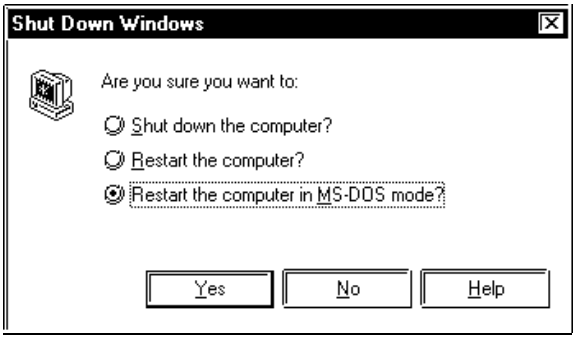
Select (CL) [Start].

Select (CL) [Shut Down].



(9-2) <Restart the computer in MS-DOS mode>

Select “Restart the computer in MS-DOS mode” from Shut Down Windows, and select (CL) [Yes] in response to “Are you sure you want to:”.



(10) <Installation of Micro-program>

NOTICE
Do not Micro-program replacement to SVP for 20 minutes after turning AC Power on.
The SSVP may power off and power on the SVP in order to recover.

① Insert the floppy disk of (1/24 or 1/31) into the FDD.
② Input “a:\setcopy.bat” in ‘DOS prompt’, and press the [Enter] key.
③ When the message “SET FD NO. (2/24 or 1/31)” is displayed, insert the floppy disk of (2/24 or 1/31) into the FDD and press the [Enter] Key.
④ Copy the remaining floppy disks ((3/24 or 3/31) through (24/24 or 31/31)) in succession in response to the displayed messages.
⑤ When the message “SET FD NO. (1/24 or 1/31)” is displayed, insert the floppy disk of (1/24 or 1/31) into the FDD and press the [Enter] key.
⑥ Remove the floppy disk of (1/24 or 1/31) from FDD.

(11) <Copy the SVP information to HD>

① Insert the floppy disk of (1/24 or 1/31) into the FDD.
② Input “a:\pcconf.bat” in ‘DOS prompt’ and press the [Enter] key.
③ The message “"pcconf" change START!!” is displayed, when the message “"pcconf" change END!!” is displayed, file copy, is complete.
④ Press the [Enter] key, and remove the floppy disk of (1/24 or 1/31) from the FDD.

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(12) <Reboot the SVP>

① Reboot the SVP by [Alt], [Ctrl], and [Del] keys simultaneously.

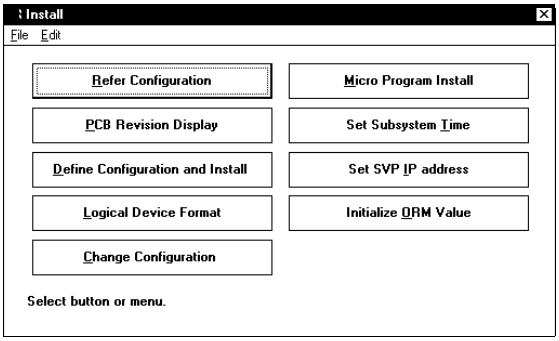
(13) <Set IP address of SVP>

(13-1) <Open [Install]>

Select (CL) [Install] from 'SVP'.

(13-2) <Select [Set Subsystem IP Address...]>

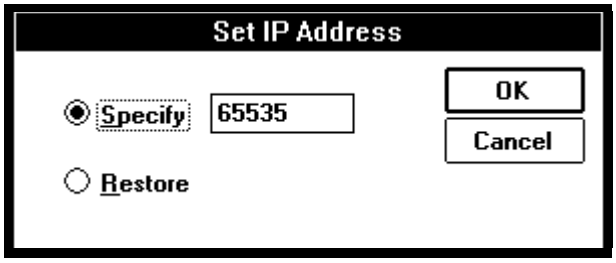
Select (CL) [Set Subsystem IP Address...] from 'Install'.



(13-3) <Set IP Address>

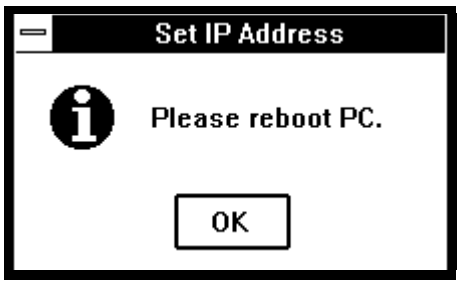
Select (CL) [Specify], Enter "Serial No.".

Select (CL) [OK].



(13-4) <Check SVP reboot>

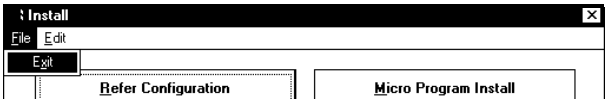
Select (CL) [OK].



(13-5) <Select [Exit]>

Select (CL) [File].

Select (CL) [Exit].



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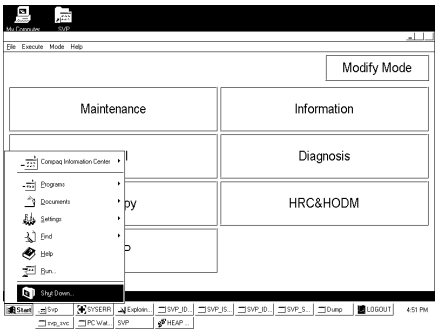
(14) <Reboot the SVP>

(14-1) <Shut Down Windows>

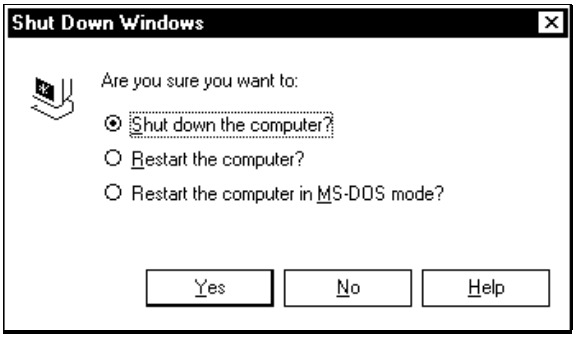
Select (CL) [Start].

Select (CL) [Shut Down].



(14-2) <Shut down the SVP>

Select (CL) “Shut down the computer?” from Shut Down Windows, and select (CL) [OK] in response to “Are you sure you want to:”.



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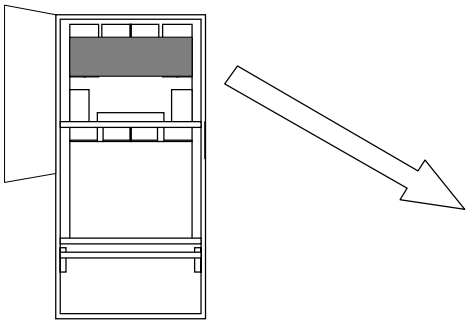
(15) <Connect the RS232C cable>

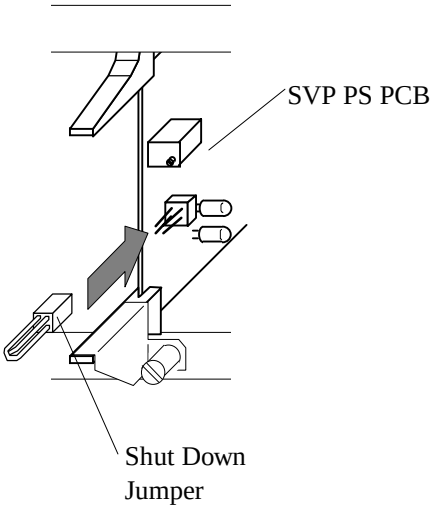
(15-1) Power Off SVP

① Insert the Shut Down Jumpers in SVPPS1 and SVPPS2.

② Wait for one minute.



Front View of DKC

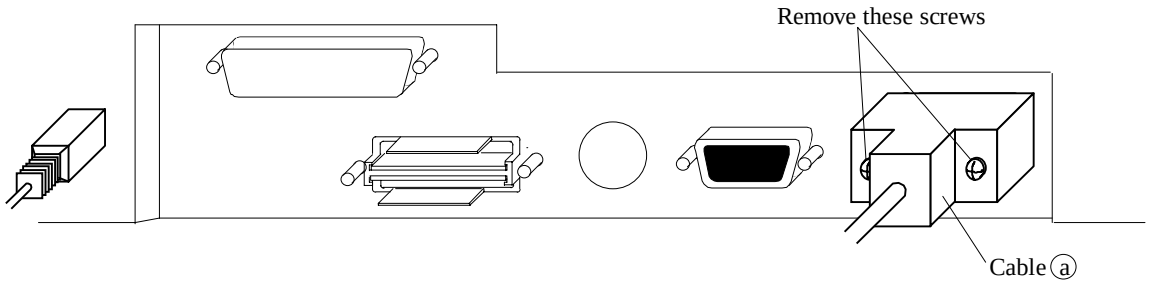


Front PS Box

N	L	KU	JU	HU	GU	F	E	D	C	B	A
MPS 10	MPS 11	SVP PS 1	BAT CTR 10	BAT CTR 11	BAT CTR 12	PWR CTR 1	SSVP	HUB	PWR CTR 2	MPS 20	MPS 21
		SVP PS 2	BAT CTR 20	BAT CTR 21	BAT CTR 22						
		KL	JL	HL	GL						

(15-2) Connect the RS232C cable from the SVP

① Connect the ⓐ (RS232C cable) from the SVP



Rear View of SVP

(15-3) Remove the Shut Down Jumpers in SVPPS1 and SVPPS2.
(Power on SVP)

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(16) <Load the Configuration from the SM to the SVP's HDD>

(16-1) <Open [Maintenance]>

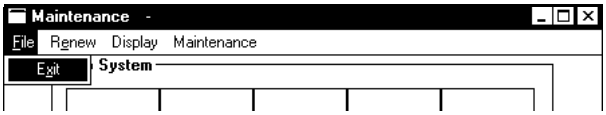
Wait a few minutes, message "Loading SVP Program... SVP requests to DKC can not be performed presently. Please wait..." will be extinguished.
Then select (CL) [Maintenance] form 'SVP'.

(16-2)

Check "Connection error occurred SVP-DKC." is not displayed.
If "Connection error occurred SVP-DKC" is displayed, see TRBL05-70.

(16-3) <Select [Exit]>

Select (CL) [File] from the "Maintenance".
Select (CL) [Exit].



(17) <SSVP Reset>

Press the "SSVP ALARM RESET" switch (see ㉚ on page LOCATION03-40).
Open the "Maintenance" window and wait until the initializing SSVP message ceases to be displayed (for about 15 minutes).

(18) <SIM Complete>

See SVP02-500.

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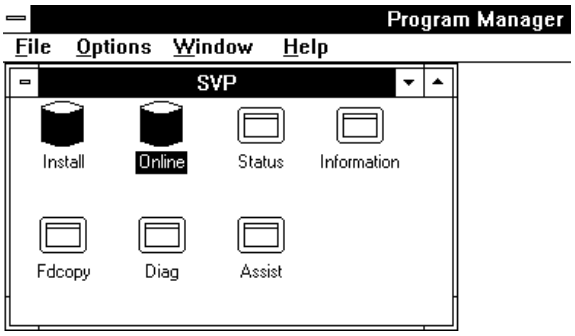
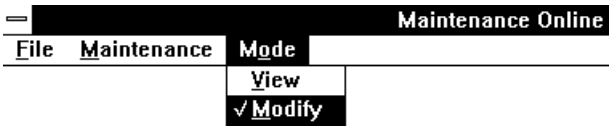
11 Procedure of checking System Option Mode (RAID200)

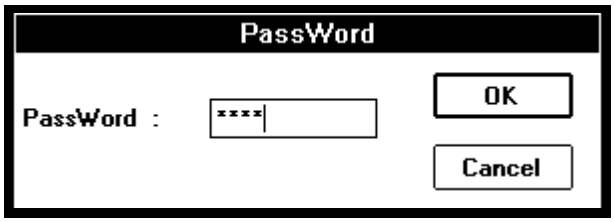
(1) Select (DC) the [Online] icon in the 'SVP' window.



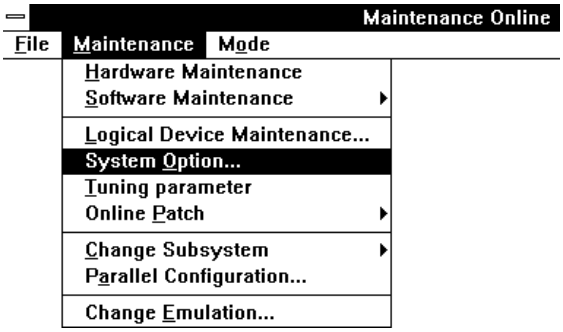
(2) Select (CL) the [Mode] menu in the 'Install' window and select (DR) [Modify].



(3) Put down the following keys at one to input in the password and. Select (CL) [OK].
"[CTL]", "[Shift]" and "[D]".



(4) Select (CL) the [Maintenance] menu in the 'Online' window and select (DR) [system Option].



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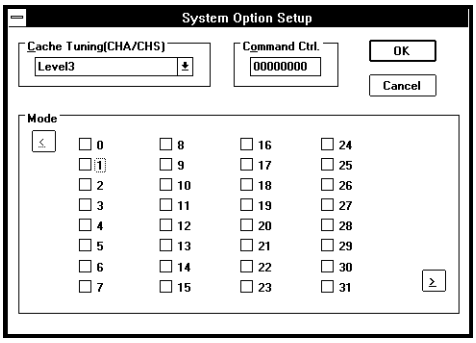
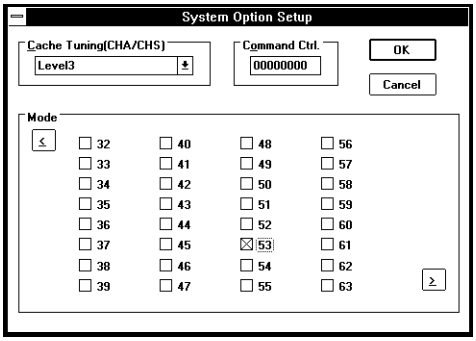
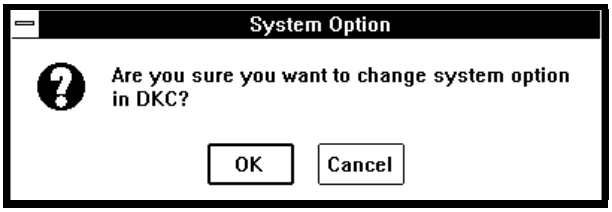
(5) Select (CL) [Up >].



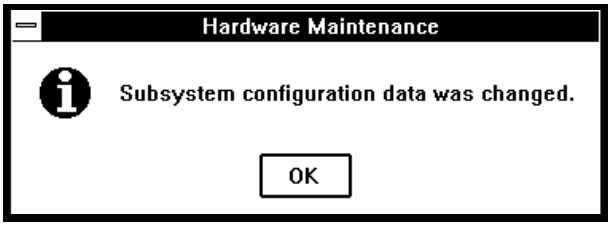
(6) Check whether the 'Mode 53' is being marked.
If 'mode 53' is being marked, remove the mark of 'mode 53', and select (CL) the [OK], to (7).
If 'mode 53' is not being marked, select (CL) the [Cancel], to (9).



(7) Select (CL) the [OK].



(8) System option setup finished after following the message is displayed with select (CL) the [OK].



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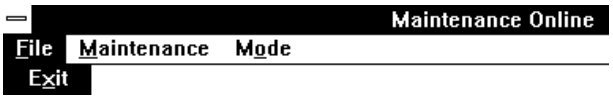
(9) Select (CL) the [File] menu in the ‘Online’ window and select (DR) [exit].
(Close Online window.)



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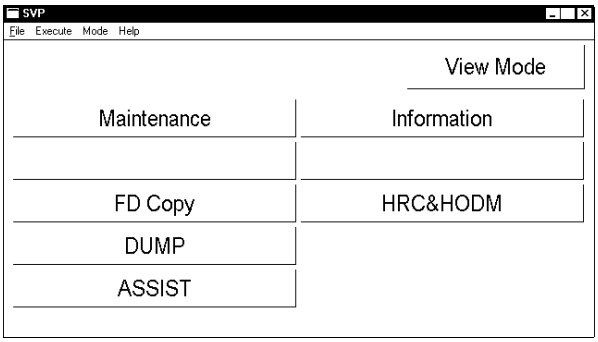
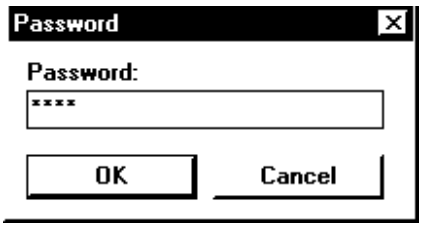
12 Procedure of setting System Option Mode (RAID300)

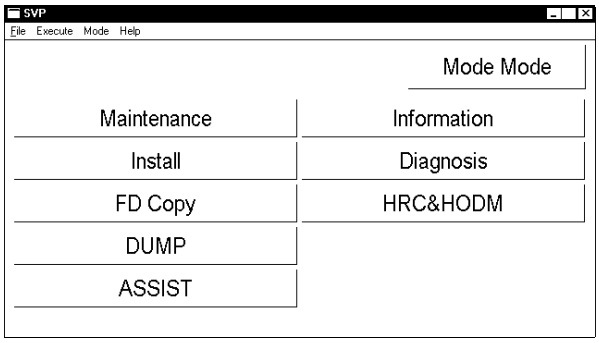
(1) Make it on the screen which shows SVP in the following.



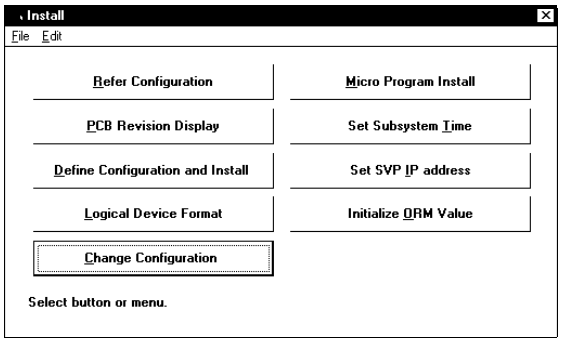
(2) Put down the following keys at one to input in the password and. Select (CL) [OK].
"[CTL]", "[Shift]" and "[D]".



(3) Select (CL) the [Install].



(4) Select (CL) the [Change Configuration].



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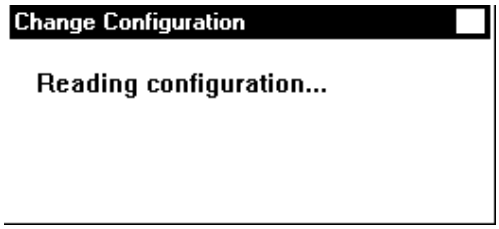
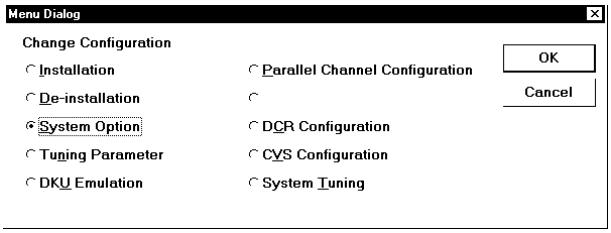
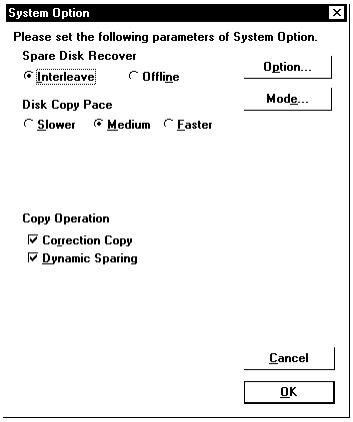
(5) “Reading configuration...” is displayed.



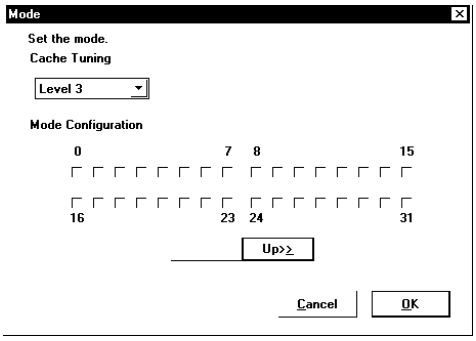
(6) Select (CL) the [System Option] and select (CL) [OK].



(7) Select (CL) the [Mode] and select (CL) [OK].



(8) Select (CL) the [Up>>].
the message is displayed with select (CL) the [OK].



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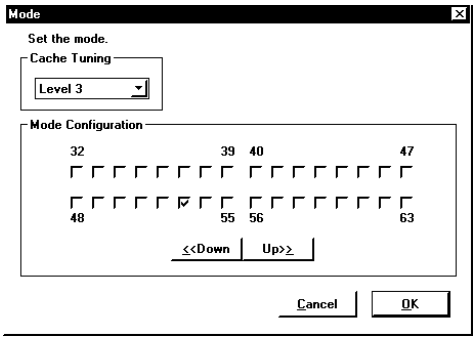
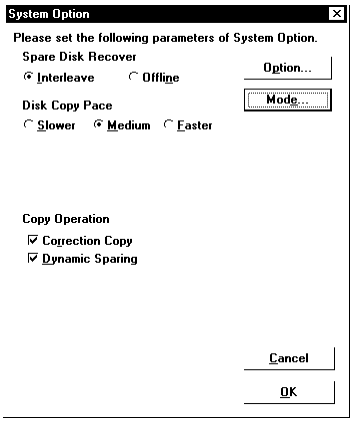
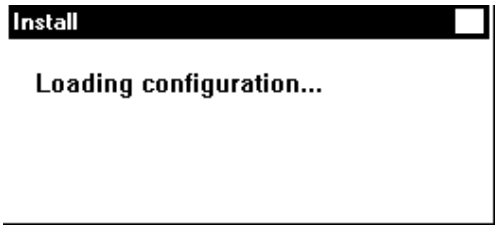
(9) Select (CL) the [Mode 53] and select (CL) [OK].



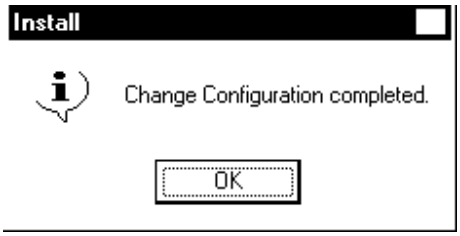
(10) Select (CL) [OK].



(11) “Loading configuration...” is displayed.



(12) “Change Configuration completed” is displayed.
Select (CL) [OK].



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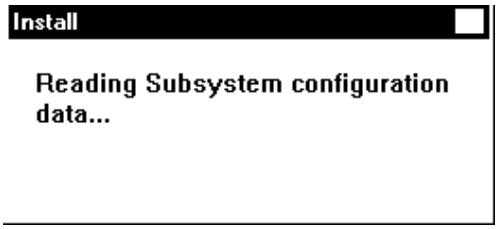
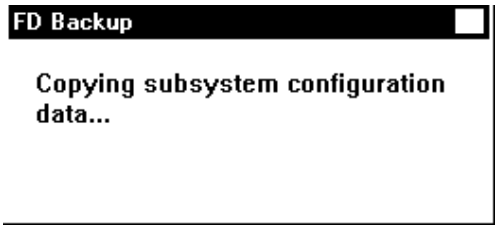
(13) “Reading Subsystem configuration data...” is displayed.

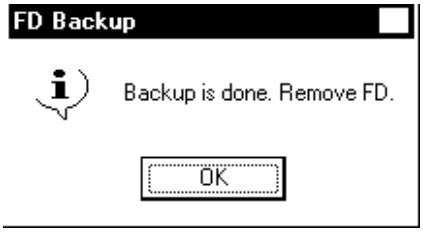


(14) “Please insert config FD in FDD.” is displayed.
Insert ‘RAID300 CONFIG FD’ in FDD, Select (CL) [OK].

(15) “Copying subsystem configuration data...” is displayed.



(16) “Backup is done, Remove FD.” is displayed.
Remove ‘RAID300 CONFIG FD’ from FDD,
Select (CL) [OK].



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(17) Check system Option (Mode 53).
Perform procedure (4) to (8).
Confirm that ‘Mode 53’ is being marked.
Select (CL) the [Cancel], Return to ‘System Option’ screen.
Select (CL) the [Cancel], Return to ‘Install’ screen.

(18) Close the ‘Install’ window, change view Mode.

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SSB SECTION

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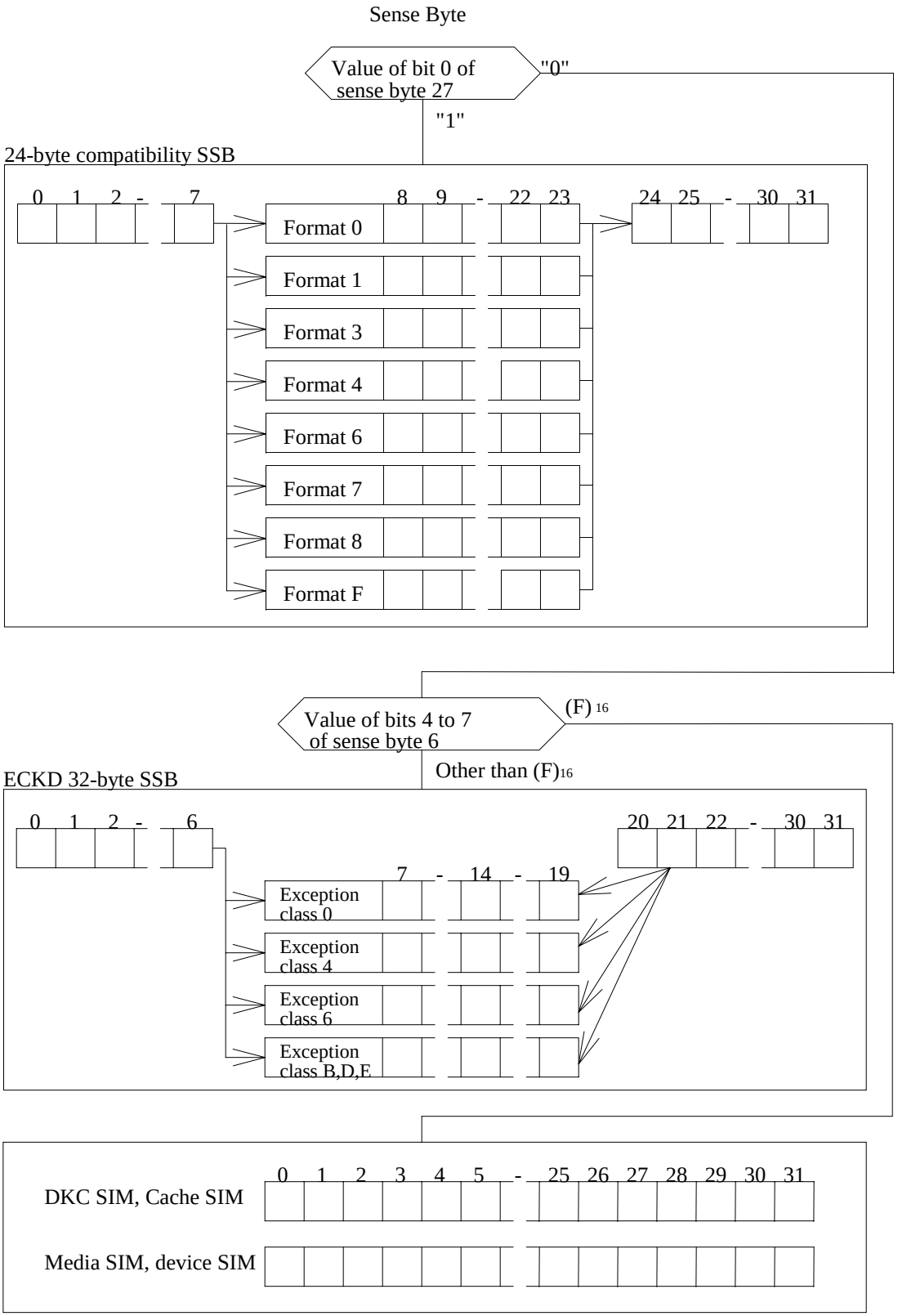
1. Sense Byte Analysis



(Note) This section is corresponding to host reported SSBs.
If you want to know about ssblog on SVP, you should see SSBLOG section.

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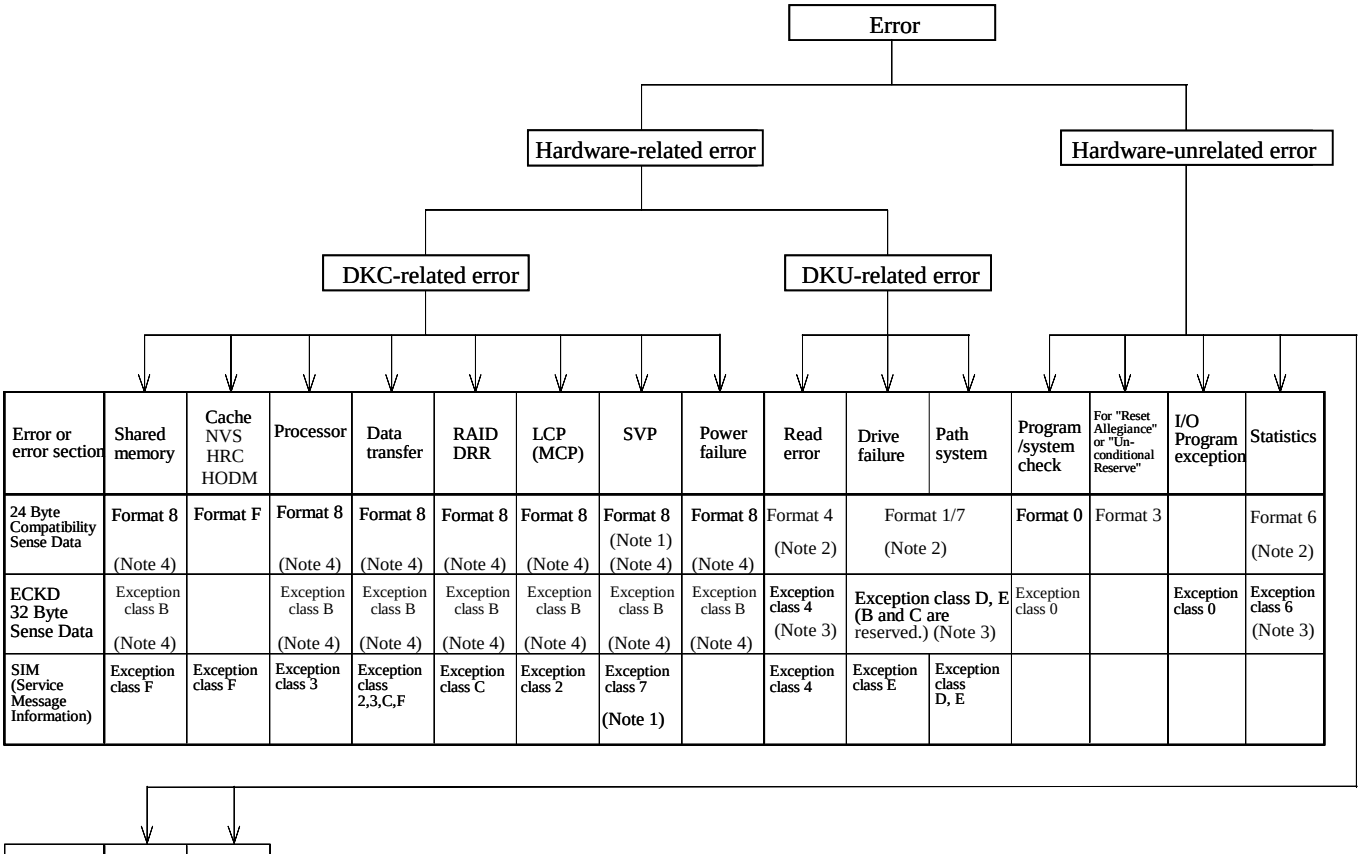
2. Procedure for Searching Sense Bytes, SIM Error Table and SSB Table

The following table shows the formats for trouble shooting in this disk.



Error or error section	Shared memory	Cache NVS HRC HODM	Processor	Data transfer	RAID DRR	LCP (MCP)	SVP	Power failure	Read error	Drive failure	Path system	Program /system check	For "Reset Allegiance" or "Un-conditional Reserve"	I/O Program exception	Statistics
24 Byte Compatibility Sense Data	Format 8 (Note 4)	Format F	Format 8 (Note 4)	Format 8 (Note 4)	Format 8 (Note 4)	Format 8 (Note 4)	Format 8 (Note 1) (Note 4)	Format 8 (Note 4)	Format 4 (Note 2)	Format 1/7 (Note 2)		Format 0	Format 3		Format 6 (Note 2)
ECKD 32 Byte Sense Data	Exception class B (Note 4)		Exception class B (Note 4)	Exception class B (Note 4)	Exception class B (Note 4)	Exception class B (Note 4)	Exception class B (Note 4)	Exception class B (Note 4)	Exception class 4 (Note 3)	Exception class D, E (B and C are reserved.) (Note 3)		Exception class 0		Exception class 0	Exception class 6 (Note 3)
SIM (Service Message Information)	Exception class F	Exception class F	Exception class 3	Exception class 2,3,C,F	Exception class C	Exception class 2	Exception class 7 (Note 1)		Exception class 4	Exception class E	Exception class D, E				

Error or error section	Logical inconsistency	Trace data/ Logdata
24 Byte Compatibility Sense Data	Format 8 (Note 4)	Format 9 (Note 1)
ECKD 32 Byte Sense Data	Exception class B (Note 4)	
SIM (Service Message Information)		

(Note 1) This error is not reported to host. (For SSB log)
(Note 2) For DKU86I (IBM 3380 emulation mode) only.
(Note 3) For DKU87I (IBM 3390 emulation mode) only.
(Note 4) These SSBs report to host with Exception-class B in 32 Byte SSB, when DKC-Type have configured 3990-6 (Enhance mode).

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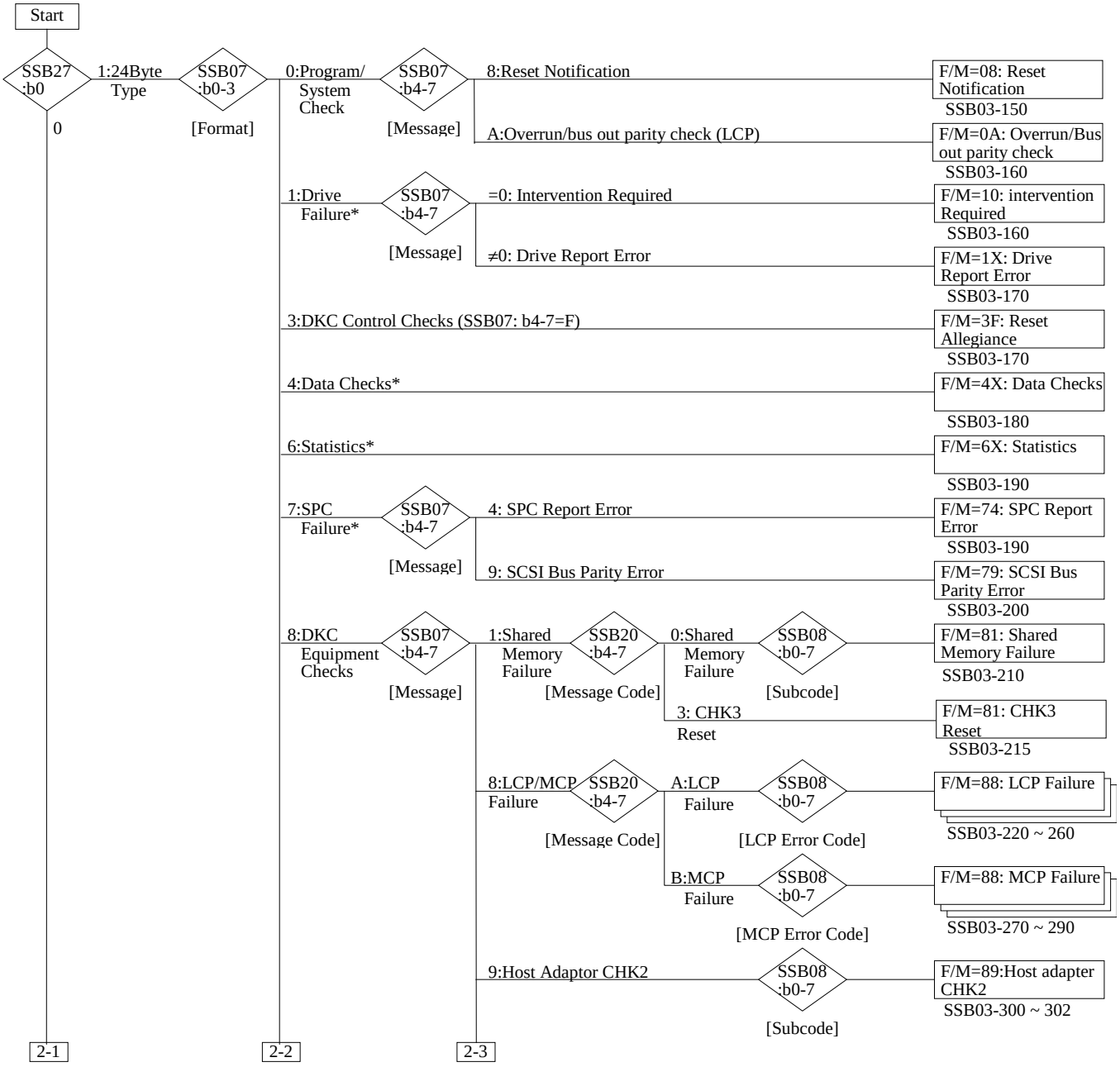

*: For DKU86I (IBM 3380 emulation mode) only.

Search method for SSB tables (1/5)

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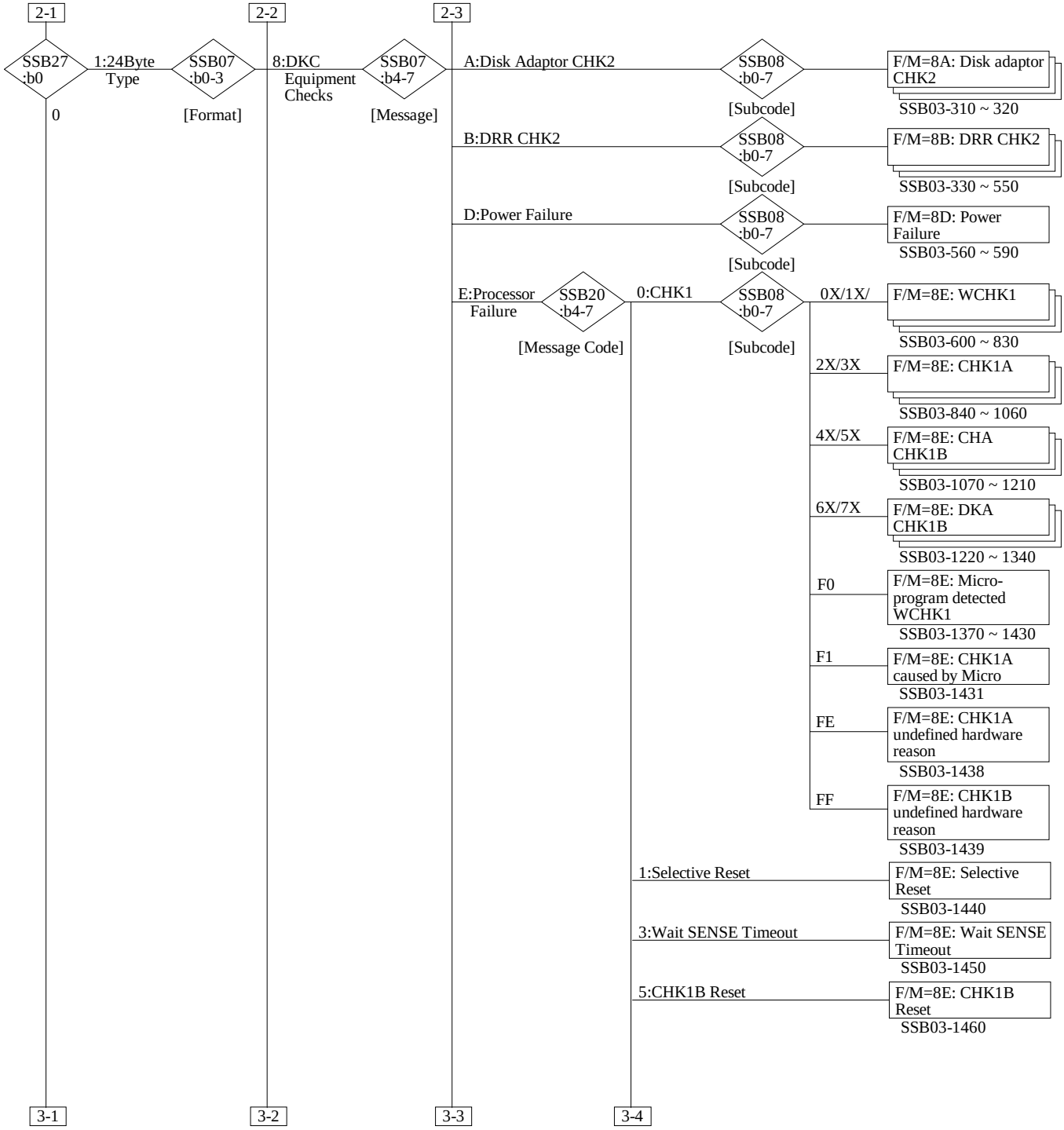

Search method for SSB tables (2/5)

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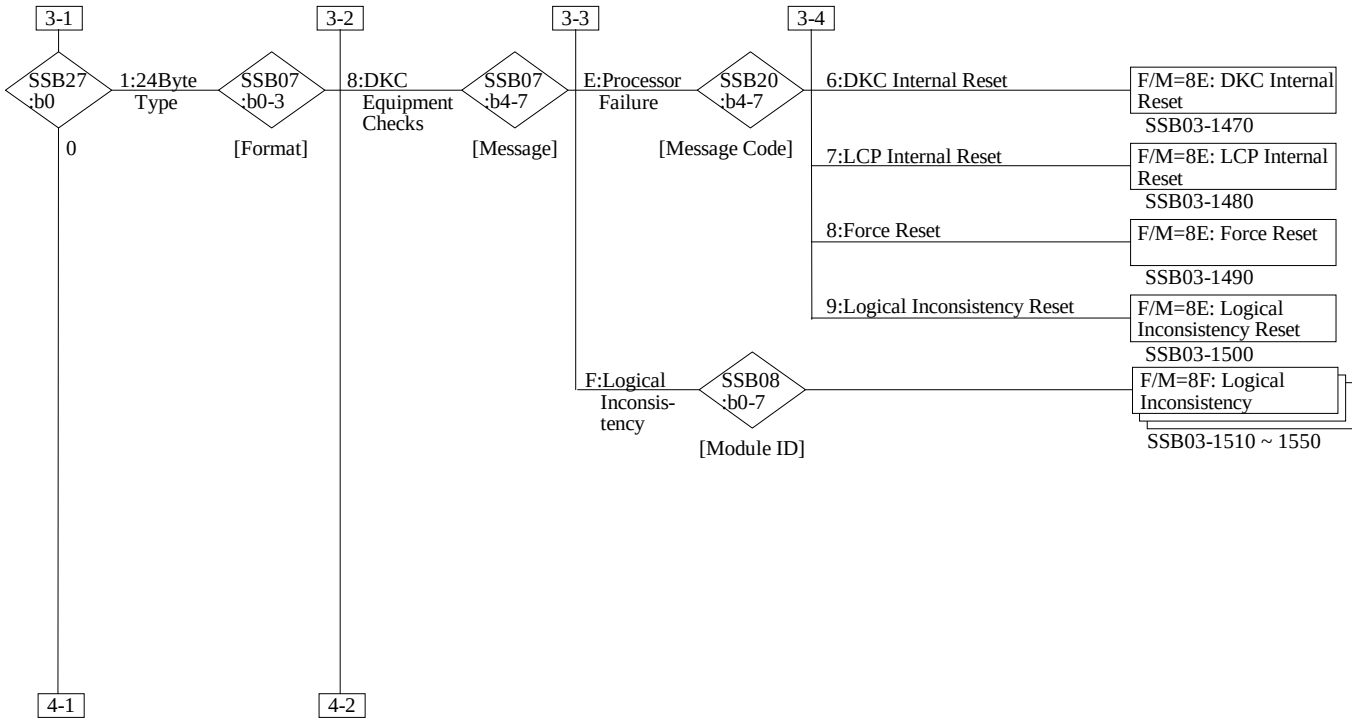

Search method for SSB tables (3/5)

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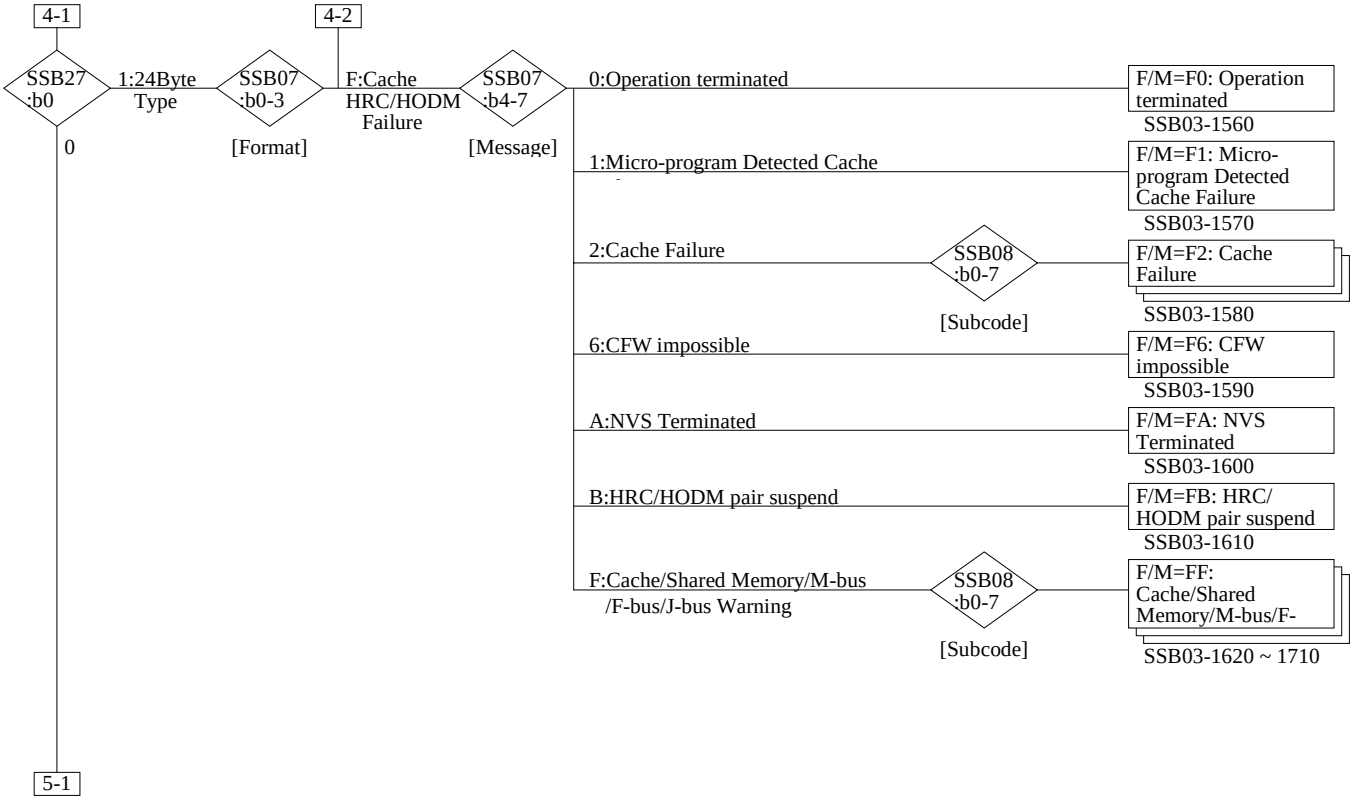

Search method for SSB tables (4/5)

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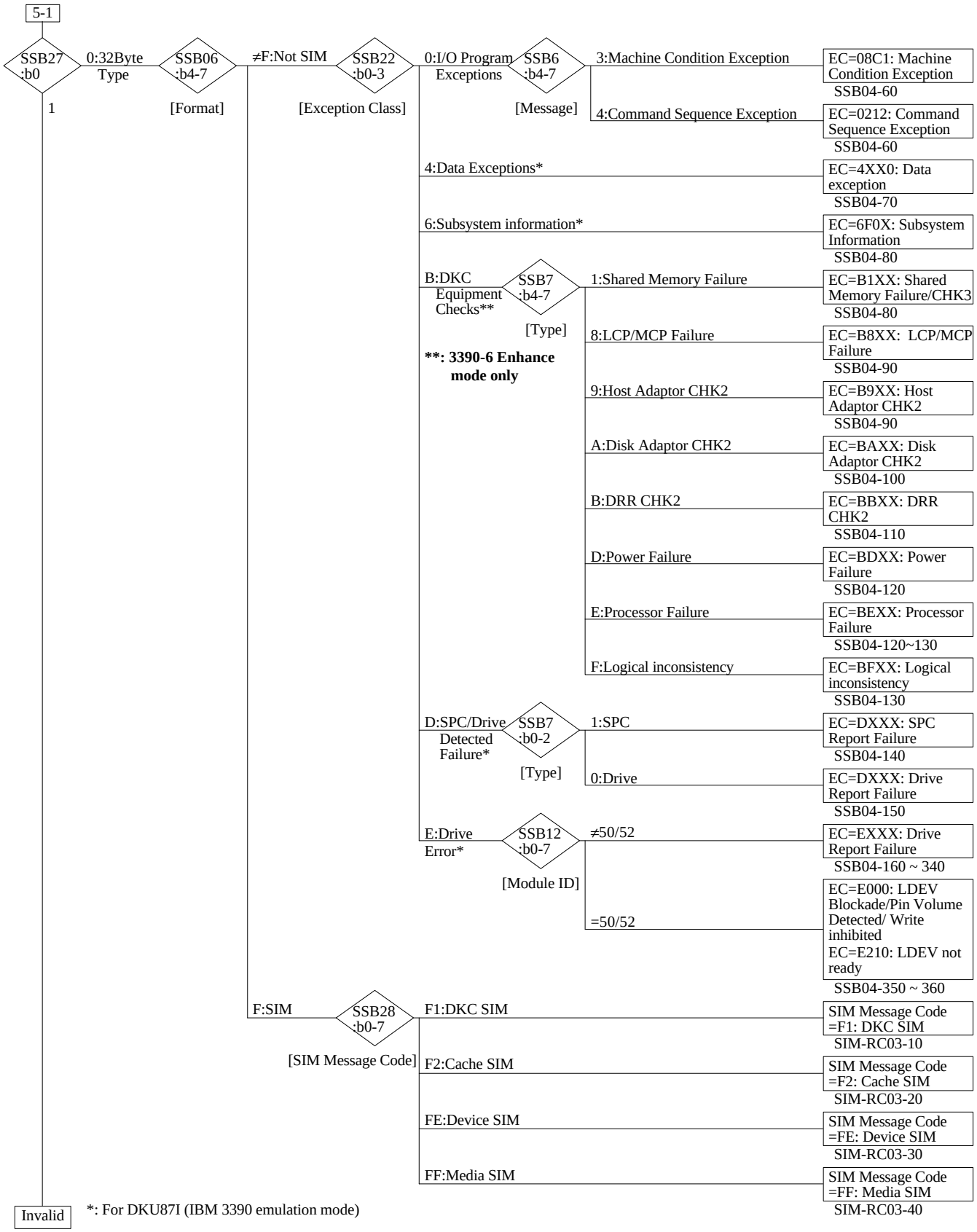

Search method for SSB tables (5/5)

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3. 24-BYTE COMPATIBILITY SSB

3.1 Basic Sense Bytes

Bit / Byte	24-Byte Compatibility Sense Data							
	0	1	2	3	4	5	6	7
0	Command reject	Intervention required	Busout parity check	Device check	Date check	Overrun	Not used	Incomplete domain
1	Permanent error	Invalid track format	End of cylinder	Operator message	No record found	File protection	Write inhibit	Imprecise ending
2	Request inhibit write	Correctable	First log mode error	Environmen-tal data present	Not used	Imprecise ending	Not used	
3	Controller ID, number of retries, number of records							
4	Device address							
5	Low cylinder address, overflow flag of command overruns							
6	Head address and high cylinder address, overflow flag of data overruns							
7	Format				Message			
8 to 23	Bytes 8 to 23: Depends on the format and message.							
24	Logging and message control							
25	Duplex pair error	Program action code						
26	Dual frame	EDCC mode	Duplex pair	Sub-volume error	Nonsynchro-nous operation	Serial channel	Not used	Permanent path error
27	24-byte SSB	Device address valid	Track address valid	Not used	DKU86I track compatible mode	Not used	Path number	
28	Not used							
29	Cylinder address							
30								
31	Head address							

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Byte	Bit	Name	Description
0	0	Command reject	1. Invalid command was received 2. The sequence of commands is invalid 3. The number of bytes sent by a CONTROL command is insufficient or the value is invalid 4. A WRITE command that violates the file mask and search conditions was received. 5. A WRITE command was received when the R/W switch was set to READ. (In this case, bit 6 of byte 1 (write inhibit) also becomes "1".) 6. The WRITE SPECIAL HA command does not permit a short byte. 7. An attempt to write an Rn record to a defective track was made. 8. No link is established for a defective or alternate track. 9. The command issued in the LOCATE domain does not match the operation specified by the LOCATE command. 10. The operation specified by the LOCATE command has violated the file mask. 11. An attempt was made to access an alternate track beyond the user cylinder during multi-track operation in the LOCATE domain. (File protected (bit 5 of byte 1) is set at the same time.) 12. The status of the cache/device does not meet the requirement of the SET SUB MD/PERF SUB FUNC command
	1	Intervention required	1. The addressed device is not READY. 2. The DKU is in the CE mode. 3. The addressed device is not physically connected
	2	Busout check	The data or command transferred from the channel has a parity error.
	3	Device check	A malfunction was detected in the subsystem. Details are indicated in Bytes 7 to 31.
	4	Data check	1. A correctable read error was detected in the data read from the device. (Bit 1 of byte 2 ("correctable") is set at the same time. The information for correction is indicated in sense bytes 15 to 23.) 2. An uncorrectable read error was detected in the data read from the device. 3. The end by the PCI fetch mode is indicated. Bit 1 of byte 2 ("correctable") is set at the same time and restart displacement is guaranteed. Error displacement and error pattern are 0.
	5	Overrun	1. A response to a data request or reconnection request could not be received within the predetermined time on the parallel channel. This error is reported with F/M=0A. 2. No response was made or an invalid frame was received when the serial channel was in a data transfer sequence; so, retry was impossible. 3. Command retry (overrun) was requested from the channel, but retry was impossible. This error is reported with F/M=0A. 4. Termination of overrun was requested from the channel. This error is reported with F/M=0A. Note: This bit is set on if ten overruns have occurred through command retry including the format write command. (Permanent error (bit 0 of byte 1) is not set.) If a data overrun has occurred with a WRITE command, data transfer is aborted immediately and (00H) is written till the end of that record.
	6	Not used	Always 0
	7	Incomplete domain	This bit is set if a short domain has been detected during a write in asynchronous transfer. Environmental data present (bit 3 of byte 2) is also set to '1'.
1	0	Permanent error	Command retry failed.

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Byte	Bit	Name	Description
1	1	Invalid track format	1. An index was encountered during a data write. (A data write beyond the track capacity was made.) 2. An index marker was detected in the key or data field when the READ or SEARCH command (except SCH ID) was handling a record. 3. An updating write was attempted for a record with a different size from the record size specified in TLF of the LOCATE command or the block length of the DEF EXT command. 4. The length of the data field of R0 was not 8 bytes during WRITE TRK operation.
	2	End of cylinder	An attempt was made to perform track switching from the last track of the logical cylinder by a READ or SEARCH command with multi-track specification. (End of cylinder is not reported in the LOCATE domain.)
	3	Message to operator	This bit is set to display an error to the operator.
	4	No record found	1. Two index markers were detected in the same command chain without intervention of a WRITE or SENSE command or a read operation that handles the HA or data field. 2. The target record searched for by a LOCATE command could not be detected. Imprecise ending (bit 7 of byte 1) is also set at the same time.
	5	File protected	1. A SEEK command has violated the file mask or extent range. 2. A READ or SEARCH command with multi-track specification has violated the file mask or extent range. 3. An attempt was made to access an alternate track beyond the user cylinder during multi-track operation in the LOCATE domain. (Command reject (bit 0 of byte 0) is also set at the same time.) 4. Multi-track operation was tried directly to an alternate track in the asynchronous mode. 5. The track set is out of the extent specified for WRITE ANY/READ ANY. 6. The LOCATE RECORD/LOCATE RECORD EXTENDED domain is out of extent.
	6	Write inhibit	1. A WRITE command was received when the R/W switch was set to READ. (Bit 0 of byte 0 (command rejection) also becomes “1”.) 2. Indicates that the write prohibition status has been established by the DIAG CTL command. (Bit 3 of byte 0 (device check) is also set at the same time.)
	7	Imprecise ending	Indicates that the error indicated in the sense byte is due to a command before the command that reported the unit check. (abnormal end in the LOCATE domain) Bit 5 of byte 2 is also set at the same time.
2	0	Request inhibit write	Requests issuance of a DIAG CTL command that instructs prohibition of a write through the path to avoid an error from which the path cannot recover. (At the same time, the faulty section is set in byte 25 “program action code”.)
	1	Correctable	Indicates that bit 4 of sense byte 0 (data check) can be corrected. Restart displacement, error displacement, and error pattern are indicated in bytes 15 to 23.
	2	First log mode error	The number of occurrences of seek/data errors exceeded the threshold. (Bit 3 of byte 2 (environmental data present) is also set at the same time.)
	3	Environmen-tal data present	Indicates that this SSB is not due to the current CCW chain but it is the statistics to be reported from the DKC to the host. The statistics include log information and reset notification.
	4	Not used	Always 0
	5	Imprecise ending	Same as bit 7 of byte 1
	6	Not used	Always 0
	7	Not used	Always 0

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<table>
<tr><th>Byte</th><th>Bit</th><th>Name</th><th>Description</th></tr>
<tr><td>3</td><td>0
|
7</td><td>Controller ID, number of retries, number of records</td><td>1. Controller ID (Format 1, 6, 7, 8, or F, without imprecise ending)
2. Number of retries (Format 4 or 5, without imprecise ending, and environmental data present = 1)
3. Number of remaining records or tracks in the LOCATE domain (when indeterminate end or file protection is 1)
4. Zero
(For other than 1 to 3 above)</td></tr>
<tr><td>4</td><td colspan="3"><table>
<tr><td>0</td><td>SP number 2^1</td></tr>
<tr><td>1</td><td>SP number 2^0</td></tr>
<tr><td>2</td><td>Controller number</td></tr>
<tr><td>3
|
7</td><td>DKU physical device number</td></tr>
</table></td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">0
|
7</td><td>Lower digits of cylinder address</td><td>Indicates the lower digits of the cylinder address of the seek address received from the last channel (2^7 to 2^0).</td></tr>
<tr><td>Overflow flag of command overruns</td><td>Set to x‘01’ when the command overrun threshold is exceeded.
(For format 6 only)</td></tr>
</table>

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Byte	Bit	Name	Description
6	0 | 3	Upper digits of cylinder address	(1) Indicates the upper digits of sense byte 5. Indicates the upper digits of the cylinder address of the last seek address received from the channel.
	4 | 7	Head address	(1) Indicates the head address of the last seek address received from the channel. This address is updated in multi-track operation.
	0 | 7	Overflow flag of data overruns	(2) Set to x'01' when the data overrun threshold is exceeded. (For format 6 only)
7	0 | 3	Format	The following indicate the meanings of sense bytes 8 to 23. 0000 Format 0 Program check or system check 0001 Format 1 Drive failure *1 0010 Format 2 DKC function check (Not used) 0011 Format 3 DKC control check 0100 Format 4 Data check without information for correction *1 0101 Format 5 Data check with information for correction (Not used) 0110 Format 6 Statistics *1 0111 Format 7 SPC Failure *1 1000 Format 8 Microprogram detected error or DKC/DKU failure 1001 Format 9 Microprogram detected error 1110 Format E Service information message (SIM) (Not used) 1111 Format F Cache system error
	4 | 7	Message	Indicates the determined characteristics of the error status for the above formats. Hexadecimal digits of 0 to F indicated in bits 4 to 7 correspond to 0 to F for messages.
24	0 -2	Logging message control	Reserved
	3		Logging mode
	4 | 5		Logging action (only '01' used) 00: Not logged 01: Unconditionally logged 10: Only the first record logged at retry 11: Only the first record logged upon occurrence of a permanent error
	6 | 7		Operator message control (only ë01í used) 00: No operator message 01: Message unconditionally output 10: Message output only for the first record at retry 11: Message output only for the first record upon occurrence of a permanent error.

*1: For DKU86I (IBM 3380 emulation mode) only.

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Byte	Bit	Name	Description
25	0	Program action code	Duplex pair volume error (Not used) Indicates the error on a duplex pair (neither pending nor suspended). This bit is set to 1 for device check or intervention request. F/M=1/7/8
	1-7		Instructs the method of error recovery. $(00)_{16}$: No action $(10)_{16}$: SIM (Not used) $(16)_{16}$: Reset notification $(17)_{16}$ or $(57)_{16}$: Device check with FMT=7/8 during write operation. Prohibits write to the controller if a permanent error has occurred on that path. $(18)_{16}$ or $(58)_{16}$: Device check during write operation. Prohibits write to the channel path if a permanent error has occurred on that path. $(19)_{16}$ or $(59)_{16}$: Device check during write operation. Prohibits write to the storage path if a permanent error has occurred on that path. $(70)_{16}$: The command was rejected because the condition specified in the specific blocking condition setting order of the PERF SUB FUNC command was met. $(71)_{16}$: Attention was reported from the interface placed in the specific blocking status by the PERF SUB FUNC command. $(1D)_{16}$:The subsystem or device is in the State Change Pending status (statistics send (bit 3 of byte 2) = 1, F/M = F0).
26	0	Configuration information	Dual-frame configuration 0: Single-frame configuration 1: Dual-frame configuration
	1		EDCC mode 0: DCC 1: EDCC
	2		Duplex pair indication (Not used) 0: Simplex 1: Duplex pair
	3		Sub-volume error indication (Not used) 0: Not a sub-volume error 1: Sub-volume error
	4		Nonsynchronous operation 0: Synchronous operation 1: Nonsynchronous operation
	5		Serial channel 0: Parallel channel 1: Serial channel
	6		Not used
	7		Permanent path error 0: Permanent error for all paths 1: Permanent error for this path

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Byte	Bit	Name	Description
27	0	Configuration information	24-byte SSB indication 0: Indicates 32-byte SSB. 1: Indicates 24-byte SSB.
	1		Device address valid 0: Device address in byte 4 is invalid. 1: Device address in byte 4 is valid.
	2		Track address valid 0: Track address in bytes 29 to 31 is invalid. 1: Track address in bytes 29 to 31 is valid.
	3		Not used
	4		DKU86I track compatible mode 0: Not in DKU86I track compatible mode 1: In DKU86I track compatible mode or changing to DKU86I track compatible mode
	5		Not used
	6-7		Fence path (1) Fence path: When operator message (bit 3 of byte 1) = 1 and F/M = 03 (2) SSB creation path: For other than the above
28	0 | 7	Message code	F/M=4X, MT0=1: Sub-retry succeeded (‘01’) F/M=F4, MT0=1: Cache stopped (‘04’) F/M=F7, MT0=1: Invalid track format (‘07’) F/M=FA, MT0=1: NVS stopped (‘0A’) F/M=FB, MT0=1: Suspend duplex (‘0B’)

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Byte	Bit	Name	Description
29	0 | 3	Cylinder address	Not used
	4		Cylinder 2048
	5		Cylinder 1024
	6		Cylinder 512
	7		Cylinder 256
30	0		Cylinder 128
	1		Cylinder 64
	2		Cylinder 32
	3		Cylinder 16
	4		Cylinder 8
	5		Cylinder 4
	6		Cylinder 2
	7		Cylinder 1
31	0 | 3	Head address	Not used
	4		Head 8
	5		Head 4
	6		Head 2
	7		Head 1

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3.2 Formats and messages

(1/2)

Format	Message	Description	
0		Operator message (bit 3 of byte 1) = 0	Operator message (bit 3 of byte 1) = 1
	0	No message	Not used
	1	Invalid command	Log mode end (Not used)
	2	Invalid sequence	Not used
	3	Data count is fewer than the specified number.	Device was fenced. (Not used)
	4	Data value differs from the specified number.	Not used
	5	The file mask allows neither RD SP HA nor WR SP HA.	
	6	The channel isolated the retry.	
	7	The channel sent an incorrect retry command.	
	8	System reset was received (reset notification).	
	9	Not used	
	A	Overrun/bus out parity check (LCP)	
	B	Improper instruction for a defective track or alternate track	
	C	Not used	
	D	ECM software error (Not used)	
	E	Invalid command for sub-volume (Not used)	
	F	Invalid status (reason code in byte 8)	
1	0	Intervention required	For DKU86I only
	1	Not used	
	2	Drive not ready	
	3	Not used	
	4	Drive report error	
	5-F	Not used	
3	0-E	Not used	
	F	Reset allegiance	
4	0	Data check in HA field	For DKU86I only
	1	Data check in C field	
	2	Data check in K field	
	3	Data check in D field	
	4	Not used	
	5	PA error	
	6-F	Not used	
6	0-7	Statistics	
	8~F	Not used	
7	0-3	Not used	
	4	SPC report error	
	5-8	Not used	
	9	SCSI bus parity error	
	A-F	Not used	

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(2/2)

Format	Message	Description
8	0	Reserved
	1	Shared memory failure
	2	Not used
	3-7	Reserved
	8	LCP failure/MCP failure
	9	Host adapter CHK-2
	A	Disk adapter CHK-2
	B	DRR failure
	C	Reserved (for SSB log)
	D	Power failure
	E	Processor failure
	F	Microprogram detected error (Logical inconsistency)
9	0-E	Reserved
	F	Microprogram datected error (Trace data/Log data) (For SSB log)
F	0	Operation terminated
	1	Microprogram detected cache failure
	2	Cache failure
	3	Reserved
	4	Not used
	5	Reserved
	6	CFW impossible
	7	Invalid track format (Does not occur with RAID200.)
	8-9	Reserved
	A	NVS terminated
	B	HRC/HODM Pair suspend
	C-E	Reserved
	F	Cache/Shared memory/M-bus/F-bus/J-bus warning

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3.3 Details of Sense Bytes

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Format 0, Message ≠ 8/A (Program or system check)

	0	1	2	3	4	5	6	7
7	Format (x'0')				Message(x'X' : x ≠ 8, A)			
8	Reason code when F/M = 0F Command code when F/M ≠ 0F							
9	Error detail information (Note 1)							
10								
11								
12								
13	SSID of mate subsystem (x'0000' for EDCC)							
14								
15	Manufacturer code ('000000')						Factory code ('00')	
16	Module ID							
17	Routine ID							
18	Processor No. CHA (0-7) DKA (8-F)				Error detail information (Note 2)			
19								
20	SSID of self subsystem							
21								
22	Symptom code (x'0F0X' : X = message code) (Note 3)							
23								

(Note 1)

(1) Issued command information when F/M=02

B\b	0	1	2	3	4	5	6	7
9	SCH ID	SCH KEY	Locate, LC EXT	SK, SK CYL	RD IPL	RECAL	SUSP MPR	RD C
10	DIAG CTL	DIAG CTL (LOC DOM)	DEF EXT	SET FM	SET SUB MODE	SP C	WR CKD	WR R0
11	SET INTF ID	DIAG CTL (PRE REM)	0	Other command	RD C chaining	All byte match	LC domain	Erase execute
12	Pseud through	0	0	Allow WR KD	Allow WR D	Allow WR CKD	Allow WR R0	Allow WR HA

(2) Short byte flag when F/M=03

x'0040 0000'

(3) Mask information when F/M=05

Byte 9 : Mask for write control
- x'00' : Allow all write operation except WR HA, WR R0.
- x'40' : Inhibit all write operation.
- x'80' : Allow update write operation.
- x'C0' : Allow all write operation.

Byte 10 : Mask for seek control
- x'00' : Allow all seek commands and RECAL.
- x'08' : Allow SK CYL and SK HD only.
- x'10' : Allow SK HD only.
- x'18' : Inhibit all seek command and multi operation.

Byte 11 : Mask for access
- x'00' : Allow normal access.
- x'02' : Allow device support.
- x'04' : Allow diagnostic access.
- x '06' : Allow device support inhibit data check correction and retry.

Byte 12 : Not used

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(4) Record address when other F/M
Byte 9 and 10 : Cylinder address
Byte 11 : Head address
Byte 12 : Record number

(Note 2) Bit 4-7 of byte 18 : Type of byte 19
x‘08’ : Byte 19 is cylinder address (high).
x‘09’ : Byte 19 is cylinder address (low).
x‘0A’ : Byte 19 is head address (high).
x‘0B’ : Byte 19 is head address (low).
x‘0C’ : Byte 19 is record number.
Byte 19 : One byte of CCHHR.

(Note 3) x‘2F00’ for dummy SENSE

Reason code list for Format 0, Message F (1/2)

Code	Reason
00	No messages
01	An attempt was made to make a cache usable but the cache was in the pending status.
02	Not used
03	An attempt was made to forcibly make a cache unusable but he cache was not holding destage completion.
04	An attempt was made to activate a CFW but the CFW was in the ending status.
05	An attempt was made to perform caching for a device but a cache was in the pending status.
06	An attempt was made to destage a track but an NVS was in the failed status.
07	An attempt was made to make an NVS unusable but the NVS was being initialized.
08	An attempt was made to halt or discarded caching/DFW for a device but the DFW of the device was in the ailed status.
09	An attempt was made to forcibly halt a DFW of a device but the device was not in the following status. • The DFW was in the pending status. • The DFW was in the failed status. • An NVS was failed. The data was in the NVS but not in the cache.
0A	An attempt was made to make an NVS usable but a DFW of a device was in the pending or failed status.
0B	An attempt was made to make an NVS usable but the NVS was in the pending status.
0C	An attempt was made to halt caching/DFW of a device when an NVS was failed but the data of the device was in the NVS but not in the cache.
0D	An NVS was requested by a command but the NVS was unusable.
0E	A cache was requested by a command but the cache was unusable.
0F	Not used
10-24	Not used
25	(TPF,RC) A SSM command (subcommand: Make Cache Unavailable to Subsystem) was received while a cache storage initialization procedure was underway.
26-27	Not used
28	(TPF,RC) A PSF command (Order: Prepare for Read Subsystem Data, Suborder: X‘05’) was received when cache was not available or pending.
29	The PSF command of specific blocking status setting order was issued from an interface having no path group.
2A	An attempt was made to make a path group having parallel and serial channels intermixed.
2B	A message buffer is full.
2C-2F	Not used

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Reason code list for Format 0, Message F (2/2)

Code	Reason
30	(TPF,RC) The cache partition indicated by PSF command (Order: Prepare for Read Subsystem Data) was not initialized.
31-34	Not used
35	SET GUARANTEED PATH sub-command was issued to a path in a fence.
36-39	Not used
3A	(TPF,RC) Read or Search or Write commands were received while 3380 Track Compatibility Mode.
3B-3E	Not used
3F	An attempt was made to execute the MAKE NVS AVAIL FOR SUB sub-command but the NVS was disabled because the 'enable/disable NVS capability' has been set to 'disable' in a VPD.
40	Not used
41	An ordinary command was issued to a device being reserved for media maintenance.
42-7F	Not used
80	A specific command was issued on an interface which has been in the specific command blocking status by the SET SPECIAL INTERCEPT CONDITION order of the PSF command.
81	An attention was reported to an interface which has been in the specific command blocking status by the SET SPECIAL INTERCEPT CONDITION order of the PSF command.
82-8F	Not used
90	(TPF,RC) 1. A Locate Record Extended command was received on a 3990 that have ESCON channel capability. 2. A PSF command (one of these orders: Establish Duplex Pair, Terminate Duplex Pair, Suspend Duplex Pair, or Direct I/O to One Device of the Duplex Pair) was received. 3. A PSF command (Order: Prepare for Read Subsystem Data, Suborder: X'04') was received. 4. A PSF command (one of these orders: Prepare for Read Subsystem Data, Set Lock State, Purge Lock, Unlock, Connect, or Disconnect) was received in the case of MPLF feature was not installed.
91	(TPF,MPLF)Specified MPLP had not been initialized and the cache was not in an available status.
92	(TPF,RC) A SSS command was rejected because additional pinned data still existed.
93	(TPF,MPLF) A cache storage control command was received when Disconnect order was in progress for any MPLP.
94	(TPF,RC) Destage Modified Tracks order was received while a scan of the cache for modified data is underway, which was initiated from the receipt of a prior Destage Modified Tracks order.
95	(TPF,MPLF) The attention message buffer was full when the order which has the potential of generating attention interrupt was received.
96-FF	Not used

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Format 0, Message 8 (reset notification)

	0	1	2	3	4	5	6	7
7	Format (x‘0’)				Message (x‘8’)			
8	x‘00’							
9								
10								
11	Hardware level (Note)							
12								
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Module ID							
17	Routine ID							
18	Processor No.				Not used			
19	Not used							
20	SSID of self subsystem							
21								
22	Symptom code (x‘2FFF’)							
23								

(Note) Hardware level

Bit 0 : Hardware level

When the bit 0 = 0,

Bit 1: Not used
Bit 2-3: Reported storage path
Bit 4-5: Number of channels per cluster
00 : 4
01 : 8
10 : Not used
11 : Not used
Bit 6: NVS
0 : Not exist
1 : Exist
Bit 7: Not used
Bit 8-10: Cache size
000 : Non cache
001 : 256MB
010 : 512MB
011 : 768MB
100 : 1024MB
101 : 1280MB
110 : 1536MB
111 : Over 1536MB
Bit 11-13: Cluster hardware level
Bit 14-15: Cache/NVS hardware level

When the bit 0 = 1,

Bit 1: Not used
Bit 2-3: Failed storage path
Bit 4-7: Number of channels per cluster
0000 : Parallel channel = 4, serial channel = 0
0001 : Parallel channel = 8, serial channel = 0
0010 : Parallel channel = 4, serial channel = 2
0100 : Parallel channel = 4, serial channel = 4
0110 : Parallel channel = 0, serial channel = 2
1000 : Parallel channel = 0, serial channel = 4
1010 : Parallel channel = 0, serial channel = 8
1100 : Parallel channel = 0, serial channel = 6
Bit 8: Dual frame
0 : Dual frame
1 : Modular power
Bit 9-11: Cache size
000 : Non cache
001 : 256MB
010 : 512MB
011 : 768MB
100 : 1024MB
101 : 1280MB
110 : 1536MB
111 : Over 1536MB
Bit 12-13: Cluster hardware level
Bit 14-15: Cache/NVS hardware level

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Format 0, Message A (LCP & overrun, bus out parity check)

	0	1	2	3	4	5	6	7
7	Format (x‘0’)				Message (x‘A’)			
8	Command code							
9	Cylinder address							
10								
11	Head address							
12	Record No.							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Module ID							
17	Routine ID							
18	Processor No. CHA(0-7)				BBF OVER (XR4B)	PND OVER (XR4B)	STOP (XR49)	OVER (XR4A)
19	Not used							
20	SSID of self subsystem							
21								
22	Symptom code (x‘0F0A’)							
23								

Format 1, Message 0 (Intervention required)

	0	1	2	3	4	5	6	7
7	Format (x‘1’)				Message (x‘0’)			
8	Ready	Enable	SSB PEND	Not used (‘00000’)				
9	Not used							
10	M.M.RSV	PIN VOL	Not used (‘000000’)					
11	Host type	DKC type	Not used (‘00’)		DKU type			
12	Module ID							
13	Routine ID							
14	Command code							
15	Not used (x‘00’)							
16								
17								
18	Processor number				Not used (x‘0’)			
19	Not used (x‘00’)							
20	SSID of self subsystem							
21								
22	Symptom code (x‘9F10’)							
23								

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Format 1, Message X (Drive report error)

	0	1	2	3	4	5	6	7
7	Format (x‘1’)				Message (x‘2/4’)			
8	Additional sense code + Additional sense code qualifier (See EC = E SSB for detail)							
9								
10	SCSI Command code (See EC = E SSB for detail)							
11	Threshold type (See EC = E SSB for detail)							
12	Module ID							
13	Routine ID							
14	Not used (x‘0’)				DKA number			
15	CDEV number				RDEV number			
16	Type code (‘000’)			0	Sense key (See EC = E SSB for detail)			
17	Not used (x‘00’)							
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (x‘9F1X’ X : Message)							
23								

Format 3, Message F (reset allegiance)

	0	1	2	3	4	5	6	7
7	Format (x‘3’)				Message (x‘F’)			
8	Not used							
9	Activated LPN							
10	Device busy	ECI	Command chaining	Path reserve	Stack status	Wait sense	Long busy	Processor connect
11	Single path mode	Guarant path mode	MCB chaining	0	Block switch	0	0	0
12	Command code							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Specific information (module ID, routine ID)							
17								
18	Processor No. CHA (0 - 7) DKA (8 - F)				Not used			
19	Not used							
20	SSID of self subsystem							
21								
22	Symptom code (x‘3F3F’)							
23								

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Format 4, Message X (Data check)

	0	1	2	3	4	5	6	7
7	Format (x‘4’)				Message (x‘X’)			
8	Cylinder address							
9								
10	Head address							
11								
12	Record number							
13	Sector number							
14	Controller ID							
15	Not used (x‘00’)							
16								
17								
18	Processor number				Not used (x‘0’)			
19	Not used (x‘00’)							
20	Command code							
21	SSID of self subsystem (low order)							
22	Symptom code (x‘4XYY’ Note 1)							
23								

(Note 1) Symptom code

X : x‘0’ : Data check in HA field
x‘1’ : Data check in C field
x‘2’ : Data check in K field
x‘3’ : Data check in D field
x‘5’ : PA error

YY : x‘80’ : Correctable (Recovered)
x‘C0’ : Uncorrectable

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Format 6, Message X (Statistics)

	0	1	2	3	4	5	6	7
7	Format (x‘6’)				Message (x‘X’) (Note 1)			
8	Number of read or searched bytes							
9								
10								
11								
12	Seek count							
13								
14	Not used (x‘00’)							
15	Manufacture code (‘000000’)						Factory code (‘00’)	
16	Not used (x‘00’)							
17	DKC serial number							
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (x‘6FYX’) (Note 2)							
23								

(Note 1) X: When parallel channel connected, channel number.
When serial channel connected, LCP number in cluster.

(Note 2) Y: 0 : Statistics or RRBL command
1 : Channel data overrun
X : See note 1.

Format 7, Message 4 (SPC report error)

	0	1	2	3	4	5	6	7
7	Format (x‘7’)				Message (x‘4’)			
8	SPC interruption status register (See EC = D SSB for detail)							
9	SPC command step register (See EC = D SSB for detail)							
10	SCSI command code (See EC = D SSB for detail)							
11	Threshold type (See EC = D SSB for detail)							
12	Module ID							
13	Routine ID							
14	Not used (x‘0’)				DKA number			
15	CDEV number				RDEV number			
16	Type code (‘111’)			0	Not used (x‘0’)			
17	Not used (x‘00’)							
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (x‘DF74’)							
23								

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Format 7, Message 9 (SCSI bus parity error)

	0	1	2	3	4	5	6	7
7	Format (x‘7’)				Message (x‘9’)			
8	Additional sense code + Additional sense code qualifier (See EC = E SSB for detail)							
9								
10	SCSI command code (See EC = E SSB for detail)							
11	Threshold type							
12	Module ID							
13	Routine ID							
14	Not used (x‘0’)				DKA number			
15	CDEV number				RDEV number			
16	Type code (‘000’)			0	Sense Key (See (EC = E SSB for detail)			
17	Not used (x‘00’)							
18								
19								
20	SSID of self subsystem							
21								
22	Symptom code (x‘DF79’)							
23								

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Format 8, Message 1 (shared memory failure)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message(x‘1’)			
8	Micro error	M bus error	M bus ID	Arbiter error	Shared memory Side A error	Shared memory Side B error	SMP error	Other errors
9	MIC:TIM4L:8400 0334(b10-17)							
	MICTIM4L							
10	MIC:TIM4L:8400 0334(b20-27)							
	MICTIM4L							
11	MIC:TIM4L:8400 0334(b30-37)							
	MICTIM4L							
12	SMP:MSTERR:8200 07D4(b00-07)							
	H bus requester error	Shared memory reduction setting error	Bus mode setting error	PKID parity error	L bus requester error	Reserved	1st. read dats bus code errror	2nd. read data bus code error
13	SMP:MSTERR:8200 07D4(b10-17)							
	Read data compare error	1st. error phase bus code error	2nd. error phase bus code error	Error phase warning	Error phase ANYERR	ML bus check error Side A	MH bus check error Side A	Master timeout
14	SMP:MSTERR:8200 07D4(b20-27)							
	ML bus check error Side B	MH bus check error Side B	always 0	SMP internal failure	always 0	ML bus open was detected	MH bus open was detected	ML bus SYNC ERR
15	SMP:MSTERR:8200 07D4(b30-37)							
	MH bus SYNC ERR	always 0	always 0	Lock micro error	Burst micro error	Bus error	always 0	Hot line access error
16								
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
17								
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
18	Not used							
19	Not used							
20	PCB No.				Message code: x‘0’			
21	SSID (low order)							
22	Symptom code (x’FF81’ : LDEV type = 6587)							
23	(x’EF81’ : LDEV type = 6586)							

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Format 8, Message 1 (CHK3 Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Related failure internal SSB log No. (Error procedure aid)							
9								
10	Not used (x‘00’)							
11								
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No. (reset)							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘3’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF81’:LDEV type=DKU87I / x‘EF81’:LDEV type=DKU86I)							
23								

(Note) Indicates the ‘CHK3 Reset’.

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Format 8, Message 8 (LCP failure) (Note)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	LCP error message (x‘01’: LCP CHK-2/adapter interface error)							
9	LCP error code							
10								
11	XR4B(H)							
	BBF OVERRUN	PND OVERRUN	0	0	0	0	0	0
12	XR4B(L)							
	LRCA ERR	LRCB ERR	BBFP PER	BBIP PER	BBOP PER	PND CK2	CNT PER	REQ CNT OVERRUN
13	XR3E(H)							
	RBFA APER	RBFB APER	RBFC APER	RBF WRDER	MBFA APER	MBFB APER	MBFC APER	MBF WRDER
14	XR3E(L)							
	FRM RCTPE	CMP DPER	XFR CHRPER	XFR SEQPER	M-CNT PER	H-CNT PER	0	0
15	XR55(H)							
	BUSPE PA	LRCER PA	REQ ER A	ADTDT ER A	0	0	0	0
16	XR55(L)							
	BUSPE PB	LRCER PB	REQ ER B	ADTDT ER B	0	0	0	0
17								
	Control flag	0	0	STOP (XR49:bit15)	CK2 DTX (XR4A:bit0)	CK2 LIN (XR4A:bit1)	IFERA (XR51:bit12)	IFERB (XR51:bit13)
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘A’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note): Indicates LCP failure when SSB7 = 88 and SSB20:b4-7 = A.

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Format 8, Message 8 (LCP failure) (Note)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	LCP error message (x‘02’: Link reception error)							
9	LCP error code							
10								
11	XR36(H)							
	L-SIG ERR0	L-SIG ERR1	CONN ERR0	CONN ERR1	CONN ERR2	0	0	0
12	XR37(H)							
	CONN ERR3	L-SIG ERR	CODE VIORA	SEQ ERR	CRC ERR	ABORT ERR	PROT ERR0	PROT ERR1
13	XR37(L)							
	PROT ERR2	PROT ERR3	PROT ERR4	PROT ERR5	PROT ERR6	PROT ERR7	PROT ERR8	PROT ERR9
14	XR33(H)							
	C-SOF ERR	P-SOF ERR	D-EOF ERR	P-EOF ERR	L-SIG ERR	CODE VIOLA	SEQ ERR	CRC ERR
15	XR33(L)							
	0	0	0	R-CNT 0	R-CNT 1	R-CNT 2	R-CNT 3	R-CNT 4
16								
	0	0	STOP (XR49:bit15)	ABORT (XR32:bit11)	ER RCV1 (XR4A:bit3)	ER RCV2 (XR4A:bit4)	ER RCV3 (XR4A:bit5)	OTHER (XR51:bit6)
17	XR2A(L)							
	Field Information							
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘A’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note): Indicates LCP failure when SSB7 = 88 and SSB20:b4-7 = A.

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Format 8, Message 8 (LCP failure) (Note)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	LCP error message (x‘0C’: CHL data > DEV data at writing)							
9	LCP error code							
10								
11	Request count							
12								
13	Number of data received							
14								
15	Not used (x‘00’)							
16								
17								
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘A’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note): Indicates LCP failure when SSB7 = 88 and SSB20:b4-7 = A.

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Format 8, Message 8 (LCP failure) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	LCP error message (x‘0E’:Timeout)							
9 10	LCP error code							
11 12	Reason code (Note 2)							
13	XR49(H)							
	ESYCN	END	RDYOK	RDYRCV	0	CMDFRM	ACPRSP	DATAXF
14	XR49(L)							
	XFREND	DEVEND	CNTFLG	EOF	CMPEQ	CMPGT	0	STOP
15	XR51(H)							
	CAL PA	CAL PB	RDY	P BSY	CALL	SELTD	CHK1	DCK1
16	XR51(L)							
	BFBSY	ATTN	0	0	IFERA	IFERB	PA BSY	PB BSY
17	XR48(H)							
	RUN BSY	RUN TRS	RUN ADP	DAR REQ MOD	XFSTOP	CDFLG	CMPA	CMPB
18	Module ID							
19	Routine ID							
20	Processor No.				Message code:x‘A’ (Note 1)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note1): Indicates LCP failure when SSB7 = 88 and SSB20:b4-7 = A.

(Note2): Reason code

x‘FF01’ : (READ) Timeout at waiting for ACP CMD RSP
x‘FF02’ : (READ) Timeout at waiting for frame header
x‘FF03’ : (READ) Timeout at waiting for data frame
x‘FF04’ : (READ) Timeout at waiting for end of data transfer
x‘FF05’ : (READ) Timeout at waiting for data frame
x‘FF06’ : (READ) Timeout at waiting for end of data transfer
x‘FF07’ : (READ) Timeout at waiting for command frame
x‘FF08’ : (READ) Timeout at waiting for DATA REQ
x‘FF09’ : (READ) Timeout at waiting for status
x‘FFF1’ : (WRITE) Timeout at waiting for ACP CMD RSP
x‘FFF2’ : (WRITE) Timeout at waiting for first data
x‘FFF3’ : (WRITE) Timeout at waiting for frame header
x‘FFF4’ : (WRITE) Timeout at waiting for frame header
x‘FFF5’ : (WRITE) Timeout at waiting for frame header
x‘FFF6’ : (WRITE) Timeout at waiting for command frame
x‘FFF7’ : (WRITE) Timeout at waiting for frame header
x‘FFF8’ : (WRITE) Timeout at waiting for end of data transfer
x‘FFF9’ : (WRITE) Timeout at waiting for status

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Format 8, Message 8 (LCP failure) (Note1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	LCP error message (except x‘01’/x‘02’/x‘0C’/x‘0E’) (Note2)							
9	LCP error code							
10								
11	Not used							
12								
13								
14								
15								
16								
17								
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘A’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note1): Indicates LCP failure when SSB7 = 88 and SSB20:b4-7 = A.

(Note2): LCP error message

x‘00’ : No message
x‘08’ : Transmission error
x‘09’ : Protocol error
x‘0D’ : Retry abort

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Format 8, Message 8 (MCP failure) (Note)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	MCP error message (x‘01’: MCP CHK-2/adapter interface error/bus-out parity error)							
9	MCP error code							
10								
11	XRBS(H)							
	XFR END	CHK2	ADP ER	BO PER	CHL OVERRUN	TRUNCA-TION	HALT I/O	FCE END
12	XRBS(L)							
	ABEND	CHL END	DEV END	0	0	0	0	0
13	XRCK20(H)							
	MOD ERR	CAER	BSI0ER	BSI1ER	MBFAAPER	MBFCAPER	MBFWDPER	0
14	XRCK20(L)							
	SPCPER	CHCPER	PNDCPER	PNDOV-RUN	CBIDER	BSI0PER	BSI1PER	0
15	XRCK21(H)							
	BBFIPER	LRCAER	LRCBER	BBIPPER	BBOPPER	TGOPER	CBOBPER	FLGMPER
16	XRCK21(L)							
	CBOBLER	TAGSEQER	PLSWER	PLSDER	0	0	0	0
17	XRIFER							
	BUSPE0	LRCER0	SEQER0	ADPER0	BUSPE1	LRCER1	SEQER1	ADPDER1
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘B’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note): Indicates MCP failure when SSB7 = 88 and SSB20:b4-7 = B

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Format 8, Message 8 (MCP failure) (Note)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	MCP error message (x‘0E’: MCP timeout)							
9	MCP error code							
10								
11	Cause code (H)							
12	Cause code (L)							
13	XRBS(H)							
	XFR END	CHK2	ADP ER	BO PER	CHL OVERRUN	TRUNCA-TION	HALT I/O	FCE END
14	XRBS(L)							
	ABEND	CHL END	DEV END	0	0	0	0	0
15	XRASTS(H)							
	CALP0	CALP1	RDY	PBSY	CALL	SELTD	CHK1	DCK1
16	XRASTS(L)							
	BFBSY	ATTN	0	0	IFER0	IFER1	P0BSY	P1BSY
17	XRBC0(H)							
	ENBL CHL	EXEC CHL	0	INC MODE	CHMODE0	CHMODE1	0	0
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘B’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note): Indicates MCP failure when SSB7 = 88 and SSB20:b4-7 = B.

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Format 8, Message 8 (MCP failure) (Note)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘8’)			
8	MCP error message (x‘80’: burst failed)							
9	MCP error code							
10								
11	Not used (x‘0000’)							
12								
13	Not used (x‘0000’)							
14								
15	Not used (x‘00’)							
16								
17								
18	Module ID							
19	Routine ID							
20	Processor No.				Message code: x‘B’ (Note)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘88’)							

(Note): Indicates MCP failure when SSB7 = 88 and SSB20:b4-7 = B.

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Format 8, Message 9 (Channel interface CHA CHK2)
(byte 8 ≠ x‘01’, x‘02’)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	Subcode (Note 1)							
9	SIP::XFS0							
	CHA transfer end	BSA0 retry request	BSA1 retry request	Packet flow count reg status	CHK2	EADP CHK2	CHA CHK2	BSA0 CHK2
10	SIP::XFS0							
	BSA1 CHK2	Truncation	Halt I/O	Search result DASD = CPU	Search result DASD > CPU	Search result DASD < CPU	RETRY	ABORT
11	SIP::SELP							
	Path A select	Path B select	Path C select	Path D select	Path E select	Path F select	Path G select	Path H select
12	SIP::XFC0							
	Validate data transfer circuit	Execute data transfer	Not used	Not used	CBF mode 0: 40 - 7F 1: 00 - 7F	CBF pointer increment inhibit	CACHE I/O register access	SSD mode 0: DKC200 1: SSD
13	SIP::XFC0							
	DATA PATH 0	DATA PATH 1	DATA PATH 2	DATA PATH 3	UNISYS mode	FBUS 0	FBUS 1	FBUS 2
14	QBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
15	QBSA::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
16	QBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
17	QBSA1::STATUS							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF89’:LDEV type = DKU87I / x‘EF89’:LDEV type = DKU86I)							
23								

(Note 1) Subcode Bit 1-3 : Detected LSI
(Bit 1 = 1 : BSA1 error , Bit 2 = 1 : BSA1 error , Bit 3 = 1 : SIP error)
Subcode Bit 4-6 : Error location
(Bit 4 = 1 : FBUS error , Bit 5 = 1 : Detection PCB error , Bit 6 = 1 : Micro setting error)

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Format 8, Message 9 (host adapter CHK-2 : Abnomal cache slot status 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	Subcode: x‘01’: Abnomal cache slot status 1 (Note 1)							
9	Slot status							
10								
11								
12								
13	Write in progress	Make GAP	Erase	Update HA/R0	Update bit map	Not used	Not used	Not used
14	Subblock number (for transfer ready response)							
15	Start subblock number (for update)							
16	End subblock number (for update)							
17	Not used							
18	Module ID (Note 1)							
19	Routine ID							
20	Processor No.				Message code (don’t care)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘89’)							

(Note 1) Module ID = x‘55’ : After synchronous destage, cache slot with dirty attribute has been detected.

Module ID ≠ x‘55’ : In internal seqrch or orientation process, incomplete subblock has been detected.

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Format 8, Message 9 (host adapter CHK-2 : Abnomal cache slot status 2

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	Subcode: x‘02’: Abnomal cache slot status 2 (Note 1)							
9	Slot status							
10								
11								
12								
13	Write in progress	Make GAP	Erase	Update HA/R0	Update bit map	Not used	Not used	Not used
14	Subblock number (for transfer ready response)							
15	Start subblock number (for update)							
16	End subblock number (for update)							
17	Not used							
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (don’t care)			
21	SSID (low order)							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘89’)							

(Note 1) Cache ECC/LRC error has been detected in read side.

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Format 8, Message A (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘A’)			
8	Subcode (Note 1)							
9	DSCA::FMD				FA			
	Segment mode	Not used	Not used	Not used	Free area format No.			
10	HMIC::RCVINT							
	Monitor bit for interrupt signal by SYSRST	Monitor bit for interrupt signal by SELRST	Monitor bit for interrupt signal by CHK1A	Monitor bit for interrupt signal by CHK1B	Monitor bit for interrupt signal by SMP	Monitor bit for interrupt signal by LAN/SI0	Monitor bit for interrupt signal by CHA/DRR	Monitor bit for interrupt signal by ADP/SCA0
11	HMIC::RCVINT							
	Not used	Monitor bit for interrupt signal by CHK3	Not used	Monitor bit for interruption signal by SCA1 to SCA5				
12	DSCA::INT							
	Data transfer end in SCA	SPC interrupt request	SCA error occurred	BSA0 error occurred	BSA1 error occurred	Not used	0	Not used
13	DSCA::SCK2							
	BSA data bus parity error	SPC data bus parity error	SCA data bus parity error	LA error or LRC error	SCA hardware error	SBUS I/F error	Error in micro setting	Not used
14	DSCA::CXM							
	0	Not used	Bus mode	Not used	Not used	Transfer mode	Not used	Not used
15	DSCA::DKUCHK2							
	Error detected by SCSI buffer	DKU I/F addr or data parity error detected by SCA	Not used	Not used	Not used	Not used	Not used	Not used
16	DSCA::XFC							
	Force stop DMA in xfer mode 1 (SPC → CACHE)	Force stop DMA in xfer mode 1 (CAXHE → SPC)	Force stop DMA in xfer mode 1 (SCB → CACHE)	Force stop DMA in xfer mode 1 (CACHE → SCB)	Force stop DMA in xfer mode 1 (SPC → SCB)	Force stop DMA in xfer mode 1 (SPC → CACHE)	0	Force stop at data error (xfer mode 1 and 2 only)
17	DSCA::XFC							
	Start DMA in xfer mode 1 (SPC → CACHE)	Start DMA in xfer mode 1 (CACHE → SPC)	Start DMA in xfer mode 1 (SCB → CACHE)	Start DMA in xfer mode 1 (CACHE → SCB)	Start DMA in xfer mode 1 (SPC → SCB)	Start DMA in xfer mode 1 (SPC → CACHE)	0	0
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8A’:LDEV type = DKU87I / x‘EF8A’:LDEV type = DKU86I)							
23								

(note 1) Meaning of subcode

bit 0 to 2 : Type of error (‘000’ ...data transfer, ‘001’ ...LED BUS, ‘111’ ...micro-program)
bit 3 : Access mode (‘0’ ...Cache write, ‘1’ ...Cache read)
bit 4 to 6 : Code designating the part to be replaced
bit 7 : SCA number

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Format 8, Message A (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘A’)			
8	Subcode (Note 1)							
9	DSCA::FMD				FA			
	Segment mode	Not used	Not used	Not used	Free area format No.			
10	HMIC::RCVINT							
	Monitor bit for interrupt signal by SYSRST	Monitor bit for interrupt signal by SELRST	Monitor bit for interrupt signal by CHK1A	Monitor bit for interrupt signal by CHK1B	Monitor bit for interrupt signal by SMP	Monitor bit for interrupt signal by LAN/SI0	Monitor bit for interrupt signal by CHA/DRR	Monitor bit for interrupt signal by ADP/SCA0
11	HMIC::RCVINT							
	Not used	Monitor bit for interrupt signal by CHK3	Not used	Monitor bit for interruption signal by SCA1 to SCA5				
12	DSCA::INT							
	Data transfer end in SCA	SPC interrupt request	SCA error occurred	BSA0 error occurred	BSA1 error occurred	Not used	0	Not used
13	DSCA::SCK2							
	BSA data bus parity error	SPC data bus parity error	SCA data bus parity error	LA error or LRC error	SCA hardware error	SBUS I/F error	Error in micro setting	Not used
14	DSCA::CXM							
	0	Not used	Bus mode	Not used	Not used	Transfer mode	Not used	Not used
15	DSCA::DKUCHK2							
	Error detected by SCSI buffer	DKU I/F addr or data parity error detected by SCA	Not used	Not used	Not used	Not used	Not used	Not used
16	DSCA::XFC2							
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
17	DSCA::XFC2							
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8A’:LDEV type = DKU87I / x‘EF8A’:LDEV type = DKU86I)							
23								

(note 1) Meaning of subcode

bit 0 to 2 : Type of error (‘000’ ...data transfer, ‘001’ ...LED BUS, ‘111’ ...micro-program)
bit 3 : Access mode (‘0’ ...Cache write, ‘1’ ...Cache read)
bit 4 to 6 : Code designating the part to be replaced
bit 7 : SCA number

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘14’ : DDRR DATA-CHK2)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Sequencer error (DRR →BUFF)	Sequencer error (BUFF →DRR)	Sequencer error (data transfer in BUFF)	Sequencer error (BUFF control)	Sequencer error (double side command)	Sequencer error (multiple packets transfer)	Sequencer error (data transfer in BSA:RD)	Sequencer error (data transfer in BSA:WR)
12	DDRR::ESTA1							
	Command ID parity error	Transfer command setting error	Total data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF write address counter parity error	BUFF read address counter parity error
13	DDRR::ESTA2							
	RD/WR ptr and SYNC0 counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grand ID parity error	Offset address parity error
14	DDRR::ESTA2							
	Offset addr overflow error	LRC data counter parity error	Side A command parity error	Side B command parity error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
15	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
16	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
17	DDRR::ESTA4							
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistic counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘15’ : DDRR CONTROL-CHK2)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Sequencer error (DRR →BUFF)	Sequencer error (BUFF →DRR)	Sequencer error (data transfer in BUFF)	Sequencer error (BUFF control)	Sequencer error (double side command)	Sequencer error (multiple packets transfer)	Sequencer error (data transfer in BSA:RD)	Sequencer error (data transfer in BSA:WR)
12	DDRR::ESTA1							
	Command ID parity error	Transfer command setting error	Total data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF write address counter parity error	BUFF read address counter parity error
13	DDRR::ESTA2							
	RD/WR ptr and SYNC0 counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grand ID parity error	Offset address parity error
14	DDRR::ESTA2							
	Offset addr overflow error	LRC data counter parity error	Side A command parity error	Side B command parity error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
15	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
16	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
17	DDRR::ESTA4							
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistic counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘16’ : DDRR DATA & CONTROL-CHK2)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Sequencer error (DRR →BUFF)	Sequencer error (BUFF →DRR)	Sequencer error (data transfer in BUFF)	Sequencer error (BUFF control)	Sequencer error (double side command)	Sequencer error (multiple packets transfer)	Sequencer error (data transfer in BSA:RD)	Sequencer error (data transfer in BSA:WR)
12	DDRR::ESTA1							
	Command ID parity error	Transfer command setting error	Total data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF write address counter parity error	BUFF read address counter parity error
13	DDRR::ESTA2							
	RD/WR ptr and SYNC0 counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grand ID parity error	Offset address parity error
14	DDRR::ESTA2							
	Offset addr overflow error	LRC data counter parity error	Side A command parity error	Side B command parity error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
15	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
16	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
17	DDRR::ESTA4							
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistic counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘17’ : DDRR NO FACTOR-CHK2)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Sequencer error (DRR →BUFF)	Sequencer error (BUFF →DRR)	Sequencer error (data transfer in BUFF)	Sequencer error (BUFF control)	Sequencer error (double side command)	Sequencer error (multiple packets transfer)	Sequencer error (data transfer in BSA:RD)	Sequencer error (data transfer in BSA:WR)
12	DDRR::ESTA1							
	Command ID parity error	Transfer command setting error	Total data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF write address counter parity error	BUFF read address counter parity error
13	DDRR::ESTA2							
	RD/WR ptr and SYNC0 counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grand ID parity error	Offset address parity error
14	DDRR::ESTA2							
	Offset addr overflow error	LRC data counter parity error	Side A command parity error	Side B command parity error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
15	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
16	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
17	DDRR::ESTA4							
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistic counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘24, 28’ : DBSA0 CHK2B/C)							
9	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
10	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
11	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
12	DBSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
13	DBSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
14	DBSA0::MASK							
	Mask CHK1B error output	Mask CHK2A error output	Mask CHK2B error output	Mask CHK2C error output	Mask CHK2D error output	Mask SEQ input when error	Mask BTL CLR	Not used
15	DBSA0::MASK							
	Mask LIVE INS input signal	FBUS timer EN	ABT timer EN	Arbitration count CNT EN	CUDG MODE Output at read Output data parity check EN	Mask arbiter requester halt function by LIVE INS	Mask CHK2D by LIVE INS	Mask DISABLE error output
16	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘25, 29’ : DBSA0 CHK2A/D)							
9	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
10	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
11	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
12	DBSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
13	DBSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
14	DBSA0::MASK							
	Mask CHK1B error output	Mask CHK2A error output	Mask CHK2B error output	Mask CHK2C error output	Mask CHK2D error output	Mask SEQ input when error	Mask BTL CLR	Not used
15	DBSA0::MASK							
	Mask LIVE INS input signal	FBUS timer EN	ABT timer EN	Arbitration count CNT EN	CUDG MODE Output at read Output data parity check EN	Mask arbiter requester halt function by LIVE INS	Mask CHK2D by LIVE INS	Mask DISABLE error output
16	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘44, 48’ : DBSA1 CHK2B/C)							
9	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
10	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
11	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
12	DBSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
13	DBSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
14	DBSA1::MASK							
	Mask CHK1B error output	Mask CHK2A error output	Mask CHK2B error output	Mask CHK2C error output	Mask CHK2D error output	Mask SEQ input when error	Mask BTL CLR	Not used
15	DBSA1::MASK							
	Mask LIVE INS input signal	FBUS timer EN	ABT timer EN	Arbitration count CNT EN	CUDG MODE Output at read Output data parity check EN	Mask arbiter requester halt function by LIVE INS	Mask CHK2D by LIVE INS	Mask DISABLE error output
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘45, 49’ : DBSA1 CHK2A/D)							
9	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
10	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
11	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
12	DBSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
13	DBSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
14	DBSA1::MASK							
	Mask CHK1B error output	Mask CHK2A error output	Mask CHK2B error output	Mask CHK2C error output	Mask CHK2D error output	Mask SEQ input when error	Mask BTL CLR	Not used
15	DBSA1::MASK							
	Mask LIVE INS input signal	FBUS timer EN	ABT timer EN	Arbitration count CNT EN	CUDG MODE Output at read Output data parity check EN	Mask arbiter requester halt function by LIVE INS	Mask CHK2D by LIVE INS	Mask DISABLE error output
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘64, 68’ : DBSA0 & DBSA1 CHK2B/C)							
9	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
10	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
11	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
12	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
13	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘65, 69’ : DBSA0 & DBSA1 CHK2A/D)							
9	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
10	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
11	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
12	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
13	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘34, 38’ : DDRR & DBSA0 CHK2B/C)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
12	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘35, 39’ : DDRR & DBSA0 CHK2B/C)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Data buffer (DN0) parity error	Data buffer (DM1) parity error	Data buffer (DN1) parity error	ECC generater Multiplier0 parity error	ECC generater Multiplier1 parity error	ECC generater Adder0 parity error
12	DDRR::ESTA2							
	ECC generater Adder1 parity error	ECC generater Adder2 parity error	ECC generater Adder3 parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘36, 3A’ : DDRR & DBSA0 CHK2A/D)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
12	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘37, 3B’ : DDRR & DBSA0 CHK2A/D)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Data buffer (DN0) parity error	Data buffer (DM1) parity error	Data buffer (DN1) parity error	ECC generater Multiplier0 parity error	ECC generater Multiplier1 parity error	ECC generater Adder0 parity error
12	DDRR::ESTA2							
	ECC generater Adder1 parity error	ECC generater Adder2 parity error	ECC generater Adder3 parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘54, 58’ : DDRR & DBSA1 CHK2B/C)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
12	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘55, 59’ : DDRR & DBSA1 CHK2B/C)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Data buffer (DN0) parity error	Data buffer (DM1) parity error	Data buffer (DN1) parity error	ECC generater Multiplier0 parity error	ECC generater Multiplier1 parity error	ECC generater Adder0 parity error
12	DDRR::ESTA2							
	ECC generater Adder1 parity error	ECC generater Adder2 parity error	ECC generater Adder3 parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘56, 5A’ : DDRR & DBSA1 CHK2A/D)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
12	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘57, 5B’ : DDRR & DBSA1 CHK2A/D)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Data buffer (DN0) parity error	Data buffer (DM1) parity error	Data buffer (DN1) parity error	ECC generater Multiplier0 parity error	ECC generater Multiplier1 parity error	ECC generater Adder0 parity error
12	DDRR::ESTA2							
	ECC generater Adder1 parity error	ECC generater Adder2 parity error	ECC generater Adder3 parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MY GRANT NO 0	MY GRANT NO 1	MY GRANT NO 2	MY GRANT NO 3	MY GRANT NO 8
16	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘74, 78’ : DDRR & DBSA0 & DBSA1 CHK2B/C)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
12	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
16	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘75, 79’ : DDRR & DBSA0 & DBSA1 CHK2B/C)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Command ID parity error	Transfer command setting error	Total data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF write address counter parity error	BUFF read address counter parity error
12	DDRR::ESTA2							
	RD/WR ptr and SYNC0 counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grand ID parity error	Offset address parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
16	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘76, 7A’ : DDRR & DBSA0 & DBSA1 CHK2A/D)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA3							
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generater Adder 2 parity error
12	DDRR::ESTA3							
	LA fixed part error	LA variable part error	LA parity error	Symdorome (ECC) error	Write data parity error	LRC error	LRC checker Multiplier parity error	LRC checker Adder parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
16	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
17	DBSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘77, 7B’ : DDRR & DBSA0 & DBSA1 CHK2A/D)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::ESTA1							
	Command ID parity error	Transfer command setting error	Total data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF write address counter parity error	BUFF read address counter parity error
12	DDRR::ESTA2							
	RD/WR ptr and SYNC0 counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grand ID parity error	Offset address parity error
13	DBSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
14	DBSA0::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
15	DBSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
16	DBSA1::STATUS1							
	Execution of CACHE RD	Execution of CACHE WR	Not used	Requester master EN	F BUS H valid signal	F BUS L valid signal	Transaction mode	Set F BUS OPEN
17	DBSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	Subcode (x‘04’ : Micro-program time-out)							
9	DDRR::STATS							
	Transfer end A	Not used	Command A Waiting/ Executing	Command A Data transferring	Transfer end B	Not used	Command B Waiting/ Executing	Command B Data transferring
10	DDRR::STATS							
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B occurred	Stop transfer forcibly	Pseudo error occurred
11	DDRR::CSABM0							
	Arbiter sequencer bit 00	Arbiter sequencer bit 01	Arbiter sequencer bit 02	Arbiter sequencer bit 03	Arbiter sequencer bit 04	Arbiter sequencer bit 05	Arbiter sequencer bit 06	Arbiter sequencer bit 07
12	DDRR::CSABM0							
	Arbiter sequencer bit 10	Arbiter sequencer bit 11	Arbiter sequencer bit 12	Arbiter sequencer bit 13	Arbiter sequencer bit 14	Arbiter sequencer bit 15	Arbiter sequencer bit 16	Arbiter sequencer bit 17
13	DDRR::CSCRM0							
	Cache read sequencer bit 00	Cache read sequencer bit 01	Cache read sequencer bit 02	Cache read sequencer bit 03	Cache read sequencer bit 04	Cache read sequencer bit 05	Cache read sequencer bit 06	Cache read sequencer bit 07
14	DDRR::CSCRM0							
	Cache read sequencer bit 10	Cache read sequencer bit 11	Cache read sequencer bit 12	Cache read sequencer bit 13	Cache read sequencer bit 14	Cache read sequencer bit 15	Not used	Not used
15	DDRR::CSCWM0							
	Cache write sequencer bit 00	Cache write sequencer bit 01	Cache write sequencer bit 02	Cache write sequencer bit 03	Cache write sequencer bit 04	Cache write sequencer bit 05	Cache write sequencer bit 06	Cache write sequencer bit 07
16	DDRR::SCSWM0							
	Cache write sequencer bit 08	Cache write sequencer bit 09	Cache write sequencer bit 10	Cache write sequencer bit 11	Not used	Not used	Not used	Not used
17	DDRR::RMODE8							
	Output address parity error	Input address parity error	WT control error	RD control error	AREG data parity error 0	AREG data parity error 1	AREG data parity error 2	AREG data parity error 3
18	Module ID							
19	Routine ID							
20	Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8B’:LDEV type = DKU87I / x‘EF8B’:LDEV type = DKU86I)							
23								

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Format 8, Message D (Power failure)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	Subcode: x‘01’ : CHA detected cluster 1 down. x‘02’ : CHA detected cluster 2 down. x‘0F’ : CHA detected cluster 1 or 2 down.*							
9	MIC::RCVINT							
	SYS RST interrupt	SEL RST interrupt	CHK1A interrupt	CHK1B interrupt	SMP interrupt	LAN/SIO interrupt	CHA/DRR interrupt	ADP/SCA0 interrupt
10	MIC::RCVINT							
	Not used	CHK3 interrupt	Not used	SCA1 interrupt	SCA2 interrupt	SCA3 interrupt	SCA4 interrupt	SCA5 interrupt
11	MIC::PSOFFOK							
	Not used	Not used	Not used	Not used	Not used	Power off requested	Reset LANC INT pending	Allow power off
12	MIC::CHK3STS							
	Not used	Not used	Not used	Not used	Not used	Not used	MIC ABT CHK3	SMP LSI CHK3
13	SMP::MSTERR							
	Requester error (M bus)	Shared memory reduction error	Bus mode setting error	Address byte 0 parity error	Address byte 1 parity error	Address byte 2 parity error	1st read data bus code error	2nd read data bus code error
14	SMP::MSTERR							
	Read data compare error	1st error phase bus code error	2nd error phase bus code error	Error phase warning	Error phase any error	F bus check error	M bus check error	Master timeout error
15	SMP::MSTERR							
	Master timer parity error	F bus ABT error	Address byte 3 parity error	SMP data parity error	Last data check error	F bus open detected	M bus open detected	Not used
16	RCHA::XFS0							
	CHA transfer end	BSA0 requests retry	BSA1 requests retry	Packet flow counter register status	CHK2	EADP CHK2	CHA CHK2	BSA0 CHK2
17	RCHA::XFS0							
	BSA1 CHK2	Truncation	Halt I/O	Search result DASD = CPU	Search result DASD > CPU	Search result DASD < CPU	MP requests BSA 0,1 retry	MP or CHA aborts BSA 0,1
18	Analysis execution flag x‘00FF’: executed x‘FF00’: not execute							
19								
20	Processor No.							
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8D’ : LDEV type = DKU87I/x‘EF8D’ : LDEV type = DKU86I)							
23								

* If cluster # is necessary, refer to the SSB reported from other MPs.

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Format 8, Message D (Power failure)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	Subcode: x‘11’ : DKA detected cluster 1 down. x‘12’ : DKA detected cluster 2 down. x‘1F’ : DKA detected cluster 1 or 2 down.*							
9	MIC::RCVINT							
	SYS RST interrupt	SEL RST interrupt	CHK1A interrupt	CHK1B interrupt	SMP interrupt	LAN/SIO interrupt	CHA/DRR interrupt	ADP/SCA0 interrupt
10	MIC::RCVINT							
	Not used	CHK3 interrupt	Not used	SCA1 interrupt	SCA2 interrupt	SCA3 interrupt	SCA4 interrupt	SCA5 interrupt
11	MIC::PSOFFOK							
	Not used	Not used	Not used	Not used	Not used	Power off requested	Reset LANC INT pending	Allow power off
12	MIC::CHK3STS							
	Not used	Not used	Not used	Not used	Not used	Not used	MIC ABT CHK3	SMP LSI CHK3
13	SMP::MSTERR							
	Requester error (M bus)	Shared memory reduction error	Bus mode setting error	Address byte 0 parity error	Address byte 1 parity error	Address byte 2 parity error	1st read data bus code error	2nd read data bus code error
14	SMP::MSTERR							
	Read data compare error	1st error phase bus code error	2nd error phase bus code error	Error phase warning	Error phase any error	F bus check error	M bus check error	Master timeout error
15	SMP::MSTERR							
	Master timer parity error	F bus ABT error	Address byte 3 parity error	SMP data parity error	Last data check error	F bus open detected	M bus open detected	Not used
16	BSA0::MONITOR0							
	Not used	Not used	Not used	Not used	Not used	Not used	Option flag 0	Option flag 1
17	BSA1::MONITOR1							
	Not used	Not used	Not used	Not used	Not used	Not used	Option flag 0	Option flag 1
18	Analysis execution flag x‘00FF’: executed x‘FF00’: not execute							
19								
20	Processor No.							
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8D’ : LDEV type = DKU87I/x‘EF8D’ : LDEV type = DKU86I)							
23								

* If cluster # is necessary, refer to the SSB reported from other MPs.

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Format 8, Message D (Power failure)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	Subcode: x‘80’: DKU/HDU Power Failure							
9	Failure detected PDEV							
	SPC Pass# (0 ~ 3)				SCSI id# (0 ~ x‘F’)			
10	PDEV Power Status (SPC Pass#0, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
11	PDEV Power Status (SPC Pass#0, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
12	PDEV Power Status (SPC Pass#1, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
13	PDEV Power Status (SPC Pass#1, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
14	PDEV Power Status (SPC Pass#2, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
15	PDEV Power Status (SPC Pass#2, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
16	PDEV Power Status (SPC Pass#3, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
17	PDEV Power Status (SPC Pass#3, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
18	Not used							
19								
20	Processor No.							
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8D’ : LDEV type = DKU87I/x‘EF8D’ : LDEV type = DKU86I)							
23								

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Format 8, Message D (Power failure)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	Subcode: x‘90’: DKU/HDU Power Failure							
9	Failure HDU (SPC Pass) before restore detected							
	0				Pass#3 Status	Pass#2 Status	Pass#1 Status	Pass#0 Status
10	PDEV Power Status (SPC Pass#0, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
11	PDEV Power Status (SPC Pass#0, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
12	PDEV Power Status (SPC Pass#1, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
13	PDEV Power Status (SPC Pass#1, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
14	PDEV Power Status (SPC Pass#2, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
15	PDEV Power Status (SPC Pass#2, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
16	PDEV Power Status (SPC Pass#3, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
17	PDEV Power Status (SPC Pass#3, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
18	Not used							
19								
20	Processor No.							
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8D’ : LDEV type = DKU87I/x‘EF8D’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode: x‘00’: I960 uncorrectable error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::ERORD							
	Data before correction							
14	HMIC::ERORD							
	Data before correction							
15	HMIC::ERORD							
	Data before correction							
16	HMIC::ERORD							
	Data before correction							
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘01’: LM access sequencer error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::LAST1IP							
	Last address before CHK1A occurred							
11	HMIC::LAST1IP							
	Last address before CHK1A occurred							
12	HMIC::LAST1IP							
	Last address before CHK1A occurred							
13	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘02’: LM access sequencer parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::LAST1IP							
	Last address before CHK1A occurred							
11	HMIC::LAST1IP							
	Last address before CHK1A occurred							
12	HMIC::LAST1IP							
	Last address before CHK1A occurred							
13	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘03’: DRAM control line error							
9	HMIC::DRAMCTRLERR							
	DRAM CTL signal RAS0 error	DRAM CTL signal RAS1 error	DRAM CTL signal CAS0 error	DRAM CTL signal CAS1 error	DRAM CTL signal WE0/1 error	DRAM CTL signal OE0/1 error	DRAM CTL signal ROW ADDRESS error	DRAM CTL signal COLUM ADDRESS error
10	HMIC::LAST1IP							
	Last address before CHK1A occurred							
11	HMIC::LAST1IP							
	Last address before CHK1A occurred							
12	HMIC::LAST1IP							
	Last address before CHK1A occurred							
13	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘04’: SRAM write parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘05’: SRAM read parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘06’: SRAM address line error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘07’: SRAM control line error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘08’: SRAM sequencer state error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘09’: SRAM sequencer parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘0A’: FM sequencer parity error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘0B’: FM control line error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘0C’: I960 read data parity error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
12	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
13	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘0D’: LANC read data parity error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
12	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
13	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘10’: I960 LM write protect error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
14	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
15	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
16	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘11’: I960 LM address over error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
14	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
15	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
16	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘12’: LANC LM write protect error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
14	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
15	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
16	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘13’: LANC LM address over error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
14	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
15	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
16	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘14’: SRAM LANC access error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘15’: SRAM write protect error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘16’: SRAM address over error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘17’: FM write protect error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘18’: FM address over error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: WCHK1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘19’: MP check error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
12	MIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	MIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘20’: I960 uncorrecctable error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::ERORD							
	Data before correction							
14	HMIC::ERORD							
	Data before correction							
15	HMIC::ERORD							
	Data before correction							
16	HMIC::ERORD							
	Data before correction							
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘21’: LM access sequencer error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::LAST1IP							
	Last address before CHK1A occurred							
11	HMIC::LAST1IP							
	Last address before CHK1A occurred							
12	HMIC::LAST1IP							
	Last address before CHK1A occurred							
13	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘22’: LM access sequencer parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::LAST1IP							
	Last address before CHK1A occurred							
11	HMIC::LAST1IP							
	Last address before CHK1A occurred							
12	HMIC::LAST1IP							
	Last address before CHK1A occurred							
13	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘23’: DRAM control line error							
9	HMIC::DRAMCTRLERR							
	DRAM CTL signal RAS0 error	DRAM CTL signal RAS1 error	DRAM CTL signal CAS0 error	DRAM CTL signal CAS1 error	DRAM CTL signal WE0/1 error	DRAM CTL signal OE0/1 error	DRAM CTL signal ROW ADDRESS error	DRAM CTL signal COLUM ADDRESS error
10	HMIC::LAST1IP							
	Last address before CHK1A occurred							
11	HMIC::LAST1IP							
	Last address before CHK1A occurred							
12	HMIC::LAST1IP							
	Last address before CHK1A occurred							
13	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘24’: SRAM write parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘25’: SRAM read parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘26’: S SRAM address line error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘27’: SRAM control line error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘28’: SRAM sequencer state error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘29’: SRAM sequencer parity error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘2A’: FM sequencer parity error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘2B’: FM control line error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘2C’: I960 read data parity error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
12	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
13	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x'8')				Message (x'E')			
8	Subcode x'2D': LANC read data parity error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
12	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
13	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x'0')			
21	SSID (low order)							
22	Symptom code (x'FF8E' : LDEV type = DKU87I/x'EF8E' : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘30’: I960 LM write protect error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
14	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
15	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
16	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘31’: I960 LM address over error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
14	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
15	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
16	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘32’: LANC LM write protect error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
14	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
15	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
16	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘33’: LANC LM address over error							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
14	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
15	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
16	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘34’: SRAM LANC access error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘35’: SRAM write protect error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘36’: SRAM address over error							
9	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
10	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
11	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
12	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
13	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
14	HMIC::SRAMERRADR							
	Error address in access to SRAM							
15	HMIC::SRAMERRADR							
	Error address in access to SRAM							
16	HMIC::SRAMERRADR							
	Error address in access to SRAM							
17	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22 23	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘37’: FM write protect error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘38’: FM address over error							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
12	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
13	Not used							
14	HMIC::LAST1							
	Execution address before CHK1A occurred							
15	HMIC::LAST1							
	Execution address before CHK1A occurred							
16	HMIC::LAST1							
	Execution address before CHK1A occurred							
17	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘40’: SIP CHA CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	CHA::MPCHK1B							
	XR address 2 parity error	XR address 3 parity error	DBUS parity error 0 (write data)	DBUS parity error 1 (write data)	BBUS parity error 0 (read data)	BBUS parity error 1 (read data)	XR address decode error 2	XR address decode error 3
12	CHA::MPCHK1B							
	CHA clock error	Micro access error	Not used	Not used	Not used	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘41’: SIP ADP CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	ADP::CCK10							
	Even CD DECODE signals are decoded at same time	CD address parity error	CB address parity error	BBUS data parity error	DBUS data parity error	Not used	Not used	Not used
12	ADP::CCK11							
	I960 MP I/F address parity error	I960 MP I/F upper data bus WR parity error	I960 MP I/F lower data bus WR parity error	I960 MP I/F upper data bus RD parity error	I960 MP I/F lower data bus RD parity error	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘42’: DSMP CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DSMP::CHK1B							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Burst WR data parity error
12	DSMP::CHK1B							
	Address parity error byte0 FM/SMP access REG	Address parity error byte1 FM/SMP access REG	Address parity error byte2 FM/SMP access REG	Address parity error byte3 FM/SMP access REG	Data parity error byte0 FM/SMP access REG	Data parity error byte1 FM/SMP access REG	Data parity error byte2 FM/SMP access REG	Data parity error byte3 FM/SMP access REG
13	DSMP::WDTPERR							
	WR data parity error word0, byte0	WR data parity error word0, byte1	WR data parity error word0, byte2	WR data parity error word0, byte3	WR data parity error word1, byte0	WR data parity error word1, byte1	WR data parity error word1, byte2	WR data parity error word1, byte3
14	DSMP::WDTPERR							
	WR data parity error word2, byte0	WR data parity error word2, byte1	WR data parity error word2, byte2	WR data parity error word2, byte3	WR data parity error word3, byte0	WR data parity error word3, byte1	WR data parity error word3, byte2	WR data parity error word3, byte3
15	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
16	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
17	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘43’: QBSA0 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	QBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
12	QBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘44’: QBSA1 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	QBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
12	QBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘45’: HMIC CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
15	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
16	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
17	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘46’: HMIC DRAM CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
12	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
13	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
14	HMIC::ERADR							
	Address from L bus							
15	HMIC::ERADR							
	Address from L bus							
16	HMIC::ERADR							
	Address from L bus							
17	HMIC::ERADR							
	Address from L bus						Not used	Not used
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘50’: SIP CHA CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	CHA::MPCHK1B							
	XR address 2 parity error	XR address 3 parity error	DBUS parity error 0 (write data)	DBUS parity error 1 (write data)	BBUS parity error 0 (read data)	BBUS parity error 1 (read data)	XR address decode error 2	XR address decode error 3
12	CHA::MPCHK1B							
	CHA clock error	Micro access error	Not used	Not used	Not used	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘51’: SIP ADP CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	ADP::CCK10							
	Even CD DECODE signals are decoded at same time	CD address parity error	CB address parity error	BBUS data parity error	DBUS data parity error	Not used	Not used	Not used
12	ADP::CCK11							
	I960 MP I/F address parity error	I960 MP I/F upper data bus WR parity error	I960 MP I/F lower data bus WR parity error	I960 MP I/F upper data bus RD parity error	I960 MP I/F lower data bus RD parity error	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘53’: QBSA0 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	QBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
12	QBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘54’: QBSA1 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	QBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
12	QBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
13	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
14	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
15	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
16	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
17	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘55’: HMIC CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
15	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
16	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
17	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘56’: HMIC DRAM CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::ERADR							
	Address from L bus							
15	HMIC::ERADR							
	Address from L bus							
16	HMIC::ERADR							
	Address from L bus							
17	HMIC::ERADR							
	Address from L bus						Not used	Not used
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘57’: I960 read data parity error							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
15	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect access	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
16	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘58’: LANC read data parity error							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
15	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect access	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
16	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘60’: DRR CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DDRR::ESTA0							
	Write to unused register	Write to read-only register	Write to A register in executing side A	Write to B register in executing side B	Address parity error	Byte access error	Input data parity error	Output data parity error
12	DDRR::ESTA0							
	Address decode error	Clock phase error	Write to 64 CMD in executing 64 CMD	Switching error RAID200/ RAID300	Communica-tion buffer Read data parity error	Communica-tion buffer TOV/SEQ/ Illegal access/ Timer parity error	BSA0 CHK1 error	BSA1 CHK1 error
13	DDRR::STATS							
	Transfer END A	Not used	Command A Exec wait/ Executing	Command A Data transferring	Transfer END B	Not used	Command B Exec wait/ Executing	Command B Data transferring
14	DBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
15	DBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
16	DDRR::MODE4							
	Micro I/F address parity reverse bit	Micro I/F input data parity reverse bit	Micro I/F output data parity reverse bit	S-BUS GND ID parity reverse bit	BSA I/F mode signal parity reverse bit	BSA I/F command ID parity reverse bit	BSA I/F input data parity reverse bit	BSA I/F output data parity reverse bit
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘62’: DSMP CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DSMP::CHK1B							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Burst WR data parity error
12	DSMP::CHK1B							
	Address parity error byte0 FM/SMP access REG	Address parity error byte1 FM/SMP access REG	Address parity error byte2 FM/SMP access REG	Address parity error byte3 FM/SMP access REG	Data parity error byte0 FM/SMP access REG	Data parity error byte1 FM/SMP access REG	Data parity error byte2 FM/SMP access REG	Data parity error byte3 FM/SMP access REG
13	DSMP::WDTPERR							
	WR data parity error word0, byte0	WR data parity error word0, byte1	WR data parity error word0, byte2	WR data parity error word0, byte3	WR data parity error word1, byte0	WR data parity error word1, byte1	WR data parity error word1, byte2	WR data parity error word1, byte3
14	DSMP::WDTPERR							
	WR data parity error word2, byte0	WR data parity error word2, byte1	WR data parity error word2, byte2	WR data parity error word2, byte3	WR data parity error word3, byte0	WR data parity error word3, byte1	WR data parity error word3, byte2	WR data parity error word3, byte3
15	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
16	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
17	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘63’: DSCA0 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DSCA0::SCHK1							
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
12	DSCA0::SCHK1							
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
13	BSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
14	BSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
15	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
16	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
17	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘64’: DSCA1 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DSCA1::SCHK1							
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
12	DSCA1::SCHK1							
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
13	BSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
14	BSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
15	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
16	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
17	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘65’: HMIC CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
15	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
16	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
17	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘66’: HMIC DRAM CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
12	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
13	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
14	HMIC::ERADR							
	Address from L bus							
15	HMIC::ERADR							
	Address from L bus							
16	HMIC::ERADR							
	Address from L bus							
17	HMIC::ERADR							
	Address from L bus						Not used	Not used
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘70’: DRR CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DDRR::ESTA0							
	Write to unused register	Write to read-only register	Write to A register in executing side A	Write to B register in executing side B	Address parity error	Byte access error	Input data parity error	Output data parity error
12	DDRR::ESTA0							
	Address decode error	Clock phase error	Write to 64 CMD in executing 64 CMD	Switching error RAID200/ RAID300	Communica-tion buffer Read data parity error	Communica-tion buffer TOV/SEQ/ Illegal access/ Timer parity error	BSA0 CHK1 error	BSA1 CHK1 error
13	DDRR::STATS							
	Transfer END A	Not used	Command A Exec wait/ Executing	Command A Data transferring	Transfer END B	Not used	Command B Exec wait/ Executing	Command B Data transferring
14	DBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
15	DBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
16	DDRR::MODE4							
	Micro I/F address parity reverse bit	Micro I/F input data parity reverse bit	Micro I/F output data parity reverse bit	S-BUS GND ID parity reverse bit	BSA I/F mode signal parity reverse bit	BSA I/F command ID parity reverse bit	BSA I/F input data parity reverse bit	BSA I/F output data parity reverse bit
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘73’: DSCA0 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DSCA0::SCHK1							
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
12	DSCA0::SCHK1							
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
13	BSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
14	BSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
15	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
16	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
17	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘74’: DSCA1 CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	DSCA1::SCHK1							
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
12	DSCA1::SCHK1							
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
13	BSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
14	BSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
15	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
16	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
17	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: CHA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘75’: HMIC CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
15	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
16	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
17	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘76’: HMIC DRAM CHK1B							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::ERADR							
	Address from L bus							
15	HMIC::ERADR							
	Address from L bus							
16	HMIC::ERADR							
	Address from L bus							
17	HMIC::ERADR							
	Address from L bus						Not used	Not used
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘77’: I960 read data parity error							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
15	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect access	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
16	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: DKA CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘78’: LANC read data parity error							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
12	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
13	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
14	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
15	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect access	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
16	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	Failure section information							
11								
12	Bus mode information							
13	Shared memory data information							
14								
15								
16	CHK3 status information							
17	Master error information							
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘32’ : Error procedure aid.
Routine ID: x‘51’ : CHK3 in initializing.
x‘52’ : CHK3 in scanning.
x‘53’ : Unknown CHK3.
x‘54’ : CHK3 threshold exceeded.
x‘55’ : CHK3 in main recovery process.
x‘56’ : CHK3 in slave process.
x‘57’ : Other function failed in CHK3 process.
x‘58’ : Reconstruction failed in CHK3 process.
x‘59’ : Making SSB failed in CHK3 interruption process.
x‘5A’ : Making SSB failed in CHK3 process.
x‘5B’ : Making SSB failed in CHK3 error process.
x‘5C’ : System down in CHK3 process.
x‘5D’ : MP down because reset CHK3 impossibly.

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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	Not used							
11	Not used							
12	Not used							
13	Not used							
14	Not used							
15	Not used							
16	Not used							
17	Not used							
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘32’ : Error procedure aid.
Routine ID: x‘81’ : Unknown CHA CHK2.
x‘82’ : Unknown DKA CHK2.
x‘F1’ : CHK1A threshold exceeded.
x‘F4’ : CHK1B threshold exceeded.
x‘F7’ : None MP.
x‘F8’ : None logical error information when pseudo-WCHK1 detected.
x‘F8’ : CHK1A detected (execute REBOOT).

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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	Return value of arbiter process							
11								
12								
13								
14	Not used							
15	Not used							
16	Not used							
17	Not used							
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘32’ : Error procedure aid.
Routine ID: x‘C1’ : Arbiter process failed in cluster failure.

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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	Access test bit map (initial value)							
11								
12								
13								
14	Access test bit map for succeeded section							
15								
16								
17								
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘32’ : Error procedure aid.
Routine ID: x‘C2’ : No last path in cluster failure.

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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	Interruption information							
11								
12								
13								
14	CHK1B status information							
15								
16								
17								
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘32’ : Error procedure aid.
Routine ID: x‘F5’ : CHK1B in CHK3.
x‘F6’ : No error CHK3.
x‘F9’ : Reset CHK3 impossibly.

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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	INITYPER (x‘49 4E 49 54 59 50 45 52’)							
11								
12								
13								
14								
15								
16								
17								
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘80’ : CHA/DKA kernel.
Routine ID: x‘00’ : Invalid reset cause.

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Format 8, Message E (processor failure: Micro WCHK1) (Note 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode (x‘F0’: Micro WCHK1)							
9	Not used							
10	WCHK1 type code							
11	Reserved							
12	Initialize interface information							
13								
14	Reset type code							
15								
16	1st reset type code							
17	Reset SSB type code							
18	Module ID (Note 2)							
19	Routine ID (Note 2)							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID of self subsystem (low order)							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note 1) This format is specified by bytes 18 and 19.

(Note 2) Module ID: x‘16’ : Reset
Routine ID: x‘27’ : CHK1B in initializing
x‘28’ : Force Reset in initializing
x‘29’ : Internal Reset in initializing
x‘2F’ : CHK3 in initializing
x‘32’ : Logical Inconsistency Reset in initializing
x‘33’ : Live Ins in initializing
x‘34’ : Power Failure Reset in initializing
x‘37’ : Fault Reset in initializing
x‘60’ : Internal Reset Loop in Resetting
x‘61’ : Logical Inconsistency Reset Loop in Resetting
x‘62’ : CHK1B Loop in Resetting
x‘63’ : CHK3 Loop in Resetting
x‘64’ : CHK1B unrecoverable
x‘65’ : Fault Reset Loop in Resetting
x‘66’ : CHK2A Reset
x’8E’ : Force WCHK1 (by another MP)

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘F1’: CHK1A caused by Micro							
9	HMIC::ERADR							
	Address from L bus							
10	HMIC::ERADR							
	Address from L bus							
11	HMIC::ERADR							
	Address from L bus							
12	HMIC::ERADR							
	Address from L bus						Not used	Not used
13	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
14	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
15	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
16	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
17	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: CHK1A)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘FE’: CHK1A undefined hardware reason							
9	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
10	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
11	Not used							
12	Not used							
13	Not used							
14	Not used							
15	Not used							
16	Not used							
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (processor failure: CHK1B)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Subcode x‘FF’: CHK1B undefined hardware reason							
9	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
10	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
11	Not used							
12	Not used							
13	Not used							
14	Not used							
15	Not used							
16	Not used							
17	Not used							
18	Module ID							
19	Routine ID							
20	Failed Processor No.				Message code (x‘0’)			
21	SSID (low order)							
22	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
23								

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Format 8, Message E (Selective Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	DCN status							
	Force device busy	Channel connect request	Command chain execute	Path reserve	Stack status	Sense pending	Long Busy (Command process)	Processor connect
10	DCN status							
	Single path mode	Gurant path mode	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	Garant path MP
11	DCN flag							
	RST NTF/RST ALG SSB PND	Pin Data pending	(RSV)	(RSV)	ODE pending	RSQ pending	SCI/SCE pending	PCH pending
12	LCT initiation cause							
	0: Ready 1: Not ready	0: Disable 1: Enable	0: No SNS 1: 64 SNS pending	0: Mount 1: Not mount	0: No RST ALG LPN 1: Exist	0: No SYS RST LPN 1: Exist	0: No stack 1: Exist	0: No Wait SNS 1: Exist
13	LCT initiation cause							
	0: No Wait-RI 1: Exist	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	0: Others 1: DEV BSY JOB
14	Command interface flag							
	Pending exist	SCE(RSP)	(RSV)	(RSV)	ODE pending	RSG pending	SCI pending	PCH pending
15	Command code							
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘1’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note) Indicates the ‘Selective Reset’.

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Format 8, Message E (Wait SENSE Timeout)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	Not used (x‘00’)							
10*	Basic sense byte 0							
	Basic sense byte 0							
11*	Basic sense byte 1							
	Basic sense byte 1							
12*	Basic sense byte 2							
	Exception code (higher order)							
13*	Format/Message							
	Exception code (lower order)							
14*	Module ID							
	Module ID							
15*	Routine ID							
	Routine ID							
16	Internal SSB number for RESET							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘3’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

* Timeout SSB information
Upper case: 24-byte format SSB
Lower case: 32-byte format SSB

(Note) Indicates the ‘Wait SENSE Timeout’.

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Format 8, Message E (CHK1B Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Related failure internal SSB log No. (Error procedure aid)							
9								
10	Not used (x‘00’)							
11								
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No. (reset)							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘5’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note) Indicates the ‘CHK1B Reset’.

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Format 8, Message E (DKC Internal Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9								
10								
11								
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘6’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note) Indicates the ‘DKC Internal Reset’.

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Format 8, Message E (LCP Internal Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	Not used (x‘00’)							
10	Reset cause							
11								
12*	OLD PSW (0)							
	LCP error code (higher order)							
13*	OLD PSW (1)							
	LCP error code (lower order)							
14*	OLD PSW (2)							
	x ‘00’							
15*	OLD PSW (3)							
	x‘00’							
16	Internal SSB No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘7’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

* Upper case: Hot line
Lower case: Int Sel Reset

(Note) Indicates the ‘LCP Internal Reset’.

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Format 8, Message E (Force Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9								
10								
11								
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘8’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note) Indicates the ‘Force Reset’.

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Format 8, Message E (Logical inconsistency reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used							
9								
10								
11								
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log number							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘9’) (Note)			
21	SSID (lower order) of self subsystem							
22	Symptom code (x‘FF8E’:LDEV type=DKU87I / x‘EF8E’:LDEV type=DKU86I)							
23								

(Note) Indicates the ‘Logical inconsistency reset’.

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Format 8, Message F (Micro-program detected error : Logical inconsistency)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘F’)			
8	Module ID							
9	Routine ID							
10	Error information							
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	Processor No.				Message code (don’t care)			
21	SSID (lower order) of self subsystem							
22	Symptom code (high order) (x‘FF’:LDEV type=DKU87I / x‘EF’:LDEV type=DKU86I)							
23	Symptom code (low order) (x‘8F’)							

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Module ID (SSB8) List (1/4)

No.	Module ID	Function name	Remarks
1	00	Initialization	
2	01	Power disconnection	
3	02	CUDG	
4	10	Job management	
5	11	Synchronous management	
6	12	Communication control between processors	
7	13	Cache control	
8	14	Resource management	
9	15	Configuration control	
10	16	Reset	
11	17	SVP management	
12	18	Configuration control (RAID provided)	
13	19	Configuration control (drive recovery provided)	
14	30	Standard function	
15	31	SVP-provided function	
16	32	Error procedure aid	
17	40	CHA monitor	
18	41	CHA initiator	
19	42	CHA terminator	
20	43	CHA kernel (common function)	
21	48	Remote copy command	
22	49	Remote copy command	
23	50	Command chain start	
24	51	Command chain termination	
25	52	Command execution status analysis	
26	53	Command execution CHL I/F control	
27	54	Channel server common process 1	
28	55	Channel server common process 2	
29	56	Channel server common process 3	
30	57	Channel server common process 4	
31	58	Channel server data transfer 1	
32	59	Channel server data transfer 2	
33	5A	Read/write common process	

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Module ID (SSB8) List (2/4)

No.	Module ID	Function name	Remarks
34	5B	Subsystem command common process	
35	5C	Channel server asynchronous control 1	
36	5D	Channel server asynchronous control 2	
37	5E	Channel server command queuing control	
38	5F	Channel server JOB FRR	
39	60	Read command process 1	
40	61	Read command process 2	
41	62	Read command process 3	
42	63	Read command process 4	
43	64	Read command process 5	
44	65	Read command process 6	
45	66	Write command process 1	
46	67	Write command process 2	
47	68	Write command process 3	
48	69	Write command process 4	
49	6A	Write command process 5	
50	6B	Write command process 6	
51	6D	Control command process 1	
52	6E	Control command process 2	
53	6F	Search command	
54	70	Path control command process	
55	71	Diagnostic command process	
56	72	DIAG command process	
57	73	Subsystem command process 1	
58	74	Subsystem command process 2	
59	75	Subsystem command process 3	
60	78	CHL I/F link level frame control	
61	79	CHL I/F device frame control	
62	7A	CHL I/F common control	
63	7B	LDEV format	
64	7E	Concurrent copy process	

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Module ID (SSB8) List (3/4)

No.	Module ID	Function name	Remarks
65	7F	Channel server WDCP/differential (M specified)	
66	80	DKA monitor	
67	81	DKA initiator	
68	82	DKA terminator	
69	90	Staging	
70	91	LDEV destaging	
71	92	PDEV destaging	
72	93	Drive recovery	
73	94	Offline monitor	
74	95	Physical drive maintenance	
75	98	RAID synchronous type	
76	99	RAID LDEV destaging	
77	9A	RAID PDEV destaging	
78	9B	RAID drive recovery	
79	9C	RAID external provided	
80	9D	RAID 0 destaging	
81	9E	RAID 0 Error/merge	
82	9F	RAID failed slot operation	
83	A0	SCSI control	
84	A1	DRR control	
85	A2	SVP command execution	
86	A3	Test activation	
87	A4	SCSI control	
88	A5	Offline monitor	
89	A6	Physical drive maintenance	
90	A7	SCSI control	
91	A8	DRR control	
92	AE	SCSI control	
93	C0	HRC/HODM CHL/SVP I/F	
94	C1	HRC/HODM Remote copy monitor	
95	C2	HRC/HODM Configuration control	

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Module ID (SSB8) List (4/4)

No.	Module ID	Function name	Remarks
96	C3	HRC/HODM common copy procedure	
97	C4	HRC Remote copy procedure	
98	C5	HODM Migration copy procedure	
99	C6	HRC/HODM channel server procedure	Note 1
100	C7	HRC/HODM Remote I/O manager	
101	C8	HRC/HODM Remote I/O 1	Note 1
102	C9	HRC/HODM Remote I/O 2	
103	CA	HRC/HODM path control	
104	CB	HRC asynchronous remote copy procedure	
105	CC	HRC asynchronous CT manager	
106	CD	HRC asynchronous scheduler	
107	CE	HRC semi-synchronous Configuration control	
108	CF	HRC/HODM Configuration control	

(Note 1) No action is required for error codes, C60E, C870, C871 and C872. These error codes are reported only to have the host processor re-drive the failed CCW chain.

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Format F, Message 0 (Operation terminated)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘0’)			
8	Not used (x‘000000’)							
9								
10								
11	Hardware level (Note)							
12								
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	Processor number				Error code (don’t care)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFF0’)							
23								

(Note) Hardware level

Bit 0 : Hardware level

When the bit 0 = 0,

- Bit 1: Not used
- Bit 2-3: Reported storage path
- Bit 4-5: Number of channels per cluster
  - 00 : 4
  - 01 : 8
  - 10 : Not used
  - 11 : Not used
- Bit 6: NVS
  - 0 : Not exist
  - 1 : Exist
- Bit 7: Not used
- Bit 8-10: Cache size
  - 000 : Non cache
  - 001 : 256MB
  - 010 : 512MB
  - 011 : 768MB
  - 100 : 1024MB
  - 101 : 1280MB
  - 110 : 1536MB
  - 111 : Over 1536MB
- Bit 11-13: Cluster hardware level
- Bit 14-15: Cache/ NVS hardware level

When the bit 0 = 1,

- Bit 1: Not used
- Bit 2-3: Failed storage path
- Bit 4-7: Number of channels per cluster
  - 0000 : Parallel channel = 4, serial channel = 0
  - 0001 : Parallel channel = 8, serial channel = 0
  - 0010 : Parallel channel = 4, serial channel = 2
  - 0100 : Parallel channel = 4, serial channel = 4
  - 0110 : Parallel channel = 0, serial channel = 2
  - 1000 : Parallel channel = 0, serial channel = 4
  - 1010 : Parallel channel = 0, serial channel = 8
  - 1100 : Parallel channel = 4, serial channel = 6
- Bit 8: Dual frame
  - 0 : Dual frame
  - 1 : Modular power
- Bit 9-11: Cache size
  - 000 : Non cache
  - 001 : 256MB
  - 010 : 512MB
  - 011 : 768MB
  - 100 : 1024MB
  - 101 : 1280MB
  - 110 : 1536MB
  - 111 : Over 1536MB
- Bit 11-13: Cluster hardware level
- Bit 14-15: Cache/ NVS hardware level

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Format F, Message 1 (Micro-program detected cache failure)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘1’)			
8	Queue transition in progress (Side A)	Queue transition in progress (Side B)	Free SGCB queue operation in progress	Free SLCB queue operation in progress	Free GRPT queue operation in progress	Not used		
9*	Not used							
	VDEV number							
10*	Queue type							
	VDEV number		Slot number					
11*	Queue number							
	Slot number							
12*	Queue number							
	Slot number							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacture code (‘000000’)						Factory code (‘00’)	
16	Not used							
17	Module ID							
18	Routine ID							
19	Processor number				Error code (don’t care)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFF1’)							
23								

* When byte 8, bit 2-4 = 000, upper value is valid.
When byte 8, bit 2-4 ≠ 000, lower value is valid.

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Format F, Message 2 (Cache Failure)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘2’)			
8	Subcode (Note 1)							
9	Indefinite register flag							
	F bus/H error at logging of PCB #0	F bus/H error at logging of PCB #1	F bus/H error at logging of PCB #2	F bus/H error at logging of PCB #3	F bus/L error at logging of PCB #0	F bus/L error at logging of PCB #1	F bus/L error at logging of PCB #2	F bus/L error at logging of PCB #3
10	Operation mode							
	Bit 2, 5 to 7 valid	Used arbiter 0: F bus/H 1: F bus/L	Access part 0: memory 1: register	Bus mode 0: 2 bus 2: bus L 3: bus H	Transfer mode 0: normal write 1: normal read 2: cache to cache 4: double write			
11	BSA error flug							
	Arbiter error in F bus/H	Cache error info in F bus/H (high priority order)	BSA error info in F bus/H	Cache error info in F bus/H (low priority order)	Arbiter error in F bus/L	Cache error info in F bus/L (high priority order)	BSA error info in F bus/L	Cache error info in F bus/L (low priority order)
12	Internal MP number							
13	SSID of mate subsystem (‘0000’ for of EDCC							
14								
15	Maker code (‘000000’)						Manufacture code (‘00’)	
16	Blockade flag							
	No blockade	MP bus blockade	F bus/H blockade	F bus/L blockade	Cache PCB blockade (side A)	Cache PCB blockade (side B)	Cache MG blockade (side A)	Cache MG blockade (side B)
17	Module ID							
18	Routine ID							
19	Processor No.				Error code (don’t care)			
20	SSID							
21								
22	Symptom code (x‘FFF2’)							
23								

(Note 1) Subcode = 0X : Arbiter error
1X : Cache error
2X/AX : Control circuit error per MG on cache
32/36/B2/B6: ECC UNCORR
3A/3E/BA/BE: RDS/LRC error in cache
4X/CX : F bus error
5X/DX : LRC error in cache
6X/EX : No cache error information
8X/9X : Cache error
FX : No error information

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Format F, Message 6 (CFW impossible)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘6’)			
8	Reason code (Note)							
9	Not used							
10								
11								
12								
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Not used							
17	Module ID							
18	Routine ID							
19	Processor number				Error code (don’t care)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFF6’)							
23								

(Note) Reason code

x‘00’ : Reserved
x‘01’ : CFW ID inconsistent
x‘02’-x‘0F’ : Reserved

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Format F, Message A (NVS terminated)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘A’)			
8	Reason code (Note)							
9	Not used							
10								
11								
12								
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Not used							
17	Module ID							
18	Routine ID							
19	Processor number				Error code (don’t care)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFA’)							
23								

(Note) Reason code
x‘00’-x‘01’ : Reserved
x‘02’ : NVS failure
x‘03’-x‘0F’ : Reserved

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Format F, Message B (HRC/HODM Pair Suspend)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘B’)			
8	R-Vol suspended	R-Vol failed	Reason code (Note)					
9	RCU device address							
10	RCU Manufacture code/Factory code (x‘0C690’)							
11								
12								
13	RCU Sequence No.							
14								
15	MCU Manufacture code/Factory code (x‘0C690’)							
16								
17								
18	MCU Sequence No							
19								
20								
21								
22	Symptom code (x‘FE’)							
23	Symptom code (same byte #8)							

(Note) Reason code

x‘14’-x‘2F’ : Reserved
x‘30’ : Pair suspended. MCU device write error.
x‘31’ : Pair suspended. RCU subsystem error/or MCU subsystem error.
x‘32’ : Pair suspended. RCU device communication error.
x‘33’ : Pair suspended (Critical device status). All write command is rejected until pair re-established.
x‘34’ : Pair suspended. RCU device is not ready (intervention required).

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Format F, Message F (Cache memory : Correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘02’ : Cache 1 symbol error							
9	Slot number of cache board (Refer to SIM-RC section for the correspondense to slot.)							
10	CMC::MEMERROR0							
	Module group number			Module side unmber	Byte number of 1 symbol error valid	Byte number of 1 symbol error		
11	CMC::MEMERROR0							
	Byte number of 1 symbol error		Not used	Not used	Not used	Not used	Not used	Not used
12	CMC::WARNING							
	1 symbol error of memory was detected	Not used	Not used	Not used	Not used	Not used	Not used	Not used
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Module number of cache							
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (Shared memory : Correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘04’ : Shared memory 1 symbol error							
9	Slot number of shared memory (Side A : x‘00’ ,Side B : x‘01’)							
10	SMC::MHBUS ERRSTATUS							
	Correctable error	Uncorre-ctable error	Read data check error	Write data check error	DBL access unmatch	Trnsfer count error	Bus mode error	Transfer mode error
11	SMC::MLBUS ERRSTATUS							
	Correctable error	Uncorre-ctable error	Read data check error	Write data check error	DBL access unmatch	Trnsfer count error	Bus mode error	Transfer mode error
12	SMC::MEMORY READY							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Memory ready
13	Module in which correctable error occurred							
	module 00	module 01	module 02	module 03	module 04	module 05	Not ready	Not ready
14	Module in which correctable error occurred							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
15	Not used (x‘00’)							
16	Module number of cache							
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (MBUS/Shared memory : Warning)

	0	1	2	3	4	5	6	7
7	Format (x'F')				Message (x'F')			
8	Subcode : x'10' : Three SMP MBUSH MBUSOPEN lines inconsistent x'11' : Two SMP MBUSH CHKERR (A) lines inconsistent x'12' : Two SMP MBUSH CHKERR (B) lines inconsistent x'13' : Three SMP MBUSH DISABLE lines inconsistent x'14' : Three SMP MBUSH DISABLE lines inconsistent x'20' : Three SMP MBUSH MBUSOPEN lines inconsistent x'21' : Two SMP MBUSL CHKERR (A) lines inconsistent x'22' : Two SMP MBUSL CHKERR (B) lines inconsistent x'23' : Three SMP MBUSL DISABLE lines inconsistent x'24' : Three SMP MBUSL ABTRST lines inconsistent x'30' : Three SMP SMA DISABLE lines inconsistent x'40' : Three SMP SMB DISABLE lines inconsistent							
9	MPID							
10	SMP::HOTLINE STATUS							
	Not used	MBUS/H BUSDISABLE 0	MBUS/H BUSDISABLE 1	MBUS/H BUSDISABLE 2	Not used	MBUS/L BUSDISABLE 0	MBUS/L BUSDISABLE 1	MBUS/L BUSDISABLE 2
11	SMP::HOTLINE STATUS							
	MBUS/H ABTRST ENABLE	MBUS/H ABTRST 0	MBUS/H ABTRST 1	MBUS/H ABTRST 2	MBUS/L ABTRST ENABLE	MBUS/L ABTRST 0	MBUS/L ABTRST 1	MBUS/L ABTRST 2
12	SMP::HOTLINE WARNING							
	Not used	SM (A) TM1 DISABLE WARNING	SM (A) TM2 DISABLE WARNING	SM (A) DISABLE UNMATCH	Not used	SM (B) TM1 DISABLE WARNING	SM (B) TM2 DISABLE WARNING	SM (B) DISABLE UNMATCH
13	SMP::HOTLINE WARNING							
	Not used	Not used	MBUS/H BUSDISABLE WARNING	MBUS/L BUSDISABLE WARNING	MBUS/H ABTRST WARNING	MBUS/L ABTRST WARNING	Not used	Not used
14	SMP::MBUSOPEN READ							
	MBUS/L BUSOPEN 0	MBUS/L BUSOPEN 1	MBUS/L BUSOPEN 2	MBUS/L BUSOPEN WARNING	MBUS/H BUSOPEN 0	MBUS/H BUSOPEN 1	MBUS/H BUSOPEN 2	MBUS/H BUSOPEN WARNING
15	SMP::MHCHKERR READ							
	MBUS/H CHKERR B 0	MBUS/H CHKERR B 1	Not used	MBUS/H CHKERR B WARNING	MBUS/H CHKERR A 0	MBUS/H CHKERR A 1	Not used	MBUS/H CHKERR A WARNING
16	SMP::MLCHKERR READ							
	MBUS/L CHKERR B 0	MBUS/L CHKERR B 1	Not used	MBUS/L CHKERR B WARNING	MBUS/L CHKERR A 0	MBUS/L CHKERR A 1	Not used	MBUS/L CHKERR A WARNING

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	0	1	2	3	4	5	6	7
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (FBUSH : Warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘50’ : Three BSA FBUSH BUSOPEN lines inconsistent x‘51’ : Three BSA FBUSH CHKERR lines inconsistent x‘53’ : Three BSA FBUSH FBUSDSBL lines inconsistent x‘55’ : Three BSA FBUSH LIVEINS lines inconsistent							
9	MPID							
10	BSA0::CK2DST1							
	FBUS OPEN 0	FBUS OPEN 1	FBUS OPEN 2	FBUS OPEN 0 and 1	FBUS OPEN 0 and 2	FBUS OPEN 1 and 2	Not used	Not used
11	BSA0::CK2DST2							
	FBUS LIVEINS 0	FBUS LIVEINS 1	FBUS LIVEINS 2	FBUS LIVEINS 0 and 1	FBUS LIVEINS 0 and 2	FBUS LIVEINS 1 and 2	Not used	Not used
12	BSA0::CK2AST0							
	FBUS CHKERR 0	FBUS CHKERR 1	FBUS CHKERR 2	FBUS CHKERR 0 and 1	FBUS CHKERR 0 and 2	FBUS CHKERR 1 and 2	Not used	Not used
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	BSA0::CK2DST1							
	FBUS DISABLE 0	FBUS DISABLE 1	FBUS DISABLE 2	FBUS DISABLE 0 and 1	FBUS DISABLE 0 and 2	FBUS DISABLE 1 and 2	Not used	Not used
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (FBUSL : Warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘60’ : Three BSA FBUSL BUSOPEN lines inconsistent x‘61’ : Three BSA FBUSL CHKERR lines inconsistent x‘63’ : Three BSA FBUSL FBUSDSBL lines inconsistent x‘65’ : Three BSA FBUSL LIVEINS lines inconsistent							
9	MPID							
10	BSA0::CK2DST1							
	FBUS OPEN 0	FBUS OPEN 1	FBUS OPEN 2	FBUS OPEN 0 and 1	FBUS OPEN 0 and 2	FBUS OPEN 1 and 2	Not used	Not used
11	BSA0::CK2DST2							
	FBUS LIVEINS 0	FBUS LIVEINS 1	FBUS LIVEINS 2	FBUS LIVEINS 0 and 1	FBUS LIVEINS 0 and 2	FBUS LIVEINS 1 and 2	Not used	Not used
12	BSA0::CK2AST0							
	FBUS CHKERR 0	FBUS CHKERR 1	FBUS CHKERR 2	FBUS CHKERR 0 and 1	FBUS CHKERR 0 and 2	FBUS CHKERR 1 and 2	Not used	Not used
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	BSA0::CK2DST1							
	FBUS DISABLE 0	FBUS DISABLE 1	FBUS DISABLE 2	FBUS DISABLE 0 and 1	FBUS DISABLE 0 and 2	FBUS DISABLE 1 and 2	Not used	Not used
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (MBUS : Slave error warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘70’ : SMP slave error							
9	MPID							
10	SMP::SLVERR							
	Address code error	Commans bus code error	Data bus code error	Write bus code error	Transfer count error (command)	Bus mode error (command)	Transfer mode error (command)	Not used
11	SMP::SLVERR							
	Not used	Not used	Not used	Slave ti,eout error	Slave timer parity error	Not used	Sequencer state error	Not used
12	SMP::SLVERR							
	MH address code error	MH command bus code error	MH data bus code error	Not used	MH transfer count error (command)	MH bus mode error (command)	MH transfer mode error (command)	Not used
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	SMP::SLVERR							
	ML address code error	ML command bus code error	ML data bus code error	Not used	ML transfer count error (command)	ML bus mode error (command)	ML transfer mode error (command)	Not used
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (MBUS : Warning)

	0	1	2	3	4	5	6	7
7	Format (x'F')				Message (x'F')			
8	Subcode : x'16' : SMP MBUSH Arbiter ENB OFF detected x'26' : SMP MBUSL Arbiter ENB OFF detected							
9	MPID							
10	SMP::HOTLINE STATUS							
	Not used	MBUS/H BUS-DISABLE 0	MBUS/H BUS-DISABLE 1	MBUS/H BUS-DISABLE 2	Not used	MBUS/L BUS-DISABLE 0	MBUS/L BUS-DISABLE 1	MBUS/L BUS-DISABLE 2
11	SMP::HOTLINE STATUS							
	MBUS/H ABTRST ENABLE	MBUS/H ABTRST 0	MBUS/H ABTRST 1	MBUS/H ABTRST 2	MBUS/L ABTRST ENABLE	MBUS/L ABTRST 0	MBUS/L ABTRST 1	MBUS/L ABTRST 2
12	SMP::HOTLINE WARNING							
	Not used	SM(A) TM1 DISABLE WARNING	SM(A) TM2 DISABLE WARNING	SM(A) DISABLE UNMATCH	Not used	SM(B) TM1 DISABLE WARNING	SM(B) TM2 DISABLE WARNING	SM(B) DISABLE UNMATCH
13	SMP::HOTLINE WARNING							
	Not used	Not used	MBUS/H BUS-DISABLE WARNING	MBUS/L BUS-DISABLE WARNING	MBUS/H ABTRST WARNING	MBUS/L ABTRST WARNING	Not used	Not used
14	SMP::MBUSOPEN READ							
	MBUS/L BUSOPEN 0	MBUS/L BUSOPEN 1	MBUS/L BUSOPEN 2	MBUS/L BUSOPEN WARNING	MBUS/H BUSOPEN 0	MBUS/H BUSOPEN 1	MBUS/H BUSOPEN 2	MBUS/H BUSOPEN WARNING
15	SMP::MHCHKERR READ							
	MBUS/H CHKERR B 0	MBUS/H CHKERR B 1	Not used	MBUS/H CHKERR B WARNING	MBUS/H CHKERR A 0	MBUS/H CHKERR A 1	Not used	MBUS/H CHKERR A WARNING
16	SMP::MLCHKERR READ							
	MBUS/L CHKERR B 0	MBUS/L CHKERR B 1	Not used	MBUS/L CHKERR B WARNING	MBUS/L CHKERR A 0	MBUS/L CHKERR A 1	Not used	MBUS/L CHKERR A WARNING
17	Module ID							
18	Routine ID							
19	PKID				Not used (x'0')			
20	SSID of self subsystem							
21								
22	Symptom code (x'FFFF')							
23								

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Format F, Message F (FBUSH : Warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘56’ : BSA FBUSH Arbiter ENB OFF detected							
9	MPID							
10	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Not used	Not used	FBUS ABT valid	Not used	Not used
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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Format F, Message F (FBUSL : Warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	Subcode : x‘66’ : BSA FBUSL Arbiter ENB OFF detected							
9	MPID							
10	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Not used	Not used	FBUS ABT valid	Not used	Not used
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	PKID				Not used (x‘0’)			
20	SSID of self subsystem							
21								
22	Symptom code (x‘FFFF’)							
23								

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4 ECKD 32-BYTE SSB

4.1 Basic Sense Bytes

The following describes details of 32 ECKD basic sense bytes 0 to 6 and 22 to 31.

	ECKD 32-Byte Sense Data							
	0	1	2	3	4	5	6	7
0	Command rejection	Intervention required	Not used	Device check	Data check	Not used		Incomplete domain
1	Permanent error	Invalid track format	Not used	Operator message	Not used	File protection	Write inhibit	Imprecise ending
2	Storage control type							
3	Remaining count; or, command overrun reached threshold *							
4	Device address							
5	Device type							
6	Unit indication 0: SSB2 1: SSB5	SSB4 valid	SSB29-31 valid	Not used	Format			
7 to 21	Bytes 7 to 21: Depend on the exception class and format. (For details, see Section 4.3.)							
22	Exception class							
23	Exception code; or, CHL#, LPN, and LCP# beyond the threshold †							
24	Logging message control							
25	Program action code							
26	Dual frame	EDCC Mode	Duplex pair	Subvolume error	Nonsynchro-nous operation	Serial channel	Report output	Permanent path error
27	32-byte SSB (0)	Not used			DKU86I TRK compatible mode	Not used	Path number	
28	Message code; or, number of read or searched bytes ††							
29	Cylinder address; or, number of read or searched bytes ††							
30								
31	Head address; or, number of read or searched bytes ††							

: Varies by the exception class and format.

* "Remaining count" is for exception class 0 and format 4; otherwise, "Command overrun threshold reached" applies.

† "CHL#, LPN, and LCP# beyond the threshold" is for exception class 6; otherwise, "Exception code" applies.

†† "Number of read or searched bytes" is for exception class 6.

Otherwise:

Byte 28 = "Message code"
Byte 29-30 = "Cylinder address"
Byte 31 = "Head address"

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Common Sense Bytes (ECKD 32-Byte SSB)

ECKD 32-Byte SSB (1/3)

Byte	Bit	Name	Description
0	0	Command rejection	A chain ended without receiving the expected number of data transfer commands in the LR/LRE domain. If no other error is detected, “incomplete domain” (byte 0, bit 7) is also set to 1.
	1	Intervention required	1. The drive is not physically connected. 2. The drive power is off. 3. The ENABLE/DISABLE switch is set to DISABLE.
	2	Not used	
	3	Device check	DKC or drive hardware is abnormal.
	4	Data check	Indicates that a data error has been detected in the information from the drive. This bit is set to 1 when the data error is uncorrectable or error correction is prohibited by the mask byte.
	5	Not used	
	6	Not used	
	7	Incomplete domain	Indicates that as many data transfer commands as defined in the LOCATE RECORD count parameter have not been received.
1	0	Permanent error	Indicates that an error occurred and recovery failed.
	1	Invalid track format	1. The record size parameter is inconsistent with the record to be updated. 2. Nonstandard R0 was detected during branching in Fast Write/Dual Copy operation.
	2	Not used	X‘06’
	3	Operator message	Not used for other than DKC SIM. For DKC SIM, indicates that messages are output to the operator
	4	Not used	
	5	File protection	An attempt was made to move to a track not defined in DEFINE EXTENT during execution of the LOCATE RECORD command (updating write in asynchronous mode).
	6	Write inhibit	A write command has been received that uses a resource write-prohibited by the DIAGNOSTIC CONTROL command. “Device check” (byte 0, bit 3) is also set to 1.
	7	Imprecise ending	Indicates that CCW has ended abnormally in the LR/LRE domain and the error is for a previously completed command (whose end status report is already finished).
2	Storage control type/environmental data present		1. For excluding DKC SIM and Cache SIM, this byte indicate DKC type (x‘06’). 2. For DKC SIM and Cache SIM, this byte indicate environmental data present (x‘10’).
3	Remaining count; or, command overrun threshold reached		When the command overrun threshold is reached in exception class 6: X‘01’ — Exception class 0 In exception class 0 and format 4: “Remaining count” (number of records/tracks remaining in the LR/LRE domain being handled)
4	Device address		1. When the exception class is 4, 6, B, C, D, or E: Bit 0-1: Storage path number Bit 2: Controller number Bit 3-7: Device number 2. When the exception class is 1, 2, 3, or F: Always ‘00’

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ECKD 32-Byte SSB (2/3)

Byte	Bit	Name	Description			
5	Device type code		1. For exception class 4, 6, B, C, D and E, this byte indicates device type (x‘24’). 2. For exception class 1, 2, 3 and F, always x‘00’.			
6	Content and format		Indicates whether the other bytes of SSB are valid or invalid and their formats			
	0	Unit indication	0: SSB2 (storage control type) is valid 1: SSB5 (device type) is valid			
	1	Device address valid	0: SSB4 is invalid 1: SSB4 is valid			
	2	CYL, HD address valid	0: SSB29-31 invalid 1: SSB29-31 valid			
	3	Not used				
	4-7	Format	When x‘F’, this SSB is SIM.			
22	0-3	Exception class	0: File protection, invalid track format, status exception, command sequence exception 4: Data check, retry prohibition, PCI, subretry success 6: Subsystem data B: Failure between DKC and DASD CTL (reserved) C: Controller failure (reserved) D: Failure between controller and device E: Device failure			
	4-7		For details, see Section 4.3.			
23	Exception code; or, CHL#, LPN, and LCP# beyond the threshold					
24	(Logging message control)					
	0-2	Not used				
	3	Logging mode	Forced log mode			
	4-5	Logging action	00: Not logged 01: Unconditionally logged 10: Logged only once 11: Logged only for frequent occurrence on the path			
	6-7	Operator message control	00: Message not output 01: Message output unconditionally 10: Message output only once 11: Message output only once only for frequent occurrence on the path			
25	Program action code		Bit 0 = 0		Bit 0 = 1	
			Bit 1-7	Single program action code	Bit 1	0 SSBs 26 and 27 have no meaning. 1 Executes error recovery specific to DC.
					2	0 Does not execute ERP based on SSB28. 1 Executes ERP based on SSB28.
					3	Another path retry request
					4-5	Not used
					6-7	00 Does not retry 01 Retry twice 10 Retry ten times 11 Retry 255 times

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ECKD 32-Byte SSB (3/3)

Byte	Bit	Name	Description	
26 *	0	Dual frame	0: Single-frame configuration 1: Dual-frame configuration	
	1	EDCC mode	0: DCC mode 1: EDCC mode	
	2	Duplex pair	0: Simplex 1: Duplex pair	
	3	Subvolume error	0: Not a subvolume error 1: Subvolume error	
	4	Nonsynchronous operation	0: Synchronous operation 1: Asynchronous operation	
	5	Serial channel	0: Parallel channel 1: Serial channel	
	6	Report output	0: Excluding environmental data present and SIM 1: Environmental data present and SIM	
	7	Permanent path error	0: Permanent error for all paths 1: Permanent error for this path	
27 *	0	32-byte SSB	ECKD 32-byte SSB = 0	
	1-3	Not used		
	4	DKU86I TRK compatible mode	0: Not in DKU86I track compatible mode 1: In DKU86I track compatible mode or changing to DKU86I track compatible mode	
	5	Not used		
	6-7	Path number	Indicates the SSB creation path number.	
28	Message code		Instructs the message status of the EREP log and operator console.	“Number of read or searched bytes” for exception class 6
29	Cylinder address		Indicates the cylinder address with an error.	
30				
31	Head address		Indicates the head address with an error.	

* Configuration information

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4.2 Exception Classes and Formats

Exception class	Format	Description
0	0-1	Reserved
	2	Reserved
	3	Machine condition exception
	4	Command sequence exception
	5-F	Reserved
4	0	Reserved
	1	Data exception (PCI, permanent)*
	2	Reserved
	3-E	Reserved
	F	SIM
6	0	Reserved
	1	Subsystem information*
	2-F	Reserved
B	0	Reserved
	1	Shared Memory Failure
	2-7	Reserved
	8	LCP/MCP Failure
	9	Host Adapter CHK2
	A	Disk Adapter CHK2
	B	DRR CHK2
	C	Reserved
	D	Power Failure
	E	Processor Failure
	F	Logical inconsistency
D	0	Drive report error*
	1	SPC report error*
	2-E	Reserved
	F	SIM
E	0	Drive failure, LDEV blockade/Pin volume detected/Write inhibited, LDEV not ready*
	1-E	Reserved
	F	SIM

* For DKU87I (IBM 3390 emulation mode) only.

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4.3 Details of Sense Bytes

Exception 0, Format 3 (Machine condition exception)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘3’)			
7	LR/LRE command operation byte							
8	Extension operation byte (byte 17) for LR/LRE command							
9	byte 2 for LR/LRE command							
10	Reserved							
11	Search parameter of LR command (CCHHR) or Record ID of re-execution command (R)							
12								
13								
14								
15								
16	Sector number to re-execute the LR							
17	TLF for LR/LRE command							
18								
19	Operation byte = 0x3F :LR/LRE External operation byte Others :Reserved							
20	SSID							
21								
22	Exception code							
23	x‘08C1’							

Exception 0, Format 4 (Command sequence exception)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘4’)			
7	LR/LRE command operation byte							
8	Extension operation byte (byte 17) for LR/LRE command							
9	Head address of extent (DX command parameter)							
10								
11								
12								
13	Path group ID (bytes 1 to 7 of the ID transferred by the newest SET PATH GROUP ID command)							
14								
15								
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code							
23	x‘0212’: incomplete domain							

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Exception 4, Format 1 (data exception, PCI, permanent)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘1’)			
7	Sector number*							
8	Cylinder address*							
9								
10	Head address*							
11								
12	Record number*							
13	Error displacement							
14								
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘4’)				Message†			
23	Correction flag††							

* Not determined for occurrence in HA or R0.

† Contents of message
- x‘0’: Data check in HA field
- x‘1’: Data check in C field
- x‘2’: Data check in K field
- x‘3’: Data check in D field
- x‘4’: Missing sink byte in HA field
- x‘5’: Missing sink byte in C field (PA error)
- x‘6’: Missing sink byte in K field
- x‘7’: Missing sink byte in D field
- x‘8’: Not used
- x‘9’: Missing AM during retry
- x‘A’ to x‘F’ : Not used

†† Contents of correction flag
- Bits 0 and 1: CORRECTION BIT
  - 00: Correctable (Recovered)
  - 11: Uncorrectable
- Bit 2: Offset active
- Bits 3 to 7: Not used

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Exception 6, Format 1 (Subsystem information)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 27 to 31 valid	Not used	Format (x‘1’)			
7	Data overrun threshold exceeded							
8	Seek count							
9								
10	Drive serial number (X ‘0C69’ + DKU sequence number)							
11								
12								
13								
14								
15	DKC serial number (X‘0C6900’ + DKC sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘6’)				Exception code (x‘F’)			
23	0: Statistics or RRBL command 2: Channel data overrun				For parallel/serial channel standard path: CHL#/LPN (0-7) For serial channel extension path: LCP number			

Exception B, Format 1 (Shared Memory Failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x81							
8	Subcode (F/M = 81 SSB Byte 8)							
9	F/M = 81 SSB Byte 9							
10	Module ID (F/M = 81 SSB Byte 18)							
11	Routine ID (F/M =81 SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	F/M = 81 SSB Byte 10							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0x1)							
23	Exception code (F/M = 81 SSB Byte 20:Processor#/Message code)							

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Exception B, Format 8 (LCP/MCP Failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x88							
8	LCP Error Code (F/M = 88 SSB Byte 9)							
9	LCP Error Code (F/M = 88 SSB Byte 10)							
10	Module ID (F/M = 88 SSB Byte 18)							
11	Routine ID (F/M =88 SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	LCP Error Message (F/M = 88 SSB Byte 8)							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0x8)							
23	Exception code (F/M = 88 SSB Byte 20:Processor#/Message code)							

Exception B, Format 9 (Host Adapter CHK2)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x89							
8	Subcode (F/M = 89 SSB Byte 8)							
9	F/M = 89 SSB Byte 9							
10	Module ID (F/M = 89 SSB Byte 18)							
11	Routine ID (F/M =89 SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code *1							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0x9)							
23	Exception code (F/M = 89 SSB Byte 20:Processor#/Message code)							

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Exception B, Format A (Disk Adapter CHK2)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x8A							
8	Subcode (F/M = 8A SSB Byte 8)							
9	F/M = 8A SSB Byte 9							
10	Module ID (F/M = 8A SSB Byte 18)							
11	Routine ID (F/M =8A SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code *1							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0xA)							
23	Exception code (F/M = 8A SSB Byte 20:Processor#/Message code)							

*1

ID Code	Sense
0x20	LA Error
0x10	LRC Error
0x00	Other Error

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Exception B, Format B (DRR CHK2)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x8B							
8	Subcode (F/M = 8B SSB Byte 8)							
9	F/M = 8B SSB Byte 9							
10	Module ID (F/M = 8B SSB Byte 18)							
11	Routine ID (F/M =8B SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code *1							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0xB)							
23	Exception code (F/M = 8B SSB Byte 20:Processor#/Message code)							

*1

ID Code	Sense
0x10	LRC Error
0x00	Other Error

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Exception B, Format D (Power Failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x8D							
8	Subcode (F/M = 8D SSB Byte 8)							
9	F/M = 8D SSB Byte 9							
10	F/M = 8D SSB Byte 10							
11	F/M =8D SSB Byte 11							
12	Internal SSB Serial number							
13								
14	F/M = 8D SSB Byte 18							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0xD)							
23	Exception code (F/M = 8D SSB Byte 20:Processor#/Message code)							

Exception B, Format E (Power Failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x8E							
8	F/M = 8E SSB Byte 8							
9	F/M = 8E SSB Byte 9							
10	Module ID (F/M = 8E SSB Byte 18)							
11	Routine ID (F/M =8E SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	F/M = 8E SSB Byte 10							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0xE)							
23	Exception code (F/M = 8E SSB Byte 20:Processor#/Message code)							

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Exception B, Format E (Wait Sense Time Over)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x8E							
8	F/M = 8E SSB Byte 8							
9	F/M = 8E SSB Byte 9							
10	Lost SSB’s Module ID (F/M = 8E SSB Byte 14)							
11	Lost SSB’s Routine ID (F/M =8E SSB Byte 15)							
12	Internal SSB Serial number							
13								
14	F/M = 8E SSB Byte 10							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0xE)							
23	Exception code (F/M = 8E SSB Byte 20:Processor#/Message code)							

Exception B, Format F (Logical inconsistency)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	0x8F							
8	Module ID (F/M = 8F SSB Byte 8)							
9	Routine ID (F/M = 8F SSB Byte 9)							
10	F/M = 8F SSB Byte 10							
11	F/M =8F SSB Byte 11							
12	Internal SSB Serial number							
13								
14	F/M = 8F SSB Byte 12							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID							
21								
22	Exception class (0xB)/Exception code (0xF)							
23	Exception code (F/M = 8F SSB Byte 20:Processor#/Message code)							

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Exception D, Format 1 (SPC report error)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘1’)			
7	Type code (‘111’) (SPC report error)			Not used	Reserved			
8	SPC interruption status register (See SSB04-170 ~ 200)							
9	SPC command step register (See SSB04-210 ~ 230)							
10	SCSI command code (See SSB04-150)							
11	Threshold type (See SSB04-340)							
12	Module ID							
13	Routine ID							
14	Not used							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘D’)				DKA No.			
23	CDEV No.				RDEV No.			

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Exception D, Format 0 (drive report error)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	Type code (‘000’) (drive report error)			Not used	Sense key†			
8	Additional Sense Code+Additional Sense Code Qualifier (See SSB04-250 ~ 330)							
9								
10	SCSI command code††							
11	Threshold type (See SSB04-340)							
12	Module ID							
13	Routine ID							
14	Not used							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘E’)				DKA No.			
23	CDEV No.				RDEV No.			

† Sense key
- x‘0’ : NO SENSE
- x‘1’ : RECOVERED
- x‘2’ : NOT READY
- x‘3’ : MEDIUM ERROR
- x‘4’ : HARDWARE ERROR
- x‘5’ : ILLEGAL REQUEST
- x‘6’ : UNIT ATTENTION
- x‘7’ : DATA PROTECT
- x‘8’ : BLANK CHECK (Not used)
- x‘9’ : VENDOR UNIQUE (Not used)
- x‘A’ : COPY ABORTED (Not used)
- x‘B’ : ABORTED COMMAND
- x‘C’ : EQUAL (Not used)
- x‘D’ : VOLUME OVERFLOW (Not used)
- x‘E’ : MISCOMPARE
- x‘F’ : (RESERVED)

†† SCSI command
- x‘00’ : TEST UNIT READY
- x‘03’ : REQUEST SENSE
- x‘04’ : FORMAT UNIT
- x‘07’ : REASSIGN BLOCKS
- x‘12’ : INQUIRY
- x‘15’ : MODE SELECT
- x‘1A’ : MODE SENSE
- x‘1B’ : START/STOP UNIT
- x‘1C’ : RECEIVE DIAGNOSTIC RESULT
- x‘1D’ : SEND DIAGNOSTIC
- x‘28’ : READ (EXTEND)
- x‘2A’ : WRITE (EXTEND)
- x‘2E’ : WRITE AND VERIFY
- x‘3B’ : WRITE BUFFER

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Exception E, Format 0 (drive report error)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	Type code (‘000’) (drive report error)			Not used	Sense key†			
8	Additional Sense Code+Additional Sense Code Qualifier (See SSB04-250 ~ 330)							
9								
10	SCSI command code††							
11	Threshold type (≠ x‘5X/6X’)							
12	Module ID							
13	Routine ID							
14	Not used							
15	Drive serial number (X‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘E’)				DKA No.			
23	CDEV No.				RDEV No.			

† Sense key
- x‘0’ : NO SENSE
- x‘1’ : RECOVERED
- x‘2’ : NOT READY
- x‘3’ : MEDIUM ERROR
- x‘4’ : HARDWARE ERROR
- x‘5’ : ILLEGAL REQUEST
- x‘6’ : UNIT ATTENTION
- x‘7’ : DATA PROTECT
- x‘8’ : BLANK CHECK (Not used)
- x‘9’ : VENDOR UNIQUE (Not used)
- x‘A’ : COPY ABORTED (Not used)
- x‘B’ : ABORTED COMMAND
- x‘C’ : EQUAL (Not used)
- x‘D’ : VOLUME OVERFLOW (Not used)
- x‘E’ : MISCOMPARE
- x‘F’ : (RESERVED)

†† SCSI command
- x‘00’ : TEST UNIT READY
- x‘03’ : REQUEST SENSE
- x‘04’ : FORMAT UNIT
- x‘07’ : REASSIGN BLOCKS
- x‘12’ : INQUIRY
- x‘15’ : MODE SELECT
- x‘1A’ : MODE SENSE
- x‘1B’ : START/STOP UNIT
- x‘1C’ : RECEIVE DIAGNOSTIC RESULT
- x‘1D’ : SEND DIAGNOSTIC
- x‘28’ : READ (EXTEND)
- x‘2A’ : WRITE (EXTEND)
- x‘2E’ : WRITE AND VERIFY
- x‘3B’ : WRITE BUFFER

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Interruption status codes

1. Interruption related to SCSI reset

Interruption code	Cause of interruption	Conditions for interruption
01h	RESET-CONDITION DETECTED	Reset status has been detected on the SCSI bus.

2. Interruption related to transfer

Interruption code	Cause of interruption	Conditions for interruption
24h	SCSI parity error	A parity error has been detected in the input/output data of the SCSI interface in the current phase.
22h	MPU parity error	A parity error has been detected in the output data of the MPU interface during program transfer (data phase).
21h	DMA parity error	A parity error has been detected in the input/output data of the DMA interface during DMA transfer (data phase).
26h	SCSI parity error & MPU parity error	A parity error has been detected in the input/output data of the MPU and SCSI interfaces during program transfer (data phase).
25h	SCSI parity error & DMA parity	A parity error has been detected in the input/output data of the DMA and SCSI interfaces during DMA transfer (data phase).
29h	Offset error	More REQ/ACK signals have been received in synchronous transfer than the offset value that is set
2Ah	Short transfer period error	SPC could not be tracked during synchronous transfer because the cycle of the received REQ/ACK signal was short.
2Bh	Offset error & Short transfer period error	An offset error and short transfer period error have been detected during synchronous transfer.
2Ch	REQ/ACK timeout	The time that is set for REQ/ACK TIMEOUT has been exceeded.
31h	Disconnected in transfer progress	Bus free status has been detected during phase execution (transfer operation).
32h	Phase error in transfer progress	A phase error has occurred during phase execution (transfer operation).

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3. Interruption related to phase transition

Interruption code	Cause of interruption	Conditions for interruption
54h	Initial phase error*	Inconsistency occurred when the phase of the received C. COMMAND received the first REQ signal.
55h	Initial phase error & MSG received†	An initial phase error occurred and one message was received for the target MSG-IN request.
56h	Initial phase error & STATUS received†	An initial phase error occurred and one STATUS was received for the target STATUS receive request.
42h	Command stop (ATN condition detected)††	During execution of the data phase that failed in phase transition due to the generation of the ATN condition of the initiator, the transfer is stopped at the transfer block boundary and this interruption is reported. (At this time, the data register is empty.)
43h	Command stop (ATN condition detected & MSG received)†	One message was received after responding to the MSG-OUT request of the initiator that failed in phase transition due to the generation of the ATN condition of the initiator. During execution of the data phase, one message is received after responding at the transfer block boundary. (At this time, the data register is empty.)

* If a phase error has occurred and the DATAIN phase has been requested, the operation is as follows:

1) When the target with a nexus is in the asynchronous transfer mode
   One-byte data is received.
2) When the target with a nexus is in the synchronous transfer mode
   The number of bytes for the received REQ signal are received (ACK signal is not asserted).

† Occurs only when the AUTO receive mode is set.

†† Occurs only when the AUTO receive mode is not set.

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4. Interruption related to report

Interruption code	Cause of interruption	Conditions for interruption
60h	Command complete	Received command has ended normally.
64h	Command Reject	1) A command has been received during automatic operation of this SPC (AUTO selection/reselection response). 2) Another command has been received during execution of a command. 3) The message length is 33 or more bytes when the SEND MSG command for EXTEND-MSG has been received.
65h	Command Invalid	1) A command of the target has been received during operation as an initiator. 2) A command of the initiator has been received during operation as a target. 3) A sequential command is present in the user program memory. 4) The received command code is not defined. 5) A command that requires the setting of the data block register/data byte register (MC byte counter) has been received, but the register value is “0”. 6) Transfer is impossible because the CDB length of group 6/7 is set to “0”. 7) The CDB of group 3/4 or a transfer command has been received.
66h	REG parity error detected	A parity error has been detected in the register set by the host MPU.
67h	COMMAND PAUSE	1) The COMMAND PAUSE command was received and processing ended.
68h	Self-diagnostic result “GOOD”	Self-diagnostics are performed, and the result is “normal.”
69h	Self-diagnostic result “NO GOOD”	Self-diagnostics are performed, and the result is “abnormal.”
70h	Disconnected	Bus free status has been detected while making a nexus as an initiator.
71h	REQ Asserted	Next phase execution is requested from the target. This interruption occurs only when no command is received in the nexus.
61h	Command complete (ATN condition detected)	The command ends normally and the ATN condition generated by the initiator is detected only when an ATN signal is asserted when an ACK signal is asserted for the last phase of the executed command.
62h	Command complete (ATN condition detected & MSG received)	A command has ended normally and one message has been received after responding to the ATN condition generated by the initiator. An ATN signal is detected only when an ATN signal is asserted when an ACK signal is asserted for the last phase of the executed command.

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5. Interruption related to selection/reselection

Interruption code	Cause of interruption	Conditions for interruption
82h	Sel/Reselection timeout	The time that is set for selection/reselection timeout has been exceeded.
90h	Reselected	The target has been reset as the initiator.
80h	Selected	The initiator has been selected as the target.
81h	Selected with ATN	The initiator has been selected as the target, and the ATN condition generated by the initiator has been detected.

5. Interruption related to response operation for auto selection/reselection

Interruption code	Cause of interruption	Conditions for interruption
B0h	AUTO mode phase error	The reselection phase changed to a phase other than the MSG-IN phase.
B1h	MSG received	After the reselection phase, one message was received.
A0h	AUTO mode phase error	No ATN signal was asserted in the selection phase. This interruption occurs only when the MSG-OUT phase is set after the selection phase.
A1h	MSG received	After the selection phase, a message other than Identify-MSG was received.
A2h	Illegal Identify MSG received	Identify-MSG was received after the selection phase, but bits 5, 4, and 3 are set to ë1í.
A3h	MSG received with Identify MSG	After the selection phase, Identify-MSG was received, followed by another message.
A4h	unknown CDB received	After the selection phase, an attempt to receive one command was made, but only one byte was received because the CD8 length of group 6 or 7 was unobtainable. This interruption occurs only when the MSG or CMD phase is set after the selection phase.
A5h	unknown CDB received with Identify MSG	After the selection phase, an attempt was made to receive a command following Identify-MSG, but only one byte was received because the CD8 length of group 6 or 7 was unobtainable.
A6h	CMD received **	After the selection phase, one command was received. This interruption occurs only when the MSG or CMD phase is set after the selection phase.
A7h	CMD received with Identify MSG	After the selection phase, Identify-MSG was received, followed by a command.
A8h	CMD received & MSG received	After the selection phase, one command was received. Then one message was received for the attention status. This interruption occurs only when the MSG or CMD phase is set after the selection phase.
A9h	CMD received with Identify MSG received	After the selection phase, Identify-MSG was received, followed by a command. Then one message was received for the attention status.

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Command step

No.	Command name	Function	STEP	Description
1	RESELECTION & 1-MSG	1) Performs reselection. 2) Changes to the MSG-IN phase. 3) Issues a message.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete
2	RESELECTION & N-Byte-MSG	1) Performs reselection. 2) Changes to the MSG-IN phase. 3) Issues a message.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete
3	RESELECTION & TERMINATE	1) Performs reselection. 2) Performs the Terminate sequence.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Transition to the STATUS phase STATUS phase running
			X‘04’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘05’	Message issuance complete Disconnect Command complete
4	RESELECTION & LINK TERMINATE	1) Performs reselection. 2) Performs the LINK-Terminate sequence.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘01’	Nexus established Transition to the STATUS phase STATUS phase running
			X‘03’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete

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No.	Command name	Function	STEP	Description
5	TERMINATE	1) Changes to the STATUS phase. 2) Issues one-byte status. 3) Changes to the MSG-IN phase. 4) Issues a one-byte message. 5) Disconnect	X‘00’	Command received
			X‘01’	During transition to the STATUS phase STATUS phase running
			X‘02’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘03’	Message issuance complete Disconnect Command complete
6	LINK TERMINATE	1) Changes to the STATUS phase. 2) Issues one-byte status. 3) Changes to the MSG-IN phase. 4) Issues a one-byte message.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	Transition to the STATUS phase STATUS phase running
			X‘02’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘03’	Message issuance complete Command complete
7	DISCONNECT SEQUENCE	1) Changes to the MSG-IN phase. 2) Issues a two-byte message. 3) Disconnect	X‘00’	Command received BUS FREE phase awaited
			X‘01’	Transition to the MSG-IN phase MSG-IN phase running
			X‘02’	Two-byte message issuance complete Disconnect Command complete
8	SEND N-Byte-MSG	1) Changes to the MSG-IN phase 2) Issues N-byte messages (two or more messages)	X‘00’	Command received
			X‘03’	Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete
9	RECEIVE N-Byte-CMD	1) Changes to the CMD phase. 2) Receives an N-byte CDB (undefined CDB).	X‘00’	Command received
			X‘04’	Transition to the CMD phase CMD phase running
			X‘05’	All CDB bytes received completely Command complete
10	RECEIVE N-Byte-MSG	1) Transition to the MSG-OUT phase 2) Receives an N-byte CDB (33 bytes or more messages).	X‘00’	Command received
			X‘02’	Transition to the MSG-OUT phase MSG-OUT phase running
			X‘03’	All message bytes received completely Command complete
11	RESELECTION	Performs reselection.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Command complete
12	SET REQ	Asserts REQ.	X‘00’	Command received
			X‘01’	C. Command Complete
13	RESET REQ	Negates REQ.	X‘00’	Command received
			X‘01’	C. Command Complete

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No.	Command name	Function	STEP	Description
14	Disconnect	Releases a BSY signal.	X‘00’	Command received
			X‘01’	C. Command Complete
15	SEND DATA from MPU	1) Changes to the DATA-IN. phase. 2) Issues data in the program transfer mode	X‘00’	Command received
			X‘01’	Transition to the DATA-IN phase DATA-IN phase running
			X‘02’	All data bytes received completely Command complete
16	SEND DATA from DMA	1) Changes to the DATA-IN. phase. 2) Issues data in the program transfer mode	X‘00’	Command received
			X‘01’	Transition to the DATA-IN phase DATA-IN phase running
			X‘02’	All data bytes received completely Command complete
17	RECEIVE DATA from MPU	1) Changes to the DATA-OUT phase. 2) Receives data in the program transfer mode.	X‘00’	Command received
			X‘01’	Transition to the DATA-OUT phase. DATA-OUT phase running
			X‘02’	All data bytes received completely Command complete
18	RECEIVE DATA from DMA	1) Changes to the DATA-OUT phase. 2) Receives data in the program transfer mode.	X‘00’	Command received
			X‘01’	Transition to the DATA-OUT phase. DATA-OUT phase running
			X‘02’	All data bytes received completely Command complete
19	SEND 1-MSG	1) Changes to the MSG-IN phase. 2) Issues a message.	X‘00’	Command received
			X‘01’	Transition to the MSG-IN phase MSG-IN phase running
			X‘02’	All message bytes issued completely Command complete
20	RECEIVE MSG	1) Changes to the MSG-OUT phase. 2) Issues a message.	X‘00’	Command received
			X‘01’	Transition to the MSG-OUT phase MSG-OUT phase running
			X‘02’	All message bytes received completely Command complete
21	SEND STATUS	1) Changes to the STATUS phase. 2) Issues one-byte status.	X‘00’	Command received
			X‘01’	Transition to the STATUS phase STATUS phase running
			X‘02’	STATUS issuance complete Command complete
22	RECEIVE CMD	1) Changes to the CMD phase. 2) Receives CDB.	X‘00’	Command received
			X‘01’	Transition to the CMD phase CMD phase running
			X‘02’	All CDB bytes received completely Command complete

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SCSI sense key

Sense key	Definition
0_H	NO SENSE: Indicates that the key information reported from the specified logical unit is not for specific use. This indicates that the command has ended normally.
1_H	RECOVERED ERROR: Indicates that the last command has ended normally after recovery operation by the controller. Details can be determined by checking the additional sense byte and information byte.
2_H	NOT READY: Indicates that the addressed logical unit cannot be accessed. Recovery from this status may require operator's intervention.
3_H	MEDIUM ERROR: Indicates that the command has ended in the irrecoverable error status due to damage to the medium or an error in recorded data.
4_H	HARDWARE ERROR: Indicates that the controller has detected an irrecoverable hardware error (e.g., controller failure, device failure, parity error, etc.) during execution of a command or self-diagnostics.
5_H	ILLEGAL REQUEST: Indicates that illegal data has been detected in the CDB or the additional parameter given as data for some commands (FORMAT UNIT, MODE SELECT, etc.). The controller terminates the command without changing the medium if an invalid parameter has been detected in the CDB. If an invalid parameter has been detected in the additional parameter given as data, the medium may already have been changed.
6_H	UNIT ATTENTION: Indicates that the unit attention status has occurred because the MODE SELECT parameter has been changed or the controller has been reset.
7_H	DATA PROTECT: Indicates that a write command has been received when write to media is prohibited. Write operation is not performed.
8_H	BLANK CHECK. (Not used)
9_H	Vendor Unique. (Not used)
A_H	COPY ABORTED. (Not used)
B_H	ABORTED COMMAND: Indicates that the controller has aborted the command. The host can retry the command for recovery.
C_H	EQUAL. (Not used)
D_H	VOLUME OVERFLOW. (Not used)
E_H	MISCOMPARE: Data comparison failed during byte comparison and verification. Or, data in the WRITE BUFFER command from the same host was changed before execution of the READ BUFFER command.
F_H	Reserved

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Additional sense code + Additional sense code Qualifier

Sense key	Code*	Error name	Description
0	00 00	No Additional Sense Information	No valid additional sense information.
4	01 00	No Index/Sector Signal	• Index signal cannot be detected. • Sector signal cannot be detected.
1/4	02 00	No Seek Complete	The Seek operation of the drive cannot be performed properly.
1/4	03 00	Write Fault	Drive Write Fault has been detected.
1/4	03 80	Write at inhibit condition	The Write is attempted under the write inhibit condition.
2	04 00	Drive Not Ready	• Drive Ready signal cannot be detected. • The drive cannot be accessed.
2	04 01	Drive is in Progress of Becoming Ready	The drive is not ready and will soon get ready.
2	04 02	Drive Not Ready, Initializing Command Required	The drive is not ready. Issue the START UNIT command to get it ready.
2	04 04	Drive Not Ready, Format in Progress	The drive is not ready. (Format in progress)
2	04 80	Drop Ready	Drive got not Ready because motor has stopped incorrectly.
2	05 00	Drive Not Selected	Drive cannot be selected.
1/4	06 00	No Track Zero Found	Positioning to track zero is impossible.
4	08 00	Logical Unit Communication Failure	A drive interface error has occurred. (MESDI I/F Error)
4	08 01	Logical Unit Communication Time Out	A drive interface time-out error has occurred. (MESDI I/F Time Out)
4	08 02	Logical Unit Communication Parity Error	A drive interface parity error has occurred. (MESDI I/F Parity Error)
1/4	09 00	Track Following Error	Track positioning failed.
1/4	09 80	Track Positioning Error	The track is out of position between ATN OFF and MESDI command (seek) issued.
1/4	09 81	ESDI Invalid Command	An invalid ESDI command has occurred.
1	0C 01	Write Error Recovered with Auto Reallocation	Write Error Recovered with Auto Reallocation.
3	0C 02	Write Error Auto Reallocation Failed	Automatic reallocation was attempted for an ID error detected during a write, but it failed.
1	0C 81	Auto REA Exhausted with Write Auto REA	Auto reassignment resulted in failure because of over- threshold.
1/3	10 00	ID CRC Error	A CRC or ECC error has occurred in the ID field.
3	11 00	Unrecovered Read Error	An error has occurred in the DATA field (retry not applied).

* The higher-order byte of the code indicates an additional sense code (byte 8), and the lower-order byte an additional sense code qualifier (byte 9).

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Sense key	Code	Error name	Description
3	11 01	Read Retries Exhausted	A retry was attempted for a DATA field read error, but recovery was impossible (error correction not applied).
3	11 02	Error Too Long to Correct	ECC correction of the DATA field read error is impossible.
3	11 04	Unrecovered Read Error-Auto Reallocation Failed	Auto reallocation was attempted to a correctable error but failed.
3	11 82	Error Too Long to Multi-Symbol Soft Correction	Can not correct a Read error in DATA field with Multi-Symbol Soft Correction.
1/3	12 00	No Address Mark Found in ID Field	No address mark cannot be detected in the ID field.
1/3	13 00	No Address Mark Found in Data Field	No address mark cannot be detected in the DATA field.
1/3	13 80	Sprit Data AM Not Found	AM in Sprit Data is not found.
1	13 E1	VFO Data AM Recovered (Read Gate Delay:4, PLL:8)	Data AM Error is recovered with Read Gate Delay:4 byte, PLL:6 byte.
1	13 E2	VFO Data AM Recovered (Read Gate Delay:0, PLL:6)	Data AM Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1	13 E3	VFO Data AM Recovered (Read Gate Delay:8, PLL:6)	Data AM Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
1	13 E4	Split Data AM Recovered (Read Gate Delay:4, PLL:8)	Split Data AM Error is recovered with Read Gate Delay:4 byte, PLL:8 byte.
1	13 E5	Split Data AM Recovered (Read Gate Delay:0, PLL:6)	Split Data AM Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1	13 E6	Split Data AM Recovered (Read Gate Delay:8, PLL:6)	Split Data AM Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
1/3	14 01	No Record Found	A block with a consistent ID field cannot be detected.
3	14 03	Write Fault (Require Reassign)	Write Fault of Drive is detected. (Require Reassign)
1/3	14 80	Flag Error	The flag in the ID field is inconsistent.
1/3	14 81	Drive Fault with ATN OFF	A drive fault was detected when ESDI ATN is off.
1/3	14 82	Mismatch Sector ID	The sector address in the ID field is inconsistent.
1/3	14 83	Drive Error with no Factor	A drive error was detected, but all error cause were off.
3	14 84	ID Check Code Error at ID ON the Fly	Check Code error is detected in ID On the Fly.
3	14 91	Uncorrectable Data Error using previous sector ID	A data error was recovered by a previous sector ID retry, but the data is uncorrectable error by ECC.
3	14 93	Data AM not found using previous Sector ID	A previous sector ID retry was attempted, but the data AM of the data cannot be detected.
3	14 94	Sprit Data AM Not Found using Previous Sector ID	A previous sector ID retry was attempted, but the Sprit data AM of the data cannot be detected.
1	14 98	ECC Correctable Error using previous Sector ID	A data error was recovered using previous sector ID retry, but the data is recovered data by ECC.

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Sense key	Code	Error name	Description
3	14 A0	Reassign Fault because of Reserve Sector No REC	A reassign command failed. (The reserved sector is No REC.)
3	14 A1	Previous Sector Error with Previous Sector ID retry	A previous sector ID retry was attempted, but an error occurred in previous ID.
3	14 B1	Error too much to recover using previous ID	A previous sector ID retry cannot execute. (Number of error ID ≥ 2)
1/3	14 C0	ID On the Fly Correction Error	ID error is detected with ID On the Fly correction and CCH not coincident.
1/3	14 E1	VFO ID Error Recovered (Read Gate Delay:4, PLL:8)	VFO ID Error is recovered with Read Gate Delay:4 byte, PLL:8 byte.
1/3	14 E2	VFO ID Error Recovered (Read Gate Delay:0, PLL:6)	VFO ID Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1/3	14 E3	VFO ID Error Recovered (Read Gate Delay:8, PLL:6)	VFO ID Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
3	15 00	Seek Positioning Error	The target address cannot be sought.
1/3	15 01	Mechanical Positioning Error	A seek error has occurred.
1/3	15 02	Positioning Error Detected by Read of Medium	A seek ended normally but the address was not the target address.
1/3	15 B0	Drive Check Code Error	The drive found a check code error (Read).
1/3	15 DA	SCTSTUS Register Error	An error has occurred in SCTSTUS register.
3	15 DB	SCTSTUS Register Error (Index Pulse Error)	An index pulse error has occurred in SCTSTUS register.
1/3	17 XX	Recovered Data with Retries	Retry Succeeded in error recovery. XX depends on retry method.
1	17 00	Recovered Data with No Error Correction Applied	Indicates that a retry has succeeded in error recovery with no Error Correction Applied. (Retries: max. 3 times)
1	17 01	Recovered Data with Retries	A retry has succeeded in error recovery with change of data strobe offset, slice level, etc.
1	17 02	Recovered Data with Positive Head Offset	A retry with a positive head offset has succeeded in error recovery.
1	17 03	Recovered Data with Negative Head Offset	A retry with a negative head offset has succeeded in error recovery.
1	17 05	Recovered Data Using Previous Sector ID	A data recovery has been executed by a previous ID retry.
1	17 06	Recovered Data without ECC-Data Auto Reallocation	Recovered with Auto Reallocation, without Error Correction Applied.
1	17 85	Recovered Data with Physical SCT Pulse Read	Error is recovered with Physical Sector pulse read.
1	17 86	Auto REA Exhausted without ECC Correction	Auto Reallocation (with no Error Correction Applied) Exhausted.
1/3	17 D6	Drive Overrun Occurred Recovered:RTRY Recovered	Drive Overrun occurred by hardware failure. Recovered by retry.

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Sense key	Code	Error name	Description
1	17 E1	Data Error Recovered by VFO (Read Gate Delay:4, PLL:8)	Data Error is recovered with Read Gate Delay:4 byte, PLL:8 byte.
1	17 E2	Data Error Recovered by VFO (Read Gate Delay:0, PLL:6)	Data Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1	17 E3	Data Error Recovered by VFO (Read Gate Delay:8, PLL:6)	Data Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
1	18 00	Recovered Data with Error Correction Applied	Error recovery has been accomplished with ECC correction (no retry).
1	18 01	Recovered Data with ECC and Retries Applied	Indicates that a retry has succeeded in error recovery with ECC correction.
1	18 02	Recovered Data with ECC and/or Retries Data Auto Reallocated	Recovered Data with ECC and/or Retries Data Auto Reallocated.
1	18 80	Recovered Data without Retries or Multi-Symbol Soft Correction	Recovered Data without Retries or Multi-Symbol Soft Correction.
1	18 81	Recovered Data with Retries and Multi-Symbol Soft Correction	Recovered Data with Retries and Multi-Symbol Soft Correction.
1	18 82	Auto REA Exhausted with ECC Correction	After recovering data with ECC correction, Auto reassignment resulted in failure because of over-threshold.
1/3	19 02	Defect List Error in Primary List	An error has occurred during Primary (P) list access.
1/3	19 03 04 05 06	Defect List Error in Grown List	An error has occurred during Grown (G) list access.
5	1A 00	Parameter List Length Error	Parameter list length is invalid.
1/3	1C 01	Primary Defect List Not Found	Positioning to the Primary (P) list failed.
1/3	1C 02	Grown Defect List Not Found	Positioning to the Grown (G) list failed.
E	1D 00	Miscompare During Verify Operation	Indicates that a data compare error has occurred during Verify operation.
5	20 00	Invalid Command Operation Code	The operation code is invalid.
5	21 00	Logical Block Address out of Volume Range	A logical address (LBA) beyond the capacity of the medium has been pointed out.
5	21 44	Logical Block Address out of Zone Range	Illegal access is made over a zone in LBA Mapping.
5	24 00	Illegal Field in CDB	An error is in the CDB command.

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Sense key	Code	Error name	Description
5	24 81	Odd Byte Data Out Request in Wide Transfer	Odd Byte Data Out is requested in Wide Transfer.
5	24 82	Odd Byte Data Out Request	Odd bytes data out requirement has occurred.
5	25 00	Invalid LUN	The LUN indicated in the CDB command or IDENTIFY message is not supported.
5	26 00	Invalid Field in Parameter List	An error is in the parameter list.
5	26 01	Parameter Not Supported	An unsupported parameter has been received.
5	26 02	Parameter Value Invalid	A parameter value is invalid.
5	26 03	Threshold Parameters Not Supported	Received threshold parameters that not supported.
5	26 80	Microprogram Download Error	Illegal Product type name is detected in the download file.
7	27 00	Write Protected	The drive is write-protected.
6	29 00	Power On, Reset or Bus Device Reset or Reboot Occurred	• A Power On Reset has occurred. • A Bus Device Reset has occurred. • A SCSI Bus Reset has occurred. • Reboot has occurred.
6	2A 00	Parameter Changed	• Mode/Log parameters changed. • Parameters were changed by MODE SELECT command. • Set Mode/Log parameters because drive condition changed from not ready to ready.
6	2A 01	Mode Parameters Changed	• Mode/Log parameters changed. • Key = 2 : Format Mode Parameters Changed (Page 3, 4).
6	2A 02	Log Parameters Changed	Log Parameters Changed.
6	2F 00	Command Cleared by Another Initiator	Command Cleared by Another Initiator.

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Sense key	Code	Error name	Description
2/3	31 00	Medium Format Corrupted	The medium is not correctly formatted. It must be reformatted by the FORMAT command.
3	31 01	Format Command Failed	The FORMAT command has ended abnormally.
1	31 F0	ETF Cylinder Read Error	ETF Cylinder Read Error has occurred in Initial Formatting, and treats as it has no P-list.
1	31 F1	ETF Cylinder ESDI Defect List Check Error	ETF Cylinder ESDI Defect List Check Error has occurred in Initial Formatting, and treats as it has no P-list.
1	31 F2	M-List Write Error	M-List Write Error has occurred in Initial Formatting.
1/4	32 00 32 8X	No Defect Spare Location Available	Reallocation is impossible because of alternate area shortage.
1/3	32 01	Defect List Update Failure	Updating the Grown (G) list failed.
1	37 00	Rounded Parameter	The parameter value has been rounded because it cannot be handled as it is
1	3D 00	Invalid Bits in Identify Message	Invalid bits have been detected in the Identify message.
2	3E 00	Logical Unit Has Not Self-Configured Yet.	The self-configuration of the drive has not been determined yet. Initial Formatting has not completed.
2	3E 01	Program Load Error	Program Load Error.
2	3E 02	Program Load Error at CSN	Program Load Error at CSN.
4	3E 03	Can’t found Program with Program Loader	A program (loaded by program loader) cannot be found.
4	3E 04	Check SUM Error with Program Loader	A SUM check error detected during a program loading.
4	3E 05	Can’t found end Mark with Program Loader	An end mark of partitioned file cannot be found when a program load. (Does not occur.)
6	3F 00	Target Operating Conditions Have Changed	Target Operating Conditions Have Changed.
6	3F 01	Microcode Has been Changed	A microcode has been changed by downloading microcode.
6	3F 03	Inquiry Data Has Changed	Inquiry data has changed. (by switching ROM-RAM)

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Sense key	Code	Error name	Description
4	40 00	RAM Failure	RAM failure detected.
4	42 00	Power On or Self test Failure	Indicates that an error has occurred during Power On Diagnostic. _ MPU error _ TIMER error _ ROM error _ Disk controller error _ Initial Formatting Failure _ RAM diagnostic error _ Buffer error
4	42 80	Hard Register Error in Send Diag Self Test	Hardware Register diag error is detected in Send Diag Self Test.
B	43 00	Message Error	The message is rejected and operation cannot continue.
4	44 00	Internal Target Error	A hardware/firmware error has been detected in the controller during execution of a command.
B	44 00	Write ABORT with Array Mode	Received ABORT message in writing with Array Mode.
4	44 80	Pin occurred with Forced Write After	A PIN occurred at forcible write after. (only in case 8MB cache)
4	44 90	Management Data Read Error	A read process for management data in a management area was failed.
4	44 91	Multi Track R/W Error	A read/write process for multi track in a management area was failed.
4	44 97	Master Data Read Error	A read process for the master data in a management area was failed.
4	44 98	Can’t Multi Track Write Remain Trackless	A write process for a management area was failed because remain track is one.
4	44 99	Multi Track Write Error	All write operations for a management area were failed.
4	44 9E	Master Data Write Error	A write process for master data of management area was failed.
4	44 9F	Time Out in CTL Area Access	Time Out Error is detected when Control Area is accessed.
4	44 A0	REA Sector not found	The sector for reassignment cannot be found.
4	44 A1	Reassign Data Restore Fail	Reassign Data Restore Failed.
4	44 A2	Reassign Sector ID Not Found (ID Misscompare)	Sector ID to be reassigned can not be found.
4	44 A3	No Defect Spare Location Available at Skip REA.	No Spare Sector is available for Skip Reassign.
4	44 A4	ID String Check Error	Reassign failed due to ID String check error.
4	44 A5	Reassign Data Save Error	Reassign Data Save Error.
4	44 A6	Reassign ID Write Error	Source sector ID for Reassign can not be updated.
4	44 A9 AD	BASM acceding order error	BASM acceding order error has occurred during reassignment.

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Sense key	Code	Error name	Description
4	44 AB AC	G List irregular Order	G List acceding order error has occurred.
4	44 AE	BATM irregular Order	BATM acceding order error has occurred.
4	44 B0	HDC FIFO Error (Check Code Error etc.)	HDC FIFO Error is detected.
4	44 B1	SCSI FIFO Error (Check Code Error etc.)	SCSI FIFO Error is detected.
4	44 C0	HDC DMAC Error	HDC DMAC Error is detected.
4	44 C1	SCSI DMAC Error	SCSI DMAC Error is detected.
4	44 D0	HDC Sequencer Setting Mismatch	HDC Sequencer setting values have compare check error.
4	44 D1	HDC DMA Next Condition Full	Can not set DMA due to Next being full after Current is finished.
4	44 D2	Offline ECC Correction Time Out	Time out is detected after initiating HDC for Offline one burst error correction.
4	44 D3	HDC Time Out	Time out is detected after initiating HDC for R/W.
4	44 D4	HDC Illegal Stop	HDC Stopped illegally.
4	44 D5	STRD Register Error	Error is detected in STRD Register.
4	44 D6	EERD Register Error	Error is detected in EERD Register.
4	44 D7	ESDIERR Register Error	Error is detected in ESDIERR Register.
4	44 D8	ECSTR Register Error	Error is detected in ECSTR Register.
4	44 D9	SST Register Error	Error is detected in SST Register.
4	44 DA	SCTSTUS Register Error	An error has occurred in SCTSTUS register.
4	44 DF	Error Factor Analysis Error	Error factor can not be identified.
4	44 F0	Spare Head Select Error	Wrong Jumper setting for Spare Head is made.
4	44 F1	Invalid Logical Cylinder Count	Number of Logical Cylinders returned from Drive ROM is out of Extent.
4	44 FF	Multi Track R/W Parameter Error	An internal parameter is detected in multi track R/W operation.
B	45 00	Select/Reselect Failed	_ Reselection Time Over has been detected. _ Invalid Select On has been detected.
B	47 00	SCSI Parity Error	A SCSI bus parity error has occurred.
B	48 00	Initiator Detected Error Message Received	The INITIATOR DETECTED ERROR message has been received from the initiator.
B	49 00	Invalid Message Error	An invalid message has been received.
B	4A 00	Command Phase Error	An error occurred in the COMMAND phase.
B	4B 00	Data Phase Error	An error occurred in the DATA phase.
4	4C 00	Logical Unit Failed Self-Configured	Microcode or parameter loading failed at the startup of the controller.
4	4C 80	RAM Configuration Load Error	A loading process for configuration information for RAM initialization was failed.
4	4C 90	Program Change Error	Incompatible micro code exchange was attempt.
4	4E 00	Overlapped Commands Attempted	(Does not occur.)

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Sense key	Code	Error name	Description
1	5B 00	Log Exception	Log Exception detected.
6	5B 01	Threshold Condition Met	Threshold Condition Met.
1	5B 02	Log Counter at Maximum	Log Counter has reached at Maximum.
1	5B 03	Log List Codes Exhausted	Log List Codes Exhausted.
4/6	5C 00	RPL Status Change	RPL Status has changed.
6	5C 01	Spindles Synchronized	Spindles Synchronized.
1/4/6	5C 02	Spindles Not Synchronized	Spindles Not Synchronized.
1	80 00	Read with Pin Hit	Read with Pin Hit. (only in case 8MB cache)
4	81 00	LA Check Error	LA Error is detected within Drive.
4	94 00	Auto-Reallocation Fail at No REC Sector	Auto reassignment failed on No REC sector.
1	AE 00	Spare Sector less then Threshold	There are few spare sector for alternate sector.
3	C2 00	Reassign required 11, 13, 14 Error Occurred with ORM	Reassign required error (code = 11,13,14) occurred in ORM. (Only in ORM Logging)
3	C4 00	Reassign required 11, 13, 14, 18 Error Occurred with ORM	Reassign required error (code = 11,13,14,18) occurred in ORM. (Only in ORM Logging)
3	E0 00	Read Error with 10 Retry SHR LOG Only	Read Error with 10 Retry (without Uncorrectable Error, without Error in Correction Applied and without AM Not Found). (SHR LOG Only)
3/4	E1 00	Uncorrectable Error with 10 Retry SHR LOG Only	Uncorrectable Error with 10 Retry. (SHR LOG Only)
3	E2 00	Uncorrectable Error with 10 Retry SHR LOG Only	Uncorrectable Error with 10 Retry. (SHR LOG Only)
3/4	E3 00	AM Not Found Error with 10 Retry SHR LOG Only	AM Not Found Error with 10 Retry, and Auto Reallocation Applied. Key = 4 : Auto Reallocation Failed. (SHR LOG Only)
3	E4 00	Correctable Error Sector No Same with 10 Retry SHR LOG Only	Correctable Error Sector No Same with 10 Retry. (SHR LOG Only)
4	E5 00	10 Retry Error Sector Auto Reallocation Failed SHR LOG Only	10 Retry Error Sector, and Auto Reallocation Failed. (SHR LOG Only)
3	E6 00	Another Sector Error with 10 Retry SHR LOG Only	Another Sector Error with 10 Retry. (SHR LOG Only)

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Threshold type

Code	Threshold (failure) type	Code	Threshold (failure) type
00	CHA CHK1A	30	Cache 1 bit correctable error
01	CHA CHK1B	31	Cache uncorrectable error
02	CHA CHK3	32	Cache 2 bits correctable error
03	CHA CHK2	33	CPC check error
04	CHA ADP temporary error	40	SCSI port failure
05	LCM hardware error	41	Drive mechanism recovered error
06	BSA F bus open	42	Drive mechanism unrecovered error
07	BSA LIVEINS	43	Drive media recovered error
08	BSA check error	44	Drive media unrecovered error
09	SMP M bus open	45	Drive R/W recovered error
0A	SMP M bus check error	46	Drive R/W unrecovered error
0B	SMP H/L check error	47	Drive interface recovered error
10	DKA CHK1A	48	Drive interface unrecovered error
11	DKA CHK1B	49	Controller recovered error
12	DKA CHK3	4A	Controller unrecovered error
13	DKA SCA temporary error	4B	SCSI interface recovered error
14	DKA DRR temporary error	4C	SCSI interface unrecovered error
16	BSA F bus open	4D	Drive I/O read error
17	BSA LIVEINS	4E	Drive I/O write error
18	BSA check error	60	SVP interface error
19	SMP M bus open	FF	Invalid threshold type
1A	SMP M bus check error		
1B	SMP H/L check error		
20	Shared memory correctable error		
21	Shared memory uncorrectable error		
22	SMC M bus open		
23	SMC H/L bus open		

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Exception E, Format 0 (LDEV blockade/Pin volume detected/Write inhibited) (Note 1)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘0’)			
7	Type Code (‘000’)			Not used				
8	Ready	Enable	SSB pending	Not used				
9	Not used							
10	Media maintenance reserve	Pin volume	Write inhibited	Not used				
11	Not used							
12	Module ID (Note 2)							
13	Routine ID (Note 2)							
14	Not used							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘E000’)							
23								

(Note 1) Byte 0, Bit 3 (device check) is set to 1.

(Note 2) Module ID · Routine ID

x‘5011/501C/5202’ ; LDEV blockade

x‘501A/501B’ ; PIN volume detected

x‘6605/6697/6705/6784/6805/6853/6909/6953’ ; Write inhibited

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Exception E, Format 0 (LDEV not ready) (Note 1)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte 4 valid	Bytes 29 to 31 valid	Not used	Format (x‘2’)			
7	Type Code (‘000’)			Not used	Not used			
8	Ready	Enable	SSB pending	0	0	0	0	0
9	x‘00’							
10	Media maintenance reserve	Pin volume	0	0	0	0	0	0
11	Host type	DKC type	0	0	DKU type			
12	Module ID (x‘50’/x ‘52’)							
13	Routine ID (x‘1C’/x‘02’)							
14	Not used							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘E210’)							
23								

(Note 1) Byte 0, bit 1 (intervention required) is set to 1.

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SSBLOG SECTION

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• Byte27 = 74 (SPC report error) SSBLOG05-180
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• Byte27 = 81 & Byte34:b4-7 = 0 (Shared Memory Failure) SSBLOG05-220
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• Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 01 (LCP Failure:CHK-2/ADP I/F Error) SSBLOG05-370
• Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 02 (LCP Failure:Link Recieve Error) SSBLOG05-390
• Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 0C (LCP Failure:Long Write Data) SSBLOG05-410
• Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 0E (LCP Failure:Timeout) SSBLOG05-430
• Byte27 = 88 & Byte34:b4-7 = A & Byte28 ≠ 01/02/0C/0E (LCP Failure:Others) SSBLOG05-450
• Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 01 (MCP Failure:CHK2/ADP I/F ERR/BO P-ERR) SSBLOG05-470
• Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 0E (MCP Failure:Timeout) SSBLOG05-500
• Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 80 (MCP Failure:Burst Failed) SSBLOG05-530
• Byte27 = 89 (SCSI Interface CHA CHK2) SSBLOG05-670
• Byte27 = 8A (Disk Adapter CHK2) SSBLOG05-1220
• Byte27 = 8B (DRR CHK2) SSBLOG05-1890
• Byte27 = 8C (SVP Failure) SSBLOG05-2270
• Byte27 = 8D (Power Failure) SSBLOG05-2360
• Byte27 = 8E & Byte34 = X0 & Byte28 = 0X/1X/2X/3X/FE (CHK1A/WCHK1) SSBLOG05-2400
• Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 54/50 ~ 54 (CHA CHK1B) SSBLOG05-2930
• Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) SSBLOG05-3080
• Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) SSBLOG05-3200
• Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78 (DKA CHK1B) SSBLOG05-3043
• Byte27 = 8E & Byte34 = X0 & Byte28 = 9X (DKA CHK1B (SRAM P/K)) SSBLOG05-3044
• Byte27 = 8E & Byte34 = X0 & Byte28 = F0 (Microprogram detected WCHK1) SSBLOG05-3460
• Byte27 = 8E & Byte34 = X0 & Byte28 = F1 (Microprogram CHK1A) SSBLOG05-3540
• Byte27 = 8E & Byte34:bit4-7 = 1 (Selective Reset) SSBLOG05-3560
• Byte27 = 8E & Byte34:bit4-7 = 3 (Wait SENSE Timeout) SSBLOG05-3590
• Byte27 = 8E & Byte34:bit4-7 = 5 (CHK1B Reset) SSBLOG05-3610
• Byte27 = 8E & Byte34:bit4-7 = 6 (DKC Internal Reset) SSBLOG05-3630
• Byte27 = 8E & Byte34:bit4-7 = 7 (LCP Internal Reset) SSBLOG05-3650
• Byte27 = 8E & Byte34:bit4-7 = 8 (Force Reset) SSBLOG05-3670
• Byte27 = 8E & Byte34:bit4-7 = 9 (Logical Inconsistency Reset) SSBLOG05-3690
• Byte27 = 8F (Logical Inconsistency) SSBLOG05-3710
• Byte27 = 9F (Trace data/Log data) SSBLOG05-3730
• Byte27 = EC (Environment Monitor Detected DKC Failure) SSBLOG05-3750
• Byte27 = EE (Environment Monitor Detected DKU Failure) SSBLOG05-3780

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- Byte27 = F0 (Opearation terminated) SSBLOG05-3810
- Byte27 = F1 (Micro-program Detected Cacher Failure) SSBLOG05-3830
- Byte27 = F2 (Cache Failre) SSBLOG05-3850
- Byte27 = F6 (CFW Access not Authorized) SSBLOG05-3990
- Byte27 = FA (NVS Terminated) SSBLOG05-4010
- Byte27 = FB (HRC/HODM Pair suspend) SSBLOG05-4030
- Byte27 = FF (Cache/Shared Memory/M bus/F bus/J bus warning) SSBLOG05-4050
- Byte0F:Bit1 = 1 & Byte36-37 = 08C1 (Machine Condition Exception) SSBLOG05-4280
- Byte0F:Bit1 = 1 & Byte36-37 = 0212 (Command Sequence Exception:Incomplete Domain) SSBLOG05-4300
- Byte0F:Bit1 = 1 & Byte36-37 = 4XXX (Data exception) SSBLOG05-4320
- Byte36 = 6F (Subsystem Information) SSBLOG05-4350
- Byte36:Bit0-3 = D & Byte27:bit0-2 = 7 (SPC Detected Failure) SSBLOG05-4360
- Byte36:Bit0-3 = D & Byte27:bit0-2 = 0 (Drive Detected Failure) SSBLOG05-4460
- Byte36:Bit0-3 = E & Byte2C:bit0-7 ≠ 5X/6X (Drive Detected Failure) SSBLOG05-4480
- Byte36 = E0 & Byte2C = 5X/6X & Byte20:b3 =1 (LDEV blockade/Pin VOL detected/Write inhibited) SSBLOG05-4540
- Byte36-37 = E210 & Byte2C = 5X/6X & Byte20:b1 = 1 (Intervention requested:LDEV not ready) SSBLOG05-4560
- Byte26:b4-7 = F & Byte3C = F1 (DKC SIM) SSBLOG05-4580
- Byte26:b4-7 = F & Byte3C = F2 (CACHE SIM) SSBLOG05-4610
- Byte26:b4-7 = F & Byte3C = FE (Device SIM) SSBLOG05-4640
- Byte26:b4-7 = F & Byte3C = FF (Media SIM) SSBLOG05-4660
- Reference code of Mp detected SIM SSBLOG05-4680
- Reference code of SVP detected SIM SSBLOG05-4840

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1 Introduction

The internal SSB (SSB Log) information is presented as either 24-byte compatibi-lity SSB format or ECKD 32-byte SSB format. The 24-byte SSB is used for DKC and the 32-byte SSB is used for DKU.

The internal SSB is devided the following sections:

- Internal SSB common information
  This information is used for SSB management, and same for all formats.

- External SSB information presented to host.
  This is 32 bytes sense information presented to host as SSB.

- Format-dependent information
  This is auxiliary information for error analysis.

See Fig.1-1 and Fig.1-2.

Note : The byte offset in SSB logs is described by hexadecimal number.
This section is correspondind to SSB log on SVP.
If you want to know about SSB which was reported to host, you should see SSB section.

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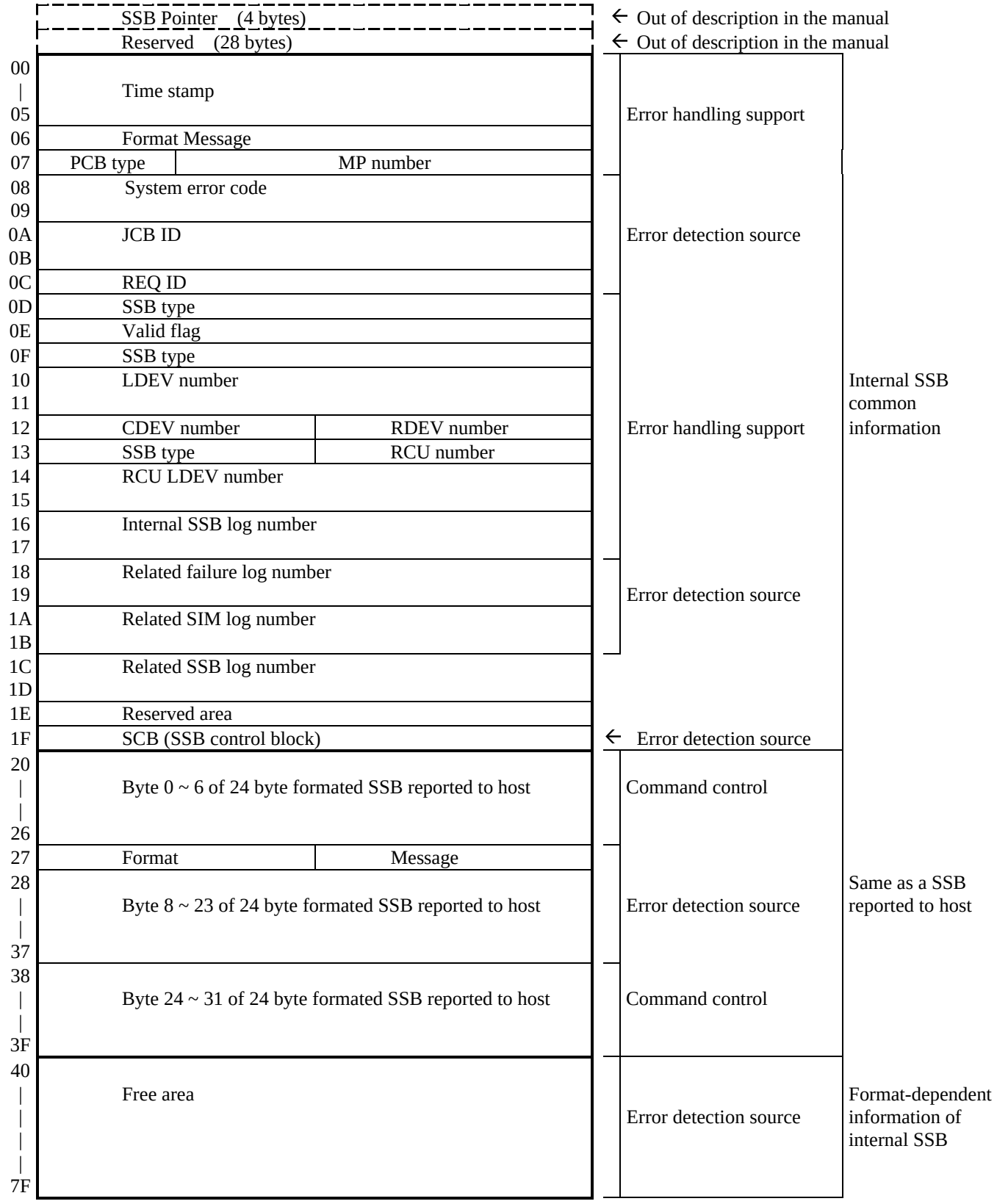

Fig.1-1 Outline of 24-byte Format Internal SSB

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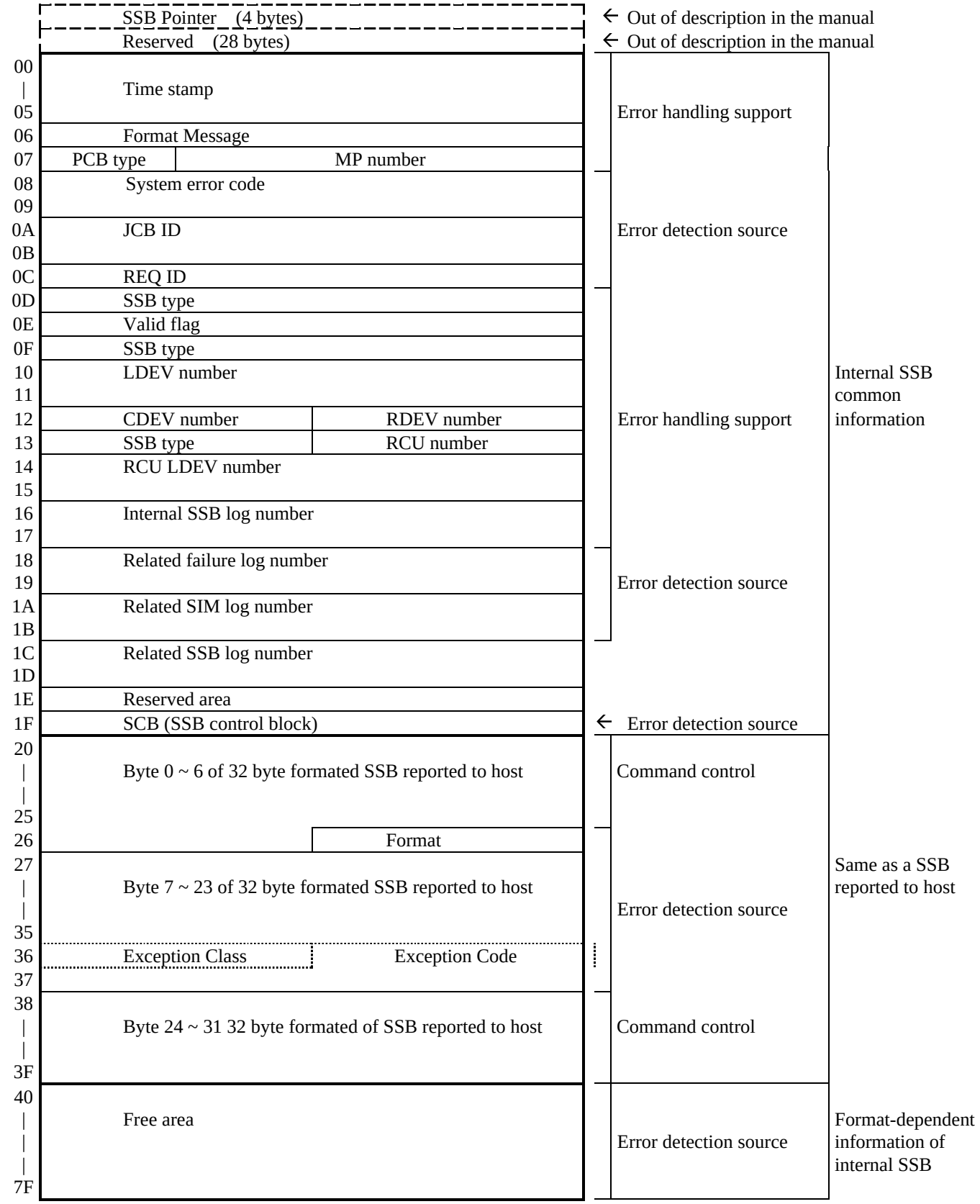

Fig.1-2 Outline of 32-byte Format Internal SSB

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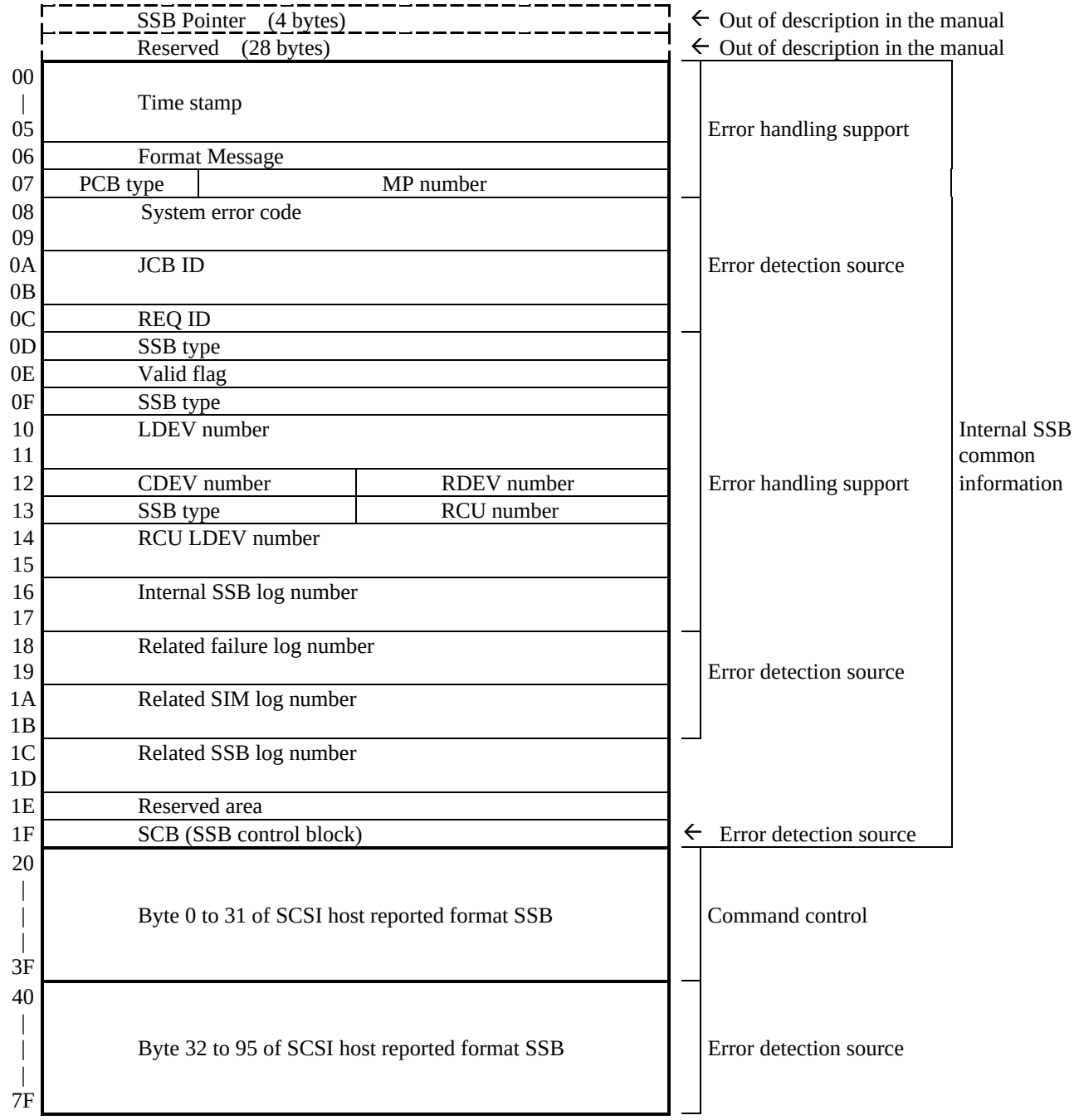

Fig.1-3 Overview of SCSI Host Report Format Internal SSB

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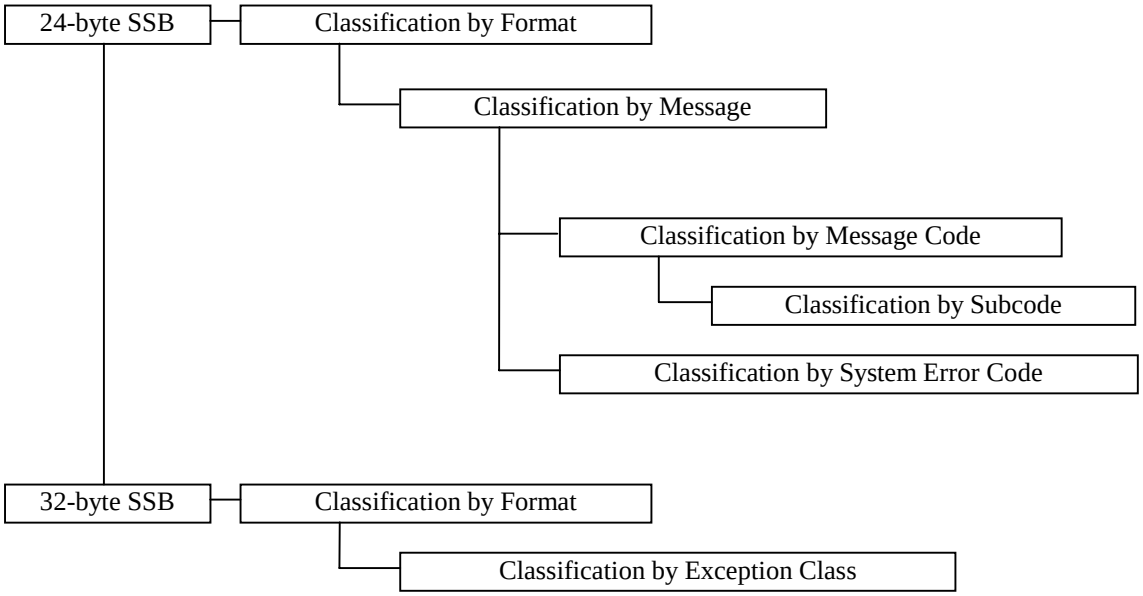
2 Classification of Internal SSB

The internal SSB is classfied as the following figure, and Fig.2-1 for detail.



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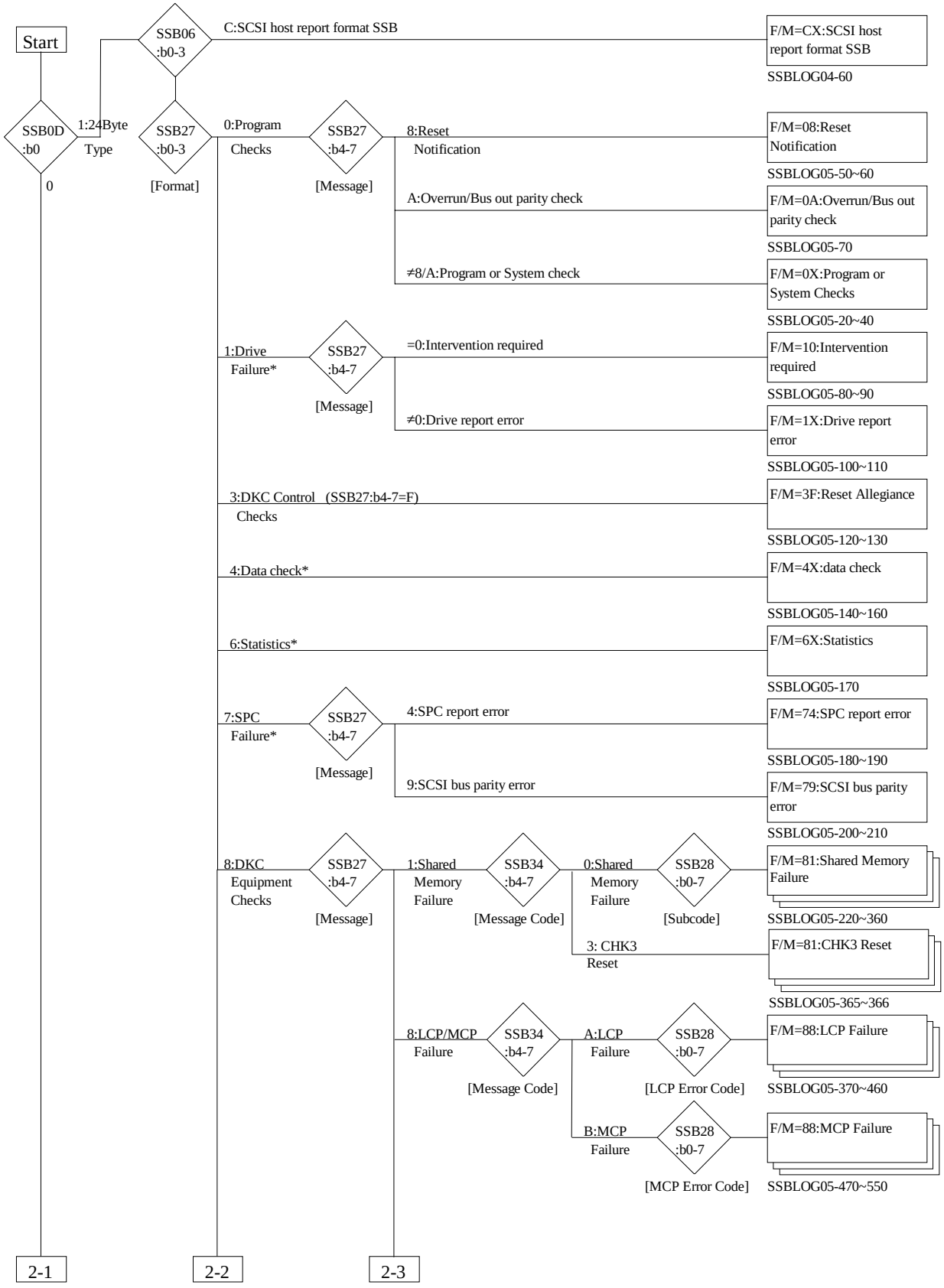

* : For DKU86I (IBM 3380 emulation mode) only.

Fig.2-1 Search method for SSB tables (1/5)

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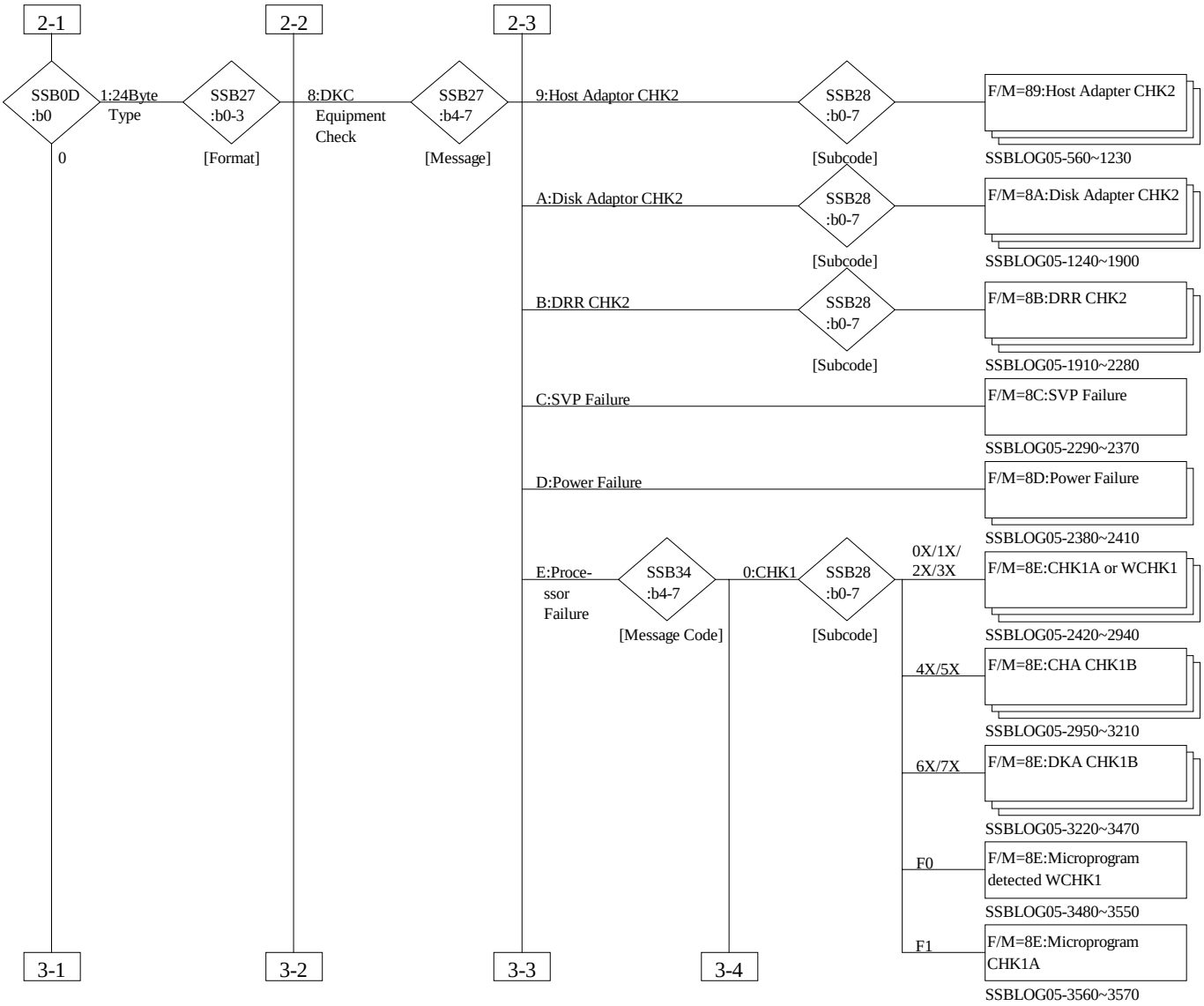

Fig.2-1 Search method for SSB tables (2/5)

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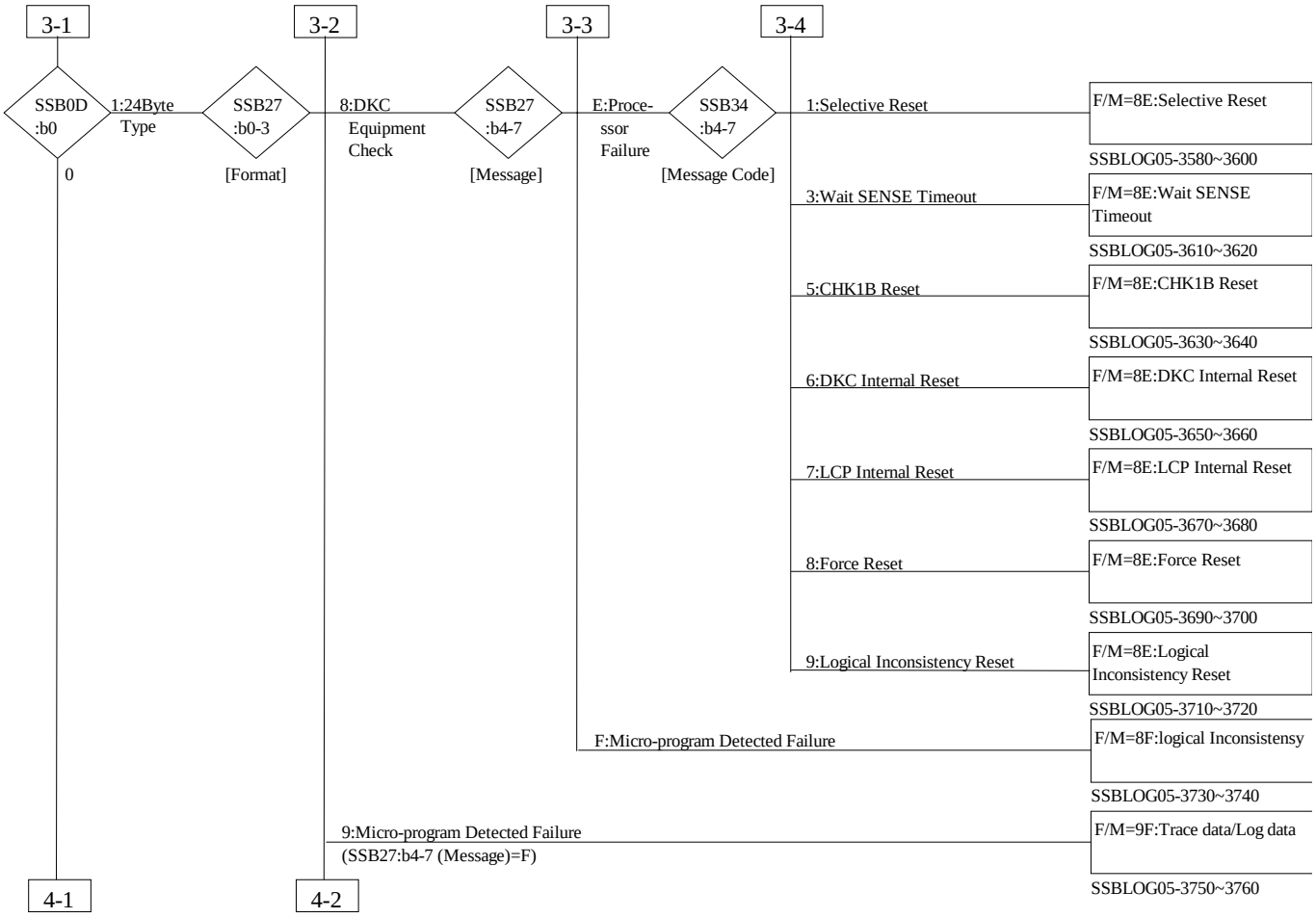

Fig.2-1 Search method for SSB tables (3/5)

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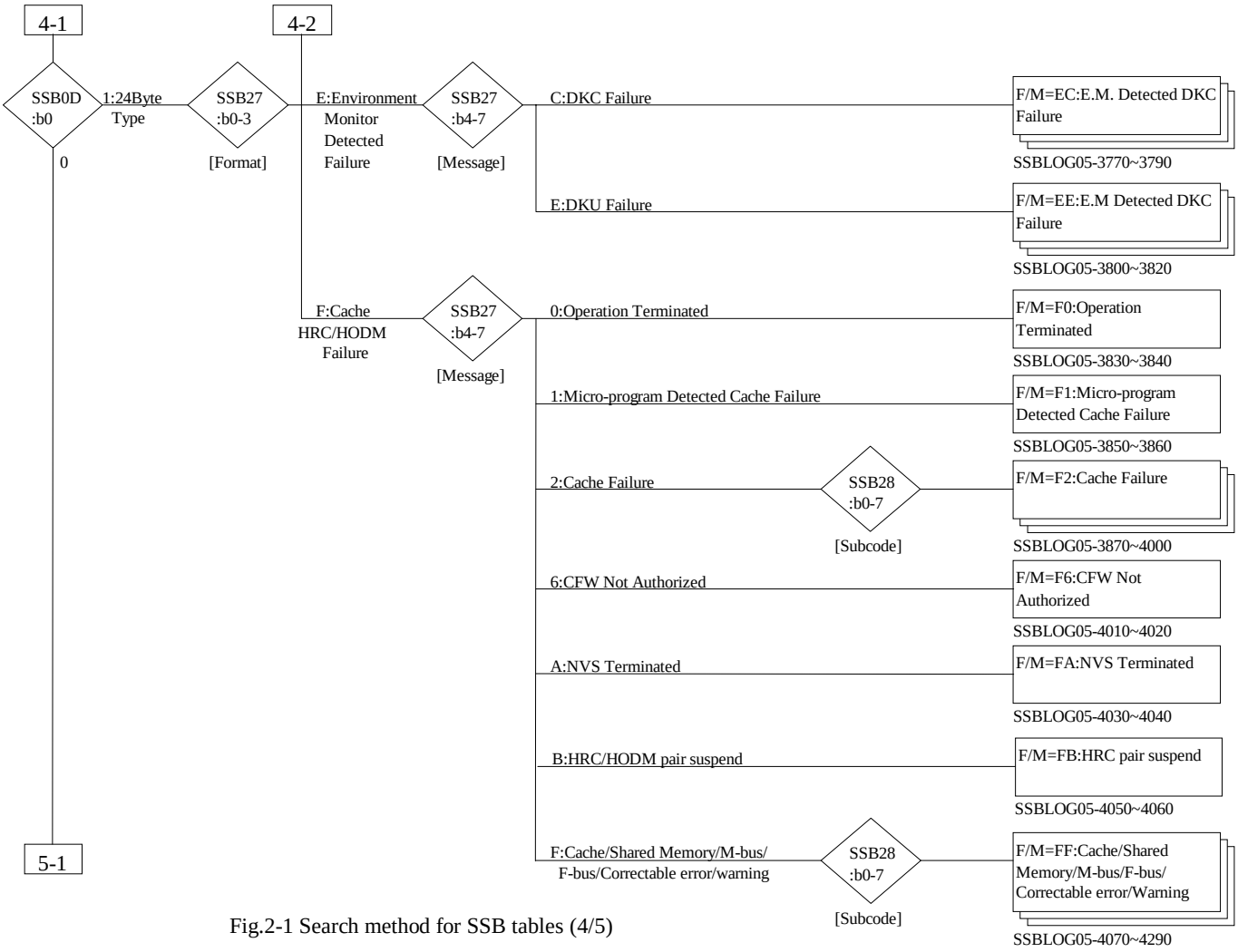

Fig.2-1 Search method for SSB tables (4/5)

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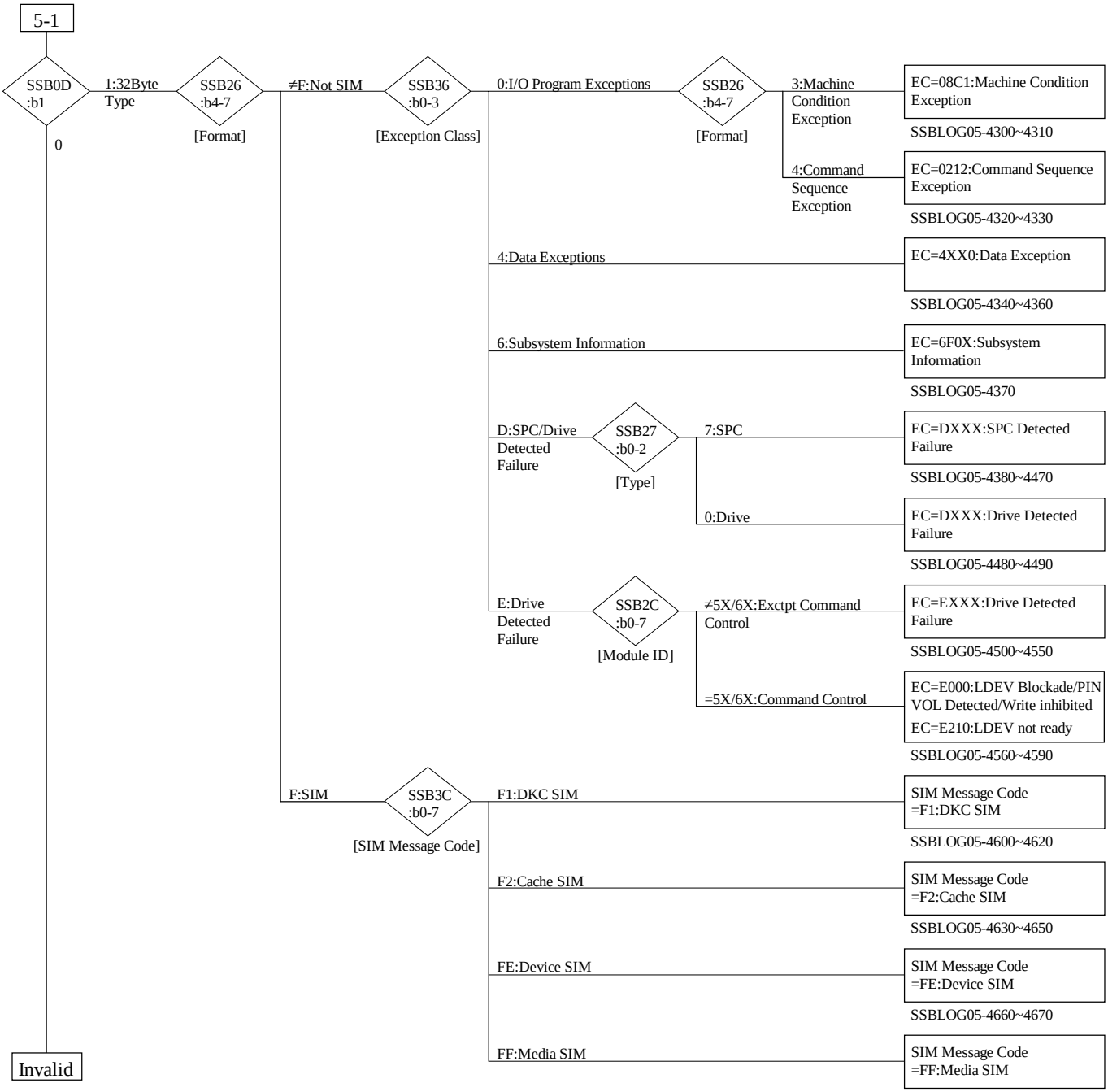

Fig.2-1 Search method for SSB tables (5/5)

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3 Common information description

	0	1	2	3	4	5	6	7
00	Time Stamp							
01								
02								
03								
04								
05								
06	Format Message							
07	PCB Type		Processor ID					
08	System Error Code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host RSP	SVP RSP	Force Log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	Rerserved							
1F	SCB (SSB Control Block)							
20	Host SSB Information							
3F								
40	Internal SSB Format-Dependent Information							
7F								

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Common Information (1/2)

Byte	Bit	Meanning	Setting	Remarks
00 - 05		Time stamp The time error occured	Error handling support	
06		Format Message	Error handling support	
07		Information of the processor detected this error	Error handling support	
	0 - 1	PCB type x‘1’ : CHA x‘2’ : DKA x‘3’ : CHS		
	2 - 7	Processor number (Internal ID) x‘00’ - x‘07’ : CHA0 - CHA7 x‘08’ - x‘0F’ : DKA0 - DKA7		
08 - 09		System error code	Error detection source	
	0 - 7	Module ID See “Module ID” table.		
	8 - 15	Routine ID		
0A - 0B		JCB ID	Error detection source	
0C		REQ ID	Error detection source	
0D		Valid flag	Error handling support	
	0	24Byte type flag 0:Invalid 1:24Byte type SSB		
	1	32Byte type flag 0:Invalid 1:32Byte type SSB		
	2	Flag for SCSI host processor detected the error 0:SSB detected by CHA and DKA 1:SSB detected by CHS		
	3	Remote copy flag 0:Invalid 1:Remote copy valid		
	4	Separately stored log flag 0:General log 1:Separately stored log		
	5	Host report flag 0:Pending 1:Reported		
	6	SVP report flag 0:Pending 1:Reported		
	7	Forcible log flag 0:Normal 1:Forcibly ejected log		

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Common Information (2/2)

Byte	Bit	Meanning		
0E		Valid flag	Error handling support	
	0	LDEV number valid or invalid 0:Invalid 1:Valid		
	1	PDEV number valid or invalid 0:Invalid 1:Valid		
	2	SSB number valid or invalid 0:Invalid 1:Valid		
	3	Related failure log number valid or invalid 0:Invalid 1:Valid		
	4	Related SIM log number valid or invalid 0:Invalid 1:Valid		
	5	Related SSB log number valid or invalid 0:Invalid 1:Valid		
	6 - 7	Reserved		
0F		Valid flag	Error handling support	
	0	SIM reception flag 0:First log / Log after the host reported 1:Log after SIM was received		
	1 - 7	Reserved		
10 - 11		LDEV number	Error handling support	
12		PDEV number	Error handling support	
	0 - 3	CDEV number		
	4 - 7	RDEV number		
13		HRC information	Error handling support	
	0	SEMI-SYNC flag 0:Invalid 1:SEMI-SYNC valid		
	1	RCU SIM flag 0:Invalid 1:RCU SIM valid		
	2 - 3	Reserved		
	4 - 7	RCU number		
14 - 15		RCU LDEV number		
16 - 17		Internal SSB log number		
18 - 19		Related Failure log number		
1A - 1B		Related SIM log number		
1C - 1D		Related SSB log number		
1E		Reserved area		
1F		SSB control block Use when assemble BASIC SSB of Host SSB. See "SSB Key Code" table.		

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Module ID (1/3)

Module ID	Module Name		Remarks
00	Initializer		
01	Power Off Process		
02	CUDG		
10	Job Management		
11	Synchronous Management		
12	Processor Communication		
13	Cache Control		
14	Resource Management		
15	Configuration Control		
16	Reset		
17	SVP Management		
18	Configuration Control(RAID)		
19	Configuration Control(Drive Recovery)		
30	Standard Function		
31	SVP Function		
32	Error Procedure Aid		
34	Error Procedure Aid		
35	Error Procedure Aid		
40	CHA Kernel	CHA Monitor	
41		CHA Initiator	
42		CHA Terminator	
43		CHA Common Function	
50	Command Control	Command Chain Initiate(Command Main)	
51		Command Chain Terminate(Command Main)	
52		Command Execution Status Analyze	
53		Command Execution Channel Interface Control	
54		Channel Server Common Process 1	
55		Channel Server Common Process 2	
56		Channel Server Common Process 3	
57		Channel Server Common Process 4	
58		Channel Server Transfer Process 1	
59		Channel Server Transfer Process 2	
5A		Read/Write Common Process	
5B		Substem Command Common Process	
5C		Channel Server Nonsynchronous Control 1	
5D		Channel Server Nonsynchronous Control 2	
5E		Channel Server Command Queuing Control	
5F		Channel Server Job FRR	
60		Read Command Process 1	
61		Read Command Process 2	
62		Read Command Process 3	
63		Read Command Process 4	
64		Read Command Process 5	
65		Read Command Process 6	
66		Write Command Process 1	
67		Write Command Process 2	
68		Write Command Process 3	
69		Write Command Process 4	
6A		Write Command Process 5	
6B		Write Command Process 6	
6D		Control Command Process 1	
6E		Control Command Process 2	
6F		Search Command Process	

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Module ID (2/3)

Module ID	Module Name		Remarks
70	Command Control	Path Control Command Process	
71		Sense & Miscellaneous Command Process	
72		Diagnostic Command Process	
73		Subsystem Command Process 1	
74		Subsystem Command Process 2	
75		Subsystem Command Process 3	
78		Channel Interface Link Level Frame Control	
79		Channel Interface Device Level Frame Control	
7A		Channel Interface Control Common	
7B		LDEV Format	
7C		Concurrent Copy Process	
7D		Concurrent Copy Process	
7E		Concurrent Copy Process	
7F		Channel Server WDCP/DUMP(M specified)	
80	DKA Kernel	DKA Monitor	
81		DKA Initiator	
82		DKA Terminator	
90	Staging Destaging	Staging	
91		LDEV Destaging	
92		PDEV Destaging	
93	Drive Recovery		
94	Offline Monitor		
95	Physical Device Maintenance		
98	RAID Synchrinous Type		
99	RAID LDEV Destaging		
9A	RAID PDEV Destaging		
9B	RAID Drive Recovery		
9C	RAID external provided		
9D	RAID 0 Destaging		
9E	RAID 0 Error/Merge		
9F	RAID Slot Falure Status Operation		
A0	SCSI Control		
A1	DRR Control		
A2	SVP Command Execution Process		
A3	Test Initiator		
A4	SCSI Control		
A5	Offline Monitor		
A6	Physical Drive Maintenance		
A7	SCSI Control		
A8	DRR Control		
AE	SCSI Control		
C0	HRC/HODM CHL/SVP I/F		
C1	HRC/HODM Remote copy monitor		
C2	HRC/HODM Configuration control		
C3	HRC/HODM Common copy procedure		
C4	HRC Remote copy procedure		
C5	HODM Migration copy procedure		
C6	HRC/HODM channel server procedure		
C7	HRC/HODM Remote I/O manager		
C8	HRC/HODM Remote I/O 1		
C9	HRC/HODM Remote I/O 2		
CA	HRC/HODM path control		
CF	HRC/HODM Service SIM log		

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Module ID (3/3)

Module ID	Module Name		Remarks
D0	Multiplatform Comand Control	Command Main	
D1		Transfer Process/SSB Function	
D2		Read/Write Command	
D3		Read/Write Common Process	
D4		Control/Diagnostic Command	
D8	Multiplatform SCP Control	SCP Control 1	
D9		SCP Control 2	
DA		SCP Control 3	
DC	Multiplatform Kernel	Command Queuing Procedure	
DD		CHS Scan	
DE		CHS Initiator	
DF		CHS Terminator	
E0	RCP initialize / Reset / Sequence control		
E1	RCP idle scan / Starting process		
E2	RCP link level process		
E3	RCP device level process		
E4	RCP error process / Received frame check / physical service		
E5	Communication between RCP and CHP / Path control / Clock timer control / Frame transmission and reception		
E6	RCP sequence process / Device level process		

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SSB Key Code (1/2)

Code	Basic SSB	Meanning	Remarks
00	000000	Dummy SSB	
01	800000	Command reject (A program error or invalid link between BAD and ALT)	
02	400000	Intervention required (An addressed device is offline or not connect)	
03	200000	Bus out check (Channel bus out parity error)	
04	100000	Equipment check (Equipment check in subsystem)	
05	080000	Data check (Uncorrectable:retry failed or retry inhibited)	
06	040000	Overrun (command retry failed when service overrun occured)	
07	004000	Invalid track format (Track capacity over or track format error)	
08	002000	End of cylinder (A multi track operation outside LOCATE domain)	
09	000800	No record found	
0A	000400	File protected (A seek or multi track operation violates the file mask or extent)	
0B	100200	Equipment check and write inhibited (A write command on the write inhibited path by a DIAG CTL command)	
0C	080040	Data check and correctable (The retry succeeded for data check in PCI fetch mode)	
0D	000020	First log mode error	Not used
0E	800400	Command rejected and file protected (A multi track operation outside primary track)	
0F	800200	Command reject and write inhibited	Not used
10	108000	Equipment check and permanent error) (A retry failed for the equipment check)	
11	088000	Data check and permanent error) (A retry failed for the data check)	
12	009010	SIM (DKC SIM or Cache SIM)	
13	000000	Reserved	
14	000104	Imprecise ending (This error is for a previousry completed CCW)	
15	800104	Command reject and imprecise ending	
16	400104	Intervention required and imprecise ending	
17	200104	Bus out check and imprecise ending	
18	100104	Equipment check and imprecise ending	
19	080104	Data check and imprecise ending	
1A	040104	Overrun and imprecise ending	
1B	004104	Invalid track format and imprecise ending	
1C	002104	End of cylinder and imprecise ending	
1D	000904	No record found and imprecise ending	
1E	000504	File protected and imprecise ending	
1F	100304	Equipment check and write inhibited and imprecise ending	

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SSB Key Code (2/2)

Code	Basic SSB	Meanning	Remarks
20	080144	Equipment check and correctable and imprecise ending	
21	000124	First log mode error and imprecise ending	Not used
22	800504	Command reject and file protected and imprecise ending	
23	800304	Command reject and write inhibited and imprecise ending	
24	108104	Equipment check and permanent error and imprecise ending	
25	088104	Data check and permanent error and imprecise ending	
26	009114	SIM and imprecise ending	Not used
27	000000	Reserved	
28	808000	Command reject and permanent error	
29	00C000	Permanent error and invalid track format	
2A	008800	Permanent error and request inhibit write	
2B	088200	Data check and permanent error and write protected	
2C	000000	Reserved	
2D	000000	Reserved	
2E	000000	Reserved	
2F	000000	Reserved	
30	000000	Reserved	
31	000000	Reserved	
32	010000	Incomplete domain (Received commands < LOCATE command prameter)	
33	804000	Command reject and invalid track format (A TLF unmatch in CKD conversion mode)	
34	000000	Reserved	
35	100010	Equipment check and environmental data present (Status change pending)	
36	800010	Command reject and environmental data present	
37	000000	Reserved	
38	000000	Reserved	
39	000000	Reserved	
3A	000000	Reserved	
3B	000000	Reserved	
3C	000000	Reserved	
3D	000000	Reserved	
3E	000000	Reserved	
3F	000000	Reserved	

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4 Host SSB information and internal SSB format-depended information description

4.1 24-byte type SSB

	0	1	2	3	4	5	6	7	
00	Internal SSB common Information								
1F									
20	Command reject	Intervention REQ	Bus out check	Equipment check	Data check	Overrun	Unused	Incomplete domain	Basic SSB
21	Permanent error	Invalid track FMT	End of cylinder	Operator message	No Record found	File protect	Write inhibit	Imprecise ending	
22	Write INH reques	Correctable	1st log mode ERR	Environmen-tal DAT	Unused	Imprecise ending	Not used	Not used	
23	Count								
24	Device address								
25	Cylinder address(low)								
26	Cylinder address(high)				Head address				
27	Format (See next page)				Message (See next page)				
28	Host SSB Format-depended Information								
37									
38	Log and message control								
39	Program action code								
3A	Dual frame	EDCC mode (1)	Duplex pair (0)	S-volume ERR (0)	Nonsync operation	Serial channel	Report output	Permanent path ERR	*
3B	24Byte SSB (1)	DEV ADR valid	TRK ADR valid	Not used	3380 TRK COMPT(0)	Not used	Storage path number		
3C	Not used								
3D	Cylinder address								
3E									
3F	Head address								
40	Internal SSB Format-depended Information								
7F									

*:Configuration information

**:Byte 20-27 and byte 38-3F are not certain until DKC reports SSB to Host. So if you want to know the detail, please refer to SSB section.

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Format and Message

(1/2)

Format	Message	Meanning	
0	0	No message	
	1	Invalid command	
	2	Invalid sequence	
	3	Data short	
	4	Invalid data	
	5	Violate file mask	
	6	Channel disconnect retry.	
	7	Invalid retry command	
	8	System reset	
	9	Not used	
	A	Bus of parity check/Overrun	
	B	Invalid link between bad track and alternate track.	
	C	Not used	
	D	Not used	
	E	Invalid command to secondary volume	
	F	Invalid status	
1	0	Intervention required	For DKU86I (IBM 3380 emulation mode) only
	1	Not used	
	2	Drive not ready	
	3	Not used	
	4	Drive report error	
	5~F	Not used	
3	0~E	Not used	
	F	Reset allegiance	
4	0	Data check in HA field	For DKU86I (IBM 3380 emulation mode) only
	1	Data check in C field	
	2	Data check in K field	
	3	Data check in D field	
	4	Not used	
	5	PA error	
	6~F	Not used	
6	0~7	Statistics	
	8~F	Not used	
7	0~3	Not used	
	4	SPC report error	
	5~8	Not used	
	9	SCSI bus parity error	
	A~F	Not used	
8	0	Not used	
	1	Shared memory failure	
	2~7	Not used	
	8	LCP failure or MCP failure	
	9	Host adaptor CHK2	
	A	Disk adaptor CHK2	
	B	DRR failure	
	C	SVP failure	
	D	Power failure	
	E	Processor failure	
	F	Micro-program detected error (Logical Inconsistency)	
9	0~E	Not used	
	F	Micro-program detected error (Trace data/Log data)	
E	0~B	Not used	
	C	Environmental monitor detected DKC failure	
	D	Not used	
	E	Environmental monitor detected DKU failure	
	F	Not used	

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Format and Message

(2/2)

Format	Message	Meanning
F	0	Operation Terminated
	1	Microprogram detected cache failure
	2	Cache failure
	3	Not used
	4	Not used
	5	Not used
	6	CFW not authorized
	7~9	Not used
	A	NVS terminated
	B	HRC/HODM Pair suspend
	C~E	Not used
	F	Cache/Shared memory/M-bus/F-bus/J-bus warning

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4.2 32-byte type SSB

	0	1	2	3	4	5	6	7	
00	Internal SSB common Information								
1F									
20	Command reject	Intervention REQ	Not used	Equipment check	Data check	Not used	Not used	Incomplete domain	Basic SSB
21	Permanent error	Invalid TRK FMT	End of cylinder	Operator message	Not used	File protect	Write inhibit	Imprecice ending	
22	EC=0/1/2/3/F:Environmental data present								
	EC=4/6/D/E :Strage control type (x'06':Cache DKC)								
23	Count / Command overrun threshold is exceede.								
24	Device address								
25	Device type (x'24':DKU871-3)								
26	SSB2/SSB5 valid	SSB4 valid	SSB29-31 valid	Not used	Format				
27	Host SSB Format-depended Information								
37									
38	Log and message control								
39	Program action code								
3A	Dual frame	EDCC mode (1)	Duplex pair (0)	S-Volume ERR (0)	Nonsync operation	Serial channed	Report output	Permanent path ERR	*
3B	32Byte SSB (0)	Not used	Not used	Not used	3380 TRK COMPT(0)	Not used	Storage path number		
3C	Message code								
3D	Cylinder address								
3E									
3F	Heas address								
40	Internal SSB Format-depended Information								
7F									

*:Configuration information

**:Byte 20-26 and byte 38-3F are not certain until DKC reports SSB to Host. So if you want to know the detail, please refer to SSB section.

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Exception Class (Byte36:bit0-3) and Format (Byte26:bit4-7)

Exception Class	Format	Meanning
0	0~2	Not used
	3	Machine condition exception
	4	I/O Program exception (incomplete Domain)
	5~F	Not used
2	0~E	Not used
	F	DKC SIM
3	0~E	Not used
	F	DKC SIM
4	0	Not used
	1	Data exception (PCI,Permanent)*
	2~E	Not used
	F	Dedia SIM
5	0~E	Not used
	F	Device SIM/Media SIM
6	0	Not used
	1	Statistics*
	2~F	Not used
C	0~E	Not used
	F	DKC SIM
D	0	Drive detected failure*
	1	SPC detected failure*
	0~E	Not used
	F	DKC SIM
E	0	Drive detected failure/LDEV blockade/PIN VOL detected/LDEV not ready/Write inhibited*
	1~E	Not used
	F	Device SIM
F	0~E	Not used
	F	DKC SIM/Cache SIM

* : For DKU87I (IBM 3390 emulation mode) only.

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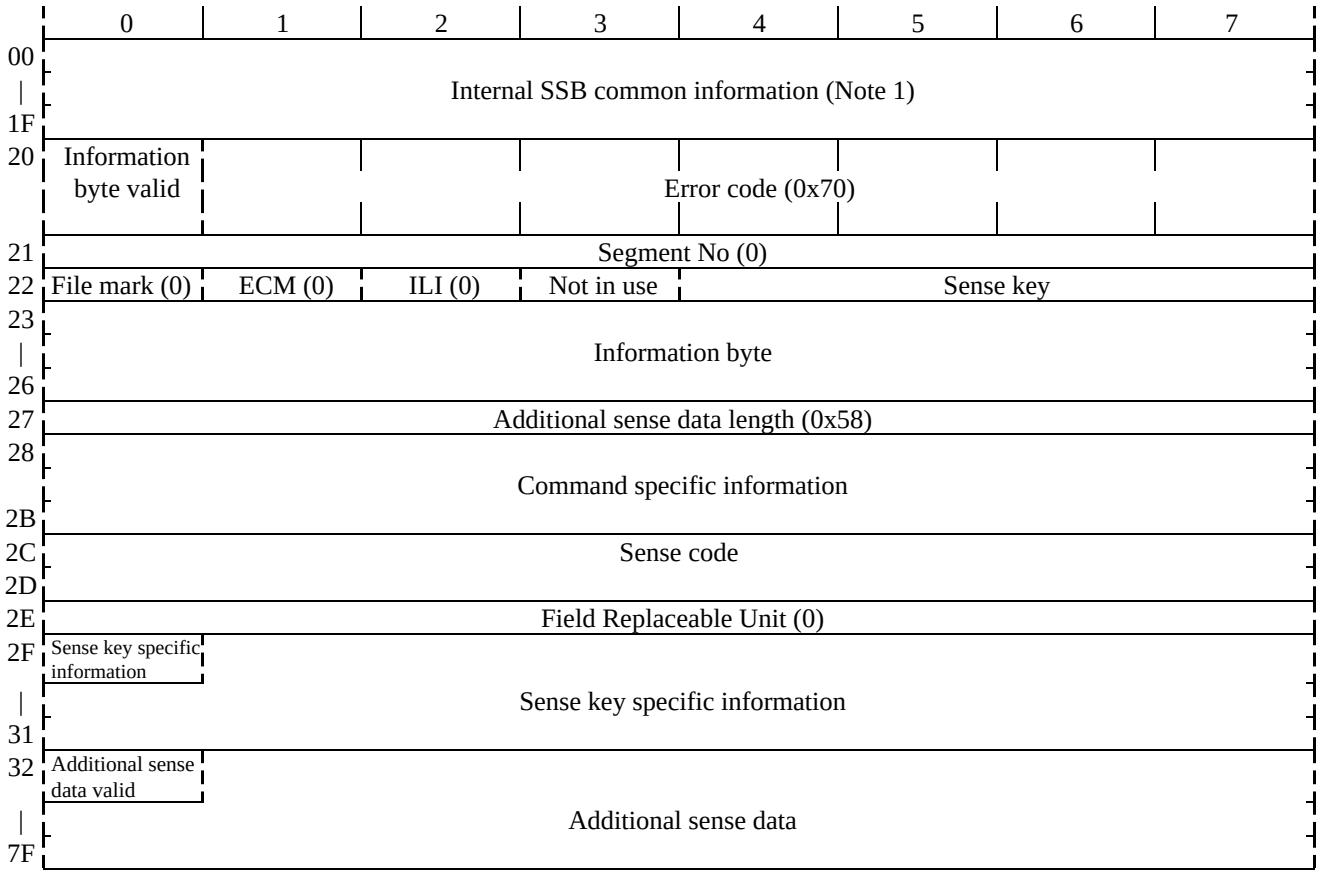
4.3 SCSI host report format SSB



(Note 1) 0xCX (X=sense key) is set to byte 7 (log type low-order byte). SSB on SVP is indicated as F/M=CX.

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Details of SCSI host report format SSB information

Byte	Bit	Description	Setting	Remarks
20	0	Information byte valid/invalid 0:Invalid 1:Valid	CHS command control	
	1 ~ 7	Error code (0x7): Indicates an I/O process error.		
21		Segment No. (0)		
22	0	File mark (0)		
	1	ECM (0)		
	2	ILI (0)		
	3	Not in use		
	4 ~ 7	Sense key: For more details, see “sense keys list”.		
23 ~ 26		Information bytes: LBA related to sense key if information byte is valid.		
27		Additional sense data length (0x58): Indicates sense data length after byte 8 or latter.		
28 ~ 2B		Command specific information		
2C ~ 2D		Sense codes: For more details, see “sense codes list”.		
2E		Field Replaceable Unit (0)		
2F ~ 31	0	Sense key specific information valid/invalid 0:Invalid 1:Valid		
	1 ~ 17	Sense key specific information		
32 ~ 7E	0	Additional sense data valid/invalid 0:Invalid 1:Valid	Error detection source	
	1 ~ END	Additional sense data		

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Sense Keys List

Sense key	Description
0	NO SENSE
1	RECOVERED ERROR
2	NOT READY
3	MEDIUM ERROR
4	HARDWARE ERROR
5	ILLEGAL REQUEST
6	UNIT ATTENTION
7	DATA PROTECT
8	BLANK CHECK (Not in use)
9	VENDOR UNIQUE
A	COPY ABORTED (Not in use)
B	ABORTED COMMAND
C	EQUAL (Not in use)
D	VOLUME OVERFLOW
E	MISCOMPARE
F	(RESERVED)

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Table 6.9 Sense Codes List

Sense key	Code		Error name	Desciption/meaning
0/5	00	00	NO ADDITIONAL SENSE INFORMATION	•Valid ADDITIONAL SENSE information is not found.
	00	06	I/O PROCESS TERMINATED	(doesn't occur)
4	01	00	NO INDEX/SECTOR SIGNAL	•INDEX signal connot be detected. •SECTOR signal cannot be detected.
14	02	00	NO SEEK COMPLETE	•Drive SEEK operation cannot be performed normally.
4	03	00	PERIPHERAL DEVICE WRITE FAULT	•Drive WRITE FAULT was detected.
2	04	00	LOGICAL UNIT NOT READY, CAUSE NOT REPORTABLE	•Dreve READY signal cannot be detected. •Drive ACCESSES
2	04	01	LOGICAL UNIT IS IN PROCESS OF BECOMING READY	•Drive is not ready now but will be ready soon.
2	04	02	LOGICAL UNIT NOT READY, INITIALIZING COMMAND REQUIRED	•Drive is not ready now. Spin-up is not started.
2	04	03	LOGICAL UNIT NOT READY, MANUAL INTERVENTION REQUIRED	(doesn't occur)
2	04	04	LOGICAL UNIT NOT READY, FORMAT IN PROGRESS	•Logical unit is not ready now (during execution of format command.)
2	04	80	LOGICAL UNIT NOT READY, PARITY RECOVERY IN PROCESS	(doesn't occur)
2	04	81	LOGICAL NIT NOT READY, DATA RECONSTRUCTION IN PROCESS	(doesn't occur) Logical unit is not ready now. Data is in reconstruction process.
2	04	82	LOGICAL UNIT NOT READY, SERIAL PORT COMMUNICATION IN PROCESS	(doesn't occur)
2	04	83	LOGICAL UNIT NOT READY	(doesn't occur)
2	04	84	POWER OFF IN PROCESS	•Planned shutdown is in process.
2	05	00	LOGICAL UNIT DOSE NOT RESPOND SELECTION	•No response is sent from drive interface.
1/4	06	00	NO REFERENCE POSITION FOUND	•Positioning to TRACK ZERO is impossible.
4	07	00	MULTIPLE PERIPHERAL DEVICES SELECTED	•Multiple drives are selected simultaneously.
4	08	00	LOGICAL UNIT COMMUNICATION FAILURE	•A logical unit drive interface error occurred.
4	08	01	LOGICAL UNIT COMMUNICATION TIME OUT	•A logical unit drive interface timeout error occurred.
1/4	08	02	LOGICAL UNIT COMMUNICATION PARITY ERROR	•A logical unit drive interface parity error occurred.
1/4	09	00	TRACK FOLLOWING ERROR	•Track positioning is out range.
-	0A	00	ERROR LOG OVERFLOW	(doesn't occur)
-	0B	00	(RESERVED)	(doesn't occur)
1	0C	01	WRITE ERROR RECOVERED WITH AUTO REALLOCATION	(doesn't occur)

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
3	0C 02	WRITE ERROR AUTO REALLOCATION FAILED	•Auto reallocation was attempted to a write error but failed.
-	0D ~ 0F	(RESERVED)	(doesn't occur)
3	10 00	ID CRC OR ECC ERROR	•A CRC error occurred in ID field.
3	11 00	UNRECOVERED READ ERROR	•An error occurred in DATA field. (retry not applied)
3	11 01	READ RETRIES EXHAUSTED	•Read error retries were attempted in DATA field but error recovery did not result. (error correction not applied)
3	11 02	ERROR TOO LONG TO CORRECT	•A read error in DATA field cannot be ECC-corrected.
3	11 03	MULTIPLE READ ERROR	(doesn't occur)
3	11 04	UNRECOVERED READ ERROR. AUTO REALLOCATION FAILED	•Auto reallocation was attempted to a correctable error but failed.
3	11 0A	MISCORRECTED ERROR	(doesn't occur)
3	11 0B	UNRECOVERED READ ERROR RECOMMEND REASSIGNMENT	(doesn't occur)
3	11 0C	UNRECOVERED READ ERROR. RECOMMEND REWRITE THE DATA	(doesn't occur)
3	12 00	ADDRESS MARK NOT FOUND FOR ID FIELD	•ADDRESS MARK in ID field cannot be detected.
1/3	13 00	ADDRESS MARK NOT FOUND FOR DATA FIELD	•ADDRESS MARK in DATA field cannot be detected.
1/3	14 00	RECORDED ENTITY NOT FOUND	(doesn't occur)
1/3	14 01	RECORD NOT FOUND	•Block with matching ID field cannot be detected.
3	15 00	RANDOM POSITIONING ERROR	(doesn't occur)
1/3	15 01	POSITIONING ERROR DETECTED BY READ OF MEDIUM	•Seek operation error occurred.
1/3	15 02	MECHANICAL POSITIONING ERROR	•Seek operation was terminated normally but the address was a target one.
1/3	16 00	DATA SYNCHRONIZATION MARK ERROR	(doesn't occur)
1	17 00	RECOVERED DATA WITH NO ERROR CORRECTION APPLIED	•Retry succeeded in error recovery.
1	17 01	RECOVERED DATA WITH RETRIES	•Retry succeeded in error recovery. (without head offset)
1	17 02	RECOVERED DATA WITH POSITIVE HEAD OFFSET	•Retry with head offset (positive direction) succeeded in error recovery.
1	17 03	RECOVERED DATA WITH NEGATIVE HEAD OFFFSET	•Retry with head offset (negative direction) succeeded in error recovery
1	17 05	RECOVERED DATA USING PREVIOUS SECTOR ID	(doesn't occur)
1	17 06	RECOVERED DATA WITHOUT ECC. DATA AUTO REALLOCATED	(doesn't occur)

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
1	17 07	RECOVERED DATA WITHOUT ECC. (doesn't occur)	(doesn't occur)
1	18 00	RECOVERED DATA WITH ERROR CORRECTION APPLIED	•ECC succeeded in error recovery. (without retry)
1	18 01	RECOVERED DATA WITH ERROR CORRECTION AND RETRIES APPLIED	•Retrying and ECC succeeded in error recovery.
1	18 02	RECOVERED DATA-DATA AUTO-REALLOCATED	•Data was recovered by auto reallocation.
1	18 05	RECOVERED DATA-RECOMMEND REASSIGNMENT	(doesn't occur)
1/3	19 00	DEFECT LIST ERROR	(doesn't occur)
1/3	19 01	DEFECT LIST NOT AVAILABLE	(doesn't occur)
1/3	19 02	DEFECT LIST ERROR IN PRIMARY LIST	•An error occurred during access to PRIMARY (P) list.
1/3	19 03	DEFECT LIST ERROR IN GROWN LIST	•An error occurred during access to GROWN (G) list.
5	1A 00	PARAMETER LIST LENGTH ERROR	•Parameter list length is invalid.
4	1B 00	SYNCHRONOUS DATA TRANSFER ERROR	•A synchronous transfer error occurred during data transfer.
3	1C 00	DEFECT LIST NOT FOUND	(doesn't occur)
3	1C 01	PRIMARY DEFECT LIST NOT FOUND	•Positioning to PRIMARY (P) list failed.
3	1C 02	GROWN DEFECT LIST NOT FOUND	•Positioning to GROWN (G) list failed.
E	1D 00	MISCOMPARE DURING VERIFY OPERATION	•A data compare error occurred during WRITE/READ BUFFER verification.
1	1E 00	RECOVERED ID WITH ECC CORRECTION	(doesn't occur)
-	1F	(RESERVED)	(doesn't occur)
5	20 00	INVALID COMMAND OPERATION CODE	•OPERATION CODE is invalid.
5	21 00	LOGICAL BLOCK ADDRESS OUT OF RANGE	•An attempt was made to gain access over the logical block address reported by READ CAPACITY. (PMI bit=0)
5	22 00	ILLEGAL FUNCTION	•SCSI initiator issued write command to HMDE read only LDEV.
-	23 00	(RESERVED)	(doesn't occur)
5	24 00	INVALID FIELD IN CDB	•Invalid field is contained in CDB
5	25 00	LOGICAL UNIT NOT SUPPORTED	•LUM indicated by CDB or IDENTIFY message is not supported.
5	25 80	LOGICAL UNIT ALLOCATE ERROR	•Logical unit allocation failed.
5	25 81	RAID GROUP NOT DEFINE	•RG (RAID GROUP) is not defined.
5	26 00	INVALID FIELD IN PARAMETER LIST	•Invalid field is contained in parameter list.
5	26 01	PARAMETER NOT SUPPORTED	•Unsupported parameter was received.
5	26 02	PARAMETER VALUE INVALID	•Parameter value is invalid.
5	26 03	THRESHOLD PARAMETERS NOT SUPPORTED	(doesn't occur)
7	27 00	WRITE PROTECTED	(doesn't occur)

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
-	28 00	NOT READY TO READY TRANSITION	(doesn't occur)
6	29 00	POWER ON RESET, RESET OR BUS DEVICE RESET OCCURRED	•POWER ON RESET occurred. •BUS DEVICE RESET occurred. •SCSI BUS RESET occurred.
6	2A 00	PARAMETERS CHANGED	•MODE SELECT parameter changed. ex.) Parameter was changed by MODE SELECT command.
6	2A 01	MODE PARAMETERS CHANGED	(doesn't occur)
6	2A 02	LOG PARAMETERS CHANGED	(doesn't occur)
5	2B 00	COPY CANNOT EXECUTE SINCE HOST CANNOT DISCONNECT	(doesn't occur)
5	2C 00	COMMAND SEQUENCE ERROR	(doesn't occur)
-	2D ~ 2E	(RESERVED)	(doesn't occur)
6	2F 00	COMMANDS CLEARED BY ANOTHER INITIATOR	•Commands were cleared because of CLEAR QUEUE message from another initiator or occurrence of CA state with another initiator.
3	30 00	INCOMPATIBLE MEDIUM INSTALLED	(doesn't occur)
3	30 01	CANNOT READ MEDIUM. UNKNOWN FORMAT	(doesn't occur)
3	30 02	CANNOT READ MEDIUM. INCOMPATIBLE FORMAT	(doesn't occur)
3	30 03	CLEANING CARTRIDGE INSTALLED	(doesn't occur)
3	31 00	MEDIUM FORMAT CORRUPTED	•Medium is not formatted corrected. Medium must be reformatted by FORMAT UNIT command.
3	31 01	FORMAT COMMAND FAILED	•FORMAT command was terminated abnormally. Medium must be reformatted by FORMAT UNIT command.
3	31 80	DATA FORMAT CORRUPTED	•Array data format is not established.
3	31 81	FORMAT COMMAND NOT EXECUTE	•FORMAT command cannot be executed because of imperfect disk configuration. (data drive or parity drive detached)
1/4	32 00	NO DEFECT SPARE LOCATION AVAILABLE	•Reallocation is impossible because alternate area is not large enough.
1/3	32 01	DEFECT LIST UPDATE FAILURE	•GROWN (G) list update failed.
-	33 ~ 36	(RESERVED)	(doesn't occur)
1	37 00	FOUNDED PARAMETER	(doesn't occur)
-	38	(RESERVED)	(doesn't occur)
5	39 00	SAVING PARAMETERS NOT SUPPORTED	(doesn't occur)
-	3A 00	MEDIUM NOT PRESENT	(doesn't occur)
-	3B ~ 3C	(RESERVED)	(doesn't occur)
B	3D 00	INVALID BITS IN IDENTIFY MESSAGE	•An invalid bit was detected in IDENTIFY message.

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
2	3E 00	LOGICAL UNIT HAS NOT SELF-CONFIGURED YET	•Drive self-configuration is not established yet.
6	3F 00	TERGET OPERATING CONDITIONS HAVE CHANGED	(doesn't occur)
6	3F 01	MICROCODE HAS BEEN CHANGED	•Microprogram was downloaded.
6	3F 02	CHANGED OPERATING DEFINITION	(doesn't occur)
6	3F 03	INQUIRY DATA HAS CHANGED	(doesn't occur)
4	40 00	RAM FAILURE	(doesn't occur)
4	41 00	DATA PATH FAILURE	(doesn't occur)
4	42 00	POWER-ON OR SELF-TEST FAILURE	(doesn't occur)
B	43 00	MESSAGE ERROR	•The message is rejected and operation cannot be continued or a message phase error occurred.
4	44 00	INTERNAL TARGET FAILURE	•A HARDWARE/FIRMWARE error was detected in controller during command execution.
4	44 A0	NO REASSIGN SECTOR	•Sector to be reassigned cannot be detected.
B	45 00	SELECT OR RESELECT FAILURE	•SELECT/RESELECT TIMEOVER was detected. •An invalid SELECTION was detected.
-	46 00	UNSUCCESSFUL SOFT RESET	(doesn't occur)
B	47 00	SCSI PARITY ERROR	•SCSI bus parity error occurred.
B	48 00	INITIATOR DETECTED ERROR MESSAGE RECEIVED	•An INITIATOR DETECTED ERROR message was received from INITIATOR.
B	49 00	INVALID MESSAGE ERROR	•An invalid message was received.
B	4A 00	COMMAND PHASE ERROR	•A command phase error occurred.
B	4B 00	DATA PHASE ERROR	•A data phase error occurred.
4	4C 00	LOGICAL UNIT FAILED SELF-CONFIGURATION	•Microcode or parameter loading failed at the startup of controller.
4	4C 80	LOGICAL UNIT FAILED SELF-CONFIGURATIN, UNSUPPORTED DRIVE	(doesn't occur)
-	4D	(RESERVED)	(doesn't occur)
-	4E 00	OVERLAPPED COMMANDS ATTEMPTED	(doesn't occur)
-	4F ~ 52	(RESERVED)	(doesn't occur)
-	53 00	MEDIA LOAD OR EJECT FAILED	(doesn't occur)
-	53 02	MEDIUM REMOVAL PREVENTED	(doesn't occur)
-	54 ~ 59	(RESERVED)	(doesn't occur)
-	5A 00	OPERATOR REQUEST OR STATE CHANGE INPUT	(doesn't occur)
-	5A 01	OPERATOR MEDIUM REMOVAL REQUEST	(doesn't occur)
-	5A 02	OPERATOR SELECTED WRITE PROTECT	(doesn't occur)
-	5A 03	OPERATOR SELECTED WRITE PERMIT	(doesn't occur)
1	5B 00	LOG EXCEPTION	•A drive log exception was detected.
6	5B 01	THRESHOLD CONDITION MET	(doesn't occur)
1	5B 02	LOG COUNTER AT MAXIMUM	•Log counter in drive reached the maximum.
1	5B 03	LOG LIST CODES EXHAUSTED	•Log list codes in drive were exhausted.

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
4/6	5C 00	RPL STATUS CHANGE	(doesn't occur)
6	5C 01	SPINDLES SYNCHRONIZED	(doesn't occur)
1/6	5C 02	SPINDLES NOT SYNCHRONIZED	(doesn't occur)
-	5D ~ 7F	(RESERVED)	(doesn't occur)
5	80 00	MAIN-FLAME RESERVE	•Logical unit was reserved by Main-flame-Host.
9	80 00	MICRO PROGRAM DETECTED ERROR	•Microprogram detected an error.
1	80 01	RECOVERED DATA WITH RECOVERED PARITY DISK ERROR	(doesn't occur) •Microprogram detected an error.
1	80 02	DATA WRITE IN DRIVE REGRESSION	(doesn't occur)
9	81 00	MICRO PROGRAM DETECTED ERROR	•Microprogram detected an error.
1	81 01	RECOVERED DATA WITH PARITY DISK AND SUTO-REALLOCATED	(doesn't occur) •Using parity disk data succeeded in recovery. (medium repaired)
9	82 00	MICRO PROGRAM DETECTED ERROR	•Microprogram detected an error.
6	82 01	DRIVE RECOVER ERROR FOR UNCORRECTABLE DATA ERROR	•Disk recovery by drive recovery was terminated but uncorrectable data occurred.
6	82 02	DRIVE RECOVER COMPLETE (EXIST UNCORRECTABLE DATA ERROR)	•Disk recovery by drive recovery was terminated but configuration status was not set to recovery complete state because of uncorrectable data error.
6	82 03	DRIVE RECOVER ERROR FOR DISK MEDIA ERROR (FROM)	(doesn't occur)
6	82 04	DRIVE RECOVER ERROR FOR DISK MEDIA ERROR (TO)	(doesn't occur)
6	82 05	DRIVE RECOVER ERROR FOR DISK HARD ERROR (FROM)	(doesn't occur)
6	82 06	DRIVE RECOVER ERROR FOR DISK HARD ERROR (TO)	(doesn't occur)
6	82 08	DRIVE RECOVER FORCE STOP	(doesn't occur)
6	82 0A	DRIVE RECOVER COMPLETES WITH UNRECOVERED DATA	(doesn't occur)
6	82 0B	DRIVE RECOVER ERROR FOR DATA REGRESSION (FROM)	(doesn't occur)
6	82 0C	DRIVE RECOVER ERROR FOR DATA REGRESSION (TO)	(doesn't occur)
6	82 0D	DRIVE RECOVER ERROR FOR CACHE HARD ERROR	(doesn't occur)
6	82 0E	STRUCTURE INFORMATION CHANGE	(doesn't occur)
6	82 0F	DRIVE RECOVER ERROR FOR SPARE DISK USED	(doesn't occur)
6	82 10	DRIVE RECOVER FORCIBLY TERMINATE	•Drive recovery was forcibly terminated according to an operator's instruction.

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
6	82 11	DRIVE RECOVER FORCIBLY TERMINSTE (MEDIA ERR DETECT:FROM)	•Drive recovery was forcibly terminated because a medium error was detected from source disk during the recover.
6	82 12	DRIVE RECOVER FORCIBLY TERMINATE (MEDIA ERR DETECT:TO)	•Drive recovery was forcibly terminated because a medium error was detected from source disk during the recover.
6	82 13	DRIVE RECOVER FORCIBLY TARMINATE (HARD ERR DETECT:FROM)	•Drive recovery was forcibly terminated because a hardware error was detected from source disk during the recover.
6	82 14	DRIVE RECOVER FORCIBLY TERMINATE (HARD ERR DETEC:TO)	•Drive recovery was forcibly terminated because a hardware error was detected from source disk during the recover.
6	82 15	DRIVE RECOVER FORCIBLY TERMINATE (DISK BLOCKED:FROM)	•Drive recovery was forcibly terminated because source disk was blocked during the recover.
6	82 16	DRIVE RECOVER FORCIBLY TERMINATE (DISK BLOCKED:TO)	•Drive recovery was forcibly terminated because source disk was blocked during the recover.
6	82 17	DRIVE RECOVER FORCIBLY TERMINATE (CACHE HARD ERR DETECT)	•Drive recovery was forcibly terminated because a hardware error was detected in inter-cache control during the recovery.
6	82 18	DRIVE RECOVER FORCIBLY TERMINATE (CONFIGURATION CHANGE)	•Drive recovery was forcibly terminated because configuration information was changed in status.
6	82 19	DRIVE RECOVER FAIL (WRITE AFTER DATA REMAIN)	•System cannot be started because write after data remains on spare disk.
6	82 1A	TIME OUT DETECTED IN CONTROLLER	•Drive recovery was forcibly terminated because a timeout occurred during internal processing.
9	83 00	MICRO PROGRAM DETECTED ERROR	•Microprogram detected an error.
3	88 00	READ ATENPTED TO NOT INITIALIZED AREA IN REGRESSION MODE	(doesn't occur)
3	89 00	WRITE UNABLE IN PARITY INCONSISTENT AREA IN REGRESSION MODE	(doesn't occur)
4	8A 01	PARITY ERROR DETECTED DURING MEDIUM PARITY CERTIFICATION	•A parity error was detected during medium parity check.
4	8A 02	CHECK CODE ERROR DETECTED DURING MEDIUM LA CERTIFICATION	•A check code error was detected during medium LA check
1	8A 03	DIRTY DATA EXIST DURING MEDIUM PARITY CERTIFICATION	•Remaining intermediate or dirty pin data was detected during parity check.
1	8A 04	DIRTY DATA EXIST DURING MEDIUM LA CERTIFICATION	•Remaining intermediate or physical dirty pin data was detected during medium LA check.
4	8B 01	COMMAND ATTEMPTED TO BLOCKED LOGICAL UNIT	•An inoperable command was issued to blocked logical unit.
5	8C 01	PARITY CHECK REQUESTED DURING REGRESSION MODE	A prity check was requested during regression mode.

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Sense Codes List (Cont'd)

Sense key	Code		Error name	Desciption/meaning
5	8D	01	DETACH IS REJECTED BECAUSE THE LOGICAL UNIT WILL BE BLOCKD	(doesn't occur)
3	8E	01	READ ATTEMPTED TO WRITE-UNCOMPLETED BLOCK	•A READ or VERIFY attempt was made to WRITE-incomplete block.
1	8F	00	SYSTEM AREA WRITE ERROR	(doesn't occur)
4	8F	01	SYSTEM AREA WRITE ERROR OCCURED AT ONE OF SYSTEM DRIVE	(doesn't occur)
4	90	00	UNRECOVERED DATA ERROR WITH PARITY DISK DATA	•An error occurred during data recovery by parity disk data.
4	90	01	UNRECOVERED DATA ERROR WITH PARITY DISK DATA IN REGRESSION MODE	•An unrecoverable data error occurred during regression.
4	91	00	AUTO-REALLOCATION NOT COMPLETE FOR UNCORRECTABLE ERROR	•Data could not be rebuilt because an unrecoverable error was detected during auto reallocation.
4	91	01	AUTO-REALLOCATION NOT COMPLETE FOR UNCORRECTABLE ERROR	•Alternate block could be reallocated during auto reallocation.
9	92	00	UNRECOVERED ERROR IN REGRESSION MODE	(doesn't occur)
3	93	00	PARITY ADJUSTMENT ERROR ON CACHE MEMORY	•A parity mismatch occurred in cache memory.
5	94	01	LOGICAL UNIT NOT OHWNER	•Logical unit was not ohwner.
1	98	00	DRIVE DETACHED AND LOST IN PARITY INCONSISTENT AREA	(doesn't occur)
4	99	00	DATA WRITE ERROR ON SYNCHRONIZE CACHE	•Data in synchronize cache memory cannot be written to drive.
4	A0	00	CACHE MEMORY HARDWARE ERROR	•A hardware error occurred in cache circuit.
4	A1	00	NO INDEX/SECTOR SIGNAL IN WRITE AFTER	(doesn't occur)
4	A2	00	NO SEEK CONPLETE IN WRITE AFTER	(doesn't occur)
4	A3	00	WRITE FAULT IN WRITE AFTER	(doesn't occur)
4	A4	00	DRIVE NOT READY IN WRITE AFTER	(doesn't occur)
4	A6	00	NO TRACK ZERO FOUND IN WRITE AFTER	(doesn't occur)
4	A8	00	LOGICAL UNIT COMMUNICATION ERROR IN WRITE AFTER	(doesn't occur)
4	A8	01	LOGICAL UNIT COMMUNICATION TIME OUT IN WRITE AFTER	(doesn't occur)
4	A8	02	LOGICAL UNIT COMMUNICATION PARITY ERROR IN WRITE AFTER	(doesn't occur)
3	A8	03	LOGICAL UNIT NOT READY, CAUSE NOT REPORTABLE	•Drive READY signal cannot be detected. •Drive ACCESSES
4	A9	00	TRACK FOLLOWING ERROR IN WRITE AFTER	(doesn't occur)
4	AC	02	WRITE ERROR AUTO REALLOCATION FAILED IN WRITE AFTER	(doesn't occur)

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Sense Codes List (Cont'd)

Sense key	Code		Error name	Desciption/meaning
4	AE	00	PIN DATA MORE THAN THRESHOLD	(doesn't occur)
4	AF	00	WRITE ERROR AUTO REALLOCATION FAILED BY NO DEFECT SPARE IN WRITE AFTER	(doesn't occur)
4	B0	00	INTERNAL TARGET ERROR IN WRITE AFTER	(doesn't occur)
4	B2	00	NO ADDRESS MARK FOUND IN ID FIELD AT WRITE AFTER	(doesn't occur)
4	B3	00	NO ADDRESS MARK FOUND IN DATA FIELD AT WRITE AFTER	(doesn't occur)
4	B4	00	NO RECORD FOUND IN WRITE AFTER	(doesn't occur)
4	B5	02	POSITIONING ERROR DETECTED BY READ OF MEDIUM IN WRITE AFTER	(doesn't occur)
1	BF	01	DISK DIRECT WRITE BY BATTERY ALARM	(doesn't occur)
1	BF	02	DISK DIRECT WRITE BY PIN DATA OVER	(doesn't occur)
1	BF	03	WRITE THROUGH FOR DMA ERROR	(doesn't occur)
1	BF	04	WRITE THROUGH FOR PIN DATA	(doesn't occur)
B	C0	00	TIME OUT DETECTED IN CONTROLLER	•A timeout occurred during internal processing.
B	C0	01	TIME OUT DETECTED IN HOST DATA TRANSFER	•A timeout occurred during data transfer to host.
B	C1	00	CACHE MEMORY UNASSIGNED FOR FORMAT	•Cache memory required for formatting cannot be reserved.
B	C2	00	SYSTEM DRIVE CHANGED	•System current drive was changed.
B	C3	00	GENERATED OF SIM NOTIFICATION	•SVP reported some SIM
B	C4	00	REMOTE COPY FAILURE	•Remote copy to an R-VOL has ended abnormally.
5	DA	00	DRIVE RECOVERY REQUEST IS REJECTED, SINCE ANOTHER DRIVE RECOVERY IN PROCESS	•A new data recovery request cannot be accepted because another drive recovery is in process.
6	DB	00	ONLINE RECOVERY COMMAND ABORTED	(doesn't occur)
6	E0	00	BATTERY ALARM	•The battery is running out.
6	E2	00	FAN ALARM	•One of the fans stopped.
4	E4	00	NVS INTERNAL TABLE OVERFLOW, WRITE INCOMPLETE MANAGEMENT AREA	•A system area overflow occurred. (PIN data control area)
6	E5	00	POWER SUPPLY FAILURE	•One of power supply units failed.
6	E5	01	DC VOLTAGE DECREASED	•DC voltage dropped.
4	E8	00	SYSTEM FLOPPY DISK ERROR	(doesn't occur)
4	E9	00	BACK UP FLOPPY DISK ERROR	(doesn't occur)
1	EA	00	CONTROL INFORMATION WRITE ERROR ON A DISK	(doesn't occur)
4	EA	01	PROGRAM SIZE OUT OF RANGE	•Program size received in WRITE BUFFER is larger than system program area.

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Sense Codes List (Cont'd)

Sense key	Code	Error name	Desciption/meaning
4	EA 02	CONTROL INFORMATION SIZE OUT OF RANGE	•Inherited information size received in WRITE BUFFER is larger than system inherited information size.
3	F0 00	R/W BUFFER ERROR	•Microcode or parameter loading failed at the startup of controller.
3	F1 00	ERROR IN CONTROLLER INITIALIZATION	
4	F2 00	ERROR IN CONTROLLER INITIALIZATION	
	F3 00	ERROR IN CONTROLLER INITIALIZATION	
4	F4 00	CACHE MEMORY FAILURE	•Cache module was blocked because of cache meory failure
4	FA 00	LOGICAL UNIT INTERNAL ERROR	(doesn't occur)
4	FB 00	LOGICAL UNIT INTERFACE UNMATCH	(doesn't occur)
4	FC 00	LOGICAL UNIT INTERFACE ERROR	(doesn't occur)

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5 Format-depended information description

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Byte27 = 0X (X ≠ 8/A:System/Program Check) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type	Processor ID (Note)						
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘0’)				Message (x‘X’:X ≠ 8/A)			
28	Command code (for F/M ≠ F)/Reason code (for F/M=F) (Note 1)							
29	Detail failure information 1 (Note 2)							
2A								
2B								
2C								
2D	SSID of mate subsystem (x‘0000’ for EDCC)							
2E								
2F	Maker code & Manufacture code (x‘00’)							
30	Module ID							
31	Routine ID							
32	PCB number							
33	Detail failure information 2 (Note 3)							
34	SSID of self subsystem							
35								
36	Symptom code (x‘0F0X’)							
37	X=Message code (x‘2F00’ for dummy SENSE)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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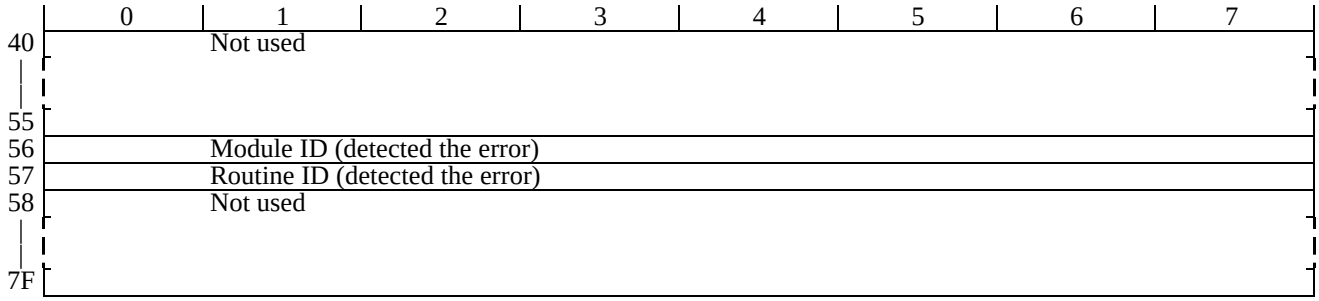
Byte27 = 0X (X ≠ 8/A:System/Program Check) (2/3)



(Note 1)

F/M = 0F:Byte08 Reason code

Code	Reason
00	No message
01	Trying to make cache available and cache status is pending.
02	Not used
03	Trying to make cache force unavailable and cache status is not pending with destage complete.
04	Trying to activate CFW and CFW status is pending.
05	Trying to activate caching (device) and cache status is pending.
06	Trying to destage (track) and NVS is failed.
07	Trying to make NVS unavailable and NVS is initializing.
08	Trying to deactivete caching , DFW or DISCARD (device) , and DFW status is failed.
09	Trying to force deactivate DFW (device) and status is not as follows. • EDFW status is pending or failed. • ENVS is failed and the data exists in NVS, but not in cache.
0A	Trying to make NVS available and DFW status (device) is pending or failed.
0B	Trying to make NVS available and NVS status is pending.
0C	When NVS is failed, trying to stop caching or DFW (device) and the data exists in NVS, but not in cache.
0D	Command requires NVS and NVS is unavailable.
0E	Command requires cache and cache is unavailable.
0F	Not used
10 ~ 28	Not used
29	PFS command (Set Special Interrupt Condition) is issued on an interface on which path group is not established.
2A	Trying to make path group include parallel channel and serial channel.
2B	Message buffer is full.
2C ~ 34	Not used
35	A Set Guaranteed Path subcommand is issued on a fenced path.
36 ~ 3E	Not used
3F	A Make NVS Avail for Subsystem subcommand is issued, but NVS is disable. (‘Disable NVS Capability’ is set to disable in VPD.)
40	Not used
41	A normal command is issued to a device reserved by maintenance.
42 ~ 7F	Not used
80	A special command is issued on an interface that was disabled by the PFS command with Set Special Intercept Condition order.
81	An attention report on an interface that was disabled by the PFS command with Set Special Intercept Condition order.
82 ~ FF	Not used

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Byte27 = 0X (X ≠ 8/A:System/Program Check) (3/3)

(Note 2) (1) Issued command information when F/M=02

B\b	0	1	2	3	4	5	6	7
29	SCH ID	SCH KEY	Locate, LC EXT	SK, SK CYL	RD IPL	RECAL	SUSP MPR	RD C
2A	DIAG CTL	DIAG CTL (LOC DOM)	DEF EXT	SET FM	SET SUB MODE	SP C	WR CKD	WR R0
2B	SET INTF ID	DIAG CTL (PRE REM)	0	Other command	RD C chainning	All byte match	LC domain	Erase execute
2C	Pseud through	0	0	Allow WR KD	Allow WR D	Allow WR CKD	Allow WR R0	Allow WR HA

(2) Short byte flag when F/M=03
x‘0040 0000’

(3) Mask information when F/M=05

Byte 29: Mask for write control
- x‘00’: Allow all write operation except WR HA, WR R0.
- x‘40’: Inhibit all write operation.
- x‘80’: Allow update write operation.
- x‘C0’: Allow all write operation.

Byte 2A: Mask for seek control
- x‘00’: Allow all seek commands and RECAL.
- x‘08’: Allow SK CYL and SK HD only.
- x‘10’: Allow SK HD only.
- x‘18’: Inhibit all seek command and multi operation.

Byte 2B: Mask for access
- x‘00’: Allow normal access.
- x‘02’: Allow device support.
- x‘04’: Allow diagnostic access.
- x‘06’: Allow device support inhibit data check correction and retry.

Byte 2C: Not used

(4) Record address when other F/M
Byte 29 and 2A : Clinder address
Byte 2B : Head address
Byte 2C : Record number

(Note 3) Bit 4-7 of byte 32: Type of byte 33
- x‘08’: Byte 33 is cylinder address (high).
- x‘09’: Byte 33 is cylinder address (low).
- x‘0A’: Byte 33 is head address (high).
- x‘0B’: Byte 33 is head address (low).
- x‘0C’: Byte 33 is record number.

Byte 33: One byte of CCHHR.

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Byte27 = 08 (Reset Notification) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘0’)				Message (x‘8’)			
28	Not used (x‘00’)							
29	Not used (x‘00’)							
2A	Not used (x‘00’)							
2B	Hardware level (Note 1)							
2C								
2D	SSID of mate subsystem (x‘0000’ for EDCC)							
2E								
2F	Maker code & Manufacture code (x‘00’)							
30	Module ID							
31	Routine ID							
32	PCB number				Not used (x‘0’)			
33	Not used (x‘00’)							
34	SSID of self subsystem							
35								
36	Symptom code (x‘2FFF’)							
37								
38	Log & message control (x‘00’)							
39	Program action code (x‘16’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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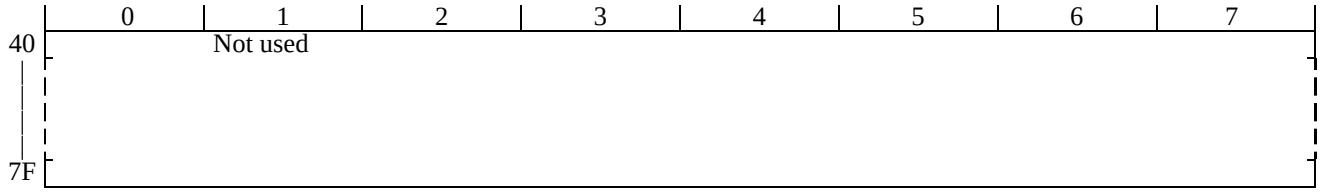
Byte27 = 08 (Reset Notification) (2/2)



(Note 1) Hardware Level

Bit0 : Serial Channel or Parallel Channel

Bit0=0(Parallel channel)

Bit 1	: Not used
Bit 2~3	: Strage Path Number
Bit 4~5	: Channels Per Cluster
	00 : 4
	01 : 8
	10 : Unused
	11 : Unused
Bit 6	: NVS
	0 : without NVS
	1 : with NVS
Bit 7	: Unused
Bit 8~10	: Cache size
	000 : none Cache
	001 : 256MB
	010 : 512MB
	011 : 768MB
	100 : 1024MB
	101 : 1280MB
	110 : 1536MB
	111 : over 1536MB
Bit 11~13	: Cluster hardware level
Bit 14~15	: Cache/NVS hardware level

Bit0=1(Serial Channel)

Bit 1	: Not used
Bit 2~3	: Strage Path Number
Bit 4~7	: Channels Per Cluster
	0000 : Parallel=4, Serial=0
	0001 : Parallel=8, Serial=0
	0010 : Parallel=4, Serial=2
	0100 : Parallel=4, Serial=4
	0110 : Parallel=0, Serial=2
	1000 : Parallel=0, Serial=4
	1010 : Parallel=0, Serial=8
	1100 : Parallel=0, Serial=6
Bit 8	: Dual Frame
	0 : Dual Frame
	1 : Modular Power
Bit 9~11	: Cache size
	000 : none Cache
	001 : 256MB
	010 : 512MB
	011 : 768MB
	100 : 1024MB
	101 : 1280MB
	110 : 1536MB
	111 : over 1536MB
Bit 12~13	: Cluster hardware level
Bit 14~15	: Cache/NVS hardware level

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Byte27 = 0A (Bus out parity check/Overrun on LCP interface (Byte3A:b4 = 1)) (1/1)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘0’)				Message (x‘A’)			
28	Command code							
29	Cylinder address							
2A								
2B	Head address							
2C	Record number							
2D	SSID of mate subsystem (x‘0000’ for EDCC)							
2E								
2F	Maker code & Manufacture code (x‘00’)							
30	Module ID							
31	Routine ID							
32	PCB number				BBF OVR	PND OVR	STOP	OVER
33	Not used							
34	SSID of self subsystem							
35								
36	Symptom code (x‘0F0A’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							
40 -7F	Not used							

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Byte27 = 10 (Intervention required) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘1’)				Message (x‘0’)			
28	Ready	Enable	SSB PEND		Not used (‘00000’)			
29	Not used (x‘00’)							
2A	M.M. RSV	PIN VOL	Not used (‘000000’)					
2B	Host type	DKC type	Not used (‘00’)		DKU type			
2C	Module ID (x‘50’)							
2D	Routine ID (x‘1C’)							
2E	Command code							
2F	Not used (x‘00’)							
30	Not used (x‘00’)							
31	Not used (x‘00’)							
32	PCB number				Not used (x‘0’)			
33	Not used							
34	SSID of self subsystem							
35								
36	Symptom code (x‘9F10’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

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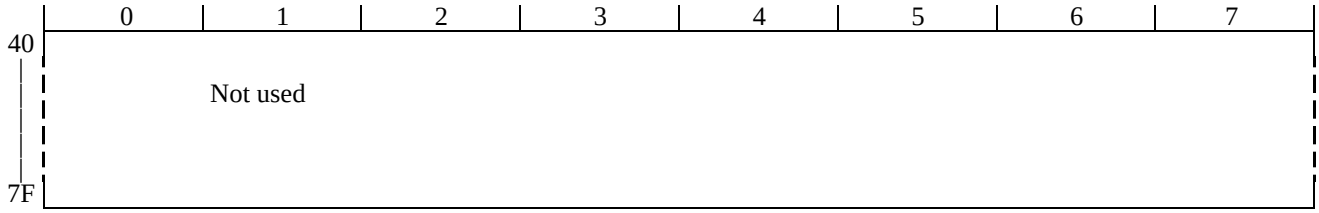
Byte27 = 10 (Intervention required) (2/2)



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Byte27 = 1X (Drive report error) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘1’)				Message (x‘2/4’)			
28	Additional sense code (Note 2)							
29	Additional sense code qualifier (Note 2)							
2A	SCSI Command (Note 3)							
2B	Threshold type (Note 4)							
2C	Module ID							
2D	Routine ID							
2E	Not used (x‘0’)				DKA#			
2F	CDEV#				RDEV#			
30	Type code (‘000’)			0	Sense key (Note 1)			
31	Not used (x‘00’)							
32	Not used (x‘00’)							
33	Not used (x‘00’)							
34	SSID of self subsystem							
35								
36	Symptom code (x‘9F1X’ X:Message)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 1X (Drive report error) (2/2)

	0	1	2	3	4	5	6	7
40		Status byte						
41		Message						
42		CDB						
4B								
4C		SPC status register						
4D		SPC nexus status register						
4E		SPC data block register						
4F								
50		SPC data byte register						
51								
52								
53		SPC SCSI control signal status register						
54		SCSI extended sense data						
73								
74		Not used						
7F								

(Note 1) Sense key

x‘0’ : No sense
x‘1’ : Recoverd error
x‘2’ : Not ready
x‘3’ : Medium error
x‘4’ : Hardware error
x‘5’ : Illigal request
x‘6’ : Unit attention
x‘7’ : Data protect
x‘8’ : Blank check (Not used)
x‘9’ : Vender unique (Not used)
x‘A’ : Copy aborted (Not used)
x‘B’ : Aborted command
x‘C’ : Equal (Not used)
x‘D’ : Volume overflow (Not used)
x‘E’ : Miscompare
x‘F’ : (Reserved)

(Note 2) See EC = E SSB log.

(Note 3) SCSI command

x‘00’ : Test unit ready
x‘03’ : Request sense
x‘04’ : Format unit
x‘07’ : Reassign blocks
x‘12’ : Inquiry
x‘15’ : Mode serect
x‘1A’ : Mode sense
x‘1B’ : Start/stop unit
x‘1C’ : Recieve diagnostic result
x‘1D’ : Send diagnostic
x‘28’ : Read (extend)
x‘2A’ : Write (extend)
x‘2E’ : Write and verify
x‘3B’ : Write buffer

(Note 4) See EC = E SSB log.

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Byte27=3F (Reset Allegiance) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x'3')				Message (x'F')			
28	Not used							
29	Logical path number							
2A	DCN status (Note 1)							
2B								
2C	Command code							
2D	SSID of mate subsystem (x'0000' for EDCC)							
2E								
2F	Maker code & Manufacture code (x'00')							
30	Module ID							
31	Routine ID							
32	PCB number							
33	Not used (x'00')							
34	SSID of self subsystem							
35								
36	Symptom code (x'3F3F')							
37								
38	Log and message control (x'00')							
39	Program action code (x'00')							
3A	Configuration information							
3B								
3C	Not used (x'00')							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27=3F (Reset Allegiance) (2/2)

	0	1	2	3	4	5	6	7
40	Not used							
7F								

(Note 1)

	0	1	2	3	4	5	6	7
28	Device busy	ECI	Command chainning	Path reserve	Stack status	Wait SENSE	Long busy	Processor connect
29	Single path mode	Guarant path mode	MCB chainning	0	Block switch	0	0	0

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Byte27 = 4X (Data check) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘4’)				Message (x‘X’)			
28	Cylinder address (Note 1)							
29								
2A	Head address (Note 1)							
2B								
2C	Record number (Note 1)							
2D	Sector number (Note 1)							
2E	Controller ID							
2F	Not used (x‘00’)							
30	Not used (x‘00’)							
31	Not used (x‘00’)							
32	PCB number				Not used (x‘0’)			
33	Not used							
34	Command code							
35	SSID (low) of self subsystem							
36	Symptom code (x‘4XYY’) (X:Note 2) (YY:Note 3)							
37								
38	Log and message control (x‘08’)							
39	Program action code (x‘91’)							
3A	Configuration information							
3B								
3C	Not usde (x‘01’)							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 4X (Data check) (2/3)

	0	1	2	3	4	5	6	7
40	Causal Key code							
41	Causal Format/Message							
42	Causal Module ID							
43	Causal Routine ID							
44	LDEV number, slot number							
45								
46								
47								
48	Slot status							
49								
4A								
4B								
4C	staging bit map/Dirty bit map							
4D								
4E								
4F								
50	Current subblock number							
51	EXIT falg (Note 4)							
52	Slot failure information (Note 5)							
53	Obtained information flat (Note 6)							
54	Head subblock number for HIT/MISS decision + Remain subblock count							
55	(when byte36 is x‘40/41/42/43’)/PACC in CBUF (when byte36 is x‘45’)							
56	Not used (when byte36 is x‘40/41/42/43’)/							
57	PAHF in CBUF (when byte36 is x‘45’)							
58	Not used (when byte36 is x‘40/41/42/43’)/							
59	Current CC in JCB (when byte36 is x‘45’)							
5A	Not used (when byte36 is x‘40/41/42/43’)/							
5B	Current HH in JCB (when byte36 is x‘45’)							
5C								
	Reserved							
7F								

(Note 1) Not determined for occurrence in HA or RO

(Note 2) Contents of message

x‘0’ : Data check in HA field
x‘1’ : Data check in C field
x‘2’ : Data check in K field
x‘3’ : Data check in D field
x‘4’ : Missing SYNC byte in HA field
x‘5’ : Missing SYNC byte in C field (PA error)
x‘6’ : Missing SYNC byte in K field
x‘7’ : Missing SYNC byte in D field
x‘8’ : Not used
x‘9’ : Missing AM during retry
x‘A’to x‘F’ : Not used

(Note 3) Contents of correctionflag

Bits 0 and 1 : ECC correction bit
10 : Correctable (Recoverd)
11 : Uncorrectable
Bit 2 : offset activ
Bits 3 to 7 : Not used

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Byte27 = 4X (Data check) (3/3)

(Note 4) EXIT flag

x‘08’ : CHL I/F CHK2 timeover
x‘0D’ : EOF
x‘0E’ : DSB=0E requested
x‘0F’ : Logical error
x‘1E’ : Make sense only
x‘1F’ : Logical error (make sense only)
x‘30’ : Selective reset requested
x‘40’ : ‘Staging’ requested
x‘41’ : ‘Waiting free segment’ requested
x‘42’ : ‘Timeover of waiting for staging’ requested
x‘43’ : ‘Staging for PA unmatch’ requested
x‘45’ : ‘Destaging’ requested
x‘46’ : ‘High priority destaging’ requested
x‘47’ : ‘Pseud-through process’ requested
x‘4B’ : ‘DSB=4E retry’ requested (data transfer)
x‘4E’ : ‘DSB=4E retry’ requested (DSB = 4E retry)
x‘4F’ :STG requested (Read or STG in progress)

(Note 5) Slot failure

x‘80’ : Sector write error
x‘40’ : Sector read error
x‘20’ : ECC/LRC error
x‘10’ : Incomplete data
x‘08’ : No decision

(Note 6) Obtained information flag

bit0-1 : Block type
- 00 : Data block
- 01 : HA/RO block
- 10 : Bit map block

bit2-3 : Side
- 00 : Cache write side
- 01 : NVS write side
- 10 : Cache read side

bit4 : Segment
- 0 :No segment
- 1 :Segment exist

bit5-7 : Reserved

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Byte27 = 6X (Statistics) (1/1)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Controller ID							
24	Device address							
25	Command overrun threshold exceeded							
26	Data overrun threshold exceeded							
27	Format (x‘6’)				Message (x‘X’)			
28	Read/search byte count							
29								
2A								
2B								
2C	Seek count							
2D								
2E	Not used (x‘00’)							
2F	Manufacture code (‘000000’)						Factory code (‘00’)	
30	Not used (x‘00’)							
31	DKC serial number							
32								
33								
34	SSID of self SSID							
35								
36	Sympton code (x‘6FXY’ X:0: Statistics/RRBL command, 2: Channel data overrun							
37	Y:CHL# (parallel CHL)/LCP# (serial CHL))							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00000000’)							
3D								
3E								
3F								
40 -7F	Not used							

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Byte27 = 74 (SPC report error) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘7’)				Message (x‘4’)			
28	SPC interuption status register (See EC = D SSB log)							
29	SPC comand step register (See EC = D SSB log)							
2A	SCSI command code (See EC = D SSB log)							
2B	Threshold type (See EC = D SSB log)							
2C	Module ID							
2D	Routine ID							
2E	Not used (x‘0’)				DKA number			
2F	CDEV number				RDEV number			
30	Type code (‘111’)		0		Not used (x‘0’)			
31	Not used (x‘00’)							
32	Not used (x‘00’)							
33	Not used (x‘00’)							
34	SSID of self subsystem							
35								
36	Symptom code (x‘DF74’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 74 (SPC report error) (2/2)

	0	1	2	3	4	5	6	7
40		Status by						
41		Message						
42		CDB						
43								
44								
45								
46								
47								
48								
49								
4A								
4B								
4C		SPC status register						
4D		SPC nexus status register						
4E		SPC data block register						
4F								
50		SPC data byte register						
51								
52								
53		SPC SCSI control signal status register						
54		SCA SFC						
55								
56		SCA SFS0						
57								
58		SCA XFS1						
59								
5A		SCA INT						
5B								
5C		SCA SCHK1						
5D								
5E		SCA SCHK20						
5F								
60		SCA SCHK21						
61								
62		SCA SCHK22						
63								
64		SCA SCHK23						
65								
66		SCA SCHK24						
67								
68		SCA SCHK25						
69								
6A		SCA SCACHK2						
6B								
6C		SCA BSACHK2						
6D								
6E		SCA XFS2						
6F								
70		SCA XFS3						
71								
72		Not used						
7F								

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Byte27 = 79 (SCSI bus parity error) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘7’)				Message (x‘9’)			
28	Additional sense code (Note 2)							
29	Additional sense code qualifier (Note 2)							
2A	SCSI Command (Note 3)							
2B	Threshold type (Note 4)							
2C	Module ID							
2D	Routine ID							
2E	Not used (x‘0’)				DKA#			
2F	CDEV#				RDEV#			
30	Type code (‘000’)			0	Sense key (Note 1)			
31	Not used (x‘00’)							
32	Not used (x‘00’)							
33	Not used (x‘00’)							
34	SSID of self subsystem							
35								
36	Symptom code (x‘DF79’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 79 (SCSI bus parity error) (2/2)

	0	1	2	3	4	5	6	7
40		Status byte						
41		Message						
42		CDB						
4B								
4C		SPC status register						
4D		SPC nexus status register						
4E		SPC data block register						
4F								
50		SPC data byte register						
51								
52								
53		SPC SCSI control signal status register						
54		SCSI extended sense data						
73								
74		Not used						
7F								

(Note 1) Sense key

x‘0’ : No sense
x‘1’ : Recoverd error
x‘2’ : Not ready
x‘3’ : Medium error
x‘4’ : Hardware error
x‘5’ : Illigal request
x‘6’ : Unit attention
x‘7’ : Data protect
x‘8’ : Blank check (Not used)
x‘9’ : Vender unique (Not used)
x‘A’ : Copy aborted (Not used)
x‘B’ : Aborted command
x‘C’ : Equal (Not used)
x‘D’ : Volume overflow (Not used)
x‘E’ : Miscompare
x‘F’ : (Reserved)

(Note 2) See EC = E SSB log.

(Note 3) SCSI command

x‘00’ : Test unit ready
x‘03’ : Request sense
x‘04’ : Format unit
x‘07’ : Reassign blocks
x‘12’ : Inquiry
x‘15’ : Mode serect
x‘1A’ : Mode sense
x‘1B’ : Start/stop unit
x‘1C’ : Recieve diagnostic result
x‘1D’ : Send diagnostic
x‘28’ : Read (extend)
x‘2A’ : Write (extend)
x‘2E’ : Write and verify
x‘3B’ : Write buffer

(Note 4) See EC = E SSB log.

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Byte27 = 81 & Byte34:b4-7 = 0 (Shared Memery Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘1’)			
28	Subcode			(See following pages)				
29	Hardware information			(See following pages)				
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Not used (x‘00’)							
33	Not used (x‘00’)							
34	PCB number				Message code (x‘0’)			
35	SSID of self subsystem							
36	Symptom code (x‘FF81’ : LDEV type = DKU87I/x‘EF81’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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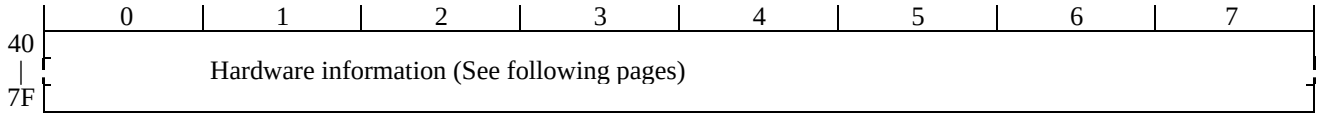
Byte27 = 81 & Byte34:b4-7 = 0 (Shared Memory Failure) (2/2)



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Byte27 = 81 (Shared Memory Failure) Byte28-31 Detail

(1) Byte34, Bit4 to Bit7 = 0: Shared Memory Failure

	0	1	2	3	4	5	6	7
28	Subcode							
	Micro error	M bus error	M bus ID	Arbiter error	Shared memory Side A error	Shared memory Side B error	SMP error	Other errors
29	MIC:TIM4L:8400 0334(b10-17)							
	MIC TIM4L							
2A	MIC:TIM4L:8400 0334(b20-27)							
	MIC TIM4L							
2B	MIC:TIM4L:8400 0334(b30-37)							
	MIC TIM4L							
2C	SMP:MSTERR:8200 07D4(b00-07)							
	H bus requester error	Shared memory reduction setting error	Bus mode setting error	PKID parity error	L bus requester error	Reserved	1st. read dats bus code errror	2nd. read data bus code error
2D	SMP:MSTERR:8200 07D4(b10-17)							
	Read data compare error	1st. error phase bus code error	2nd. error phase bus code error	Error phase warning	Error phase ANYERR	ML bus check error Side A	MH bus check error Side A	Master timeout
2E	SMP:MSTERR:8200 07D4(b20-27)							
	ML bus check error Side B	MH bus check error Side B	always 0	SMP internal failure	always 0	ML bus open was detected	MH bus open was detected	ML bus SYNC ERR
2F	SMP:MSTERR:8200 07D4(b30-37)							
	MH bus SYNC ERR	always 0	always 0	Lock micro error	Burst micro error	Bus error	always 0	Hot line access error
30								
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
31								
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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Byte27 = 81 Byte40-7F (CHK3 MICRO ERROR, SMPIN ERROR, REQUESTER ERROR) (1/5)

	0	1	2	3	4	5	6	7
40	MIC:MIC RCVINT :84000100 (b10 - 17)							
	SYSRST interrupt	SELRST interrupt	CHK1A interrupt	CHK1B interrupt	SMP interrupt	LAN interrupt	CHA/DRR interrupt	ADP/CLST interrupt
41	DSMP HOTLIN STATUS 820006FC (b20 - 27)							
	Directly read value of input signal of MH ABTENBL LSI	Directly read value of input signal of MH ARBRST LSI			Directly read value of input signal of ML ABTENBL LSI	Directly read value of input signal of ML ARBRST LSI		
42	DSMP BMD 820003F8 (b30 - 37)							
	F bus valid	M bus valid	Pseudo access mode	SM DIAG access	REQ output enable	SM copy mode	SM Side A reduction	SM Side B reduction
43	DSMP CMPERR 8200004C (b34 - 37)				DSMP MLSEL 82000414 (b34 - 37)			
	Double read burst0 data Side A/Side B data unmatch	Double read burst1 data Side A/Side B data unmatch	Double read burst2 data Side A/Side B data unmatch	Double read burst3 data Side A/Side B data unmatch	CMPERR BURST0	CMPERR BURST1	CMPERR BURST2	CMPERR BURST3
44	DSMP TIMEOUT STATUS 820007FC (b34 - 37)				DSMP SYNCFLG 82000720 (b34 - 37)			
	Bus open timeout	Arbiter response disable	No response of bus timeout		Transfer of second data (A) at double read	Transfer of second error phase (A) at double read	Transfer of second data (B) at double read	Transfer of second error phase (B) at double read
45	DSMP CHK3 STATUS 82000050 (b30 - 37)							
	Side A ERR	Side B ERR	SMP ERR	LBUS	WRITE	Single	4B	2B
46	DSMP HOTLIN STATUS 820006FC (b30 - 37)							
	SMB bus SMADSBL unmatch	SMA bus SMBDSBL unmatch	MH bus MHDSBL unmatch	MH bus MLDSBL unmatch	MH bus ARBRST unmatch	ML bus ARBRST unmatch	SM redundant error	M bus redundant error
47	DSMP HOTLIN OUTPUT 8200071C (b30 - 37)							
	SM side A invalid Report to all MPs	SM side B invalid Report to all MPs	MH bus invalid Report to all MPs	ML bus invalid Report to all MPs	MH ARBRST invalid Report to all MPs	ML ARBRST invalid Report to all MPs	Reserved	Reserved
48	DSMP SMPINERR 82000058 (b20 - 27)							
	MH bus code last check (1)	MH bus code last check (2)	MH bus code last check (3)	MH bus code last check (4)	ML bus code last check (1)	ML bus code last check (2)	ML bus code last check (3)	ML bus code last check 4)
49	DSMP SMPINERR 82000058 (b30 - 37)							
	Unmatch at resource lock	Resource lock Block read parity error	Burst address generater parity error	Address phase parity error	Command phase parity error	Master timer parity error	MP IP generater parity error	Requester timer parity error
4A	DSMP BURST MICRO ERR 82000054 (b30 - 37)							
	2 words burst transfer area boundary error	4 words burst transfer area boundary error	0	Burst access Illegal command	0	Long, 1 word transfer command at read	Burst address (2 words) over	Burst address (4 words) over
4B	DSMP LOCK MICRO ERR 8200005C (b30 - 37)							
				Resource lock control mode error	Lock byte error	Wait queue error (1 bit lost)	Wait queue error (2 bits lost)	Wait queue error (all bits lost)
4C	DSMP HGRANT 820003C4 (b30 - 37)							
				4 bit code #0	4 bit code #1	4 bit code #2	4 bit code #3	4 bit code parity
4D	DSMP LGRANT 8200034C (b30 - 37)							
				4 bit code #0	4 bit code #1	4 bit code #2	4 bit code #3	4 bit code parity
4E	DSMP ENTI 820003C0 (b34 - 37)				DSMP REQ ERR 82000350 (b24 - 27)			
	Not used	Not used	MLENT	MHENT	Not used	Not used	Not used	L bus GRANT error
4F	DSMP REQ ERR 82000350 (b30 - 37)							
	H bus GRANT error	L bus GRANT parity error	H bus GRANT parity error	Transfer end timeout error	GSYNC over error	GSYNC counter parity error	Timeout check time parity error	MP IP parity error

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Byte27 = 81 Byte40-7F (CHK3 MICRO ERROR, SMPIN ERROR, REQUESTER ERROR) (2/5)

	0	1	2	3	4	5	6	7
50	DSMP WAD820004F0 (b00 - 07)							
	WAD00	WAD01	WAD02	WAD03	WAD04	WAD05	WAD06	WAD07
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
51	DSMP WAD820004F0 (b10 - 17)							
	WAD10	WAD11	WAD12	WAD13	WAD14	WAD15	WAD16	WAD17
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
52	DSMP WAD820004F0 (b20 - 27)							
	WAD20	WAD21	WAD22	WAD23	WAD240	WAD25	WAD26	WAD27
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
53	DSMP WAD820004F0 (b30 - 37)							
	WAD30	WAD31	WAD32	WAD33	WAD34	WAD35		
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
54	DSMP TXA820004C0 (b00 - 07)							
	TXA00	TXA01	TXA02	TXA03	TXA04	TXA05	TXA06	TXA07
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
55	DSMP TXA820004C0 (b10 - 17)							
	TXA10	TXA11	TXA12	TXA13	TXA14	TXA15	TXA16	TXA17
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
56	DSMP TXA820004C0 (b20 - 27)							
	TXA20	TXA21	TXA22	TXA23	TXA24	TXA25	TXA26	TXA27
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
57	DSMP TXA820004C0 (b30 - 37)							
	TXA30	TXA31	TXA32	TXA33	TXA34	TXA35	TXA36	TXA37
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
58	DSMP TXC820004C8 (b00 - 07)							
	TXC00	TXC01	TXC02	TXC03	TXC04	TXC05	TXC06	TXC07
	Address (lower 1 byte) which was output to M bus/F bus							
59	DSMP TXC820004C8 (b10 - 17)							
	TXC10 Reserved	TXC11 Reserved	TXC12 Reserved	TXC13 Reserved	TXC14 DIAG access monitor bit	TXC15 Reserved	TXC16 Reserved	TXC17 Reserved
5A	DSMP TXC820004C8 (b20 - 27)							
	TXC20 TX DATA <00-07> valid	TXC21 TX DATA <10-17> valid	TXC22 TX DATA <20-27> valid	TXC23 TX DATA <30-37> valid	TXC24	TXC25 Bus transfer count (0001)	TXC26	TXC27
5B	DSMP TXC820004C8 (b30 - 37)							
	TXC30 Reserved	TXC31 MP bus space access : 101	TXC32	TXC33	TXC34 Transfer Mode Single area write: 0, Single area read: 1 Double area write: 4, Double area read: 5, Broadcast: 8	TXC35	TXC36	TXC37
5C	DSMP WDT820004DC (b00 - 07)							
	Write data which is stored to write buffer in accessing M bus at master mode							
5D	DSMP WDT820004DC (b10 - 17)							
	Write data which is stored to write buffer in accessing M bus at master mode							
5E	DSMP WDT820004DC (b20 - 27)							
	Write data which is stored to write buffer in accessing M bus at master mode							
5F	DSMP WDT820004DC (b30 - 37)							
	Write data which is stored to write buffer in accessing M bus at master mode							

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Byte27 = 81 Byte40-7F (CHK3 MICRO ERROR, SMPIN ERROR, REQUESTER ERROR) (3/5)

	0	1	2	3	4	5	6	7
60	DSMP R1D 820004E0 (b00 - 07)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
61	DSMP R1D 820004E0 (b10 - 17)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
62	DSMP R1D 820004E0 (b20 - 27)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
63	DSMP R1D 820004E0 (b30 - 37)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
64	DSMP R2D 820004E4 (b00 - 07)							
	Read data from F bus / M bus (Double read using slave 1)							
65	DSMP R2D 820004E4 (b10 - 17)							
	Read data from F bus / M bus (Double read using slave 1)							
66	DSMP R2D 820004E4 (b20 - 27)							
	Read data from F bus / M bus (Double read using slave 1)							
67	DSMP R2D 820004E4 (b30 - 37)							
	Read data from F bus / M bus (Double read using slave 1)							
68	DSMP E1D 820004E8 (b00 - 07)							
	E1D00	E1D01	E1D02	E1D03	E1D04	E1D05	E1D06	E1D07
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
69	DSMP E1D 820004E8 (b10 - 17)							
	E1D10	E1D11	E1D12	E1D13	E1D14	E1D15	E1D16	E1D17
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
6A	DSMP E1D 820004E8 (b20 - 27)							
	E1D20	E1D21	E1D22	E1D23	E1D24	E1D25	E1D26	E1D27
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
6B	DSMP E1D 820004E8 (b30 - 37)							
	E1D30	E1D31	E1D32	E1D33	E1D34	E1D35	E1D36	E1D37
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
6C	DSMP E2D 820004EC (b00 - 07)							
	E2D00	E2D01	E2D02	E2D03	E2D04	E2D05	E2D06	E2D07
	Error phase data from F bus / M bus (Double read using slave 1)							
6D	DSMP E2D 820004EC (b10 - 17)							
	E2D10	E2D11	E2D12	E2D13	E2D14	E2D15	E2D16	E2D17
	Error phase data from F bus / M bus (Double read using slave 1)							
6E	DSMP E2D 820004EC (b20 - 27)							
	E2D20	E2D21	E2D22	E2D23	E2D24	E2D25	E2D26	E2D27
	Error phase data from F bus / M bus (Double read using slave 1)							
6F	DSMP E2D 820004EC (b30 - 37)							
	E2D30	E2D31	E2D32	E2D33	E2D34	E2D35	E2D36	E2D37
	Error phase data from F bus / M bus (Double read using slave 1)							

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Byte27 = 81 Byte40-7F (CHK3 MICRO ERROR, SMPIN ERROR, REQUESTER ERROR) (4/5)

	0	1	2	3	4	5	6	7
70	SMC:MHERR A C0000030 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC err	DTSYNC or ERSYNC err	ASYNC or ERSYNC err	0	0	0	0	Release of locked access
71	SMC:MHERR A C0000030 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
72	SMC:MHERR A C0000030 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
73	SMC:MHERR A C0000030 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error
74	SMC:MHERR B C2000030 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC err	DTSYNC or ERSYNC err	ASYNC or ERSYNC err	0	0	0	0	Release of locked access
75	SMC:MHERR B C2000030 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
76	SMC:MHERR B C2000030 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
77	SMC:MHERR B C2000030 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error
78	SMC:MLERR A C0000038 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC err	DTSYNC or ERSYNC err	ASYNC or ERSYNC err	0	0	0	0	Release of locked access
79	SMC:MLERR A C0000038 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
7A	SMC:MLERR A C0000038 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
7B	SMC:MLERR A C0000038 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error

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Byte27 = 81 Byte40-7F (CHK3 MICRO ERROR, SMPIN ERROR, REQUESTER ERROR) (5/5)

	0	1	2	3	4	5	6	7
7C	SMC:MLERR B C0000038 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC error	DTSYNC or ERSYNC error	ASYNC or ERSYNC error	0	0	0	0	Release of locked access
7D	SMC:MLERR B C0000038 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
7E	SMC:MLERR B C0000038 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
7F	SMC:MLERR B C0000038 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error

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Byte27 = 81 (Shared Memory Failure) Byte28-31 Detail

(2) Byte34, Bit4 to Bit7 = 0: Shared Memory Failure

	0	1	2	3	4	5	6	7
28	Subcode							
	Micro error	M bus error	M bus ID	Arbiter error	Shared memory Side A error	Shared memory Side B error	SMP error	Other errors
29	MIC:TIM4L:8400 0334(b10-17)							
	MIC TIM4L							
2A	MIC:TIM4L:8400 0334(b20-27)							
	MIC TIM4L							
2B	MIC:TIM4L:8400 0334(b30-37)							
	MIC TIM4L							
2C	SMP:MSTERR:8200 07D4(b00-07)							
	H bus requester error	Shared memory reduction setting error	Bus mode setting error	PKID parity error	L bus requester error	Reserved	1st. read dats bus code errror	2nd. read data bus code error
2D	SMP:MSTERR:8200 07D4(b10-17)							
	Read data compare error	1st. error phase bus code error	2nd. error phase bus code error	Error phase warning	Error phase ANYERR	ML bus check error Side A	MH bus check error Side A	Master timeout
2E	SMP:MSTERR:8200 07D4(b20-27)							
	ML bus check error Side B	MH bus check error Side B	always 0	SMP internal failure	always 0	ML bus open was detected	MH bus open was detected	ML bus SYNC ERR
2F	SMP:MSTERR:8200 07D4(b30-37)							
	MH bus SYNC ERR	always 0	always 0	Lock micro error	Burst micro error	Bus error	always 0	Hot line access error
30								
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
31								
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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Byte27 = 81 Byte40-7F (OTHER ERROR) (1/6)

	0	1	2	3	4	5	6	7
40	MIC:MIC RCVINT :84000100 (b10 - 17)							
	SYSRST interrupt	SELRST interrupt	CHK1A interrupt	CHK1B interrupt	SMP interrupt	LAN interrupt	CHA/DRR interrupt	ADP/CLST interrupt
41	DSMP HOTLIN STATUS 820006FC (b20 - 27)							
	Directly read value of input signal of MH ABTENBL LSI	Directly read value of input signal of MH ARBRST LSI			Directly read value of input signal of ML ABTENBL LSI	Directly read value of input signal of ML ARBRST LSI		
42	DSMP BMD 820003F8 (b30 - 37)							
	F bus valid	M bus valid	Pseudo access mode	SM DIAG access	REQ output enable	SM copy mode	SM Side A reduction	SM Side B reduction
43	DSMP CMPERR 8200004C (b34 - 37)				DSMP MLSEL 82000414 (b34 - 37)			
	Double read burst0 data Side A/Side B data unmatch	Double read burst1 data Side A/Side B data unmatch	Double read burst2 data Side A/Side B data unmatch	Double read burst3 data Side A/Side B data unmatch	CMPERR BURST0	CMPERR BURST1	CMPERR BURST2	CMPERR BURST3
44	DSMP TIMEOUT STATUS 820007FC (b34 - 37)				DSMP SYNCFLG 82000720 (b34 - 37)			
	Bus open timeout	Arbiter response disable	No response of bus timeout		Transfer of second data (A) at double read	Transfer of second error phase (A) at double read	Transfer of second data (B) at double read	Transfer of second error phase (B) at double read
45	DSMP CHK3 STATUS 82000050 (b30 - 37)							
	Side A ERR	Side B ERR	SMP ERR	LBUS	WRITE	Single	4B	2B
46	DSMP HOTLIN STATUS 820006FC (b30 - 37)							
	SMB bus SMADSBL unmatch	SMA bus SMBDSBL unmatch	MH bus MHDSBL unmatch	MH bus MLDSBL unmatch	MH bus ARBRST unmatch	ML bus ARBRST unmatch	SM redundant error	M bus redundant error
47	DSMP HOTLIN OUTPUT 8200071C (b30 - 37)							
	SM side A invalid Report to all MPs	SM side B invalid Report to all MPs	MH bus invalid Report to all MPs	ML bus invalid Report to all MPs	MH ARBRST invalid Report to all MPs	ML ARBRST invalid Report to all MPs	Reserved	Reserved
48	DSMP BUSERR 82000048 (b20 - 27)							
	Bus check error of first read data				Bus check error of second read data			
49	DSMP BUSERR 82000048 (b30 - 37)							
	MPID of 1st received error phase differ from own MPID	MPID of 2nd received error phase differ from own MPID	1st received P-LRC code error	2nd received P-LRC code error	0	0	0	0

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Byte27 = 81 Byte40-7F (OTHER ERROR) (2/6)

	0	1	2	3	4	5	6	7
4A	DSMP BOARD ERR A C0000018 (b10 - 17)							
	0	Bus select signal parity error	Bus select sequencer parity error	Lock time counter parity error	0	0	Memory control line check error via SIMM	Correctable counter parity error
4B	DSMP BOARD ERR A C0000018 (b20 - 27)							
	Loop check error in RAS signal output	Loop check error in CAS signal output	Loop check error in WE signal output	Loop check error in OE signal output	Loop check error in direction signal output	Loop check error in address line output	Loop check error in data line output	Loop check error in ECC data line output
4C	DSMP BOARD ERR A C0000018 (b30 - 37)							
	External clock, 4-phase clock check error	Refresh timer parity error	SMC timer parity error	M bus use rate counter parity error (number)	M bus use rate counter parity error (time)	Main sequencer parity error	M bus sequencer parity error	F bus sequencer parity error
4D	DSMP BOARD ERR B C2000018 (b10 - 17)							
	0	Bus select signal parity error	Bus select sequencer parity error	Lock time counter parity error	0	0	Memory control line check error via SIMM	Correctable counter parity error
4E	DSMP BOARD ERR B C2000018 (b20 - 27)							
	Loop check error in RAS signal output	Loop check error in CAS signal output	Loop check error in WE signal output	Loop check error in OE signal output	Loop check error in direction signal output	Loop check error in address line output	Loop check error in data line output	Loop check error in ECC data line output
4F	DSMP BOARD ERR B C2000018 (b30 - 37)							
	External clock, 4-phase clock check error	Refresh timer parity error	SMC timer parity error	M bus use rate counter parity error (number)	M bus use rate counter parity error (time)	Main sequencer parity error	M bus sequencer parity error	F bus sequencer parity error

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Byte27 = 81 Byte40-7F (OTHER ERROR) (3/6)

	0	1	2	3	4	5	6	7
50	DSMP WAD820004F0 (b00 - 07)							
	WAD00	WAD01	WAD02	WAD03	WAD04	WAD05	WAD06	WAD07
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
51	DSMP WAD820004F0 (b10 - 17)							
	WAD10	WAD11	WAD12	WAD13	WAD14	WAD15	WAD16	WAD17
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
52	DSMP WAD820004F0 (b20 - 27)							
	WAD20	WAD21	WAD22	WAD23	WAD240	WAD25	WAD26	WAD27
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
53	DSMP WAD820004F0 (b30 - 37)							
	WAD30	WAD31	WAD32	WAD33	WAD34	WAD35		
	I960 address which SMP receives from XR bus in accessing M bus space at master mode							
54	DSMP TXA820004C0 (b00 - 07)							
	TXA00	TXA01	TXA02	TXA03	TXA04	TXA05	TXA06	TXA07
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
55	DSMP TXA820004C0 (b10 - 17)							
	TXA10	TXA11	TXA12	TXA13	TXA14	TXA15	TXA16	TXA17
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
56	DSMP TXA820004C0 (b20 - 27)							
	TXA20	TXA21	TXA22	TXA23	TXA24	TXA25	TXA26	TXA27
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
57	DSMP TXA820004C0 (b30 - 37)							
	TXA30	TXA31	TXA32	TXA33	TXA34	TXA35	TXA36	TXA37
	Address (upper 4 bits) which is output to F bus/M bus after conversion of WAD data in accessing Mbus							
58	DSMP TXC820004C8 (b00 - 07)							
	TXC00	TXC01	TXC02	TXC03	TXC04	TXC05	TXC06	TXC07
	Address (lower 1 byte) which was output to M bus/F bus							
59	DSMP TXC820004C8 (b10 - 17)							
	TXC10 Reserved	TXC11 Reserved	TXC12 Reserved	TXC13 Reserved	TXC14 DIAG access monitor bit	TXC15 Reserved	TXC16 Reserved	TXC17 Reserved
5A	DSMP TXC820004C8 (b20 - 27)							
	TXC20 TX DATA <00-07> valid	TXC21 TX DATA <10-17> valid	TXC22 TX DATA <20-27> valid	TXC23 TX DATA <30-37> valid	TXC24	TXC25 Bus transfer count (0001)	TXC26	TXC27
5B	DSMP TXC820004C8 (b30 - 37)							
	TXC30 Reserved	TXC31 MP bus space access : 101	TXC32	TXC33	TXC34 Transfer Mode Single area write: 0, Single area read: 1 Double area write: 4, Double area read: 5, Broadcast: 8	TXC35	TXC36	TXC37
5C	DSMP WDT820004DC (b00 - 07)							
	Write data which is stored to write buffer in accessing M bus at master mode							
5D	DSMP WDT820004DC (b10 - 17)							
	Write data which is stored to write buffer in accessing M bus at master mode							
5E	DSMP WDT820004DC (b20 - 27)							
	Write data which is stored to write buffer in accessing M bus at master mode							
5F	DSMP WDT820004DC (b30 - 37)							
	Write data which is stored to write buffer in accessing M bus at master mode							

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Byte27 = 81 Byte40-7F (OTHER ERROR) (4/6)

	0	1	2	3	4	5	6	7
60	DSMP R1D 820004E0 (b00 - 07)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
61	DSMP R1D 820004E0 (b10 - 17)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
62	DSMP R1D 820004E0 (b20 - 27)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
63	DSMP R1D 820004E0 (b30 - 37)							
	Read data from F bus / M bus (Double read using slave 2 or single read using appointed slave)							
64	DSMP R2D 820004E4 (b00 - 07)							
	Read data from F bus / M bus (Double read using slave 1)							
65	DSMP R2D 820004E4 (b10 - 17)							
	Read data from F bus / M bus (Double read using slave 1)							
66	DSMP R2D 820004E4 (b20 - 27)							
	Read data from F bus / M bus (Double read using slave 1)							
67	DSMP R2D 820004E4 (b30 - 37)							
	Read data from F bus / M bus (Double read using slave 1)							
68	DSMP E1D 820004E8 (b00 - 07)							
	E1D00	E1D01	E1D02	E1D03	E1D04	E1D05	E1D06	E1D07
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
69	DSMP E1D 820004E8 (b10 - 17)							
	E1D10	E1D11	E1D12	E1D13	E1D14	E1D15	E1D16	E1D17
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
6A	DSMP E1D 820004E8 (b20 - 27)							
	E1D20	E1D21	E1D22	E1D23	E1D24	E1D25	E1D26	E1D27
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
6B	DSMP E1D 820004E8 (b30 - 37)							
	E1D30	E1D31	E1D32	E1D33	E1D34	E1D35	E1D36	E1D37
	Error phase data from F bus / M bus (Double read using slave 2, single read using slave 1/2)							
6C	DSMP E2D 820004EC (b00 - 07)							
	E2D00	E2D01	E2D02	E2D03	E2D04	E2D05	E2D06	E2D07
	Error phase data from F bus / M bus (Double read using slave 1)							
6D	DSMP E2D 820004EC (b10 - 17)							
	E2D10	E2D11	E2D12	E2D13	E2D14	E2D15	E2D16	E2D17
	Error phase data from F bus / M bus (Double read using slave 1)							
6E	DSMP E2D 820004EC (b20 - 27)							
	E2D20	E2D21	E2D22	E2D23	E2D24	E2D25	E2D26	E2D27
	Error phase data from F bus / M bus (Double read using slave 1)							
6F	DSMP E2D 820004EC (b30 - 37)							
	E2D30	E2D31	E2D32	E2D33	E2D34	E2D35	E2D36	E2D37
	Error phase data from F bus / M bus (Double read using slave 1)							

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Byte27 = 81 Byte40-7F (OTHER ERROR) (5/6)

	0	1	2	3	4	5	6	7
70	SMC:MHERR A C0000030 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC err	DTSYNC or ERSYNC err	ASYNC or ERSYNC err	0	0	0	0	Release of locked access
71	SMC:MHERR A C0000030 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
72	SMC:MHERR A C0000030 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
73	SMC:MHERR A C0000030 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error
74	SMC:MHERR B C2000030 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC err	DTSYNC or ERSYNC err	ASYNC or ERSYNC err	0	0	0	0	Release of locked access
75	SMC:MHERR B C2000030 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
76	SMC:MHERR B C2000030 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
77	SMC:MHERR B C2000030 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error
78	SMC:MLERR A C0000038 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC err	DTSYNC or ERSYNC err	ASYNC or ERSYNC err	0	0	0	0	Release of locked access
79	SMC:MLERR A C0000038 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
7A	SMC:MLERR A C0000038 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
7B	SMC:MLERR A C0000038 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error

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Byte27 = 81 Byte40-7F (OTHER ERROR) (6/6)

	0	1	2	3	4	5	6	7
7C	SMC:MLERR B C0000038 (b00 - 07)							
	CSYNC or DTSYNC or ERSYNC error	DTSYNC or ERSYNC error	ASYNC or ERSYNC error	0	0	0	0	Release of locked access
7D	SMC:MLERR B C0000038 (b10 - 17)							
	0	Invalid SIMM memory access	WR data RD data unmatch	Fatal error in PCB or in LSI	Memory, SMC access when all locked	Memory accesss when SM not ready	Memory access during backup of SM	Double all lock setting
7E	SMC:MLERR B C0000038 (b20 - 27)							
	Correctable data error in memory read	Uncorrectable data error in memory read	Bus code error in memory read	Bus code error in memory write	Transfer mode of access command unmatch	Unsupported command transfer count	Unsupported command bus mode	Unsupported command transfer mode
7F	SMC:MLERR B C0000038 (b30 - 37)							
	P-LRC check error	No input of LACTCYCL signal at end of transfer	No input of memory write timing DTSYNC signal	No input of memory write timing CSTNC signal	End of ERSYNC wait transfer at double access	Data phase check code error	Command phase check code error	Address phase check code error

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Byte27 = 81 & Byte34 : bit4-7 = 3 (CHK3 Reset) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘1’)			
28	Related internal SSB log number							
29								
2A	Not used							
2B	Not used							
2C	Old PSW							
2D								
2E								
2F								
30	Internal SSB log number (RESET)							
31								
32	Related RESET detail log number							
33								
34	PCB number				Message code (x‘3’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF81’ : LDEV type = DKU87I/x‘EF81’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 81 & Byte34 : bit4-7 = 3 (CHK3 Reset) (2/2)

	0	1	2	3	4	5	6	7
40		Not used						
41		Not used						
42		Initialize interface information						
43								
44		Reset type code						
45								
46		1st reset type code						
47		Reset SSB type code						
48		Reset type code for making SSB						
49		Self CHK1A difference code						
4A		Multi reset type code						
4B								
4C		Interrupted address						
4D								
4E								
4F								
50		Interrupted opration code						
51								
52								
53								
54		Current LDEV number						
55								
56		Current LPN number						
57								
58		Initiation cause code						
59								
5A		Command interface						
5B		DSB (from LCT)						
5C		sys status						
5D		REQ ID (from LCT)						
5E		JCB ID (form LCT)						
5F								
60		wchklmpbitmap (from LCT)						
61								
62								
63								
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN						
77								
78		Not used						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 88 & Byte34:b4-7=A & Byte28 = 01 (LCP Failure:CHK-2/ADP I/F Error) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	LCP error message”(x‘01’:LCP CHK-2/ADP interface error)							
29	LCP error code							
2A								
2B	XR4B(H)							
	BBF OVERRUN	PND OVERRUN	0	0	0	0	0	0
2C	XR4B(L)							
	LRCA ERR	LRCB ERR	BBFP PER	BBIP PER	BBOP PER	PND CK2	CNT PER	REQ CNT OVERRUN
2D	XR3E(H)							
	RBFA APER	RBFB APER	RBFC APER	RBF WRDER	MBFA APER	MBFB APER	MBFC APER	MBF WRDER
2E	XR3E(L)							
	FRM RCTPE	CMP DPER	XFR CHRPER	XFR SEQPER	M-CNT PER	H-CNT PER	0	0
2F	XR55(H)							
	BUSPE PA	LRCER PA	REQ ER A	ADTDT ER A	0	0	0	0
30	XR55(L)							
	BUSPE PB	LRCER PB	REQ ER B	ADTDT ER B	0	0	0	0
31								
	Control flag	0	0	STOP (XR49:bit15)	CK2 DTX (XR4A:bit0)	CK2 LIN (XR4A:bit1)	IFERA (XR51:bit12)	IFERB (XR51:bit13)

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 01 (LCP Failure:CHK-2/ADP I/F Error) (2/2)

	0	1	2	3	4	5	6	7
32		Module ID						
33		Routine ID						
34		PCB number			Message code (x‘A’)			
35		SSID (Low) of self subsystem						
36		Symptom code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)						
37								
38		Log and message control (x‘00’)						
39		Program action code (x‘00’)						
3A		Configuration information						
3B								
3C		Not used						
3D		Cylinder address						
3E								
3F		Head address						
40		LCP error message (x‘01’)						
41		Key code (x‘04’)						
42		LCP error code						
43								
44		x‘00’						
45		Command code						
46		x‘00’						
47		x‘00’						
48		XR4B						
49								
4A		XR3E						
4B								
4C		XR55						
4D								
4E		Control flag						
4F		x‘00’						
50		Not used						
7F								

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 02 (LCP Failure:Link Receive Error) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	LCP error message”(x‘02’:Link receive error)							
29	LCP error code							
2A								
2B	XR36(H)							
	L-SIG ERR0	L-SIG ERR1	CONN ERR0	CONN ERR1	CONN ERR2	0	0	0
2C	XR37(H)							
	CONN ERR3	L-SIG ERR	CODE VIOLA	SEQ ERR	CRC ERR	ABORT ERR	PROT ERR0	PROT ERR1
2D	XR37(L)							
	PROT ERR2	PROT ERR3	PROT ERR4	PROT ERR5	PROT ERR6	PROT ERR7	PROT ERR8	PROT ERR9
2E	XR33(H)							
	C-SOF ERR	P-SOF ERR	D-EOF ERR	P-EOF ERR	L-SIG ERR	CODE VIOLA	SEQ ERR	CRC ERR
2F	XR33(L)							
	0	0	0	R-CNT 0	R-CNT 1	R-CNT 2	R-CNT 3	R-CNT 4
30								
	0	0	STOP (XR49:bit15)	ABORT (XR32:bit11)	ER RCV1 (XR4A:bit3)	ER RCV2 (XR4A:bit4)	ER RCV3 (XR4A:bit5)	OTHER (XR51:bit6)
31	XR2A(L)							
	Field Information							

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 02 (LCP Failure:Link Receive Error) (2/2)

	0	1	2	3	4	5	6	7
32		Module ID						
33		Routine ID						
34		PCB number			Message code (x‘A’)			
35		SSID (Low) of self subsystem						
36		Symptom code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)						
37								
38		Log and message control (x‘00’)						
39		Program action code (x‘00’)						
3A		Configuration information						
3B								
3C		Not used (x‘00’)						
3D		Cylinder address						
3E								
3F		Head address						
40		LCP error message (x‘02’)						
41		Key code (x‘04’)						
42		LCP error code						
43								
44		x‘00’						
45		Command code						
46		x‘00’						
47		x‘00’						
48		XR36						
49								
4A		XR37						
4B								
4C		XR33						
4D								
4E		Control flag						
4F		x‘00’						
50		Not used						
7F								

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 0C (LCP Failure:Long Write Data) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	LCP error message (x‘0C’:Long Write Data)							
29	LCP error code							
2A								
2B	Request count							
2C								
2D	Received data count							
2E								
2F	Not used (x‘00’)							
30	Not used (x‘00’)							
31	Not used (x‘00’)							
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘A’)			
35	SSID (low) of self subsystem							
36	Symptom Code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 0C (LCP Failure:Long Write Data) (2/2)

	0	1	2	3	4	5	6	7
40		LCP error message (x‘0C’)						
41		Key code (x‘04’)						
42		LCP error code						
43								
44		x‘00’						
45		Command code						
46		x‘00’						
47		x‘00’						
48		Requested count						
49								
4A		Received data count						
4B								
4C		x‘00’						
4D		x‘00’						
4E		x‘00’						
4F		x‘00’						
50		Not used						
7F								

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 0E (LCP Failure:Timeout) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	LCP error message (x‘0E’:Timeout)							
29	LCP error code							
2A								
2B	Reason code (Note 1)							
2C								
2D	XR49 (H)							
	ESYCN	END	RDYOK	RDYRCV	0	CMDFRM	ACPRSP	DATAXF
2E	XR49 (L)							
	XFREND	DEVEND	CNTFLG	EOF	CMPEQ	CMPGT	0	STOP
2F	XR51 (H)							
	CAL PA	CAL PB	RDY	P BSY	CALL	SELTD	CHK1	DCK1
30	XR51 (L)							
	BFBSY	ATTN	0	0	IFERA	IFERB	PA BSY	PB BSY
31	XR48 (H)							
	RUN BSY	RUN TRS	RUN ADP	DAT REQ MOD	XFSTOOP	CDFLG	CMPA	CMPB
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘A’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)							
37								

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 = 0E (LCP Failure:Timeout) (2/2)

	0	1	2	3	4	5	6	7
38		Log and message control (x‘00’)						
39		Program action code (x‘00’)						
3A		Configuration information						
3B								
3C		Not used (x‘00’)						
3D		Cylinder address						
3E								
3F		Head address						
40		LCP error message (x‘0E’)						
41		Key code (x‘04’)						
42		LCP error code						
43								
44		x‘00’						
45		Command code						
46		x‘00’						
47		x‘00’						
48		Reason code						
49								
4A		XR49(H)						
	ESYCN	END	RDYOK	RDYRCV	0	CMDFRM	ACPRSP	DATAXF
4B		XR49(L)						
	XFREND	DEVEND	CNTFLG	EOF	CMPEQ	CMPGT	0	STOP
4C		XR51(H)						
	CAL PA	CAL PB	RDY	P BSY	CALL	SELTD	CHK1	DCK1
4D		XR51(L)						
	BFBSY	ATTN	0	0	IFERA	IFERB	PA BSY	PB BSY
4E		XR48(H)						
	RUN BSY	RUN TRS	RUN ADP	DAT REQ MOD	XFSTOP	CDFLG	CMPA	CMPB
4F		XR48(L)						
	DATA XF	RD / WR (0) (1)	1st CCW	RD/WR XFR	MEFLG	BBF SWEEP	BBIP INC	BBIP INC
50		Not used						
7F								

(Note 1) Reason code

x‘FF01’ : (Read) Timeout at wating for ACP CMD RSP
x‘FF02’ : (Read) Timeout at wating for frame header
x‘FF03’ : (Read) Timeout at wating for data frame
x‘FF04’ : (Read) Timeout at wating for end of data transfer
x‘FF05’ : (Read) Timeout at wating for data frame
x‘FF06’ : (Read) Timeout at wating for end of data transfer
x‘FF07’ : (Read) Timeout at wating for command frame
x‘FF08’ : (Read) Timeout at wating for DATA REQ
x‘FF09’ : (Read) Timeout at wating for status
x‘FFF1’ : (Write) Timeout at wating for ACP CMD RSP
x‘FFF2’ : (Write) Timeout at wating for first data
x‘FFF3’ : (Write) Timeout at wating for frame header
x‘FFF4’ : (Write) Timeout at wating for frame header
x‘FFF5’ : (Write) Timeout at wating for frame header
x‘FFF6’ : (Write) Timeout at wating for command frame
x‘FFF7’ : (Write) Timeout at wating for frame header
x‘FFF8’ : (Write) Timeout at wating for end of data transfer
x‘FFF9’ : (Write) Timeout at wating for status

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 ≠ 01/02/0C/0E (LCP Failure:Others) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	LCP error message (Note 1)							
29	LCP error code							
2A								
2B	Not used (x‘00’)							
2C	Not used (x‘00’)							
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	Not used (x‘00’)							
31	Not used (x‘00’)							
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘A’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 88 & Byte34:b4-7 = A & Byte28 ≠ 01/02/0C/0E (LCP Failure:Others) (2/2)

	0	1	2	3	4	5	6	7
40	LCP error message (Note 1)							
41	Key code (x‘04’)							
42	LCP error code							
43								
44	x‘00’							
45	Command code							
46	x‘00’							
47	x‘00’							
48	x‘00’							
49	x‘00’							
4A	x‘00’							
4B	x‘00’							
4C	x‘00’							
4D	x‘00’							
4E	x‘00’							
4F	x‘00’							
50	Not used							
7F								

(Note 1) LCP error message

x‘00’ : No message
x‘08’ : Transmission error
x‘09’ : Protocol error
x‘0D’ : Retry abort

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 01 (MCP Failure:CHK2/ADP I/F ERR/B0 P-ERR) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	MCP error message (x‘01’:LCP CHK2 / ADP I/F error / Bus out parity ERR)							
29	MCP error code							
2A								
2B	XRBS(H)							
	Data transfer end	CHK2 error	ADP interface error	Channel bus out parity ER	Channel overrun	Truncation	Halt I/O	Data XFR force end
2C	XRBS(L)							
	Data XFR abnormal end	Channel data XFR end	MP data XFR end	0	0	0	0	0
2D	XRCK20(H)							
	EDCC/DCC mode unmatch	Duplicate CU ADR in DCC	CHL BIN0 parity ER:data XFR	CHL BIN1 parity ER:data XFR	MBF•¨ADP MBF ADR parity ER	ADP•¨MBF MBF ADR parity ER	ADP•¨MBF MBF data parity ER	(RSV)
2E	XRCK20(L)							
	SPC counter parity ER	CHC counter parity ER	PND counter parity ER	PND counter overrun	BBF out CBID in LRC ERR	CHL BUS IN 0 parity ER	CHL BUS IN 1 parity ER	0
2F	XRCK21(H)							
	BBF input data LRC ERR	BBF input section LRC ERR	BBF input-output LRC ERR	BBIP parity error	BBOP parity error	TAG OUT parity error	CBOB out data parity ER	CBOB in-BBF in parity ER
30	XRCK21(L)							
	TAG IN FLG MEM parity ER	FLG MEM INP PTR parity ER	FLG MEM OUT PTR parity ER	TAG OUT sequence error	TAG OUT signal narrow	TAG OUT signal duplicate	0	0

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 01 (MCP Failure:CHK2/ADP I/F ERR/B0 P-ERR) (2/3)

	0	1	2	3	4	5	6	7
31		XRIFER						
	LCM-ADPA bus parity ER	LCM-ADPA bus LRC error	ADP I/F sequencer parity ER	ADP0 error	LCM-ADPB bus parity ER	LCM-ADPB bus LRC error	ADP I/F sequencer parity ER	ADP1 error
32		Module ID						
33		Routine ID						
34		PCB number			Message code (x'B')			
35		SSID (low) of self subsystem						
36		Symptom code (x'FF88' : LDEV type = DKU87I/x'EF88' : LDEV type = DKU86I)						
37								
38		Log and message control (x'00')						
39		Program action code (x'00')						
3A		Configuration information						
3B								
3C		Not used (x'00')						
3D		Cylinder address						
3E								
3F		Head address						
40		MCP message code (x'01)						
41		Key code (x'04')						
42		MCP error code						
43								
44		x'00'						
45		Command code						
46		x'00'						
47		x'00'						
48		XRBS (H)						
	Data transfer end	CHK2 error	ADP interface error	Channel bus out parity ER	Channel overrun	Truncation	Halt I/O	Data XFR force end
49		XRBS (L)						
	Data XFR abnormal end	Channel data XFR end	MP data XFR end	0	0	0	0	0
4A		XRCK20 (H)						
	EDCC/DCC mode unmatch	Duplicate CU ADR in DCC	CHL BIN0 parity ER:data XFR	CHL BIN1 parity ER:data XFR	MBF→ADP MBF ADR parity ER	ADP→MBF MBF ADR parity ER	ADP→MBF MBF data parity ER	(RSV)
4B		XRCK20 (L)						
	SPC counter parity ER	CHC counter parity ER	PND counter parity ER	PND counter overrun	BBF out CBID in LRC ERR	CHL BUS IN 0 parity ER	CHL BUS IN 1 parity ER	0
4C		XRCK21 (H)						
	BBF input data LRC ERR	BBF input section LRC ERR	BBF input-output LRC ERR	BBIP parity error	BBOP parity error	TAG OUT parity error	CBOB out data parity ER	CBOB in-BBF in parity ER
4D		XRCK21 (L)						
	TAG IN FLG MEM parity ER	FLG MEM INP PTR parity ER	FLG MEM OUT PTR parity ER	TAG OUT sequence error	TAG OUT signal narrow	TAG OUT signal duplicate	0	0
4E		XRIFER						
	LCM-ADPA bus parity ER	LCM-ADPA bus LRC error	ADP I/F sequencer parity ER	ADP0 error	LCM-ADPB bus parity ER	LCM-ADPB bus LRC error	ADP I/F sequencer parity ER	ADP1 error
4F		XRBC0						
	Channel enable	Channel execute	Increment mode	Channel XFR mode 10:Read 11:Write		ADP I/F execute	Chain data flag	LRC enable

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 01(MCP Failure:CHK2/ADP I/F ERR/B0 P-ERR) (3/3)

	0	1	2	3	4	5	6	7
50	XRCHC(H)							
	Channel data transfer count							
51	XRCHC(L)							
	Channel data transfer count							
52	XRBBIP(H)							
	BBF data input address							
53	XRBBIP(L)							
	BBF data input address							
54	XRBBOP(H)							
	BBF data output address							
55	XRBBOP(L)							
	BBF data output address							
56	XRPNDR(H)							
	Burst Buffet Output Pointer							
57	XRPNDR(L)							
	Pend Counter							
58	XRBC1(H)							
	Force channel overrun	Force data XFR stop	Suppress data valid	BBF dummy DT output	(RSV)	(RSV)	(RSV)	(RSV)
59	XRBC1(L)							
	Request suppress data	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
5A	XRCC0(H)							
	DCC mode	EDCC mode	(RSV)	(RSV)	(RSV)	CHL XFR rate	010 : 4.5MB/S 000 : 3.0MB/S 100 : 6.0MB/S 001 : 4.2MB/S 110 : 9.0MB/S	
5B	XRCC0(L)							
	XRCA0,1, XRCC0 INIT end	(RSV)	(RSV)	HALT I/O→CU Busy valid	DISCON valid	SEL RST valid	SYS RST valid (OPL OUT)	SYS RST valid (SUP OUT)
5C	x‘00’							
5D	x‘00’							
5E	x‘00’							
5F	x‘00’							
60	Module ID detected error							
61	Routine ID detected error							
62	Not used							
7F								

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 0E (MCP Failure:Timeout) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	MCP error message (x‘0E’:Timeout)							
29	LCP error code							
2A								
2B	Reason code							
2C								
2D	XRBS(H)							
	Data transfer end	CHK2 error	ADP interface error	Channel bus out parity ER	Channel overrun	Truncation	Halt I/O	Data XFR force end
2E	XRBS(L)							
	Data XFR abnormal end	Channel data XFR end	MP data XFR end	0	0	0	0	0
2F	XRASTS(H)							
	Path 0 ADP data XFR request	Path 1 ADP data XFR request	ADP path interface ready	ADP path busy	ADP path CALL M	ADP path SEL	ADP path CHK1	ADP path W-CHK1
30	XRASYS(L)							
	Receive buffer busy	Data FRM with attention	(RSV)	(RSV)	Path 0 ADP interface error	Path 1 ADP interface error	CHP 0 path busy	CHP 1 path busy
31	XRBC0(H)							
	Enable channel	Execute channel	(RSV)	Increment mode	Channel XFR mode 10:READ 11:WRITE		(RSV)	(RSV)

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 0E (MCP Failure:Timeout) (2/3)

	0	1	2	3	4	5	6	7
32		Module ID						
33		Routine ID						
34		PCB number			Message code (x‘B’)			
35		SSID (low) of self subsystem						
36		Symptom code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)						
37								
38		Log and message control (x‘00’)						
39		Program action code (x‘00’)						
3A		Configuration information						
3B								
3C		Not used (x‘00’)						
3D		Cylinder address						
3E								
3F		Head address						
40		MCP message code (x‘0E)						
41		Key code (x‘04’)						
42		MCP error code						
43								
44		x‘00’						
45		Command code						
46		x‘00’						
47		x‘00’						
48		Reason code						
49								
4A		XRBS (H)						
	Data transfer end	CHK2 error	ADP interface error	Channel bus out parity ER	Channel overrun	Truncation	Halt I/O	Data XFR force end
4B		XRBS (L)						
	Data XFR abnormal end	Channel data XFR end	MP data XFR end	0	0	0	0	0
4C		XRASTS (H)						
	Path 0 ADP data XFR request	Path 1 ADP data XFR request	ADP path interface ready	ADP path busy	ADP parh CALL M	ADP path SEL	ADP parh CHK1	ADP path W-CHK1
4D		XRASTS (L)						
	Receive buffer busy	Data FRM with attention	(RSV)	(RSV)	Path 0 ADP interface error	Path 1 ADP interface error	CHP 0 path busy	CHP 1 path busy
4E		XRBC0 (H)						
	Enable channel	Execute channel	(RSV)	Increment mode	Channel XFR mode 10:READ 11:WRITE		(RSV)	(RSV)
4F		XRBC0 (L)						
	ADP I/F data XFR execute	Chain data flag	LRC enable	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
50		XRCHC (H)						
		Channel data transfer count						
51		XRCHC (L)						
		Channel data transfer count						
52		XRBBIP (H)						
		BBF data input address						
53		XRBBIP (L)						
		BBF data input address						

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 0E (MCP Failure:Timeout) (3/3)

	0	1	2	3	4	5	6	7
54		XRBBOP(H)						
		BBF data output address						
55		XRBBOP(L)						
		BBF data output address						
56		XRPNDR(H)						
		Burst Buffet Output Pointer						
57		XRPNDR(L)						
		Pend Counter						
58		XRBC1(H)						
	Force channel overrun	Force data XFR stop	Suppress data valid	BBF dummy DT output	(RSV)	(RSV)	(RSV)	(RSV)
59		XRBC1(L)						
	Suppress data request	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
5A		XRCC0(H)						
	DCC mode	EDCC mode	(RSV)	(RSV)	(RSV)	CHL XFR rate	010 : 4.5MB/S 000 : 3.0MB/S 100 : 6.0MB/S 001 : 4.2MB/S 110 : 9.0MB/S	
5B		XRCC0(L)						
	XRCA0,1, XRCC0 INIT end	(RSV)	(RSV)	HALT I/O→CU Busy valid	DISCON valid	SEL RST valid	SYS RST valid (OPL OUT)	SYS RST valid (SUP OUT)
5C		x‘00’						
5D		x‘00’						
5E		x‘00’						
5F		x‘00’						
60		Module ID detected error						
61		Routine ID detected error						
62		Not used						
7F								

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 80 (MCP Failure :Burst Failed) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘8’)			
28	MCP error message (x‘80’:Burst failed)							
29	MCP error code							
2A								
2B	x‘00’							
2C	x‘00’							
2D	x‘00’							
2E	x‘00’							
2F	x‘00’							
30	x‘00’							
31	x‘00’							
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘B’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF88’ : LDEV type = DKU87I/x‘EF88’ : LDEV type = DKU86I)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 80 (MCP Failure:Burst Failed) (2/3)

	0	1	2	3	4	5	6	7
40	MCP message code (x‘80’)							
41	Key code (x‘04’)							
42	MCP error code							
43								
44	Not used							
4F								
50	XRCHC(H)							
	Channel data transfer count							
51	XRCHC(L)							
	Channel data transfer count							
52	XRBBIP(H)							
	BBF data input address							
53	XRBBIP(L)							
	BBF data input address							
54	XRBBOP(H)							
	BBF data output address							
55	XRBBOP(L)							
	BBF data output address							
56	XRPNDR(H)							
	Burst buffer output pointer							
57	XRPNDR(L)							
	Pend Counter							
58	XRBC1(H)							
	Force channel overrun	Force data XFR stop	Suppress data valid	BBF dummy DT output	(RSV)	(RSV)	(RSV)	(RSV)
59	XRBC1(L)							
	Suppress data request	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
5A	XRCC0(H)							
	DCC mode	EDCC mode	(RSV)	(RSV)	(RSV)	CHL XFR rate 010:4.5MB/S 000:3.0MB/S 100:6.0MB/S 001:4.2MB/S 110:9.0MB/S		
5B	XRCC0(L)							
	XRCA0,1, XRCC0 INIT end	(RSV)	(RSV)	HALT I/O →CU Busy valid	DISCON valid	SEL RST valid	SYS RST valid (OPL OUT)	SYS RST valid (SUP OUT)

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Byte27 = 88 & Byte34:b4-7 = B & Byte28 = 80 (MCP Failure :Burst failed) (3/3)

	0	1	2	3	4	5	6	7
5C		Not used						
5D								
5E								
5F								
60		Module ID detected error						
61		Routine ID detected error						
62		Not used						
63								
64								
65								
66								
67								
68								
69								
6A								
6B								
6C								
6D								
6E								
6F								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
7A								
7B								
7C								
7D								
7E								
7F								

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Byte27 = 89 & Byte0D Bit2 = 0 (Channel interface CHA)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘9’)			
28	Subcode (‘’)							
29	Hardware information (See following pages.)							
|								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID of self subsystem							
36	Symptom code (x‘FF89’ : LDEV type = 6587 / x‘EF89’ : LDEV type = 6586)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							
40	Hardware information (See following pages.)							
|								
7F								

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Byte27 = 89, Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte28-31 Detail

(1) Byte28 = 01, 02 (Cache slot status error)

	0	1	2	3	4	5	6	7
28	Subcode (Note 1)							
29 2A 2B 2C	Slot status							
2D	Write in progress	Make GAP	Execute ERASE	Update HA/R0	Update BIT MAP	Not used	Not used	Not used
2E	Subblock number for ready response for transfer							
2F	Start subblock number for incomplete record							
30	End subblock number for incomplete record							
31	Not used							

(Note 1) Subcode = x‘01’ : Abnormal cache slot status 1
(1) Module ID (Byte 32) = 55 : After synchronous destage, cache slot with dirty attribute has been detected.
(2) Module ID (Byte 32) ≠ 55 : In internal search or orientation process, incomplete subblock has been detected.

Subcode = x‘02’ : Abnormal cache slot status 2
Cache ECC/LRC error has been detected in read side.

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Byte27 = 89, Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte28-31 Detail

(2) Byte28 ≠ 01,02 (Data transfer CHK2 detected)

	0	1	2	3	4	5	6	7
28		Subcode (Note 1)						
29		SIP:XFS0						
	CHA transfer end	BSA0 retry request	BSA1 retry request	Packet flow count register status	CHK2	EADP CHK2	CHA CHK2	BSA0 CHK2
2A		SIP:XFS0						
	BSA1 CHK2	Truncation	Halt I/O	Search result DASD=CPU	Search result DASD>CPU	Search result DASD<CPU	RETRY	ABORT
2B		SIP:SELP						
	Path A select	Path B select	Path C select	Path D select	Path E select	Path F select	Path G select	Path H select
2C		SIP:XFC0						
	Validate data transfer circuit	Execute data transfer	Not used	Not used	CBF mode 0: 40 - 7F 1: 00 - 7F	CBF pointer increment inhibit	CACHE I/O register access	SSD mode 0: DKC200 1: SSD
2D		SIP:XFC0						
	DATA PATH 0	DATA PATH 1	DATA PATH 2	DATA PATH 3	UNISYS mode	FBUS 0	FBUS 1	FBUS 2
2E		QBSA0:ERROR						
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
2F		QBSA0:STATUS1						
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
30		QBSA1:EROR						
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
31		QBSA1:STATUS1						
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set

(Note 1) Subcode Bit 1-3 : Detected LSI
(Bit 1 = 1 : BSA1 error , Bit 2 = 1 : BSA1 error , Bit 3 = 1 : SIP error)
Subcode Bit 4-6 : Error location
(Bit 4 = 1 : FBUS error , Bit 5 = 1 : Detection PCB error , Bit 6 = 1 : Micro setting error)

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Byte27 = 89 (Host Adaptor CHK2) Byte40-7F Detail

(1) Subcode (byte28) = 01/02 (1/2)

	0	1	2	3	4	5	6	7
40	Causal Key code							
41	Causal Format/Message							
42	Causal Module ID							
43	Causal Routine ID							
44	VDEV and slot number							
45								
46								
47								
48	Slot status							
49								
4A								
4B								
4C	Staging bit map/dirty bit map							
4D								
4E								
4F								
50	Current subblok number							
51	EXIT flag (Note 1)							
52	Slot failure information (Note 2)							
53	Obtained information flag (Note 3)							
54	Head subblock number for HIT/MISS decision							
55	Remain subblock count							
56	Not used							
7F								

(Note 1) EXIT flag
- x‘08’ : CHL I/F CHK2 timeover
- x‘0D’ : EOP
- x‘0E’ : DSB=0E requested
- x‘0F’ : Logical error
- x‘1E’ : Make sense only
- x‘1F’ : Logical error (make sense only)
- x‘30’ : Selective reset requested
- x‘40’ : ‘Staging’ requested
- x‘41’ : ‘Waiting free segment’ requested
- x‘42’ : ‘Timeover of waiting for staging’ requested
- x‘43’ : ‘Staging for PA unmatch’ requested
- x‘45’ : ‘Destaging’ requested
- x‘46’ : ‘High priority destaging’requested
- x‘47’ : ‘Pseud-through process’ requested
- x‘4B’ : ‘DSB = 4E retry’ requested (data transfer)
- x‘4E’ : ‘DSB = 4E retry’ requested (DSB = 4E retry)
- x‘4F’ : STG requested (Read or STG in progress)

(Note 2) Slot failure information
- x‘80’ : Sector write error
- x‘40’ : Sector read error
- x‘20’ : ECC/LRC error
- x‘10’ : Incomplete data
- x‘08’ : No decision

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Byte27 = 89 (Host Adaptor CHK2) Byte40-7F Detail

(1) Subcode (byte28) = 01/02 (2/2)

(Note 3) Obtained information flag

bit0-1 : Block type
- 00 : Data block
- 01 : HA/R0 block
- 10 : Bit map block

bit2-3 : Side
- 00 : Cache write side
- 01 : NVS write side
- 10 : Cache read side

bit4 : Segment
- 0 : No segment
- 1 : Segment exist

bit5-7 : Reserved

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte 40-7F Detail
(2) Byte28 ≠ 01,02 and Byte 40 = 00 (1/4)

	0	1	2	3	4	5	6	7
40		x'00'						
41		SIP:CK2ST0						
	M/E sequencer parity error	M/E loop pointer parity error	CHL XFR sequencer parity error	CHR/CBIR pointer parity error	CHR sequencer parity error	CHR/CHL pointer parity error	CBIR sequencer parity error	CBIR0/CBIR1 pointer parity error
42		SIP:CK2ST0						
	CBR pointer parity error	CBX sequencer parity error	CBX SQ CBOR pointer parity error	CBOR sequencer parity error	CBOR/CHR /SHR pointer parity error	RPACKET sequencer parity error	SCH sequencer parity error	CBIR0/CBIR1 pointer parity error
43		SIP:CK2ST1						
	Pending counter parity error	Sub block offset counter parity error	CKD data length counter parity error	T length counter parity error	Block length counter parity error	Segment length counter parity error	FBA data length counter parity error	Packet length counter parity error
44		SIP:CK2ST1						
	CHL/CHR pointer parity error	CBF T W/R pointer parity error	BSA packet receive stop error	CBIR0 FLRC compare error	CBX FLRC compare error	CHC parity error	BSA data reg. counter parity error	CBXSQ CBR pointer parity error
45		SIP:CK2ST2						
	Pending counter parity error	CBIRDY/ ALWCBI counter parity error	CBIRDY count overflow	CHR input data parity error	CHR output data parity error	CBIR0 input data parity error	CBIR0 LRC compare error	CBIR1 input data parity error
46		SIP:CK2ST2						
	CBF input data parity error	CBOR input data parity error	LA compare error	SHRA LRC compare error	SHRB LRC compare error	SHRA input data parity error	SHRA output data parity error	SHRB input data parity error
47		SIP:CK2ST3						
	SHRB output data parity error	SHR compare error 0	SHR compare error 1	MRKOUT/ PRTOUT/ PRTOUTP parity error	CBIR0 SEL pointer parity error	CBIR1 SEL pointer parity error	MICRO packet counter parity error	XFREND0 counter parity error
48		SIP:CK2ST3						
	XFREND1 counter parity error	Write BSA0/1 pointer parity error	Read BSA0/1 pointer parity error	CSA0 counter parity error	CSA1 counter parity error	CBP R/W pointer parity error	PFC counter overflow	Reduction CBIR pointer parity error
49		SIP:CK2ST4						
	Next segment address data remain at end of transfer	CHR data remain at end of transfer	CBIR0 data remain at end of transfer	CBIR1 data remain at end of transfer	CBR data remain at end of transfer	CBOR data remain at end of transfer	SHR data remain at end of transfer	Not used
4A		SIP:CK2ST4						
	MICRO access error (CKD data length error)	MICRO access error (FBA data length error)	Not used	Not used	Not used	Not used	Not used	Not used
4B		SIP:ADPCK2						
	CHL XFR CK	CHL Over run	CHA CHK2 (CHA)	CHA CHK2 (EADP)	CHA CHK2 (BSA)	CHA CHK2 (MP)	ESCON side CHA=0	BSA side FBADL=0
4C		SIP:CK20						
	MRKI, PRTI, PRTIP flag parity error in data transfer ADP-CHA	CHBUS0 parity error in reading data ADP-CHA	CHBUS1 parity error in writing data ADP-CHA	CHBUS0 parity error in writing data ADP-CHA	CHBUS1 parity error in writing data ADP-CHA	LRC error in reading data ADP-CHA	LRC error in writing data ADP-CHA	Not used
4D		SIP:CK21						
	LCM RCV micro frame LRC error in communi-cating ADP-CHA	BUS0 parity error in communi-cating ADP-CHA	BUS1 parity error in communi-cating ADP-CHA	Sequencer parity error in communi-cating ADP-CHA	Not used	Not used	Not used	Not used
4E		SIP:CK22						
	ADP-LCM interface error in LCMA	ADP-LCM interface error in LCMB	ADP-LCM interface error in LCMC	ADP-LCM interface error in LCMD	ADP-LCM interface error in LCME	ADP-LCM interface error in LCMF	ADP-LCM interface error in LCMG	ADP-LCM interface error in LCMH
4F		SIP:MESQA						
	M/E SEQ-A Sequence No. 00	M/E SEQ-A Sequence No. 01	M/E SEQ-A Sequence No. 02	M/E SEQ-A Sequence No. 03	M/E SEQ-A Sequence No. 04	M/E SEQ-A Sequence No. 05	M/E SEQ-A Sequence No. 06	M/E SEQ-A Sequence No. 07

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7 Detail
(2) Byte28 ≠ 01,02 and Byte 40 = 00 (2/4)

	0	1	2	3	4	5	6	7
50		SIP:CXRSQA						
	CHL XFR SEQ-A Sequence No. 00	CHL XFR SEQ-A Sequence No. 01	CHL XFR SEQ-A Sequence No. 02	CHL XFR SEQ-A Sequence No. 03	CHL XFR SEQ-A Sequence No. 04	CHL XFR SEQ-A Sequence No. 05	CHL XFR SEQ-A Sequence No. 06	CHL XFR SEQ-A Sequence No. 07
51		SIP:CHRSQA						
	CHR SEQ-A Sequence No. 00	CHR SEQ-A Sequence No. 01	CHR SEQ-A Sequence No. 02	CHR SEQ-A Sequence No. 03	CHR SEQ-A Sequence No. 04	CHR SEQ-A Sequence No. 05	CHR SEQ-A Sequence No. 06	CHR SEQ-A Sequence No. 07
52		SIP:CBIRSQA						
	CBIR SEQ-A Sequence No. 00	CBIR SEQ-A Sequence No. 01	CBIR SEQ-A Sequence No. 02	CBIR SEQ-A Sequence No. 03	CBIR SEQ-A Sequence No. 04	CBIR SEQ-A Sequence No. 05	CBIR SEQ-A Sequence No. 06	CBIR SEQ-A Sequence No. 07
53		SIP:CBXSQA						
	CBX SEQ-A Sequence No. 00	CBX SEQ-A Sequence No. 01	CBX SEQ-A Sequence No. 02	CBX SEQ-A Sequence No. 03	CBX SEQ-A Sequence No. 04	CBX SEQ-A Sequence No. 05	CBX SEQ-A Sequence No. 06	CBX SEQ-A Sequence No. 07
54		SIP:CBORSQA						
	CBOR SEQ-A Sequence No. 00	CBOR SEQ-A Sequence No. 01	CBOR SEQ-A Sequence No. 02	CBOR SEQ-A Sequence No. 03	CBOR SEQ-A Sequence No. 04	CBOR SEQ-A Sequence No. 05	CBOR SEQ-A Sequence No. 06	CBOR SEQ-A Sequence No. 07
55		SIP:PDPKSQA						
	R Packet SEQ-A 00	R Packet SEQ-A 01	R Packet SEQ-A 02	R Packet SEQ-A 03	R Packet SEQ-A 04	R Packet SEQ-A 05	R Packet SEQ-A 06	R Packet SEQ-A 07
56		SIP::SCHSQA						
	SCH SEQ-A Sequence No. 00	SCH SEQ-A Sequence No. 01	SCH SEQ-A Sequence No. 02	SCH SEQ-A Sequence No. 03	SCH SEQ-A Sequence No. 04	SCH SEQ-A Sequence No. 05	SCH SEQ-A Sequence No. 06	SCH SEQ-A Sequence No. 07
57		SIP::PCMD1						
	0	1	P-LRC	SP ACS	DIA ACS	TFRCNT 00	TFRCNT 01	TFRCNT 02
58		SIP::PCMD1						
	TFRCNT 03	TFRCNT 04	TFRCNT 05	TFRCNT 06	TFRCNT 07	TFRCNT 08	0	1
59		SIP::PCMD2						
	1	BM Bus mode 0	BM Bus mode 1	BM Bus mode 2	TM Transfer mode 0	TM Transfer mode 1	TM Transfer mode 2	TM Transfer mode 3
5A		SIP::CKDDL(CKD)						
	CKD data transfer byte count 00	CKD data transfer byte count 01	CKD data transfer byte count 02	CKD data transfer byte count 03	CKD data transfer byte count 04	CKD data transfer byte count 05	CKD data transfer byte count 06	CKD data transfer byte count 07
5B		SIP::CKDDL(CKD)						
	CKD data transfer byte count 10	CKD data transfer byte count 11	CKD data transfer byte count 12	CKD data transfer byte count 13	CKD data transfer byte count 14	CKD data transfer byte count 15	CKD data transfer byte count 16	CKD data transfer byte count 17
5C		SIP::CKDDL(FBA)						
	CKD data transfer byte count 00	CKD data transfer byte count 01	CKD data transfer byte count 02	CKD data transfer byte count 03	CKD data transfer byte count 04	CKD data transfer byte count 05	CKD data transfer byte count 06	CKD data transfer byte count 07
5D		SIP::CKDDL(FBA)						
	CKD data transfer byte count 10	CKD data transfer byte count 11	CKD data transfer byte count 12	CKD data transfer byte count 13	CKD data transfer byte count 14	CKD data transfer byte count 15	CKD data transfer byte count 16	CKD data transfer byte count 17
5E		SIP::FBADL						
	FBA data transfer word count 00	FBA data transfer word count 01	FBA data transfer word count 02	FBA data transfer word count 03	FBA data transfer word count 04	FBA data transfer word count 05	FBA data transfer word count 06	FBA data transfer word count 07
5F		SIP::FBADL						
	FBA data transfer word count 10	FBA data transfer word count 11	FBA data transfer word count 12	FBA data transfer word count 13	FBA data transfer word count 14	FBA data transfer word count 15	FBA data transfer word count 16	FBA data transfer word count 17

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7F Detail
(2) Byte28 ≠ 01,02 and Byte40 = 00 (3/4)

	0	1	2	3	4	5	6	7
60		SIP::CSPGR						
	Start page for storing data 00	Start page for storing data 01	Start page for storing data 02	Start page for storing data 02	Start page for storing data 00 (double write)	Start page for storing data 01 (double write)	Start page for storing data 02 (double write)	Start page for storing data 03 (double write)
61		SIP::MCSA00						
	CACHE Start address 00	CACHE Start address 01	CACHE Start address 02	CACHE Start address 03	CACHE Start address 04	CACHE Start address 05	CACHE Start address 06	CACHE Start address 07
62		SIP::MCSA00						
	CACHE Start address 10	CACHE Start address 11	CACHE Start address 12	CACHE Start address 13	CACHE Start address 14	CACHE Start address 15	CACHE Start address 16	CACHE Start address 17
63		SIP::MCSA01						
	CACHE Start address 20	CACHE Start address 21	CACHE Start address 22	CACHE Start address 23	CACHE Start address 24	CACHE Start address 25	CACHE Start address 26	CACHE Start address 27
64		SIP::MCSA01						
	CACHE Start address 30	CACHE Start address 31	CACHE Start address 32	CACHE Start address 33	CACHE Start address 34	CACHE Start address 35	CACHE Start address 36	CACHE Start address 37
65		SIP::XFRMP						
	Not used	Not used	Not used	Not used	XFRMP0 ~ XFRMP3 MP No. to be transferred to CACHE			
66		SIP::TCTR0						
	CUDG MODE	INH CHK2 (ALL)	INH BSA Read data parity error	INH Micro access error CHK1	CACHE MODE	Not used	Not used	Not used
67		SIP::TCTR0						
	Pseudo error mode (CHK1B)	Pseudo error mode (CHK2)	Sequencer trace 0	Sequencer trace 1	Sequencer trace 2	LSI REV0	LSI REV1	LSI REV2
68		QBSA0::CHK2BST0						
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
69		QBSA0::CHK2CST0						
	ADR/ CMD side A input data parity error	ADR/ CMD side B input data parity error	CMD side A illegal data	CMD side B illegal data	FBUS access timeout	FBUS Disable error typical report	WCHK1 was asserted	FBUS timer parity error
6A		QBSA0::CHK2CST0						
	Not used	REQ SEQ parity error	REQ CNT parity error	MY GRANT parity error	Arbitration count over	DBF ADR/CMD input data parity error	CHA illegal read request	Upper bus mode parity error
6B		QBSA0::CHK2CST1						
	WRS SEQ CNT/POINT parity error	Not used	WR1 SEQ parity error	WR1 SEQ CNT/POINT parity error	Not used	WR2 SEQ parity error	WR2 SEQ CNT/POINT parity error	Not used
6C		QBSA0::CHK2CST1						
	WR3 SEQ parity error	WR3 SEQ CNT/POINT parity error	DBFADR CNT parity error or COUNTER CNT over (ASIDE)	DBFADR CNT parity error or COUNTER CNT over (BSIDE)	Transfer count over (CSIDE)	REQ SEQ parity error	Command reg A, Status 1 reg inconsistent (bus mode)	Command reg B, Status 1 reg inconsistent (bus mode)
6D		QBSA0::CHK2CST2						
	Not used	RD1 SEQ parity error	RD1 SEQ CNT/POINT parity error	Not used	RD2 SEQ parity error	RD2 SEQ CNT/POINT parity error	Not used	RD3 SEQ parity error
6E		QBSA0::CHK2CST2						
	RD3 SEQ CNT/POINT parity error	Not used	RD4 SEQ parity error	RD4 SEQ CNT/POINT parity error	Not used	RD5 SEQ parity error	RD5 SEQ CNT/POINT parity error	Not used
6F		QBSA0::CHK2DST1						
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 result of decision by majority	FDISABLE ERR 0,1 result of decision by majority	FDISABLE ERR 0,1 result of decision by majority	Not used	Not used

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7F Detail
(2) Byte28 ≠ 01,02 and Byte40 = 00 (4/4)

	0	1	2	3	4	5	6	7
70	QBSA0::MONITOR1							
	Data trnsfer information from host (1: side A)	Data trnsfer information from host (1: side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
71	QBSA0::MONITOR1							
	Side A command ID code 0	Side A command ID code 1	Side A command ID code 2	Side B command ID code 0	Side B command ID code 1	Side B command ID code 2	ABORT was complete	Not used
72	QBSA0::MONITOR2							
	Side A PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3
73	QBSA0::MONITOR2							
	Side B PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3
74	QBSA1::CHK2BST0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
75	QBSA1::CHK2CST0							
	ADR/ CMD side A input data parity error	ADR/ CMD side B input data parity error	CMD side A illegal data	CMD side B illegal data	FBUS access timeout	FBUS Disable error typical report	WCHK1 was asserted	FBUS timer parity error
76	QBSA1::CHK2CST0							
	Not used	REQ SEQ parity error	REQ CNT parity error	MY GRANT parity error	Arbitration count over	DBF ADR/CMD input data parity error	CHA illegal read request	Upper bus mode parity error
77	QBSA1::CHK2CST1							
	WRS SEQ CNT/POINT parity error	Not used	WR1 SEQ parity error	WR1 SEQ CNT/POINT parity error	Not used	WR2 SEQ parity error	WR2 SEQ CNT/POINT parity error	Not used
78	QBSA1::CHK2CST1							
	WR3 SEQ parity error	WR3 SEQ CNT/POINT parity error	DBFADR CNT parity error or COUNTER CNT over (ASIDE)	DBFADR CNT parity error or COUNTER CNT over (BSIDE)	Transfer count over (CSIDE)	REQ SEQ parity error	Command reg A, Status 1 reg inconsistent (bus mode)	Command reg B, Status 1 reg inconsistent (bus mode)
79	QBSA1::CHK2CST2							
	Not used	RD1 SEQ parity error	RD1 SEQ CNT/POINT parity error	Not used	RD2 SEQ parity error	RD2 SEQ CNT/POINT parity error	Not used	RD3 SEQ parity error
7A	QBSA1::CHK2CST2							
	RD3 SEQ CNT/POINT parity error	Not used	RD4 SEQ parity error	RD4 SEQ CNT/POINT parity error	Not used	RD5 SEQ parity error	RD5 SEQ CNT/POINT parity error	Not used
7B	QBSA1::CHK2DST1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 result of decision by majority	FDISABLE ERR 0,1 result of decision by majority	FDISABLE ERR 0,1 result of decision by majority	Not used	Not used
7C	QBSA1::MONITOR1							
	Data trnsfer information from host (1: side A)	Data trnsfer information from host (1: side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7D	QBSA1::MONITOR1							
	Side A command ID code 0	Side A command ID code 1	Side A command ID code 2	Side B command ID code 0	Side B command ID code 1	Side B command ID code 2	ABORT was complete	Not used
7E	QBSA1::MONITOR2							
	Side A PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3
7F	QBSA1::MONITOR2							
	Side B PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7F Detail

(3) Byte28 ≠ 01,02 and Byte40 = 01 (1/4)

	0	1	2	3	4	5	6	7
40		FREE AREA FORMAT No.						
		'01'						
41		SIP:CK2ST0						
	M/E sequencer parity error	M/E loop pointer parity error	CHL XFR sequencer parity error	CHR/CBIR pointer parity error	CHR sequencer parity error	CHR/CHL pointer parity error	CBIR sequencer parity error	CBIR0/CBIR1 pointer parity error
42		SIP:CK2ST0						
	CBR pointer parity error	CBX sequencer parity error	CBX SQ CBOR pointer parity error	CBOR sequencer parity error	CBOR/CHR /SHR pointer parity error	RPACKET sequencer parity error	SCH sequencer parity error	CBIR0/CBIR1 pointer parity error
43		SIP:CK2ST1						
	Pending counter parity error	Sub block offset counter parity error	CKD data length counter parity error	T length counter parity error	Block length counter parity error	Segment length counter parity error	FBA data length counter parity error	Packet length counter parity error
44		SIP:CK2ST1						
	CHL/CHR pointer parity error	CBF T W/R pointer parity error	BSA packet receive stop error	CBIR0 FLRC compare error	CBX FLRC compare error	CHC parity error	BSA data reg. counter parity error	CBXSQ CBR pointer parity error
45		SIP:CK2ST2						
	Pending counter parity error	CBIRDY/ ALWCBI counter parity error	CBIRDY count overflow	CHR input data parity error	CHR output data parity error	CBIR0 input data parity error	CBIR0 LRC compare error	CBIR1 input data parity error
46		SIP:CK2ST2						
	CBF input data parity error	CBOR input data parity error	LA compare error	SHRA LRC compare error	SHRB LRC compare error	SHRA input data parity error	SHRA output data parity error	SHRB input data parity error
47		SIP:CK2ST3						
	SHRB output data parity error	SHR compare error 0	SHR compare error 1	MRKOUT/ PRTOUT/ PRTOUTP parity error	CBIR0 SEL pointer parity error	CBIR1 SEL pointer parity error	MICRO packet counter parity error	XFREND0 counter parity error
48		SIP:CK2ST3						
	XFREND1 counter parity error	Write BSA0/1 pointer parity error	Read BSA0/1 pointer parity error	CSA0 counter parity error	CSA1 counter parity error	CBP R/W pointer parity error	PFC counter overflow	Reduction CBIR pointer parity error
49		SIP:CK2ST4						
	Next segment address data remain at end of transfer	CHR data remain at end of transfer	CBIR0 data remain at end of transfer	CBIR1 data remain at end of transfer	CBR data remain at end of transfer	CBOR data remain at end of transfer	SHR data remain at end of transfer	Not used
4A		SIP:CK2ST4						
	MICRO access error (CKD data length error)	MICRO access error (FBA data length error)	Not used	Not used	Not used	Not used	Not used	Not used
4B		SIP:ADPCK2						
	CHL XFR CK	CHL OVER RUN	CHA CHK2 (CHA)	CHA CHK2 (EADP)	CHA CHK2 (BSA)	CHA CHK2 (MP)	ESCON side CHA=0	BSA side FBADL=0
4C		SIP:CK20						
	MRKI, PRTI, PRTIP flag parity error in data transfer ADP-CHA	CHBUS0 parity error in reading data ADP-CHA	CHBUS1 parity error in writing data ADP-CHA	CHBUS0 parity error in writing data ADP-CHA	CHBUS1 parity error in writing data ADP-CHA	LRC error in reading data ADP-CHA	LRC error in writing data ADP-CHA	Not used
4D		SIP:CK21						
	LCM RCV micro frame LRC error in communi-cating ADP-CHA	BUS0 parity error in communi-cating ADP-CHA	BUS1 parity error in communi-cating ADP-CHA	Sequencer parity error in communi-cating ADP-CHA	Not used	Not used	Not used	Not used
4E		SIP:CK22						
	ADP-LCM interface error in LCMA	ADP-LCM interface error in LCMB	ADP-LCM interface error in LCMC	ADP-LCM interface error in LCMD	ADP-LCM interface error in LCME	ADP-LCM interface error in LCMF	ADP-LCM interface error in LCMG	ADP-LCM interface error in LCMH
4F		SIP:MESQA						
	M/E SEQ-A SEQUENCE No.00	M/E SEQ-A SEQUENCE No.01	M/E SEQ-A SEQUENCE No.02	M/E SEQ-A SEQUENCE No.03	M/E SEQ-A SEQUENCE No.04	M/E SEQ-A SEQUENCE No.05	M/E SEQ-A SEQUENCE No.06	M/E SEQ-A SEQUENCE No.07

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7F Detail
(3) Byte28 ≠ 01,02 and Byte40 = 01 (2/4)

	0	1	2	3	4	5	6	7
50		SIP:CXRSQA						
	CHL XFR SEQ-A SEQUENCE No.00	CHL XFR SEQ-A SEQUENCE No.01	CHL XFR SEQ-A SEQUENCE No.02	CHL XFR SEQ-A SEQUENCE No.03	CHL XFR SEQ-A SEQUENCE No.04	CHL XFR SEQ-A SEQUENCE No.05	CHL XFR SEQ-A SEQUENCE No.06	CHL XFR SEQ-A SEQUENCE No.07
51		SIP:CHRSQA						
	CHR SEQ-A SEQUENCE No.00	CHR SEQ-A SEQUENCE No.01	CHR SEQ-A SEQUENCE No.02	CHR SEQ-A SEQUENCE No.03	CHR SEQ-A SEQUENCE No.04	CHR SEQ-A SEQUENCE No.05	CHR SEQ-A SEQUENCE No.06	CHR SEQ-A SEQUENCE No.07
52		SIP:CBIRSQA						
	CBIR SEQ-A SEQUENCE No.00	CBIR SEQ-A SEQUENCE No.01	CBIR SEQ-A SEQUENCE No.02	CBIR SEQ-A SEQUENCE No.03	CBIR SEQ-A SEQUENCE No.04	CBIR SEQ-A SEQUENCE No.05	CBIR SEQ-A SEQUENCE No.06	CBIR SEQ-A SEQUENCE No.07
53		SIP:CBXSQA						
	CBX SEQ-A SEQUENCE No.00	CBX SEQ-A SEQUENCE No.01	CBX SEQ-A SEQUENCE No.02	CBX SEQ-A SEQUENCE No.03	CBX SEQ-A SEQUENCE No.04	CBX SEQ-A SEQUENCE No.05	CBX SEQ-A SEQUENCE No.06	CBX SEQ-A SEQUENCE No.07
54		SIP:CBORSQA						
	CBOR SEQ-A SEQUENCE No.00	CBOR SEQ-A SEQUENCE No.01	CBOR SEQ-A SEQUENCE No.02	CBOR SEQ-A SEQUENCE No.03	CBOR SEQ-A SEQUENCE No.04	CBOR SEQ-A SEQUENCE No.05	CBOR SEQ-A SEQUENCE No.06	CBOR SEQ-A SEQUENCE No.07
55		SIP:PDPKSQA						
	R PACKET SEQ-A 00	R PACKET SEQ-A 01	R PACKET SEQ-A 02	R PACKET SEQ-A 03	R PACKET SEQ-A 04	R PACKET SEQ-A 05	R PACKET SEQ-A 06	R PACKET SEQ-A 07
56		SIP::SCHSQA						
	SCH SEQ-A SEQUENCE No.00	SCH SEQ-A SEQUENCE No.01	SCH SEQ-A SEQUENCE No.02	SCH SEQ-A SEQUENCE No.03	SCH SEQ-A SEQUENCE No.04	SCH SEQ-A SEQUENCE No.05	SCH SEQ-A SEQUENCE No.06	SCH SEQ-A SEQUENCE No.07
57		SIP::PCMD1						
	0	1	P-LRC	SP ACS	DIA ACS	TFRCNT 00	TFRCNT 01	TFRCNT 02
58		SIP::PCMD1						
	TFRCNT 03	TFRCNT 04	TFRCNT 05	TFRCNT 06	TFRCNT 07	TFRCNT 08		
59		SIP::PCMD2						
	1	BM Bus mode 0	BM Bus mode 1	BM Bus mode 2	TM Transfer mode 0	TM Transfer mode 1	TM Transfer mode 2	TM Transfer mode 3
5A		SIP::CKDDL(CKD)						
	CKD data transfer byte count 00	CKD data transfer byte count 01	CKD data transfer byte count 02	CKD data transfer byte count 03	CKD data transfer byte count 04	CKD data transfer byte count 05	CKD data transfer byte count 06	CKD data transfer byte count 07
5B		SIP::CKDDL(CKD)						
	CKD data transfer byte count 10	CKD data transfer byte count 11	CKD data transfer byte count 12	CKD data transfer byte count 13	CKD data transfer byte count 14	CKD data transfer byte count 15	CKD data transfer byte count 16	CKD data transfer byte count 17
5C		SIP::CKDDL(FBA)						
	CKD data transfer byte count 00	CKD data transfer byte count 01	CKD data transfer byte count 02	CKD data transfer byte count 03	CKD data transfer byte count 04	CKD data transfer byte count 05	CKD data transfer byte count 06	CKD data transfer byte count 07
5D		SIP::CKDDL(FBA)						
	CKD data transfer byte count 10	CKD data transfer byte count 11	CKD data transfer byte count 12	CKD data transfer byte count 13	CKD data transfer byte count 14	CKD data transfer byte count 15	CKD data transfer byte count 16	CKD data transfer byte count 17
5E		SIP::FBADL						
	FBA data transfer word count 00	FBA data transfer word count 01	FBA data transfer word count 02	FBA data transfer word count 03	FBA data transfer word count 04	FBA data transfer word count 05	FBA data transfer word count 06	FBA data transfer word count 07
5F		SIP::FBADL						
	FBA data transfer word count 10	FBA data transfer word count 11	FBA data transfer word count 12	FBA data transfer word count 13	FBA data transfer word count 14	FBA data transfer word count 15	FBA data transfer word count 16	FBA data transfer word count 17

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7F Detail
(3) Byte28 ≠ 01,02 and Byte40 = 01 (3/4)

	0	1	2	3	4	5	6	7
60	SIP::CSPGR							
	Start page for storing data 00	Start page for storing data 01	Start page for storing data 02	Start page for storing data 02	Start page for storing data 00 (double write)	Start page for storing data 01 (double write)	Start page for storing data 02 (double write)	Start page for storing data 03 (double write)
61	SIP::MCSA00							
	CACHE Start address 00	CACHE Start address 01	CACHE Start address 02	CACHE Start address 03	CACHE Start address 04	CACHE Start address 05	CACHE Start address 06	CACHE Start address 07
62	SIP::MCSA00							
	CACHE Start address 10	CACHE Start address 11	CACHE Start address 12	CACHE Start address 13	CACHE Start address 14	CACHE Start address 15	CACHE Start address 16	CACHE Start address 17
63	SIP::MCSA01							
	CACHE Start address 20	CACHE Start address 21	CACHE Start address 22	CACHE Start address 23	CACHE Start address 24	CACHE Start address 25	CACHE Start address 26	CACHE Start address 27
64	SIP::MCSA01							
	CACHE Start address 30	CACHE Start address 31	CACHE Start address 32	CACHE Start address 33	CACHE Start address 34	CACHE Start address 35	CACHE Start address 36	CACHE Start address 37
65	SIP::XFRMP							
	Not used	Not used	Not used	Not used	XFRMP0 ~ XFRMP3 MP No. to be transferred to CACHE			
66	SIP::TCTR0							
	CUDG MODE	INH CHK2 (ALL)	INH BSA Read data parity error	INH Micro access error CHK1	CACHE MODE	Not used	Not used	Not used
67	SIP::TCTR0							
	Pseudo error mode (CHK1B)	Pseudo error mode (CHK2)	Sequencer trace 0	Sequencer trace 1	Sequencer trace 2	LSI REV0	LSI REV1	LSI REV2
68	QBSA0::CHK2DST0							
	Not used	ABT SEQ parity error	Not used	ABT LIVE INSCNT parity error	Not used	Not used	Not used	Not used
69	QBSA0::CHK2DST0							
	Not used	ABT time over	ABT timeout CNT parity error	Protocol error (FBREQ (No), MYGRANT (Yes))	Not used	Not used	Not used	Not used
6A	QBSA0::CHK2DST1							
	FBUS OPEN 0 signal input was detected	FBUS OPEN 1 signal input was detected	FBUS OPEN 2 signal input was detected	FBUS OPEN 0, 1 result of decision by majority	FBUS OPEN 1, 2 result of decision by majority	FBUS OPEN 0, 2 result of decision by majority	Not used	Not used
6B	QBSA0::CHK2DST1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0, 1 signal input was detected	FDISABLE ERR 1, 2 signal input was detected	FDISABLE ERR 0, 2 signal input was detected	Not used	Not used
6C	QBSA0::CHK2DST2							
	LIVE INS0 signal input was detected	LIVE INS1 signal input was detected	LIVE INS2 signal input was detected	LIVE 0, 1 result of decision by majority	LIVE 0, 2 result of decision by majority	LIVE 1, 2 result of decision by majority	Not used	Not used
6D	QBSA0::CHK2AST1							
	EXERR1 HI BYTE input data parity error	EXERR1 LO BYTE input data parity error	EXERR2 HI BYTE input data parity error	EXERR2 LO BYTE input data parity error	Other BSA error	SLAVE ID error	LRC collator data parity error	LRC collator LRC error
6E	QBSA0::CHK2AST1							
	FDB1 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error
6F	QBSA0::COPY							
	BUSY signal from SLAVE (for debug)	Transfer in CACHE RD transfer end	Transfer in CACHE WR transfer end	ABT master is on own FBUS	FBUS ABT master	ABT error on FBUS in progress	Not used	Not used

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Byte27 = 89 Byte0D Bit2 = 0 (Channel interface CHA CHK2) Byte40-7F Detail
(3) Byte28 ≠ 01,02 and Byte40 = 01 (3/4)

	0	1	2	3	4	5	6	7
70	QBSA0::MONITOR1							
	Data trnsfer information from host (1: side A)	Data trnsfer information from host (1: side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
71	QBSA0::MONITOR1							
	Side A command ID code 0	Side A command ID code 1	Side A command ID code 2	Side B command ID code 0	Side B command ID code 1	Side B command ID code 2	ABORT was complete	Not used
72	QBSA0::MONITOR2							
	Side A PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3
73	QBSA0::MONITOR2							
	Side B PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3
74	QBSA1::CHK2DST0							
	Not used	ABT SEQ parity error	Not used	ABT LIVE INSCNT parity error	Not used	Not used	Not used	Not used
75	QBSA1::CHK2DST0							
	Not used	ABT time over	ABT timeout CNT parity error	Protocol error (FBREQ (No), MYGRANT (Yes))	Not used	Not used	Not used	Not used
76	QBSA1::CHK2DST1							
	FBUS OPEN 0 signal input was detected	FBUS OPEN 1 signal input was detected	FBUS OPEN 2 signal input was detected	FBUS OPEN 0, 1 result of decision by majority	FBUS OPEN 1, 2 result of decision by majority	FBUS OPEN 0, 2 result of decision by majority	Not used	Not used
77	QBSA1::CHK2DST1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0, 1 signal input was detected	FDISABLE ERR 1, 2 signal input was detected	FDISABLE ERR 0, 2 signal input was detected	Not used	Not used
78	QBSA1::CHK2DST2							
	LIVE INS0 signal input was detected	LIVE INS1 signal input was detected	LIVE INS2 signal input was detected	LIVE 0, 1 result of decision by majority	LIVE 0, 2 result of decision by majority	LIVE 1, 2 result of decision by majority	Not used	Not used
79	QBSA1::CHK2AST1							
	EXERR1 HI BYTE input data parity error	EXERR1 LO BYTE input data parity error	EXERR2 HI BYTE input data parity error	EXERR2 LO BYTE input data parity error	Other BSA error	SLAVE ID error	LRC collator data parity error	LRC collator LRC error
7A	QBSA1::CHK2AST1							
	FDB1 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error	FDB2 data parity error
7B	QBSA1::COPY							
	BUSY signal from SLAVE (for debug)	Transfer in CACHE RD transfer end	Transfer in CACHE WR transfer end	ABT master is on own FBUS	FBUS ABT master	ABT error on FBUS in progress	Not used	Not used
7C	QBSA1::MONITOR1							
	Data trnsfer information from host (1: side A)	Data trnsfer information from host (1: side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7D	QBSA1::MONITOR1							
	Side A command ID code 0	Side A command ID code 1	Side A command ID code 2	Side B command ID code 0	Side B command ID code 1	Side B command ID code 2	ABORT was complete	Not used
7E	QBSA1::MONITOR2							
	Side A PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3
7F	QBSA1::MONITOR2							
	Side B PLRC additional bit	Side A FBUS transfer bus mode 0	Side A FBUS transfer bus mode 1	Side A FBUS transfer bus mode 2	Side A FBUS transfer mode 0	Side A FBUS transfer mode 1	Side A FBUS transfer mode 2	Side A FBUS transfer mode 3

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Inf valid	Error code						
21	Segment number							
22	Filemark	ECM	ILI	Reserved	Sense key			
23	Information bytes							
24								
25								
26								
27	Format (x‘8’)				message (x‘9’)			
28	Subcode1 (See followed pages)							
29	Hardware information (See followed pages)							
31								
32	(Reserved)							
33								
34	Module ID 1							
35	Routine ID 1							
36	Module ID 2							
37	Routine ID 2							
38	SCP path number							
39	SCSI initiator ID							
3A	SCSI target ID							
3B	Logical unit number							
3C	SCSI command code							
3D	Processor number							
3E	LDEV number							
3F								
40	Hardware information (See followed pages)							
7F								

*:This information is not fixed until DKC reports Sense data to HOST.

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Byte27 = 89 , Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte28-31 Detail

(1) Byte28 = 88

	0	1	2	3	4	5	6	7
28	Subcode: x‘88’:CHS data transfer error							
29								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2A								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2B								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2C								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2D								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2E								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2F								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
30								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
31								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used

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Byte27 = 89 , Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte28-31 Detail

(2) Byte28 = 89

	0	1	2	3	4	5	6	7
28	Subcode: x‘89’:BSA0·1 CHK2D error							
29								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2A		BSA_XRBS009(b24-b31)						
	Requester Sequencer Parity error	Receive Grant Code Parity error	Req Inside Path Arbiter Parity error	Requester Protocol error	Arbiter Count Over	Arbiter Counter Parity error	Read / Write Sequencer parity error	Transfer Path Decode Parity error
2B		BSA_XRBS009(b16-b23)						
	Arbiter Sequencer Parity error	LIVE INS Counter Parity error	Arbiter Time Over	Atbiter Timer Parity error	Arb Grant Code Gen Parity error	Not used	Not used	Not used
2C		BSA_XRBS00A(b16-b23)						
	F bus open 0	F bus open 1	F bus open 2	F bus open 0,1	F bus open 1,2	F bus open 0,2	Not used	Not used
2D		BSA_XRBS00B(b16-b23)						
	LIVE INS 0	LIVE INS 1	LIVE INS 2	LIVE INS 0,1	LIVE INS 1,2	LIVE INS 0,2	Not used	Not used
2E		BSA_XRBS109(b24-b31)						
	Requester Sequencer Parity error	Receive Grant Code Parity error	Req Inside Path Arbiter Parity error	Requester Protocol error	Arbiter Count Over	Arbiter Counter Parity error	Read / Write Sequencer parity error	Transfer Path Decode Parity error
2F		BSA_XRBS109(b16-b23)						
	Arbiter Sequencer Parity error	LIVE INS Counter Parity error	Arbiter Time Over	Arbiter Timer Parity error	Arb Grant Code Gen Parity error	Not used	Not used	Not used
30		BSA_XRBS10A(b16-b23)						
	F bus open 0	F bus open 1	F bus open 2	F bus open 0,1	F bus open 1,2	F bus open 0,2	Not used	Not used
31		BSA_XRBS10B(b16-b23)						
	LIVE INS 0	LIVE INS 1	LIVE INS 2	LIVE INS 0,1	LIVE INS 1,2	LIVE INS 0,2	Not used	Not used

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Byte27=89, Byte0D Bit2=1 (SCSI interface CHA CHK2) Byte28-31 Detail

(3) Byte28= 8C

	0	1	2	3	4	5	6	7
28	Subcode: x‘8C’:CHT data transfer error							
29								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2A								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2B								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2C								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2D								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2E								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2F								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
30								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
31								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used

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Byte27=89, Byte0D Bit2=1 (SCSI interface CHA CHK2) Byte28-31 Detail

(4) Byte28= 8D

	0	1	2	3	4	5	6	7
28	Subcode: x‘8D’:CHT CHK2D error							
29								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2A								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2B								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2C								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2D								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2E								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2F								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
30								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
31								
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(1) Byte28 = 88, Byte42 = 10

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x10							
43	DMA path							
	0: CHP -CACHE 1: PCI-CACHE				SCP#			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	Script Execute Status (b00-b07)							
	Script Function Code							
49	Script Execute Status (b08-b15)							
	Script execute step							
4A	Script Execute Status (b16-b23)							
	Execute end	Execute	Script Abort	Interrupt	SCSI ATN asserted	MSG 33byte over	Reselected	DMA transfer
4B	Script Execute Status (b24-b31)							
	TAG MSG received	Extended MSG received	Illegal Identify MSG received	Identify MSG received	Bus Device Reset MSG received	Other MSG received	(reserved)	(reserved)
4C	I-T-L-X (b00-b07)							
	SCSI TAG Number							
4D	I-T-L-X (b08-b15)							
	Logical Unit Number							
4E	I-T-L-X (b16-b23)							
	SCSI Target ID							
4F	I-T-L-X (b24-b31)							
	SCSI Initiator ID							

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	0	1	2	3	4	5	6	7
50	SCP_ISTAT :: Interrupt Status							
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
51	SCP_DSTAT :: DMA Status							
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
52	SCP_SIST0 :: SCSI Interrupt Status 0							
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
53	SCP_SIST1 :: SCSI Interrupt Status 1							
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake time Expired
54	SCP_DSP (b00-b07)							
	DMA SCRIPTS Pointer							
55	SCP_DSP (b08-b15)							
	DMA SCRIPTS Pointer							
56	SCP_DSP (b16-b23)							
	DMA SCRIPTS Pointer							
57	SCP_DSP (b24-b31)							
	DMA SCRIPTS Pointer							
58	SCP_DSPS (b00-b07)							
	DMA SCRIPTS Pointer Save							
59	SCP_DSPS (b08-b15)							
	DMA SCRIPTS Pointer Save							
5A	SCP_DSPS (b16-b23)							
	DMA SCRIPTS Pointer Save							
5B	SCP_DSPS (b24-b31)							
	DMA SCRIPTS Pointer Save							
5C	SCP_STATUS							
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
5D	SCP_DBC (b00-07)							
	DMA Byte Counter							
5E	SCP_DBC (b08-b15)							
	DMA Byte Counter							
5F	SCP_DBC (b16-b23)							
	DMA Byte Counter							

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	0	1	2	3	4	5	6	7
60	MIC_RCVINT (b00-b07)							
	(Reserved)							
61	MIC_RCVINT (b08-b15)							
	SYSRST INT	SELRST INT	CHK1A INT	CHK1B INT	SMP INT	LAN/SIO INT	CHK2A INT	PCI INT
62	MIC_RCVINT (b16-b23)							
	(Not used)	CHK3 INT	(Not used)	SCA1 INT	SCA2 INT	SCA3 INT	SCA4 INT	SCA5 INT
63	MIC_RCVINT (b24-b31)							
	TIMER0 INT	TIMER0 INT	TIMER0 INT	TIMER0 INT	TIMER0 INT	TIMER0 INT	TIMER0 INT	SYNC STOP INT
64	PBA_XRPBA03 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
65	PBA_XRPBA00 (b24-31)							
	DEV SEL (0x00 : SCP#0, Others: Not defined)							
66	PBA_XRPBA04 (b16-b23)							
	MEM ADR (MSB)							
67	PBA_XRPBA04 (b24-b31)							
	MEM ADR (LSB)							
68	PBA_XRPBA10 (b00-b07)							
	SERR0	SERR1	PERR0	PERR1	PERR2	PERR3	MEM ADR ERR	MEM WRDT PERR
69	PBA_XRPBA10 (b08-b15)							
	MEM RDDT ERR	BSERR0	BSERR1	BSA XR PERR	BPERR0	BPERR1	BCTL ERR	TIME OUT
6A	PBA_XRPBA10 (b16-b23)							
	(Reserved)							
6B	PBA_XRPBA10 (b24-b31)							
	(Reserved)							
6C	PBA_XRPBA69 (PCI0) (b00-07)							
	00: XFC INIT 01: XFC STOP 02: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
6D	PBA_XRPBA69 (PCI0) (b08-b15)							
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	00: PCI device 01: PCI device(SKIP)	
6E	PBA_XRPBA69 (PCI0) (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400 format		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
6F	PBA_XRPBA69 (PCI0) (b24-b31)							
	DMA Sub-Block Counter							

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	0	1	2	3	4	5	6	7
70	Reserved							
71	Reserved							
72	Reserved							
73	Reserved							
74	Reserved							
75	Reserved							
76	Reserved							
77	Reserved							
78	Reserved							
79	Reserved							
7A	Reserved							
7B	Reserved							
7C	PBA_XRPBA65 (b16-b23)							
	TRFCNT (LSB)						0	1
7D	PBA_XRPBA65 (b24-b31)							
	1	BM			TM			
7E	PBA_XRPBA6A (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
7F	PBA_XRPBA6A (b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(2) Byte28 = 88, Byte42 = 11

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x11							
43	DMA path							
	0: CHP-CACHE 1: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	Script Execute Status (b00-b07)							
	Script Function Code							
49	Script Execute Status (b08-b15)							
	Script execute step							
4A	Script Execute Status (b16-b23)							
	Execute end	Execute	Script Abort	Interrupt	SCSI ATN asserted	MSG 33byte over	Reselected	DMA transfer
4B	Script Execute Status (b24-b31)							
	TAG MSG received	Extended MSG received	Illegal Identify MSG received	Identify MSG received	Bus Device Reset MSG received	Other MSG received	(reserved)	(reserved)
4C	I-T-L-X (b00-b07)							
	SCSI TAG Number							
4D	I-T-L-X (b08-b15)							
	Logical Unit Number							
4E	I-T-L-X (b16-b23)							
	SCSI Target ID							
4F	I-T-L-X (b24-b31)							
	SCSI Initiator ID							

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	0	1	2	3	4	5	6	7
50	SCP_ISTAT :: Interrupt Status							
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
51	SCP_DSTAT :: DMA Status							
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
52	SCP_SIST0 :: SCSI Interrupt Status 0							
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
53	SCP_SIST1 :: SCSI Interrupt Status 1							
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
54	SCP_DSP (b00-b07)							
	DMA SCRIPTS Pointer							
55	SCP_DSP (b08-b15)							
	DMA SCRIPTS Pointer							
56	SCP_DSP (b16-b23)							
	DMA SCRIPTS Pointer							
57	SCP_DSP (b24-b31)							
	DMA SCRIPTS Pointer							
58	SCP_DSPS (b00-b07)							
	DMA SCRIPTS Pointer Save							
59	SCP_DSPS (b08-b15)							
	DMA SCRIPTS Pointer Save							
5A	SCP_DSPS (b16-b23)							
	DMA SCRIPTS Pointer Save							
5B	SCP_DSPS (b24-b31)							
	DMA SCRIPTS Pointer Save							
5C	SCP_STATUS							
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
5D	SCP_DBC (b00-b07)							
	DMA Byte Counter							
5E	SCP_DBC (b08-b15)							
	DMA Byte Counter							
5F	SCP_DBC (b16-b23)							
	DMA Byte Counter							

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	0	1	2	3	4	5	6	7
60	MIC_RCVINT (b00-b07)							
	(Reserved)							
61	MIC_RCVINT (b08-b15)							
	SYSRST INT	SELRST INT	CHK1A INT	CHK1B INT	SMP INT	LAN/SIO INT	CHK2A INT	PCI INT
62	MIC_RCVINT (b16-b23)							
	(Not used)	CHK3 INT	(Not used)	SCA1 INT	SCA2 INT	SCA3 INT	SCA4 INT	SCA5 INT
63	MIC_RCVINT(b24-b31)							
	TIMER0 INT	TIMER1 INT	TIMER2 INT	TIMER3 INT	TIMER4 INT	TIMER5 INT	TIMER6 INT	SYNC STOP INT
64	PBA_XRPBA03(b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
65	PBA_XRPBA00 (b24-b31)							
	DEV SEL(0x00: SCP#0, Others: Not defined)							
66	PBA_XRPBA04 (b16-b23)							
	MEM ADR (MSB)							
67	PBA_XRPBA04(b24-b31)							
	MEM ADR (LSB)							
68	PBA_XRPBA10 (b00-b07)							
	(Reserved)							
69	PBA_XRPBA10 (b08-b15)							
	(Reserved)							
6A	PBA_XRPBA10(b16-b23)							
	SERR0	SERR1	PERR0	PERR1	PERR2	PERR3	MEM ADR ERR	MEM WRDT PERR
6B	PBA_XRPBA10(b24-b31)							
	MEM RDDT ERR	BSERR0	BSERR1	BSA XR PERR	BPERR0	BPERR1	BCTL ERR	TIME OUT
6C	PBA_XRPBA68 (PCI0) (b00-b07)							
	MSADR							
6D	PBA_XRPBA68 (PCI0) (b08-b15)							
	MSADR							
6E	PBA_XRPBA68(PCI0) (b16-b23)							
	MSADR							
6F	PBA_XRPBA68(PCI0) (b24-b31)							
	MSADR							

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	0	1	2	3	4	5	6	7
70	Reserved							
71	Reserved							
72	Reserved							
73	Reserved							
74	Reserved							
75	Reserved							
76	Reserved							
77	Reserved							
78	Reserved							
79	Reserved							
7A	Reserved							
7B	Reserved							
7C	Reserved							
7D	Reserved							
7E	Reserved							
7F	Reserved							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(3) Byte28 = 88, Byte42 = 12

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x12							
43	DMA path#							
	0: CHP-CACHE 1: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	Script Execute Status (b00-b07)							
	Script Function Code							
49	Script Execute Status (b08-b15)							
	Script execute step							
4A	Script Execute Status (b16-b23)							
	Execute end	Execute	Script Abort	Interrupt	SCSI ATN asserted	MSG 33byte over	Reselected	DMA transfer
4B	Script Execute Status (b24-b31)							
	TAG MSG received	Extended MSG received	Illegal Identify MSG received	Identify MSG received	Bus Device Reset MSG received	Other MSG received	(reserved)	(reserved)
4C	I-T-L-X (b00-b07)							
	SCSI TAG Number							
4D	I-T-L-X (b08-b15)							
	Logical Unit Number							
4E	I-T-L-X (b16-b23)							
	SCSI Target ID							
4F	I-T-L-X (b24-b31)							
	SCSI Initiator ID							

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	0	1	2	3	4	5	6	7
50	SCP_ISTAT :: Interrupt Status							
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
51	SCP_DSTAT :: DMA Status							
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
52	SCP_SIST0 :: SCSI Interrupt Status 0							
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
53	SCP_SIST1 :: SCSI Interrupt Status 1							
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
54	SCP_DSP (b00-b07)							
	DMA SCRIPTS Pointer							
55	SCP_DSP (b08-b15)							
	DMA SCRIPTS Pointer							
56	SCP_DSP (b16-b23)							
	DMA SCRIPTS Pointer							
57	SCP_DSP (b24-b31)							
	DMA SCRIPTS Pointer							
58	SCP_DSPS (b00-07)							
	DMA SCRIPTS Pointer Save							
59	SCP_DSPS (b08-b15)							
	DMA SCRIPTS Pointer Save							
5A	SCP_DSPS (b16-b23)							
	DMA SCRIPTS Pointer Save							
5B	SCP_DSPS (b24-b31)							
	DMA SCRIPTS Pointer Save							
5C	SCP_STATUS							
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
5D	SCP_DBC (b00-b07)							
	DMA Byte Counter							
5E	SCP_DBC (b08-b15)							
	DMA Byte Counter							
5F	SCP_DBC (b16-b23)							
	DMA Byte Counter							

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	0	1	2	3	4	5	6	7
60	MIC_RCVINT (b00-b07)							
	(Reserved)							
61	MIC_RCVINT (b08-b15)							
	SYSRST INT	SELRST INT	CHK1A INT	CHK1B INT	SMP INT	LAN/SIO INT	CHK2A INT	PCI INT
62	MIC_RCVINT (b16-b23)							
	(Not used)	CHK3 INT	(Not used)	SCA1 INT	SCA2 INT	SCA3 INT	SCA4 INT	SCA5 INT
63	MIC_RCVINT (b24-b31)							
	TIMER0 INT	TIMER1 INT	TIMER2 INT	TIMER3 INT	TIMER4 INT	TIMER5 INT	TIMER6 INT	SYNC STOP INT
64	PBA_XRPBA03 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
65	PBA_XRPBA00 (b24-b31)							
	DEV SEL (0x00: SCP#0, Others: Not defined)							
66	PBA_XRPBA04 (b16-b23)							
	MEM ADR (MSB)							
67	PBA_XRPBA04 (b24-b31)							
	MEM ADR (LSB)							
68	PBA_XRPBA28 (b00-b07)							
	SERR0	SERR1	PERR0	PERR1	PERR2	PERR3	MEM ADR ERR	MEM WRDT ERR
69	PBA_XRPBA28 (b08-b15)							
	MEM RDDT ERR	BSERR0	BSERR1	BSA XR PERR	BPERR0	BPERR1	BCTL ERR	TIME OUT
6A	PBA_XRPBA28 (b16-b23)							
	TRFCNT (LSB)						0	1
6B	PBA_XRPBA28(b24-b31)							
	1	BM			TM			
6C	PBA_XRPBA2B (b00-b07)							
	00: XFC INIT 01: XFC STOP 11: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
6D	PBA_XRPBA2B (b08-b15)							
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	10: none 11: FBUS DATA	
6E	PBA_XRPBA2B (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400 format		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
6F	PBA_XRPBA2B (b24-b31)							
	DMA Sub-Block Counter							

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	0	1	2	3	4	5	6	7
70	PBA_XRPBA2C (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
71	PBA_XRPBA2C (b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
72	PBA_XRPBA2C (b16-b23)							
	(Reserved)							
73	PBA_XRPBA2C (b24-b31)							
	(Reserved)							
74	PBA_XRPBA65 (b00-b07)							
	(Reserved)							
75	PBA_XRPBA65 (b08-b15)							
	0	1	PLRC	SP MODE	DIAG MODE	TRF CNT(MSB)		
76	PBA_XRPBA65 (b16-b23)							
	TRF CNT (LSB)						0	1
77	PBA_XRPBA65 (b24-b31)							
	1	BM			TM			
78	PBA_XRPBA69 (b00-b07)							
	00: XFC INIT 01: XFC STOP 11: XFC START	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
79	PBA_XRPBA69 (b08-b15)							
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	00: PCI device 01: PCI device (SKIP)	
7A	PBA_XRPBA69 (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400 format		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
7B	PBA_XRPBA69 (b24-b31)							
	DMA Sub-Block Counter							
7C	PBA_XRPBA6A (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
7D	PBA_XRPBA6A (b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
7E	PBA_XRPBA6A (b16-b23)							
	(Reserved)							
7F	PBA_XRPBA6A (b24-b31)							
	(Reserved)							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(4) Byte28 = 88, Byte42 = 13

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x13							
43	DMA path							
	00: CHP-CACHE 01: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	Script Execute Status (b00-b07)							
	Script Function Code							
49	Script Execute Status (b08-b15)							
	Script execute step							
4A	Script Execute Status (b16-b23)							
	Execute end	Execute	Script Abort	Interrupt	SCSI ATN asserted	MSG 33byte over	Reselected	DMA transfer
4B	Script Execute Status (b24-b31)							
	TAG MSG received	Extended MSG received	Illegal Identify MSG received	Identify MSG received	Bus Device Reset MSG received	Other MSG received	(reserved)	(reserved)
4C	I-T-L-X (b00-b07)							
	SCSI TAG Number							
4D	I-T-L-X (b08-b15)							
	Logical Unit Number							
4E	I-T-L-X (b16-b23)							
	SCSI Target ID							
4F	I-T-L-X (b24-b31)							
	SCSI Initiator ID							

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	0	1	2	3	4	5	6	7
50	SCP_ISTAT :: Interrupt Status							
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
51	SCP_DSTAT :: DMA Status							
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
52	SCP_SIST0 :: SCSI Interrupt Status 0							
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
53	SCP_SIST1 :: SCSI Interrupt Status 1							
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
54	SCP_DSP (b00-b07)							
	DMA SCRIPTS Pointer							
55	SCP_DSP (b08-b15)							
	DMA SCRIPTS Pointer							
56	SCP_DSP (b16-b23)							
	DMA SCRIPTS Pointer							
57	SCP_DSP (b24-b31)							
	DMA SCRIPTS Pointer							
58	SCP_DSPS (b00-b07)							
	DMA SCRIPTS Pointer Save							
59	SCP_DSPS (b08-b15)							
	DMA SCRIPTS Pointer Save							
5A	SCP_DSPS (b16-b23)							
	DMA SCRIPTS Pointer Save							
5B	SCP_DSPS (b24-b31)							
	DMA SCRIPTS Pointer Save							
5C	SCP_STATUS							
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
5D	SCP_DBC (b00-b07)							
	DMA Byte Counter							
5E	SCP_DBC (b08-b15)							
	DMA Byte Counter							
5F	SCP_DBC (b16-b23)							
	DMA Byte Counter							

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	0	1	2	3	4	5	6	7
60	MIC_RCVINT (b00-b07)							
	(Reserved)							
61	MIC_RCVINT (b08-b15)							
	SYSRST INT	SELRST INT	CHK1A INT	CHK1B INT	SMP INT	LAN/SIO INT	CHK2A INT	PCI INT
62	MIC_RCVINT (b16-b23)							
	(Not used)	CHK3 INT	(Not used)	SCA1 INT	SCA2 INT	SCA3 INT	SCA4 INT	SCA5 INT
63	MIC_RCVINT (b24-b31)							
	TIMER0 INT	TIMER1 INT	TIMER2 INT	TIMER3 INT	TIMER4 INT	TIMER5 INT	TIMER6 INT	SYNC STOP INT
64	PBA_XRPBA03 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
65	PBA_XRPBA00 (b24-b31)							
	DEV SEL (0x00: SCP#0, Others: Not defined)							
66	PBA_XRPBA04 (b16-b23)							
	MEM ADR (MSB)							
67	PBA_XRPBA04 (b24-b31)							
	MEM ADR (LSB)							
68	PBA_XRPBA28 (b00-b07)							
	(Reserved)							
69	PBA_XRPBA28 (b08-b15)							
	0	1	PLRC	SP MODE	DIAG MODE	TRF CNT(MSB)		
6A	PBA_XRPBA28 (b16-b23)							
	TRF CNT (LSB)						0	1
6B	PBA_XRPBA28 (b24-b31)							
	1	BM			TM			
6C	PBA_XRPBA2B (b00-07)							
	00: XFC INIT 10: XFC STOP 11: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
6D	PBA_XRPBA2B (b08-b15)							
	(Not used)	(Not used)	SCP#		(Not used)	(Not used)	10: none 11: FBUS DATA	
6E	PBA_XRPBA2B (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400 10: CACHE I/O,TOD		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
6F	PBA_XRPBA2B (b24-b31)							
	DMA Sub-Block Counter							

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	0	1	2	3	4	5	6	7
70	PBA_XRPBA2C (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
71	PBA_XRPBA2C (b08-b15)							
	(Not used)	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
72	PBA_XRPBA2C (b16-b23)							
	(Reserved)							
73	PBA_XRPBA2C (b24-b31)							
	(Reserved)							
74	PBA_XRPBA65 (b00-b07)							
	(Reserved)							
75	PBA_XRPBA65 (b08-b15)							
	0	1	PLRC	SP MODE	DIAG MODE	TRF CNT(MSB)		
76	PBA_XRPBA65 (b16-b23)							
	TRF CNT (LSB)						0	1
77	PBA_XRPBA65 (b24-b31)							
	1	BM			TM			
78	PBA_XRPBA69 (b00-b07)							
	00: XFC INIT 10: XFC STOP 11: XFC START	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
79	PBA_XRPBA69 (b08-b15)							
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	00: PCI device 01: PCI device(SKIP)	
7A	PBA_XRPBA69 (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
7B	PBA_XRPBA69 (b24-b31)							
	DMA Sub-Block Counter							
7C	PBA_XRPBA6A (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
7D	PBA_XRPBA6A (b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
7E	PBA_XRPBA6A (b16-b23)							
	(Reserved)							
7F	PBA_XRPBA6A (b24-b31)							
	(Reserved)							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(5) Byte28 = 88, Byte42 = 20

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x20							
43	DMA path							
	00: CHP-CACHE 01: SCP-CAHCE				SCP path#(03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	Script Execute Status (b00-b07)							
	Script Function Code							
49	Script Execute Status (b08-b15)							
	Script execute step							
4A	Script Execute Status (b16-b23)							
	Execute end	Execute	Script Abort	Interrupt	SCSI ATN asserted	MSG 33byte over	Reselected	DMA transfer
4B	Script Execute Status (b24-b31)							
	TAG MSG received	Extended MSG received	Illegal Identify MSG received	Identify MSG received	Bus Device Reset MSG received	Other MSG received	(reserved)	(reserved)
4C	I-T-L-X (b00-b07)							
	SCSI TAG Number							
4D	I-T-L-X (b08-b15)							
	Logical Unit Number							
4E	I-T-L-X (b16-b23)							
	SCSI Target ID							
4F	I-T-L-X (b24-b31)							
	SCSI Initiator ID							

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	0	1	2	3	4	5	6	7
50	SCP_ISTAT :: Interrupt Status							
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
51	SCP_DSTAT :: DMA Status							
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
52	SCP_SIST0 :: SCSI Interrupt Status 0							
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
53	SCP_SIST1 :: SCSI Interrupt Status 1							
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
54	SCP_DSP (b00-b07)							
	DMA SCRIPTS Pointer							
55	SCP_DSP (b08-b15)							
	DMA SCRIPTS Pointer							
56	SCP_DSP (b16-b23)							
	DMA SCRIPTS Pointer							
57	SCP_DSP (b24-b31)							
	DMA SCRIPTS Pointer							
58	SCP_DSPS (b00-07)							
	DMA SCRIPTS Pointer Save							
59	SCP_DSPS (b08-b15)							
	DMA SCRIPTS Pointer Save							
5A	SCP_DSPS (b16-b23)							
	DMA SCRIPTS Pointer Save							
5B	SCP_DSPS (b24-b31)							
	DMA SCRIPTS Pointer Save							
5C	SCP_STATUS							
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
5D	SCP_DBC (b00-b07)							
	DMA Byte Counter							
5E	SCP_DBC (b08-b15)							
	DMA Byte Counter							
5F	SCP_DBC (b16-b23)							
	DMA Byte Counter							

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	0	1	2	3	4	5	6	7
60	PBA_XRPBA03(b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
61	PBA_XRPBA00(b24-b31)							
	DEV SEL (0x00: SCP#0, Others: Not defined)							
62	PBA_XRPBA6A (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
63	PBA_XRPBA6A (b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
64	PBA_XRPBA60 (b00-b07)							
	SKIP DATA							
65	PBA_XRPBA60 (b08-b15)							
	SKIP DATA							
66	PBA_XRPBA60 (b16-b23)							
	SKIP DATA							
67	PBA_XRPBA60 (b24-b31)							
	SKIP DATA							
68	PBA_XRPBA61(b24-b31)							
	FBUS ADR00							
69	PBA_XRPBA63 (b24-b31)							
	FBUS ADR10							
6A	PBA_XRPBA6B(b00-b07)							
	WPBF IP PERR	RPBF IP PERR	RPBF IP PERR	DT OUT PERR	LRC CMP ERR	LA CMP ERR		
6B	PBA_XRPBA6B (b08-b15)							
	(Reserved)							
6C	PBA_XRPBA62 (b00-b07)							
	FBUS ADR01							
6D	PBA_XRPBA62 (b08-b15)							
	FBUS ADR02							
6E	PBA_XRPBA62 (b16-b23)							
	FBUS ADR03							
6F	PBA_XRPBA62 (b24-b31)							
	FBUS ADR04							

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	0	1	2	3	4	5	6	7
70	PBA_XRPBA64 (b00-b07)							
	FBS ADR11							
71	PBA_XRPBA64 (b08-b15)							
	FBS ADR12							
72	PBA_XRPBA64 (b16-b23)							
	FBS ADR13							
73	PBA_XRPBA64 (b24-b31)							
	FBS ADR14							
74	PBA_XRPBA65 (b00-b07)							
	(Reserved)							
75	PBA_XRPBA65 (b08-b15)							
	0	1	PLRC	SP MODE	DIAG MODE	TRF CNT (MSB)		
76	PBA_XRPBA65 (b16-b23)							
	TRF CNT (LSB)							
77	PBA_XRPBA65 (b24-b31)							
	1	BM			TM			
78	PBA_XRPBA68 (b00-b07)							
	MSADR							
79	PBA_XRPBA68 (b08-b15)							
	MSADR							
7A	PBA_XRPBA68 (b16-b23)							
	MSADR							
7B	PBA_XRPBA68 (b24-b31)							
	MSADR							
7C	PBA_XRPBA69 (b00-b07)							
	00: XFC INIT 10: XFC STOP 11: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
7D	PBA_XRPBA69 (b08-b15)							
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	00: PCI device 01: PCI device(SKIP)	
7E	PBA_XRPBA69 (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400 format		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
7F	PBA_XRPBA69 (b24-b31)							
	DMA Sub-Block Counter							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(6) Byte28 = 88, Byte42 = 21

	0	1	2	3	4	5	6	7
40		Error Code (b00-b07)						
		SCP Control Module Error Code						
41		Error Code (b08-b15)						
		SCP Control Module Error Code						
42		SubCode 2						
		0x21						
43		DMA path						
		00: CHP-CACHE 01: SCP-CACHE			SCP path#(03)			
44		SCP Function Code						
		SCP Control Module Function Code						
45		Sense Key						
		SCSI Sense Key						
46		Sense Code (b00-b07)						
		SCSI Sense Code						
47		Sense Code (b08-b15)						
		SCSI Sense Code Qualifier						
48		SCP_ISTAT :: Interrupt Status						
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
49		SCP_DSTAT :: DMA Status						
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
4A		SCP_SIST0 :: SCSI Interrupt Status 0						
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
4B		SCP_SIST1 :: SCSI Interrupt Status 1						
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
4C		SCP_STATUS						
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
4D		SCP_DBC (b00-b07)						
		DMA Byte Counter						
4E		SCP_DBC (b08-b15)						
		DMA Byte Counter						
4F		SCP_DBC (b16-b23)						
		DMA Byte Counter						

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	0	1	2	3	4	5	6	7
50	PBA_XRPBA03 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
51	PBA_XRPBA00 (b24-b31)							
	DEV SEL (0x00: SCP#0, Ohters: Not defined)							
52	PBA_XRPBA6A (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
53	PBA_XRPBA6A (b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
54	PBA_XRPBA60 (b00-b07)							
	SKIP DATA							
55	PBA_XRPBA60 (b08-b15)							
	SKIP DATA							
56	PBA_XRPBA60 (b16-b23)							
	SKIP DATA							
57	PBA_XRPBA60 (b24-b31)							
	SKIP DATA							
58	PBA_XRPBA61 (b24-b31)							
	FBS ADR00							
59	PBA_XRPBA63(b24-b31)							
	FBS ADR10							
5A	PBA_XRPBA6B(b00-07)							
	WPBF IP PERR	RPBF DT PERR	RPBF IP PERR	RPBF OP PERR	DT OUT PERR	LRC CMP ERR	LA CMP ERR	(Not used)
5B	PBA_XRPBA6B (b08-b15)							
	(Reserved)							
5C	PBA_XRPBA62 (b00-b07)							
	FBS ADR01							
5D	PBA_XRPBA62 (b08-b15)							
	FBS ADR02							
5E	PBA_XRPBA62 (b16-b23)							
	FBUS ADR03							
5F	PBA_XRPBA62 (b24-b31)							
	FBUS ADR04							

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	0	1	2	3	4	5	6	7
60	PBA_XRPBA64 (b00-b07)							
	FBS ADR11							
61	PBA_XRPBA64 (b08-b15)							
	FBS ADR12							
62	PBA_XRPBA64 (b16-b23)							
	FBS ADR13							
63	PBA_XRPBA64 (b24-b31)							
	FBS ADR14							
64	PBA_XRPBA65 (b00-07)							
	(Reserved)							
65	PBA_XRPBA65 (b08-b15)							
	0	1	PLRC	SP MODE	DIAG MODE	TRF CNT(MSB)		
66	PBA_XRPBA65 (b16-b23)							
	TRF CNT (LSB)						0	1
67	PBA_XRPBA65 (b24-b31)							
	1	BM			TM			
68	PBA_XRPBA69 (b00-b07)							
	00: XFC INIT 10: XFC STOP 11: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
69	PBA_XRPBA69 (b08-b15)							
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	00: PCI device 01: PCI device(SKIP)	
6A	PBA_XRPBA69 (b16-b23)							
	(Not used)	(Not used)	Sub-Block format 00: not AS400 01: AS400 format		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
6B	PBA_XRPBA69 (b24-b31)							
	DMA Sub-Block Counter							
6C	PBSA_XRBS000 (b8-b15)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
6D	PBSA_XRBS006 (b8-b15)							
	CUDG EN	BSA LOOP	REQ SET END	MY GRANT0	MY GRANT1	MY GRANT2	MY GRANT3	MY GRANT4
6E	PBSA_XRBS100 (b8-b15)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
6F	PBSA_XRBS106 (b8-b15)							
	CUDG EN	BSA LOOP	REQ SET END	MY GRANT0	MY GRANT1	MY GRANT2	MY GRANT3	MY GRANT4

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	0	1	2	3	4	5	6	7
70	PBSA_XRBS020 (b00-b07)							
	LAST ADR00							
71	PBSA_XRBS020 (b08-b15)							
	LAST ADR01							
72	PBSA_XRBS020 (b16-b23)							
	LAST ADR02							
73	PBSA_XRBS020 (b24-b31)							
	LAST ADR03							
74	PBSA_XRBS021 (b00-b07)							
	LAST ADR04							
75	PBSA_XRBS021 (b08-b15)							
	LAST COMMAND							
76	PBSA_XRBS021 (b16-b23)							
	LAST COMMAND							
77	PBSA_XRBS021 (b24-b31)							
	LAST COMMAND0							
78	PBSA_XRBS120 (b00-b07)							
	LAST ADR00							
79	PBSA_XRBS120 (b08-b15)							
	LAST ADR01							
7A	PBSA_XRBS120 (b16-b23)							
	LAST ADR02							
7B	PBSA_XRBS120 (b24-b31)							
	LAST ADR03							
7C	PBSA_XRBS121 (b00-b07)							
	LAST ADR04							
7D	PBSA_XRBS121 (b08-b15)							
	LAST COMMAND0							
7E	PBSA_XRBS121 (b16-b23)							
	LAST COMMAND0							
7F	PBSA_XRBS121 (b24-b31)							
	LAST COMMAND0							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(7) Byte28 = 88, Byte42 = 22

	0	1	2	3	4	5	6	7
40		Error Code (b00-b07)						
		SCP Control Module Error Code						
41		Error Code (b08-b15)						
		SCP Control Module Error Code						
42		SubCode 2						
		0x22						
43		DMA path						
		00: CHP-CACHE 01: SCP-CACHE				SCP path# (03)		
44		SCP Function Code						
		SCP Control Module Function Code						
45		Sense Key						
		SCSI Sense Key						
46		Sense Code (b00-b07)						
		SCSI Sense Code						
47		Sense Code (b08-b15)						
		SCSI Sense Code Qualifier						
48		SCP_ISTAT :: Interrupt Status						
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
49		SCP_DSTAT :: DMA Status						
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
4A		SCP_SIST0 :: SCSI Interrupt Status 0						
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
4B		SCP_SIST1 :: SCSI Interrupt Status 1						
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
4C		SCP_STATUS						
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
4D		SCP_DBC (b00-b07)						
		DMA Byte Counter						
4E		SCP_DBC (b08-b15)						
		DMA Byte Counter						
4F		SCP_DBC (b16-b23)						
		DMA Byte Counter						

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	0	1	2	3	4	5	6	7
50		PBA_XRPBA03 (b24-b31)						
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
51		PBA_XRPBA00 (b24-b31)						
		DEV SEL (0x00: SCP#0, Others: Not defined)						
52		PBA_XRPBA6A (b00-b07)						
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
53		PBA_XRPBA6A (b08-b15)						
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
54		PBSA_XRBS000 (b16-b23)						
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
55		PBSA_XRBS006 (b16-b23)						
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
56		PBSA_XRBS100 (b16-b23)						
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
57		PBSA_XRBS106 (b16-b23)						
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
58		PBSA_XRBS027 (b00-b07)						
	BBF DATA PERR0	BBF DATA PERR1	BBF DATA PERR2	BBF DATA PERR3	(Not used)	FBS ADR/ FBS CMD error	BBF Pointer PERR	(Not used)
59		PBSA_XRBS027 (b08-b15)						
		(Reserved)						
5A		PBSA_XRBS027 (b16-b23)						
	FBUS TIME OUT	FBUS TIMER PERR	PBF Pointer PERR	FBF INPUT DATA PERR	other BSA CHK2C	other BSA CHK2D	MASTER Lost Execute	Path Quiet ERROR
5B		PBSA_XRBS027 (b24-b31)						
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	Invalid Command
5C		PBSA_XRBS127 (b00-b07)						
	BBF DATA PERR0	BBF DATA PERR1	BBF DATA PERR2	BBF DATA PERR3	(Not used)	FBS ADR/ FBS CMD error	BBF Pointer PERR	(Not used)
5D		PBSA_XRBS127 (b08-b15)						
		(Reserved)						
5E		PBSA_XRBS127 (b16-b23)						
	FBUS TIME OUT	FBUS TIMER PERR	PBF Pointer PERR	FBF INPUT DATA PERR	other BSA CHK2C	other BSA CHK2D	MASTER Lost Execute	Path Quiet ERROR
5F		PBSA_XRBS127 (b24-b31)						
	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	Invalid Command

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	0	1	2	3	4	5	6	7
60	PBSA_XRBS020 (b00-b07)							
	LAST ADR00							
61	PBSA_XRBS020 (b08-b15)							
	LAST ADR01							
62	PBSA_XRBS020 (b16-b23)							
	LAST ADR02							
63	PBSA_XRBS020 (b24-b31)							
	LAST ADR03							
64	PBSA_XRBS021 (b00-b07)							
	LAST ADR04							
65	PBSA_XRBS021 (b08-b15)							
	LAST COMMAND0							
66	PBSA_XRBS021 (b16-b23)							
	LAST COMMAND0							
67	PBSA_XRBS021 (b24-b31)							
	LAST COMMAND0							
68	PBSA_XRBS022 (b00-b07)							
	LAST ADR10							
69	PBSA_XRBS022 (b08-b15)							
	LAST ADR11							
6A	PBSA_XRBS022 (b16-b23)							
	LAST ADR12							
6B	PBSA_XRBS022 (b24-b31)							
	LAST ADR13							
6C	PBSA_XRBS023 (b00-b07)							
	LAST ADR14							
6D	PBSA_XRBS023 (b08-b15)							
	LAST COMMAND1							
6E	PBSA_XRBS023 (b16-b23)							
	LAST COMMAND1							
6F	PBSA_XRBS023 (b24-b31)							
	LAST COMMAND1							

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	0	1	2	3	4	5	6	7
70	PBSA_XRBS120 (b00-b07)							
	LAST ADR00							
71	PBSA_XRBS120 (b08-b15)							
	LAST ADR01							
72	PBSA_XRBS120 (b16-b23)							
	LAST ADR02							
73	PBSA_XRBS120 (b24-b31)							
	LAST ADR03							
74	PBSA_XRBS121 (b00-b07)							
	LAST ADR04							
75	PBSA_XRBS121 (b08-b15)							
	LAST COMMAND0							
76	PBSA_XRBS121 (b16-b23)							
	LAST COMMAND0							
77	PBSA_XRBS121 (b24-b31)							
	LAST COMMAND0							
78	PBSA_XRBS122 (b00-b07)							
	LAST ADR10							
79	PBSA_XRBS122 (b08-b15)							
	LAST ADR11							
7A	PBSA_XRBS122 (b16-b23)							
	LAST ADR12							
7B	PBSA_XRBS122 (b24-b31)							
	LAST ADR13							
7C	PBSA_XRBS123 (b00-b07)							
	LAST ADR14							
7D	PBSA_XRBS123 (b08-b15)							
	LAST COMMAND1							
7E	PBSA_XRBS123 (b16-b23)							
	LAST COMMAND1							
7F	PBSA_XRBS123 (b24-b31)							
	LAST COMMAND1							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(8) Byte28 = 88, Byte42 = 23

	0	1	2	3	4	5	6	7
40		Error Code (b00-b07)						
		SCP Control Module Error Code						
41		Error Code (b08-b15)						
		SCP Control Module Error Code						
42		SubCode 2						
		0x23						
43		DMA path						
		00: CHP-CACHE 01: SCP-CACHE			SCP path# (03)			
44		SCP Function Code						
		SCP Control Module Function Code						
45		Sense Key						
		SCSI Sense Key						
46		Sense Code (b00-b07)						
		SCSI Sense Code						
47		Sense Code (b08-b15)						
		SCSI Sense Code Qualifier						
48		SCP_ISTAT :: Interrupt Status						
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
49		SCP_DSTAT :: DMA Status						
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
4A		SCP_SIST0 :: SCSI Interrupt Status 0						
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
4B		SCP_SIST1 :: SCSI Interrupt Status 1						
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
4C		SCP_STATUS						
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
4D		SCP_DBC (b00-b07)						
		DMA Byte Counter						
4E		SCP_DBC (b08-b15)						
		DMA Byte Counter						
4F		SCP_DBC (b16-b23)						
		DMA Byte Counter						

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	0	1	2	3	4	5	6	7
50		PBA_XRPBA03 (b24-b31)						
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 INT	SCP#2 INT	SCP#1 INT	SCP#0 INT
51		PBA_XRPBA00 (b24-b31)						
		DEV SEL (0x00: SCP#0, Others: Not defined)						
52		PBA_XRPBA6A (b00-b07)						
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
53		PBA_XRPBA6A (b08-b15)						
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
54		PBSA_XRBS000 (b16-b23)						
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
55		PBSA_XRBS006 (b16-b23)						
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
56		PBSA_XRBS100 (b16-b23)						
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
57		PBSA_XRBS106 (b16-b23)						
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
58		PBSA_XRBS009 (b16-b23)						
	ABT SEQ PERR	ABT LiveIns Counter PERR	ABT Time Over	ABT Timer PERR	ABT GEN GNT Code PERR	(Not used)	(Not used)	(Not used)
59		PBSA_XRBS009 (b24-b23)						
	REQ SEQ PERR	REQ Receive GNT Code PERR	REQ GEN Exepath PERR	REQ Protocol error	REQ Count Over	REQ Counter PERR	R/W SEQ PERR	R/W Exepath Decode PERR
5A		PBSA_XRBS00A (b16-b23)						
	FBUS OPEN0	FBUS OPEN1	FBUS OPEN2	FBUS OPEN0,1	FBUS OPEN1,2	FBUS OPEN2,3	(Not used)	(Not used)
5B		PBSA_XRBS00B (b16-b23)						
	LiveIns0	LiveIns1	LiveIns2	LiveIns 0,1	LiveIns 1,2	LiveIns 2,3	(Not used)	(Not used)
5C		PBSA_XRBS109 (b16-b23)						
	ABT SEQ PERR	ABT LiveIns Counter PERR	ABT Time Over	ABT Timer PERR	ABT GEN GNT Code PERR	(Not used)	(Not used)	(Not used)
5D		PBSA_XRBS 109 (b24-b31)						
	REQ SEQ PERR	REQ Receive GNT Code PERR	REQ GEN Exepath PERR	REQ Protocol error	REQ Count Over	REQ Counter PERR	R/W SEQ PERR	R/W Exepath Decode PERR
5E		PBSA_XRBS10A (b16-b23)						
	FBUS OPEN0	FBUS OPEN1	FBUS OPEN2	FBUS OPEN0,1	FBUS OPEN1,2	FBUS OPEN2,3	(Not used)	(Not used)
5F		PBSA_XRBS10B (b16-b23)						
	LiveIns0	LiveIns1	LiveIns2	LiveIns 0,1	LiveIns 1,2	LiveIns 2,3	(Not used)	(Not used)

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	0	1	2	3	4	5	6	7
60	PBSA_XRBS020 (b00-b07)							
	LAST ADR00							
61	PBSA_XRBS020 (b08-b15)							
	LAST ADR01							
62	PBSA_XRBS020 (b16-b23)							
	LAST ADR02							
63	PBSA_XRBS020 (b24-b31)							
	LAST ADR03							
64	PBSA_XRBS021 (b00-b07)							
	LAST ADR04							
65	PBSA_XRBS021 (b08-b15)							
	LAST COMMAND0							
66	PBSA_XRBS021 (b16-b23)							
	LAST COMMAND0							
67	PBSA_XRBS021 (b24-b31)							
	LAST COMMAND0							
68	PBSA_XRBS022 (b00-b07)							
	LAST ADR10							
69	PBSA_XRBS022 (b08-b15)							
	LAST ADR11							
6A	PBSA_XRBS022 (b16-b23)							
	LAST ADR12							
6B	PBSA_XRBS022 (b24-b31)							
	LAST ADR13							
6C	PBSA_XRBS023 (b00-b07)							
	LAST ADR14							
6D	PBSA_XRBS023 (b08-b15)							
	LAST COMMAND1							
6E	PBSA_XRBS023 (b16-b23)							
	LAST COMMAND1							
6F	PBSA_XRBS023 (b24-b31)							
	LAST COMMAND1							

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	0	1	2	3	4	5	6	7
70	PBSA_XRBS120 (b00-b07)							
	LAST ADR00							
71	PBSA_XRBS120 (b08-b15)							
	LAST ADR01							
72	PBSA_XRBS120 (b16-b23)							
	LAST ADR02							
73	PBSA_XRBS120 (b24-b31)							
	LAST ADR03							
74	PBSA_XRBS121 (b00-b07)							
	LAST ADR04							
75	PBSA_XRBS121 (b08-b15)							
	LAST COMMAND0							
76	PBSA_XRBS121 (b16-b23)							
	LAST COMMAND0							
77	PBSA_XRBS121 (b24-b31)							
	LAST COMMAND0							
78	PBSA_XRBS122 (b00-07)							
	LAST ADR10							
79	PBSA_XRBS122 (b08-b15)							
	LAST ADR11							
7A	PBSA_XRBS122 (b16-b23)							
	LAST ADR12							
7B	PBSA_XRBS122 (b24-b31)							
	LAST ADR13							
7C	PBSA_XRBS123 (b00-b07)							
	LAST ADR14							
7D	PBSA_XRBS123 (b08-b15)							
	LAST COMMAND1							
7E	PBSA_XRBS123 (b16-b23)							
	LAST COMMAND1							
7F	PBSA_XRBS123 (b24-b31)							
	LAST COMMAND1							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(9) Byte28 = 88, Byte42 = 30

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x30							
43	DMA path							
	00: CHP-CACHE 01: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	PBA_XRPBA06 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 Path Lock	SCP#2 Path Lock	SCP#1 Path Lock	SCP#0 Path Lock
49	PBA_XRPBA07(b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 Lock Status	SCP#2 Lock Status	SCP#1 Lock Status	SCP#0 Lock Status
4A	PBA_XRPBA2C (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
4B	PBA_XRPBA2C (b08-b15)							
	(Not used)	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
4C	PBA_XRPBA2D (b00-b07)							
	(Not used)	(Not used)	(Not used)	SBL CNT PERR	DT OUT PERR	(Not used)	(Not used)	(Not used)
4D	Reserve							
	(Reserved)							
4E	PBA_XRPBA24 (b24-b31)							
	FBS ADR00							
4F	PBA_XRPBA26 (b24-b31)							
	FBS ADR10							

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	0	1	2	3	4	5	6	7
50	PBSA_XRBS000 (b16-b23)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
51	PBSA_XRBS006 (b16-b23)							
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
52	PBSA_XRBS100 (b16-b23)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
53	PBSA_XRBS106 (b16-b23)							
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
54	PBA_XRPBA25 (b00-b07)							
	FBS ADR01							
55	PBA_XRPBA25 (b08-b15)							
	FBS ADR02							
56	PBA_XRPBA25 (b16-b23)							
	FBS ADR03							
57	PBA_XRPBA25 (b24-b31)							
	FBS ADR04							
58	PBA_XRPBA27 (b00-b07)							
	FBS ADR11							
59	PBA_XRPBA27 (b08-b15)							
	FBS ADR12							
5A	PBA_XRPBA27 (b16-b23)							
	FBS ADR13							
5B	PBA_XRPBA27 (b24-b31)							
	FBS ADR14							
5C	PBA_XRPBA28 (b00-b07)							
	(Reserved)							
5D	PBA_XRPBA28 (b08-b15)							
	0	1	PLRC	SP MODE	DIAG MODE	TRF CNT (MSB)		
5E	PBA_XRPBA28 (b16-b23)							
	TRF CNT (LSB)						0	1
5F	PBA_XRPBA28 (b24-b31)							
	1	BM			TM			

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	0	1	2	3	4	5	6	7
60	PBSA_XRBS00C (b00-b07)							
	LAST ADR00							
61	PBSA_XRBS00C (b08-b15)							
	LAST ADR01							
62	PBSA_XRBS00C (b16-b23)							
	LAST ADR02							
63	PBSA_XRBS00C (b24-b31)							
	LAST ADR03							
64	PBSA_XRBS00D (b00-b07)							
	LAST ADR04							
65	PBSA_XRBS00D (b08-b15)							
	LAST COMMAND0							
66	PBSA_XRBS00D (b16-b23)							
	LAST COMMAND0							
67	PBSA_XRBS00D (b24-b31)							
	LAST COMMAND0							
68	PBSA_XRBS00E (b00-b07)							
	LAST ADR10							
69	PBSA_XRBS00E (b08-b15)							
	LAST ADR11							
6A	PBSA_XRBS00E (b16-b23)							
	LAST ADR12							
6B	PBSA_XRBS00E (b24-b31)							
	LAST ADR13							
6C	PBSA_XRBS00F (b00-b07)							
	LAST ADR14							
6D	PBSA_XRBS00F (b08-b15)							
	LAST COMMAND1							
6E	PBSA_XRBS00F (b16-b23)							
	LAST COMMAND1							
6F	PBSA_XRBS00F (b24-b31)							
	LAST COMMAND1							

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	0	1	2	3	4	5	6	7
70	PBSA_XRBS10C (b00-b07)							
	LAST ADR00							
71	PBSA_XRBS10C (b08-b15)							
	LAST ADR01							
72	PBSA_XRBS10C (b16-b23)							
	LAST ADR02							
73	PBSA_XRBS10C (b24-b31)							
	LAST ADR03							
74	PBSA_XRBS10D (b00-b07)							
	LAST ADR04							
75	PBSA_XRBS10D (b08-b15)							
	LAST COMMAND0							
76	PBSA_XRBS10D (b16-b23)							
	LAST COMMAND0							
77	PBSA_XRBS10D (b24-b31)							
	LAST COMMAND0							
78	PBSA_XRBS10E (b00-b07)							
	LAST ADR10							
79	PBSA_XRBS10E (b08-b15)							
	LAST ADR11							
7A	PBSA_XRBS10E (b16-b23)							
	LAST ADR12							
7B	PBSA_XRBS10E (b24-b31)							
	LAST ADR13							
7C	PBSA_XRBS10F (b00-b07)							
	LAST ADR14							
7D	PBSA_XRBS10F (b08-b15)							
	LAST COMMAND1							
7E	PBSA_XRBS10F (b16-b23)							
	LAST COMMAND1							
7F	PBSA_XRBS10F (b24-b31)							
	LAST COMMAND1							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail
(10) Byte28 = 88, Byte42 = 31

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x31							
43	DMA path							
	00: CHP-CACHE 01: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	PBA_XRPBA06 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 Path Lock	SCP#2 Path Lock	SCP#2 Path Lock	SCP#1 Path Lock
49	PBA_XRPBA07 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 Lock Status	SCP#2 Lock Status	SCP#2 Lock Status	SCP#1 Lock Status
4A	PBA_XRPBA2C (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
4B	PBA_XRPBA2C (b08-b15)							
	(Not used)	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
4C	Reserve							
4D	Reserve							
4E	PBA_XRPBA24 (b24-b31)							
	FBS ADR00							
4F	PBA_XRPBA26 (b24-b31)							
	FBS ADR10							

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	0	1	2	3	4	5	6	7
50	PBSA_XRBS000 (b16-b23)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
51	PBSA_XRBS006 (b16-b23)							
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
52	PBSA_XRBS100 (b16-b23)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
53	PBSA_XRBS106 (b16-b23)							
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
54	PBSA_XRBS013 (b00-b07)							
	BBF DATA PERR0	BBF DATA PERR1	BBF DATA PERR2	BBF DATA PERR3	(Not used)	FBS ADR/ FBS CMD error	BBF pointer PERR	(Not used)
55	PBSA_XRBS013 (b16-b23)							
	FBUS TIME OUT	FBUS TIMER PERR	PBF pointer PERR	FBF input DATA PERR	other BSA CHK2C	other BSA CHK2D	MASTER Lost Execute	Path Quiet error
56	PBSA_XRBS113 (b00-b07)							
	BBF DATA PERR0	BBF DATA PERR1	BBF DATA PERR2	BBF DATA PERR3	(Not used)	FBS ADR/ FBS CMD error	BBF pointer PERR	(Not used)
57	PBSA_XRBS113 (b16-b23)							
	FBUS TIME OUT	FBUS TIMER PERR	PBF pointer PERR	FBF input DATA PERR	other BSA CHK2C	other BSA CHK2D	MASTER Lost Execute	Path Quiet error
58	PBA_XRPBA2B (b00-b07)							
	00: XFC INIT 10: XFC STOP 11: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
59	PBA_XRPBA2B (b08-b15)							
	(Not used)	(Not used)	SCP#		(Not used)	(Not used)	10: none 11: FBUS DATA	
5A	PBA_XRPBA2B (b16-b23)							
	(Not used)	(Not used)	Sub-Block format: 00: not AS400 01: AS400 format 10: CACHE I/O,TOD		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
5B	PBA_XRPBA2B (b24-b31)							
	DMA Sub-Block Counter							
5C	Reserve							
5D	Reserve							
5E	Reserve							
5F	Reserve							

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	0	1	2	3	4	5	6	7
60	PBSA_XRBS00C (b00-b07)							
	LAST ADR00							
61	PBSA_XRBS00C (b08-b15)							
	LAST ADR01							
62	PBSA_XRBS00C (b16-b23)							
	LAST ADR02							
63	PBSA_XRBS00C (b24-b31)							
	LAST ADR03							
64	PBSA_XRBS00D (b00-b07)							
	LAST ADR04							
65	PBSA_XRBS00D (b08-b15)							
	LAST COMMAND0							
66	PBSA_XRBS00D (b16-b23)							
	LAST COMMAND0							
67	PBSA_XRBS00D (b24-b31)							
	LAST COMMAND0							
68	PBSA_XRBS00E (b00-b07)							
	LAST ADR10							
69	PBSA_XRBS00E (b08-b15)							
	LAST ADR10							
6A	PBSA_XRBS00E (b16-b23)							
	LAST ADR10							
6B	PBSA_XRBS00E (b24-b31)							
	LAST ADR10							
6C	PBSA_XRBS00F (b00-b07)							
	LAST ADR10							
6D	PBSA_XRBS00F (b08-b15)							
	LAST COMMAND1							
6E	PBSA_XRBS00F (b16-b23)							
	LAST COMMAND1							
6F	PBSA_XRBS00F (b24-b31)							
	LAST COMMAND1							

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	0	1	2	3	4	5	6	7
70	PBSA_XRBS10C (b00-b07)							
	LAST ADR00							
71	PBSA_XRBS10C (b08-b15)							
	LAST ADR01							
72	PBSA_XRBS10C (b16-b23)							
	LAST ADR02							
73	PBSA_XRBS10C (b24-b31)							
	LAST ADR03							
74	PBSA_XRBS10D (b00-b07)							
	LAST ADR04							
75	PBSA_XRBS10D (b08-b15)							
	LAST COMMAND0							
76	PBSA_XRBS10D (b16-b23)							
	LAST COMMAND0							
77	PBSA_XRBS10D (b24-b31)							
	LAST COMMAND0							
78	PBSA_XRBS10E (b00-b07)							
	LAST ADR10							
79	PBSA_XRBS10E (b08-b15)							
	LAST ADR11							
7A	PBSA_XRBS10E (b16-b23)							
	LAST ADR12							
7B	PBSA_XRBS10E (b24-b31)							
	LAST ADR13							
7C	PBSA_XRBS10F (b00-b07)							
	LAST ADR14							
7D	PBSA_XRBS10F (b08-b15)							
	LAST COMMAND1							
7E	PBSA_XRBS10F (b16-b23)							
	LAST COMMAND1							
7F	PBSA_XRBS10F (b24-b31)							
	LAST COMMAND1							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail
(11) Byte28 = 88, Byte42 = 32

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x32							
43	DMA path							
	00: CHP-CAHCE 01: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	PBA_XRPBA06 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 Path Lock	SCP#2 Path Lock	SCP#1 Path Lock	SCP#0 Path Lock
49	PBA_XRPBA07 (b24-b31)							
	(Not used)	(Not used)	(Not used)	(Not used)	SCP#3 Lock Status	SCP#2 Lock Status	SCP#1 Lock Status	SCP#0 Lock Status
4A	PBA_XRPBA2C (b00-b07)							
	XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
4B	PBA_XRPBA2C (b08-b15)							
	(Not used)	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
4C	Reserve							
4D	Reserve							
4E	PBA_XRPBA24 (b24-b31)							
	FBUS ADR00							
4F	PBA_XRPBA26 (b24-b31)							
	FBUS ADR10							

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	0	1	2	3	4	5	6	7
50	PBSA_XRBS000 (b16-b23)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
51	PBSA_XRBS006 (b16-b23)							
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
52	PBSA_XRBS100 (b16-b23)							
	(Not used)	(Not used)	ABT EN	REQ EN	MP BMH	MP BML	MP BMT	SET BOPEN
53	PBSA_XRBS106 (b16-b23)							
	Busy	(Not used)	(Not used)	EX. ABTEN	MY. ABTEN	(Not used)	MPRST20	MPRST21
54	PBSA_XRBS009 (b16-b23)							
	ABT SEQ PERR	ABT LiveIns counter PERR	ABT time over	ABT timer PERR	ABT GEN GNT code PERR	(Not used)	(Not used)	(Not used)
55	PBSA_XRBS009 (b24-b31)							
	REQ SEQ PERR	REQ receive GNT code PERR	REQ GEN exepath PERR	REQ protocol error	REQ arbitration count over	REQ arbitration counter PERR	R/W SEQ PERR	R/W exepath decode PERR
56	PBSA_XRBS00A (b16-b23)							
	FBUS OPEN0	FBUS OPEN1	FBUS OPEN2	FBUS OPEN0,1	FBUS OPEN1,2	FBUS OPEN0,2	(Not used)	(Not used)
57	PBSA_XRBS00B (b16-b23)							
	LiveIns0	LiveIns1	LiveIns2	LiveIns 0,1	LiveIns 1,2	LiveIns 0,2	(Not used)	(Not used)
58	PBSA_XRBS109 (b16-b23)							
	ABT SEQ PERR	ABT LiveIns counter PERR	ABT time over	ABT timer PERR	ABT GEN GNT code PERR	(Not used)	(Not used)	(Not used)
59	PBSA_XRBS109 (b24-b31)							
	REQ SEQ PERR	REQ receive GNT code PERR	REQ GEN exepath PERR	REQ protocol error	REQ arbitration count over	REQ arbitration counter PERR	R/W SEQ PERR	R/W exepath decode PERR
5A	PBSA_XRBS10A (b16-b23)							
	FBUS OPEN0	FBUS OPEN1	FBUS OPEN2	FBUS OPEN0,1	FBUS OPEN1,2	FBUS OPEN0,2	(Not used)	(Not used)
5B	PBSA_XRBS10B (b16-b23)							
	LiveIns0	LiveIns1	LiveIns2	LiveIns 0,1	LiveIns 1,2	LiveIns 0,2	(Not used)	(Not used)
5C	PBA_XRPBA2B(b00-b07)							
	00: XFC INIT 10: XFC STOP 11: XFC START		(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
5D	PBA_XRPBA2B(b08-b15)							
	(Not used)	(Not used)	SCP#		(Not used)	(Not used)	10: none 11: FBUS DATA	
5E	PBA_XRPBA2B(b16-b23)							
	(Not used)	(Not used)	Sub-Block format: 00: not AS400 01: AS400 10: CACHE I/O, DOT		(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
5F	PBA_XRPBA2B (b24-b31)							
	DMA Sub-Block Counter							

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	0	1	2	3	4	5	6	7
60	PBSA_XRBS00C (b00-b07)							
	LASR ADR00							
61	PBSA_XRBS00C (b08-b15)							
	LAST ADR01							
62	PBSA_XRBS00C (b16-b23)							
	LAST ADR02							
63	PBSA_XRBS00C (b24-b31)							
	LAST ADR03							
64	PBSA_XRBS00D (b00-b07)							
	LAST ADR04							
65	PBSA_XRBS00D (b08-b15)							
	LAST COMMAND0							
66	PBSA_XRBS00D (b16-b23)							
	LAST COMMAND0							
67	PBSA_XRBS00D (b24-b31)							
	LAST COMMAND0							
68	PBSA_XRBS00E (b00-b07)							
	LAST ADR10							
69	PBSA_XRBS00E (b08-b15)							
	LAST ADR11							
6A	PBSA_XRBS00E (b16-b23)							
	LAST ADR12							
6B	PBSA_XRBS00E (b24-b31)							
	LAST ADR13							
6C	PBSA_XRBS00F (b00-b07)							
	LAST ADR14							
6D	PBSA_XRBS00F (b08-b15)							
	LAST COMMAND1							
6E	PBSA_XRBS00F (b16-b23)							
	LAST COMMAND1							
6F	PBSA_XRBS00F (b24-b31)							
	LAST COMMAND1							

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	0	1	2	3	4	5	6	7
70	PBSA_XRBS10C (b00-b07)							
	LASR ADR00							
71	PBSA_XRBS10C (b08-b15)							
	LASR ADR01							
72	PBSA_XRBS10C (b16-b23)							
	LASR ADR02							
73	PBSA_XRBS10C (b24-b31)							
	LASR ADR03							
74	PBSA_XRBS10D (b00-b07)							
	LASR ADR04							
75	PBSA_XRBS10D (b08-b15)							
	LAST COMMAND0							
76	PBSA_XRBS10D (b16-b23)							
	LAST COMMAND0							
77	PBSA_XRBS10D (b24-b31)							
	LAST COMMAND0							
78	PBSA_XRBS10E (b00-b07)							
	LAST ADR10							
79	PBSA_XRBS10E (b08-b15)							
	LAST ADR11							
7A	PBSA_XRBS10E (b16-b23)							
	LAST ADR12							
7B	PBSA_XRBS10E (b24-b31)							
	LAST ADR13							
7C	PBSA_XRBS10F (b00-b07)							
	LAST ADR14							
7D	PBSA_XRBS10F (b08-b15)							
	LAST COMMAND1							
7E	PBSA_XRBS10F (b16-b23)							
	LAST COMMAND1							
7F	PBSA_XRBS10F (b24-b31)							
	LAST COMMAND1							

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(12) Byte28 = 88, Byte42 = 40

	0	1	2	3	4	5	6	7
40	Error Code (b00-b07)							
	SCP Control Module Error Code							
41	Error Code (b08-b15)							
	SCP Control Module Error Code							
42	SubCode 2							
	0x40							
43	DMA path							
	00: CHP-CACHE 01: SCP-CACHE				SCP path# (03)			
44	SCP Function Code							
	SCP Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code (b00-b07)							
	SCSI Sense Code							
47	Sense Code (b08-b15)							
	SCSI Sense Code Qualifier							
48	Script Execute Status (b00-b07)							
	Script Function Code							
49	Script Execute Status (b08-b15)							
	Script execute step							
4A	Script Execute Status (b16-b23)							
	Execute end	Execute	Script Abort	Interrupt	SCSI ATN asserted	MSG 33byte over	Reselected	DMA transfer
4B	Script Execute Status (b24-b31)							
	TAG MSG received	Extended MSG received	Illegal Identify MSG received	Identify MSG received	Bus Device Reset MSG received	Other MSG received	(reserved)	(reserved)
4C	I-T-L-X (b00-b07)							
	SCSI TAG Number							
4D	I-T-L-X (b08-b15)							
	Logical Unit Number							
4E	I-T-L-X (b16-b23)							
	SCSI Target ID							
4F	I-T-L-X (b24-b31)							
	SCSI Initiator ID							

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	0	1	2	3	4	5	6	7
50	SCP_ISTAT :: Interrupt Status							
	Abort Operation	Software reset	Signal process	Semaphore	Connected	Interrupt on the Fly	SCSI Interrupt pending	DMA interrupt pending
51	SCP_DSTAT :: DMA Status							
	DMA FIFO empty	Master Data Parity Error	Bus Fault	Aborted	Single step interrupt	SCRIPTS interrupt instruction received	(Reserved)	Illegal instruction
52	SCP_SIST0 :: SCSI Interrupt Status 0							
	SCSI Phase Mismatch	Function Complete	Selected	Reselected	SCSI Gross Error	Unexpected Disconnect	SCSI Reset Condition	SCSI Parity Error
53	SCP_SIST1 :: SCSI Interrupt Status 1							
	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Selection or Reselection Time-out	General Purpose Timer Expired	Handshake to Handshake timeExpired
54	SCP_DSP (b00-b07)							
	DMA SCRIPTS Pointer							
55	SCP_DSP (b08-b15)							
	DMA SCRIPTS Pointer							
56	SCP_DSP (b16-b23)							
	DMA SCRIPTS Pointer							
57	SCP_DSP (b24-b31)							
	DMA SCRIPTS Pointer							
58	SCP_DSPS (b00-b07)							
	DMA SCRIPTS Pointer Save							
59	SCP_DSPS (b08-b15)							
	DMA SCRIPTS Pointer Save							
5A	SCP_DSPS (b16-b23)							
	DMA SCRIPTS Pointer Save							
5B	SCP_DSPS (b24-b31)							
	DMA SCRIPTS Pointer Save							
5C	SCP_STATUS							
	Detected Parity Error (from Slave)	Singled System Error	Received Master Abort (from Master)	Received Target Abort (from Master)	Reserved (Not Supported)	DESEL timing 1	DESEL timing 0	Data Parity Reported
5D	SCP_DBC (b00-b07)							
	DMA Byte Counter							
5E	SCP_DBC (b08-b15)							
	DMA Byte Counter							
5F	SCP_DBC (b16-b23)							
	DMA Byte Counter							

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	0	1	2	3	4	5	6	7
60	SCP Control return Code (b00-b07)							
	SCP Control Module return code							
61	SCP Control return Code (b08-b15)							
	SCP Control Module return code							
62	SCP Control return Code (b16-b23)							
	SCP Control Module return code							
63	SCP Control return Code (b24-b31)							
	SCP Control Module return code							
64	Resources Management Information : User Flag SCP#0							
	SCSI Resources using	BSA Resources using	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)
65	Resources Management Information : User Flag SCP#1							
	SCSI Resources using	BSA Resources using	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)
66	Resources Management Information : User Flag SCP#2							
	SCSI Resources using	BSA Resources using	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)
67	Resources Management Information : User Flag SCP#3							
	SCSI Resources using	BSA Resources using	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)
68	Resources Management Information : SCSI resources table (b00-07)							
	SCSI resources user JCB address							
69	Resources Management Information : SCSI resources table (b08-b15)							
	SCSI resources user JCB address							
6A	Resources Management Information : SCSI resources table (b16-b23)							
	SCSI resources user JCB address							
6B	Resources Management Information : SCSI resources table (b24-b31)							
	SCSI resources user JCB address							
6C	Resources Management Information : BSA resources table (b00-07)							
	BSA resources user JCB address							
6D	Resources Management Information : BSA resources table (b08-b15)							
	BSA resources user JCB address							
6E	Resources Management Information : BSA resources table (b16-b23)							
	BSA resources user JCB address							
6F	Resources Management Information : BSA resources table (b24-b31)							
	BSA resources user JCB address							

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0	1	2	3	4	5	6	7
	SCP Blockade :: SCP#0						
(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Blockade	Blockade transition
	SCP Blockade :: SCP#1						
(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Blockade	Blockade transition
	SCP Blockade :: SCP#2						
(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Blockade	Blockade transition
	SCP Blockade :: SCP#3						
(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	(Reserved)	Blockade	Blockade transition
	SCP_SCNTL3 :: SCSI Control 3						
(Reserved)	Synchronous Clock Conversion Factor 2	Synchronous Clock Conversion Factor 1	Synchronous Clock Conversion Factor 0	Enable Wide SCSI	Clock Conversion factor2	Clock Conversion factor1	Clock Conversion factor0
	SCP_SXFER :: SCSI Transfer						
SCSI Synchronous Transfer Period 2	SCSI Synchronous Transfer Period 1	SCSI Synchronous Transfer Period 0	Max SCSI sync offset 4	Max SCSI sync offset 3	Max SCSI sync offset 2	Max SCSI sync offset 1	Max SCSI sync offset 0
	SCP_SBCL :: SCSI Bus Control Lines						
SCSI REQ / status	SCSI ACK / status	SCSI BSY / status	SCSI SEL / status	SCSI ATN / status	SCSI MSG / status	SCSI C/D / status	SCSI I/O / status
	SCP_DCMD ::						
	DMA Command						
	PBA_XRPBA69 (b00-b07)						
00: XFC INIT 01: XFC STOP 02: XFC START	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
	PBA_XRPBA69 (b08-b15)						
(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	00: PCI device 01: PCI device(SKIP)	
	PBA_XRPBA69 (b16-b23)						
(Not used)	(Not used)	Sub-Block format: 00: not AS400 01: AS400 format	(Not used)	(Not used)	(Not used)	00: 2BUS mode 10: FBUS/L mode 11: FBUS/H mode	
	PBA_XRPBA69 (b24-b31)						
	DMA Sub-Block Counter						
	PBA_XRPBA6A (b00-b07)						
XFR END	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)	(Not used)
	PBA_XRPBA6A (b08-b15)						
PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	(Not used)
	PBA_XRPBA6A (b16-b23)						
	(Reserved)						
	PBA_XRPBA6A (b24-b31)						
	(Reserved)						

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Byte27 = 89, Byte0D Bit2 = 1 (SCSI Interface CHA CHK2) Byte40-7F Detail

(13) Byte28 = 89

	0	1	2	3	4	5	6	7
40	RCHK_ERSTS0							
	i960 WR compare error	Not used	MIC READYI timeout	CHK1A	CHK1B	Scan LM,XR access error	Not used	Not used
41	RCHK_CHK1ASTS							
	i960→LM access Uncorrectable error		I960 ¨LM write protect	I960 ¨LM out of area	Not used	Not used	LANC→LM write protect	LANC→LM out of area
	Bank0	Bank1						
42	RCHK_CHK1BSTS							
	Refresh register parity error	Not used	Not used	Not used	Not used	Not used	Not used	Not used
43	MIC_CHK3STS+MICCHK1STS							
	MIC arbiter CHK3	CHK3 error in SMP	Not used	Not used	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
44	MIC_MICCHK1STS							
	LAN hold timeout	Wait timeout	XR decoder error (29A)	XR decoder error (3B)	Arbiter data parity error	XR address parity error	Local bus data parity error	Data parity error
45	SMP_CHK1BERROR							
	Address byte 0 parity error	Address byte 1 parity error	Address byte 2 parity error	Address byte 3 parity error	Data byte 0 parity error	Data byte 1 parity error	Data byte 2 parity error	Data byte 3 parity error
46	SMP_MSTERR							
	Requester error (M bus)	S-memory reduction error	Bus mode setting error	Address byte 0 parity error	Address byte 1 parity error	Address byte 2 parity error	1st read data bus code error	2nd read data bus code error
47	SMP_MSTERR							
	Read data compare error	1st error phase bus code error	2nd error phase bus code error	Error phase warning	Error phase any error	F bus check error	M bus check error	Master timeout error
48	SMP_MSTERR							
	Master timer parity error	F bus Arbit error	Address byte 3 parity error	Data parity error in SMP	Last data check error (0)	F bus open detected	M bus open detected	Not used
49	SMP_SLVERR							
	Address bus code error	Command bus code error	Data bus code error	Write bus parity error	Transfer count error (Command)	Bus mode error (Command)	Transfer mode error (Command)	Not used
4A	PBA_XRPBA2C(CHP)(b00-b07)							
	XFR END	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4B	PBA_XRPBA2C(CHP)(b08-b15)							
	Not used	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	Not used
4C	PBA_XRPBA6A(PCI0)(b00-b07)							
	XFR END	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4D	PBA_XRPBA6A(PCI0)(b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	Not used
4E	PBA_XRPBA6A(PCI1)(b00-b07)							
	XFR END	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4F	PBA_XRPBA6A(PCI1)(b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	Not used

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	0	1	2	3	4	5	6	7
50	PBA_XRPBA6A(PCI2)(b00-b07)							
	XFR END	Not used	Not used	Not used	Not used	Not used	Not used	Not used
51	PBA_XRPBA6A(PCI2)(b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	Not used
52	PBA_XRPBA6A(PCI3)(b00-b07)							
	XFR END	Not used	Not used	Not used	Not used	Not used	Not used	Not used
53	PBA_XRPBA6A(PCI3)(b08-b15)							
	PCI INT	CHK2A error	CHK2B error	CHK2C error	CHK2D error	STATUS error	STATUS warning	Not used
54	PBA_XRPBA28(CHP)(b08-b15)							
	0	1	P-LRC	SP ACC	DIAG ACC	TRF CNT		
55	PBA_XRPBA28(CHP)(b16-b23)							
	TRF CNT						0	1
56	PBA_XRPBA28(CHP)(b24-b31)							
	1	BM			TM			
57	PBA_XRPBA65(PCI0)(b08-b15)							
	0	1	P-LRC	SP ACC	DIAG ACC	TRF CNT		
58	PBA_XRPBA65(PCI0)(b16-b23)							
	TRF CNT						0	1
59	PBA_XRPBA65(PCI0)(b24-b31)							
	1	BM			TM			
5A	PBA_XRPBA65(PCI1)(b08-b15)							
	0	1	P-LRC	SP ACC	DIAG ACC	TRF CNT		
5B	PBA_XRPBA65(PCI1)(b15-b23)							
	TRF CNT						0	1
5C	PBA_XRPBA65(PCI1)(b23-b31)							
	1	BM			TM			
5D	PBA_XRPBA65(PCI2)(b08-b15)							
	0	1	P-LRC	SP ACC	DIAG ACC	TRF CNT		
5E	PBA_XRPBA65(PCI2)(b16-b23)							
	TRF CNT						0	1
5F	PBA_XRPBA65(PCI2)(b24-b31)							
	1	BM			TM			

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	0	1	2	3	4	5	6	7
60	PBA_XRPBA65(PCI3)(b08-b15)							
	0	1	P-LRC	SP ACC	DIAG ACC	TRF CNT		
61	PBA_XRPBA65(PCI3)(b16-b23)							
	TRF CNT						0	1
62	PBA_XRPBA65(PCI3)(b24-b31)							
	1	BM			TM			
63	Not used							
64	BSA_XRBS000(b24-b31)							
	CUDG Enable	BBF Loop	Req Set End	My Grant 0	My Grant 1	My Grant 2	My Grant 3	My Grant 4
65	BSA_XRBS000(b16-b23)							
	Not used	Not used	Abt Enable	Req Enable	MPBMH	MPBML	MPBMT	Set Bus Open
66	BSA_XRBS001(b24-b31)							
	Abort	Not used	MPEND	Arbiter Counter 0	Arbiter Counter 1	Arbiter Counter 2	Arbiter Counter 3	Arbiter Counter 4
67	BSA_XRBS001(b16-b23)							
	Force Req 0	Force Req 1	Not used	Not used	ENT EN	LAMP0	LAMP1	MPRST00
68	BSA_XRBS002(b24-b31)							
	Arbiter Timer 0	Arbiter Timer 1	Arbiter Timer 2	Arbiter Timer 3	Arbiter Timer 4	Arbiter Timer 5	Arbiter Timer 6	Arbiter Timer 7
69	BSA_XRBS002(b16-b23)							
	F bus Timer 0	F bus Timer 1	F bus Timer 2	F bus Timer 3	F bus Timer 4	F bus Timer 5	F bus Timer 6	F bus Timer 8
6A	BSA_XRBS003(b24-b31)							
	Mask 10 LIVE INS Input Mask	Mask 11 F bus Timer Enable	Mask12 Arbiter Timer Enable	Mask 13 F bus Arbit Counter EN	Not used	Mask15 ABT Stop mask of LI	Mask16 Check2D Live Ins	Mask17 GntNo.Gen. PCK EN
6B	BSA_XRBS003(b16-b23)							
	Mask00 Check 1B	Not used	Not used	Mask03 Check 2C	Mask04 Check 2D	Not used	Mask06 SbsaOriginal Check2D	Not used
6C	BSA_XRBS004(b24-b31)							
	Mask Req 08	Mask Req 09	Mask Req 10	Mask Req 11	Mask Req 12	Mask Req 13	Mask Req 14	Mask Req 15
6D	BSA_ XRBS004(b16-b23)							
	Mask Req 00	Mask Req 01	Mask Req 02	Mask Req 03	Mask Req 04	Mask Req 05	Mask Req 06	Mask Req 07
6E	BSA_XRBS006(b16-b23)							
	Busy	Not used	Not used	EX. ABTEN	MY. ABTEN	Not used	MPRST20	MPRST21
6F	BSA_XRBS007(b24-b31)							
	F bus Req 08	F bus Req 09	F bus Req 10	F bus Req 11	F bus Req 12	F bus Req 13	F bus Req 14	F bus Req 15

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	0	1	2	3	4	5	6	7
70	BSA_XRBS007(b16-b23)							
	F bus Req 00	F bus Req 01	F bus Req 02	F bus Req 03	F bus Req 04	F bus Req 05	F bus Req 06	F bus Req 07
71	BSA_XRBS008(b16-b23)							
	Grant 0	Grant 1	Grant 2	Grant 3	Not used	Not used	Not used	Not used
72	BSA_XRBS100(b24-b31)							
	CUDG Enable	BBF Loop	Req Set End	My Grant 0	My Grant 1	My Grant 2	My Grant 3	My Grant 4
73	BSA_XRBS100(b16-b23)							
	Not used	Not used	Abt Enable	Req Enable	MPBMH	MPBML	MPBMT	Set Bus Open
74	BSA_XRBS101(b24-b31)							
	Abort	Not used	MPEND	Arbiter Counter 0	Arbiter Counter 1	Arbiter Counter 2	Arbiter Counter 3	Arbiter Counter 4
75	BSA_XRBS101(b16-b23)							
	Force Req 0	Force Req 1	Not used	Not used	ENT EN	LAMP0	LAMP1	MPRST00
76	BSA_XRB102(b24-b31)							
	Arbiter Timer 0	Arbiter Timer 1	Arbiter Timer 2	Arbiter Timer 3	Arbiter Timer 4	Arbiter Timer 5	Arbiter Timer 6	Arbiter Timer 7
77	BSA_XRBS102(b16-b23)							
	F bus Timer 0	F bus Timer 1	F bus Timer 2	F bus Timer 3	F bus Timer 4	F bus Timer 5	F bus Timer 6	F bus Timer 8
78	BSA_XRBS103(b24-b31)							
	Mask 10 LIVE INS Input Mask	Mask 11 F bus Timer Enable	Mask12 Arbiter Timer Enable	Mask 13 F bus Arbit Counter EN	Not used	Mask15 ABT Stop mask of LI	Mask16 Check2D Live Ins	Mask17 GntNo.Gen. PCK EN
79	BSA_XRBS103(b16-b23)							
	Mask00 Check 1B	Not used	Not used	Mask03 Check 2C	Mask04 Check 2D	Not used	Mask06 SbsaOriginal Check2D	Not used
7A	BSA_XRBS104(b24-b31)							
	Mask Req 08	Mask Req 09	Mask Req 10	Mask Req 11	Mask Req 12	Mask Req 13	Mask Req 14	Mask Req 15
7B	BSA_XRBS104(b16-b23)							
	Mask Req 00	Mask Req 01	Mask Req 02	Mask Req 03	Mask Req 04	Mask Req 05	Mask Req 06	Mask Req 07
7C	BSA_XRBS106(b16-b23)							
	Busy	Not used	Not used	EX. ABTEN	MY. ABTEN	Not used	MPRST20	MPRST21
7D	BSA_XRBS107(b24-b31)							
	F bus Req 08	F bus Req 09	F bus Req 10	F bus Req 11	F bus Req 12	F bus Req 13	F bus Req 14	F bus Req 15
7E	BSA_XRBS107(b16-b23)							
	F bus Req 00	F bus Req 01	F bus Req 02	F bus Req 03	F bus Req 04	F bus Req 05	F bus Req 06	F bus Req 07
7F	BSA_XRBS108(b16-b23)							
	Grant 0	Grant 1	Grant 2	Grant 3	Not used	Not used	Not used	Not used

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(14) Byte28= 8C, Byte42= 10 or 20 (1/4)

	0	1	2	3	4	5	6	7
40	Error Code							
	TPC Control Module Error Code							
41	Error Code							
	TPC Control Module Error Code							
42	SubCode 2							
	0x10: CHK2A detected (FOP transfer) 0x20: CHK2A detected (CHP transfer)							
43	DMA path							
	0x00: CHP-CACHE 0x01: FOP-CACHE				FOP path#			
44	TPC Function Code							
	TPC Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code							
	SCSI Sense Code							
47	Sense Code							
	SCSI Sense Code Qualifier							
48	LPA::PnICNTL							
	Reserved	Reserved	LPB interrupt enable	CK2A interrupt enable 4	CK2A interrupt enable 3	CK2A interrupt enable 2	CK2A interrupt enable 1	CK2A interrupt enable 0
49	LPA::PnICNTL							
	PLDB31-28 enable	PLDB27-24 enable	PLDB23-20 enable	PLDB19-16 enable	OTHER interrupt enable	PFA XFR END interrupt enable	LPA XFR END interrupt enable	PLDB interrupt enable
4A	LPA::PnISTAT							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	CK2A error 4
4B	LPA::PnISTAT							
	CK2A error 3	CK2A error 2	CK2A error 1	CK2A error 0	OTHER	PFA XFR END	LPA XFR END	PLDB
4C	LPA::PnLCK2A							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4D	LPA::PnLCK2A							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4E	LPA::PnLCK2A							
	PCI master read parity error	PCI master PERR in	PCI master PERR out	Reserved	PCI master PERR out	PCI target PERR in	PCI target PERR out	Reserved
4F								
	Reserved	Reserved	Reserved	Reserved	Reserved	LBUS time out	LBUS read parity error	LBUS write parity error

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(14) Byte28= 8C, Byte42= 10 or 20 (2/4)

	0	1	2	3	4	5	6	7
50	LPA::PnCSTA							
	Detected parity error	Detected system error	Recesived master abort	Recesived target abort	Reserved	‘0’	‘1’	Data parity report
51	LPA::PnCSTA							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
52	LPA::PnCCMD							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
53	LPA::PnCCMD							
	Reserved	Enable Parity Response	Reserved	Reserved	Reserved	Enable bus mastering	Enable memory space	Enable I/O space
54	LPA::PnPACNF							
	PCI CNF Address							
55	LPA::PnPACNF							
	PCI CNF Address							
56	LPA::PnPACNF							
	PCI CNF Address							
57	LPA::PnPACNF							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Configration type ‘00’: type0, ‘01’: type1	
58	LPA::PnPAIO							
	PCI I/O address							
59	LPA::PnPAIO							
	PCI I/O address							
5A	LPA::PnPAIO							
	PCI I/O address							
5B	LPA::PnPAIO							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5C	LPA::PnPAMEM							
	PCI memory address							
5D	LPA::PnPAMEM							
	PCI memory address							
5E	LPA::PnPAMEM							
	PCI memory address							
5F	LPA::PnPAMEM							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(14) Byte28= 8C, Byte42= 10 or 20 (3/4)

	0	1	2	3	4	5	6	7
60	LPA::PnPAXFR							
	PCI transfer address							
61	LPA::PnPAXFR							
	PCI transfer address							
62	LPA::PnPAXFR							
	PCI transfer address							
63	LPA::PnPAXFR							
	PCI transfer address						Reserved	Reserved
64	LPA::PnACTRL1							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
65	LPA::PnACTRL1							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
66	LPA::PnACTRL1							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
67	LPA::PnACTRL1							
	Reserved	Reserved	Reserved	Memory direct master access prefetch	Reserved	Memory direct master access enable	I/O direct master access enable	CNF direct master access enable
68	LPA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
69	LPA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6A	LPA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6B	PFA::PnMSADR							
	Reserved	Reserved	Reserved	PnMEMxx: Path n parameter memory area number				
6C	PFA::PnXFC							
	‘00’: XFC init ‘10’: XFC stop ‘11’: XFC start		Reserved	Reserved	Reserved	Reserved	Reserved	INT select 0: 960HD 1: 960RD
6D	PFA::PnXFC							
	Reserved	Reserved	Reserved	Reserved	Reserved	Source/Distination select ‘000’: PCI device, ‘010’: None ‘011’: FBUS DATA, ‘100’: R/W FIFO		
6E	PFA::PnXFC							
	Reserved	Reserved	‘00’: Cache memory R/W ‘10’: Cache I/O register ‘11’: Cache copy	Reserved	Reserved	Reserved	Reserved	
6F	PFA::PnXFC							
	Reserved	Reserved	Parameter memory read counter					

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(14) Byte28= 8C, Byte42= 10 or 20 (4/4)

	0	1	2	3	4	5	6	7
70		PFA::PnXFS						
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
71		PFA::PnXFS						
	MP STOP 1	CK2A error	CK2B error	CK2C error	CK2D error	STATUS error	STATUS warning	OVERRUN
72		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
73		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
74		PFA::PnCK2A						
	SERR	PERRTRS	PCIBSPER	XBIPPER	XBOPPER	PRMRDTPER	WBFIPER	RBFOPER
75		PFA::PnCK2A						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
76		Not used						
77		Not used						
78		Not used						
79		Not used						
7A		Not used						
7B		Not used						
7C		Not used						
7D		Not used						
7E		Not used						
7F		Not used						

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(15) Byte28= 8C, Byte42= 11 or 12 or 21 or 22 (1/4)

	0	1	2	3	4	5	6	7
40	Error Code							
	TPC Control Module Error Code							
41	Error Code							
	TPC Control Module Error Code							
42	SubCode 2							
	0x11: CHK2B detected (FOP transfer) 0x12: CHK2C detected (FOP transfer) 0x21: CHK2B detected (CHP transfer) 0x22: CHK2C detected (CHP transfer)							
43	DMA path							
	0x00: CHP-CACHE 0x01: FOP-CACHE				FOP path#			
44	TPC Function Code							
	TPC Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code							
	SCSI Sense Code							
47	Sense Code							
	SCSI Sense Code Qualifier							
48	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
49	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4A	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4B	PFA::PnMSADR							
	Reserved	Reserved	Reserved	PnMEMxx: Path n parameter memory area number				
4C	PFA::PnXFC							
	‘00’: XFC init ‘10’: XFC stop ‘11’: XFC start		Reserved	Reserved	Reserved	Reserved	Reserved	INT select 0: 960HD 1: 960RD
4D	PFA::PnXFC							
	Reserved	Reserved	Reserved	Reserved	Reserved	Source/Distination select ‘000’: PCI device, ‘010’: None ‘011’: FBUS DATA, ‘100’: R/W FIFO		
4E	PFA::PnXFC							
	Reserved	Reserved	‘00’: Cache memory R/W ‘10’: Cache I/O register ‘11’: Cache copy	Reserved	Reserved	Reserved	Reserved	
4F	PFA::PnXFC							
	Reserved	Reserved	Parameter memory read counter					

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(15) Byte28= 8C, Byte42= 11 or 12 or 21 or 22 (2/4)

	0	1	2	3	4	5	6	7
50		PFA::PnXFS						
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
51		PFA::PnXFS						
	MP STOP 1	CK2A error	CK2B error	CK2C error	CK2D error	STATUS error	STATUS warning	OVERRUN
52		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
53		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
54		PFA::PnCK2B						
	Read data LRC ERR	Read data LA ERR	BSA OVERRUN	Reserved	Reserved	Reserved	Reserved	Reserved
55		PFA::PnCK2B						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
56		Not used						
57		Not used						
58		PFA::PnCK2C1						
	Reserved	R-TIMER time over	Reserved	Reserved	R-TIMER PERR	R/W SEQ PERR	Reserved	Reserved
59		PFA::PnCK2C1						
	Reserved	Reserved	WR/RD FIFO POINTER PERR	Reserved	Reserved	Reserved	Reserved	Reserved
5A		PFA::PnCK2C0						
	Reserved	Reserved	CMD MODE ERR	Reserved	F-TIMER time over	FBUS disable	MP WCHK1	F-TIMER PERR
5B		PFA::PnCK2C0						
	Reserved	REQ-SEQ PERR	A-CNT PERR	GNT No. PERR	A-CNT OVER	WR FIFO DAWR FIFOTA PERR	Reserved	Reserved
5C		PFA::PnLSCNT						
		Last sub-block counter						
5D		PFA::PnLSCNT						
		Last sub-block counter						
5E		PFA::PnLSCNT						
		Last sub-block counter						
5F		PFA::PnLSCNT						
		Last sub-block counter						

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(15) Byte28= 8C, Byte42= 11 or 12 or 21 or 22 (3/4)

	0	1	2	3	4	5	6	7
60	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
61	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
62	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
63	PFA::PnLFA00							
	Last FBUS address (FBS ADR00)							
64	PFA::PnLFA01							
	Last FBUS address (FBS ADR01)							
65	PFA::PnLFA01							
	Last FBUS address (FBS ADR02)							
66	PFA::PnLFA01							
	Last FBUS address (FBS ADR03)							
67	PFA::PnLFA01							
	Last FBUS address (FBS ADR04)							
68	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
69	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6A	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6B	PFA::PnLFA10							
	Last FBUS address (FBS ADR10)							
6C	PFA::PnLFA11							
	Last FBUS address (FBS ADR11)							
6D	PFA::PnLFA11							
	Last FBUS address (FBS ADR12)							
6E	PFA::PnLFA11							
	Last FBUS address (FBS ADR13)							
6F	PFA::PnLFA11							
	Last FBUS address (FBS ADR14)							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(15) Byte28= 8C, Byte42= 11 or 12 or 21 or 22 (4/4)

	0	1	2	3	4	5	6	7
70	PFA::PnLFCMD							
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
71	PFA::PnLFCMD							
	S-LRC check enable	'1'	P-LRC	SP access	DIAG access	TRF counter (High)		
72	PFA::PnLFCMD							
	TRF counter (Low)						'0'	'1'
73	PFA::PnLFCMD							
	'1'	BM '000': 2bus mode, '010': FBUS/L mode '011': FBUS/H mode			TM '0000': Normal write, '0001': Normal read '0010': CACHE to CACHE, '0100': 2slave write			
74	PFA::PnLFLA0							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
75	PFA::PnLFLA0							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
76	PFA::PnLFLA0							
	Last FBUS LA0							
77	PFA::PnLFLA0							
	Last FBUS LA0							
78	PFA::PnLFLA1							
	Last FBUS LA1							
79	PFA::PnLFLA1							
	Last FBUS LA1							
7A	PFA::PnLFLA1							
	Last FBUS LA1							
7B	PFA::PnLFLA1							
	Last FBUS LA1							
7C	PFA::PnWLRC							
	Write data last S-LRC							
7D	PFA::PnRLRC							
	Read data last S-LRC							
7E	PFA::PnLPC							
	Parameter loading counter							
7F	PFA::PnSCNT							
	Sub-block counter							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(16) Byte28= 8C, Byte42= 13 or 23 (1/4)

	0	1	2	3	4	5	6	7
40	Error Code							
	TPC Control Module Error Code							
41	Error Code							
	TPC Control Module Error Code							
42	SubCode 2							
	0x13: CHK2C detected (FOP transfer) 0x23: CHK2C detected (CHP transfer)							
43	DMA path							
	0x00: CHP-CACHE 0x01: FOP-CACHE				FOP path#			
44	TPC Function Code							
	TPC Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code							
	SCSI Sense Code							
47	Sense Code							
	SCSI Sense Code Qualifier							
48	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
49	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4A	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4B	PFA::PnMSADR							
	Reserved	Reserved	Reserved	PnMEMxx: Path n parameter memory area number				
4C	PFA::PnXFC							
	‘00’: XFC init ‘10’: XFC stop ‘11’: XFC start		Reserved	Reserved	Reserved	Reserved	Reserved	INT select 0: 960HD 1: 960RD
4D	PFA::PnXFC							
	Reserved	Reserved	Reserved	Reserved	Reserved	Source/Distination select ‘000’: PCI device, ‘010’: None ‘011’: FBUS DATA, ‘100’: R/W FIFO		
4E	PFA::PnXFC							
	Reserved	Reserved	‘00’: Cache memory R/W ‘10’: Cache I/O register ‘11’: Cache copy	Reserved	Reserved	Reserved	Reserved	
4F	PFA::PnXFC							
	Reserved	Reserved	Parameter memory read counter					

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(16) Byte28= 8C, Byte42= 13 or 23 (2/4)

	0	1	2	3	4	5	6	7
50		PFA::PnXFS						
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
51		PFA::PnXFS						
	MP STOP 1	CK2A error	CK2B error	CK2C error	CK2D error	STATUS error	STATUS warning	OVERRUN
52		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
53		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
54		PFA::PnLCK2D0						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
55		PFA::PnLCK2D0						
	Reserved	Reserved	Reserved	Reserved	FBUS/L ABT protocol error	Reserved	Reserved	Reserved
56		PFA::PnHCK2D0						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
57		PFA::PnHCK2D0						
	Reserved	Reserved	Reserved	Reserved	FBUS/H ABT protocol error	Reserved	Reserved	Reserved
58		PFA::PnHCK2D2						
	LIVE INS 0 moniter	LIVE INS 1 moniter	LIVE INS 2 moniter	LIVE INS 0, 1 majority decision	LIVE INS 1, 2 majority decision	LIVE INS 0, 2 majority decision	Reserved	Reserved
59		PFA::PnHCK2D2						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5A		PFA::PnHCK2D1						
	FBUSOPEN 0 moniter	FBUSOPEN 1 moniter	FBUSOPEN 2 moniter	FBUSOPEN 0, 1 majority decision	FBUSOPEN 1, 2 majority decision	FBUSOPEN 0, 2 majority decision	Reserved	Reserved
5B		PFA::PnHCK2D1						
	DISABLE 0 moniter	DISABLE 1 moniter	DISABLE 2 moniter	DISABLE 0, 1 majority decision	DISABLE 1, 2 majority decision	DISABLE 0, 2 majority decision	Reserved	Reserved
5C		PFA::PnLCK2D2						
	LIVE INS 0 moniter	LIVE INS 1 moniter	LIVE INS 2 moniter	LIVE INS 0, 1 majority decision	LIVE INS 1, 2 majority decision	LIVE INS 0, 2 majority decision	Reserved	Reserved
5D		PFA::PnLCK2D2						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5E		PFA::PnLCK2D1						
	FBUSOPEN 0 moniter	FBUSOPEN 1 moniter	FBUSOPEN 2 moniter	FBUSOPEN 0, 1 majority decision	FBUSOPEN 1, 2 majority decision	FBUSOPEN 0, 2 majority decision	Reserved	Reserved
5F		PFA::PnLCK2D1						
	DISABLE 0 moniter	DISABLE 1 moniter	DISABLE 2 moniter	DISABLE 0, 1 majority decision	DISABLE 1, 2 majority decision	DISABLE 0, 2 majority decision	Reserved	Reserved

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(16) Byte28= 8C, Byte42= 13 or 23 (3/4)

	0	1	2	3	4	5	6	7
60	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
61	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
62	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
63	PFA::PnLFA00							
	Last FBUS address (FBS ADR00)							
64	PFA::PnLFA01							
	Last FBUS address (FBS ADR01)							
65	PFA::PnLFA01							
	Last FBUS address (FBS ADR02)							
66	PFA::PnLFA01							
	Last FBUS address (FBS ADR03)							
67	PFA::PnLFA01							
	Last FBUS address (FBS ADR04)							
68	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
69	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6A	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6B	PFA::PnLFA10							
	Last FBUS address (FBS ADR10)							
6C	PFA::PnLFA11							
	Last FBUS address (FBS ADR11							
6D	PFA::PnLFA11							
	Last FBUS address (FBS ADR12)							
6E	PFA::PnLFA11							
	Last FBUS address (FBS ADR13)							
6F	PFA::PnLFA11							
	Last FBUS address (FBS ADR14)							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(16) Byte28= 8C, Byte42= 13 or 23 (4/4)

	0	1	2	3	4	5	6	7
70	PFA::PnLFCMD							
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
71	PFA::PnLFCMD							
	S-LRC enable check	'1'	P-LRC	SP access	DIAG access	TRF counter (High)		
72	PFA::PnLFCMD							
	TRF counter (Low)						'0'	'1'
73	PFA::PnLFCMD							
	'1'	BM '000': 2bus mode, '010': FBUS/L mode '011': FBUS/H mode			TM '0000': Normal write, '0001': Normal read '0010': CACHE to CACHE, '0100': 2slave write			
74	PFA::PnLFLA0							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
75	PFA::PnLFLA0							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
76	PFA::PnLFLA0							
	Last FBUS LA0							
77	PFA::PnLFLA0							
	Last FBUS LA0							
78	PFA::PnLFLA1							
	Last FBUS LA1							
79	PFA::PnLFLA1							
	Last FBUS LA1							
7A	PFA::PnLFLA1							
	Last FBUS LA1							
7B	PFA::PnLFLA1							
	Last FBUS LA1							
7C	PFA::PnWLRC							
	Write data last S-LRC							
7D	PFA::PnRLRC							
	Read data last S-LRC							
7E	PFA::PnLPC							
	Parameter loading counter							
7F	PFA::PnSCNT							
	Sub-block counter							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(17) Byte28= 8C, Byte42= 14 or 24 (1/4)

	0	1	2	3	4	5	6	7
40	Error Code							
	TPC Control Module Error Code							
41	Error Code							
	TPC Control Module Error Code							
42	SubCode 2							
	0x14: CHK2D detected (FOP transfer) 0x24: CHK2D detected (CHP transfer)							
43	DMA path							
	0x00: CHP-CACHE 0x01: FOP-CACHE				FOP path#			
44	TPC Function Code							
	TPC Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code							
	SCSI Sense Code							
47	Sense Code							
	SCSI Sense Code Qualifier							
48	PFA::PnXFC							
	‘00’: XFC init ‘10’: XFC stop ‘11’: XFC start	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	INT select 0: 960HD 1: 960RD
49	PFA::PnXFC							
	Reserved	Reserved	Reserved	Reserved	Reserved	Source/Distination select ‘000’: PCI device, ‘010’: None ‘011’: FBUS DATA, ‘100’: R/W FIFO		
4A	PFA::PnXFC							
	Reserved	Reserved	‘00’: Cache memory R/W ‘10’: Cache I/O register ‘11’: Cache copy	Reserved	Reserved	Reserved	Reserved	
4B	PFA::PnXFC							
	Reserved	Reserved	Parameter memory read counter					
4C	PFA::PnXFS							
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
4D	PFA::PnXFS							
	MP STOP 1	CK2A error	CK2B error	CK2C error	CK2D error	STATUS error	STATUS warning	OVERRUN
4E	PFA::PnXFS							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4F	PFA::PnXFS							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(17) Byte28= 8C, Byte42= 14 or 24 (2/4)

	0	1	2	3	4	5	6	7
50	PFA::PnHLS0							
	CACHE answer '01': Slave 1 answer '11': Slave 2 answer		Error representing bit	Warning representing bit	Reserved	Reserved	Reserved	Reserved
51	PFA::PnHLS0							
	Another bus error form CACHE	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Warning of CACHE
52	PFA::PnHLS0							
	Reserved	Reserved	Reserved	Reserved	Reserved	2 bus access in 1bus mode	Access to blocked CACHE MG	Acess to blocked CACHE PCB
53	PFA::PnHLS0							
	Other CACHE board error	Clock or refresh abnormal	CACHE access before register set	CACHE access in refresh mode	Register and memory access inconsistency	DIAG mode access disagrement	SP mode access disagrement	Master transmission data PERR
54	PFA::PnHLS1							
	CACHE answer ‘01’: Slave 1 answer ‘11’: Slave 2 answer		Error representing bit	Warning representing bit	Reserved	Reserved	Reserved	Reserved
55	PFA::PnHLS1							
	Reserved	Reserved	Reserved	Reserved	FBUS/L ABT protocol error	Reserved	Reserved	Reserved
56	PFA::PnHLS1							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
57	PFA::PnHLS1							
	Reserved	Reserved	Reserved	Reserved	FBUS/H ABT protocol error	Reserved	Reserved	Reserved
58	PFA::PnHLS2							
	CHKERR 0 moniter	CHKERR 1 moniter	CHKERR 2 moniter	CHKERR 0 majority decision	CHKERR 1 majority decision	CHKERR 2 majority decision	Reserved	Reserved
59	PFA::PnHLS2							
	Last cycle error	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5A	PFA::PnHLS2							
	Reserved	Reserved	Reserved	Other BSA warning detected	Other BSA error detected	Slave ID error	Reserved	P-LRC error
5B	PFA::PnHLS2							
	FBUS DT0 PERR	FBUS DT1 PERR	FBUS DT2 PERR	FBUS DT3 PERR	FBUS DT4 PERR	FBUS DT5 PERR	FBUS DT6 PERR	FBUS DT7 PERR
5C	PFA::PnLLS0							
	CACHE answer ‘01’: Slave 1 answer ‘11’: Slave 2 answer		Error representing bit	Warning representing bit	Reserved	Reserved	Reserved	Reserved
5D	PFA::PnLLS0							
	Another bus error form CACHE	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Warning of CACHE
5E	PFA::PnLLS0							
	Reserved	Reserved	Reserved	Reserved	Reserved	2 bus access in 1bus mode	Access to blocked CACHE MG	Acess to blocked CACHE PCB
5F	PFA::PnLLS0							
	Other CACHE board error	Clock or refresh abnormal	CACHE access before register set	CACHE access in refresh mode	Register and memory access inconsistency	DIAG mode access disagrement	SP mode access disagrement	Master transmission data PERR

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(17) Byte28= 8C, Byte42= 14 or 24 (3/4)

	0	1	2	3	4	5	6	7
60	PFA::PnLLS1							
	CACHE answer ‘01’: Slave 1 answer ‘11’: Slave 2 answer		Error representing bit	Warning representing bit	Reserved	Reserved	Reserved	Reserved
61	PFA::PnLLS1							
	Another bus error form CACHE	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Warning of CACHE
62	PFA::PnLLS1							
	Reserved	Reserved	Reserved	Reserved	Reserved	2 bus access in 1bus mode	Access to blocked CACHE MG	Acess to blocked CACHE PCB
63	PFA::PnLLS1							
	Other CACHE board error	Clock or refresh abnormal	CACHE access before register set	CACHE access in refresh mode	Register and memory access inconsistency	DIAG mode access disagrement	SP mode access disagrement	Master transmission data PERR
64	PFA::PnLLS2							
	CHKERR 0 moniter	CHKERR 1 moniter	CHKERR 2 moniter	CHKERR 0 majority decision	CHKERR 1 majority decision	CHKERR 2 majority decision	Reserved	Reserved
65	PFA::PnLLS2							
	Last cycle error	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
66	PFA::PnLLS2							
	Reserved	Reserved	Reserved	Other BSA warning detected	Other BSA error detected	Slave ID error	Reserved	P-LRC error
67	PFA::PnLLS2							
	FBUS DT10 PERR	FBUS DT1 PERR	FBUS DT2 PERR	FBUS DT3 PERR	FBUS DT4 PERR	FBUS DT5 PERR	FBUS DT6 PERR	FBUS DT7 PERR
68	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
69	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6A	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6B	PFA::PnLFA00							
	Last FBUS address (FBS ADR00)							
6C	PFA::PnLFA01							
	Last FBUS address (FBS ADR11)							
6D	PFA::PnLFA01							
	Last FBUS address (FBS ADR02)							
6E	PFA::PnLFA01							
	Last FBUS address (FBS ADR03)							
6F	PFA::PnLFA01							
	Last FBUS address (FBS ADR04)							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(17) Byte28= 8C, Byte42= 14 or 24 (4/4)

	0	1	2	3	4	5	6	7
70	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
71	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
72	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
73	PFA::PnLFA10							
	Last FBUS address (FBS ADR10)							
74	PFA::PnLFA01							
	Last FBUS address (FBS ADR11)							
75	PFA::PnLFA01							
	Last FBUS address (FBS ADR12)							
76	PFA::PnLFA01							
	Last FBUS address (FBS ADR13)							
77	PFA::PnLFA01							
	Last FBUS address (FBS ADR14)							
78	PFA::PnLFCMD							
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
79	PFA::PnLFCMD							
	S-LRC check enable	‘1’	P-LRC	SP access	DIAG access	TRF counter (High)		
7A	PFA::PnLFCMD							
	TRF counter (Low)						‘0’	‘1’
7B	PFA::PnLFCMD							
	‘1’	BM ‘000’: 2bus mode, ‘010’: FBUS/L mode ‘011’: FBUS/H mode			TM ‘0000’: Normal write, ‘0001’: Normal read ‘0010’: CACHE to CACHE, ‘0100’: 2slave write			
7C	PFA::PnWLRC							
	Write data last S-LRC							
7D	PFA::PnRLRC							
	Read data last S-LRC							
7E	PFA::PnLPC							
	Parameter loading counter							
7F	PFA::PnSCNT							
	Sub-block counter							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(18) Byte28= 8C, Byte42= 15 or 25 (1/4)

	0	1	2	3	4	5	6	7
40	Error Code							
	TPC Control Module Error Code							
41	Error Code							
	TPC Control Module Error Code							
42	SubCode 2							
	0x15: Transfer time out detected (FOP transfer) 0x25: Transfer time out detected (CHP transfer)							
43	DMA path							
	0x00: CHP-CACHE 0x01: FOP-CACHE				FOP path#			
44	TPC Function Code							
	TPC Control Module Function Code							
45	Sense Key							
	SCSI Sense Key							
46	Sense Code							
	SCSI Sense Code							
47	Sense Code							
	SCSI Sense Code Qualifier							
48	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
49	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4A	PFA::PnMSADR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4B	PFA::PnMSADR							
	Reserved	Reserved	Reserved	PnMEMxx: Path n parameter memory area number				
4C	PFA::PnXFC							
	‘00’: XFC init ‘10’: XFC stop ‘11’: XFC start		Reserved	Reserved	Reserved	Reserved	Reserved	INT select 0: 960HD 1: 960RD
4D	PFA::PnXFC							
	Reserved	Reserved	Reserved	Reserved	Reserved	Source/Distination select ‘000’: PCI device, ‘010’: None ‘011’: FBUS DATA, ‘100’: R/W FIFO		
4E	PFA::PnXFC							
	Reserved	Reserved	‘00’: Cache memory R/W ‘10’: Cache I/O register ‘11’: Cache copy		Reserved	Reserved	Reserved	Reserved
4F	PFA::PnXFC							
	Reserved	Reserved	Parameter memory read counter					

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(18) Byte28= 8C, Byte42= 15 or 25 (2/4)

	0	1	2	3	4	5	6	7
50		PFA::PnXFS						
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
51		PFA::PnXFS						
	MP STOP 1	CK2A error	CK2B error	CK2C error	CK2D error	STATUS error	STATUS warning	OVERRUN
52		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
53		PFA::PnXFS						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
54		PFA::PnHST2						
	FORCE REQ ON	FORCE REQ OFF	FBUS LOCK 0	FBUS LOCK 1	ENT EN	Reserved	Reserved	FBUS disable ON
55		PFA::PnHST2						
	ABORT	Reserved	MPEND	FBUS arbitration count over setting				
56		PFA::PnHST1						
	Reserved	Reserved	Reserved	Request master enable	FBUS/H valid	FBUS/L valid	Transaction mode	FBUS OPEN set
57		PFA::PnHST1						
	Reserved	Reserved	REQ SET END	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
58		PFA::PnHCPY						
	BUSY	Reserved	Reserved	EX.ABTEN moniter	NY.ABTEN moniter	ABT ENBL	Reserved	Reserved
59		PFA::PnHCPY						
	Reserved	Reserved	Reserved	MYNET	ANENT	Reserved	Reserved	Reserved
5A		PFA::PnHRST						
	BSA MNTRST	Reserved	BSA CK2C/D RST	BTL RST	Last status RST	Reserved	Reserved	FBUS ABT RST
5B		PFA::PnHRST						
	CK2A RST	CK2B RST	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5C		PFA::PnLST2						
	FORCE REQ ON	FORCE REQ OFF	FBUS LOCK 0	FBUS LOCK 1	ENT EN	Reserved	Reserved	FBUS disable ON
5D		PFA::PnLST2						
	ABORT	Reserved	MPEND	FBUS arbitration count over setting				
5E		PFA::PnLST1						
	Reserved	Reserved	REQ SET END	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
5F		PFA::PnLST1						
	Reserved	Reserved	REQ SET END	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(18) Byte28= 8C, Byte42= 15 or 25 (3/4)

	0	1	2	3	4	5	6	7
60	PFA::PnLCPY							
	BUSY	Reserved	Reserved	EX.ABTEN moniter	NY.ABTEN moniter	ABT ENBL	Reserved	Reserved
61	PFA::PnLCPY							
	Reserved	Reserved	Reserved	MYNET	ANENT	Reserved	Reserved	Reserved
62	PFA::PnLRST							
	BSA MNTRST	Reserved	BSA CK2C/D RST	BTL RST	Last status RST	Reserved	Reserved	FBUS ABT RST
63	PFA::PnLRST							
	CK2A RST	CK2B RST	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
64	PFA::PnLSCNT							
	Last sub-block counter							
65	PFA::PnLSCNT							
	Last sub-block counter							
66	PFA::PnLSCNT							
	Last sub-block counter							
67	PFA::PnLSCNT							
	Last sub-block counter							
68	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
69	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6A	PFA::PnLFA00							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6B	PFA::PnLFA00							
	Last FBUS address (FBS ADR00)							
6C	PFA::PnLFA01							
	Last FBUS address (FBS ADR11)							
6D	PFA::PnLFA01							
	Last FBUS address (FBS ADR02)							
6E	PFA::PnLFA01							
	Last FBUS address (FBS ADR03)							
6F	PFA::PnLFA01							
	Last FBUS address (FBS ADR04)							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(18) Byte28= 8C, Byte42= 15 or 25 (4/4)

	0	1	2	3	4	5	6	7
70	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
71	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
72	PFA::PnLFA10							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
73	PFA::PnLFA10							
	Last FBUS address (FBS ADR10)							
74	PFA::PnLFA01							
	Last FBUS address (FBS ADR11)							
75	PFA::PnLFA01							
	Last FBUS address (FBS ADR12)							
76	PFA::PnLFA01							
	Last FBUS address (FBS ADR13)							
77	PFA::PnLFA01							
	Last FBUS address (FBS ADR14)							
78	PFA::PnLFCMD							
	XFR END	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	MP STOPP 0
79	PFA::PnLFCMD							
	S-LRC check enable	'1'	P-LRC	SP access	DIAG access	TRF counter (High)		
7A	PFA::PnLFCMD							
	TRF counter (Low)						'0'	'1'
7B	PFA::PnLFCMD							
	'1'	BM '000': 2bus mode, '010': FBUS/L mode '011': FBUS/H mode			TM '0000': Normal write, '0001': Normal read '0010': CACHE to CACHE, '0100': 2slave write			
7C	PFA::PnWLRC							
	Write data last S-LRC							
7D	PFA::PnRLRC							
	Read data last S-LRC							
7E	PFA::PnLPC							
	Parameter loading counter							
7F	PFA::PnSCNT							
	Sub-block counter							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail

(19) Byte28= 8D (1/4)

	0	1	2	3	4	5	6	7
40		PFA::PnHST2						
	FORCE REQ ON	FORCE REQ OFF	FBUS LOCK 0	FBUS LOCK 1	ENT EN	Reserved	Reserved	FBUS disable ON
41		PFA::PnHST2						
	ABORT	Reserved	MPEND	FBUS arbitration count over setting				
42		PFA::PnHST1						
	Reserved	Reserved	Reserved	Request master enable	FBUS/H valid	FBUS/L valid	Transaction mode	FBUS OPEN set
43		PFA::PnHST1						
	Reserved	Reserved	REQ SET END	MYGRANT No 00	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
44		PFA::PnHMSK						
	Reserved	Reserved	Reserved	Reserved	CHK2D mask	Reserved	Reserved	Reserved
45		PFA::PnHMSK						
	LiveIns mask	FBUS timer enable	Reserved	ABT timer enable	Reserved	Reserved	CHK2D by LiveIns mask	FBUS disable mask
46		PFA::PnHTIM						
		FBUS timer						
47		PFA::PnHTIM						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
48		PFA::PnHCPY						
	Slave BUSY signal	Reserved	Reserved	EX.ABTEN moniter	NY.ABTEN moniter	ABT ENBL	Reserved	Reserved
49		PFA::PnHCPY						
	Reserved	Reserved	Reserved	MYNET	ANENT	Reserved	Reserved	Reserved
4A		PFA::PnHRST						
	BSA MNTRST	Reserved	BSA CK2C/D RST	BTL RST	Last status RST	Reserved	Reserved	FBUS ABT RST
4B		PFA::PnHRST						
	CK2A RST	CK2B RST	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4C		PFA::PnHGNT						
	GRANT 0	GRANT 1	GRANT 2	GRANT 3	GRANT 8	Reserved	Reserved	Reserved
4D		PFA::PnHGNT						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4E		PFA::PnHERR						
	CHK1B error typecal bit	CHK2A error typecal bit	CHK2B error typecal bit	CHK2C error typecal bit	CHK2D error typecal bit	Reserved	Reserved	Reserved
4F		PFA::PnHERR						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail

(19) Byte28= 8D (2/4)

	0	1	2	3	4	5	6	7
50		PFA::PnHCK2D2						
	LIVE INS 0 moniter	LIVE INS 1 moniter	LIVE INS 2 moniter	LIVE INS 0, 1 majority decision	LIVE INS 1, 2 majority decision	LIVE INS 0, 2 majority decision	Reserved	Reserved
51		PFA::PnHCK2D2						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
52		PFA::PnHCK2D1						
	FBUSOPEN 0 moniter	FBUSOPEN 1 moniter	FBUSOPEN 2 moniter	FBUSOPEN 0, 1 majority decision	FBUSOPEN 1, 2 majority decision	FBUSOPEN 0, 2 majority decision	Reserved	Reserved
53		PFA::PnHCK2D1						
	DISABLE 0 moniter	DISABLE 1 moniter	DISABLE 2 moniter	DISABLE 0, 1 majority decision	DISABLE 1, 2 majority decision	DISABLE 0, 2 majority decision	Reserved	Reserved
54		PFA::PnLST2						
	FORCE REQ ON	FORCE REQ OFF	FBUS LOCK 0	FBUS LOCK 1	ENT EN	Reserved	Reserved	FBUS disable ON
55		PFA::PnLST2						
	ABORT	Reserved	MPEND	FBUS arbitration count over setting				
56		PFA::PnLST1						
	Reserved	Reserved	Reserved	Request master enable	FBUS/H valid	FBUS/L valid	Transaction mode	FBUS OPEN set
57		PFA::PnLST1						
	Reserved	Reserved	REQ SET END	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
58		PFA::PnLMSK						
	Reserved	Reserved	Reserved	Reserved	CHK2D mask	Reserved	Reserved	Reserved
59		PFA::PnLMSK						
	LiveIns mask	FBUS timer enable	Reserved	ABT timer enable	Reserved	Reserved	CHK2D by LiveIns mask	FBUS disable mask
5A		PFA::PnLTIM						
		FBUS timer						
5B		PFA::PnLTIM						
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5C		PFA::PnLCPY						
	Slave BUSY signal	Reserved	Reserved	EX.ABTEN moniter	NY.ABTEN moniter	ABT ENBL	Reserved	Reserved
5D		PFA::PnLCPY						
	Reserved	Reserved	Reserved	MYNET	ANENT	Reserved	Reserved	Reserved
5E		PFA::PnLRST						
	BSA MNTRST	Reserved	BSA CK2C/D RST	BTL RST	Last status RST	Reserved	Reserved	FBUS ABT RST
5F		PFA::PnLRST						
	CK2A RST	CK2B RST	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(19) Byte28= 8D (3/4)

	0	1	2	3	4	5	6	7
60	PFA::PnHGNT							
	GRANT 0	GRANT 1	GRANT 2	GRANT 3	GRANT 8	Reserved	Reserved	Reserved
61	PFA::PnHGNT							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
62	PFA::PnHERR							
	CHK1B error typecal bit	CHK2A error typecal bit	CHK2B error typecal bit	CHK2C error typecal bit	CHK2D error typecal bit	Reserved	Reserved	Reserved
63	PFA::PnHERR							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
64	PFA::PnHCK2D2							
	LIVE INS 0 moniter	LIVE INS 1 moniter	LIVE INS 2 moniter	LIVE INS 0, 1 majority decision	LIVE INS 1, 2 majority decision	LIVE INS 0, 2 majority decision	Reserved	Reserved
65	PFA::PnHCK2D2							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
66	PFA::PnHCK2D1							
	FBUSOPEN 0 moniter	FBUSOPEN 1 moniter	FBUSOPEN 2 moniter	FBUSOPEN 0, 1 majority decision	FBUSOPEN 1, 2 majority decision	FBUSOPEN 0, 2 majority decision	Reserved	Reserved
67	PFA::PnHCK2D1							
	DISABLE 0 moniter	DISABLE 1 moniter	DISABLE 2 moniter	DISABLE 0, 1 majority decision	DISABLE 1, 2 majority decision	DISABLE 0, 2 majority decision	Reserved	Reserved
68	PFA::PnLCK2D0							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
69	PFA::PnLCK2D0							
	Reserved	Reserved	Reserved	Reserved	FBUS/L ABT protocol error	Reserved	Reserved	Reserved
6A	PFA::PnLCK2D0							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
6B	PFA::PnLCK2D0							
	Reserved	Reserved	Reserved	Reserved	FBUS/H ABT protocol error	Reserved	Reserved	Reserved
6C	Not used							
6D	Not used							
6E	Not used							
6F	Not used							

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Byte27=89 Byte0D Bit2=1 (SCSI Interface CHA CHK2) Byte40-7F detail
(19) Byte28= 8D (4/4)

	0	1	2	3	4	5	6	7
70	Not used							
71	Not used							
72	Not used							
73	Not used							
74	Not used							
75	Not used							
76	Not used							
77	Not used							
78	Not used							
79	Not used							
7A	Not used							
7B	Not used							
7C	Not used							
7D	Not used							
7E	Not used							
7F	Not used							

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Byte27 = 8A (SCA CHK2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device number				
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘A’)			
28	Subcode (‘’)							
29	Hardware information (See following pages.)							
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID of self subsystem							
36	Symptom code (x‘FF8A’ : LDEV type = DKU87I / x‘EF8A’ : LDEV type = DKU86I)							
37	(This information become valid when SSB is reported to the host.)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8A (SCA CHK2) Byte28-31 Detail

(1) Byte29 Bit 4-7 ≠ '1' or '7'

	0	1	2	3	4	5	6	7
28		Subcode (Note 1)						
29		DSCA::FMD			FA			
	Segment mode	Not used	Not used	Not used	Free area format No.			
2A		HMIC::RCVINT						
	Monitor bit for interrupt signal by SYSRST	Monitor bit for interrupt signal by SELRST	Monitor bit for interrupt signal by CHK1A	Monitor bit for interrupt signal by CHK1B	Monitor bit for interrupt signal by SMP	Monitor bit for interrupt signal by LAN/SI0	Monitor bit for interrupt signal by CHA/DRR	Monitor bit for interrupt signal by ADP/SCA0
2B		HMIC::RCVINT						
	Not used	Monitor bit for interrupt signal by CHK3	Not used	Monitor bit for interruption signal by SCA1 to SCA5				
2C		DSCA::INT						
	Data transfer end in SCA	SPC interrupt request	SCA error occurred	BSA0 error occurred	BSA1 error occurred	Not used	0	Not used
2D		DSCA::SCK2						
	BSA data bus parity error	SPC data bus parity error	SCA data bus parity error	LA error or LRC error	SCA hardware error	SBUS I/F error	Error in micro setting	Not used
2E		DSCA::CXM						
	0	Not used	Bus mode	Not used	Not used	Transfer mode	Not used	Not used
2F		DSCA::DKUCHK2						
	Error detected by SCSI buffer	DKU I/F addr or data parity error detected by SCA	Not used	Not used	Not used	Not used	Not used	Not used
30		DSCA::XFC						
	Force stop DMA in xfer mode 1 (SPC → CACHE)	Force stop DMA in xfer mode 1 (CAXHE → SPC)	Force stop DMA in xfer mode 1 (SCB → CACHE)	Force stop DMA in xfer mode 1 (CACHE → SCB)	Force stop DMA in xfer mode 1 (SPC → SCB)	Force stop DMA in xfer mode 1 (SPC → CACHE)	0	Force stop at data error (xfer mode 1 and 2 only)
31		DSCA::XFC						
	Start DMA in xfer mode 1 (SPC → CACHE)	Start DMA in xfer mode 1 (CACHE → SPC)	Start DMA in xfer mode 1 (SCB → CACHE)	Start DMA in xfer mode 1 (CACHE → SCB)	Start DMA in xfer mode 1 (SPC → SCB)	Start DMA in xfer mode 1 (SPC → CACHE)	0	0

(Note 1) Meaning of subcode
bit0-2: Type of error ('000' ...data transfer, '001' ...LED BUS, '111' ...micro-program)
bit3: Access mode ('0' ...Cache write, '1' ...Cache read)
bit4-6: Code designating the part to be replaced
bit7: SCA number

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Byte27 = 8A (SCA CHK2) Byte28-31 Detail

(2) Byte29 Bit4-7 = '1' or '7'

	0	1	2	3	4	5	6	7
28		Subcode (Note 1)						
29		DSCA::FMD			FA			
	Segment mode	Not used	Not used	Not used	Free area format No.			
2A		HMIC::RCVINT						
	Monitor bit for interrupt signal by SYSRST	Monitor bit for interrupt signal by SELRST	Monitor bit for interrupt signal by CHK1A	Monitor bit for interrupt signal by CHK1B	Monitor bit for interrupt signal by SMP	Monitor bit for interrupt signal by LAN/SI0	Monitor bit for interrupt signal by CHA/DRR	Monitor bit for interrupt signal by ADP/SCA0
2B		HMIC::RCVINT						
	Not used	Monitor bit for interrupt signal by CHK3	Not used	Monitor bit for interruption signal by SCA1 to SCA5				
2C		DSCA::INT						
	Data transfer end in SCA	SPC interrupt request	SCA error occurred	BSA0 error occurred	BSA1 error occurred	Not used	0	Not used
2D		DSCA::SCK2						
	BSA data bus parity error	SPC data bus parity error	SCA data bus parity error	LA error or LRC error	SCA hardware error	SBUS I/F error	Error in micro setting	Not used
2E		DSCA::CXM						
	0	Not used	Bus mode	Not used	Not used	Transfer mode	Not used	Not used
2F		DSCA::DKUCHK2						
	Error detected by SCSI buffer	DKU I/F addr or data parity error detected by SCA	Not used	Not used	Not used	Not used	Not used	Not used
30		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
31		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used

(Note 1) Meaning of subcode
bit0-2: Type of error ('000' ...data transfer, '001' ...LED BUS, '111' ...micro-program)
bit3: Access mode ('0' ...Cache write, '1' ...Cache read)
bit4-6: Code designating the part to be replaced
bit7: SCA number

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail

(1) Byte29 Bit4-7 = '0' (1/4)

	0	1	2	3	4	5	6	7
40		Micro information						
		CDEV#, RDEV#						
41		Micro information						
		SCSI command code						
42		Micro information						
		LBA#0						
43		Micro information						
		LBA#1						
44		Micro information						
		LBA#2						
45		Micro information						
		LBA#3						
46		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48		HMIC::RCVINT						
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49		HMIC::RCVINT						
		Monitor bit for interrupt signal by TIMER0 to TIMER6						Monitor bit for interrupt signal by SYNC STOP
4A		DSCA::SCHK20						
	AIN data parity error 0	AIN data parity error 1	AIN data parity error 2	AIN data parity error 3	BIN data parity error 0	BIN data parity error 1	BIN data parity error 2	BIN data parity error 3
4B		DSCA::SCHK20						
	SCB write data parity error 0	SCB write data parity error 1	SCB write data parity error 2	SCB write data parity error 3	BSA write data parity error 0	BSA write data parity error 1	BSA write data parity error 2	BSA write data parity error 3
4C		DSCA::SCHK21						
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
4D		DSCA::SCHK21						
	ATL CNT 0 PER	ATL CNT 1 PER	BTL CNT 0 PER	BTL CNT 1 PER	SCB WT PKTL 0 PER	SCB WT PKTL 1 PER	SCB RD PKTL 0 PER	SCB RD PKTL 1 PER
4E		DSCA::SCHK22						
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
4F		DSCA::SCHK22						
	SYNVIN1 FLG RST POINTER PER	SBL CNT PER	PL CNT PER	TL CNT PER	SDL CNT PER	CACHE WT AREG DT RDY POINTER PER	CACHE RD POINTER A PER	CACHE RD POINTER B PER

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail

(1) Byte29 Bit4-7 = '0' (2/4)

	0	1	2	3	4	5	6	7
50		DSCA::SCHK23						
	CMD XFR 4 CNT PER	CACHE ADR & CMD PER	REGA DTRDY 8 CNT PER (SCA51)	REGA DTRDY 8 CNT PER (SCA56)	DSL CNT A PER	DSL CNT B PER	SBL CNT PER	STC CNT PER
51		DSCA::SCHK23						
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
52		DSCA::SCHK24						
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
53		DSCA::SCHK24						
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
54		DSCA::SCHK25						
	S bus I/F ctl sequencer state error	Sequencer 11,12 or 15,16 ctl sequencer state error	Reg A in SCA → SCB xfer ctl sequencer state error	SCB → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SCB xfer ctl sequencer state error	SCB → Reg A in SCA xfer ctl sequencer state error
55		DSCA::SCHK25						
	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Not used	Not used	Not used	Not used	Not used	Not used
56		DSCA::SCHK26						
	SCB address parity error (in SCA)	SCB address parity error (out of SCA)	SCB control signal is inconsistent in SCB read	SCB control signal is inconsistent in SCB write	Number of SCB CS signals in SCA is inconsistent with that out of SCA (BSA side)	Number of SCB CS signals in SCA is inconsistent with that out of SCA (SPC side)	SCB PLS counter A parity error	SCB PLS counter B parity error
57		DSCA::SCHK2X						
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
58		Not used						
59		DSCA::AS0CSA0						
		AS0 CSA00 ~ CSA07 Start address to cache						
5A		DSCA::AS0CSA1						
		AS0 CSA10 ~ CSA17 Start address to cache						
5B		DSCA::BS0CSA0						
		BS0 CSA00 ~ CSA07 Start address to cache						
5C		DSCA::BS0CSA1						
		BS0 CSA10 ~ CSA17 Start address to cache						
5D		Micro information						
		Cache access PCB number						
5E		Micro information						
		Diagnosis area retry						
5F		Micro information						
		Isolation result						

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail

(1) Byte29 Bit4-7 = '0' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
64	BSA0::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
65	BSA0::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
66	BSA0::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
67	BSA0::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
68	BSA0::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
69	BSA0::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
6A	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail

(1) Byte29 Bit4-7 = '0' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
74	BSA1::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
75	BSA1::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
76	BSA1::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ. CNT/POINT PTY ERR	Not used
77	BSA1::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
78	BSA1::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
79	BSA1::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
7A	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(2) Byte29 Bit4-7 = '1' (1/4)

	0	1	2	3	4	5	6	7
40		Micro information						
		CDEV#, RDEV#						
41		Micro information						
		SCSI command code						
42		Micro information						
		LBA#0						
43		Micro information						
		LBA#1						
44		Micro information						
		LBA#2						
45		Micro information						
		LBA#3						
46		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48		HMIC::RCVINT						
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49		HMIC::RCVINT						
		Monitor bit for interrupt signal by TIMER0 to TIMER6						Monitor bit for interrupt signal by SYNC STOP
4A		DSCA::SCHK21						
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
4B		DSCA::SCHK24						
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
4C		DSCA::SCHK2X						
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
4D		DSCA::A-COND1						
	Segment A0 parameters were set	Segment A1 parameters were set	Segment A2 parameters were set	Segment A3 parameters were set	Segment A4 parameters were set	Segment A5 parameters were set	Segment A6 parameters were set	Segment A7 parameters were set
4E		DSCA::B-COND1						
	Segment B0 parameters were set	Segment B1 parameters were set	Segment B2 parameters were set	Segment B3 parameters were set	Segment B4 parameters were set	Segment B5 parameters were set	Segment B6 parameters were set	Segment B7 parameters were set
4F		DSCA::DCHKE						
	Validate SCSI buffer error	Check DKU I/F error	Not used	Not used	Not used	Not used	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(2) Byte29 Bit4-7 = '1' (2/4)

	0	1	2	3	4	5	6	7
50	SCSI BUF::EXIT FLG							
51	SCSI BUF::IN STAT							
52	SCSI BUF::EXIT FLG							
53	SCSI BUF::IN STAT							
54	Not used							
55	DSCA::MCSAA0							
	Register for hardware debug							
56	DSCA::MCSAA0							
	Register for hardware debug							
57	DSCA::MCSAA1							
	Register for hardware debug							
58	DSCA::MCSAA1							
	Register for hardware debug							
59	DSCA::AS0CSA0							
	AS0 CSA00 ~ CSA07 Start address to cache							
5A	DSCA::AS0CSA1							
	AS0 CSA10 ~ CSA17 Start address to cache							
5B	DSCA::BS0CSA0							
	BS0 CSA00 ~ CSA07 Start address to cache							
5C	DSCA::BS0CSA1							
	BS0 CSA10 ~ CSA17 Start address to cache							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(2) Byte29 Bit4-7 = '1' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
64	BSA0::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
65	BSA0::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
66	BSA0::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
67	BSA0::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
68	BSA0::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
69	BSA0::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
6A	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(2) Byte29 Bit4-7 = '1' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
74	BSA1::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
75	BSA1::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
76	BSA1::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ. CNT/POINT PTY ERR	Not used
77	BSA1::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
78	BSA1::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
79	BSA1::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
7A	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(3) Byte29 Bit4-7 = '2' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
47	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
48	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
49	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
4A	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							
4B	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
4C	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
4D	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
4E	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
4F	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(3) Byte29 Bit4-7 = '2' (2/4)

	0	1	2	3	4	5	6	7
50	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
51	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
52	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
53	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
54	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
55	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
56	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
57	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
58	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
59	DSCA::AS0CSA0							
	AS0 CSA00 to CSA07 Start address to cache							
5A	DSCA::AS0CSA1							
	AS0 CSA10 to CSA17 Start address to cache							
5B	DSCA::BS0CSA0							
	BS0 CSA00 to CSA07 Start address to cache							
5C	DSCA::BS0CSA1							
	BS0 CSA10 to CSA17 Start address to cache							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(3) Byte29 Bit4-7 = '2' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
64	BSA0::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
65	BSA0::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
66	BSA0::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
67	BSA0::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
68	BSA0::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
69	BSA0::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
6A	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(3) Byte29 Bit4-7 = '2' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
74	BSA1::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
75	BSA1::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
76	BSA1::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ. CNT/POINT PTY ERR	Not used
77	BSA1::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
78	BSA1::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
79	BSA1::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
7A	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(4) Byte29 Bit4-7 = '3' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
47	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
48	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
49	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
4A	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							
4B	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
4C	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
4D	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
4E	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
4F	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(4) Byte29 Bit4-7 = '3' (2/4)

	0	1	2	3	4	5	6	7
50	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
51	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
52	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
53	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
54	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
55	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
56	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
57	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
58	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
59	DSCA::MCSAA0							
	Register for hardware debug							
5A	DSCA::MCSAA0							
	Register for hardware debug							
5B	DSCA::MCSAA1							
	Register for hardware debug							
5C	DSCA::MCSAA1							
	Register for hardware debug							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(4) Byte29 Bit4-7 = '3' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
64	BSA0::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
65	BSA0::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
66	BSA0::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
67	BSA0::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
68	BSA0::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
69	BSA0::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
6A	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(4) Byte29 Bit4-7 = '3' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
74	BSA1::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
75	BSA1::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
76	BSA1::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ. CNT/POINT PTY ERR	Not used
77	BSA1::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
78	BSA1::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
79	BSA1::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
7A	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			ABORT complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(5) Byte29 Bit4-7 = '4' (1/4)

	0	1	2	3	4	5	6	7
40		Micro information						
		CDEV#, RDEV#						
41		Micro information						
		SCSI command code						
42		Micro information						
		LBA#0						
43		Micro information						
		LBA#1						
44		Micro information						
		LBA#2						
45		Micro information						
		LBA#3						
46		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48		HMIC::RCVINT						
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49		HMIC::RCVINT						
		Monitor bit for interrupt signal by TIMER0 to TIMER6						Monitor bit for interrupt signal by SYNC STOP
4A		DSCA::SCHK20						
	AIN data parity error 0	AIN data parity error 1	AIN data parity error 2	AIN data parity error 3	BIN data parity error 0	BIN data parity error 1	BIN data parity error 2	BIN data parity error 3
4B		DSCA::SCHK20						
	SCB write data parity error 0	SCB write data parity error 1	SCB write data parity error 2	SCB write data parity error 3	BSA write data parity error 0	BSA write data parity error 1	BSA write data parity error 2	BSA write data parity error 3
4C		DSCA::SCHK21						
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
4D		DSCA::SCHK21						
	ATL CNT 0 PER	ATL CNT 1 PER	BTL CNT 0 PER	BTL CNT 1 PER	SCB WT PKTL 0 PER	SCB WT PKTL 1 PER	SCB RD PKTL 0 PER	SCB RD PKTL 1 PER
4E		DSCA::SCHK22						
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
4F		DSCA::SCHK22						
	SYNVIN1 FLG RST POINTER PER	SBL CNT PER	PL CNT PER	TL CNT PER	SDL CNT PER	CACHE WT AREG DT RDY POINTER PER	CACHE RD POINTER A PER	CACHE RD POINTER B PER

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(5) Byte29 Bit4-7 = '4' (2/4)

	0	1	2	3	4	5	6	7
50		DSCA::SCHK23						
	CMD XFR 4 CNT PER	CACHE ADR & CMD PER	REGA DTRDY 8 CNT PER (SCA51)	REGA DTRDY 8 CNT PER (SCA56)	DSL CNT A PER	DSL CNT B PER	SBL CNT PER	STC CNT PER
51		DSCA::SCHK23						
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
52		DSCA::SCHK24						
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
53		DSCA::SCHK24						
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
54		DSCA::SCHK25						
	S bus I/F ctl sequencer state error	Sequencer 11,12 or 15,16 ctl sequencer state error	Reg A in SCA → SCB xfer ctl sequencer state error	SCB → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SCB xfer ctl sequencer state error	SCB → Reg A in SCA xfer ctl sequencer state error
55		DSCA::SCHK25						
	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Not used	Not used	Not used	Not used	Not used	Not used
56		DSCA::SCHK26						
	SCB address parity error (in SCA)	SCB address parity error (out of SCA)	SCB control signal is inconsistent in SCB read	SCB control signal is inconsistent in SCB write	Number of SCB CS signals in SCA is inconsistent with that out of SCA (BSA side)	Number of SCB CS signals in SCA is inconsistent with that out of SCA (SPC side)	SCB PLS counter A parity error	SCB PLS counter B parity error
57		DSCA::SCHK2X						
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
58								
59		DSCA::AS0CSA0						
		AS0 CSA00 ~ CSA07 Start address to cache						
5A		DSCA::AS0CSA1						
		AS0 CSA10 ~ CSA17 Start address to cache						
5B		DSCA::BS0CSA0						
		BS0 CSA00 ~ CSA07 Start address to cache						
5C		DSCA::BS0CSA1						
		BS0 CSA10 ~ CSA17 Start address to cache						
5D		Micro information						
		Cache access PCB number						
5E		Micro information						
		Diagnosis area retry						
5F		Micro information						
		Isolation result						

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(5) Byte29 Bit4-7 = '4' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
64	BSA0::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
65	BSA0::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
66	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
67	BSA0::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
68	BSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
69	BSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
6A	BSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(5) Byte29 Bit4-7 = '4' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
74	BSA1::CHK2D STATUS0							
	Not used	ABT time out over	ABT time out CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
75	BSA1::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
76	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
77	BSA1::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
78	BSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
79	BSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
7A	BSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(6) Byte29 Bit4-7 = '5' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::XFC2							
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47	DSCA::XFC2							
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49	HMIC::RCVINT							
	Monitor bit for interrupt signal by TIMER0 to TIMER6							Monitor bit for interrupt signal by SYNC STOP
4A	DSCA::SCHK21							
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
4B	DSCA::SCHK24							
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
4C	DSCA::SCHK2X							
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
4D	DSCA::A-COND1							
	Segment A0 parameters were set	Segment A1 parameters were set	Segment A2 parameters were set	Segment A3 parameters were set	Segment A4 parameters were set	Segment A5 parameters were set	Segment A6 parameters were set	Segment A7 parameters were set
4E	DSCA::B-COND1							
	Segment B0 parameters were set	Segment B1 parameters were set	Segment B2 parameters were set	Segment B3 parameters were set	Segment B4 parameters were set	Segment B5 parameters were set	Segment B6 parameters were set	Segment B7 parameters were set
4F	DSCA::DCHKE							
	Validate SCSI buffer error	Check DKU I/F error	Not used	Not used	Not used	Not used	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(6) Byte29 Bit4-7 = '5' (2/4)

	0	1	2	3	4	5	6	7
50	SCSI BUF::EXIT FLG							
51	SCSI BUF::IN STAT							
52	SCSI BUF::EXIT FLG							
53	SCSI BUF::IN STAT							
54								
55	DSCA::MCSAA0							
	Register for hardware debug							
56	DSCA::MCSAA0							
	Register for hardware debug							
57	DSCA::MCSAA1							
	Register for hardware debug							
58	DSCA::MCSAA1							
	Register for hardware debug							
59	DSCA::AS0CSA0							
	AS0 CSA00 ~ CSA07 Start address to cache							
5A	DSCA::AS0CSA1							
	AS0 CSA10 ~ CSA17 Start address to cache							
5B	DSCA::BS0CSA0							
	BS0 CSA00 ~ CSA07 Start address to cache							
5C	DSCA::BS0CSA1							
	BS0 CSA10 ~ CSA17 Start address to cache							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(6) Byte29 Bit4-7 = '5' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
64	BSA0::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
65	BSA0::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
66	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
67	BSA0::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
68	BSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
69	BSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
6A	BSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(6) Byte29 Bit4-7 = '5' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
74	BSA1::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
75	BSA1::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
76	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
77	BSA1::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
78	BSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
79	BSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
7A	BSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(7) Byte29 Bit4-7 = '6' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
47	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
48	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
49	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
4A	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							
4B	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
4C	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
4D	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
4E	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
4F	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(7) Byte29 Bit4-7 = '6' (2/4)

	0	1	2	3	4	5	6	7
50	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
51	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
52	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
53	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
54	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
55	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
56	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
57	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
58	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
59	DSCA::AS0CSA0							
	AS0 CSA00 to CSA07 Start address to cache							
5A	DSCA::AS0CSA1							
	AS0 CSA10 to CSA17 Start address to cache							
5B	DSCA::BS0CSA0							
	BS0 CSA00 to CSA07 Start address to cache							
5C	DSCA::BS0CSA1							
	BS0 CSA10 to CSA17 Start address to cache							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(7) Byte29 Bit4-7 = '6' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
64	BSA0::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
65	BSA0::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
66	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
67	BSA0::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
68	BSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
69	BSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
6A	BSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(7) Byte29 Bit4-7 = '6' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
74	BSA1::CHK2D STATUS0							
	Not used	ABT time out over	ABT time out CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
75	BSA1::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
76	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
77	BSA1::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
78	BSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
79	BSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
7A	BSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(8) Byte29 Bit4-7 = '7' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
47	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
48	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
49	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
4A	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							
4B	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
4C	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
4D	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
4E	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
4F	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(8) Byte29 Bit4-7 = '7' (2/4)

	0	1	2	3	4	5	6	7
50	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
51	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
52	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
53	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
54	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
55	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
56	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
57	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
58	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
59	DSCA::MCSAA0							
	Register for hardware debug							
5A	DSCA::MCSAA0							
	Register for hardware debug							
5B	DSCA::MCSAA1							
	Register for hardware debug							
5C	DSCA::MCSAA1							
	Register for hardware debug							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(8) Byte29 Bit4-7 = '7' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
61	BSA0::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
62	BSA0::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
63	BSA0::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
64	BSA0::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
65	BSA0::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
66	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
67	BSA0::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
68	BSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
69	BSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
6A	BSA0::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
6B	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
6C	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
6D	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
6E	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(8) Byte29 Bit4-7 = '7' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
71	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
72	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
73	BSA1::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
74	BSA1::CHK2D STATUS0							
	Not used	ABT time out over	ABT time out CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
75	BSA1::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
76	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
77	BSA1::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
78	BSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
79	BSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
7A	BSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
7B	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
7D	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7E	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(9) Byte29 Bit4-7 = '8' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::XFC2							
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47	DSCA::XFC2							
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49	HMIC::RCVINT							
	Monitor bit for interrupt signal by TIMER0 to TIMER6							Monitor bit for interrupt signal by SYNC STOP
4A	DSCA::A-COND0							
	Segment A0 parameter can be updated	Segment A1 parameter can be updated	Segment A2 parameter can be updated	Segment A3 parameter can be updated	Segment A4 parameter can be updated	Segment A5 parameter can be updated	Segment A6 parameter can be updated	Segment A7 parameter can be updated
4B	DSCA::B-COND0							
	Segment B0 parameter can be updated	Segment B1 parameter can be updated	Segment B2 parameter can be updated	Segment B3 parameter can be updated	Segment B4 parameter can be updated	Segment B5 parameter can be updated	Segment B6 parameter can be updated	Segment B7 parameter can be updated
4C	DSCA::A-COND1							
	Segment A0 parameters were set	Segment A1 parameters were set	Segment A2 parameters were set	Segment A3 parameters were set	Segment A4 parameters were set	Segment A5 parameters were set	Segment A6 parameters were set	Segment A7 parameters were set
4D	DSCA::B-COND1							
	Segment B0 parameters were set	Segment B1 parameters were set	Segment B2 parameters were set	Segment B3 parameters were set	Segment B4 parameters were set	Segment B5 parameters were set	Segment B6 parameters were set	Segment B7 parameters were set
4E	DSCA::DCHKE							
	Validate SCSI buffer error	Check DKU I/F error	Not used	Not used	Not used	Not used	Not used	Not used
4F	DSCA::PLAOS							
	LA offset value of ECC group in horizontal direction							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(9) Byte29 Bit4-7 = '8' (2/4)

	0	1	2	3	4	5	6	7
50		DSCA::SAM						
	SCB access mode 0: conventional 1: high speed	Not used	Not used	Not used	Not used	Not used	Not used	Not used
51		DSCA::SCHKD2						
	SCHK2X0 error is not checked	SCHK2X1 error is not checked	SCHK2X2 error is not checked	SCHK2X3 error is not checked	SCHK2X4 error is not checked	SCHK2X5 error is not checked	SCHK2X6 error is not checked	SCHK2X7 error is not checked
52		DSCA::SCHKD2						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	SCHK2 100 error is not checked
53		DSCA::MCSAA0						
		Register for hardware debug						
54		DSCA::MCSAA0						
		Register for hardware debug						
55		DSCA::MCSAA1						
		Register for hardware debug						
56		DSCA::MCSAA1						
		Register for hardware debug						
57		DSCA::AS0CSA0						
		AS0 CSA00 ~ CSA07 Start address to cache						
58		DSCA::AS0CSA1						
		AS0 CSA10 ~ CSA17 Start address to cache						
59		DSCA::BS0CSA0						
		BS0 CSA00 ~ CSA07 Start address to cache						
5A		DSCA::BS0CSA1						
		BS0 CSA10 ~ CSA17 Start address to cache						
5B		Not used						
5C		Not used						
5D		Micro information						
		Cache access PCB number						
5E		Micro information						
		Diagnosis area retry						
5F		Micro information						
		Isolation result						

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(9) Byte29 Bit4-7 = '8' (3/4)

	0	1	2	3	4	5	6	7
60	DSCA::SCHK20							
	AIN data parity error 0	AIN data parity error 1	AIN data parity error 2	AIN data parity error 3	BIN data parity error 0	BIN data parity error 1	BIN data parity error 2	BIN data parity error 3
61	DSCA::SCHK20							
	SCB write data parity error 0	SCB write data parity error 1	SCB write data parity error 2	SCB write data parity error 3	BSA write data parity error 0	BSA write data parity error 1	BSA write data parity error 2	BSA write data parity error 3
62	DSCA::SCHK21							
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
63	DSCA::SCHK21							
	ATL CNT 0 PER	ATL CNT 1 PER	BTL CNT 0 PER	BTL CNT 1 PER	SCB WT PKTL 0 PER	SCB WT PKTL 1 PER	SCB RD PKTL 0 PER	SCB RD PKTL 1 PER
64	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
65	DSCA::SCHK22							
	SYNVIN1 FLG RST POINTER PER	SBL CNT PER	PL CNT PER	TL CNT PER	SDL CNT PER	CACHE WT AREG DT RDY POINTER PER	CACHE RD POINTER A PER	CACHE RD POINTER B PER
66	DSCA::SCHK23							
	CMD XFR 4 CNT PER	CACHE ADR & CMD PER	REGA DTRDY 8 CNT PER (SCA51)	REGA DTRDY 8 CNT PER (SCA56)	DSL CNT A PER	DSL CNT B PER	SBL CNT PER	STC CNT PER
67	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
68	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
69	DSCA::SCHK24							
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
6A	DSCA::SCHK25							
	S bus I/F ctl sequencer state error	Sequencer 11,12 or 15,16 ctl sequencer state error	Reg A in SCA → SCB xfer ctl sequencer state error	SCB → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SCB xfer ctl sequencer state error	SCB → Reg A in SCA xfer ctl sequencer state error
6B	DSCA::SCHK25							
	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Not used	Not used	Not used	Not used	Not used	Not used
6C	DSCA::SCHK26							
	SCB address parity error (in SCA)	SCB address parity error (out of SCA)	SCB control signal is inconsistent in SCB read	SCB control signal is inconsistent in SCB write	Number of SCB CS signals in SCA is inconsistent with that out of SCA (BSA side)	Number of SCB CS signals in SCA is inconsistent with that out of SCA (SPC side)	SCB PLS counter A parity error	SCB PLS counter B parity error
6D	DSCA::SCHK2X							
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
6E	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
6F	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(9) Byte29 Bit4-7 = '8' (4/4)

	0	1	2	3	4	5	6	7
70	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
71	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
72	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
73	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
74	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							
75	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
76	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
77	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
78	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
79	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
7A	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
7B	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
7C	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
7D	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
7E	SCSI BUF::EXIT FLG							
7F	SCSI BUF::EXIT FLG							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(10) Byte29 Bit4-7 = '9' (1/4)

	0	1	2	3	4	5	6	7
40		Micro information						
		CDEV#, RDEV#						
41		Micro information						
		SCSI command code						
42		Micro information						
		LBA#0						
43		Micro information						
		LBA#1						
44		Micro information						
		LBA#2						
45		Micro information						
		LBA#3						
46		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48		HMIC::RCVINT						
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49		HMIC::RCVINT						
		Monitor bit for interrupt signal by TIMER0 to TIMER6						Monitor bit for interrupt signal by SYNC STOP
4A		Not used						
4B		BSA0::ERROR						
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
4C		BSA0::STATUS1						
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
4D		BSA0::STATUS1						
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
4E		BSA0::MONITOR0						
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
4F		BSA0::MONITOR0						
	BSA CH 0	BSA CH 1	Not used	Not used	Not used	Option information BIT2	Option information BIT0	Option information BIT1

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(10) Byte29 Bit4-7 = '9' (2/4)

	0	1	2	3	4	5	6	7
50	BSA0::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
51	BSA0::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
52	BSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
53	BSA0::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
54	BSA1::ERROR							
	CHK1B representing bit	CHK2A representing bit	CHK2B representing bit	CHK2C representing bit	CHK2D representing bit	Not used	Not used	Not used
55	BSA1::STATUS1							
	Execute Cache RD	Execute Cache WR	Not used	Requester master ENABLE	FBUS/H valid signal	FBUS/L valid signal	Transaction mode	FBUS OPEN set
56	BSA1::STATUS1							
	Set BSA diagnosis mode	DBF feed mode	Requester setting complete bit	MYGRANT No 0	MYGRANT No 1	MYGRANT No 2	MYGRANT No 3	MYGRANT No 8
57	BSA1::MONITOR0							
	BSA LSI type 0	BSA LSI type 1	BSA LSI type 2	BSA LSI type 3	Revision 0	Revision 1	Revision 2	Revision 3
58	BSA1::MONITOR0							
	BSA CH 0	BSA CH 1	Not used	Not used	Not used	Option information BIT2	Option information BIT0	Option information BIT1
59	BSA1::MONITOR1							
	Data trnsfer information from host (WR)	Data trnsfer information from host (RD)	FBUS data trnsfer information	Side A F bus transfer in progress by DBF	Side B F bus transfer in progress by DBF	Not used	Not used	Not used
5A	BSA1::MONITOR1							
	Side A Command ID code			Side B Command ID code			Abort complete	Not used
5B	BSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
5C	BSA1::MONITOR2							
	Side B PLRC additional bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(10) Byte29 Bit4-7 = '9' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
61	BSA0::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
62	BSA0::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
63	BSA0::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
64	BSA0::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
65	BSA0::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
66	BSA0::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
67	BSA0::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
68	BSA0::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT(yes)	Not used	Not used	Not used	Not used
69	BSA0::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
6A	BSA0::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6B	BSA0::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
6C	BSA0::CHK2D STATUS2							
	Not used							
6D	BSA0::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
6E	BSA0::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
6F	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(10) Byte29 Bit4-7 = '9' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::CHK2B STATUS0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
71	BSA1::CHK2C STATUS0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
72	BSA1::CHK2C STATUS0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
73	BSA1::CHK2C STATUS1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
74	BSA1::CHK2C STATUS1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
75	BSA1::CHK2C STATUS2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
76	BSA1::CHK2C STATUS2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
77	BSA1::CHK2D STATUS0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
78	BSA1::CHK2D STATUS0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT(yes)	Not used	Not used	Not used	Not used
79	BSA1::CHK2D STATUS1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
7A	BSA1::CHK2D STATUS1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
7B	BSA1::CHK2D STATUS2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
7C	BSA1::CHK2D STATUS2							
	Not used							
7D	BSA1::STATUS2							
	FBUS request force ON by micro	FBUS request force OFF by micro	FBUS XFER normal end Bus lock	FBUS XFER abnormal end Bus lock	Decision bit for referring to opposite ENT at 1 Bus mode	BTL LOOPBACK force ON	BTL OEA force ON	FBUS DISABLE force ON
7E	BSA1::STATUS2							
	Halt of LSI by micro	Instruction of F bus XFER restart by micro	Force stop of F bus XFER by micro	Register setting the count exceeding the maximum arbitration count in FBUS arbiter (1 to 16)				
7F	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail

(11) Byte29 Bit4-7 = 'A' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::XFC2							
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47	DSCA::XFC2							
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49	HMIC::RCVINT							
	Monitor bit for interrupt signal by TIMER0 to TIMER6							Monitor bit for interrupt signal by SYNC STOP
4A	DSCA::A-COND0							
	Segment A0 parameter can be updated	Segment A1 parameter can be updated	Segment A2 parameter can be updated	Segment A3 parameter can be updated	Segment A4 parameter can be updated	Segment A5 parameter can be updated	Segment A6 parameter can be updated	Segment A7 parameter can be updated
4B	DSCA::B-COND0							
	Segment B0 parameter can be updated	Segment B1 parameter can be updated	Segment B2 parameter can be updated	Segment B3 parameter can be updated	Segment B4 parameter can be updated	Segment B5 parameter can be updated	Segment B6 parameter can be updated	Segment B7 parameter can be updated
4C	DSCA::A-COND1							
	Segment A0 parameters were set	Segment A1 parameters were set	Segment A2 parameters were set	Segment A3 parameters were set	Segment A4 parameters were set	Segment A5 parameters were set	Segment A6 parameters were set	Segment A7 parameters were set
4D	DSCA::B-COND1							
	Segment B0 parameters were set	Segment B1 parameters were set	Segment B2 parameters were set	Segment B3 parameters were set	Segment B4 parameters were set	Segment B5 parameters were set	Segment B6 parameters were set	Segment B7 parameters were set
4E	DSCA::DCHKE							
	Validate SCSI buffer error	Check DKU I/F error	Not used	Not used	Not used	Not used	Not used	Not used
4F	DSCA::PLAOS							
	LA offset value of ECC group in horizontal direction							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(11) Byte29 Bit4-7 = 'A' (2/4)

	0	1	2	3	4	5	6	7
50		DSCA::SAM						
	SCB access mode 0: conventional 1: high speed	Not used	Not used	Not used	Not used	Not used	Not used	Not used
51		DSCA::SCHKD2						
	SCHK2X0 error is not checked	SCHK2X1 error is not checked	SCHK2X2 error is not checked	SCHK2X3 error is not checked	SCHK2X4 error is not checked	SCHK2X5 error is not checked	SCHK2X6 error is not checked	SCHK2X7 error is not checked
52		DSCA::SCHKD2						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	SCHK2 100 error is not checked
53		DSCA::MCSAA0						
		Register for hardware debug						
54		DSCA::MCSAA0						
		Register for hardware debug						
55		DSCA::MCSAA1						
		Register for hardware debug						
56		DSCA::MCSAA1						
		Register for hardware debug						
57		DSCA::AS0CSA0						
		AS0 CSA00 ~ CSA07 Start address to cache						
58		DSCA::AS0CSA1						
		AS0 CSA10 ~ CSA17 Start address to cache						
59		DSCA::BS0CSA0						
		BS0 CSA00 ~ CSA07 Start address to cache						
5A		DSCA::BS0CSA1						
		BS0 CSA10 ~ CSA17 Start address to cache						
5B		Micro information::SCSIBUF OPTION						
5C		SCSI BUF0::IN_STAT						
5D		SCSI BUF0::PRTY_ERROR						
5E		SCSI BUF1::IN_STAT						
5F		SCSI BUF1::PRTY_ERROR						

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(11) Byte29 Bit4-7 = 'A' (3/4)

	0	1	2	3	4	5	6	7
60	DSCA::SCHK20							
	AIN data parity error 0	AIN data parity error 1	AIN data parity error 2	AIN data parity error 3	BIN data parity error 0	BIN data parity error 1	BIN data parity error 2	BIN data parity error 3
61	DSCA::SCHK20							
	SCB write data parity error 0	SCB write data parity error 1	SCB write data parity error 2	SCB write data parity error 3	BSA write data parity error 0	BSA write data parity error 1	BSA write data parity error 2	BSA write data parity error 3
62	DSCA::SCHK21							
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
63	DSCA::SCHK21							
	ATL CNT 0 PER	ATL CNT 1 PER	BTL CNT 0 PER	BTL CNT 1 PER	SCB WT PKTL 0 PER	SCB WT PKTL 1 PER	SCB RD PKTL 0 PER	SCB RD PKTL 1 PER
64	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
65	DSCA::SCHK22							
	SYNVIN1 FLG RST POINTER PER	SBL CNT PER	PL CNT PER	TL CNT PER	SDL CNT PER	CACHE WT AREG DT RDY POINTER PER	CACHE RD POINTER A PER	CACHE RD POINTER B PER
66	DSCA::SCHK23							
	CMD XFR 4 CNT PER	CACHE ADR & CMD PER	REGA DTRDY 8 CNT PER (SCA51)	REGA DTRDY 8 CNT PER (SCA56)	DSL CNT A PER	DSL CNT B PER	SBL CNT PER	STC CNT PER
67	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
68	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
69	DSCA::SCHK24							
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
6A	DSCA::SCHK25							
	S bus I/F ctl sequencer state error	Sequencer 11,12 or 15,16 ctl sequencer state error	Reg A in SCA → SCB xfer ctl sequencer state error	SCB → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SCB xfer ctl sequencer state error	SCB → Reg A in SCA xfer ctl sequencer state error
6B	DSCA::SCHK25							
	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Not used	Not used	Not used	Not used	Not used	Not used
6C	DSCA::SCHK26							
	SCB address parity error (in SCA)	SCB address parity error (out of SCA)	SCB control signal is inconsistent in SCB read	SCB control signal is inconsistent in SCB write	Number of SCB CS signals in SCA is inconsistent with that out of SCA (BSA side)	Number of SCB CS signals in SCA is inconsistent with that out of SCA (SPC side)	SCB PLS counter A parity error	SCB PLS counter B parity error
6D	DSCA::SCHK2X							
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER		SEQ10A ERR	SEQ10B ERR	
6E	DSCA::LACM							
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
6F	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(11) Byte29 Bit4-7 = 'A' (4/4)

	0	1	2	3	4	5	6	7
70		DSCA::FLA1 LA value of start subblock (Upper 2nd byte)						
71		DSCA::FLA1 LA value of start subblock (Upper 3rd byte)						
72		DSCA::FLA2 LA value of start subblock (Upper 4th byte)						
73		DSCA::FLA2 LA value of start subblock (Upper 5th byte)						
74		DSCA::LLA0 No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)						
75		DSCA::LLA1 No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)						
76		DSCA::LLA1 No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)						
77		DSCA::LLA2 No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)						
78		DSCA::LLA2 No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)						
79		DSCA::EXLA0 Expected LA value when an error occurs (Upper 1st byte)						
7A		DSCA::EXLA1 Expected LA value when an error occurs (Upper 2nd byte)						
7B		DSCA::EXLA1 Expected LA value when an error occurs (Upper 3rd byte)						
7C		DSCA::EXLA2 Expected LA value when an error occurs (Upper 4th byte)						
7D		DSCA::EXLA2 Expected LA value when an error occurs (Upper 5th byte)						
7E		SCSI BUF::EXIT FLG						
7F		SCSI BUF::EXIT FLG						

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(12) Byte29 Bit4-7 = 'B' (1/4)

	0	1	2	3	4	5	6	7
40		Micro information						
		CDEV#, RDEV#						
41		Micro information						
		SCSI command code						
42		Micro information						
		LBA#0						
43		Micro information						
		LBA#1						
44		Micro information						
		LBA#2						
45		Micro information						
		LBA#3						
46		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48		HMIC::RCVINT						
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49		HMIC::RCVINT						
		Monitor bit for interrupt signal by TIMER0 to TIMER6						Monitor bit for interrupt signal by SYNC STOP
4A		DSCA::SCHK20						
	AIN data parity error 0	AIN data parity error 1	AIN data parity error 2	AIN data parity error 3	BIN data parity error 0	BIN data parity error 1	BIN data parity error 2	BIN data parity error 3
4B		DSCA::SCHK20						
	SCB write data parity error 0	SCB write data parity error 1	SCB write data parity error 2	SCB write data parity error 3	BSA write data parity error 0	BSA write data parity error 1	BSA write data parity error 2	BSA write data parity error 3
4C		DSCA::SCHK21						
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
4D		DSCA::SCHK21						
	ATL CNT 0 PER	ATL CNT 1 PER	BTL CNT 0 PER	BTL CNT 1 PER	SCB WT PKTL 0 PER	SCB WT PKTL 1 PER	SCB RD PKTL 0 PER	SCB RD PKTL 1 PER
4E		DSCA::SCHK22						
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
4F		DSCA::SCHK22						
	SYNVIN1 FLG RST POINTER PER	SBL CNT PER	PL CNT PER	TL CNT PER	SDL CNT PER	CACHE WT AREG DT RDY POINTER PER	CACHE RD POINTER A PER	CACHE RD POINTER B PER

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(12) Byte29 Bit4-7 = 'B' (2/4)

	0	1	2	3	4	5	6	7
50		DSCA::SCHK23						
	CMD XFR 4 CNT PER	CACHE ADR & CMD PER	REGA DTRDY 8 CNT PER (SCA51)	REGA DTRDY 8 CNT PER (SCA56)	DSL CNT A PER	DSL CNT B PER	SBL CNT PER	STC CNT PER
51		DSCA::SCHK23						
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
52		DSCA::SCHK24						
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
53		DSCA::SCHK24						
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
54		DSCA::SCHK25						
	S bus I/F ctl sequencer state error	Sequencer 11,12 or 15,16 ctl sequencer state error	Reg A in SCA → SCB xfer ctl sequencer state error	SCB → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Reg B in SCA → SCB xfer ctl sequencer state error	SCB → Reg A in SCA xfer ctl sequencer state error
55		DSCA::SCHK25						
	Reg B in SCA → SPC xfer ctl sequencer state error	SPC → Reg B in SCA xfer ctl sequencer state error	Not used	Not used	Not used	Not used	Not used	Not used
56		DSCA::SCHK26						
	SCB address parity error (in SCA)	SCB address parity error (out of SCA)	SCB control signal is inconsistent in SCB read	SCB control signal is inconsistent in SCB write	Number of SCB CS signals in SCA is inconsistent with that out of SCA (BSA side)	Number of SCB CS signals in SCA is inconsistent with that out of SCA (SPC side)	SCB PLS counter A parity error	SCB PLS counter B parity error
57		DSCA::SCHK2X						
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
58		Not used						
59		DSCA::AS0CSA0						
		AS0 CSA00 ~ CSA07 Start address to cache						
5A		DSCA::AS0CSA1						
		AS0 CSA10 ~ CSA17 Start address to cache						
5B		DSCA::BS0CSA0						
		BS0 CSA00 ~ CSA07 Start address to cache						
5C		DSCA::BS0CSA1						
		BS0 CSA10 ~ CSA17 Start address to cache						
5D		Micro information						
		Cache access PCB number						
5E		Micro information						
		Diagnosis area retry						
5F		Micro information						
		Isolation result						

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(12) Byte29 Bit4-7 = 'B' (3/4)

	0	1	2	3	4	5	6	7
60	SPC#0::IS							
	SPC#0 IS register 1st read data							
61	SPC#0::CS							
	SPC#0 CS register 1st read data							
62	SPC#0::IS							
	SPC#0 IS register 2nd read data							
63	SPC#0::CS							
	SPC#0 CS register 2nd read data							
64	SPC#0::IS							
	SPC#0 IS register 3rd read data							
65	SPC#0::CS							
	SPC#0 CS register 3rd read data							
66	SPC#0::IS							
	SPC#0 IS register 4th read data							
67	SPC#0::CS							
	SPC#0 CS register 4th read data							
68	SPC#0::IS							
	SPC#0 IS register 5th read data							
69	SPC#0::CS							
	SPC#0 CS register 5th read data							
6A	SPC#0::IS							
	SPC#0 IS register 6th read data							
6B	SPC#0::CS							
	SPC#0 CS register 6th read data							
6C	SPC#0::IS							
	SPC#0 IS register 7th read data							
6D	SPC#0::CS							
	SPC#0 CS register 7th read data							
6E	SPC#0::IS							
	SPC#0 IS register 8th read data							
6F	SPC#0::CS							
	SPC#0 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(12) Byte29 Bit4-7 = 'B' (4/4)

	0	1	2	3	4	5	6	7
70	SPC#1::IS							
	SPC#1 IS register 1st read data							
71	SPC#1::CS							
	SPC#1 CS register 1st read data							
72	SPC#1::IS							
	SPC#1 IS register 2nd read data							
73	SPC#1::CS							
	SPC#1 CS register 2nd read data							
74	SPC#1::IS							
	SPC#1 IS register 3rd read data							
75	SPC#1::CS							
	SPC#1 CS register 3rd read data							
76	SPC#1::IS							
	SPC#1 IS register 4th read data							
77	SPC#1::CS							
	SPC#1 CS register 4th read data							
78	SPC#1::IS							
	SPC#1 IS register 5th read data							
79	SPC#1::CS							
	SPC#1 CS register 5th read data							
7A	SPC#1::IS							
	SPC#1 IS register 6th read data							
7B	SPC#1::CS							
	SPC#1 CS register 6th read data							
7C	SPC#1::IS							
	SPC#1 IS register 7th read data							
7D	SPC#1::CS							
	SPC#1 CS register 7th read data							
7E	SPC#1::IS							
	SPC#1 IS register 8th read data							
7F	SPC#1::CS							
	SPC#1 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(13) Byte29 Bit4-7 = 'C' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::XFC2							
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47	DSCA::XFC2							
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49	HMIC::RCVINT							
	Monitor bit for interrupt signal by TIMER0 to TIMER6							Monitor bit for interrupt signal by SYNC STOP
4A	DSCA::SCHK21							
	Bus GRT ID parity error state	CMD ID parity error 0 state	CMD ID parity error 1 state	DCNT 0 PER	DCNT 1 PER	SPC WT DT PER 0	SPC WT DT PER 1	PKT DCNT PER
4B	DSCA::SCHK24							
	SCA illegai multiple transfer	SDL setting error in LA/ LRC GEN	SYNC0 4CNT PER	SYNC1 4CNT PER	Not used	Not used	LBA1/2/3 CNT PER	LBA CNT PER
4C	DSCA::SCHK2X							
	BMSL CNT PER	CSA CNT PER	CSASL CNT PER	STL CNT PER	DMA start flag was OFF before transfer end	SEQ10A ERR	SEQ10B ERR	Not used
4D	DSCA::A-COND1							
	Segment A0 parameters were set	Segment A1 parameters were set	Segment A2 parameters were set	Segment A3 parameters were set	Segment A4 parameters were set	Segment A5 parameters were set	Segment A6 parameters were set	Segment A7 parameters were set
4E	DSCA::B-COND1							
	Segment B0 parameters were set	Segment B1 parameters were set	Segment B2 parameters were set	Segment B3 parameters were set	Segment B4 parameters were set	Segment B5 parameters were set	Segment B6 parameters were set	Segment B7 parameters were set
4F	DSCA::DCHKE							
	Validate SCSI buffer error	Check DKU I/F error	Not used	Not used	Not used	Not used	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(13) Byte29 Bit4-7 = 'C' (2/4)

	0	1	2	3	4	5	6	7
50	SCSI BUF::EXIT FLG							
51	SCSI BUF::IN STAT							
52	SCSI BUF::EXIT FLG							
53	SCSI BUF::IN STAT							
54	Not used							
55	DSCA::MCSAA0							
	Register for hardware debug							
56	DSCA::MCSAA0							
	Register for hardware debug							
57	DSCA::MCSAA1							
	Register for hardware debug							
58	DSCA::MCSAA1							
	Register for hardware debug							
59	DSCA::AS0CSA0							
	AS0 CSA00 ~ CSA07 Start address to cache							
5A	DSCA::AS0CSA1							
	AS0 CSA10 ~ CSA17 Start address to cache							
5B	DSCA::BS0CSA0							
	BS0 CSA00 ~ CSA07 Start address to cache							
5C	DSCA::BS0CSA1							
	BS0 CSA10 ~ CSA17 Start address to cache							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(13) Byte29 Bit4-7 = 'C' (3/4)

	0	1	2	3	4	5	6	7
60	SPC#0::IS							
	SPC#0 IS register 1st read data							
61	SPC#0::CS							
	SPC#0 CS register 1st read data							
62	SPC#0::IS							
	SPC#0 IS register 2nd read data							
63	SPC#0::CS							
	SPC#0 CS register 2nd read data							
64	SPC#0::IS							
	SPC#0 IS register 3rd read data							
65	SPC#0::CS							
	SPC#0 CS register 3rd read data							
66	SPC#0::IS							
	SPC#0 IS register 4th read data							
67	SPC#0::CS							
	SPC#0 CS register 4th read data							
68	SPC#0::IS							
	SPC#0 IS register 5th read data							
69	SPC#0::CS							
	SPC#0 CS register 5th read data							
6A	SPC#0::IS							
	SPC#0 IS register 6th read data							
6B	SPC#0::CS							
	SPC#0 CS register 6th read data							
6C	SPC#0::IS							
	SPC#0 IS register 7th read data							
6D	SPC#0::CS							
	SPC#0 CS register 7th read data							
6E	SPC#0::IS							
	SPC#0 IS register 8th read data							
6F	SPC#0::CS							
	SPC#0 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(13) Byte29 Bit4-7 = 'C' (4/4)

	0	1	2	3	4	5	6	7
70	SPC#1::IS							
	SPC#1 IS register 1st read data							
71	SPC#1::CS							
	SPC#1 CS register 1st read data							
72	SPC#1::IS							
	SPC#1 IS register 2nd read data							
73	SPC#1::CS							
	SPC#1 CS register 2nd read data							
74	SPC#1::IS							
	SPC#1 IS register 3rd read data							
75	SPC#1::CS							
	SPC#1 CS register 3rd read data							
76	SPC#1::IS							
	SPC#1 IS register 4th read data							
77	SPC#1::CS							
	SPC#1 CS register 4th read data							
78	SPC#1::IS							
	SPC#1 IS register 5th read data							
79	SPC#1::CS							
	SPC#1 CS register 5th read data							
7A	SPC#1::IS							
	SPC#1 IS register 6th read data							
7B	SPC#1::CS							
	SPC#1 CS register 6th read data							
7C	SPC#1::IS							
	SPC#1 IS register 7th read data							
7D	SPC#1::CS							
	SPC#1 CS register 7th read data							
7E	SPC#1::IS							
	SPC#1 IS register 8th read data							
7F	SPC#1::CS							
	SPC#1 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(14) Byte29 Bit4-7 = 'D' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
47	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
48	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT (BSA0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
49	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
4A	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							
4B	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
4C	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
4D	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
4E	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
4F	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(14) Byte29 Bit4-7 = 'D' (2/4)

	0	1	2	3	4	5	6	7
50	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
51	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
52	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
53	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
54	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
55	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
56	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
57	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
58	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
59	DSCA::AS0CSA0							
	AS0 CSA00 ~ CSA07 Start address to cache							
5A	DSCA::AS0CSA1							
	AS0 CSA10 ~ CSA17 Start address to cache							
5B	DSCA::BS0CSA0							
	BS0 CSA00 ~ CSA07 Start address to cache							
5C	DSCA::BS0CSA1							
	BS0 CSA10 ~ CSA17 Start address to cache							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(14) Byte29 Bit4-7 = 'D' (3/4)

	0	1	2	3	4	5	6	7
60	SPC#0::IS							
	SPC#0 IS register 1st read data							
61	SPC#0::CS							
	SPC#0 CS register 1st read data							
62	SPC#0::IS							
	SPC#0 IS register 2nd read data							
63	SPC#0::CS							
	SPC#0 CS register 2nd read data							
64	SPC#0::IS							
	SPC#0 IS register 3rd read data							
65	SPC#0::CS							
	SPC#0 CS register 3rd read data							
66	SPC#0::IS							
	SPC#0 IS register 4th read data							
67	SPC#0::CS							
	SPC#0 CS register 4th read data							
68	SPC#0::IS							
	SPC#0 IS register 5th read data							
69	SPC#0::CS							
	SPC#0 CS register 5th read data							
6A	SPC#0::IS							
	SPC#0 IS register 6th read data							
6B	SPC#0::CS							
	SPC#0 CS register 6th read data							
6C	SPC#0::IS							
	SPC#0 IS register 7th read data							
6D	SPC#0::CS							
	SPC#0 CS register 7th read data							
6E	SPC#0::IS							
	SPC#0 IS register 8th read data							
6F	SPC#0::CS							
	SPC#0 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(14) Byte29 Bit4-7 = 'D' (4/4)

	0	1	2	3	4	5	6	7
70	SPC#1::IS							
	SPC#1 IS register 1st read data							
71	SPC#1::CS							
	SPC#1 CS register 1st read data							
72	SPC#1::IS							
	SPC#1 IS register 2nd read data							
73	SPC#1::CS							
	SPC#1 CS register 2nd read data							
74	SPC#1::IS							
	SPC#1 IS register 3rd read data							
75	SPC#1::CS							
	SPC#1 CS register 3rd read data							
76	SPC#1::IS							
	SPC#1 IS register 4th read data							
77	SPC#1::CS							
	SPC#1 CS register 4th read data							
78	SPC#1::IS							
	SPC#1 IS register 5th read data							
79	SPC#1::CS							
	SPC#1 CS register 5th read data							
7A	SPC#1::IS							
	SPC#1 IS register 6th read data							
7B	SPC#1::CS							
	SPC#1 CS register 6th read data							
7C	SPC#1::IS							
	SPC#1 IS register 7th read data							
7D	SPC#1::CS							
	SPC#1 CS register 7th read data							
7E	SPC#1::IS							
	SPC#1 IS register 8th read data							
7F	SPC#1::CS							
	SPC#1 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(15) Byte29 Bit4-7 = 'E' (1/4)

	0	1	2	3	4	5	6	7
40	Micro information							
	CDEV#, RDEV#							
41	Micro information							
	SCSI command code							
42	Micro information							
	LBA#0							
43	Micro information							
	LBA#1							
44	Micro information							
	LBA#2							
45	Micro information							
	LBA#3							
46	DSCA::SCHK22							
	CPKT CNT 0 PER	CPKT CNT 1 PER	LA PER	SCB LRC ERR	SPC LRC ERR	SYNVIN0 FLG SET POINTER PER	SYNVIN0 FLG RET POINTER PER	SYNVIN1 FLG SET POINTER PER
47	DSCA::SCHK23							
	WT REGB 3CNT PER	WT REGB 6CNT PER	RD REGB 6CNT PER	SPCRD REGB 3CNT	SCB WT/RD CYCLE POINTER PER	EXEU CNT PER	LA ERR	LBA ERR
48	DSCA::SCHK24							
	SCB ADR A CNT PER	SCB ADR B CNT PER	SCB ADR C CNT PER	SCB RD 0 POINT(BSA 0) PER	SCB RD 1 POINT (BSA1) PER	SCB WT 0 POINT (BSA0) PER	SCB WT 1 POINT (BSA1) PER	S-LRC ERR
49	DSCA::LACM							
	0: Check whole LA 1: Check fixed part of LA	0: Normal data transfer 1: Parity data transfer	Not used	Not used	Not used	Not used	Not used	Not used
4A	DSCA::FLA0							
	LA value of start subblock (Upper 1st byte)							
4B	DSCA::FLA1							
	LA value of start subblock (Upper 2nd byte)							
4C	DSCA::FLA1							
	LA value of start subblock (Upper 3rd byte)							
4D	DSCA::FLA2							
	LA value of start subblock (Upper 4th byte)							
4E	DSCA::FLA2							
	LA value of start subblock (Upper 5th byte)							
4F	DSCA::LLA0							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 1st byte)							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(15) Byte29 Bit4-7 = 'E' (2/4)

	0	1	2	3	4	5	6	7
50	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 2nd byte)							
51	DSCA::LLA1							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 3rd byte)							
52	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 4th byte)							
53	DSCA::LLA2							
	No LA error: LA value of last subblock LA error : LA value when the error occurred (Upper 5th byte)							
54	DSCA::EXLA0							
	Expected LA value when an error occurs (Upper 1st byte)							
55	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 2nd byte)							
56	DSCA::EXLA1							
	Expected LA value when an error occurs (Upper 3rd byte)							
57	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 4th byte)							
58	DSCA::EXLA2							
	Expected LA value when an error occurs (Upper 5th byte)							
59	DSCA::MCSAA0							
	Register for hardware debug							
5A	DSCA::MCSAA0							
	Register for hardware debug							
5B	DSCA::MCSAA1							
	Register for hardware debug							
5C	DSCA::MCSAA1							
	Register for hardware debug							
5D	Micro information							
	Cache access PCB number							
5E	Micro information							
	Diagnosis area retry							
5F	Micro information							
	Isolation result							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(15) Byte29 Bit4-7 = 'E' (3/4)

	0	1	2	3	4	5	6	7
60	SPC#0::IS							
	SPC#0 IS register 1st read data							
61	SPC#0::CS							
	SPC#0 CS register 1st read data							
62	SPC#0::IS							
	SPC#0 IS register 2nd read data							
63	SPC#0::CS							
	SPC#0 CS register 2nd read data							
64	SPC#0::IS							
	SPC#0 IS register 3rd read data							
65	SPC#0::CS							
	SPC#0 CS register 3rd read data							
66	SPC#0::IS							
	SPC#0 IS register 4th read data							
67	SPC#0::CS							
	SPC#0 CS register 4th read data							
68	SPC#0::IS							
	SPC#0 IS register 5th read data							
69	SPC#0::CS							
	SPC#0 CS register 5th read data							
6A	SPC#0::IS							
	SPC#0 IS register 6th read data							
6B	SPC#0::CS							
	SPC#0 CS register 6th read data							
6C	SPC#0::IS							
	SPC#0 IS register 7th read data							
6D	SPC#0::CS							
	SPC#0 CS register 7th read data							
6E	SPC#0::IS							
	SPC#0 IS register 8th read data							
6F	SPC#0::CS							
	SPC#0 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(15) Byte29 Bit4-7 = 'E' (4/4)

	0	1	2	3	4	5	6	7
70	SPC#1::IS							
	SPC#1 IS register 1st read data							
71	SPC#1::CS							
	SPC#1 CS register 1st read data							
72	SPC#1::IS							
	SPC#1 IS register 2nd read data							
73	SPC#1::CS							
	SPC#1 CS register 2nd read data							
74	SPC#1::IS							
	SPC#1 IS register 3rd read data							
75	SPC#1::CS							
	SPC#1 CS register 3rd read data							
76	SPC#1::IS							
	SPC#1 IS register 4th read data							
77	SPC#1::CS							
	SPC#1 CS register 4th read data							
78	SPC#1::IS							
	SPC#1 IS register 5th read data							
79	SPC#1::CS							
	SPC#1 CS register 5th read data							
7A	SPC#1::IS							
	SPC#1 IS register 6th read data							
7B	SPC#1::CS							
	SPC#1 CS register 6th read data							
7C	SPC#1::IS							
	SPC#1 IS register 7th read data							
7D	SPC#1::CS							
	SPC#1 CS register 7th read data							
7E	SPC#1::IS							
	SPC#1 IS register 8th read data							
7F	SPC#1::CS							
	SPC#1 CS register 8th read data							

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(16) Byte29 Bit4-7 ='F' (1/4)

	0	1	2	3	4	5	6	7
40		Micro information						
		CDEV#, RDEV#						
41		Micro information						
		SCSI command code						
42		Micro information						
		LBA#0						
43		Micro information						
		LBA#1						
44		Micro information						
		LBA#2						
45		Micro information						
		LBA#3						
46		DSCA::XFC2						
	Force stop DMA in xfer mode 1	Force stop DMA in xfer mode 2	Force stop DMA in xfer mode 3	Force stop DMA in xfer mode 4	Force stop DMA in xfer mode 5	Force stop DMA in xfer mode 6	Not used	Stop DMA in packet boundary
47		DSCA::XFC2						
	Start DMA in xfer mode 1	Start DMA in xfer mode 2	Start DMA in xfer mode 3	Start DMA in xfer mode 4	Start DMA in xfer mode 5	Start DMA in xfer mode 6	Not used	Not used
48		HMIC::RCVINT						
	Not used	Not used	Not used	Monitor bit for interrupt signal by CLPON	Monitor bit for interrupt signal by SPC0	Monitor bit for interrupt signal by SPC1	Monitor bit for interrupt signal by DRRMP0	Monitor bit for interrupt signal by DRRMP1
49		HMIC::RCVINT						
		Monitor bit for interrupt signal by TIMER0 to TIMER6						Monitor bit for interrupt signal by SYNC STOP
4A		DSCA::SQ0 A0						
	SQ0 A0 00	SQ0 A0 01	SQ0 A0 02	SQ0 A0 03	SQ0 A0 04	SQ0 A0 05	SQ0 A0 06	SQ0 A0 07
4B		DSCA::SQ0 A0						
	SQ0 A0 08	SQ0 A0 09	SQ0 A0 10	SQ0 A0 11	SQ0 A0 12	SQ0 A0 13	SQ0 A0 14	SQ0 A0 20
4C		DSCA::SQ0 A1						
	SQ0 A1 15	SQ0 A1 30	SQ0 A1 31	Not used	Not used	Not used	Not used	Not used
4D		DSCA::SQ0 B0						
	SQ0 B0 00	SQ0 B0 01	SQ0 B0 02	SQ0 B0 03	SQ0 B0 04	SQ0 B0 05	SQ0 B0 06	SQ0 B0 07
4E		DSCA::SQ0 B0						
	SQ0 B0 08	SQ0 B0 09	SQ0 B0 10	SQ0 B0 11	SQ0 B0 12	SQ0 B0 13	SQ0 B0 14	SQ0 B0 20
4F		DSCA::SQ0 B1						
	SQ0 B1 15	SQ0 B1 30	SQ0 B1 31	Not used	Not used	Not used	Not used	Not used

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(16) Byte29 Bit4-7 = 'F' (2/4)

	0	1	2	3	4	5	6	7
50		DSCA::SQ1 A						
	SQ1A 00	SQ1A 01	SQ1A 02	SQ1A 03	SQ1A 04	SQ1A 05	SQ1A 06	SQ1A 07
51		DSCA::SQ1 A						
	SQ1A 08	SQ1A 09	SQ1A 10	SQ1A 11	SQ1A 12	SQ1A 13	SQ1A 14	Not used
52		DSCA::SQ1 B						
	SQ1B 00	SQ1B 01	SQ1B 02	SQ1B 03	SQ1B 04	SQ1B 05	SQ1B 06	SQ1B 07
53		DSCA::SQ1 B						
	SQ1B 08	SQ1B 09	SQ1B 10	SQ1B 11	SQ1B 12	SQ1B 13	SQ1B 14	Not used
54		DSCA::SQ2 A						
	SQ2A 00	SQ2A 01	SQ2A 02	SQ2A 03	SQ2A 04	SQ2A 05	SQ2A 06	SQ2A 20
55		DSCA::SQ2 A						
	SQ2A 07	SQ2A 08	SQ2A 09	SQ2A 10	SQ2A 11	SQ2A 12	Not used	Not used
56		DSCA::SQ2 B						
	SQ2B 00	SQ2B 01	SQ2B 02	SQ2B 03	SQ2B 04	SQ2B 05	SQ2B 06	SQ2B 20
57		DSCA::SQ2 B						
	SQ2B 07	SQ2B 08	SQ2B 09	SQ2B 10	SQ2B 11	SQ2B 12	Not used	Not used
58		DSCA::SQ11 A0						
	SQ11A0 00	SQ11A0 01	SQ11A0 02	SQ11A0 03	SQ11A0 04	SQ11A0 05	SQ11A0 06	SQ11A0 07
59		DSCA::SQ11 A0						
	SQ11A0 10	SQ11A0 11	SQ11A0 12	SQ11A0 13	SQ11A0 14	SQ11A0 15	SQ11A0 16	SQ11A0 17
5A		DSCA::SQ11 A1						
	SQ11A1 00	Not used	Not used	Not used	Not used	Not used	Not used	Not used
5B		DSCA::SQ11 B0						
	SQ11B0 00	SQ11B0 01	SQ11B0 02	SQ11B0 03	SQ11B0 04	SQ11B0 05	SQ11B0 06	SQ11B0 07
5C		DSCA::SQ11 B0						
	SQ11B0 10	SQ11B0 11	SQ11B0 12	SQ11B0 13	SQ11B0 14	SQ11B0 15	SQ11B0 16	SQ11B0 17
5D		DSCA::SQ11 B1						
	SQ11B1 00	Not used	Not used	Not used	Not used	Not used	Not used	Not used
5E		DSCA::SQ16 A0						
	SQ16A0 00	SQ16A0 01	SQ16A0 02	SQ16A0 03	SQ16A0 04	SQ16A0 05	SQ16A0 06	SQ16A0 07
5F		DSCA::SQ16 A0						
	SQ16A0 10	SQ16A0 11	SQ16A0 12	SQ16A0 13	SQ16A0 14	SQ16A0 15	SQ16A0 16	SQ16A0 17

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(16) Byte29 Bit4-7 = 'F' (3/4)

	0	1	2	3	4	5	6	7
60		DSCA::SQ16 A1						
	SQ16A1 00	Not used	Not used	Not used	Not used	Not used	Not used	Not used
61		DSCA::SQ16 B0						
	SQ16B0 00	SQ16B0 01	SQ16B0 02	SQ16B0 03	SQ16B0 04	SQ16B0 05	SQ16B0 06	SQ16B0 07
62		DSCA::SQ16 B0						
	SQ16B0 10	SQ16B0 11	SQ16B0 12	SQ16B0 13	SQ16B0 14	SQ16B0 15	SQ16B0 16	SQ16B0 17
63		DSCA::SQ16 B1						
	SQ16B1 00	Not used	Not used	Not used	Not used	Not used	Not used	Not used
64		DSCA::SQ20 A0						
	SQ20A0 00	SQ20A0 01	SQ20A0 02	SQ20A0 03	SQ20A0 04	SQ20A0 05	SQ20A0 06	SQ20A0 07
65		DSCA::SQ20 A0						
	SQ20A0 10	SQ20A0 11	SQ20A0 12	SQ20A0 13	SQ20A0 14	SQ20A0 15	SQ20A0 16	SQ20A0 17
66		DSCA::SQ20 A1						
	SQ20A1 00	Not used	Not used	Not used	Not used	Not used	Not used	Not used
67		DSCA::SQ20 B0						
	SQ20B0 00	SQ20B0 01	SQ20B0 02	SQ20B0 03	SQ20B0 04	SQ20B0 05	SQ20B0 06	SQ20B0 07
68		DSCA::SQ20 B0						
	SQ20B0 10	SQ20B0 11	SQ20B0 12	SQ20B0 13	SQ20B0 14	SQ20B0 15	SQ20B0 16	SQ20B0 17
69		DSCA::SQ20 B1						
	SQ20B1 00	Not used	Not used	Not used	Not used	Not used	Not used	Not used
6A		DSCA::SQ21 A0						
	SQ21A0 00	SQ21A0 01	SQ21A0 02	SQ21A0 03	SQ21A0 04	SQ21A0 05	SQ21A0 06	SQ21A0 07
6B		DSCA::SQ21 A0						
	SQ21A0 10	SQ21A0 11	SQ21A0 12	SQ21A0 13	SQ21A0 14	SQ21A0 15	SQ21A0 16	SQ21A0 17
6C		DSCA::SQ21 A1						
	SQ21A1 00	SQ21A1 01	SQ21A1 02	SQ21A1 03	SQ21A1 04	SQ21A1 05	SQ21A1 06	SQ21A1 07
6D		DSCA::SQ21 A1						
	SQ21A1 10	Not used	Not used	Not used	Not used	Not used	Not used	Not used
6E		DSCA::SQ21 B0						
	SQ21B0 00	SQ21B0 01	SQ21B0 02	SQ21B0 03	SQ21B0 04	SQ21B0 05	SQ21B0 06	SQ21B0 07
6F		DSCA::SQ21 B0						
	SQ21B0 10	SQ21B0 11	SQ21B0 12	SQ21B0 13	SQ21B0 14	SQ21B0 15	SQ21B0 16	SQ21B0 17

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Byte27 = 8A (SCA CHK2) Byte40-7F Detail
(16) Byte29 Bit4-7 = 'F' (4/4)

	0	1	2	3	4	5	6	7
70	DSCA::SQ21 B1							
	SQ21B1 00	SQ21B1 01	SQ21B1 02	SQ21B1 03	SQ21B1 04	SQ21B1 05	SQ21B1 06	SQ21B1 07
71	DSCA::SQ21 B1							
	SQ21B1 10	Not used	Not used	Not used	Not used	Not used	Not used	Not used
72	DSCA::SQ1 A1							
	SQ1A 00	SQ1A 01	SQ1A 02	SQ1A 03	SQ1A 04	SQ1A 05	SQ1A 06	SQ1A 07
73	DSCA::SQ1 B1							
	SQ1B 00	SQ1B 01	SQ1B 02	SQ1B 03	SQ1B 04	SQ1B 05	SQ1B 06	SQ1B 07
74	DSCA::SQ2 A1							
	SQ2A 00	SQ2A 01	SQ2A 02	SQ2A 03	SQ2A 04	SQ2A 05	SQ2A 06	SQ2A 20
75	DSCA::SQ2 B1							
	SQ2B 00	SQ2B 01	SQ2B 02	SQ2B 03	SQ2B 04	SQ2B 05	SQ2B 06	SQ2B 20
76	DSCA::SSE							
	Segment group A parameters can be updated	Segment group B parameters can be updated	Not used	Not used	Not used	Not used	Not used	Not used
77	DSCA::A-COND0							
	Segment A0 parameter can be updated	Segment A1 parameter can be updated	Segment A2 parameter can be updated	Segment A3 parameter can be updated	Segment A4 parameter can be updated	Segment A5 parameter can be updated	Segment A6 parameter can be updated	Segment A7 parameter can be updated
78	DSCA::B-COND0							
	Segment B0 parameter can be updated	Segment B1 parameter can be updated	Segment B2 parameter can be updated	Segment B3 parameter can be updated	Segment B4 parameter can be updated	Segment B5 parameter can be updated	Segment B6 parameter can be updated	Segment B7 parameter can be updated
79	DSCA::A-COND1							
	Segment A0 parameters were set	Segment A1 parameters were set	Segment A2 parameters were set	Segment A3 parameters were set	Segment A4 parameters were set	Segment A5 parameters were set	Segment A6 parameters were set	Segment A7 parameters were set
7A	DSCA::B-COND1							
	Segment B0 parameters were set	Segment B1 parameters were set	Segment B2 parameters were set	Segment B3 parameters were set	Segment B4 parameters were set	Segment B5 parameters were set	Segment B6 parameters were set	Segment B7 parameters were set
7B	DSCA::EXSEG							
	Segment A0 transfer in progress	Segment A1 transfer in progress	Segment A2 transfer in progress	Segment A3 transfer in progress	Segment A4 transfer in progress	Segment A5 transfer in progress	Segment A6 transfer in progress	Segment A7 transfer in progress
7C	DSCA::EXSEG							
	Segment B0 transfer in progress	Segment B1 transfer in progress	Segment B2 transfer in progress	Segment B3 transfer in progress	Segment B4 transfer in progress	Segment B5 transfer in progress	Segment B6 transfer in progress	Segment B7 transfer in progress
7D	DSCA::PLAOS							
	LA offset value of ECC group in horizontal direction							
7E	DSCA::SAM							
	SCB access mode 0: conventional 1: high speed	Not used	Not used	Not used	Not used	Not used	Not used	Not used
7F	DSCA::DNUM							
	ECC unit				Not used	Not used	Not used	Not used

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Byte27 = 8B Byte28 = 14, 15, 16, 17, 24, 28, 34, 35, 38, 39, 44, 48, 54, 55, 58, 59, 64, 68, 74, 75, 78, 79 (CHK2) (1/5)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device number				
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘B’)			
28	Subcode (x‘xx’)							
29	Hardware information (See following pages.)							
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Module ID							
33	Routine ID							
34	Processor number				Message code (x‘0’)			
35	SSID of self subsystem							
36	Symptom code (x‘FF8B’ : LDEV type = DKU87I / x‘EF8B’ : LDEV type = DKU86I)							
37	(This information become valid when SSB is reported to the host.)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8B Byte28 = 14, 15, 16, 17, 24, 28, 34, 35, 38, 39, 44, 48, 54, 55, 58, 59, 64, 68, 74, 75, 78, 79 (CHK2) (2/5)

	0	1	2	3	4	5	6	7
40	Micro							
41	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit of interrupt signal by CLPON	Monitor bit of interrupt signal by SPC0	Monitor bit of interrupt signal by SPC1	Monitor bit of interrupt signal by DRRMP0	Monitor bit of interrupt signal by DRRMP1
42	HMIC::RCVINT							
	Interrupt signal monitor bit by TIMER0 - TIMER6							Interrupt signal monitor bit by SYNC STOP
43	Micro							
44	Micro							
45	Micro							
46	Micro							
47	Micro							
48	Micro							
49	DDRR::MODE2							
	Data change by CUDG mode	System clock mask signal	Pseudo failure setting signal	BSA micro access request	Subblock LRC check mask	DRB access mode setting	DRB access mode 0:DRBOWT DRB1RD 1:DRBORD DRB1WT	Subblock data number variable
4A	DDRR::MODE2							
	DRB RD/WR ADR High bit change	Not used	Selector change in circuit & output selector change of data setting register	Output selector change of data setting register	Selector change signal in circuit			
4B	DDRR::MODE5							
	DRR block parity inverse bit	Offset address parity inverse bit in DRR	S-BUS I/F counter/ pointer parity inverse bit in DRR	LRC parity inverse bit	Sequencer forcible error	Not used	Not used	Not used
4C	DDRR::CSABM0							
	Arbiter sequencer bit 00	Arbiter sequencer bit 01	Arbiter sequencer bit 02	Arbiter sequencer bit 03	Arbiter sequencer bit 06	Arbiter sequencer bit 07	Arbiter sequencer bit 08	Arbiter sequencer bit 09
4D	DDRR::CSABM0							
	Arbiter sequencer bit 10	Arbiter sequencer bit 11	Arbiter sequencer bit 12	Arbiter sequencer bit 13	Arbiter sequencer bit 14	Arbiter sequencer bit 15	Arbiter sequencer bit 16	Not used
4E	DDRR::ADR0A							
	Transfer address (slave 1/slave 2) setting register 0A							
4F	DDRR::ADR0A							
	Transfer address (slave 1/slave 2) setting register 0A							

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Byte27 = 8B Byte28 = 14, 15, 16, 17, 24, 28, 34, 35, 38, 39, 44, 48, 54, 55, 58, 59, 64, 68, 74, 75, 78, 79 (CHK2) (3/5)

	0	1	2	3	4	5	6	7
50	DDRR::CMD0A							
	Not used	Not used	P-LRC setting information	Soft exclusive controler when cache access	Special operation instruction information	Not used	Not used	Not used
51	DDRR::CMD0A							
	Not used	Bus mode (BM0)	Bus mode (BM1)	Bus mode (BM2)	Not used	Not used	Not used	Not used
52	DDRR::TRMDA							
	Syndrome verify	Not used	Not used	Double write by write transfer mode	Transfer command			
53	DDRR::TRMDA							
	Set coefficient for 2 parity							
54	DDRR::ADR0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
55	DDRR::ADR0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
56	DDRR::CMD0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
57	DDRR::CMD0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
58	DDRR::TRMDB							
	Not used	Bus mode (BM0)	Bus mode (BM1)	Bus mode (BM2)	Not used	Not used	Not used	Not used
59	DDRR::TRMDB							
	Set coefficient for 2 parity							
5A	DDRR::EXLA0							
	LBA in transfer end (EXLA0 (0, 0) - EXLA0 (0, 7))							
5B	DDRR::EXLA0							
	Logical volume (fixing/movable) in transfer end (EXLA0 (1, 0) - EXLA0 (1, 7))							
5C	DDRR::EXLA1							
	Logical block in transfer end (EXLA1 (0, 0) - EXLA1 (0, 7))							
5D	DDRR::EXLA1							
	Logical block in transfer end (EXLA1 (1, 0) - EXLA1 (1, 7))							
5E	DDRR::EXLA2							
	Logical block in transfer end (EXLA2 (0, 0) - EXLA2 (0, 7))							
5F	DDRR::EXLA2							
	Logical block in transfer end (EXLA2 (1, 0) - EXLA2 (1, 7))							

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Byte27 = 8B Byte28 = 14, 15, 16, 17, 24, 28, 34, 35, 38, 39, 44, 48, 54, 55, 58, 59, 64, 68, 74, 75, 78, 79 (CHK2) (4/5)

	0	1	2	3	4	5	6	7
60		DDRR::ERLA0						
		LBA in transfer end (EXLA0 (0, 0) - EXLA0 (0, 7))						
61		DDRR::ERLA0						
		Logical volume (fixing/movable) in transfer end (EXLA0 (1, 0) - EXLA0 (1, 7))						
62		DDRR::ERLA1						
		Logical block in transfer end (EXLA1 (0, 0) - EXLA1 (0, 7))						
63		DDRR::ERLA1						
		Logical block in transfer end (EXLA1 (1, 0) - EXLA1 (1, 7))						
64		DDRR::ERLA2						
		Logical block in transfer end (EXLA2 (0, 0) - EXLA2 (0, 7))						
65		DDRR::ERLA2						
		Logical block in transfer end (EXLA2 (1, 0) - EXLA2 (1, 7))						
66		DDRR::COND						
	Not used	Not used	Not used	Not used	Not used	Not used	Command point	
67		DDRR::COND						
		Command point			Position in one command			
68		QBSA0::CHK2BST0						
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
69		QBSA0::CHK2CST0						
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
6A		QBSA0::CHK2CST0						
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
6B		QBSA0::CHK2CST1						
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
6C		QBSA0::CHK2CST1						
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
6D		QBSA0::CHK2CST2						
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
6E		QBSA0::CHK2CST2						
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
6F		QBSA0::CHK2DST1						
	FDISABLE ERR 0 signal input	FDISABLE ERR 1 signal input	FDISABLE ERR 1 signal input	FDISABLE ERR 0, 1 majority decision result	FDISABLE ERR 0, 1 majority decision result	FDISABLE ERR 0, 1 majority decision result	Not used	Not used

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Byte27 = 8B Byte28 = 14, 15, 16, 17, 24, 28, 34, 35, 38, 39, 44, 48, 54, 55, 58, 59, 64, 68, 74, 75, 78, 79 (CHK2) (5/5)

	0	1	2	3	4	5	6	7
70	QBSA0::MONITOR1							
	Data trnsfer information from host (1:Side A)	Data trnsfer information from host (1 Side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
71	QBSA0::MONITOR1							
	Side A Command ID code 0	Side A Command ID code 1	Side A Command ID code 2	Side B Command ID code 0	Side B Command ID code 1	Side B Command ID code 2	ABORT complete	Not used
72	QBSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
73	QBSA0::MONITOR2							
	Side B PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
74	QBSA1::CHK2BST0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
75	QBSA1::CHK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
76	QBSA1::CHK2CST0							
	Not used	REQ SEQ parity error	REQ CNT parity error	MY GRANT parity error	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
77	QBSA1::CHK2CST1							
	WRS SEQ. CNT/POINT parity error	Not used	WR1 SEQ. parity error	WR1 SEQ. CNT/POINT parity error	Not used	WR2 SEQ. parity error	WR2 SEQ. CNT/POINT parity error	Not used
78	QBSA1::CHK2CST1							
	WR3 SEQ. parity error	WR3 SEQ. CNT/POINT parity error	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ parity error	Command reg A/Status1 reg inconsistent (bus mode)	Command reg B/Status1 reg inconsistent (bus mode)
79	QBSA1::CHK2CST2							
	Not used	RD1SEQ. parity error	RD1SEQ. CNT/POINT parity error	Not used	RD2SEQ. parity error	RD2SEQ. CNT/POINT parity error	Not used	RD3SEQ. parity error
7A	QBSA1::CHK2CST2							
	RD3SEQ. CNT/POINT parity error	Not used	RD4SEQ. parity error	RD4SEQ. CNT/POINT parity error	Not used	RD5SEQ. parity error	RD5SEQ. CNT/POINT parity error	Not used
7B	QBSA1::CHK2DST1							
	FDISABLE ERR 0 signal input	FDISABLE ERR 1 signal input	FDISABLE ERR 1 signal input	FDISABLE ERR 0, 1 majority decision result	FDISABLE ERR 0, 1 majority decision result	FDISABLE ERR 0, 1 majority decision result	Not used	Not used
7C	QBSA1::MONITOR1							
	Data trnsfer information from host (1:Side A)	Data trnsfer information from host (1 Side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7D	QBSA1::MONITOR1							
	Side A Command ID code 0	Side A Command ID code 1	Side A Command ID code 2	Side B Command ID code 0	Side B Command ID code 1	Side B Command ID code 2	ABORT complete	Not used
7E	QBSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
7F	QBSA1::MONITOR2							
	Side B PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x'14' : DDRR DATA-CHK2)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	Sequencer error (DRR → BUFF)	Sequencer error (BUFF → DRR)	Sequencer error (Data transfer in BUFF side)	Sequencer error Side BUFF administration	Sequencer error (Side 2 command)	Sequencer error (Multi-packet transfer)	Sequencer error (Data transfer in BSA side: RD)	Sequencer error (Data transfer in BSA side: WR)
2C		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2D		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2E		DDRR::ESTA2						
	Offset address overflow error	LRC data counter parity error	Side A command parameter error	Side B command parameter error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
2F		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
30		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
31		DDRR::ESTA4						
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistics counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x'15' : DDRR CONTROL-CHK2)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	Sequencer error (DRR → BUFF)	Sequencer error (BUFF → DRR)	Sequencer error (Data transfer in BUFF side)	Sequencer error Side BUFF administration	Sequencer error (Side 2 command)	Sequencer error (Multi-packet transfer)	Sequencer error (Data transfer in BSA side: RD)	Sequencer error (Data transfer in BSA side: WR)
2C		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2D		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2E		DDRR::ESTA2						
	Offset address overflow error	LRC data counter parity error	Side A command parameter error	Side B command parameter error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
2F		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
30		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
31								
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistics counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x'16' : DDRR DATA&CONTROL-CHK2)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	Sequencer error (DRR → BUFF)	Sequencer error (BUFF → DRR)	Sequencer error (Data transfer in BUFF side)	Sequencer error Side BUFF administration	Sequencer error (Side 2 command)	Sequencer error (Multi-packet transfer)	Sequencer error (Data transfer in BSA side: RD)	Sequencer error (Data transfer in BSA side: WR)
2C		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2D		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2E		DDRR::ESTA2						
	Offset address overflow error	LRC data counter parity error	Side A command parameter error	Side B command parameter error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
2F		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
30		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
31		DDRR::ESTA4						
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistics counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x'17' : DDRR NO FACTOR-CHK2)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	Sequencer error (DRR → BUFF)	Sequencer error (BUFF → DRR)	Sequencer error (Data transfer in BUFF side)	Sequencer error Side BUFF administration	Sequencer error (Side 2 command)	Sequencer error (Multi-packet transfer)	Sequencer error (Data transfer in BSA side: RD)	Sequencer error (Data transfer in BSA side: WR)
2C		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2D		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2E		DDRR::ESTA2						
	Offset address overflow error	LRC data counter parity error	Side A command parameter error	Side B command parameter error	BSA0 CHK2C error	BSA0 CHK2D error	BSA1 CHK2C error	BSA1 CHK2D error
2F		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
30		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
31		DDRR::ESTA4						
	Not used	BSA input data parity error	BSA output data parity error	Offset address adder parity error	Statistics counter parity error	BSA0 CHK2A error	BSA1 CHK2A error	Not used

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘24, 28’ : DBSA0 CHK2B/C)							
29	DBSA0::ERROR							
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2A	DBSA0::STATUS1							
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2B	DBSA0::STATUS1							
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
2C	DBSA0::STATUS2							
	Forcibly ON F bus request by micro	Forcibly OFF F bus request by micro	F bus transfer normal end bus lock	F bus transfer abnormal end bus lock	1 BUSMODE opposite ENT existence dicision bit	Forcibly ON LOOPBACK of BTL	Forcibly ON OEA of BTL	Forcibly ON DISABLE of FBUS
2D	DBSA0::STATUS2							
	Stopped LSI by micro	Repeated F bus transfer by micro	Forcibly termination F bus transfer by micro	F bus arbitration count over setting register (1-16)				
2E	DBSA0::MASK							
	Masked CHK1B error output	Masked CHK2A error output	Masked CHK2B error output	Masked CHK2C error output	Masked CHK2D error output	Masked error SEQ input	Masked BTL CLR	Not used
2F	DBSA0::MASK							
	Masked LIVE INS input signal	F bus timer enable	ABT timer enable	Arbitration count enable	Output CUDG MODE in RD output data parity check enable	Masked arbiter requester temporary stop by LIVE IMS	Masked CHK2D by LIVE INS	Masked DISABLE error output
30	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31	DBSA0::MONITOR0							
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘44, 48’ : DBSA1 CHK2B/C)							
29	DBSA1::ERROR							
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2A	DBSA1::STATUS1							
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2B	DBSA1::STATUS1							
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
2C	DBSA1::STATUS2							
	Forcibly ON F bus request by micro	Forcibly OFF F bus request by micro	F bus transfer normal end bus lock	F bus transfer abnormal end bus lock	1 BUSMODE opposite ENT existence dicision bit	Forcibly ON LOOPBACK of BTL	Forcibly ON OEA of BTL	Forcibly ON DISABLE of FBUS
2D	DBSA1::STATUS2							
	Stopped LSI by micro	Repeated F bus transfer by micro	Forcibly termination F bus transfer by micro	F bus arbitration count over setting register (1-16)				
2E	DBSA1::MASK							
	Masked CHK1B error output	Masked CHK2A error output	Masked CHK2B error output	Masked CHK2C error output	Masked CHK2D error output	Masked error SEQ input	Masked BTL CLR	Not used
2F	DBSA1::MASK							
	Masked LIVE INS input signal	F bus timer enable	ABT timer enable	Arbitration count enable	Output CUDG MODE in RD output data parity check enable	Masked arbiter requester temporary stop by LIVE IMS	Masked CHK2D by LIVE INS	Masked DISABLE error output
30	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31	DBSA1::MONITOR0							
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘64, 68’ : DBSA0&DBSA1 CHK2B/C)							
29		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2A		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2B		DBSA0::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
2C		DBSA0::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
2D		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA1::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘34, 38’ : DDRR&DBSA0 CHK2B/C)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
2C		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA0::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA0::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘35, 39’ : DDRR&DBSA0 CHK2B/C)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2C		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA0::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA0::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘54, 58’ : DDRR&DBSA1 CHK2B/C)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
2C		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
2D		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA1::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA1::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘55, 59’ : DDRR&DBSA1 CHK2B/C)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2C		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2D		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA1::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA1::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘74, 78’ : DDRR&DBSA0&DBSA1 CHK2B/C)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
2C		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
30		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x'75, 79' : DDRR&DBSA0&DBSA1 CHK2B/C)							
29	DDRR::STATS							
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A	DDRR::STATS							
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B	DDRR::ESTA1							
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2C	DDRR::ESTA2							
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2D	DBSA0::ERROR							
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E	DBSA0::STATUS1							
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F	DBSA1::ERROR							
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
30	DBSA1::STATUS1							
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
31	DBSA0::MONITOR0							
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Byte27 = 8B Byte28 = 25, 29, 36, 37, 3A, 3B, 45, 49, 56, 57, 5A, 5B, 65, 69, 76, 77, 7A, 7B (CHK2) (1/5)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device number				
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘B’)			
28	Subcode (x‘xx’)							
29	Hardware information (See following pages.)							
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Module ID							
33	Routine ID							
34	Processor number				Message code (x‘0’)			
35	SSID of self subsystem							
36	Symptom code (x‘FF8B’ : LDEV type = DKU87I / x‘EF8B’ : LDEV type = DKU86I)							
37	(This information become valid when SSB is reported to the host.)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8B Byte28 = 25, 29, 36, 37, 3A, 3B, 45, 49, 56, 57, 5A, 5B, 65, 69, 76, 77, 7A, 7B (CHK2) (2/5)

	0	1	2	3	4	5	6	7
40	Micro							
41	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit of interrupt signal by CLPON	Monitor bit of interrupt signal by SPC0	Monitor bit of interrupt signal by SPC1	Monitor bit of interrupt signal by DRRMP0	Monitor bit of interrupt signal by DRRMP1
42	HMIC::RCVINT							
	Interrupt signal monitor bit by TIMER0 - TIMER6							Interrupt signal monitor bit by SYNC STOP
43	Micro							
44	Micro							
45	Micro							
46	Micro							
47	Micro							
48	Micro							
49	DDRR::MODE2							
	Data change by CUDG mode	System clock mask signal	Pseudo failure setting signal	BSA micro access request	Subblock LRC check mask	DRB access mode setting	DRB access mode 0:DRBOWT DRB1RD 1:DRBORD DRB1WT	Subblock data number variable
4A	DDRR::MODE2							
	DRB RD/WR ADR High bit change	Not used	Selector change in circuit & output selector change of data setting register	Output selector change of data setting register	Selector change signal in circuit			
4B	DDRR::MODE5							
	DRR block parity inverse bit	Offset address parity inverse bit in DRR	S-BUS I/F counter/ pointer parity inverse bit in DRR	LRC parity inverse bit	Sequencer forcible error	Not used	Not used	Not used
4C	DDRR::CSABM0							
	Arbiter sequencer bit 00	Arbiter sequencer bit 01	Arbiter sequencer bit 02	Arbiter sequencer bit 03	Arbiter sequencer bit 06	Arbiter sequencer bit 07	Arbiter sequencer bit 08	Arbiter sequencer bit 09
4D	DDRR::CSABM0							
	Arbiter sequencer bit 10	Arbiter sequencer bit 11	Arbiter sequencer bit 12	Arbiter sequencer bit 13	Arbiter sequencer bit 14	Arbiter sequencer bit 15	Arbiter sequencer bit 16	Not used
4E	DDRR::ADR0A							
	Transfer address (slave 1/slave 2) setting register 0A							
4F	DDRR::ADR0A							
	Transfer address (slave 1/slave 2) setting register 0A							

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Byte27 = 8B Byte28 = 25, 29, 36, 37, 3A, 3B, 45, 49, 56, 57, 5A, 5B, 65, 69, 76, 77, 7A, 7B (CHK2) (3/5)

	0	1	2	3	4	5	6	7
50	DDRR::CMD0A							
	Not used	Not used	P-LRC setting information	Soft exclusive controler when cache access	Special operation instruction information	Not used	Not used	Not used
51	DDRR::CMD0A							
	Not used	Bus mode (BM0)	Bus mode (BM1)	Bus mode (BM2)	Not used	Not used	Not used	Not used
52	DDRR::TRMDA							
	Syndrome verify	Not used	Not used	Double write by write transfer mode	Transfer command			
53	DDRR::TRMDA							
	Set coefficient for 2 parity							
54	DDRR::ADR0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
55	DDRR::ADR0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
56	DDRR::CMD0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
57	DDRR::CMD0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
58	DDRR::TRMDB							
	Not used	Bus mode (BM0)	Bus mode (BM1)	Bus mode (BM2)	Not used	Not used	Not used	Not used
59	DDRR::TRMDB							
	Set coefficient for 2 parity							
5A	DDRR::EXLA0							
	LBA in transfer end (EXLA0 (0, 0) - EXLA0 (0, 7))							
5B	DDRR::EXLA0							
	Logical volume (fixing/movable) in transfer end (EXLA0 (1, 0) - EXLA0 (1, 7))							
5C	DDRR::EXLA1							
	Logical block in transfer end (EXLA1 (0, 0) - EXLA1 (0, 7))							
5D	DDRR::EXLA1							
	Logical block in transfer end (EXLA1 (1, 0) - EXLA1 (1, 7))							
5E	DDRR::EXLA2							
	Logical block in transfer end (EXLA2 (0, 0) - EXLA2 (0, 7))							
5F	DDRR::EXLA2							
	Logical block in transfer end (EXLA2 (1, 0) - EXLA2 (1, 7))							

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Byte27 = 8B Byte28 = 25, 29, 36, 37, 3A, 3B, 45, 49, 56, 57, 5A, 5B, 65, 69, 76, 77, 7A, 7B (CHK2) (4/5)

	0	1	2	3	4	5	6	7
60	DDRR::ERLA0							
	LBA in transfer end (EXLA0 (0, 0) - EXLA0 (0, 7))							
61	DDRR::ERLA0							
	Logical volume (fixing/movable) in transfer end (EXLA0 (1, 0) - EXLA0 (1, 7))							
62	DDRR::ERLA1							
	Logical block in transfer end (EXLA1 (0, 0) - EXLA1 (0, 7))							
63	DDRR::ERLA1							
	Logical block in transfer end (EXLA1 (1, 0) - EXLA1 (1, 7))							
64	DDRR::ERLA2							
	Logical block in transfer end (EXLA2 (0, 0) - EXLA2 (0, 7))							
65	DDRR::ERLA2							
	Logical block in transfer end (EXLA2 (1, 0) - EXLA2 (1, 7))							
66	DDRR::COND							
	Not used	Not used	Not used	Not used	Not used	Not used	Command point	
67	DDRR::COND							
	Command point				Position in one command			
68	QBSA0::CHK2BST0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
69	QBSA0::CHK2DST0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
6A	QBSA0::CHK2DST1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
6B	QBSA0::CHK2DST1							
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6C	QBSA0::CHK2DST2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
6D	QBSA0::CHK2AST1							
	EXERR1 HI BYTE input data parity error	EXERR1 LO BYTE input data parity error	EXERR2 HI BYTE input data parity error	EXERR2 LO BYTE input data parity error	Mate BSA error	SLAVE ID ERROR	LRC section data parity error	LRC section LRC error
6E	QBSA0::CHK2AST1							
	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error	FDB8 data parity error
6F	QBSA0::COPY							
	Slave BUSY signal was received (For debug)	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	Arbiter error on F bus	Not used	Not used

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Byte27 = 8B Byte28 = 25, 29, 36, 37, 3A, 3B, 45, 49, 56, 57, 5A, 5B, 65, 69, 76, 77, 7A, 7B (CHK2) (5/5)

	0	1	2	3	4	5	6	7
70	QBSA0::MONITOR1							
	Data trnsfer information from host (1:Side A)	Data trnsfer information from host (1 Side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
71	QBSA0::MONITOR1							
	Side A Command ID code 0	Side A Command ID code 1	Side A Command ID code 2	Side B Command ID code 0	Side B Command ID code 1	Side B Command ID code 2	ABORT complete	Not used
72	QBSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
73	QBSA0::MONITOR2							
	Side B PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
74	QBSA1::CHK2DST0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
75	QBSA1::CHK2DST0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
76	QBSA1::CHK2DST1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
77	QBSA1::CHK2DST1							
	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error	FDB8 data parity error
78	QBSA1::CHK2DST2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
79	QBSA1::CHK2AST1							
	EXERR1 HI BYTE input data parity error	EXERR1 LO BYTE input data parity error	EXERR2 HI BYTE input data parity error	EXERR2 LO BYTE input data parity error	Mate BSA error	SLAVE ID ERROR	LRC section data parity error	LRC section LRC error
7A	QBSA1::CHK2AST1							
	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error	FDB8 data parity error
7B	QBSA1::COPY							
	Slave BUSY signal was received (For debug)	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	Arbiter error on F bus	Not used	Not used
7C	QBSA1::MONITOR1							
	Data trnsfer information from host (1:Side A)	Data trnsfer information from host (1 Side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7D	QBSA1::MONITOR1							
	Side A Command ID code 0	Side A Command ID code 1	Side A Command ID code 2	Side B Command ID code 0	Side B Command ID code 1	Side B Command ID code 2	ABORT complete	Not used
7E	QBSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
7F	QBSA1::MONITOR2							
	Side B PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘25, 29’ : DBSA0 CHK2A/D)							
29	DBSA0::ERROR							
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2A	DBSA0::STATUS1							
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2B	DBSA0::STATUS1							
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
2C	DBSA0::STATUS2							
	Forcibly ON F bus request by micro	Forcibly OFF F bus request by micro	F bus transfer normal end bus lock	F bus transfer abnormal end bus lock	1 BUSMODE opposite ENT existence dicision bit	Forcibly ON LOOPBACK of BTL	Forcibly ON OEA of BTL	Forcibly ON DISABLE of FBUS
2D	DBSA0::STATUS2							
	Stopped LSI by micro	Repeated F bus transfer by micro	Forcibly termination F bus transfer by micro	F bus arbitration count over setting register (1-16)				
2E	DBSA0::MASK							
	Masked CHK1B error output	Masked CHK2A error output	Masked CHK2B error output	Masked CHK2C error output	Masked CHK2D error output	Masked error SEQ input	Masked BTL CLR	Not used
2F	DBSA0::MASK							
	Masked LIVE INS input signal	F bus timer enable	ABT timer enable	Arbitration count enable	Output CUDG MODE in RD output data parity check enable	Masked arbiter requester temporary stop by LIVE IMS	Masked CHK2D by LIVE INS	Masked DISABLE error output
30	DBSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31	DBSA0::MONITOR0							
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘45, 49’ : DBSA1 CHK2A/D)							
29	DBSA1::ERROR							
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2A	DBSA1::STATUS1							
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2B	DBSA1::STATUS1							
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
2C	DBSA1::STATUS2							
	Forcibly ON F bus request by micro	Forcibly OFF F bus request by micro	F bus transfer normal end bus lock	F bus transfer abnormal end bus lock	1 BUSMODE opposite ENT existence dicision bit	Forcibly ON LOOPBACK of BTL	Forcibly ON OEA of BTL	Forcibly ON DISABLE of FBUS
2D	DBSA1::STATUS2							
	Stopped LSI by micro	Repeated F bus transfer by micro	Forcibly termination F bus transfer by micro	F bus arbitration count over setting register (1-16)				
2E	DBSA1::MASK							
	Masked CHK1B error output	Masked CHK2A error output	Masked CHK2B error output	Masked CHK2C error output	Masked CHK2D error output	Masked error SEQ input	Masked BTL CLR	Not used
2F	DBSA1::MASK							
	Masked LIVE INS input signal	F bus timer enable	ABT timer enable	Arbitration count enable	Output CUDG MODE in RD output data parity check enable	Masked arbiter requester temporary stop by LIVE IMS	Masked CHK2D by LIVE INS	Masked DISABLE error output
30	DBSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31	DBSA1::MONITOR0							
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘65, 69’ : DBSA0&DBSA1 CHK2A/D)							
29		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2A		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2B		DBSA0::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
2C		DBSA0::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
2D		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA1::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘36, 3A’ : DDRR&DBSA0 CHK2A/D)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
2C		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA0::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA0::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘37, 3B’ : DDRR&DBSA0 CHK2A/D)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2C		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA0::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA0::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘56, 5A’ : DDRR&DBSA1 CHK2A/D)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
2C		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
2D		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA1::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA1::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘57, 5B’ : DDRR&DBSA1 CHK2A/D)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2C		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2D		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::STATUS1						
	BSA diagnosis mode set	DBF turn mode	Requester setting end bit	MYGRANT NO 0	MYGRANT NO 1	MYGRANT NO 2	MYGRANT NO 3	MYGRANT NO 8
30		DBSA1::COPY						
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	ABT error on F bus	Not used	Not used
31		DBSA1::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘76, 7A’ : DDRR&DBSA0&DBSA1 CHK2A/D)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA3						
	Data buffer (TR1) parity error	Data buffer (DM0) parity error	Not used	Data buffer (DMI) parity error DRB signal error	DRB error was reported from other side	Not used	Parity error in loading the bitmap	ECC generation adder 2 parity error
2C		DDRR::ESTA3						
	LA fixed part error	LA variable part error	LA parity error	Syndrome (ECC) error	Write data parity error	LRC error	LRC check multiplier parity error	LRC check adder parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
30		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x‘77, 7B’ : DDRR&DBSA0&DBSA1 CHK2A/D)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::ESTA1						
	CMD ID parity error	Transfer CMD setting error	All data counter parity error	Packet data counter parity error	RD packet counter parity error	WR packet counter parity error	BUFF WR address counter parity error	BUFF RD address counter parity error
2C		DDRR::ESTA2						
	RD/WR pointer & SYNC counter parity error	SYNC IN pointer parity error	DIF counter parity error	SBL counter parity error	PL counter parity error	MODE output parity error	Bus grant ID parity error	Offset address parity error
2D		DBSA0::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
2E		DBSA0::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
2F		DBSA1::ERROR						
	CHK1B error typical bit	CHK2A error typical bit	CHK2B error typical bit	CHK2C error typical bit	CHK2D error typical bit	Not used	Not used	Not used
30		DBSA1::STATUS1						
	CACHE transfer: CACHE RD	CACHE transfer: CACHE WR	Not used	Requester master enable	F bus (H) valid	F bus (L) valid	Transaction mode	F bus open set
31		DBSA0::MONITOR0						
	BSA LSI 0	BSA LSI 1	BSA LSI 2	BSA LSI 3	Revision 0	Revision 1	Revision 2	Revision 3

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Byte27 = 8B Byte28 = 04 (CHK2) (1/5)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device number				
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘B’)			
28	Subcode (x‘xx’)							
29	Hardware information (See following pages.)							
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Module ID							
33	Routine ID							
34	Processor number				Message code (x‘0’)			
35	SSID of self subsystem							
36	Symptom code (x‘FF8B’ : LDEV type = DKU87I / x‘EF8B’ : LDEV type = DKU86I)							
37	(This information become valid when SSB is reported to the host.)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8B Byte28 = 04 (CHK2) (2/5)

	0	1	2	3	4	5	6	7
40	Micro							
41	HMIC::RCVINT							
	Not used	Not used	Not used	Monitor bit of interrupt signal by CLPON	Monitor bit of interrupt signal by SPC0	Monitor bit of interrupt signal by SPC1	Monitor bit of interrupt signal by DRRMP0	Monitor bit of interrupt signal by DRRMP1
42	HMIC::RCVINT							
	Interrupt signal monitor bit by TIMER0 - TIMER6							Interrupt signal monitor bit by SYNC STOP
43	Micro							
44	Micro							
45	Micro							
46	Micro							
47	Micro							
48	Micro							
49	DDRR::MODE2							
	Data change by CUDG mode	System clock mask signal	Pseudo failure setting signal	BSA micro access request	Subblock LRC check mask	DRB access mode setting	DRB access mode 0:DRBOWT DRB1RD 1:DRBORD DRB1WT	Subblock data number variable
4A	DDRR::MODE2							
	DRB RD/WR ADR High bit change	Not used	Selector change in circuit & output selector change of data setting register	Output selector change of data setting register	Selector change signal in circuit			
4B	DDRR::MODE5							
	DRR block parity inverse bit	Offset address parity inverse bit in DRR	S-BUS I/F counter/ pointer parity inverse bit in DRR	LRC parity inverse bit	Sequencer forcible error	Not used	Not used	Not used
4C	DDRR::CSABM0							
	Arbiter sequencer bit 00	Arbiter sequencer bit 01	Arbiter sequencer bit 02	Arbiter sequencer bit 03	Arbiter sequencer bit 06	Arbiter sequencer bit 07	Arbiter sequencer bit 08	Arbiter sequencer bit 09
4D	DDRR::CSABM0							
	Arbiter sequencer bit 10	Arbiter sequencer bit 11	Arbiter sequencer bit 12	Arbiter sequencer bit 13	Arbiter sequencer bit 14	Arbiter sequencer bit 15	Arbiter sequencer bit 16	Not used
4E	DDRR::ADR0A							
	Transfer address (slave 1/slave 2) setting register 0A							
4F	DDRR::ADR0A							
	Transfer address (slave 1/slave 2) setting register 0A							

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Byte27 = 8B Byte28 = 04 (CHK2) (3/5)

	0	1	2	3	4	5	6	7
50	DDRR::CMD0A							
	Not used	Not used	P-LRC setting information	Soft exclusive controler when cache access	Special operation instruction information	Not used	Not used	Not used
51	DDRR::CMD0A							
	Not used	Bus mode (BM0)	Bus mode (BM1)	Bus mode (BM2)	Not used	Not used	Not used	Not used
52	DDRR::TRMDA							
	Syndrome verify	Not used	Not used	Double write by write transfer mode	Transfer command			
53	DDRR::TRMDA							
	Set coefficient for 2 parity							
54	DDRR::ADR0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
55	DDRR::ADR0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
56	DDRR::CMD0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
57	DDRR::CMD0B							
	Transfer ADR (slave 1/slave 2) setting register 0B							
58	DDRR::TRMDB							
	Not used	Bus mode (BM0)	Bus mode (BM1)	Bus mode (BM2)	Not used	Not used	Not used	Not used
59	DDRR::TRMDB							
	Set coefficient for 2 parity							
5A	DDRR::EXLA0							
	LBA in transfer end (EXLA0 (0, 0) - EXLA0 (0, 7))							
5B	DDRR::EXLA0							
	Logical volume (fixing/movable) in transfer end (EXLA0 (1, 0) - EXLA0 (1, 7))							
5C	DDRR::EXLA1							
	Logical block in transfer end (EXLA1 (0, 0) - EXLA1 (0, 7))							
5D	DDRR::EXLA1							
	Logical block in transfer end (EXLA1 (1, 0) - EXLA1 (1, 7))							
5E	DDRR::EXLA2							
	Logical block in transfer end (EXLA2 (0, 0) - EXLA2 (0, 7))							
5F	DDRR::EXLA2							
	Logical block in transfer end (EXLA2 (1, 0) - EXLA2 (1, 7))							

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Byte27 = 8B Byte28 = 04 (CHK2) (4/5)

	0	1	2	3	4	5	6	7
60		DDRR::CIOPR3						
		S-BUS I/F signal (control) (BSMODE0 - 8)						
61		DDRR::CDRSS0						
	DRR change sequencer state 00	DRR change sequencer state 01	DRR change sequencer state 02	DRR change sequencer state 03	DRR change sequencer state 04	DRR change sequencer state 05	DRR change sequencer state 06	DRR change sequencer state 07
62		DDRR::CDRSS0						
	DRR change sequencer state 08	DRR change sequencer state 09	DRR change sequencer state 10	DRR change sequencer state 11	DRR change sequencer state 12	DRR change sequencer state 13	DRR change sequencer state 14	DRR change sequencer state 15
63		DDRR::CDRSS1						
	DRR change sequencer state 16	DRR change sequencer state 17	Not used	Not used	Not used	Not used	Not used	Not used
64		DDRR::CDRBS0						
	DRR access control sequencer state 00	DRR access control sequencer state 01	DRR access control sequencer state 02	DRR access control sequencer state 03	DRR access control sequencer state 04	DRR access control sequencer state 05	DRR access control sequencer state 06	DRR access control sequencer state 07
65		DDRR::CDRBS0						
	DRR access control sequencer state 08	DRR access control sequencer state 09	DRR access control sequencer state 10	DRR access control sequencer state 11	DRR access control sequencer state 12	Not used	Not used	Not used
66		DDRR::COND						
	Not used	Not used	Not used	Not used	Not used	Not used	Command point	
67		DDRR::COND						
		Command point			Position in one command			
68		QBSA0::CHK2BST0						
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
69		QBSA0::CHK2DST0						
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
6A		QBSA0::CHK2DST1						
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
6B		QBSA0::CHK2DST1						
	FDISABLE ERR 0 signal input was detected	FDISABLE ERR 1 signal input was detected	FDISABLE ERR 2 signal input was detected	FDISABLE ERR 0,1 majority decision result	FDISABLE ERR 1,2 majority decision result	FDISABLE ERR 0,2 majority decision result	Not used	Not used
6C		QBSA0::CHK2DST2						
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
6D		QBSA0::CHK2AST1						
	EXERR1 HI BYTE input data parity error	EXERR1 LO BYTE input data parity error	EXERR2 HI BYTE input data parity error	EXERR2 LO BYTE input data parity error	Mate BSA error	SLAVE ID ERROR	LRC section data parity error	LRC section LRC error
6E		QBSA0::CHK2AST1						
	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error	FDB8 data parity error
6F		QBSA0::COPY						
	Slave BUSY signal was received (For debug)	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	Arbiter error on F bus	Not used	Not used

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Byte27 = 8B Byte28 = 04 (CHK2) (5/5)

	0	1	2	3	4	5	6	7
70	QBSA0::MONITOR1							
	Data trnsfer information from host (1:Side A)	Data trnsfer information from host (1 Side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
71	QBSA0::MONITOR1							
	Side A Command ID code 0	Side A Command ID code 1	Side A Command ID code 2	Side B Command ID code 0	Side B Command ID code 1	Side B Command ID code 2	ABORT complete	Not used
72	QBSA0::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
73	QBSA0::MONITOR2							
	Side B PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
74	QBSA1::CHK2DST0							
	Not used	ABT SEQ PTY ERR	Not used	ABT LIVE INSCNT PTY ERR	Not used	Not used	Not used	Not used
75	QBSA1::CHK2DST0							
	Not used	ABT timeout over	ABT timeout CNT parity error	Protocol error FBREQ(no) MYGRANT (yes)	Not used	Not used	Not used	Not used
76	QBSA1::CHK2DST1							
	F bus open0 signal input was detected	F bus open1 signal input was detected	F bus open2 signal input was detected	F bus open0, 1 majority decision result	F bus open1, 2 majority decision result	F bus open0, 2 majority decision result	Not used	Not used
77	QBSA1::CHK2DST1							
	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error	FDB8 data parity error
78	QBSA1::CHK2DST2							
	LIVE INS 0 signal input was detected	LIVE INS 1 signal input was detected	LIVE INS 2 signal input was detected	LIVE 0, 1 majority decision result	LIVE 1, 2 majority decision result	LIVE 0, 2 majority decision result	Not used	Not used
79	QBSA1::CHK2AST1							
	EXERR1 HI BYTE input data parity error	EXERR1 LO BYTE input data parity error	EXERR2 HI BYTE input data parity error	EXERR2 LO BYTE input data parity error	Mate BSA error	SLAVE ID ERROR	LRC section data parity error	LRC section LRC error
7A	QBSA1::CHK2AST1							
	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error	FDB8 data parity error
7B	QBSA1::COPY							
	Slave BUSY signal was received (For debug)	CACHE RD transfer end	CACHE WR transfer end	Arbiter master in self F bus	F bus arbiter master	Arbiter error on F bus	Not used	Not used
7C	QBSA1::MONITOR1							
	Data trnsfer information from host (1:Side A)	Data trnsfer information from host (1 Side A)	FBUS data trnsfer information (1: side A)	Side A FBUS transfer in progress by DBF	Side B FBUS transfer in progress by DBF	Not used	Not used	Not used
7D	QBSA1::MONITOR1							
	Side A Command ID code 0	Side A Command ID code 1	Side A Command ID code 2	Side B Command ID code 0	Side B Command ID code 1	Side B Command ID code 2	ABORT complete	Not used
7E	QBSA1::MONITOR2							
	Side A PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3
7F	QBSA1::MONITOR2							
	Side B PLRC additional bit	Side A F bus transfer bus mode 0	Side A F bus transfer bus mode 1	Side A F bus transfer bus mode 2	Side A F bus transfer mode 0	Side A F bus transfer mode 1	Side A F bus transfer mode 2	Side A F bus transfer mode 3

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Format 8, Message B (CHK2)

	0	1	2	3	4	5	6	7
28	Subcode (x'04' :)							
29		DDRR::STATS						
	TRANSFER END A	Not used	CMD A execution wait/being executed	CMD A data being transferred	TRANSFER END B	Not used	CMD B execution wait/being executed	CMD B data being transferred
2A		DDRR::STATS						
	CHK2 typical error	DRR data transfer CHK2	DRR control CHK2	BSA0 CHK2 (A/C/D)	BSA1 CHK2 (A/C/D)	CHK1B	Transfer forcibly terminated	Pseudo-failure occurred
2B		DDRR::CSABM0						
	Arbiter sequencer bit 00	Arbiter sequencer bit 01	Arbiter sequencer bit 02	Arbiter sequencer bit 03	Arbiter sequencer bit 04	Arbiter sequencer bit 05	Arbiter sequencer bit 06	Arbiter sequencer bit 07
2C		DDRR::CSABM0						
	Arbiter sequencer bit 10	Arbiter sequencer bit 11	Arbiter sequencer bit 12	Arbiter sequencer bit 13	Arbiter sequencer bit 14	Arbiter sequencer bit 15	Arbiter sequencer bit 16	Arbiter sequencer bit 17
2D		DDRR::CSCRM0						
	Cache RD sequencer bit 00	Cache RD sequencer bit 01	Cache RD sequencer bit 02	Cache RD sequencer bit 03	Cache RD sequencer bit 04	Cache RD sequencer bit 05	Cache RD sequencer bit 06	Cache RD sequencer bit 07
2E		DDRR::CSCRM0						
	Cache RD sequencer bit 10	Cache RD sequencer bit 11	Cache RD sequencer bit 12	Cache RD sequencer bit 13	Cache RD sequencer bit 14	Cache RD sequencer bit 15	Not used	Not used
2F		DDRR::CSCWM0						
	Cache WR sequencer bit 00	Cache WR sequencer bit 01	Cache WR sequencer bit 02	Cache WR sequencer bit 03	Cache WR sequencer bit 04	Cache WR sequencer bit 05	Cache WR sequencer bit 06	Cache WR sequencer bit 07
30		DDRR::CSCWM0						
	Cache WR sequencer bit 08	Cache WR sequencer bit 09	Cache WR sequencer bit 10	Cache WR sequencer bit 11	Not used	Not used	Not used	Not used
31		DDRR::RMODE8						
	Output address parity error	Input address parity error	WR control error	RD control error	AREG DATA PARITY ERROR 0	AREG DATA PARITY ERROR 1	AREG DATA PARITY ERROR 2	AREG DATA PARITY ERROR 3

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Byte27 = 8C (SVP Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘C’)			
28	Error information (See following pages)							
29								
2A								
2B								
2C								
2D								
2E								
2F								
30	Error type code (Note 1)							
31								
32	Error information (See following pages)							
33								
34								
35								
36	Sympton code (x‘FF8C’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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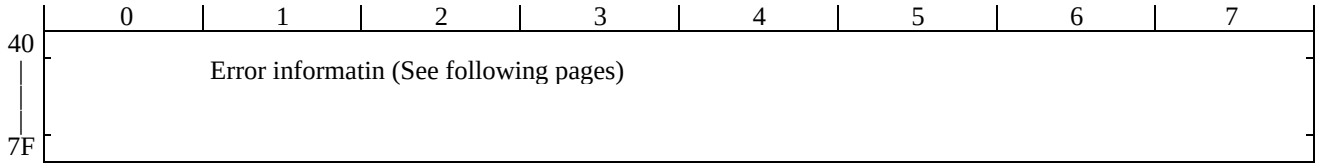
Byte27 = 8C (SVP Failure) (2/2)



(Note 1) Error type code

x‘0000’ : Logical inconsistency
x‘0001’ : HEAP related error
x‘0002’ : File related error
x‘0003’ : LAN failure
x‘0004’ : SSVP failure
x‘0005’ : Windows failure
x‘0006’ : CUDG detected error
x‘0009’ : BOOT detected error
x‘000A’ : SVP message

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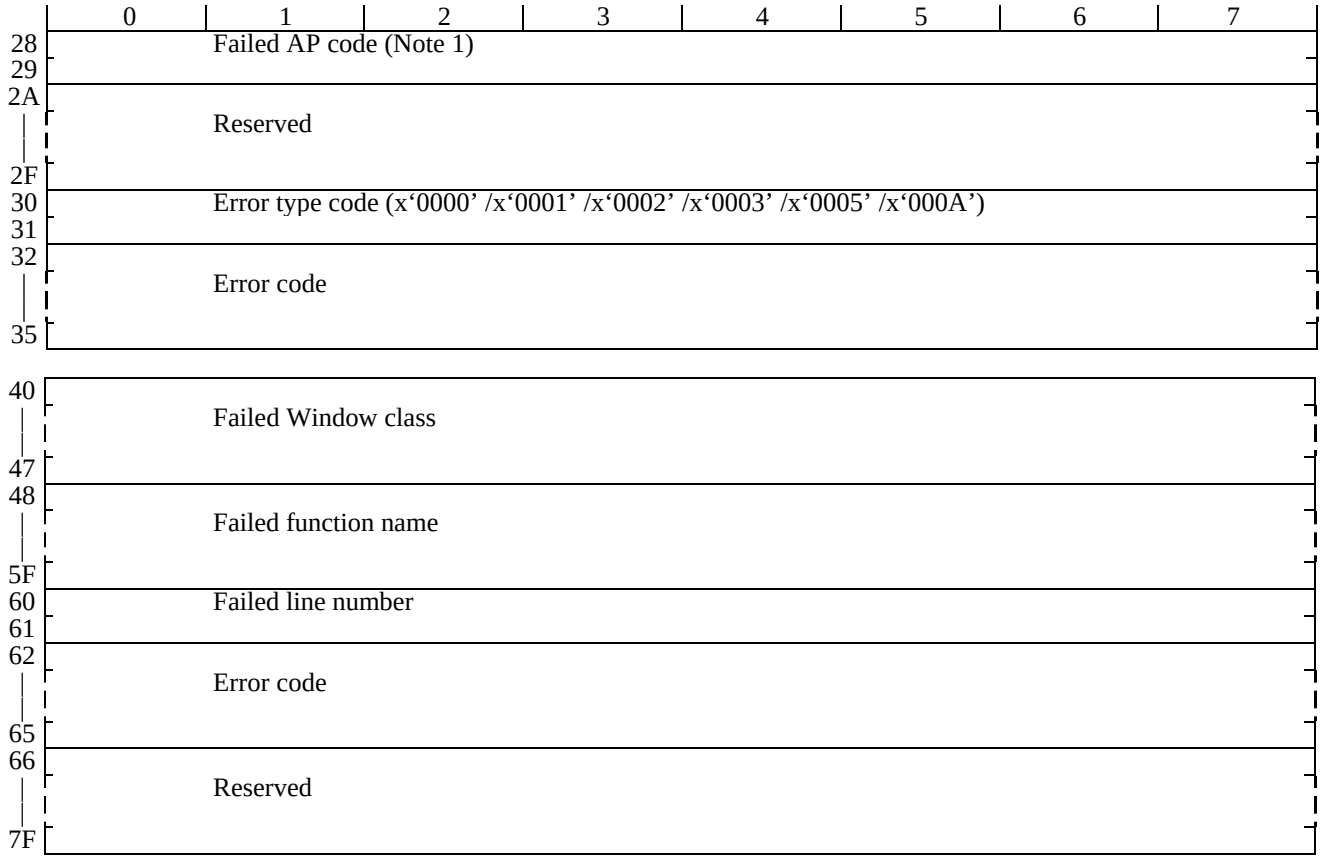
Byte27 = 8 C (SVP Failure) Byte28-35,40-7F detail

(1) Logical inconsistency / HEEP/File/LAN/Windows failure/SVP message



(Note 1) Failed AP code

x‘0000’ : Dump task
x‘0001’ : DKU inline
x‘0002’ : Microprogram change (online)
x‘0003’ : Information
x‘0004’ : LOGOUT
x‘0005’ : PATH inline
x‘0006’ : Back ground
x‘0007’ : DIAG
x‘0008’ : Install
x‘0009’ : On-line
x‘000A’ : Micro-program change (off-line)
x‘000B’ : Special package change
x‘000C’ : Common function for communication
x‘00FF’ : Others

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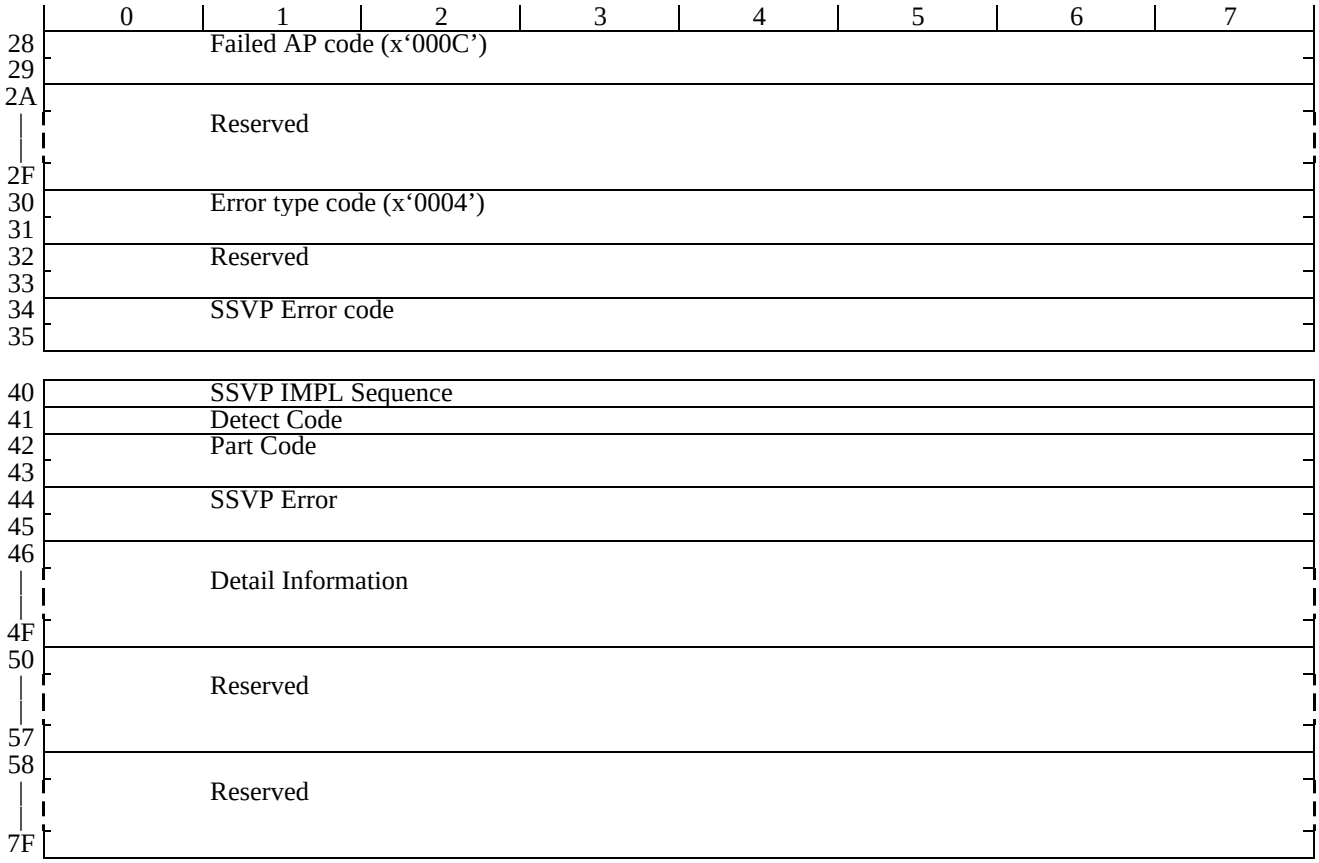
Byte27 = 8C (SVP Failure) Byte28-35,40-7F detail

(2) SSVP failure



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Byte27 = 8C (SVP Failure) Byte28-35,40-7F detail

(3) CUDG detected error

	0	1	2	3	4	5	6	7
28 29 2A 2B 2C 2D 2E 2F		‘CUDG ERR’ (x‘43 55 44 47 20 45 52 52’)						
30 31		Error type code (x‘0006’)						
32 33 34 35		Error code (x‘00000000’)						

40	Error occured time (year)
41	Error occured time (month)
42	Error occured time (day)
43	Error occured time (hour)
44	Error occured time (minute)
45	Error occured time (second)
46	Report MPID
47	Test object
48	Test type (x‘01’ : CUDG3, x‘10’ : LCDG3)
49	Failed LCP number
4A	Test contents
4B	Test contents
4C	Error code
4D	Error code
4E	Not used
4F	Not used
50	Cache module group number (slave 1)
51	Cache module group number (slave 1)
52	Cache module group number (slave 1)
53	Cache module group number (slave 1)
54	Cache module group number (slave 2)
55	Cache module group number (slave 2)
56	Cache module group number (slave 2)
57	Cache module group number (slave 2)
58	PCB location (main platter)
59	PCB location (main platter)
5A	PCB location (main platter)
5B	PCB location (cache platter 1)
5C	PCB location (cache platter 1)
5D	PCB location (cache platter 2)
5E	PCB location (cache platter 2)
5F	Run option
60 | | | 7F	Additional information (Note 1)

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Byte27 = 8C (SVP Failure) Byte28-35, 40-7F detail

(Note 1) Additional information (for LCDG3 only)

	0	1	2	3	4	5	6	7
60	Reserved							
61								
62								
63								
64	Record type (x‘0F’ : LCP IMPL diagnostic)							
65	Reserved							
66	MP ID (of CHP : x‘10’~x‘17’)							
67	LCP ID (LCP#A : x‘80’~LCP#H : x‘01’)							
68	Error code (Note 2)							
69	Process type (Note 3)							
6A	Error status 1 (Note 4)							
6B								
6C	Error status 2 (Note 5)							
6D								
6E								
6F								
70								
71								
72								
73								
74	Reserved							
|								
7F								

(Note 2) Error code

Code	Meaning	Function	Remarks
0A	LCDG3’ load error	LCDG3’	Make status in loading process
10	Memory clear and test error	LCDG3’	Set LCP address into error status 1
18	LCDG3’ MP detected error	LCDG3	Detail information in error status 1 and 2
1A	LCDG3 load error	LCDG3	Make status in loading process
1F	LCDG3’ error before LCP loading	Main loading	LCDG 3 information in status
20	SCAN detected error	All	MP detected error
2A	LCP main load error	Main loading	Make status in loading process
30	LCPdetected error	LCDG3’	Detail information in error status 1 and 2
|		LCDG3	
FF			

(Note 3) Process type

Code	Process	Remarks
01	LCDG3’	Set loading error status when a loading error occured.
02	LCDG3	Set loading error status when a loading error occured.
03	Loading	

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Byte27 = 8C (SVP Failure) Byte 28-35,40-7F detail

(Note 4) Error status 1

Code	Meaning
0101	LCDG3' activation faild.
010F	LCP terminated after LCDG3' activation.
0118	No notification after LCDG3' communication.
011F	LCP CHK1 occured after LCDG3' activation.
0120	No REQM after LCDG3' completion.
0122	No notification after LCDG3' set CALM.
0123	No notification after LCDG3' set DGIN.
0125	LCP# ≠ Board#
0301	CRC check start error after loading.
030F	LCP terminated after CRC check completion.
0318	No notification for communicatin after CRC check completion.
031F	CHK1 occured in CRC check.
0320	No REQM after CRC check completion.
0322	No notification after CRC check and CALM completion.
0323	No notification after CRC check and DGIN completion.
0325	LCP# ≠ Board#
032F	No CRC check status ID.
0340	CRC check error in LCDG3 loading/Main loaking.
0380	No start address for CRC check routine.
0385	An error occured in configuration/version information transfer for Main loading.
0401	LCDG3 activation for internal diagnosis failed.
040F	LCP terminated after LCDG3' activation.
0418	No notification after communication for internal diagnosis.
041F	LCP CHK1 occured after internal diagnosis activation.
0420	No REQM after internal diagnosis completion.
0422	No notification after internal diagnosis and CALM.
0423	No notification after internal diagnosis and DGIN.
0425	LCP# ≠ Board#
042F	No status ID for internal diagnosis effect.
043F	No parameter ID for internal diagnosis activation.
044F	No activation address ID for internal diagnosis.
04F0	Controller in configutation is inconsistent with rea1 machine.
04F1	Controller in configutation is inconsistent with rea1 machine.
0501	LCDG3 activation for communication diagnosis failed.
050F	LCP terminated after LCDG3' activation.
0518	No notification after communication for communication diagnosis.
051F	LCP CHK1 occured after communication diagnosis activation.
0520	No REQM after communication diagnosis completion.
0522	No notification after communication diagnosis and CALM.
0523	No notification after communication diagnosis and DGIN.
0525	LCP# ≠ Board#
052F	No effect status ID for communication diagnosis.
053F	No activation parameter ID for communication diagnosis.
054F	No activation address ID for communication diagnosis.
1000-FFFF	An error address of memory clear test (when error code = x'10')
1000-FFFF	LCDG3 error code for internal/communication diagnosis (when error code ≥ x'30')
XXXX	MP error code for LCDG3 communication diagnosis (when error code = x'18')

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(Note 5) Error status 2

(1) When process type = x‘01’ and error code ≥ x‘30’ and error status 1 ≥ x‘1000’, LCP error code for LCDG3’.
(2) When process type = x‘02’ and error code ≥ x‘30’ and error status 1 ≥ x‘1000’), LCP error code for LCDG3.
(3) When process type = x‘02’ and error code = x‘18’,
    Byte 6C-6D : Error register address
    Byte 6E-6F : Active register value.
    Byte 70-71 : Expected register value
    Byte 72-73 : Return sequence
(4) When other case, this value is invalid.

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Byte27 = 8C (SVP Failure) Byte28-35,40-7F detail

(4) BOOT detected error

	0	1	2	3	4	5	6	7
28								
29								
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32								
33								
34								
35								
40								
|								
4F								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
5A								
5B								
5C								
5D								
5E								
5F								
60								
|								
7F								

'BOOT ERR' (x'42 4F 4F 54 20 45 52 52')

Error type code (x'0009')

Error code (x'0000X000' X:Processor number)

Error detection point

Reserved

Error code for loading error

Error code of internal interface

Error code of initialization function (Note 1)

Reserved

(Note 1) Error code of initialization function.

x'31000041' : Forcible start with jumper pin.

x'40000041' : Load module ID in FM is incorrect.
(FM writing was failed or load module is incorrect)

x'42000041' : Sum check error of FM.
(Failure occured at FM writing or input/output error of FM occurred)

x'48000041' : This MP has the micro-programs which type is different from the PCB name.
(In the MP-Install procedure, the package may have been set which type is different from one that is specified in the define configuration.)

x'56000041' : Sum check error of the load module.
(SVP Failure occured)

Others : Loading for the load module impossible.
(The load module was incorrect)

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Byte27 = 8D (Power Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low order)							
26	Cylinder address (high order)				Head address			
27	Format (x‘8’)				Message (x‘D’)			
28	Hardware information (See following pages)							
29								
2A								
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Not used							
33								
34	PCB							
35	SSID of self subsystem (low order)							
36	Sympton code (x‘FF8D’ : LDEV type = DKU87I/x‘EF8D’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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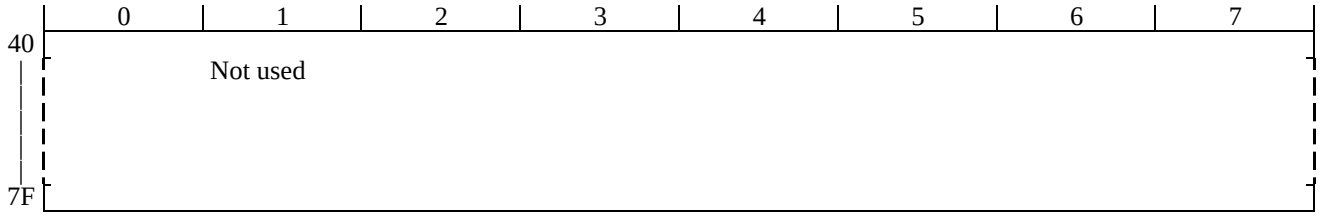
Byte27 = 8D (Power Failure) (2/2)



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Byte27 = 8D (DKU/HDU Power Failure) Hard information

	0	1	2	3	4	5	6	7
28	Subcode : x‘80’ : DKA detected DKU/HDU Power Failure							
29	Failure detected PDEV							
	SPC Pass# (0 ~ 3)				SCSI id# (0 ~ x‘F’)			
2A	PDEV Power Status (SPC Pass#0, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
2B	PDEV Power Status (SPC Pass#0, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
2C	PDEV Power Status (SPC Pass#1, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
2D	PDEV Powr Status (SPC Pass#1, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
2E	PDEV Power Status (SPC Pass#2,basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
2F	PDEV Power Status (SPC Pass#2, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
30	PDEV Power Status (SPC Pass#3, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
31	PDEV Power Status (SPC Pass#3, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)

(*) BYTE32 ~ 7F : Not Used

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Byte27 = 8D (DKU/HDU Power Failure) Hard information

	0	1	2	3	4	5	6	7
28	Subcode : x‘90’ : DKA detected DKU/HDU Power Failure							
29	Failure HDU (SPC Pass) before restore detected							
	0				Pass#3 Status	Pass#2 Status	Pass#1 Status	Pass#0 Status
2A	PDEV Power Status (SPC Pass#0, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
2B	PDEV Power Status (SPC Pass#0, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
2C	PDEV Power Status (SPC Pass#1, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
2D	PDEV Powr Status (SPC Pass#1, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
2E	PDEV Power Status (SPC Pass#2,basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
2F	PDEV Power Status (SPC Pass#2, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)
30	PDEV Power Status (SPC Pass#3, basic DKU box)							
	PDEV (id# x‘F’)	PDEV (id# x‘E’)	PDEV (id# x‘D’)	PDEV (id# x‘C’)	PDEV (id# x‘B’)	PDEV (id# x‘A’)	PDEV (id# x‘9’)	PDEV (id# x‘8’)
31	PDEV Power Status (SPC Pass#3, extent DKU box)							
	PDEV (id# x‘7’)	PDEV (id# x‘6’)	PDEV (id# x‘5’)	PDEV (id# x‘4’)	PDEV (id# x‘3’)	PDEV (id# x‘2’)	PDEV (id# x‘1’)	PDEV (id# x‘0’)

(*) BYTE32 ~ 7F : Not Used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 0X/1X/2X/3X/FE (CHK1A/WCHK1) (1/5)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	Reserved							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device no.				
25	Cylinder addres (low order)							
26	Cylinder address (high order)							
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘00’ ~ x‘38’/x‘FE’)							
29	Hardware information (See following pages)							
|								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

Note : Failed processor number for WCHK1

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Byte27 = 8E & Byte34 = X0 & Byte28 = 0X/1X/2X/3X/FE (CHK1A/WCHK1) (2/5)

	0	1	2	3	4	5	6	7
40	FREE AREA FORMAT No.							
	‘00’							
41	HMIC::ERRSTS							
	Not used	Not used	Not used	Not used	Not used	WCHK1	CHK1B	CHK1A
42	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	i960 parity error	LANC parity error	CHK1A at FM
43	HMIC::C1WSTS							
	CHK1A detected	WCHK1 detected	CHK1A at MPCHK	CHK1A at SRAM	CHK1A at DRAM	WCHK1 at MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
44	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
45	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						
46	HMIC::DRAMCNTRLERR							
	DRAM CTL signal RAS0 error	DRAM CTL signal RAS1 error	DRAM CTL signal CAS0 error	DRAM CTL signal CAS1 error	DRAM CTL signal WE0/1 error	DRAM CTL signal OE0/1 error	DRAM CTL signal ROW ADDRESS error	DRAM CTL signal COLUM ADDRESS error
47	HMIC::ERADR							
	Address from L bus							
48	HMIC::ERADR							
	Address from L bus							
49	HMIC::ERADR							
	Address from L bus							
4A	HMIC::ERADR							
	Address from L bus						Not used	Not used
4B	HMIC::ERBYT							
	Not used	Not used	Not used	Not used	REQ0 to REQ3 signals from L bus			
4C	HMIC::ERORD							
	Data before correction							
4D	HMIC::ERORD							
	Data before correction							
4E	HMIC::ERORD							
	Data before correction							
4F	HMIC::ERORD							
	Data before correction							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 0X/1X/2X/3X/FE (CHK1A/WCHK1) (3/5)

	0	1	2	3	4	5	6	7
50		HMIC::ERORC						
		Check bit before correction						
51		HMIC::ERSYD						
		Syndrome of the object in which the error was detected						
52		HMIC::ERWR						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
53		HMIC::MPCERRSTS						
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
54		HMIC::LAST1IP						
		Last address before CHK1A occurred						
55		HMIC::LAST1IP						
		Last address before CHK1A occurred						
56		HMIC::LAST1IP						
		Last address before CHK1A occurred						
57		HMIC::LAST1IP						
		Last address before CHK1A occurred			Not used	Not used	Not used	Not used
58		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred						
59		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred						
5A		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred						
5B		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred			Not used	Not used	Not used	Not used
5C		HMIC::LAST3IP						
		Address two generations older than the last one before CHK1A occurred						
5D		HMIC::LAST3IP						
		Address two generations older than the last one before CHK1A occurred						
5E		HMIC::LAST3IP						
		Address two generations older than the last one before CHK1A occurred						
5F		HMIC::LAST3IP						
		Address two generations older than the last one before CHK1A occurred			Not used	Not used	Not used	Not used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 0X/1X/2X/3X/FE (CHK1A/WCHK1) (4/5)

	0	1	2	3	4	5	6	7
60	HMIC::LAST4IP							
	Address three generations older than the last one before CHK1A occurred							
61	HMIC::LAST4IP							
	Address three generations older than the last one before CHK1A occurred							
62	HMIC::LAST4IP							
	Address three generations older than the last one before CHK1A occurred							
63	HMIC::LAST4IP							
	Address three generations older than the last one before CHK1A occurred				Not used	Not used	Not used	Not used
64	HMIC::LAST1							
	Last execution address before CHK1A occurred							
65	HMIC::LAST1							
	Last execution address before CHK1A occurred							
66	HMIC::LAST1							
	Last execution address before CHK1A occurred							
67	HMIC::LAST1							
	Last execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
68	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
69	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
6A	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
6B	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
6C	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
6D	HMIC::SRAMERRSTS							
	Not used	Not used	Upper address loop check error		Loop check error of SRAM CTL signel (OE-N)		Loop check error of SRAM CTL signel (WE-N)	
6E	HMIC::SRAMERRSTS							
	Lower address loop check error		Not used	LAN access error	Sequencer state error	Sequencer parity error	Acces to write-protect area	
6F	HMIC::SRAMERRSTS							
	Parity error in reading from SRAM							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 0X/1X/2X/3X/FE (CHK1A/WCHK1) (5/5)

	0	1	2	3	4	5	6	7
70	HMIC::SRAMERRSDR							
	Error address in access to SRAM							
71	HMIC::SRAMERRSDR							
	Error address in access to SRAM							
72	HMIC::SRAMERRSDR							
	Error address in access to SRAM							
73	HMIC::SRAMERRSDR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold
74	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
75	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
76	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B at SRAM CTLR	CHK1B at CHA/DRR	CHK1B at SMP	CHK1B at MIC
77	HMIC::CHK1BSTS							
	XR0 (SCA#0) CHK1B	XR1 (SCA#1) CHK1B	XR2 (SCA#2) CHK1B	XR3 (SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B at DRAM CTLR
78	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
79	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
7A	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
7B	HMIC::CECNT							
	Correctable error counter (for lower address bank)							
7C	HMIC::CECNT							
	Correctable error counter (for upper address bank)							
7D	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
7E	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	MIC internal bus parity error	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
7F	MIC::MICCHK1STS							
	LAN hold timeout	Wait timeout	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus parity error	XR data parity error

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(1) I960 uncorrectable error

	0	1	2	3	4	5	6	7
28	Subcode x‘00’: I960 uncorrecctable error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::ERORD							
	Data before correction							
2E	HMIC::ERORD							
	Data before correction							
2F	HMIC::ERORD							
	Data before correction							
30	HMIC::ERORD							
	Data before correction							
31	HMIC::CHK1ASTS							
	i960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(2) LM access sequencer error

	0	1	2	3	4	5	6	7
28	Subcode x‘01’: LM access sequencer error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2B	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2D	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(3) LM access sequencer parity error

	0	1	2	3	4	5	6	7
28	Subcode x‘02’: LM access sequencer parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2B	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2D	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(4) DRAM control line error

	0	1	2	3	4	5	6	7
28	Subcode x‘03’: DRAM control line error							
29	HMIC::DRAMCTRLERR							
	DRAM CTL signal RAS0 error	DRAM CTL signal RAS1 error	DRAM CTL signal CAS0 error	DRAM CTL signal CAS1 error	DRAM CTL signal WE0/1 error	DRAM CTL signal OE0/1 error	DRAM CTL signal ROW ADDRESS error	DRAM CTL signal COLUM ADDRESS error
2A	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2B	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2D	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(5) SRAM write parity error

	0	1	2	3	4	5	6	7
28	Subcode x'04': SRAM write parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(6) SRAM read parity error

	0	1	2	3	4	5	6	7
28	Subcode x'05': SRAM read parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(7) SRAM address line error

	0	1	2	3	4	5	6	7
28	Subcode x‘06’: SRAM address line error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(8) SRAM control line error

	0	1	2	3	4	5	6	7
28	Subcode x‘07’: SRAM control line error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(9) SRAM sequencer state error

	0	1	2	3	4	5	6	7
28	Subcode x‘08’: SRAM sequencer state error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(10) SRAM sequencer parity error

	0	1	2	3	4	5	6	7
28	Subcode x'09': SRAM sequencer parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(11) FM sequencer parity error

	0	1	2	3	4	5	6	7
28	Subcode x'0A': FM sequencer parity error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(12) FM control line error

	0	1	2	3	4	5	6	7
28	Subcode x‘0B’: FM control line error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(13) i960 read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'0C': i960 read data parity error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2C	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2D	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(14) LANC read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'0D': LANC read data parity error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2C	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2D	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(15) I960 LM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x‘10’: I960 LM write protect error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
2E	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
2F	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
30	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(16)I960 LM address over error

	0	1	2	3	4	5	6	7
28	Subcode x‘11’: I960 LM address over error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
2E	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
2F	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
30	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(17) LANC LM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x'12': LANC LM write protect error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
2E	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
2F	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
30	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(18) LANC LM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'13': LANC LM address over error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
2E	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
2F	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	
30	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(19) SRAM LANC access error

	0	1	2	3	4	5	6	7
28	Subcode x‘14’: SRAM LANC access error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(20) SRAM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x'15': SRAM write protect error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(21) SRAM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'16': SRAM address over error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(22) FM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x'17': FM write protect error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(23) FM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'18': FM address over error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : WCHK1) Byte28-31 Detail

(24) MP check error

	0	1	2	3	4	5	6	7
28	Subcode x'19': MP check error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
2C	MIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	MIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(25) I960 uncorrectable error

	0	1	2	3	4	5	6	7
28	Subcode x‘20’: I960 uncorrecctable error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::ERORD							
	Data before correction							
2E	HMIC::ERORD							
	Data before correction							
2F	HMIC::ERORD							
	Data before correction							
30	HMIC::ERORD							
	Data before correction							
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(26) LM access sequencer error

	0	1	2	3	4	5	6	7
28	Subcode x'21': LM access sequencer error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2B	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2D	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(27) LM access sequencer parity error

	0	1	2	3	4	5	6	7
28	Subcode x‘22’: LM access sequencer parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2B	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2D	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(28) DRAM control line error

	0	1	2	3	4	5	6	7
28	Subcode x‘23’: DRAM control line error							
29	HMIC::DRAMCTRLERR							
	DRAM CTL signal RAS0 error	DRAM CTL signal RAS1 error	DRAM CTL signal CAS0 error	DRAM CTL signal CAS1 error	DRAM CTL signal WE0/1 error	DRAM CTL signal OE0/1 error	DRAM CTL signal ROW ADDRESS error	DRAM CTL signal COLUM ADDRESS error
2A	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2B	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
2D	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(29) SRAM write parity error

	0	1	2	3	4	5	6	7
28	Subcode x'24': SRAM write parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(30) SRAM read parity error

	0	1	2	3	4	5	6	7
28	Subcode x'25': SRAM read parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(31) SRAM address line error

	0	1	2	3	4	5	6	7
28	Subcode x‘26’: SRAM address line error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(32) SRAM control line error

	0	1	2	3	4	5	6	7
28	Subcode x‘27’: SRAM control line error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(33) SRAM sequencer state error

	0	1	2	3	4	5	6	7
28	Subcode x‘28’: SRAM sequencer state error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(34) SRAM sequencer parity error

	0	1	2	3	4	5	6	7
28	Subcode x‘29’: SRAM sequencer parity error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(35) FM sequencer parity error

	0	1	2	3	4	5	6	7
28	Subcode x'2A': FM sequencer parity error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(36) FM control line error

	0	1	2	3	4	5	6	7
28	Subcode x‘2B’: FM control line error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(37) I960 read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'2C': I960 read data parity error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2C	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2D	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(38) LANC read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x‘2D’: LANC read data parity error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2C	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2D	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(39) I960 LM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x'30': I960 LM write protect error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
2E	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
2F	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
30	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(40) I960 LM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'31': I960 LM address over error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
2E	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
2F	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
30	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(41) LANC LM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x'32': LANC LM write protect error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (high)							
2E	HMIC::LMWRADRU							
	Upper limit address of writable LM mounting area (low)						Not used	Not used
2F	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (high)							
30	HMIC::LMWRADRL							
	Lower limit address of writable LM mounting area (low)						Not used	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(42) LANC LM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'33': LANC LM address over error							
29	HMIC::ERADR							
	Address from L bus							
2A	HMIC::ERADR							
	Address from L bus							
2B	HMIC::ERADR							
	Address from L bus							
2C	HMIC::ERADR							
	Address from L bus						Not used	Not used
2D	HMIC::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM mounting area	
2E	HMIC::LMADRLMT							
	Upper limit address of LM mounting area							
2F	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
30	HMIC::ERSTS0							
	Not used	Not used	Not used	CHK1A cause detected	CHK1B cause detected	LM, XR Access error in scanning	DRAM control signal error	Not used
31	HMIC::CHK1ASTS							
	I960→LM access Uncorrectable error		I960 → LM write protect	I960 → LM out of area	LM sequencer error	LM sequencer parity error	LANC→LM write protect	LANC→LM out of area
	Bank 0	Bank 1						

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(43) SRAM LANC access error

	0	1	2	3	4	5	6	7
28	Subcode x‘34’: SRAM LANC access error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(44) SRAM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x‘35’: SRAM write protect error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(45) SRAM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'36': SRAM address over error							
29	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2A	HMIC::SRAMERRSTS							
	Data parity error in writing to SRAM							
2B	HMIC::SRAMERRSTS							
	Not used	Not used	Loop check error was detected in upper address		Loop check error was detected in SRAM control signal (OE-N)		Loop check error was detected in SRAM control signal (WE-N)	
2C	HMIC::SRAMERRSTS							
	Loop check error was detected in lower address		Not used	LAN access error was detected	Sequencer state error occurred	Sequencer parity error occurred	Access to write-protect area	Access to out of area of SRAM
2D	HMIC::SRAMERRSTS							
	Parity error occurred in reading from SRAM							
2E	HMIC::SRAMERRADR							
	Error address in access to SRAM							
2F	HMIC::SRAMERRADR							
	Error address in access to SRAM							
30	HMIC::SRAMERRADR							
	Error address in access to SRAM							
31	HMIC::SRAMERRADR							
	Error address in access to SRAM						Write/Read flag hold	CMD/Data flag hold

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(46) FM write protect error

	0	1	2	3	4	5	6	7
28	Subcode x'37': FM write protect error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(47) FM address over error

	0	1	2	3	4	5	6	7
28	Subcode x'38': FM address over error							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	HMIC::FMERRSTS							
	Not used	Not used	Not used	Not used	Access to out of FM area	Write to FM write protect area	Parity error of FM CTL sequencer	VPPON signal error
2C	HMIC::FMERRSTS							
	FMCS0 signal error	FMCS1 signal error	FMCS2 signal error	FMCS3 signal error	FMOE signal error	FMWE signal error	FMBDIR signal error	FMBENB signal error
2D	Not used							
2E	HMIC::LAST1							
	Execution address before CHK1A occurred							
2F	HMIC::LAST1							
	Execution address before CHK1A occurred							
30	HMIC::LAST1							
	Execution address before CHK1A occurred							
31	HMIC::LAST1							
	Execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address

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Byte27 = 8E (Processor failure : CHK1A) Byte28-31 Detail

(48) CHK1A

	0	1	2	3	4	5	6	7
28	Subcode x'FE': CHK1A undefined hardware reason							
29	HMIC::C1WSTS							
	Not used	Not used	Not used	Not used	Not used	I960 parity error was detected	LANC parity error was detected	CHK1A was detected in FM
2A	HMIC::C1WSTS							
	CHK1A occurred	WCHK1 occurred	CHK1A occurred in MPCHK	CHK1A occurred at SRAM	CHK1A occurred at DRAM	WCHK1 occurred in MPCHK	WCHK1 by CHK1A in CHK1A	Micro-force WCHK1
2B	Not used							
2C	Not used							
2D	Not used							
2E	Not used							
2F	Not used							
30	Not used							
31	Not used							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 44/50 ~ 54 (CHA CHK1B) (1/6)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	Reserved							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device no.				
25	Cylinder addres (low order)							
26	Cylinder address (high order)							
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘40’ ~ x‘44’/x‘50’ ~ x‘54’)							
29	Hardware information (See following pages)							
|								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = 6587/x‘EF8E’ : LDEV type = 6586)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 44/50 ~ 54 (CHA CHK1B) (2/6)

	0	1	2	3	4	5	6	7
40	FREE AREA FORMAT No.							
	'01'							
41	HMIC::ERRSTS							
	Not used	Not used	Not used	Not used	Not used	WCHK1	CHK1B	CHK1A
42	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
43	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
44	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
45	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
46	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
47	HMIC::CHK1BADRS							
	Address when CHK1B occurred						WR/RD flag in CHK1B	Command/ Data flag in CHK1B
48	HMIC::CHK1BBE							
	Not used	Not used	Not used	Not used	I960BE0 in CHK1B	I960BE1 in CHK1B	I960BE2 in CHK1B	I960BE3 in CHK1B
49	HMIC::MICPERSTS							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
4A	HMIC::XRADRPERR							
	Not used	Not used	Not used	XR bus address parity error reset				
				<30-35, BE>	<Byte 0>	<Byte 1>	<Byte 2>	<Byte 3>
4B	HMIC::XBUSDTPERR							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
4C	HMIC::LAST1IP							
	Last address before CHK1A occured							
4D	HMIC::LAST1IP							
	Last address before CHK1A occured							
4E	HMIC::LAST1IP							
	Last address before CHK1A occurred							
4F	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 44/50 ~ 54 (CHA CHK1B) (3/6)

	0	1	2	3	4	5	6	7
50	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
51	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
52	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
53	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred				Not used	Not used	Not used	Not used
54	HMIC::LAST1							
	Last execution address before CHK1A occurred							
55	HMIC::LAST1							
	Last execution address before CHK1A occurred							
56	HMIC::LAST1							
	Last execution address before CHK1A occurred							
57	HMIC::LAST1							
	Last execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
58	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
59	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
5A	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
5B	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
5C	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error <00-07>	L bus data parity error <10-17>	L bus data parity error <20-27>	L bus data parity error <30-37>
5D	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
5E	HMIC::CHK3STS							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	CHK3 error in SMP, LSI
5F	HMIC::RSTSTS							
	Not used	Not used	Micro CHK1B occurred	Micro CHK1A occurred	Micro MCNRST2 occurred	Micro MCNRST1 occurred	Micro MPRST occurred	Micro MNTRST occurred

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Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 44/50 ~ 54 (CHA CHK1B) (4/6)

	0	1	2	3	4	5	6	7
60	HMIC::RSTSTS							
	Not used	Not used	SCAN mode set occurred	CHK1A occurred	WCHK1 occurred	SELRST occurred	SYSRST occurred	Power-on reset occurred
61	HMIC::DBGUVP0123							
	Data of port UP<00-07>-P (input value)							
62	DSMP::CHK1B							
	Address parity error in accessing REG in FM/SMP				Data parity error in accessing REG in FM/SMP			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
63	DSMP::SMPERROR							
	Not used	Not used	Not used	Not used	Not used	CHK3 error Master	CHK3 error Slave	CHK1 error
64	DSMP::WDTPER							
	Data paruty error in word 0 of write-data				Data paruty error in word 1 of write-data			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
65	DSMP::WDTPER							
	Data paruty error in word 2 of write-data				Data paruty error in word 3 of write-data			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
66	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space							
67	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space							
68	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space							
69	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space						Not used	Not used
6A	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6B	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6C	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6D	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6E	DSMP::WRBE							
	Not used	Not used	Not used	I960 WR/RD flag	I960 Byte Enable			
					BE0:TXD <00-07>	BE0:TXD <10-17>	BE0:TXD <20-27>	BE0:TXD <30-37>
6F	DSMP::TXSEQ							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	State corresponding to master sequencer

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Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 44/50 ~ 54 (CHA CHK1B) (5/6)

	0	1	2	3	4	5	6	7
70		DSMP::TXSEQ						
		SEQ 01-08						
71		DSMP::TXSEQ						
		SEQ 09-16						
72		CHA::XFC						
	Data transfer valid	Data transfer execution	Not used	Not used	CBP mode	Inhibit CPF ptr increment	Cache I/O reg access	SSD mode
73		CHA::XFC						
	DATA PATH 0	DATA PATH 1	DATA PATH 2	DATA PATH 3	Not used	FBUS 0	FBUS 1	FBUS 2
74		CHA::PCMD2						
	Fixed length	BM bus mode			TM transfer mode			
75		CHA::XFS0						
	CHA transfer end	Retry request from BSA0	Retry request from BSA1	Packet flow count reg status	CHK2 occurred	EADP CHK2 occurred	CHA CHK2 occurred	BSA0 CHK2 occurred
76		CHA::XFS0						
	BSA1 CHK2 occurred	Yruncation occurred	HOLT I/O occurred	Result of SEARCH DASD=CPU	Result of SEARCH DASD>CPU	Result of SEARCH DASD<CPU	Retry occurred	Abort occurred
77		CHA::XFS1						
	ESCON/ METAL flag	XFR MODE0	XFR MODE1	MP retry occurred	MP abort occurred	CHA abort occurred	Pseud error (CHK1B)	Pseud error (CHK2)
78		CHA::XFS1						
	Next segment address reg status	BSA0 Last packet XFR end (when read)	BSA1 Last packet XFR end (when read)	BSA0 CHK1B	BSA1 CHK1B	Next segment address wait	Packet flow counter zero	MCN PST occurred
79		CHA::MPCHK1B						
	XR address 2 parity error	XR address 3 parity error	DBUS parity error 0 (write data)	DBUS parity error 1 (write data)	BBUS parity error 0 (read data)	BBUS parity error 1 (read data)	XR address decode error 2	XR address decode error 3

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Byte27 = 8E & Byte34 = X0 & Byte28 = 40 ~ 44/50 ~ 54 (CHA CHK1B) (6/6)

	0	1	2	3	4	5	6	7
7A		CHA::MPCHK1B						
	CHA clock error	Micro access error	Not used	Not used	Not used	Not used	Not used	Not used
7B		ADP::CCK10						
	Even CD DECODE signals are decoded at same time	CD address parity error	CB address parity error	BBUS data parity error	DBUS data parity error	Not used	Not used	Not used
7C		ADP::CCK11						
	I960 MP I/F address parity error	I960 MP I/F upper data bus WR parity error	I960 MP I/F lower data bus WR parity error	I960 MP I/F upper data bus RD parity error	I960 MP I/F lower data bus RD parity error	Not used	Not used	Not used
7D		ADP::LSTA						
	LCM is BUSY state	LCP is STOP state	ADRCMP is coincident	LCM stopped by TRACER stop condition	LCM detects ADP-LCM communica-tion error	LCM detects DOUBLE CHK1	LCM is PATH-DISABLE state	Connected LCM is for Parallel channel
7E		QBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
7F		QBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(1) SIP CHA CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'40': SIP CHA CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	CHA::MPCHK1B							
	XR address 2 parity error	XR address 3 parity error	DBUS parity error 0 (write data)	DBUS parity error 1 (write data)	BBUS parity error 0 (read data)	BBUS parity error 1 (read data)	XR address decode error 2	XR address decode error 3
2C	CHA::MPCHK1B							
	CHA clock error	Micro access error	Not used	Not used	Not used	Not used	Not used	Not used
2D	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(2) SIP ADP CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'41': SIP ADP CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		ADP::CCK10						
	Even CD DECODE signals are decoded at same time	CD address parity error	CB address parity error	BBUS data parity error	DBUS data parity error	Not used	Not used	Not used
2C		ADP::CCK11						
	I960 MP I/F address parity error	I960 MP I/F upper data bus WR parity error	I960 MP I/F lower data bus WR parity error	I960 MP I/F upper data bus RD parity error	I960 MP I/F lower data bus RD parity error	Not used	Not used	Not used
2D		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30		HMIC::XRADRSPER						
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31		HMIC::XBUSDTPER						
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(3) DSMP CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'42': DSMP CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DSMP::CHK1B						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Burst data parity error
2C		DSMP::CHK1B						
	Address parity error byte0 FM/SMP access REG	Address parity error byte1 FM/SMP access REG	Address parity error byte2 FM/SMP access REG	Address parity error byte3 FM/SMP access REG	Data parity error byte0 FM/SMP access REG	Data parity error byte1 FM/SMP access REG	Data parity error byte2 FM/SMP access REG	Data parity error byte3 FM/SMP access REG
2D		DSMP::WDTPERR						
	WR data parity error word0, byte0	WR data parity error word0, byte1	WR data parity error word0, byte2	WR data parity error word0, byte3	WR data parity error word1, byte0	WR data parity error word1, byte1	WR data parity error word1, byte2	WR data parity error word1, byte3
2E		DSMP::WDTPERR						
	WR data parity error word2, byte0	WR data parity error word2, byte1	WR data parity error word2, byte2	WR data parity error word2, byte3	WR data parity error word3, byte0	WR data parity error word3, byte1	WR data parity error word3, byte2	WR data parity error word3, byte3
2F		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
30		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
31		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(4) QBSA0 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x‘43’: QBSA0 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		QBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2C		QBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2D		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30		HMIC::XRADRSPER						
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31		HMIC::XBUSDTPER						
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(5) QBSA1 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'44': QBSA1 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		QBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2C		QBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2D		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30		HMIC::XRADRSPER						
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31		HMIC::XBUSDTPER						
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(6) SIP CHA CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'50': SIP CHA CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	CHA::MPCHK1B							
	XR address 2 parity error	XR address 3 parity error	DBUS parity error 0 (write data)	DBUS parity error 1 (write data)	BBUS parity error 0 (read data)	BBUS parity error 1 (read data)	XR address decode error 2	XR address decode error 3
2C	CHA::MPCHK1B							
	CHA clock error	Micro access error	Not used	Not used	Not used	Not used	Not used	Not used
2D	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30	HMIC::XRADRSPER							
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31	HMIC::XBUSDTPER							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(7) SIP ADP CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'51': SIP ADP CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		ADP::CCK10						
	Even CD DECODE signals are decoded at same time	CD address parity error	CB address parity error	BBUS data parity error	DBUS data parity error	Not used	Not used	Not used
2C		ADP::CCK11						
	I960 MP I/F address parity error	I960 MP I/F upper data bus WR parity error	I960 MP I/F lower data bus WR parity error	I960 MP I/F upper data bus RD parity error	I960 MP I/F lower data bus RD parity error	Not used	Not used	Not used
2D		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30		HMIC::XRADRSPER						
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31		HMIC::XBUSDTPER						
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(8) QBSA0 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x‘53’: QBSA0 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		QBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2C		QBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2D		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30		HMIC::XRADRSPER						
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31		HMIC::XBUSDTPER						
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(9) QBSA1 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'54': QBSA1 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		QBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2C		QBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2D		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2E		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2F		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
30		HMIC::XRADRSPER						
	Not used	Not used	Not used	XR bus address parity error reset 30-35	XR bus address parity error reset (Byte0-3)			
31		HMIC::XBUSDTPER						
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>

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Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) (1/6)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	Reserved							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device no.				
25	Cylinder addres (low order)							
26	Cylinder address (high order)							
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘45’ ~ x‘46’/x‘55’ ~ x‘58’)							
29	Hardware information (See following pages)							
|								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = 6587/x‘EF8E’ : LDEV type = 6586)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) (2/6)

	0	1	2	3	4	5	6	7
40	FREE AREA FORMAT No.							
	'02'							
41	HMIC::ERRSTS							
	Not used	Not used	Not used	Not used	Not used	WCHK1	CHK1B	CHK1A
42	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
43	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
44	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
45	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
46	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
47	HMIC::CHK1BADRS							
	Address when CHK1B occurred						WR/RD flag in CHK1B	Command/ Data flag in CHK1B
48	HMIC::CHK1BBE							
	Not used	Not used	Not used	Not used	I960BE0 in CHK1B	I960BE1 in CHK1B	I960BE2 in CHK1B	I960BE3 in CHK1B
49	HMIC::MICPERSTS							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
4A	HMIC::XRADRPERR							
	Not used	Not used	Not used	XR bus address parity error reset				
				<30-35, BE>	<Byte 0>	<Byte 1>	<Byte 2>	<Byte 3>
4B	HMIC::XBUSDTPERR							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
4C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
4D	HMIC::LAST1IP							
	Last address before CHK1A occurred							
4E	HMIC::LAST1IP							
	Last address before CHK1Aoccurred							
4F	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) (3/6)

	0	1	2	3	4	5	6	7
50	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
51	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
52	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
53	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred				Not used	Not used	Not used	Not used
54	HMIC::LAST1							
	Last execution address before CHK1A occurred							
55	HMIC::LAST1							
	Last execution address before CHK1A occurred							
56	HMIC::LAST1							
	Last execution address before CHK1A occurred							
57	HMIC::LAST1							
	Last execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
58	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
59	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
5A	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
5B	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
5C	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error <00-07>	L bus data parity error <10-17>	L bus data parity error <20-27>	L bus data parity error <30-37>
5D	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
5E	HMIC::RSTSTS							
	Not used	Not used	Micro CHK1B occurred	Micro CHK1A occurred	Micro MCNRST2 occurred	Micro MCNRST1 occurred	Micro MPRST occurred	Micro MNTRST occurred
5F	HMIC::RSTSTS							
	Not used	Not used	SCAN MODE SET occurred	CHK1A occurred	WCHK1 occurred	SELRST occurred	SYSRST occurred	Power-on reset occurred

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Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) (4/6)

	0	1	2	3	4	5	6	7
60	HMIC::CHK3STS							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	CHK3 error in SMP, LSI
61	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
62	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
63	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
64	HMIC::ERADR							
	Address from L bus							
65	HMIC::ERADR							
	Address from L bus							
66	HMIC::ERADR							
	Address from L bus							
67	HMIC::ERADR							
	Address from L bus						Not used	Not used
68	HMIC::ERBYT							
	Not used	Not used	Not used	Not used	BE0 - 3 signals from L bus			
69	HMIC::ERORD							
	Data before correction							
6A	HMIC::ERORD							
	Data before correction							
6B	HMIC::ERORD							
	Data before correction							
6C	HMIC::ERORD							
	Data before correction							
6D	HMIC::ERORC							
	Check bit before correction							
6E	HMIC::ERCRD							
	Data after correction							
6F	HMIC::ERCRD							
	Data after correction							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) (5/6)

	0	1	2	3	4	5	6	7
70	HMIC::ERCRD							
	Data after correction							
71	HMIC::ERCRD							
	Data after correction							
72	HMIC::ERCRC							
	Check bit after correction							
73	HMIC::ERSYD							
	Syndrome of the object in which the error was detected							
74	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
75	HMIC::CECNT							
	Correctable error counter (for lower address bank)							
76	HMIC::CECNT							
	Correctable error counter (for upper address bank)							
77	DSMP::CHK1B							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Burst write data parity error
78	DSMP::CHK1B							
	Address parity error in accessing REG in FM/SMP				Data parity error in accessing REG in FM/SMP			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
79	DSMP::SMPERROR							
	Not used	Not used	Not used	Not used	Not used	CHK3 error Master	CHK3 error Slave	CHK1 error

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Byte27 = 8E & Byte34 = X0 & Byte28 = 45 ~ 46/55 ~ 58 (CHA CHK1B) (6/6)

	0	1	2	3	4	5	6	7
7A	CHA::MPCHK1B							
	XR address 2 parity error	XR address 3 parity error	DBUS parity error 0 (write data)	DBUS parity error 1 (write data)	BBUS parity error 0 (read data)	BBUS parity error 1 (read data)	XR address decode error 2	XR address decode error 3
7B	CHA::MPCHK1B							
	CHA clock error	Micro access error	Not used	Not used	Not used	Not used	Not used	Not used
7C	ADP::CCK10							
	Even CD DECODE signals are decoded at same time	CD address parity error	CB address parity error	BBUS data parity error	DBUS data parity error	Not used	Not used	Not used
7D	ADP::CCK11							
	I960 MP I/F address parity error	I960 MP I/F upper data bus WR parity error	I960 MP I/F lower data bus WR parity error	I960 MP I/F upper data bus RD parity error	I960 MP I/F lower data bus RD parity error	Not used	Not used	Not used
7E	QBSA0::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
7F	QBSA1::CK1BST0							
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(1) HMIC CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'45': HMIC CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
2F	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
30	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
31	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(2) HMIC DRAM CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'46': HMIC DRAM CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
2C	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
2D	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
2E	HMIC::ERADR							
	Address from L bus							
2F	HMIC::ERADR							
	Address from L bus							
30	HMIC::ERADR							
	Address from L bus							
31	HMIC::ERADR							
	Address from L bus						Not used	Not used

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(3) HMIC CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'55': HMIC CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
2F	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
30	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
31	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(4) HMIC DRAM CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'56': HMIC DRAM CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::ERADR							
	Address from L bus							
2F	HMIC::ERADR							
	Address from L bus							
30	HMIC::ERADR							
	Address from L bus							
31	HMIC::ERADR							
	Address from L bus						Not used	Not used

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(5) I960 read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'57': I960 read data parity error							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
2F	HMIC:: DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
30	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
31	Not used							

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Byte27 = 8E (Processor failure : CHA CHK1B) Byte28-31 Detail

(6) LANC read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'58': LANC read data parity error							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
2F	HMIC:: DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
30	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
31	Not used							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) (1/6)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	Reserved							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device no.				
25	Cylinder addres (low order)							
26	Cylinder address (high order)							
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘60’ ~ x‘64’/x‘70’ ~ x‘74’)							
29	Hardware information (See following pages)							
|								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = 6587/x‘EF8E’ : LDEV type = 6586)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) (2/6)

	0	1	2	3	4	5	6	7
40	FREE AREA FORMAT No.							
	'03'							
41	HMIC::ERRSTS							
	Not used	Not used	Not used	Not used	Not used	WCHK1	CHK1B	CHK1A
42	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
43	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
44	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
45	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
46	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
47	HMIC::CHK1BADRS							
	Address when CHK1B occurred						WR/RD flag in CHK1B	Command/ Data flag in CHK1B
48	HMIC::CHK1BBE							
	Not used	Not used	Not used	Not used	I960BE0 in CHK1B	I960BE1 in CHK1B	I960BE2 in CHK1B	I960BE3 in CHK1B
49	HMIC::MICPERSTS							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
4A	HMIC::XRADRPERR							
	Not used	Not used	Not used	XR bus address parity error reset				
				<30-35, BE>	<Byte 0>	<Byte 1>	<Byte 2>	<Byte 3>
4B	HMIC::XBUSDTPERR							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
4C	HMIC::LAST1IP							
	Last address before CHK1A occurred							
4D	HMIC::LAST1IP							
	Last address before CHK1A occurred							
4E	HMIC::LAST1IP							
	Last address before CHK1A occurred							
4F	HMIC::LAST1IP							
	Last address before CHK1A occurred				Not used	Not used	Not used	Not used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) (3/6)

	0	1	2	3	4	5	6	7
50		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred						
51		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred						
52		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred						
53		HMIC::LAST2IP						
		Address one generation older than the last one before CHK1A occurred			Not used	Not used	Not used	Not used
54		HMIC::LAST1						
		Last execution address before CHK1A occurred						
55		HMIC::LAST1						
		Last execution address before CHK1A occurred						
56		HMIC::LAST1						
		Last execution address before CHK1A occurred						
57		HMIC::LAST1						
		Last execution address before CHK1A occurred			Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
58		HMIC::LAST2						
		Execution address one generation older than the last one before CHK1A occurred						
59		HMIC::LAST2						
		Execution address one generation older than the last one before CHK1A occurred						
5A		HMIC::LAST2						
		Execution address one generation older than the last one before CHK1A occurred						
5B		HMIC::LAST2						
		Execution address one generation older than the last one before CHK1A occurred			Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
5C		HMIC::LBUSPERR						
	Not used	Not used	Not used	Not used	L bus data parity error <00-07>	L bus data parity error <10-17>	L bus data parity error <20-27>	L bus data parity error <30-37>
5D		HMIC::TIMERR						
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
5E		HMIC::CHK3STS						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	CHK3 error in SMP, LSI
5F		HMIC::RSTSTS						
	Not used	Not used	Micro CHK1B occurred	Micro CHK1A occurred	Micro MCNRST2 occurred	Micro MCNRST1 occurred	Micro MPRST occurred	Micro MNTRST occurred

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Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) (4/6)

	0	1	2	3	4	5	6	7
60	HMIC::RSTSTS							
	Not used	Not used	SCAN mode set occurred	CHK1A occurred	WCHK1 occurred	SELRST occurred	SYSRST occurred	Power-on reset occurred
61	HMIC::DBGUVP0123							
	Data of port UP<00-07>-P (input value)							
62	DSMP::CHK1B							
	Address parity error in accessing REG in FM/SMP				Data parity error in accessing REG in FM/SMP			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
63	DSMP::SMPERROR							
	Not used	Not used	Not used	Not used	Not used	CHK3 error Master	CHK3 error Slave	CHK1 error
64	DSMP::SMPERROR							
	Data paruty error in word 0 of write-data				Data paruty error in word 1 of write-data			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
65	DSMP::WDTPER							
	Data paruty error in word 2 of write-data				Data paruty error in word 3 of write-data			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
66	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space							
67	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space							
68	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space							
69	DSMP::WAD							
	I960 address which SMP receives through XR bus in accessing M bus space						Not used	Not used
6A	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6B	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6C	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6D	DSMP::WDT							
	Write-data stored to write-buffer in accessing M bus space							
6E	DSMP::WRBE							
	Not used	Not used	Not used	I960 WR/RD flag	I960 Byte Enable			
					BE0:TXD <00-07>	BE0:TXD <10-17>	BE0:TXD <20-27>	BE0:TXD <30-37>
6F	DDRR::STATUS							
	Transfer END A	Not used	Command A Exec wait/ Executing	Command A Data transferring	Transfer END B	Not used	Command B Exec wait/ Executing	Command B Data transferring

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Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) (5/6)

	0	1	2	3	4	5	6	7
70		DDRR::STATUS						
	CHK2 typical error	CHK2 in DRR data transfer	CHK2 in DRR control	BSA0 CHK2	BSA1 CHK2	CHK1B occurred	Forcible end of transfer	Pseude error occurred
71		DDRR::ESTA0						
	Write to unused register	Write to read-only register	Write to A register in executing side A	Write to B register in executing side B	Address parity error	Byte access error	Input data parity error	Output data parity error
72		DDRR::ESTA0						
	Address decode error	Clock phase error	Write to 64 CMD in executing 64 CMD	Switching error RAID200/ RAID300	Communica-tion buffer Read data parity error	Communica-tion buffer TOV/SEQ/ Illegal access/ Timer parity error	BSA0 CHK1 error	BSA1 CHK1 error
73		DBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
74		DBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
75		DDRR::MODE4						
	Micro I/F address parity reverse bit	Micro I/F input data parity reverse bit	Micro I/F output data parity reverse bit	S-BUS GND ID parity reverse bit	BSA I/F mode signal parity reverse bit	BSA I/F command ID parity reverse bit	BSA I/F input data parity reverse bit	BSA I/F output data parity reverse bit
76		DSCA0::SCHK1						
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
77		DSCA0::SCHK1						
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
78		SCA0::SCHK11						
	Segment parameter was updated before XFR end	'FUNCTION MODE' reg was accessed in XFR	XFC/XFC2 illegal write access	Not used	Not used	Not used	Not used	Not used
79		S0BSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 60 ~ 64/70 ~ 74 (DKA CHK1B) (6/6)

	0	1	2	3	4	5	6	7
7A		S0BSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
7B		SCA1::SCHK1						
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
7C		SCA1::SCHK1						
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
7D		SCA1::SCHK11						
	Segment parameter was updated before XFR end	'FUNCTION MODE' reg was accessed in XFR	XFC/XFC2 illegal write access	Not used	Not used	Not used	Not used	Not used
7E		S1BSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
7F		S1BSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(1) DRR CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'60': DRR CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DDRR::ESTA0						
	Write to unused register	Write to read-only register	Write to A register in executing side A	Write to B register in executing side B	Address parity error	Byte access error	Input data parity error	Output data parity error
2C		DDRR::ESTA0						
	Address decode error	Clock phase error	Write to 64 CMD in executing 64 CMD	Switching error RAID200/ RAID300	Communica-tion buffer Read data parity error	Communica-tion buffer TOV/SEQ/ Illegal access/ Timer parity error	BSA0 CHK1 error	BSA1 CHK1 error
2D		DDRR::STATS						
	Transfer END A	Not used	Command A Exec wait/ Executing	Command A Data transferring	Transfer END B	Not used	Command B Exec wait/ Executing	Command B Data transferring
2E		DBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2F		DBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
30		DDRR::MODE4						
	Micro I/F address parity reverse bit	Micro I/F input data parity reverse bit	Micro I/F output data parity reverse bit	S-BUS GND ID parity reverse bit	BSA I/F mode signal parity reverse bit	BSA I/F command ID parity reverse bit	BSA I/F input data parity reverse bit	BSA I/F output data parity reverse bit
31		Not used						

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(2) DSMP CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'62': DSMP CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DSMP::CHK1B						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Burst write data parity error
2C		DSMP::CHK1B						
	Byte0 address parity error FM/SMP access REG	Byte1 address parity error FM/SMP access REG	Byte2 address parity error FM/SMP access REG	Byte3 address parity error FM/SMP access REG	Byte0 data parity error FM/SMP access REG	Byte1 data parity error FM/SMP access REG	Byte2 data parity error FM/SMP access REG	Byte3 data parity error FM/SMP access REG
2D		DSMP::WDTPERR						
	WR data parity error word0, byte0	WR data parity error word0, byte1	WR data parity error word0, byte2	WR data parity error word0, byte3	WR data parity error word1, byte0	WR data parity error word1, byte1	WR data parity error word1, byte2	WR data parity error word1, byte3
2E		DSMP::WDTPERR						
	WR data parity error word2, byte0	WR data parity error word2, byte1	WR data parity error word2, byte2	WR data parity error word2, byte3	WR data parity error word3, byte0	WR data parity error word3, byte1	WR data parity error word3, byte2	WR data parity error word3, byte3
2F		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
30		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
31		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(3) DSCA0 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'63': DSCA0 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DSCA0::SCHK1						
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
2C		DSCA0::SCHK1						
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
2D		BSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2E		BSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2F		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
30		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
31		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(4) DSCA1 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'64': DSCA1 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DSCA1::SCHK1						
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
2C		DSCA1::SCHK1						
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
2D		BSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2E		BSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2F		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
30		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
31		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(5) DRR CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'70': DRR CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DDRR::ESTA0						
	Write to unused register	Write to read-only register	Write to A register in executing side A	Write to B register in executing side B	Address parity error	Byte access error	Input data parity error	Output data parity error
2C		DDRR::ESTA0						
	Address decode error	Clock phase error	Write to 64 CMD in executing 64 CMD	Switching error RAID200/ RAID300	Communica-tion buffer Read data parity error	Communica-tion buffer TOV/SEQ/ Illegal access/ Timer parity error	BSA0 CHK1 error	BSA1 CHK1 error
2D		DDRR::STATS						
	Transfer END A	Not used	Command A Exec wait/ Executing	Command A Data transferring	Transfer END B	Not used	Command B Exec wait/ Executing	Command B Data transferring
2E		DBSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2F		DBSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
30		DDRR::MODE4						
	Micro I/F address parity reverse bit	Micro I/F input data parity reverse bit	Micro I/F output data parity reverse bit	S-BUS GND ID parity reverse bit	BSA I/F mode signal parity reverse bit	BSA I/F command ID parity reverse bit	BSA I/F input data parity reverse bit	BSA I/F output data parity reverse bit
31		Not used						

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(6) DSCA0 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'73': DSCA0 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DSCA0::SCHK1						
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
2C		DSCA0::SCHK1						
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
2D		BSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2E		BSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2F		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
30		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
31		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(7) DSCA1 CHK1B

	0	1	2	3	4	5	6	7
28		Subcode x'74': DSCA1 CHK1B						
29		HMIC::CHK1BSTS						
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A		HMIC::CHK1BSTS						
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B		DSCA1::SCHK1						
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
2C		DSCA1::SCHK1						
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
2D		BSA0::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2E		BSA1::CK1BST0						
	MP address parity error	MP WR data (high) parity error	MP WR data (low) parity error	MP RD data parity error	Upper bus mode parity error	Not used	Not used	Not used
2F		HMIC::MICCHK1STS						
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
30		HMIC::MICCHK1STS						
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
31		HMIC::MICCHK1STS						
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error

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Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78/FF (DKA CHK1B) (1/6)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	Reserved							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	SP no. 2^1	SP no. 2^0	CTLR no.	DKU physical device no.				
25	Cylinder addres (low order)							
26	Cylinder address (high order)							
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘65’ ~ x‘66’/x‘75’ ~ x‘78’/x‘FF’)							
29	Hardware information (See following pages)							
|								
31								
32	Module ID							
33	Routine ID							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = 6587/x‘EF8E’ : LDEV type = 6586)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78/FF (DKA CHK1B) (2/6)

	0	1	2	3	4	5	6	7
40	FREE AREA FORMAT No.							
	'04'							
41	HMIC::ERRSTS							
	Not used	Not used	Not used	Not used	Not used	WCHK1	CHK1B	CHK1A
42	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
43	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
44	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
45	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
46	HMIC::CHK1BADRS							
	Address when CHK1B occurred							
47	HMIC::CHK1BADRS							
	Address when CHK1B occurred						WR/RD flag in CHK1B	Command/ Data flag in CHK1B
48	HMIC::CHK1BBE							
	Not used	Not used	Not used	Not used	I960BE0 in CHK1B	I960BE1 in CHK1B	I960BE2 in CHK1B	I960BE3 in CHK1B
49	HMIC::MICPERSTS							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
4A	HMIC::XRADRPERR							
	Not used	Not used	Not used	XR bus address parity error reset				
				<30-35, BE>	<Byte 0>	<Byte 1>	<Byte 2>	<Byte 3>
4B	HMIC::XBUSDTPERR							
	Not used	Not used	Not used	Not used	XR bus data parity error <00-07>	XR bus data parity error <10-17>	XR bus data parity error <20-27>	XR bus data parity error <30-37>
4C	HMIC::LAST1IP							
	Last address before CHK1A occured							
4D	HMIC::LAST1IP							
	Last address before CHK1A occured							
4E	HMIC::LAST1IP							
	Last address before CHK1A occured							
4F	HMIC::LAST1IP							
	Last address before CHK1A occured				Not used	Not used	Not used	Not used

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Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78/FF (DKA CHK1B) (3/6)

	0	1	2	3	4	5	6	7
50	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
51	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
52	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred							
53	HMIC::LAST2IP							
	Address one generation older than the last one before CHK1A occurred				Not used	Not used	Not used	Not used
54	HMIC::LAST1							
	Last execution address before CHK1A occurred							
55	HMIC::LAST1							
	Last execution address before CHK1A occurred							
56	HMIC::LAST1							
	Last execution address before CHK1A occurred							
57	HMIC::LAST1							
	Last execution address before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
58	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
59	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
5A	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred							
5B	HMIC::LAST2							
	Execution address one generation older than the last one before CHK1A occurred				Not used	Not used	CHK1A occurred in LAN OP	Fetch attribute of last exec address
5C	HMIC::LBUSPERR							
	Not used	Not used	Not used	Not used	L bus data parity error <00-07>	L bus data parity error <10-17>	L bus data parity error <20-27>	L bus data parity error <30-37>
5D	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
5E	HMIC::RSTSTS							
	Not used	Not used	Micro CHK1B occurred	Micro CHK1A occurred	Micro MCNRST2 occurred	Micro MCNRST1 occurred	Micro MPRST occurred	Micro MNTRST occurred
5F	HMIC::RSTSTS							
	Not used	Not used	SCAN mode set occurred	CHK1A occurred	WCHK1 occurred	SELRST occurred	SYSRST occurred	Power-on reset occurred

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Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78/FF (DKA CHK1B) (4/6)

	0	1	2	3	4	5	6	7
60	HMIC::CHK3STS							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	CHK3 error in SMP, LSI
61	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
62	HMIC::DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
63	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
64	HMIC::ERADR							
	Address from L bus							
65	HMIC::ERADR							
	Address from L bus							
66	HMIC::ERADR							
	Address from L bus							
67	HMIC::ERADR							
	Address from L bus						Not used	Not used
68	HMIC::ERBYT							
	Not used	Not used	Not used	Not used	BE0 - BE3 signals from L bus			
69	HMIC::ERORD							
	Data before correction							
6A	HMIC::ERORD							
	Data before correction							
6B	HMIC::ERORD							
	Data before correction							
6C	HMIC::ERORD							
	Data before correction							
6D	HMIC::ERORC							
	Check bit before correction							
6E	HMIC::ERCRD							
	Data after correction							
6F	HMIC::ERCRD							
	Data after correction							

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Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78/FF (DKA CHK1B) (5/6)

	0	1	2	3	4	5	6	7
70	HMIC::ERCRD							
	Data after correction							
71	HMIC::ERCRD							
	Data after correction							
72	HMIC::ERCRC							
	Check bit after correction							
73	HMIC::ERSYD							
	Syndrome of the object in which the error was detected							
74	HMIC::ERWR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	WR signal value
75	HMIC::CECNT							
	Correctable error counter (for lower address bank)							
76	HMIC::CECNT							
	Correctable error counter (for upper address bank)							
77	DSMP::CHK1B							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Burst write data parity error
78	DSMP::CHK1B							
	Address parity error in accessing REG in FM/SMP				Data parity error in accessing REG in FM/SMP			
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 0	Byte 1	Byte 2	Byte 3
79	DSMP::SMPERROR							
	Not used	Not used	Not used	Not used	Not used	CHK3 error Master	CHK3 error Slave	CHK1 error

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Byte27 = 8E & Byte34 = X0 & Byte28 = 65 ~ 66/75 ~ 78/FF (DKA CHK1B) (6/6)

	0	1	2	3	4	5	6	7
7A	DDRR::ESTA0							
	Write to unused register	Write to read-only register	Write to A register in executing side A	Write to B register in executing side B	Address parity error	Byte access error	Input data parity error	Output data parity error
7B	DDRR::ESTA0							
	Address decode error	Clock phase error	Write to 64 CMD in executing 64 CMD	Switching error RAID200/ RAID300	Communica-tion buffer Read data parity error	Communica-tion buffer TOV/SEQ/ Illegal access/ Timer parity error	BSA0 CHK1 error	BSA1 CHK1 error
7C	DSCA0::SCHK1							
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
7D	DSCA0::SCHK1							
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used
7E	DSCA1::SCHK1							
	XR address parity error (high)	XR address parity error (low)	Write data 0 parity error	Write data 1 parity error	Read data 0 parity error	Read data 1 parity error	Address decode error (high)	Address decode error (low)
7F	DSCA1::SCHK1							
	8-phase clock error	Illegal addr access	CHK1 occurred in BSA0	CHK1 occurred in BSA1	10-phase clock error	SBUS XFR BSA accessed by micro	Not used	Not used

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(1) HMIC CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'65': HMIC CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
2F	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
30	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
31	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(2) HMIC DRAM CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'66': HMIC DRAM CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
2C	HMIC:: DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
2D	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
2E	HMIC::ERADR							
	Address from L bus							
2F	HMIC::ERADR							
	Address from L bus							
30	HMIC::ERADR							
	Address from L bus							
31	HMIC::ERADR							
	Address from L bus						Not used	Not used

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(3) HMIC CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'75': HMIC CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::MPCERRSTS							
	Not used	Not used	WCHK1 at MPCHK	CHK1A at MPCHK	Timeout monitor timer parity error	A/B REG inconsistent check error	A/B REG write time-out	A/B REG access sequence error
2F	HMIC::HMICPERR							
	Not used	Not used	Not used	Not used	Data parity err in HMIC <00-07>	Data parity err in HMIC <10-17>	Data parity err in HMIC <20-27>	Data parity err in HMIC <30-37>
30	HMIC::TIMERR							
	Timer 0 parity error	Timer 1 parity error	Timer 2 parity error	Timer 3 parity error	Timer 4 parity error	Timer 5 parity error	Timer 6 parity error	Not used
31	HMIC::LBUSPER							
	Not used	Not used	Not used	Not used	L bus data parity error			
					<00-07>	<10-17>	<20-27>	<30-37>

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(4) HMIC DRAM CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'76': HMIC DRAM CHK1B							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::ERADR							
	Address from L bus							
2F	HMIC::ERADR							
	Address from L bus							
30	HMIC::ERADR							
	Address from L bus							
31	HMIC::ERADR							
	Address from L bus						Not used	Not used

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(5) I960 read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'77': I960 read data parity error							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
2F	HMIC:: DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
30	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
31	Not used							

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Byte27 = 8E (Processor failure : DKA CHK1B) Byte28-31 Detail

(6) LANC read data parity error

	0	1	2	3	4	5	6	7
28	Subcode x'78': LANC read data parity error							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	HMIC::MICCHK1STS							
	Not used	Not used	Not used	Not used	Not used	Not used	XR decoder error (3B0)	XR decoder error (3B1)
2C	HMIC::MICCHK1STS							
	XR decoder error (90)	XR decoder error (91)	MPCHK counter parity error	Parity error in MIC internal bus	MPU reset counter parity error	Hard timer parity error	Wait timer parity error	Hold timer parity error
2D	HMIC::MICCHK1STS							
	LAN hold time-out	Wait time-out	XR decoder error (29A)	Not used	Not used	XR address parity error	Local bus data parity error	XR data parity error
2E	HMIC::DRAMC1BSTS							
	i960→LM access Correctable errors are over the specified time		I960 XR read incorrect address	I960 XR write incorrect address	Not used	Not used	Not used	Not used
	Bank 0	Bank 1						
2F	HMIC:: DRAMC1BSTS							
	LANC→LM access Correctable errors are over the specified time		LANC→LM access Uncorrectable error detected		LANC→XR incorrect address	Not used	Not used	Not used
	Bank 0	Bank 1	Bank 0	Bank 1				
30	HMIC::DRAMC1BSTS							
	Parity error at refresh addr reg	Refresh request timer error	Not used	Refresh time out	Not used	Not used	Not used	Not used
31	Not used							

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Byte27 = 8E (Processor failure : CHK1B) Byte28-31 Detail

(7) CHK1B

	0	1	2	3	4	5	6	7
28	Subcode x'FF': CHK1B undefined hardware reason							
29	HMIC::CHK1BSTS							
	Not used	Not used	Not used	Not used	CHK1B in SRAM controller	CHK1B in CHA/DRR	CHK1B in SMP	CHK1B in MIC
2A	HMIC::CHK1BSTS							
	XR0(SCA#0) CHK1B	XR1(SCA#1) CHK1B	XR2(SCA#2) CHK1B	XR3(SCA#3) CHK1B	XR4 CHK1B	XR5 CHK1B	Not used	CHK1B in DRAM controller
2B	Not used							
2C	Not used							
2D	Not used							
2E	Not used							
2F	Not used							
30	Not used							
31	Not used							

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Byte27 = 8E & Byte34 = X0 & Byte28 = F0 (Microprogram detected WCHK1) (1/1)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘F0’)							
29	Hardware information (See following pages)							
31								
32	Module ID (See following pages)							
33	Routine ID (See following pages)							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
37	(This information is not fixed until DKC reports SSB to HOST.)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							
40	Free area							
7F								

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(1) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Failure section information							
2B								
2C	Bus mode information							
2D	Shared memory data informatin							
2E								
2F								
30	CHK3 status information							
31	Master error information							
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘32’ : Error procedure aid
Routine ID : x‘51’ : CHK3 in initializing
x‘52’ : CHK3 in scanning
x‘53’ : Unknown CHK3
x‘54’ : CHK3 threshold exceeded
x‘55’ : CHK3 in main recovery process
x‘56’ : CHK3 in slave proces
x‘57’ : Other function failed in CHK3 process
x‘58’ : Reconstruction failed in CHK3 process
x‘59’ : Making SSB failed in CHK3 interruption process
x‘5A’ : Making CHK3 SIM failed
x‘5B’ : Making SSB failed in CHK3 error process
x‘5C’ : System down in CHK3 process
x‘5D’ : MP down because reset CHK3 impossibly

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(2) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Not used							
2B	Not used							
2C	Not used							
2D	Not used							
2E	Not used							
2F	Not used							
30	Not used							
31	Not used							
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘32’ : Error procedure aid
Routine ID : x‘81’ : Unknown CHA CHK3
x‘82’ : Unknown DKA CHK3
x‘F1’ : CHK1A threshold exdeeded
x‘F4’ : CHK1B threshold exceeded
x‘F7’ :None MP
x‘F8’ :No logical error information when pseudo-WCHK1 detected
x‘FB’ : CHK1A detected (execte REBOOT)

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(3) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Return value of arbiter process							
2B								
2C								
2D								
2E								
2F	Not used							
30	Not used							
31	Not used							
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘32’ : Error procedure aid
Routine ID : x‘C1’ : Arbiter process failed in cluster failure

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(4) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Access test bit map (initial value)							
2B								
2C								
2D								
2E	Access test bit map for succeeded section							
2F								
30								
31								
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘32’ : Error procedure aid
Routine ID : x‘C2’ : No last path in cluster failure

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(5) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Interruption information							
2B								
2C								
2D								
2E	CHK1B status information							
2F								
30								
31	Master error information							
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘32’ : Error procedure aid
Routine ID : x‘F5’ : CHK1B in CHK3
x‘F6’ : No error CHK3
x‘F9’ : Reser CHK3 impossibly

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(6) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	INITYPER (x‘49 4E 49 54 59 45 52’)							
2B								
2C								
2D								
2E								
2F								
30								
31								
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘80’ : CHA/DKA kernael
Routine ID : x‘00’ : Invalid reset cause

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(7) Byte28 = F0 : Micro WCHK1 (Note 1)

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	WCHK1 type code							
2B	Reserved							
2C	Initialize interface information							
2D								
2E	Reset type code							
2F								
30	1st reset type code							
31	Reset SSB type code							
32	Module ID (Note 2)							
33	Routine ID (Note 2)							

(Note 1) This format is soecfied by byte 32 and 33.

(Note 2) Module ID : x‘16’ : Reset
Routine ID : x‘27’ : CHK1B in initializing
Routine ID : x‘28’ : Force Reset in initializing
Routine ID : x‘29’ : Initernal Reset in initializing
Routine ID : x‘2f’ : CHK3 in initializing
Routine ID : x‘32’ : Logical Inconsistency Reset in initializing
Routine ID : x‘33’ : Live Ins in initializing
Routine ID : x‘34’ : Power Failure Reset in initializing
Routine ID : x‘37’ : Fault Reset in initializing
Routine ID : x‘60’ : Internal Reset Loop in Resetting
Routine ID : x‘61’ : Logical Inconsistency Reset Loop in Resetting
Routine ID : x‘62’ : CHK1B Loop in Resetting
Routine ID : x‘63’ : CHK3 Loop in Resetting
Routine ID : x‘64’ : CHK1B unrecoverable
Routine ID : x‘65’ : Fault Reset Loop in Resetting
Routine ID : x‘66’ : CHK2A Reset
Routine ID : x‘8e’ : Force WCHK1 (by another MP)

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(8) Byte32 33 = x‘B4D0’ : TPC : FOP force WCHK1

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Not used							
2B	Not used							
2C	Not used							
2D	Not used							
2E	Not used							
2F	Not used							
30	Not used							
31	Not used							

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Byte27 = 8E (Micro WCHK1) Byte28-31 Detail

(9) Byte32 33 = x‘B4D1’ : TPC : FOP force WCHK1

	0	1	2	3	4	5	6	7
28	Subcode : x‘F0’ : Micro WCHK1							
29	Not used							
2A	Not used							
2B	Not used							
2C	FOP Detected error code							
2D								
2E	Not used							
2F	Not used							
30	Not used							
31	Not used							

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Byte27 = 8E & Byte34 = X0 & Byte28 = F1 (Microprogram CHK1A) (1/1)

	0	1	2	3	4	5	6	7
00	Time stamp							
|								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Subcode (x‘F0’)							
29	Hardware information (See following pages)							
|								
31								
32	Module ID (See following pages)							
33	Routine ID (See following pages)							
34	PCB number				Message code (x‘0’)			
35	SSID (low) of self subsystem							
36	Sympton code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)							
37	(This information is not fixed until DKC reports SSB to HOST.)							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							
40	Free area							
|								
7F								

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Byte27 = 8E (Microprogram CHK1A) Byte28-31 Detail

(1) Byte32·33 = x‘165X’ : Microprogram simulated CHK1A for error recovery by REBOOT.

	0	1	2	3	4	5	6	7
28	Subcode : x‘F1’ : Microprogram CHK1A							
29	RCHK::ERADR							
	Address (0) from L bus							
2A	RCHK:: ERADR							
	Address (1) from L bus							
2B	RCHK:: ERADR							
	Address (2) from L bus							
2C	RCHK:: ERADR							
	Address (3) from L bus						Not used	Not used
2D	RCHK::LMADRLMT							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Upper limit address of LM
2E	RCHK::LMADRLMT							
	Upper limit address of LM mounting area (lower order)				Not used	Not used	Not used	Not used
2F	RCHK::ERSTS0							
	Inconsist in i960 wrote operation	Not used	MIC READYI timeout	CHK1A cause detected	CHK1B cause detected	Scan→ LM/XR access error	Not used	Not used
30	RCHK::SCANER							
	Scan→Uncorrectable error in LM		Not used	Scan→out of LM area	Scan→ Invalid read XR address	Scan→ Invalid write XR address	Not used	Not used
	Bank0	Bank1						
31	RCHK::CHK1ASTS							
	i960→Uncorrectable error in LM		I960→WR protected LM area	i960→Out of mount LM area	Not used	Not used	LANC→WR protected LM area	LANC→Out of mount LM area
	Bank0	Bank1						

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Byte27 = 8E & Byte34 : bit4-7 = 1 (Selective Reset) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Not used (‘00’)							
29	DCN status							
	Force device busy	Channel connect request	Command chain execute	Path reserve	Stack status	Sense pending	Long Busy (Command process)	Processor connect
2A	DCN status							
	Single path mode	Gurant path mode	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	Garant path MP
2B	DCN flag							
	RST NTF/ RST ALG SSB PND	Pin Data pending	(RSV)	(RSV)	ODE pending	RSQ pending	SCI/SCE pending	PCH pending
2C	LCT initiation cause							
	0:Ready 1:Not ready	0:Disable 1:Enable	0:No SNS 1:64SNS pending	0:Mount 1:Not mount	0:No RST ALG LPN 1:Exist	0:No SYS RST LPN 1:Exist	0:No stack 1:Exist	0:No wait SNS 1:Exist
2D	LCT initiation cause							
	0:No wait-RI 1:Exist	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	0:Others 1:DEV BSY JOB

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Byte27 = 8E & Byte34 : bit4-7 = 1 (Selective Reset) (2/3)

	0	1	2	3	4	5	6	7
2E	Command interface flag							
	Pending exist	SCE(RSP)	(RSV)	(RSV)	ODE pending	RSQ pending	SCI pending	PCH pending
2F	Command code							
30	Internal SSB log number							
31								
32	Related reset detailed log number							
33								
34	PCB number				Message code (x'1')			
35	SSID (low) of self subsystem							
36	Sympton code (x'FF8E' : LDEV type = DKU87I/x'EF8E' : LDEV type = DKU86I)*							
37								
38	Log and message control (x'00')							
39	Program action code (x'00')							
3A	Configuration information							
3B								
3C	Not used (x'00')							
3D	Cylinder address							
3E								
3F	Head address							
40	Not used							
41	Not used							
42	Initialize interface information							
43								
44	Reset type code							
45								
46	1st reset type code							
47	Reset SSB type code							
48	Reset type code for making SSB							
49	Self CHK1A diference code							
4A	Multi reset type code							
4B								
4C	Interrupted address							
4D								
4E								
4F								
50	Interrupted opration code							
51								
52								
53								
54	Current LDEV number							
55								
56	Current LPN number							
57								
58	Initiation cause code							
59								
5A	Command interface							
5B	DSB (from LCT)							
5C	sys status							
5D	REQ ID (from LCT)							
5E	JCB ID (from LCT)							
5F								
60	wchklmpbitmap (from LCT)							
61								
62								
63								

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 1 (Selective Reset) (3/3)

	0	1	2	3	4	5	6	7
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN (wldcn1l)						
71								
72								
73								
74		DCN (wldcn2l)						
75								
76								
77								
78		Not used						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 8E & Byte34 : bit4-7 = 3 (wait SENSE Timeout) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Not used (‘00’)							
29	Not used (‘00’)							
2A	24-byte format	Basic SSB			32-byte format	Basic SSB		
2B								
2C						Exception code		
2D		F/M						
2E		System error code				System error code		
2F								
30	Reset internal SSB number							
31								
32	Detail log number for RESET							
33								
34	PCB number				Message code (x‘3’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 3 (Wait SENSE Timeout) (2/2)

	0	1	2	3	4	5	6	7
40								
41		Not used						
42								
43								
44								
45								
46								
47								
48								
49								
4A								
4B								
4C								
4D								
4E								
4F								
50								
51								
52								
53								
54								
55								
56		LPN						
57								
58		Not used						
5F								
60								
61		Timeout SSB						
62								
63								
64								
65								
66								
67								
68								
69								
6A								
6B								
6C								
6D								
6E								
6F								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
7A								
7B								
7C								
7D								
7E								
7F								

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Byte27 = 8E & Byte34 : bit4-7 = 5 (CHK1B Reset) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Related internal SSB log number							
29								
2A	Not used							
2B	Not used							
2C	Old PSW							
2D								
2E								
2F								
30	Internal SSB log number (RESET)							
31								
32	Related RESET detail log number							
33								
34	PCB number				Message code (x‘5’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 5 (CHK1B Reset) (2/2)

	0	1	2	3	4	5	6	7
40		Not used						
41		Not used						
42		Initialize interface information						
43								
44		Reset type code						
45								
46		1st reset type code						
47		Reset SSB type code						
48		Reset type code for making SSB						
49		Self CHK1A difference code						
4A		Multi reset type code						
4B								
4C		Interrupted address						
4D								
4E								
4F								
50		Interrupted opration code						
51								
52								
53								
54		Current LDEV number						
55								
56		Current LPN number						
57								
58		Initiation cause code						
59								
5A		Command interface						
5B		DSB (from LCT)						
5C		sys status						
5D		REQ ID (from LCT)						
5E		JCB ID (form LCT)						
5F								
60		wchklmpbitmap (from LCT)						
61								
62								
63								
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN						
77								
78		Not used						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 8E & Byte34 : bit4-7 = 6 (DKC Internal Reset) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Not used							
29								
2A								
2B								
2C	Old PSW							
2D								
2E								
2F								
30	Internal SSB log number							
31								
32	Reset detail log number							
33								
34	PCB number				Message code (x‘6’)			
35	SSID (Low) of self subsystem							
36	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 6 (DKC Internal Reset) (2/2)

	0	1	2	3	4	5	6	7
40		Not used						
41		Not used						
42		Initialize interface information						
43								
44		Reset type code						
45								
46		1st reset type code						
47		Reset SSB type code						
48		Reset type code for making SSB						
49		Self CHK1A difference code						
4A		Multi reset type code						
4B								
4C		Interrupted address						
4D								
4E								
4F								
50		Interrupted opration code						
51								
52								
53								
54		Current LDEV number						
55								
56		Current LPN						
57								
58		Initiation cause code						
59								
5A		Command interface						
5B		DSB (from LCT)						
5C		sys status						
5D		REQ ID (from LCT)						
5E		JCB ID (form LCT)						
5F								
60		wchklmpbitmap (from LCT)						
61								
62								
63								
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN						
77								
78		Not used						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 8E & Byte34 : bit4-7 = 7 (LCP Internal Reset) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Not used							
29	Not used							
2A	Internal Sel ective Reset cause							
2B								
2C	For Hotline	Old PSW			For INT SEL RST	LCP error code		
2D								
2E						x‘00’		
2F						x‘00’		
30	Internal SSB log number							
31								
32	Reset detail log number							
33								
34	PCB number				Message code (x‘7’)			
35	SSID (Low) of self subsystem							
36	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 7 (LCP Internal Reset) (2/2)

	0	1	2	3	4	5	6	7
40		Not used						
41		Not used						
42		Initialize interface information						
43								
44		Reset type code						
45								
46		1st reset type code						
47		Reset SSB type code						
48		Reset type code for making SSB						
49		Self CHK1A difference code						
4A		Multi reset type code						
4B								
4C		Interrupted address						
4D								
4E								
4F								
50		Interrupted opration code						
51								
52								
53								
54		Current LDEV number						
55								
56		Current LPN						
57								
58		Initiation cause code						
59								
5A		Command interface						
5B		DSB (from LCT)						
5C		sys status						
5D		REQ ID (from LCT)						
5E		JCB ID (form LCT)						
5F								
60		wchklmpbitmap (from LCT)						
61								
62								
63								
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN						
77								
78		Not used						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 8E & Byte34 : bit4-7 = 8 (Force Reset) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Not used							
29	Not used							
2A	Not used							
2B	Not used							
2C	Old PSW							
2D								
2E								
2F								
30	Internal SSB log number (RESET)							
31								
32	Reset detail log number							
33								
34	PCB number				Message code (x‘8’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 8 (Foece Reset) (2/2)

	0	1	2	3	4	5	6	7
40		Not used						
41		Not used						
42		Initialize interface information						
43								
44		Reset type code						
45								
46		1st reset type code						
47		Reset SSB type code						
48		Reset type code for making SSB						
49		Self CHK1A difference code						
4A		Multi reset type code						
4B								
4C		Interrupted address						
4D								
4E								
4F								
50		Interrupted opration code						
51								
52								
53								
54		Current LDEV number						
55								
56		Current LPN						
57								
58		Initiation cause code						
59								
5A		Command interface						
5B		DSB (from LCT)						
5C		sys status						
5D		REQ ID (from LCT)						
5E		JCB ID (form LCT)						
5F								
60		wchklmpbitmap (from LCT)						
61								
62								
63								
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN						
77								
78		Not used						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 8E & Byte34 : bit4-7 = 9 (Logical Inconsistency Reset) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCU number			
14	RCU LDEV number							
15								
16	Internal SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘E’)			
28	Not used							
29								
2A								
2B								
2C	OLD PSW (Interruption source address)							
2D								
2E								
2F								
30	Internal SSB log number							
31								
32	Reset detail log number							
33								
34	PCB number				Message code (x‘9’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF8E’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte27 = 8E & Byte34 : bit4-7 = 9 (Logical Inconsistency Reset) (2/2)

	0	1	2	3	4	5	6	7
40		Not used						
41		Not used						
42		Initialize interface information						
43								
44		Reset type code						
45								
46		1st reset type code						
47		Reset SSB type code						
48		Reset type code for making SSB						
49		Self CHK1A difference code						
4A		Multi reset type code						
4B								
4C		Interrupted address						
4D								
4E								
4F								
50		Interrupted opration code						
51								
52								
53								
54		Current LDEV number						
55								
56		Current LPN						
57								
58		Initiation cause code						
59								
5A		Command interface						
5B		DSB (from LCT)						
5C		sys status						
5D		REQ ID (from LCT)						
5E		JCB ID (form LCT)						
5F								
60		wchklmpbitmap (from LCT)						
61								
62								
63								
64		jcb id						
65								
66		req id						
67		Job type code						
68		job status						
69		Executing processor number						
6A		Initiation cause code						
6B		Initiation detail code						
6C		Command code						
6D		Channel sequence						
6E		Reserved						
6F								
70		DCN						
77								
78		Fault reason code						
79								
7A								
7B								
7C		SLV-DCN (slvdcnr)						
7D								
7E								
7F								

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Byte27 = 8F (Logical Inconsistency) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘8’)				Message (x‘F’)			
28	Module ID							
29	Routine ID							
2A	Error information							
2B								
2C								
2D								
2E								
2F								
30								
31								
32								
33								
34	PCB number				Not used (x‘00’)			
35	SSID(low) of self subsystem							
36	Symptom code (x‘FF8F’ : LDEV type = DKU87I/x‘EF8E’ : LDEV type = DKU86I)*							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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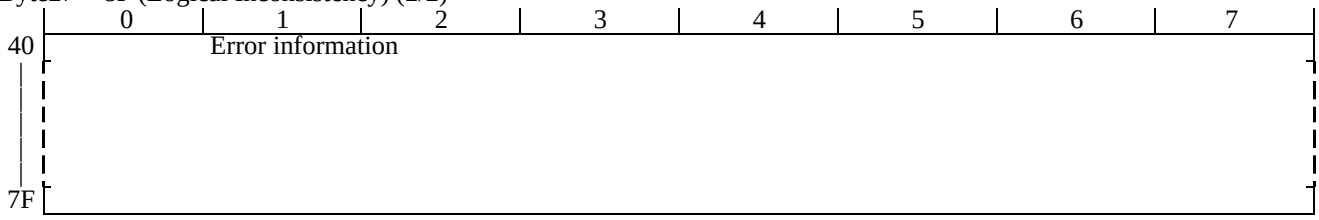
Byte27 = 8F (Logical Inconsistency) (2/2)



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Byte27 = 9F (Trace data/Log data) (1/2)

All of F/M = 9F SSB informations are no problem on DKC performance.

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘9’)				Message (x‘F’)			
28	Module ID							
29	Routine ID							
2A	Error information							
2B								
2C								
2D								
2E								
2F								
30								
31								
32								
33								
34	PCB number				Not used (x‘00’)			
35	SSID (low) of self subsystem							
36	Symptom code (x‘FF9F’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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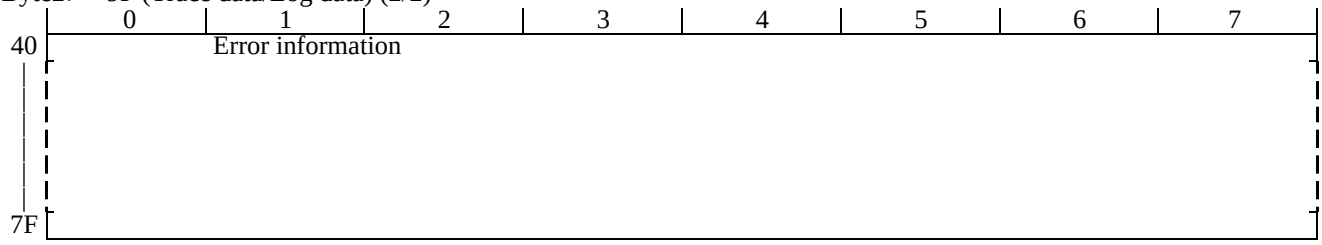
Byte27 = 9F (Trace data/Log data) (2/2)



Note 1

The pare of system error code x‘AE5A’ (Drive not Ready) and x‘A772’ are reported even when one of the following processes has completed successfully. These indicate the PDEV spin down executed correctly and do not mean the error condition. Please ignore them.

- PDEV replace
- DKU Inline execution at Installation or at PDEV expansion.

Note 2

System error code x‘AE5B’ (Unit Attention) is reported even after one of the following processes has completed successfully. It indicates the PDEV was reset correctly and does not mean the error condition. Please ignore it.

- DKA replace
- DKA expansion
- PDEV expansion
- DKA micro-program exchange
- PDEV micro-program exchange

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Byte27 = EC (Envirnment Monitor Detected DKC Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘E’)				Message (x‘C’)			
28	Error detection code (Note 1)							
29	Error detection code (Note 2)							
2A	Error reason code (Note 3)							
2B								
2C	Reserved area							
2D								
2E								
2F								
30								
31								
32								
33								
34	PCB number (don’t care)				Message code (don’t care)			
35	SSID(low) of self subsystem (don’t care)							
36	Symptom code (x‘FFEC’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = EC (Environment Monitor Detected DKC Failure) (2/2)

	0	1	2	3	4	5	6	7
40	Error Detection Code 1 (Note 1)							
41	Error Detection Code 2 (Note 2)							
42	Error Detection Code 3 (Note 3)							
43								
|	Not used							
7F								

(Note 1) Error Detection Code 1

Code	Detection
10	PWRCTL-1
20	PWRCTL-2
30	SSVP

(Note 2) Error Detection Code 2

Code	Component
10	Logic 1
20	Logic 2
80	PWRCTL1
81	PWRCTL2
90	AC BOX-R10
91	AC BOX-R11

(Note 3) Error Detection Code 3

Code	Reason
10	Abnormal temperature (over60°C) is detected in the front side.
11	Abnormal temperature (over60°C) is detected in the back side.
12	Abnormal temperature (over45°C) is detected in the front side.
13	Abnormal temperature (over45°C) is detected in the back side.
20	5V voltage has dropped below 80%.
21	3V voltage has dropped below 80%.
30	Voltage for shared memory has dropped below 80%.
32	Voltage for cache memory has dropped below 80%.
33	12V voltage has dropped below 80%
40	5VPS0 box abnormality has been detected.
41	5VPS1 box abnormality has been detected.
42	5VPS2 box abnormality has been detected.
43	5VPS3 box abnormality has been detected.
44	3VPS0 box abnormality has been detected.
45	3VPS1 box abnormality has been detected.
46	3VPS2 box abnormality has been detected.
47	3VPS3 box abnormality has been detected.
48	Multi PS0 box abnormality has been detected.
49	Multi PS1 box abnormality has been detected.

(Continue)

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Code	Reason
50	Battery0 or BATT-CTR0 abnormality has been detected.
52	Battery1 or BATT-CTR1 abnormality has been detected.
53	Battery2 or BATT-CTR2 abnormality has been detected.
5A	Battery0 abnormality has been detected. (DIAG)
5B	Battery1 abnormality has been detected. (DIAG)
5C	Battery2 abnormality has been detected. (DIAG)
60	AC power off/interruption of breaker box occurred.
70	Low rotation speed of FPSFAN12A has been detected when Error Detection Code 1 is 10.
70	Low rotation speed of FPSFAN21A has been detected when Error Detection Code 1 is 20.
71	Low rotation speed of FPSFAN12B has been detected when Error Detection Code 1 is 10.
71	Low rotation speed of FPSFAN21B has been detected when Error Detection Code 1 is 20.
72	Low rotation speed of FPSFAN11A has been detected when Error Detection Code 1 is 10.
72	Low rotation speed of FPSFAN22A has been detected when Error Detection Code 1 is 20.
73	Low rotation speed of FPSFAN11B has been detected when Error Detection Code 1 is 10.
73	Low rotation speed of FPSFAN22B has been detected when Error Detection Code 1 is 20.
74	Low rotation speed of RPSFAN11A has been detected when Error Detection Code 1 is 10.
74	Low rotation speed of RPSFAN21A has been detected when Error Detection Code 1 is 20.
75	Low rotation speed of RPSFAN11B has been detected when Error Detection Code 1 is 10.
75	Low rotation speed of RPSFAN21B has been detected when Error Detection Code 1 is 20.
76	Low rotation speed of RPSFAN12A has been detected when Error Detection Code 1 is 10.
76	Low rotation speed of RPSFAN22A has been detected when Error Detection Code 1 is 20.
77	Low rotation speed of RPSFAN12B has been detected when Error Detection Code 1 is 10.
77	Low rotation speed of RPSFAN22B has been detected when Error Detection Code 1 is 20.
78	Low rotation speed of FLGFAN12A has been detected when Error Detection Code 1 is 10.
78	Low rotation speed of FLGFAN22A has been detected when Error Detection Code 1 is 20.
79	Low rotation speed of FLGFAN12B has been detected when Error Detection Code 1 is 10.
79	Low rotation speed of FLGFAN22B has been detected when Error Detection Code 1 is 20.
7A	Low rotation speed of FLGFAN11A has been detected when Error Detection Code 1 is 10.
7A	Low rotation speed of FLGFAN21A has been detected when Error Detection Code 1 is 20.
7B	Low rotation speed of FLGFAN11B has been detected when Error Detection Code 1 is 10.
7B	Low rotation speed of FLGFAN21B has been detected when Error Detection Code 1 is 20.
7C	Low rotation speed of RLGFAN11A has been detected when Error Detection Code 1 is 10.
7C	Low rotation speed of RLGFAN21A has been detected when Error Detection Code 1 is 20.
7D	Low rotation speed of RLGFAN11B has been detected when Error Detection Code 1 is 10.
7D	Low rotation speed of RLGFAN21B has been detected when Error Detection Code 1 is 20.
7E	Low rotation speed of RLGFAN12A has been detected when Error Detection Code 1 is 10.
7E	Low rotation speed of RLGFAN22A has been detected when Error Detection Code 1 is 20.
7F	Low rotation speed of RLGFAN12B has been detected when Error Detection Code 1 is 10.
7F	Low rotation speed of RLGFAN22B has been detected when Error Detection Code 1 is 20.
81	JP for LOGIC1 remains.
82	JP for LOGIC2 remains.
90	Environment monitor register access error.
91	Basic clock error of the environment monitor PCB occurred.
92	Parity error of the environment monitor PCB occurred.
93	Battery diagnostic mode setting failure.
A0	An environment monitors disagreement error occurred.
A1	An environment monitors disagreement error of P/S occurred.
C0	SVP P/S abnormal.

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Byte27 = EE (Envirnment Monitor Detected DKU Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘E’)				Message (x‘E’)			
28	Error detection code (Note 1)							
29	Error detection code (Note 2)							
2A	Error reason code (Note 3)							
2B								
2C	Reserved area							
2D								
2E								
2F								
30								
31								
32								
33								
34	PCB number (don’t care)				Message code (don’t care)			
35	SSID (low) of self subsystem (don’t care)							
36	Symptom code (x‘FFEE’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = EE (Environment Monitor Detected DKU Failure) (2/2)

	0	1	2	3	4	5	6	7
40	Error Detection Code 1 (Note 1)							
41	Error Detection Code 2 (Note 2)							
42	Error Detection Code 3 (Note 3)							
43	Not used							
|								
7F								

(Note 1) Error Detection Code 1

Code	Detection
11	DKUMN-R1F
21	DKUMN-R1R
12	DKUMN-L1F
22	DKUMN-L1R
13	DKUMN-R2F
23	DKUMN-R2R
14	DKUMN-L2F
24	DKUMN-L2R

(Note 2) Error Detection Code 2

Code	Component	Code	Component	Code	Component
30	HDU-R10	50	HDU-R20	70	DKUMN-R1F
31	HDU-R11	51	HDU-R21	71	DKUMN-R1R
32	HDU-R12	52	HDU-R22	72	DKUMN-L1F
33	HDU-R13	53	HDU-R23	73	DKUMN-L1R
34	HDU-R14	54	HDU-R24	74	DKUMN-R2F
35	HDU-R15	55	HDU-R25	75	DKUMN-R2R
36	HDU-R16	56	HDU-R26	76	DKUMN-L2F
37	HDU-R17	57	HDU-R27	77	DKUMN-L2R
40	HDU-L10	60	HDU-L20		
41	HDU-L11	61	HDU-L21		
42	HDU-L12	62	HDU-L22		
43	HDU-L13	63	HDU-L23		
44	HDU-L14	64	HDU-L24		
45	HDU-L15	65	HDU-L25		
46	HDU-L16	66	HDU-L26		
47	HDU-L17	67	HDU-L27		

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(Note 3) Error Detection Code 3

Code	Reason
20	5V voltage has dropped below 80%.
22	12V voltage has dropped below 80%.
4A	HDD P/L Multi PS1 box abnormality has been detected.
4B	HDD P/L Multi PS0 box abnormality has been detected.
70	Low rotation speed of FAN-xxx2A has been detected. (xxx : the part shown in Error Detection Code 2)
71	Low rotation speed of FAN-xxx1A has been detected.
72	Low rotation speed of FAN-xxx0A has been detected.
73	Low rotation speed of FAN-xxx2B has been detected.
74	Low rotation speed of FAN-xxx1B has been detected.
75	Low rotation speed of FAN-xxx0B has been detected.
85	JP for HDU-xx0 to HDU-xx3 remains.
86	JP for HDU-xx4 to HDU-xx7 remains.
90	Environment monitor register access error.
91	Basic clock error of the environment monitor PCB occurred.
92	Parity error of the environment monitor PCB occurred.
A0	An environment monitors disagreement error occurred.
A1	An environment monitors disagreement error of P/S occurred.

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Byte27 = F0 (Operation Terminated) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘F’)				Message (x‘E’)			
28	Not used (x‘00’)							
29	Not used (x‘00’)							
2A	Not used (x‘00’)							
2B	Hardware level (Note 1)							
2C								
2D	SSID of mate subsystem (x‘0000’ for EDCC)							
2E								
2F	Maker code & Manufacture code (x‘00’)							
30	Not used (x‘00’)							
31	Module ID							
32	Routine ID							
33	PCB number				Message code (x‘0’)			
34	SSID of self subsystem							
35								
36	Symptom code (x‘FFF0’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘1D’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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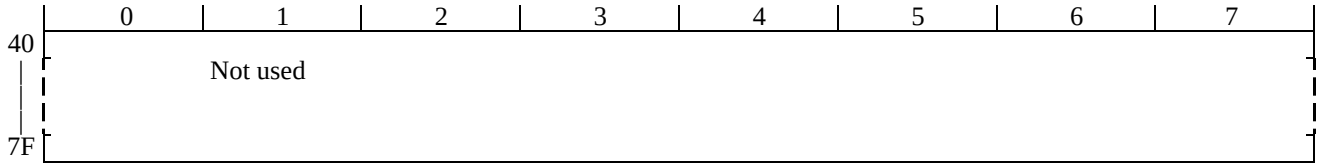
Byte27 = F0 (Openation Terminated) (2/2)



(Note 1) Hardware level

Bit0 : Hardware level flag

For bit0=0

Bit 1	: Not used
Bit 2 ~ 3	: SP number
Bit 4 ~ 5	: CHLs per Cluster
	00 : 4
	01 : 8
	10 : Not used
	11 : Not used
Bit 6	: NVS
	0 : Without NVS
	1 : With NVS
Bit 7	: Not used
Bit 8 ~ 10	: Cache size
	000 : Non cache
	001 : 256MB
	010 : 512MB
	011 : 768MB
	100 : 1024MP
	101 : 1280MP
	110 : 1536MP
	111 : Over 1536MB
Bit11 ~ 13	: Cluster hardware level
Bit14 ~ 15	: Cache/NVS hardware level

For bit0=1

Bit 1	: Not used
Bit 2 ~ 3	: SP number
Bit 4 ~ 5	: CHLs per Cluster
	0000 : Parallel=4, Serial=0
	0001 : Parallel=8, Serial=0
	0010 : Parallel=4, Serial=2
	0100 : Parallel=4, Serial=4
	0110 : Parallel=0, Serial=2
	1000 : Parallel=0, Serial=4
	1010 : Parallel=0, Serial=8
	1100 : Parallel=0, Serial=8
Bit 8	: DUAL FRAME
	0 : DUAL FRAME
	1 : MODULAR POWER
Bit 9 ~ 11	: Cache size
	000 : Non cache
	001 : 256MB
	010 : 512MB
	011 : 768MB
	100 : 1024MB
	101 : 1280MB
	110 : 1536MB
	111 : Over 1536MB
Bit12 ~ 13	: Cluster hardware level
Bit14 ~ 15	: Cache/NVS hardware level

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Byte27 = F1 (Micro-program Detected Cache Failure) (1/2)

	0	1	2	3	4	5	6	7	
00	Time stamp								
05									
06	Format Message								
07	PCB type		Processor ID (Note)						
08	System error code								
09									
0A	JCB ID								
0B									
0C	REQ ID								
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log	
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0	
0F	RCV SIM	0	0	0	0	0	0	0	
10	LDEV number								
11									
12	CDEV number				RDEV number				
13	SEMI-SYNC	RCU SIM	0	0	RCV number				
14	RCU LDEV number								
15									
16	SSB log number								
17									
18	Related failure log number								
19									
1A	Related SIM log number								
1B									
1C	Related SSB log number								
1D									
1E	(Reserved)								
1F	SCB								
20	Basic SSB								
21									
22									
23	Count								
24	Device address								
25	Cylinder addres (low)								
26	Cylinder address (high)				Head address				
27	Format (x‘F’)				Message (x‘1’)				
28	Queue transition in progress (Side A)	Queue transition in progress (Side B)	Free SGCB queue operation in progress	Free SLCB queue operation in progress	Free GRPT queue operation in progress	Not used			
29	Not used								*
	VDEV number								*
2A	Queue type								*
	VDEV number		Slot number						*
2B	Queue number								*
	Slot number								*
2C	Queue number								*
	Slot number								*
2D	SSID of mate subsystem (x‘0000’ for EDCC)								
2E									
2F	Maker code & Manufacture code (x‘00’)								
30	Not used (x‘00’)								

* : When byte 28, bit2-4 = 000, upper value is valid.
: When byte 28, bit2-4 ≠ 000, lower value is valid.

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Byte27 = F1 (Micro-program Detected Cache Failure) (2/2)

	0	1	2	3	4	5	6	7
31	Module ID							
32	Routine ID							
33	PCB number				Message code (x‘0’)			
34	SSID of self subsystem							
35								
36	Symptom code (x‘FFF1’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							
40	Error information							
7F								

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Byte27=F2 (Cache Failure)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder address (low)							
26	Cylinder address (high)				Head address			
27	Format (x‘F’)				Message (x‘2’)			
28	Subcode (See following pages.)							
29	Hardware information (See following pages.)							
2A								
2B								
2C								
2D	Other subsystem ID (x‘0000’ for EDCC)							
2E								
2F	Maker code, Manufacture code (x‘00’)							
30	Hardware information (See following pages.)							
31	Module ID							
32	Routine ID							
33	Processor number (Note)				Error code (Invalid)			
34	SSID of self subsystem							
35								
36	Sympton code (x‘FFF2’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used							
3D	Cylinder address							
3E								
3F	Head address							
40 -7F	Hardware information (See following pages.)							

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Byte27 = F2 (Cache Failure)

	0	1	2	3	4	5	6	7
28	Subcode (Note)							
29	Indefinite register flag							
	F bus/H error at logging of PCB #0	F bus/H error at logging of PCB #1	F bus/H error at logging of PCB #2	F bus/H error at logging of PCB #3	F bus/L error at logging of PCB #0	F bus/L error at logging of PCB #1	F bus/L error at logging of PCB #2	F bus/L error at logging of PCB #3
2A	Operation mode							
	Bit 2, 5 to 7 valid	Used arbiter 0: F bus/H 1: F bus/L	Access part 0: memory 1: register	Bus mode 0: 2 bus 2: bus L 3: bus H		Transfer mode 0: normal write 1: normal read 2: cache to cache		
2B	BSA error flag							
	Arbiter error in F bus/H	Cache error info in F bus/H (high priority order)	BSA error info in F bus/H	Cache error info in F bus/H (low priority order)	Arbiter error in F bus/L	Cache error info in F bus/L (high priority order)	BSA error info in F bus/L	Cache error info in F bus/L (low priority order)
2C	Internal MP number							

30	Blockade flag							
	Not blocked	MP was blocked	FBUS/H was blocked	FBUS/L was blocked	Any CACHE on side A was blocked	Any CACHE on side B was blocked	Any module group on side A was blocked	Any module group on side B was blocked

40 | 7F	Hardware Information (see Type for detail)

(Note) Subcode

0X : Arbiter error
1X : Cache error
2X/AX : Control circuit error per MG on cache
32/36/B2/B6 : ECC UNCORR
3A/3E/BA/BE : RDS/LRC error in cache
4X/CX : F bus error
5X/DX : LRC error in cache
6X/EX : No cache error information
8X/9X : Cache error
FX : No error information

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Byte27 = F2 (Cache Failure) Byte40-7F Detail

(1) Byte28 Bit6,7 = '00' (1/4)

	0	1	2	3	4	5	6	7
40								
		Slave 1 access cache PCB#						
41								
		Slave 1 access cache MG#						
42								
		Slave 2 access cache PCB#						
43								
		Slave 2 access cache MG#						
44		Cache PCB#0 cache error flag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
45		Cache PCB#1 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
46		Cache PCB#2 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
47		Cache PCB#3 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
48		BSA0::COPY						
	Receive BUSY signal for slave	RD transfer end in cache	WR transfer end in cache	Not used	Not used	Arbiter enable	Not used	Not used
49		BSA0::COPY						
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4A		BSA0::CK2AST0						
	CHKERR0 Input signal	CHKERR1 Input signal	CHKERR2 Input signal	CHKERR0, 1 majority decision	CHKERR0, 2 majority decision	CHKERR1, 2 majority decision	Not used	Not used
4B		BSA0::CK2AST0						
	LAST CYCLE ERROR	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4C		BSA0::CK2AST1						
	EXERR1 HI input data parity error	EXERR1 LO input data parity error	EXERR2 HI input data parity error	EXERR2 LO input data parity error	Another BSA failure	SLAVE ID ERROR	LRC compare data parity error	LRC compare LRC error
4D		BSA0::CK2AST1						
	FDB0 data parity error	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error
4E		BSA0::CK2AST2						
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
4F		BSA0::CK2AST2						
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache

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Byte27 = F2 (Cache Failure) Byte40-7F Detail

(1) Byte28 Bit6,7 = '00' (2/4)

	0	1	2	3	4	5	6	7
50	BSA0::CK2AST3							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
51	BSA0::CK2AST3							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
52	BSA0::CK2AST4							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
53	BSA0::CK2AST4							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
54	BSA0::CK2AST5							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
55	BSA0::CK2AST5							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
56	BSA0::CK2BST0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
57	BSA0::CK2BST0							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
58	BSA0::CK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
59	BSA0::CK2CST0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
5A	BSA0::CK2CST1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
5B	BSA0::CK2CST1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent	Command reg B/Status1 reg inconsistent
5C	BSA0::CK2CST2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
5D	BSA0::CK2CST2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
5E	BSA0::CK2DST0							
	Not used	ABT SEQ parity error	Not used	ABT LIVE INSCNT parity error	Not used	Not used	Not used	Not used
5F	BSA0::CK2DST0							
	Not used	ABT timeout	ABT timeout counter parity error	Protcol error (FBREQ invalid MYGRANT valid)	Not used	Not used	Not used	Not used

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Byte27 = F2 (Cache Failure) Byte40-7F Detail

(1) Byte28 Bit6,7 = '00' (3/4)

	0	1	2	3	4	5	6	7
60	BSA0::MONITOR1							
	WR data transfer side information (1:Side A transfer)	RD data transfer side information (1:Side A transfer)	F bus data transfer side information (1:Side A transfer)	F bus transfer execution for side A DBF	F bus transfer execution for side B DBF	Not used	Not used	Not used
61	BSA0::MONITOR1							
	Side A command ID code			Side B command ID code			ABROT processing end	Not used
62	BSA0::MONITOR2							
	Side A PLRC added bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
63	BSA0::MONITOR2							
	Side B PLRC added bit	Side B F bus transfer bus mode			Side B F bus transfer mode			
64	BSA1::COPY							
	Receive BUSY signal for slave	RD transfer end in cache	WR transfer end in cache	Not used	Not used	Arbiter enable	Not used	Not used
65	BSA1::COPY							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
66	BSA1::CK2AST0							
	CHKERR0 Input signal	CHKERR1 Input signal	CHKERR2 Input signal	CHKERR0, 1 majority decision	CHKERR0, 2 majority decision	CHKERR1, 2 majority decision	Not used	Not used
67	BSA1::CK2AST0							
	LAST CYCLE ERROR	Not used	Not used	Not used	Not used	Not used	Not used	Not used
68	BSA1::CK2AST1							
	EXERR1 HI input data parity error	EXERR1 LO input data parity error	EXERR2 HI input data parity error	EXERR2 LO input data parity error	Another BSA failure	SLAVE ID ERROR	LRC compare data parity error	LRC compare LRC error
69	BSA1::CK2AST1							
	FDB0 data parity error	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error
6A	BSA1::CK2AST2							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
6B	BSA1::CK2AST2							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
6C	BSA1::CK2AST3							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
6D	BSA1::CK2AST3							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
6E	BSA1::CK2AST4							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
6F	BSA1::CK2AST4							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache

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Byte27 = F2 (Cache Failure) Byte40-7F Detail

(1) Byte28 Bit6,7 = '00' (4/4)

	0	1	2	3	4	5	6	7
70	BSA1::CK2AST5							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
71	BSA1::CK2AST5							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
72	BSA1::CK2BST0							
	HDB1 data parity error	HDB3 data parity error	HDB2 data parity error	HDB4 data parity error	LRC generater data parity error	HDB1,2 output data parity error	HDB3,4 output data parity error	Not used
73	BSA1::CK2BST0							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
74	BSA1::CK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
75	BSA1::CK2CST0							
	Not used	REQ SEQ PTY ERR	REQ CNT PTY ERR	MY GRANT PTY ERR	Arbitration count over	DBF input ADR/CMD data parity error	CHA illegal RD request	Upper bus mode parity error
76	BSA1::CK2CST1							
	WRS SEQ. CNT/POINT PTY ERR	Not used	WR1 SEQ. PTY ERR	WR1 SEQ. CNT/POINT PTY ERR	Not used	WR2 SEQ. PTY ERR	WR2 SEQ CNT/POINT PTY ERR.	Not used
77	BSA1::CK2CST1							
	WR3 SEQ. PTY ERR	WR3 SEQ. CNT/POINT PTY ERR	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (A SIDE)	DBFADR CNT PTYERR or COUNTER CNT OVER ERR (B SIDE)	Transfer count over error (C SIDE)	REQ SEQ PTY ERR	Command reg A/Status1 reg inconsistent	Command reg B/Status1 reg inconsistent
78	BSA1::CK2CST2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
79	BSA1::CK2CST2							
	RD3SEQ. CNT/POINT PTY ERR	Not used	RD4SEQ. PTY ERR	RD4SEQ. CNT/POINT PTY ERR	Not used	DKA SEQ. PTY ERR	DKA SEQ. CNT/POINT PTY ERR	Not used
7A	BSA1::CK2DST0							
	Not used	ABT SEQ parity error	Not used	ABT LIVE INSCNT parity error	Not used	Not used	Not used	Not used
7B	BSA1::CK2DST0							
	Not used	ABT timeout	ABT timeout counter parity error	Protcol error (FBREQ invalid MYGRANT valid)	Not used	Not used	Not used	Not used
7C	BSA1::MONITOR1							
	WR data transfer side information (1:Side A transfer)	RD data transfer side information (1:Side A transfer)	F bus data transfer side information (1:Side A transfer)	F bus transfer execution for side A DBF	F bus transfer execution for side B DBF	Not used	Not used	Not used
7D	BSA1::MONITOR1							
	Side A command ID code			Side B command ID code			ABROT processing end	Not used
7E	BSA1::MONITOR2							
	Side A PLRC added bit	Side A F bus transfer bus mode			Side A F bus transfer mode			
7F	BSA1::MONITOR2							
	Side B PLRC added bit	Side B F bus transfer bus mode			Side B F bus transfer mode			

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(2) Byte28 Bit6,7 = '01' (1/4)

	0	1	2	3	4	5	6	7
40								
	Slave 1 access cache PCB#							
41								
	Slave 1 access cache MG#							
42								
	Slave 2 access cache PCB#							
43								
	Slave 2 access cache MG#							
44		Cache PCB#0 cache error flag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
45		Cache PCB#1 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
46		Cache PCB#2 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
47		Cache PCB#3 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
48		BSA0::CK2AST0						
	CHKERR0 Input signal	CHKERR1 Input signal	CHKERR2 Input signal	CHKERR0, 1 majority decision	CHKERR0, 2 majority decision	CHKERR1, 2 majority decision	Not used	Not used
49		BSA0::CK2AST0						
	LAST CYCLE ERROR	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4A		BSA0::CK2AST1						
	EXERR1 HI input data parity error	EXERR1 LO input data parity error	EXERR2 HI input data parity error	EXERR2 LO input data parity error	Another BSA failure	SLAVE ID ERROR	LRC compare data parity error	LRC compare LRC error
4B		BSA0::CK2AST1						
	FDB0 data parity error	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error
4C		BSA0::CK2AST2						
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
4D		BSA0::CK2AST2						
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
4E		BSA0::CK2AST3						
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
4F		BSA0::CK2AST3						
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(2) Byte28 Bit6,7 = '01' (2/4)

	0	1	2	3	4	5	6	7
50	BSA0::CK2AST4							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
51	BSA0::CK2AST4							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
52	BSA0::CK2AST5							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
53	BSA0::CK2AST5							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
54	BSA0::CK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
55	BSA0::CK2CST2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
56	BSA1::CK2AST0							
	CHKERR0 Input signal	CHKERR1 Input signal	CHKERR2 Input signal	CHKERR0, 1 majority decision	CHKERR0, 2 majority decision	CHKERR1, 2 majority decision	Not used	Not used
57	BSA1::CK2AST0							
	LAST CYCLE ERROR	Not used	Not used	Not used	Not used	Not used	Not used	Not used
58	BSA1::CK2AST1							
	EXERR1 HI input data parity error	EXERR1 LO input data parity error	EXERR2 HI input data parity error	EXERR2 LO input data parity error	Another BSA failure	SLAVE ID ERROR	LRC compare data parity error	LRC compare LRC error
59	BSA1::CK2AST1							
	FDB0 data parity error	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error
5A	BSA1::CK2AST2							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
5B	BSA1::CK2AST2							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
5C	BSA1::CK2AST3							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
5D	BSA1::CK2AST3							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
5E	BSA1::CK2AST4							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
5F	BSA1::CK2AST4							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(2) Byte28 Bit6,7 = '01' (3/4)

	0	1	2	3	4	5	6	7
60	BSA1::CK2AST5							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
61	BSA1::CK2AST5							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
62	BSA1::CK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
63	BSA1::CK2CST2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
64	CACHE(1) PCB#							
	Cache PCB# for information of BYTE65-71							
65	CMC(1)::REV							
66	CMC(1)::ADRERR1H							
	Slave 1 appointed AC SEQ ERR	Slave 1 appointed AC TIME OUT	Slave 1 appointed ADR PE	Slave 1 appointed CMD PE	Slave 1 appointed BM ERROR	Slave 1 appointed TM ERROR	Slave 1 appointed ZERO ERROR	Slave 1 appointed TRF CNT ERR
67	CMC(1)::ADRERR1H							
	Slave 1 appointed LRC UNMATCH	Not used	Not used	Slave 1 appointed ADR COM ERR	Slave 1 appointed CMD COM ERR	Not used	Not used	Slave 1 appointed AC TIME OUT OTHER
68	CMC(1)::ADRERR2H							
	Slave 2 appointed AC SEQ ERR	Slave 2 appointed AC TIME OUT	Slave 2 appointed ADR PE	Slave 2 appointed CMD PE	Slave 2 appointed BM ERROR	Slave 2 appointed TM ERROR	Slave 2 appointed ZERO ERROR	Slave 2 appointed TRF CNT ERR
69	CMC(1)::ADRERR2H							
	Slave 2 appointed LRC UNMATCH	Not used	Not used	Slave 2 appointed ADR COM ERR	Slave 2 appointed CMD COM ERR	Not used	Not used	Slave 2 appointed AC TIME OUT
6A	CMC(1)::BUSERRH							
	F bus/H side DT SEQ ERR	F bus/H side DT STOP	F bus/H side AC ACT	F bus/H side CNT UNMATCH	F bus/H side ENT OFF	F bus/H side ES SEQ ERR	Not used	Not used
6B	CMC(1)::BUSERRH							
	F bus/H side DATA PE	F bus/H side OVER RUN	Not used	Not used	Not used	Not used	Not used	F bus/L side ENT OFF in 2 bus mode
6C	CMC(1)::ADRERR1L							
	Slave 1 appointed AC SEQ ERR	Slave 1 appointed AC TIME OUT	Slave 1 appointed ADR PE	Slave 1 appointed CMD PE	Slave 1 appointed BM ERROR	Slave 1 appointed TM ERROR	Slave 1 appointed ZERO ERROR	Slave 1 appointed TRF CNT ERR
6D	CMC(1)::ADRERR1L							
	Slave 1 appointed LRC UNMATCH	Not used	Not used	Slave 1 appointed ADR COM ERR	Slave 1 appointed CMD COM ERR	Not used	Not used	Slave 1 appointed AC TIME OUT OTHER
6E	CMC(1)::ADRERR2L							
	Slave 2 appointed AC SEQ ERR	Slave 2 appointed AC TIME OUT	Slave 2 appointed ADR PE	Slave 2 appointed CMD PE	Slave 2 appointed BM ERROR	Slave 2 appointed TM ERROR	Slave 2 appointed ZERO ERROR	Slave 2 appointed TRF CNT ERR
6F	CMC(1)::ADRERR2L							
	Slave 2 appointed LRC UNMATCH	Not used	Not used	Slave 2 appointed ADR COM ERR	Slave 2 appointed CMD COM ERR	Not used	Not used	Slave 2 appointed AC TIME OUT

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(2) Byte28 Bit6,7 = '01' (4/4)

	0	1	2	3	4	5	6	7
70		CMC(1)::BUSERRL						
	F bus/L side DT SEQ ERR	F bus/L side DT STOP	F bus/L side AC ACT	F bus/L side CNT UNMATCH	F bus/L side ENT OFF	F bus/L side ES SEQ ERR	Not used	Not used
71		CMC(1)::BUSERRL						
	F bus/L side DATA PE	F bus/L side OVER RUN	Not used	Not used	Not used	Not used	Not used	F bus/H side ENT OFF in 2 bus mode
72		CACHE(2) PCB#						
		Cache PCB# for information of BYTE73-7F						
73		CMC(2)::REV						
74		CMC(2)::ADRERR1H						
	Slave 1 appointed AC SEQ ERR	Slave 1 appointed AC TIME OUT	Slave 1 appointed ADR PE	Slave 1 appointed CMD PE	Slave 1 appointed BM ERROR	Slave 1 appointed TM ERROR	Slave 1 appointed ZERO ERROR	Slave 1 appointed TRF CNT ERR
75		CMC(2)::ADRERR1H						
	Slave 1 appointed LRC UNMATCH	Not used	Not used	Slave 1 appointed ADR COM ERR	Slave 1 appointed CMD COM ERR	Not used	Not used	Slave 1 appointed AC TIME OUT OTHER
76		CMC(2)::ADRERR2H						
	Slave 2 appointed AC SEQ ERR	Slave 2 appointed AC TIME OUT	Slave 2 appointed ADR PE	Slave 2 appointed CMD PE	Slave 2 appointed BM ERROR	Slave 2 appointed TM ERROR	Slave 2 appointed ZERO ERROR	Slave 2 appointed TRF CNT ERR
77		CMC(2)::ADRERR2H						
	Slave 2 appointed LRC UNMATCH	Not used	Not used	Slave 2 appointed ADR COM ERR	Slave 2 appointed CMD COM ERR	Not used	Not used	Slave 2 appointed AC TIME OUT
78		CMC(2)::BUSERRH						
	F bus/H side DT SEQ ERR	F bus/H side DT STOP	F bus/H side AC ACT	F bus/H side CNT UNMATCH	F bus/H side ENT OFF	F bus/H side ES SEQ ERR	Not used	Not used
79		CMC(2):: BUSERRH						
	F bus/H side DATA PE	F bus/H side OVER RUN	Not used	Not used	Not used	Not used	Not used	F bus/L side ENT OFF in 2 bus mode
7A		CMC(2)::ADRERR1L						
	Slave 1 appointed AC SEQ ERR	Slave 1 appointed AC TIME OUT	Slave 1 appointed ADR PE	Slave 1 appointed CMD PE	Slave 1 appointed BM ERROR	Slave 1 appointed TM ERROR	Slave 1 appointed ZERO ERROR	Slave 1 appointed TRF CNT ERR
7B		CMC(2)::ADRERR1L						
	Slave 1 appointed LRC UNMATCH	Not used	Not used	Slave 1 appointed ADR COM ERR	Slave 1 appointed CMD COM ERR	Not used	Not used	Slave 1 appointed AC TIME OUT OTHER
7C		CMC(2)::ADRERR2L						
	Slave 2 appointed AC SEQ ERR	Slave 2 appointed AC TIME OUT	Slave 2 appointed ADR PE	Slave 2 appointed CMD PE	Slave 2 appointed BM ERROR	Slave 2 appointed TM ERROR	Slave 2 appointed ZERO ERROR	Slave 2 appointed TRF CNT ERR
7D		CMC(2)::ADRERR2L						
	Slave 2 appointed LRC UNMATCH	Not used	Not used	Slave 2 appointed ADR COM ERR	Slave 2 appointed CMD COM ERR	Not used	Not used	Slave 2 appointed AC TIME OUT
7E		CMC(2)::BUSERRL						
	F bus/L side DT SEQ ERR	F bus/L side DT STOP	F bus/L side AC ACT	F bus/L side CNT UNMATCH	F bus/L side ENT OFF	F bus/L side ES SEQ ERR	Not used	Not used
7F		CMC(2)::BUSERRL						
	F bus/L side DATA PE	F bus/L side OVER RUN	Not used	Not used	Not used	Not used	Not used	F bus/H side ENT OFF in 2 bus mode

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(3) Byte28 Bit6,7 = '10' (1/4)

	0	1	2	3	4	5	6	7
40								
	Slave 1 access cache PCB#							
41								
	Slave 1 access cache MG#							
42								
	Slave 2 access cache PCB#							
43								
	Slave 2 access cache MG#							
44		Cache PCB#0 cache error flag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
45		Cache PCB#1 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
46		Cache PCB#2 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
47		Cache PCB#3 cache error frag						
	Bit 1-7 Valid flag	Cache error	MG error (PCB failure)	MG error (ECC UNCORR)	MG error (RDS-LRC error)	F bus/H error	F bus/L error	LRC error
48		BSA0::CK2AST0						
	CHKERR0 Input signal	CHKERR1 Input signal	CHKERR2 Input signal	CHKERR0, 1 majority decision	CHKERR0, 2 majority decision	CHKERR1, 2 majority decision	Not used	Not used
49		BSA0::CK2AST0						
	LAST CYCLE ERROR	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4A		BSA0::CK2AST1						
	EXERR1 HI input data parity error	EXERR1 LO input data parity error	EXERR2 HI input data parity error	EXERR2 LO input data parity error	Another BSA failure	SLAVE ID ERROR	LRC compare data parity error	LRC compare LRC error
4B		BSA0::CK2AST1						
	FDB0 data parity error	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error
4C		BSA0::CK2AST2						
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
4D		BSA0::CK2AST2						
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
4E		BSA0::CK2AST3						
		Cache port error information bit				2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
4F		BSA0::CK2AST3						
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(3) Byte28 Bit6,7 = '10' (2/4)

	0	1	2	3	4	5	6	7
50	BSA0::CK2AST4							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
51	BSA0::CK2AST4							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
52	BSA0::CK2AST5							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
53	BSA0::CK2AST5							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
54	BSA0::CK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
55	BSA0::CK2CST2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
56	BSA1::CK2AST0							
	CHKERR0 Input signal	CHKERR1 Input signal	CHKERR2 Input signal	CHKERR0, 1 majority decision	CHKERR0, 2 majority decision	CHKERR1, 2 majority decision	Not used	Not used
57	BSA1::CK2AST0							
	LAST CYCLE ERROR	Not used	Not used	Not used	Not used	Not used	Not used	Not used
58	BSA1::CK2AST1							
	EXERR1 HI input data parity error	EXERR1 LO input data parity error	EXERR2 HI input data parity error	EXERR2 LO input data parity error	Another BSA failure	SLAVE ID ERROR	LRC compare data parity error	LRC compare LRC error
59	BSA1::CK2AST1							
	FDB0 data parity error	FDB1 data parity error	FDB2 data parity error	FDB3 data parity error	FDB4 data parity error	FDB5 data parity error	FDB6 data parity error	FDB7 data parity error
5A	BSA1::CK2AST2							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
5B	BSA1::CK2AST2							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache
5C	BSA1::CK2AST3							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
5D	BSA1::CK2AST3							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
5E	BSA1::CK2AST4							
	Cache answer slave : 01: Slave 1 answer 10: Slave 2 answer		Error representing bit	Warning representing bit	Cache port error information bit			
5F	BSA1::CK2AST4							
	Another bus error of cache	Cache port error information bit		Not used	Cache port warning information bit			Warning of cache

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(3) Byte28 Bit6,7 = '10' (3/4)

	0	1	2	3	4	5	6	7
60	BSA1::CK2AST5							
	Cache port error information bit					2 bus access error in 1 bus mode	memory access error for block cache MG	Blockade cache PCB
61	BSA1::CK2AST5							
	Error in another board	Clock abnormal/ refresh abnormal	Memory access before end on register set	Memory access in self refresh	Register set and memory access instruction inconsistency	DIAGMODE and command phase DIAG disagrement	SPMODE and command phase SPACK disagrement	Master transmission data
62	BSA1::CK2CST0							
	Side A ADR/CMD input data parity error	Side B ADR/CMD input data parity error	Side A CMD illegal data	Side B CMD illegal data	F bus access timeout	F bus Disable ERR typical report	WCHK1 was asserted	F bus timer parity error
63	BSA1::CK2CST2							
	Not used	RD1SEQ. PTY ERR	RD1SEQ. CNT/POINT PTY ERR	Not used	RD2SEQ. PTY ERR	RD2SEQ. CNT/POINT PTY ERR	Not used	RD3SEQ. PTY ERR
64	CACHE PCB#							
	Cache PCB# for information of BYTE65-7F							
65	CMC::REV							
66	CMC::ADRERR1H							
	Slave 1 appointed AC SEQ ERR	Slave 1 appointed AC TIME OUT	Slave 1 appointed ADR PE	Slave 1 appointed CMD PE	Slave 1 appointed BM ERROR	Slave 1 appointed TM ERROR	Slave 1 appointed ZERO ERROR	Slave 1 appointed TRF CNT ERR
67	CMC::ADRERR1H							
	Slave 1 appointed LRC UNMATCH	Not used	Not used	Slave 1 appointed ADR COM ERR	Slave 1 appointed CMD COM ERR	Not used	Not used	Slave 1 appointed AC TIME OUT OTHER
68	CMC::ADRERR2H							
	Slave 2 appointed AC SEQ ERR	Slave 2 appointed AC TIME OUT	Slave 2 appointed ADR PE	Slave 2 appointed CMD PE	Slave 2 appointed BM ERROR	Slave 2 appointed TM ERROR	Slave 2 appointed ZERO ERROR	Slave 2 appointed TRF CNT ERR
69	CMC::ADRERR2H							
	Slave 2 appointed LRC UNMATCH	Not used	Not used	Slave 2 appointed ADR COM ERR	Slave 2 appointed CMD COM ERR	Not used	Not used	Slave 2 appointed AC TIME OUT
6A	CMC::BUSERRH							
	F bus/H side DT SEQ ERR	F bus/H side DT STOP	F bus/H side AC ACT	F bus/H side CNT UNMATCH	F bus/H side ENT OFF	F bus/H side ES SEQ ERR	Not used	Not used
6B	CMC::BUSERRH							
	F bus/H side DATA PE	F bus/H side OVER RUN	Not used	Not used	Not used	Not used	Not used	F bus/L side ENT OFF in 2 bus mode
6C	CMC::ADRERR1L							
	Slave 1 appointed AC SEQ ERR	Slave 1 appointed AC TIME OUT	Slave 1 appointed ADR PE	Slave 1 appointed CMD PE	Slave 1 appointed BM ERROR	Slave 1 appointed TM ERROR	Slave 1 appointed ZERO ERROR	Slave 1 appointed TRF CNT ERR
6D	CMC::ADRERR1L							
	Slave 1 appointed LRC UNMATCH	Not used	Not used	Slave 1 appointed ADR COM ERR	Slave 1 appointed CMD COM ERR	Not used	Not used	Not used
6E	CMC::ADRERR2L							
	Slave 2 appointed AC SEQ ERR	Slave 2 appointed AC TIME OUT	Slave 2 appointed ADR PE	Slave 2 appointed CMD PE	Slave 2 appointed BM ERROR	Slave 2 appointed TM ERROR	Slave 2 appointed ZERO ERROR	Slave 2 appointed TRF CNT ERR
6F	CMC::ADRERR2L							
	Slave 2 appointed LRC UNMATCH	Not used	Not used	Slave 2 appointed ADR COM ERR	Slave 2 appointed CMD COM ERR	Not used	Not used	Slave 2 appointed AC TIME OUT

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Byte27 = F2 (Cache Failure) Byte40-7F Detail
(3) Byte28 Bit6,7 = '10' (4/4)

	0	1	2	3	4	5	6	7
70	CMC::BUSERRL							
	F bus/L side DT SEQ ERR	F bus/L side DT STOP	F bus/L side AC ACT	F bus/L side CNT UNMATCH	F bus/L side ENT OFF	F bus/L side ES SEQ ERR	Not used	Not used
71	CMC::BUSERRL							
	F bus/L side DATA PE	F bus/L side OVER RUN	Not used	Not used	Not used	Not used	Not used	F bus/H side ENT OFF in 2 bus mode
72	CMC::BOARDERR							
	WE ERR	RAS0 ERR	RAS1 ERR	CAS0 ERR	CAS1 ERR	ADR0 PE	ADR1 PE	SYND PE
73	CMC::BOARDERR							
	ECC COMP ERR	ECC UNCORR	WR ECC ERR	LVTCTLERR	LRC0 ERR	LRC1 ERR	LRC2 ERR	LRC3 ERR
74	CMC::SLRERR							
	WR LRCERR	RD LRC ERR	Not used	Not used	Not used	Not used	Not used	Not used
75	CMC::SLRERR							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
76	CMC::CRERR							
	CLOCK ERR representing bit	ADRCTL LSI CLOCK ERR	ECCCTL1 LSI CLOCK ERR	ECCCTL2 LSI CLOCK ERR	Not used	ADR CNT ERR	TF CNT ERR	REF CNT ERR
77	CMC::CRERR							
	REF ERR	RAS0 ERR	RAS1 ERR	CAS0 ERR	CAS1 ERR	Disconnect operating RDDTPE	Disconnect operating MEMBKUP	Disconnect operating PGERR
78	CMC::MEMERROR0							
	Memory error module group			Memory error module side	Memory error valid byte 1	Memory error byte 1 (High)		
79	CMC::MEMERROR0							
	Memory error byte 1 (Low)		Memory error valid byte 2	Memory error byte 2				
7A	CMC::MEMERROR1							
	Memory error module group			Memory error module side	Memory error valid byte 1	Memory error byte 1 (High)		
7B	CMC::MEMERROR1							
	Memory error byte 1 (Low)		Memory error valid byte 2	Memory error byte 2				
7C	CMC::MEMERROR2							
	Memory error module group			Memory error module side	Memory error valid byte 1	Memory error byte 1 (High)		
7D	CMC::MEMERROR2L							
	Memory error byte 1 (Low)		Memory error valid byte 2	Memory error byte 2				
7E	CMC::MEMERROR3							
	Memory error module group			Memory error module side	Memory error valid byte 1	Memory error byte 1 (High)		
7F	CMC::MEMERROR3							
	Memory error byte 1 (Low)		Memory error valid byte 2	Memory error byte 2				

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Byte27 = F6 (CFW Access not Authorized) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘F’)				Message (x‘6’)			
28	Reason code (x‘01’ : CFW ID unmatch)							
29	Not used							
2A								
2B								
2C								
2D	SSID of mate subsystem (x‘0000’ for EDCC)							
2E								
2F	Maker code & Manufacture code (x‘00’)							
30	Not used							
31	Module ID							
32	Routine ID							
33	PCB number				Not used			
34	SSID of self subsystem							
35								
36	Symptom code (x‘FFF6’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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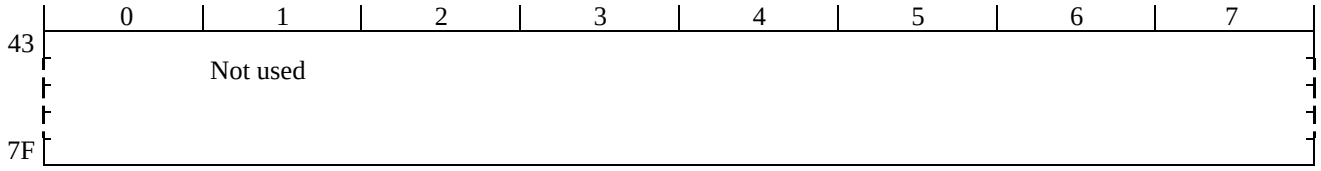
Byte27 = F6 (CFW Access not Authorized) (2/2)



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Byte27 = FA (NVS Terminated) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘F’)				Message (x‘A’)			
28	Reason code (x‘02’ : NVS failure)							
29	Not used							
2A								
2B								
2C								
2D	SSID of mate subsystem (x‘0000’ for EDCC)							
2E								
2F	Mader code & Manufacture code (x‘00’)							
30	Not used							
31	Module ID							
32	Routine ID							
33	PCB number				Error code (x‘F’)			
34	SSID of self subsystem							
35								
36	Symptom code (x‘FFFA’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not usde (x‘00’)							
3D	Cylinder address							
3E								
3F	Head address							

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Byte27 = FA (NVS Terminated) (2/2)

	0	1	2	3	4	5	6	7
40	Key cede (for reconnection)							
41	Format/Message (for reconnection)							
42	Module ID (for reconnection)							
43	Routine ID(for reconnection)							
44								
	Not used							
7F								

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Byte27 = FB (HRC/HODM Pair suspend) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (low order)							
26	Cylinder address (high order)				Head address			
27	Format (x‘F’)				Message (x‘B’)			
28	R-Vol Suspended	R-Vol failed	Reason code(Note)					
29	RCU device address							
2A	RCU Manufacture code/Factory code							
2B								
2C								
2D	RCU Sequence No.							
2E								
2F	MCU Manufacture code/Factory code							
30								
31								
32	MCU Sequence No.							
33								
34	SSID of self subsystem							
35								
36	Sympton code (x‘FE’)							
37	Sympton code (same byte #28)							
38	Not used (x‘00’)							
39	Not used (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Not used (x‘00’)							
3E	Reference code(x‘FFFB’)							
3F								

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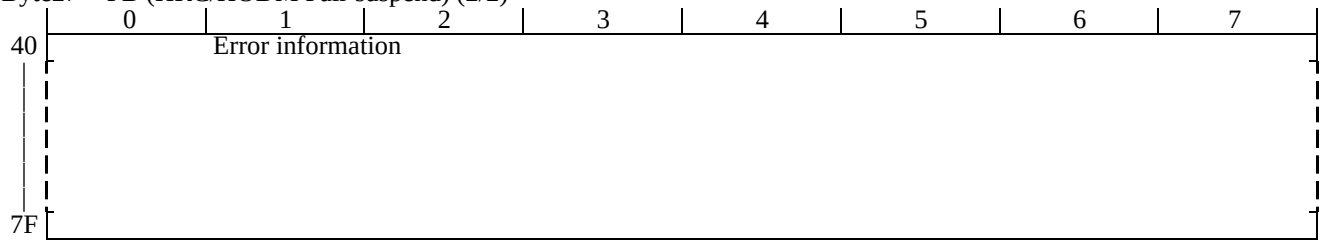
Byte27 = FB (HRC/HODM Pair suspend) (2/2)



(Note) Reason code

X‘14’-X‘2F’ : Reserved
X‘30’ : Pair suspended. MCU device write error.
X‘31’ : Pair suspended. RCU subsystem error/or MCU subsystem error.
X‘32’ : Pair suspended. RCU device communication error.
X‘33’ : Pair suspended (Critical device status). All write command is rejected until pair re-established.
X‘34’ : Pair suspended. RCU device is not ready (intervention required).

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/warning:error handling support) (1/1)

	0	1	2	3	4	5	6	7
00	Time stamp							
01								
02								
03								
04								
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22								
23	Count							
24	Device address							
25	Cylinder addres (Low)							
26	Cylinder address (High)				Head address			
27	Format (x‘F’)				Message (x‘F’)			
28	Subcode (See following pages)							
29	Hardware information (See following pages)							
30								
31	Module ID							
32	Routine ID							
33	PCB number				Message code (x‘0’)			
34	SSID of self subsystem							
35								
36	Symptom code (x‘FFFF’)							
37								
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Not used (x‘00’)							
3D	Sylinder address							
3E								
3F	Head address							
40	Hardware information (See following pages)							
41								
42								
43								
44								
45								
46								
47								
48								
49								
4A								
4B								
4C								
4D								
4E								
4F								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
5A								
5B								
5C								
5D								
5E								
5F								
60								
61								
62								
63								
64								
65								
66								
67								
68								
69								
6A								
6B								
6C								
6D								
6E								
6F								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
7A								
7B								
7C								
7D								
7E								
7F								

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(1) Byte28 = 02 : Cache 1 symbol error

	0	1	2	3	4	5	6	7
28	Subcode : x‘02’ : Cache 1 symbol error							
29	Slot number of cache board (Refer to SIM-RC section for the correspondense to slot.)							
2A	CMC::MEMERROR0							
	Module group number			Module side unmber	Byte number of 1 symbol error valid	Byte number of 1 symbol error		
2B	CMC::MEMERROR0							
	Byte number of 1 symbol error		Not used	Not used	Not used	Not used	Not used	Not used
2C	CMC::WARNING							
	1 symbol error of memory was detected	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	Module number of cache							

40 | 7F	Common information (See “Type 1”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(2) Byte28 = 04 : Shared memory 1 symbol error

	0	1	2	3	4	5	6	7
28	Subcode : x‘04’ : Shared memory 1 symbol error							
29	Slot number of shared memory (Side A : x‘00’ ,Side B : x‘01’)							
2A	SMC::MHBUS ERRSTATUS							
	Correctable error	Uncorre-ctable error	Read data check error	Write data check error	DBL access unmatch	Trnsfer count error	Bus mode error	Transfer mode error
2B	SMC::MLBUS ERRSTATUS							
	Correctable error	Uncorre-ctable error	Read data check error	Write data check error	DBL access unmatch	Trnsfer count error	Bus mode error	Transfer mode error
2C	SMC::MEMORY READY							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Memory ready
2D	Module in which correctable error occurred							
	module 00	module 01	module 02	module 03	module 04	module 05	Not ready	Not ready
2E	Module in which correctable error occurred							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
2F	Not used (x‘00’)							
30	Not used (x‘00’)							

40 | 7F	Common information (See “Type 2”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(3) Byte28 = 10/11/12/13/14/20/21/22/23/24/30/40 :Two or three SMP lines inconsistent

	0	1	2	3	4	5	6	7
28	Subcode : x‘10’ : Three SMP MBUSH MBUSOPEN lines inconsistent x‘11’ : Two SMP MBUSH CHKERR (A) lines inconsistent x‘12’ : Two SMP MBUSH CHKERR (B) lines inconsistent x‘13’ : Three SMP MBUSH DISABLE lines inconsistent x‘14’ : Three SMP MBUSH DISABLE lines inconsistent x‘20’ : Three SMP MBUSH MBUSOPEN lines inconsistent x‘21’ : Two SMP MBUSL CHKERR (A) lines inconsistent x‘22’ : Two SMP MBUSL CHKERR (B) lines inconsistent x‘23’ : Three SMP MBUSL DISABLE lines inconsistent x‘24’ : Three SMP MBUSL ABTRST lines inconsistent x‘30’ : Three SMP SMA DISABLE lines inconsistent x‘40’ : Three SMP SMB DISABLE lines inconsistent							
29	MPID							
2A	SMP::HOTLINE STATUS							
	Not used	MBUS/H BUSDISABLE 0	MBUS/H BUSDISABLE 1	MBUS/H BUSDISABLE 2	Not used	MBUS/L BUSDISABLE 0	MBUS/L BUSDISABLE 1	MBUS/L BUSDISABLE 2
2B	SMP::HOTLINE STATUS							
	MBUS/H ABTRST ENABLE	MBUS/H ABTRST 0	MBUS/H ABTRST 1	MBUS/H ABTRST 2	MBUS/L ABTRST ENABLE	MBUS/L ABTRST 0	MBUS/L ABTRST 1	MBUS/L ABTRST 2
2C	SMP::HOTLINE WARNING							
	Not used	SM (A) TM1 DISABLE WARNING	SM (A) TM2 DISABLE WARNING	SM (A) DISABLE UNMATCH	Not used	SM (B) TM1 DISABLE WARNING	SM (B) TM2 DISABLE WARNING	SM (B) DISABLE UNMATCH
2D	SMP::HOTLINE WARNING							
	Not used	Not used	MBUS/H BUSDISABLE WARNING	MBUS/L BUSDISABLE WARNING	MBUS/H ABTRST WARNING	MBUS/L ABTRST WARNING	Not used	Not used
2E	SMP::MBUSOPEN READ							
	MBUS/L BUSOPEN 0	MBUS/L BUSOPEN 1	MBUS/L BUSOPEN 2	MBUS/L BUSOPEN WARNING	MBUS/H BUSOPEN 0	MBUS/H BUSOPEN 1	MBUS/H BUSOPEN 2	MBUS/H BUSOPEN WARNING
2F	SMP::MHCHKERR READ							
	MBUS/H CHKERR B 0	MBUS/H CHKERR B 1	Not used	MBUS/H CHKERR B WARNING	MBUS/H CHKERR A 0	MBUS/H CHKERR A 1	Not used	MBUS/H CHKERR A WARNING
30	SMP::MLCHKERR READ							
	MBUS/L CHKERR B 0	MBUS/L CHKERR B 1	Not used	MBUS/L CHKERR B WARNING	MBUS/L CHKERR A 0	MBUS/L CHKERR A 1	Not used	MBUS/L CHKERR A WARNING

40 | 7F	Common information (See “Type 3”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(4) Byte28 = 50/51/53/55 : Three BSA FBUSH lines inconsistent

	0	1	2	3	4	5	6	7
28	Subcode : x‘50’ : Three BSA FBUSH BUSOPEN lines inconsistent x‘51’ : Three BSA FBUSH CHKERR lines inconsistent x‘53’ : Three BSA FBUSH FBUSDSBL lines inconsistent x‘55’ : Three BSA FBUSH LIVEINS lines inconsistent							
29	MPID							
2A	BSA0::CK2DST1							
	FBUS OPEN 0	FBUS OPEN 1	FBUS OPEN 2	FBUS OPEN 0 and 1	FBUS OPEN 0 and 2	FBUS OPEN 1 and 2	Not used	Not used
2B	BSA0::CK2DST2							
	FBUS LIVEINS 0	FBUS LIVEINS 1	FBUS LIVEINS 2	FBUS LIVEINS 0 and 1	FBUS LIVEINS 0 and 2	FBUS LIVEINS 1 and 2	Not used	Not used
2C	BSA0::CK2AST0							
	FBUS CHKERR 0	FBUS CHKERR 1	FBUS CHKERR 2	FBUS CHKERR 0 and 1	FBUS CHKERR 0 and 2	FBUS CHKERR 1 and 2	Not used	Not used
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	BSA0::CK2DST1							
	FBUS DISABLE 0	FBUS DISABLE 1	FBUS DISABLE 2	FBUS DISABLE 0 and 1	FBUS DISABLE 0 and 2	FBUS DISABLE 1 and 2	Not used	Not used

40 | 7F	Common information (See “Type 3”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(5) Byte28 = 60/61/63/65 : Three BSA FBUSL lines inconsistent

	0	1	2	3	4	5	6	7
28	Subcode : x‘60’ : Three BSA FBUSL BUSOPEN lines inconsistent x‘61’ : Three BSA FBUSL CHKERR lines inconsistent x‘63’ : Three BSA FBUSL FBUSDSBL lines inconsistent x‘65’ : Three BSA FBUSL LIVEINS lines inconsistent							
29	MPID							
2A	BSA0::CK2DST1							
	FBUS OPEN 0	FBUS OPEN 1	FBUS OPEN 2	FBUS OPEN 0 and 1	FBUS OPEN 0 and 2	FBUS OPEN 1 and 2	Not used	Not used
2B	BSA0::CK2DST2							
	FBUS LIVEINS 0	FBUS LIVEINS 1	FBUS LIVEINS 2	FBUS LIVEINS 0 and 1	FBUS LIVEINS 0 and 2	FBUS LIVEINS 1 and 2	Not used	Not used
2C	BSA0::CK2AST0							
	FBUS CHKERR 0	FBUS CHKERR 1	FBUS CHKERR 2	FBUS CHKERR 0 and 1	FBUS CHKERR 0 and 2	FBUS CHKERR 1 and 2	Not used	Not used
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	BSA0::CK2DST1							
	FBUS DISABLE 0	FBUS DISABLE 1	FBUS DISABLE 2	FBUS DISABLE 0 and 1	FBUS DISABLE 0 and 2	FBUS DISABLE 1 and 2	Not used	Not used

40 | 7F	Common information (See “Type 3”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(6) Byte28 = 70 : SMP slave error

	0	1	2	3	4	5	6	7
28	Subcode : x‘70’ : SMP slave error							
29	MPID							
2A	SMP::SLVERR							
	Address code error	Commans bus code error	Data bus code error	Write bus code error	Transfer count error (command)	Bus mode error (command)	Transfer mode error (command)	Not used
2B	SMP::SLVERR							
	Not used	Not used	Not used	Slave ti,eout error	Slave timer parity error	Not used	Sequencer state error	Not used
2C	SMP::SLVERR							
	MH address code error	MH command bus code error	MH data bus code error	Not used	MH transfer count error (command)	MH bus mode error (command)	MH transfer mode error (command)	Not used
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	SMP::SLVERR							
	ML address code error	ML command bus code error	ML data bus code error	Not used	ML transfer count error (command)	ML bus mode error (command)	ML transfer mode error (command)	Not used

40 | 7F	Common information (See “Type 4”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(7) Byte28 = 16/26 : SMP Arbiter ENB OFF detected

	0	1	2	3	4	5	6	7
28	Subcode : x‘16’ : SMP MBUSH Arbiter ENB OFF detected x‘26’ : SMP MBUSL Arbiter ENB OFF detected							
29	MPID							
2A	SMP::HOTLINE STATUS							
	Not used	MBUS/H BUSDISABLE 0	MBUS/H BUSDISABLE 1	MBUS/H BUSDISABLE 2	Not used	MBUS/L BUSDISABLE 0	MBUS/L BUSDISABLE 1	MBUS/L BUSDISABLE 2
2B	SMP::HOTLINE STATUS							
	MBUS/H ABTRST ENABLE	MBUS/H ABTRST 0	MBUS/H ABTRST 1	MBUS/H ABTRST 2	MBUS/L ABTRST ENABLE	MBUS/L ABTRST 0	MBUS/L ABTRST 1	MBUS/L ABTRST 2
2C	SMP::HOTLINE WARNING							
	Not used	SM (A) TM1 DISABLE WARNING	SM (A) TM2 DISABLE WARNING	SM (A) DISABLE UNMATCH	Not used	SM (B) TM1 DISABLE WARNING	SM (B) TM2 DISABLE WARNING	SM (B) DISABLE UNMATCH
2D	SMP::HOTLINE WARNING							
	Not used	Not used	MBUS/H BUSDISABLE WARNING	MBUS/L BUSDISABLE WARNING	MBUS/H ABTRST WARNING	MBUS/L ABTRST WARNING	Not used	Not used
2E	SMP::MBUSOPEN READ							
	MBUS/L BUSOPEN 0	MBUS/L BUSOPEN 1	MBUS/L BUSOPEN 2	MBUS/L BUSOPEN WARNING	MBUS/H BUSOPEN 0	MBUS/H BUSOPEN 1	MBUS/H BUSOPEN 2	MBUS/H BUSOPEN WARNING
2F	SMP::MHCHKERR READ							
	MBUS/H CHKERR B 0	MBUS/H CHKERR B 1	Not used	MBUS/H CHKERR B WARNING	MBUS/H CHKERR A 0	MBUS/H CHKERR A 1	Not used	MBUS/H CHKERR A WARNING
30	SMP::MLCHKERR READ							
	MBUS/L CHKERR B 0	MBUS/L CHKERR B 1	Not used	MBUS/L CHKERR B WARNING	MBUS/L CHKERR A 0	MBUS/L CHKERR A 1	Not used	MBUS/L CHKERR A WARNING

40 | 7F	Common information (See “Type 3”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(8) Byte28 = 56 : BSA FBUSH Arbiter ENB OFF detected

	0	1	2	3	4	5	6	7
28	Subcode : x‘56’ : BSA FBUSH Arbiter ENB OFF detected							
29	MPID							
2A	BSA0::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Not used	Not used	FBUS ABT valid	Not used	Not used
2B	Not used (x‘00’)							
2C	Not used (x‘00’)							
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	Not used (x‘00’)							

40 | 7F	Common information (See “Type 3”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning)

(9) Byte28 = 66 : BSA FBUSL Arbiter ENB OFF detected

	0	1	2	3	4	5	6	7
28	Subcode : x‘66’ : BSA FBUSL Arbiter ENB OFF detected							
29	MPID							
2A	BSA1::COPY							
	Slave BUSY signal was received	CACHE RD transfer end	CACHE WR transfer end	Not used	Not used	FBUS ABT valid	Not used	Not used
2B	Not used (x‘00’)							
2C	Not used (x‘00’)							
2D	Not used (x‘00’)							
2E	Not used (x‘00’)							
2F	Not used (x‘00’)							
30	Not used (x‘00’)							

40 | 7F	Common information (See “Type 3”)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 1 (1/4)

	0	1	2	3	4	5	6	7
40	CMC::MEMERROR0							
	Module group number			Module side number	Byte number of 1 symbol error valid	Byte number of 1 symbol error		
41	CMC::MEMERROR0							
	Byte number of 1 symbol error		Not used	Not used	Not used	Not used	Not used	Not used
42	CMC::MEMERROR1							
	Module group number			Module side number	Byte number of 1 symbol error valid	Byte number of 1 symbol error		
43	CMC::MEMERROR1							
	Byte number of 1 symbol error		Not used	Not used	Not used	Not used	Not used	Not used
44	CMC::MEMERROR2							
	Module group number			Module side number	Byte number of 1 symbol error valid	Byte number of 1 symbol error		
45	CMC::MEMERROR2							
	Byte number of 1 symbol error		Not used	Not used	Not used	Not used	Not used	Not used
46	CMC::MEMERROR3							
	Module group number			Module side number	Byte number of 1 symbol error valid	Byte number of 1 symbol error		
47	CMC::MEMERROR3							
	Byte number of 1 symbol error		Not used	Not used	Not used	Not used	Not used	Not used
48	Not used							
49	Not used							
4A	Not used							
4B	Not used							
4C	Not used							
4D	Not used							
4E	Not used							
4F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 1 (2/4)

	0	1	2	3	4	5	6	7
50	Threshold counter for cache memory 1 symbol error							
	Module No. 00							
51	Threshold counter for cache memory 1 symbol error							
	Module No. 01							
52	Threshold counter for cache memory 1 symbol error							
	Module No. 02							
53	Threshold counter for cache memory 1 symbol error							
	Module No. 03							
54	Threshold counter for cache memory 1 symbol error							
	Module No. 10							
55	Threshold counter for cache memory 1 symbol error							
	Module No. 11							
56	Threshold counter for cache memory 1 symbol error							
	Module No. 12							
57	Threshold counter for cache memory 1 symbol error							
	Module No. 13							
58	Threshold counter for cache memory 1 symbol error							
	Module No. 20							
59	Threshold counter for cache memory 1 symbol error							
	Module No. 21							
5A	Threshold counter for cache memory 1 symbol error							
	Module No. 22							
5B	Threshold counter for cache memory 1 symbol error							
	Module No. 23							
5C	Threshold counter for cache memory 1 symbol error							
	Module No. 30							
5D	Threshold counter for cache memory 1 symbol error							
	Module No. 31							
5E	Threshold counter for cache memory 1 symbol error							
	Module No. 32							
5F	Threshold counter for cache memory 1 symbol error							
	Module No. 33							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 1 (3/4)

	0	1	2	3	4	5	6	7
60	Threshold counter for cache memory 1 symbol error							
	Module No. 40							
61	Threshold counter for cache memory 1 symbol error							
	Module No. 41							
62	Threshold counter for cache memory 1 symbol error							
	Module No. 42							
63	Threshold counter for cache memory 1 symbol error							
	Module No. 43							
64	Threshold counter for cache memory 1 symbol error							
	Module No. 50							
65	Threshold counter for cache memory 1 symbol error							
	Module No. 51							
66	Threshold counter for cache memory 1 symbol error							
	Module No. 52							
67	Threshold counter for cache memory 1 symbol error							
	Module No. 53							
68	Threshold counter for cache memory 1 symbol error							
	Module No. 60							
69	Threshold counter for cache memory 1 symbol error							
	Module No. 61							
6A	Threshold counter for cache memory 1 symbol error							
	Module No. 62							
6B	Threshold counter for cache memory 1 symbol error							
	Module No. 63							
6C	Threshold counter for cache memory 1 symbol error							
	Module No. 70							
6D	Threshold counter for cache memory 1 symbol error							
	Module No. 71							
6E	Threshold counter for cache memory 1 symbol error							
	Module No. 72							
6F	Threshold counter for cache memory 1 symbol error							
	Module No. 73							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 1 (4/4)

	0	1	2	3	4	5	6	7
70	Not used							
71	Not used							
72	Not used							
73	Not used							
74	Not used							
75	Not used							
76	Not used							
77	Not used							
78	Not used							
79	Not used							
7A	Not used							
7B	Not used							
7C	Not used							
7D	Not used							
7E	Not used							
7F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 2 (1/4)

	0	1	2	3	4	5	6	7
40	SMC::SMC CONTROL							
	Rewrite inhibit module 00	Rewrite inhibit module 01	Rewrite inhibit module 02	Rewrite inhibit module 03	Rewrite inhibit module 04	Rewrite inhibit module 05	Not used	Not used
41	SMC::SMC CONTROL							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
42	SMC::SMC CONTROL							
	ENT RST mask	I/O register parity check inhibit	MBUS/L check error output inhibit	MBUS/H check error output inhibit	Correctable error parity check mask	Serial access	Not used	Board error mask
43	SMC::SMC CONTROL							
	LSTCYCLE signal check mask	SIMM type	00: 16M 01: mixture 1X: 64M	Refresh mode	Access mode	10X : Data read 110 : ECC read /write 111 : ECC test write		Reverse write inhibit
44	SMC::BOARD ERROR STARUS							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
45	SMC::BOARD ERROR STATUS							
	Not used	Parity error in bus select signal	Parity error in bus select sequencer	Parity error in lock timeout counter	Not used	Not used	Loop check error	Parity error in correctable counter
46	SMC::BOARD ERROR STATUS							
	RAS output error	CAS output error	WE output error	OE output error	LVT direction signal output error	Address output error	Data output error	ECC output error
47	SMC::BOARD ERROR STATUS							
	Clock error	Refresh parity error	Timer parity error	MBUS count counter parity error	MBUS time counter parity error	Main sequencer parity error	MBUS/H sequencer parity error	MBUS/L sequencer parity error
48	SMC::MBUS ERROR STATUS							
	Slave 2	Slave 1	Warning	Error	PS OFF was detected	All lock busy	Memory ready	Memory enable
49	SMC::MHBUS ERROR STATUS							
	Not used	Not used	Not used	Board error	All lock busy	Memory not ready	Back up busy	Double lock error
4A	SMC::MHBUS ERROR STATUS							
	Correctable error	Uncorrec-table error	Read data check error	Write data check error	Double access unmatch	Transfer count error	Bus mode error	Transfer mode error
4B	SMC::MBUS ERROR STATUS							
	Not used	Last cycle error	No DSYNC	Not used	Not used	Not used	Not used	Not used
4C	SMC::MHBUS ERROR LOCATION							
	Module 00 correctable error	Module 01 correctable error	Module 02 correctable error	Module 03 correctable error	Module 04 correctable error	Module 05 correctable error	Not used	Not used
4D	SMC::MHBUS ERROR LOCATION							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
4E	SMC::MHBUS ERROR LOCATION							
	Not used	Not used	Not used	Not used	Not used	Correctable error in memory element 0 (for data)	Correctable error in memory element 1 (for data)	Correctable error in memory element 2 (for data)
4F	SMC::MHBUS ERROR LOCATION							
	Correctable error in memory element 3 (for data)	Correctable error in memory element 4 (for data)	Correctable error in memory element 5 (for data)	Correctable error in memory element 6 (for data)	Correctable error in memory element 7 (for data)	Correctable error in memory element 0 (for data)	Correctable error in memory element 1 (for data)	Correctable error in memory element 2 (for data)

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 2 (2/4)

	0	1	2	3	4	5	6	7
50	SMC::MLBUS ERROR STATUS							
	Slave 2	Slave 1	Warning	Error	PS OFF was detected	All lock busy	Memory ready	Memory enable
51	SMC::MLBUS ERROR STATUS							
	Not used	Not used	Not used	Board error	All lock busy	Memory not ready	Back up busy	Double lock error
52	SMC::MLBUS ERROR STATUS							
	Correctable error	Uncorrec-table error	Read data check error	Write data check error	Double access unmatch	Transfer count error	Bus mode error	Transfer mode error
53	SMC::MLBUS ERROR STATUS							
	Not used	Last cycle error	No DSYNC	Not used	Not used	Not used	Not used	Not used
54	SMC::MLBUS ERROR LOCATION							
	Module 00 correctable error	Module 01 correctable error	Module 02 correctable error	Module 03 correctable error	Module 04 correctable error	Module 05 correctable error	Not used	Not used
55	SMC::MLBUS ERROR LOCATION							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
56	SMC::MLBUS ERROR LOCATION							
	Not used	Not used	Not used	Not used	Not used	Correctable error in memory element 0 (for data)	Correctable error in memory element 1 (for data)	Correctable error in memory element 2 (for data)
57	SMC::MLBUS ERROR LOCATION							
	Not used	Not used	Not used	Not used	Not used	Correctable error in memory element 0 (for data)	Correctable error in memory element 1 (for data)	Correctable error in memory element 2 (for data)
58	Threshold counter for shared memory 1 symbol error							
	Module No. 00							
59	Threshold counter for shared memory 1 symbol error							
	Module No. 01							
5A	Threshold counter for shared memory 1 symbol error							
	Module No. 02							
5B	Threshold counter for shared memory 1 symbol error							
	Module No. 03							
5C	Threshold counter for shared memory 1 symbol error							
	Module No. 04							
5D	Threshold counter for shared memory 1 symbol error							
	Module No. 05							
5E	Threshold counter for shared memory 1 symbol error							
	Module No. 06							
5F	Threshold counter for shared memory 1 symbol error							
	Module No. 07							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 2 (3/4)

	0	1	2	3	4	5	6	7
60	Threshold counter for shared memory 1 symbol error							
	Module No. 08							
61	Threshold counter for shared memory 1 symbol error							
	Module No. 09							
62	Threshold counter for shared memory 1 symbol error							
	Module No. 10							
63	Threshold counter for shared memory 1 symbol error							
	Module No. 11							
64	Threshold counter for shared memory 1 symbol error							
	Module No. 12							
65	Threshold counter for shared memory 1 symbol error							
	Module No. 13							
66	Threshold counter for shared memory 1 symbol error							
	Module No. 14							
67	Threshold counter for shared memory 1 symbol error							
	Module No. 15							
68	Not used							
69	Not used							
6A	Not used							
6B	Not used							
6C	Not used							
6D	Not used							
6E	Not used							
6F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 2 (4/4)

	0	1	2	3	4	5	6	7
70	Not used							
71	Not used							
72	Not used							
73	Not used							
74	Not used							
75	Not used							
76	Not used							
77	Not used							
78	Not used							
79	Not used							
7A	Not used							
7B	Not used							
7C	Not used							
7D	Not used							
7E	Not used							
7F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 3 (1/4)

	0	1	2	3	4	5	6	7
40	Threshold counter for the warning							
	MPID 0							
41	Threshold counter for the warning							
	MPID 1							
42	Threshold counter for the warning							
	MPID 2							
43	Threshold counter for the warning							
	MPID 3							
44	Threshold counter for the warning							
	MPID 4							
45	Threshold counter for the warning							
	MPID 5							
46	Threshold counter for the warning							
	MPID 6							
47	Threshold counter for the warning							
	MPID 7							
48	Threshold counter for the warning							
	MPID 8							
49	Threshold counter for the warning							
	MPID 9							
4A	Threshold counter for the warning							
	MPID 10							
4B	Threshold counter for the warning							
	MPID 11							
4C	Threshold counter for the warning							
	MPID 12							
4D	Threshold counter for the warning							
	MPID 13							
4E	Threshold counter for the warning							
	MPID 14							
4F	Threshold counter for the warning							
	MPID15							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 3 (2/4)

	0	1	2	3	4	5	6	7
50	Threshold counter for the warning							
	MPID 16							
51	Threshold counter for the warning							
	MPID 17							
52	Threshold counter for the warning							
	MPID 18							
53	Threshold counter for the warning							
	MPID 19							
54	Threshold counter for the warning							
	MPID 20							
55	Threshold counter for the warning							
	MPID 21							
56	Threshold counter for the warning							
	MPID 22							
57	Threshold counter for the warning							
	MPID 23							
58	Threshold counter for the warning							
	MPID 24							
59	Threshold counter for the warning							
	MPID 25							
5A	Threshold counter for the warning							
	MPID 26							
5B	Threshold counter for the warning							
	MPID 27							
5C	Threshold counter for the warning							
	MPID 28							
5D	Threshold counter for the warning							
	MPID 29							
5E	Threshold counter for the warning							
	MPID 30							
5F	Threshold counter for the warning							
	MPID 31							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 3 (3/4)

	0	1	2	3	4	5	6	7
60	Threshold counter for the warning							
	MPID 32							
61	Threshold counter for the warning							
	MPID 33							
62	Threshold counter for the warning							
	MPID 34							
63	Threshold counter for the warning							
	MPID 35							
64	Threshold counter for the warning							
	MPID 36							
65	Threshold counter for the warning							
	MPID 37							
66	Threshold counter for the warning							
	MPID 38							
67	Threshold counter for the warning							
	MPID 39							
68	Threshold counter for the warning							
	MPID 40							
69	Threshold counter for the warning							
	MPID 41							
6A	Threshold counter for the warning							
	MPID 42							
6B	Threshold counter for the warning							
	MPID 43							
6C	Threshold counter for the warning							
	MPID 44							
6D	Threshold counter for the warning							
	MPID 45							
6E	Threshold counter for the warning							
	MPID 46							
6F	Threshold counter for the warning							
	MPID 47							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 3 (4/4)

	0	1	2	3	4	5	6	7
70	Threshold counter for the warning							
	MPID 48							
71	Threshold counter for the warning							
	MPID 49							
72	Threshold counter for the warning							
	MPID 50							
73	Threshold counter for the warning							
	MPID 51							
74	Threshold counter for the warning							
	MPID 52							
75	Threshold counter for the warning							
	MPID 53							
76	Threshold counter for the warning							
	MPID 54							
77	Threshold counter for the warning							
	MPID 55							
78	Threshold counter for the warning							
	MPID 56							
79	Threshold counter for the warning							
	MPID 57							
7A	Threshold counter for the warning							
	MPID 58							
7B	Threshold counter for the warning							
	MPID 59							
7C	Threshold counter for the warning							
	MPID 60							
7D	Threshold counter for the warning							
	MPID 61							
7E	Threshold counter for the warning							
	MPID 62							
7F	Threshold counter for the warning							
	MPID 63							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 4 (1/4)

	0	1	2	3	4	5	6	7
40	Not used							
41	Not used							
42	Not used							
43	Threshold counter for the MP warning							
	Write bus code error							
44	Not used							
45	Not used							
46	Not used							
47	Not used							
48	Not used							
49	Not used							
4A	Not used							
4B	Threshold counter for the MP warning							
	Slave time-out error							
4C	Threshold counter for the MP warning							
	Slave timer parity error							
4D	Not used							
4E	Threshold counter for the MP warning							
	Sequencer status error							
4F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 4 (2/4)

	0	1	2	3	4	5	6	7
50	Threshold counter for the MP warning							
	MH address code error							
51	Threshold counter for the MP warning							
	MH command bus code error							
52	Threshold counter for the MP warning							
	MH data bus code error							
53	Not used							
54	Threshold counter for the MP warning							
	MH transfer count error (command)							
55	Threshold counter for the MP warning							
	MH bus mode error (command)							
56	Threshold counter for the MP warning							
	MH transfer mode error (command)							
57	Not used							
58	Threshold counter for the MP warning							
	ML address code error							
59	Threshold counter for the MP warning							
	ML command bus code error							
5A	Threshold counter for the MP warning							
	ML data bus code error							
5B	Not used							
5C	Threshold counter for the MP warning							
	ML transfer count error (command)							
5D	Threshold counter for the MP warning							
	ML bus mode error (command)							
5E	Threshold counter for the MP warning							
	ML transfer mode error (command)							
5F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 4 (3/4)

	0	1	2	3	4	5	6	7
60	Not used							
61	Not used							
62	Not used							
63	Not used							
64	Not used							
65	Not used							
66	Not used							
67	Not used							
68	Not used							
69	Not used							
6A	Not used							
6B	Not used							
6C	Not used							
6D	Not used							
6E	Not used							
6F	Not used							

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Byte27 = FF (Cache Memory/Shared Memory/M bus/F bus correctable error/Warning) Byte40-7F Type 4 (4/4)

	0	1	2	3	4	5	6	7
70	Not used							
71	Not used							
72	Not used							
73	Not used							
74	Not used							
75	Not used							
76	Not used							
77	Not used							
78	Not used							
79	Not used							
7A	Not used							
7B	Not used							
7C	Not used							
7D	Not used							
7E	Not used							
7F	Not used							

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Byte0D : Bit1 = 1 & Byte36-37 = 08C1 (Machine Condition Exception) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cache DKC)							
23	Count							
24	Device address							
25	Device type							
26	Content (x‘6’)				Format (x‘3’)			
27	Operation byte of LR/LRE command parameter							
28	Auxiliary byte of LR/LRE command parameter							
29	Byte 2 for LR/LRE command							
2A	Reserved							
2B								
2C	Search parameter of LR command(CCHHR)							
2D	or							
2E	Record ID of re-execution command(R)							
2F								
30	Sector number to re-execute the LR command							
31	TLF for LR/LRE command							
32								
33	Operation byte = 0x3F :LRE External operation byte others :Reserved							
34	SSID (Low) of self subsystem							
35								
36	Exception code (x‘08C1’)							
37								
38	Log and message control (x‘05’)							
39	Program action code (x‘10’)							
3A	Configuration information							
3B								
3C	Not usde (x‘01’)							
3D	Cylinder address							
3E								
3F	Head address							

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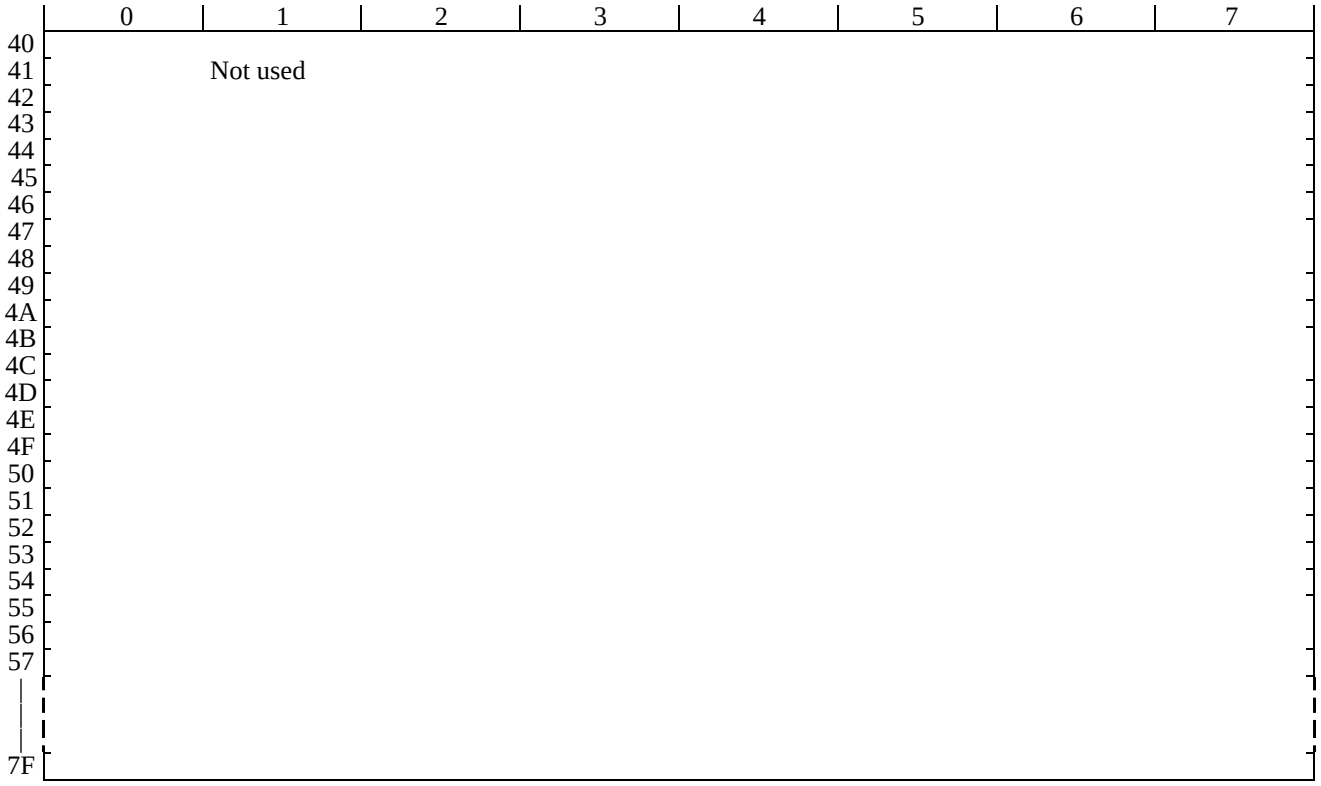
Byte0D : Bit1 = 1 & Byte36-37 = 08C1 (Machine Condition Exception) (2/2)



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Byte0D : Bit1 = 1 & Byte36-37 = 0212 (Command Sequence Exception: Incomplete Domain) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cace DKC)							
23	Count							
24	Device address							
25	Device type							
26	Content (x‘6’)				Format (x‘4’)			
27	Operation byte of LR/LRE command parameter							
28	Extension operation byte of LR/LRE command parameter							
29	Head address of extent (DX command parameter)							
2A								
2B								
2C								
2D								
2E	Path group ID (byte 1 to 7 of the ID by the last Set Path Group ID command)							
2F								
30								
31								
32								
33								
34	SSID (Low) of self subsystem							
35								
36	Exception code (x‘0212’)							
37								
38	Log and message control (x‘05’)							
39	Program action code (x‘10’)							
3A	Configuration information							
3B								
3C	Not usde (x‘01’)							
3D	Cylinder address							
3E								
3F	Head address							

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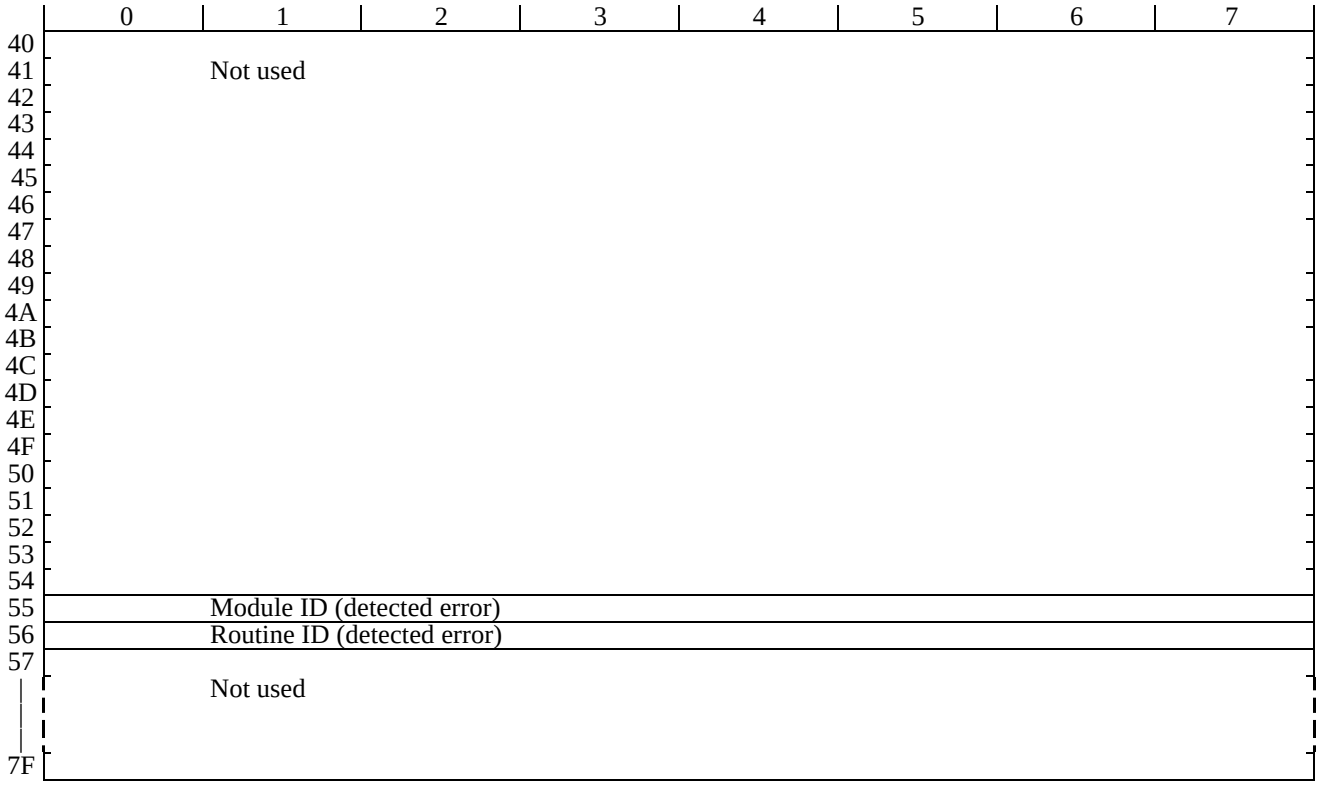
Byte0D : Bit1 = 1 & Byte36-37 = 0212 (Command Sequence Exception : Incomplete Domain) (2/2)



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Byte0D : Bit1 = 1 & Byte36-37 = 4XXX (Data exception) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cache DKC)							
23	Count							
24	Device address							
25	Device type (x‘24’ :DKU87I-3)							
26	Content				Format (x‘1’)			
27	Sector number (Note 1)							
28	Cylinder address (Note 1)							
29								
2A	Head address (Note 1)							
2B								
2C	Record number (Note 1)							
2D	Error displacement (Note 1)							
2E								
2F	Drive serial number (x‘0C’) + (x‘69’) + (DKU sequence number)							
30								
31								
32								
33								
34	SSID of self subsystem							
35								
36	Exception class (x‘4’)				Message (Note 2)			
37	Correction flag (Note 3)							
38	Log and message control (x‘08’)							
39	Program action code (x‘91’)							
3A	Configuration information							
3B								
3C	Not usde (x‘01’)							
3D	Cylinder address							
3E								
3F	Head address							

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Byte0D : Bit1 = 1 & Byte36-37 = 4XXX (Data exception) (2/3)

	0	1	2	3	4	5	6	7
40		Causal Key code						
41		Causal Format/Message						
42		Causal Module ID						
43		Causal Routine ID						
44		VDEV number, slot number						
45								
46								
47								
48		Slot status						
49								
4A								
4B								
4C		staging bit map/Dirty bit map						
4D								
4E								
4F								
50		Current subblock number						
51		EXIT falg (Note 4)						
52		Slot failure information (Note 5)						
53		Obtained information flat (Note 6)						
54		Head subblock number for HIT/MISS decision + Remain subblock count						
55		(when byte36 is x‘40/41/42/43’) / PACC in CBUF (when byte36 is x‘45’)						
56		Not used (when byte36 is x‘40/41/42/43’) /						
57		PAHF in CBUF (when byte36 is x‘45’)						
58		Not used (when byte36 is x‘40/41/42/43’) /						
59		Current CC in JCB (when byte36 is x‘45’)						
5A		Not used (when byte36 is x‘40/41/42/43’) /						
5B		Current HH in JCB (when byte36 is x‘45’)						
5C								
		Reserved						
7F								

(Note 1) Not determined for occurrence in HA or RO

(Note 2) Contents of message

x'0' : Data check in HA field
x'1' : Data check in C field
x'2' : Data check in K field
x'3' : Data check in D field
x'4' : Missing SYNC byte in HA field
x'5' : Missing SYNC byte in C field (PA error)
x'6' : Missing SYNC byte in K field
x'7' : Missing SYNC byte in D field
x'8' : Not used
x'9' : Missing AM during retry
x'A'to x'F' : Not used

(Note 3) Contents of correctionflag

Bits 0 and 1 : ECC correction bit
10 : Correctable (Recoverd)
11 : Uncorrectable
Bit 2 : offset activ
Bits 3 to 7 : Not used

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Byte0D : Bit1 = 1 & Byte36-37 = 4XXX (Data exception) (3/3)

(Note 4) EXIT flag

x'08' : CHL I/F CHK2 timeover
x'0D' : EOF
x'0E' : DSB=0E requested
x'0F' : Logical error
x'1E' : Make sense only
x'1F' : Logical error (make sense only)
x'30' : Selective reset requested
x'40' : 'Staging' requested
x'41' : 'Waiting free segment' requested
x'42' : 'Timeover of waiting for staging' requested
x'43' : 'Staging for PA unmatch' requested
x'45' : 'Destaging' requested
x'46' : 'High priority destaging' requested
x'47' : 'Pseud-through process' requested
x'4B' : 'DSB=4E retry' requested (data transfer)
x'4E' : 'DSB=4E retry' requested (DSB=4E retry)
x'4F' :STG requested (Read or STG in progress)

(Note 5) Slot failure

x'80' : Sector write error
x'40' : Sector read error
x'20' : ECC/LRC error
x'10' : Incomplete data
x'08' : No decision

(Note 6) Obtained information flag

bit0-1 : Block type
- 00 : Data block
- 01 : HA/RO block
- 10 : Bit map block

bit2-3 : Side
- 00 : Cache write side
- 01 : NVS write side
- 10 : Cache read side

bit4 : Segment
- 0 :No segment
- 1 :Segment exist

bit5-7 : Reserved

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Byte36 = 6F (Subsystem Information) (1/1)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cace DKC)							
23	Command overrun threshold exceeded							
24	Device address							
25	Device type							
26	Unit flag	DEV ADR V	TRK ADR V	Unused(0)	Format (x‘1’)			
27	Data overrun hreshold exceeded							
28	Seek count							
29								
2A	Drive serial number (x‘0C’) +							
2B	(x‘69’) +							
2C	(DKU sequence number)							
2D								
2E								
2F	DKC serial number (x‘0C’) +							
30	(x‘69’) +							
31	(x‘00’) +							
32	(DKC sequence number : high) +							
33	(DKC sequence number : low)							
34	SSID of self subsystem							
35								
36	Exception code Y : 0 : Statistics/RRBL command, 2 : Channel data overrun							
37	(x‘6FXY’) X : For serial CHL : LCP#, For parallel CHL : CHL#							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Read/search byte count							
3F								
40	Not used							
7F								

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Byte36 : Bit0-3 = D & Byte27 : bit0-2 = 7 (SPC Detected Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cache DKC)							
23	Count							
24	Device address							
25	Device type							
26	Unit flag	DEV ADR V	TRK ADR V	Not used	Format (x‘1’)			
27	Type code (b‘111’)			Not used	Reserved			
28	SPC interuption status register (See SSBLOG05-4400 to 4430)							
29	SPC comand step register (See SSBLOG05-4440 to 4460)							
2A	SCSI command code (See SSBLOG05-4490)							
2B	Threshold type (See SSBLOG05-4470)							
2C	Module ID							
2D	Routine ID							
2E	Not used							
2F	Drive serial number* (x‘0C’) +							
30	(x‘69’) +							
31	(DKU sequence number)							
32								
33								
34	SSID of self subsystem							
35								
36	Exception code (x‘Dxyz’) x : DKA number							
37	y : CDEV number z : RDEV number							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte36 : Bit0-3 = D & Byte27 : bit0-2 = 7 (SPC Detected Failure) (2/2)

	0	1	2	3	4	5	6	7
40		Status byte						
41		Message						
42		CDB						
43								
44								
45								
46								
47								
48								
49								
4A								
4B								
4C		SPC status register						
4D		SPC nexus status register						
4E		SPC data block register						
4F								
50		SPC data byte register						
51								
52								
53		SPC SCSI control signal status register						
54		SCA SFC						
55								
56		SCA SFS0						
57								
58		SCA XFS1						
59								
5A		SCA INT						
5B								
5C		SCA SCHK1						
5D								
5E		SCA SCHK20						
5F								
60		SCA SCHK21						
61								
62		SCA SCHK22						
63								
64		SCA SCHK23						
65								
66		SCA SCHK24						
67								
68		SCA SCHK25						
69								
6A		SCA SCACHK2						
6B								
6C		SCA BSACHK2						
6D								
6E		SCA XFS2						
6F								
70		SCA XFS3						
71								
72		Not used						
|								
7F								

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Interruption status codes

1. Interruption related to SCSI reset

Interruption code	Cause of interruption	Conditions for interruption
01h	RESET-CONDITION DETECTED	Reset status has been detected on the SCSI bus.

2. Interruption related to transfer

Interruption code	Cause of interruption	Conditions for interruption
24h	SCSI parity error	A parity error has been detected in the input/output data of the SCSI interface in the current phase.
22h	MPU parity error	A parity error has been detected in the output data of the MPU interface during program transfer (data phase).
21h	DMA parity error	A parity error has been detected in the input/output data of the DMA interface during DMA transfer (data phase).
26h	SCSI parity error & MPU parity error	A parity error has been detected in the input/output data of the MPU and SCSI interfaces during program transfer (data phase).
25h	SCSI parity error & DMA parity	A parity error has been detected in the input/output data of the DMA and SCSI interfaces during DMA transfer (data phase).
29h	Offset error	More REQ/ACK signals have been received in synchronous transfer than the offset value that is set
2Ah	Short transfer period error	SPC could not be tracked during synchronous transfer because the cycle of the received REQ/ACK signal was short.
2Bh	Offset error & Short transfer period error	An offset error and short transfer period error have been detected during synchronous transfer.
2Ch	REQ/ACK timeout	The time that is set for REQ/ACK TIMEOUT has been exceeded.
31h	Disconnected in transfer progress	Bus free status has been detected during phase execution (transfer operation).
32h	Phase error in transfer progress	A phase error has occurred during phase execution (transfer operation).

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3. Interruption related to phase transition

Interruption code	Cause of interruption	Conditions for interruption
54h	Initial phase error*	Inconsistency occurred when the phase of the received C. COMMAND received the first REQ signal.
55h	Initial phase error & MSG received†	An initial phase error occurred and one message was received for the target MSG-IN request.
56h	Initial phase error & STATUS received†	An initial phase error occurred and one STATUS was received for the target STATUS receive request.
42h	Command stop (ATN condition detected)††	During execution of the data phase that failed in phase transition due to the generation of the ATN condition of the initiator, the transfer is stopped at the transfer block boundary and this interruption is reported. (At this time, the data register is empty.)
43h	Command stop (ATN condition detected & MSG received)†	One message was received after responding to the MSG-OUT request of the initiator that failed in phase transition due to the generation of the ATN condition of the initiator. During execution of the data phase, one message is received after responding at the transfer block boundary. (At this time, the data register is empty.)

* If a phase error has occurred and the DATAIN phase has been requested, the operation is as follows:

1) When the target with a nexus is in the asynchronous transfer mode

   One-byte data is received.

2) When the target with a nexus is in the synchronous transfer mode

   The number of bytes for the received REQ signal are received (ACK signal is not asserted).

† Occurs only when the AUTO receive mode is set.

†† Occurs only when the AUTO receive mode is not set.

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4. Interruption related to report

Interruption code	Cause of interruption	Conditions for interruption
60h	Command complete	Received command has ended normally.
64h	Command Reject	1) A command has been received during automatic operation of this SPC (AUTO selection/reselection response). 2) Another command has been received during execution of a command. 3) The message length is 33 or more bytes when the SEND MSG command for EXTEND-MSG has been received.
65h	Command Invalid	1) A command of the target has been received during operation as an initiator. 2) A command of the initiator has been received during operation as a target. 3) A sequential command is present in the user program memory. 4) The received command code is not defined. 5) A command that requires the setting of the data block register/data byte register (MC byte counter) has been received, but the register value is “0”. 6) Transfer is impossible because the CDB length of group 6/7 is set to “0”. 7) The CDB of group 3/4 or a transfer command has been received.
66h	REG parity error detected	A parity error has been detected in the register set by the host MPU.
67h	COMMAND PAUSE	1) The COMMAND PAUSE command was received and processing ended.
68h	Self-diagnostic result “GOOD”	Self-diagnostics are performed, and the result is “normal.”
69h	Self-diagnostic result “NO GOOD”	Self-diagnostics are performed, and the result is “abnormal.”
70h	Disconnected	Bus free status has been detected while making a nexus as an initiator.
71h	REQ Asserted	Next phase execution is requested from the target. This interruption occurs only when no command is received in the nexus.
61h	Command complete (ATN condition detected)	The command ends normally and the ATN condition generated by the initiator is detected only when an ATN signal is asserted when an ACK signal is asserted for the last phase of the executed command.
62h	Command complete (ATN condition detected & MSG received)	A command has ended normally and one message has been received after responding to the ATN condition generated by the initiator. An ATN signal is detected only when an ATN signal is asserted when an ACK signal is asserted for the last phase of the executed command.

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5. Interruption related to selection/reselection

Interruption code	Cause of interruption	Conditions for interruption
82h	Sel/Reselection timeout	The time that is set for selection/reselection timeout has been exceeded.
90h	Reselected	The target has been reset as the initiator.
80h	Selected	The initiator has been selected as the target.
81h	Selected with ATN	The initiator has been selected as the target, and the ATN condition generated by the initiator has been detected.

5. Interruption related to response operation for auto selection/reselection

Interruption code	Cause of interruption	Conditions for interruption
B0h	AUTO mode phase error	The reselection phase changed to a phase other than the MSG-IN phase.
B1h	MSG received	After the reselection phase, one message was received.
A0h	AUTO mode phase error	No ATN signal was asserted in the selection phase. This interruption occurs only when the MSG-OUT phase is set after the selection phase.
A1h	MSG received	After the selection phase, a message other than Identify-MSG was received.
A2h	Illegal Identify MSG received	Identify-MSG was received after the selection phase, but bits 5, 4, and 3 are set to ë1í.
A3h	MSG received with Identify MSG	After the selection phase, Identify-MSG was received, followed by another message.
A4h	unknown CDB received	After the selection phase, an attempt to receive one command was made, but only one byte was received because the CD8 length of group 6 or 7 was unobtainable. This interruption occurs only when the MSG or CMD phase is set after the selection phase.
A5h	unknown CDB received with Identify MSG	After the selection phase, an attempt was made to receive a command following Identify-MSG, but only one byte was received because the CD8 length of group 6 or 7 was unobtainable.
A6h	CMD received **	After the selection phase, one command was received. This interruption occurs only when the MSG or CMD phase is set after the selection phase.
A7h	CMD received with Identify MSG	After the selection phase, Identify-MSG was received, followed by a command.
A8h	CMD received & MSG received	After the selection phase, one command was received. Then one message was received for the attention status. This interruption occurs only when the MSG or CMD phase is set after the selection phase.
A9h	CMD received with Identify MSG received	After the selection phase, Identify-MSG was received, followed by a command. Then one message was received for the attention status.

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Command step

No.	Command name	Function	STEP	Description
1	RESELECTION & 1-MSG	1) Performs reselection. 2) Changes to the MSG-IN phase. 3) Issues a message.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete
2	RESELECTION & N-Byte-MSG	1) Performs reselection. 2) Changes to the MSG-IN phase. 3) Issues a message.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete
3	RESELECTION & TERMINATE	1) Performs reselection. 2) Performs the Terminate sequence.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Transition to the STATUS phase STATUS phase running
			X‘04’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘05’	Message issuance complete Disconnect Command complete
4	RESELECTION & LINK TERMINATE	1) Performs reselection. 2) Performs the LINK-Terminate sequence.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘01’	Nexus established Transition to the STATUS phase STATUS phase running
			X‘03’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete

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No.	Command name	Function	STEP	Description
5	TERMINATE	1) Changes to the STATUS phase. 2) Issues one-byte status. 3) Changes to the MSG-IN phase. 4) Issues a one-byte message. 5) Disconnect	X‘00’	Command received
			X‘01’	During transition to the STATUS phase STATUS phase running
			X‘02’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘03’	Message issuance complete Disconnect Command complete
6	LINK TERMINATE	1) Changes to the STATUS phase. 2) Issues one-byte status. 3) Changes to the MSG-IN phase. 4) Issues a one-byte message.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	Transition to the STATUS phase STATUS phase running
			X‘02’	STATUS issuance complete Transition to the MSG-IN phase MSG-IN phase running
			X‘03’	Message issuance complete Command complete
7	DISCONNECT SEQUENCE	1) Changes to the MSG-IN phase. 2) Issues a two-byte message. 3) Disconnect	X‘00’	Command received BUS FREE phase awaited
			X‘01’	Transition to the MSG-IN phase MSG-IN phase running
			X‘02’	Two-byte message issuance complete Disconnect Command complete
8	SEND N-Byte-MSG	1) Changes to the MSG-IN phase 2) Issues N-byte messages (two or more messages)	X‘00’	Command received
			X‘03’	Transition to the MSG-IN phase MSG-IN phase running
			X‘04’	All MSG bytes being issued Command complete
9	RECEIVE N-Byte-CMD	1) Changes to the CMD phase. 2) Receives an N-byte CDB (undefined CDB).	X‘00’	Command received
			X‘04’	Transition to the CMD phase CMD phase running
			X‘05’	All CDB bytes received completely Command complete
10	RECEIVE N-Byte-MSG	1) Transition to the MSG-OUT phase 2) Receives an N-byte CDB (33 bytes or more messages).	X‘00’	Command received
			X‘02’	Transition to the MSG-OUT phase MSG-OUT phase running
			X‘03’	All message bytes received completely Command complete
11	RESELECTION	Performs reselection.	X‘00’	Command received BUS FREE phase awaited
			X‘01’	BUS FREE phase detected During arbitration
			X‘02’	Bus use right acquired During reselection
			X‘03’	Nexus established Command complete
12	SET REQ	Asserts REQ.	X‘00’	Command received
			X‘01’	C. Command Complete
13	RESET REQ	Negates REQ.	X‘00’	Command received
			X‘01’	C. Command Complete

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No.	Command name	Function	STEP	Description
14	Disconnect	Releases a BSY signal.	X‘00’	Command received
			X‘01’	C. Command Complete
15	SEND DATA from MPU	1) Changes to the DATA-IN. phase. 2) Issues data in the program transfer mode	X‘00’	Command received
			X‘01’	Transition to the DATA-IN phase DATA-IN phase running
			X‘02’	All data bytes received completely Command complete
16	SEND DATA from DMA	1) Changes to the DATA-IN. phase. 2) Issues data in the program transfer mode	X‘00’	Command received
			X‘01’	Transition to the DATA-IN phase DATA-IN phase running
			X‘02’	All data bytes received completely Command complete
17	RECEIVE DATA from MPU	1) Changes to the DATA-OUT phase. 2) Receives data in the program transfer mode.	X‘00’	Command received
			X‘01’	Transition to the DATA-OUT phase. DATA-OUT phase running
			X‘02’	All data bytes received completely Command complete
18	RECEIVE DATA from DMA	1) Changes to the DATA-OUT phase. 2) Receives data in the program transfer mode.	X‘00’	Command received
			X‘01’	Transition to the DATA-OUT phase. DATA-OUT phase running
			X‘02’	All data bytes received completely Command complete
19	SEND 1-MSG	1) Changes to the MSG-IN phase 2) Issues a message.	X‘00’	Command received
			X‘01’	Transition to the MSG-IN phase MSG-IN phase running
			X‘02’	All message bytes issued completely Command complete
20	RECEIVE MSG	1) Changes to the MSG-OUT phase. 2) Issues a message.	X‘00’	Command received
			X‘01’	Transition to the MSG-OUT phase MSG-OUT phase running
			X‘02’	All message bytes received completely Command complete
21	SEND STATUS	1) Changes to the STATUS phase. 2) Issues one-byte status.	X‘00’	Command received
			X‘01’	Transition to the STATUS phase STATUS phase running
			X‘02’	STATUS issuance complete Command complete
22	RECEIVE CMD	1) Changes to the CMD phase. 2) Receives CDB.	X‘00’	Command received
			X‘01’	Transition to the CMD phase CMD phase running
			X‘02’	All CDB bytes received completely Command complete

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Threshold type

Code	Threshold (failure) type	Code	Threshold (failure) type
00	CHA CHK1A	30	Cache 1 bit correctable error
01	CHA CHK1B	31	Cache uncorrectable error
02	CHA CHK3	32	Cache 2 bits correctable error
03	CHA CHK2	33	CPC check error
04	CHA ADP temporary error	40	SCSI port failure
05	LCM hardware error	41	Drive mechanism recovered error
06	BSA F bus open	42	Drive mechanism unrecovered error
07	BSA LIVEINS	43	Drive media recovered error
08	BSA check error	44	Drive media unrecovered error
09	SMP M bus open	45	Drive R/W recovered error
0A	SMP M bus check error	46	Drive R/W unrecovered error
0B	SMP H/L check error	47	Drive interface recovered error
10	DKA CHK1A	48	Drive interface unrecovered error
11	DKA CHK1B	49	Controller recovered error
12	DKA CHK3	4A	Controller unrecovered error
13	DKA SCA temporary error	4B	SCSI interface recovered error
14	DKA DRR temporary error	4C	SCSI interface unrecovered error
16	BSA F bus open	4D	Drive I/O read error
17	BSA LIVEINS	4E	Drive I/O write error
18	BSA check error	60	SVP interface error
19	SMP M bus open	FF	Invalid threshold type
1A	SMP M bus check error		
1B	SMP H/L check error		
20	Shared memory correctable error		
21	Shared memory uncorrectable error		
22	SMC M bus open		
23	SMC H/L bus open		

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Byte36 : Bit0-3 = D & Byte27 : bit0-2 = 0 (Drive Detected Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cache DKC)							
23	Count							
24	Device address							
25	Device type							
26	Unit flag	DEV ADR V	TRK ADR V	Not used	Format (x‘1’)			
27	Type code (b‘000’)			Not used	Sense key (Note 1)			
28	Additional sense code (Note 2)							
29	Additional sense code qualifier (Note 2)							
2A	SCSI Command (Note 3)							
2B	Threshold type (Note 4)							
2C	Module ID (≠ x‘50/52’)							
2D	Routine ID							
2E	Not used							
2F	Drive serial number* (x‘0C’) +							
30	(x‘69’) +							
31	(DKU sequence number)							
32								
33								
34	SSID of self subsystem							
35								
36	Exception code (x‘Dxyz’) x : DKA number							
37	y : CDEV number z : RDEV number							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte36 : Bit0-3 = D & Byte27 : bit0-2 = 0 (Drive Detected Failure) (1/2)

	0	1	2	3	4	5	6	7
40		Status byte						
41		Message						
42		CDB						
4B								
4C		SPC status register						
4D		SPC nexus status register						
4E		SPC data block register						
4F								
50		SPC data byte register						
51								
52								
53		SPC SCSI control signal status register						
54		SCSI extended sense data						
73								
74		Not used						
7F								

(Note 1) Sense key

x‘0’ : No sense
x‘1’ : Recoverd error
x‘2’ : Not ready
x‘3’ : Medium error
x‘4’ : Hardware error
x‘5’ : Illigal request
x‘6’ : Unit attention
x‘7’ : Data protect
x‘8’ : Blank check (Not used)
x‘9’ : Vender unique (Not used)
x‘A’ : Copy aborted (Not used)
x‘B’ : Aborted command
x‘C’ : Equal (Not used)
x‘D’ : Volume overflow (Not used)
x‘E’ : Miscompare
x‘F’ : (Reserved)

(Note 2) See SSBLOG05-4520~SSBLOG05-4540

(Note 3) SCSI command

x‘00’ : Test unit ready
x‘03’ : Request sense
x‘04’ : Format unit
x‘07’ : Reassign blocks
x‘12’ : Inquiry
x‘15’ : Mode serect
x‘1A’ : Mode sense
x‘1B’: Start/stop unit
x‘1C’ : Recieve diagnostic result
x‘1D’ : Send diagnostic
x‘28’ : Read (extend)
x‘2A’ : Write (extend)
x‘2E’ : Write and verify
x‘3B’ : Write buffer

(Note 4) See SSBLOG05-5370

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Byte36 : Bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Detected Failure) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cache DKC)							
23	Count							
24	Device address							
25	Device type							
26	Unit flag	DEV ADR V	TRK ADR V	Not used	Format (x‘0’)			
27	Type code (b‘000’)			Not used	Sense key (Note 1)			
28	Additional sense code (Note 2)							
29	Additional sense code qualifier (Note 2)							
2A	SCSI Command (Note 3)							
2B	Threshold type (Note 4)							
2C	Module ID (≠ x‘5X/6X’)							
2D	Routine ID							
2E	Not used							
2F	Drive serial number* (x‘0C’) +							
30	(x‘69’) +							
31	(DKU sequence number)							
32								
33								
34	SSID of self subsystem							
35								
36	Exception code (x‘Exyz’) x : DKA number							
37	y : CDEV number z : RDEV number							
38	Log and message control (x‘00’)							
39	Program action code (x‘00’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

* : This information is not fixed until DKC reports SSB to HOST.

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Byte36 : Bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Detected Failure) (2/2)

	0	1	2	3	4	5	6	7
40	Status byte							
41	Message							
42	CDB							
4B								
4C	SPC status register							
4D	SPC nexus status register							
4E	SPC data block register							
4F								
50	SPC data byte register							
51								
52								
53	SPC SCSI control signal status register							
54	SCSI extended sense data							
73								
74	Not used							
7F								

(Note 1) Sense key

x‘0’ : No sense
x‘1’ : Recoverd error
x‘2’ : Not ready
x‘3’ : Medium error
x‘4’ : Hardware error
x‘5’ : Illigal request
x‘6’ : Unit attention
x‘7’ : Data protect
x‘8’ : Blank check (Not used)
x‘9’ : Vender unique (Not used)
x‘A’ : Copy aborted (Not used)
x‘B’ : Aborted command
x‘C’ : Equal (Not used)
x‘D’ : Volume overflow (Not used)
x‘E’ : Miscompare
x‘F’ : (Reserved)

(Note 3) SCSI command

x‘00’ : Test unit ready
x‘03’ : Request sense
x‘04’ : Format unit
x‘07’ : Reassign blocks
x‘12’ : Inquiry
x‘15’ : Mode serect
x‘1A’ : Mode sense
x‘1B’ : Start/stop unit
x‘1C’ : Recieve diagnostic result
x‘1D’ : Send diagnostic
x‘28’ : Read (extend)
x‘2A’ : Write (extend)
x‘2E’ : Write and verify
x‘3B’ : Write buffer

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (1/9)

Sense key	Code*	Error name	Description
0	00 00	No Additional Sense Information	No valid additional sense information.
4	01 00	No Index/Sector Signal	• Index signal cannot be detected. • Sector signal cannot be detected.
1/4	02 00	No Seek Complete	The Seek operation of the drive cannot be performed properly.
1/4	03 00	Write Fault	Drive Write Fault has been detected.
1/4	03 80	Write at inhibit condition	The Write is attempted under the write inhibit condition.
2	04 00	Drive Not Ready	• Drive Ready signal cannot be detected. • The drive cannot be accessed.
2	04 01	Drive is in Progress of Becoming Ready	The drive is not ready and will soon get ready.
2	04 02	Drive Not Ready, Initializing Command Required	The drive is not ready. Issue the START UNIT command to get it ready.
2	04 04	Drive Not Ready, Format in Progress	The drive is not ready. (Format in progress)
2	04 80	Drop Ready	Drive got not Ready because motor has stopped incorrectly.
2	05 00	Drive Not Selected	Drive cannot be selected.
1/4	06 00	No Track Zero Found	Positioning to track zero is impossible.
4	08 00	Logical Unit Communication Failure	A drive interface error has occurred. (MESDI I/F Error)
4	08 01	Logical Unit Communication Time Out	A drive interface time-out error has occurred. (MESDI I/F Time Out)
4	08 02	Logical Unit Communication Parity Error	A drive interface parity error has occurred. (MESDI I/F Parity Error)
1/4	09 00	Track Following Error	Track positioning failed.
1/4	09 80	Track Positioning Error	The track is out of position between ATN OFF and MESDI command (seek) issued.
1/4	09 81	ESDI Invalid Command	An invalid ESDI command has occurred.
1	0C 01	Write Error Recovered with Auto Reallocation	Write Error Recovered with Auto Reallocation.
3	0C 02	Write Error Auto Reallocation Failed	Automatic reallocation was attempted for an ID error detected during a write, but it failed.
1	0C 81	Auto REA Exhausted with Write Auto REA	Auto reassignment resulted in failure because of over-threshold.
1/3	10 00	ID CRC Error	A CRC or ECC error has occurred in the ID field.
3	11 00	Unrecovered Read Error	An error has occurred in the DATA field (retry not applied).

* The higher-order byte of the code indicates an additional sense code (byte 8), and the lower-order byte an additional sense code qualifier (byte 9).

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (2/9)

Sense key	Code	Error name	Description
3	11 01	Read Retries Exhausted	A retry was attempted for a DATA field read error, but recovery was impossible (error correction not applied).
3	11 02	Error Too Long to Correct	ECC correction of the DATA field read error is impossible.
3	11 04	Unrecovered Read Error-Auto Reallocation Failed	Auto reallocation was attempted to a correctable error but failed.
3	11 82	Error Too Long to Multi-Symbol Soft Correction	Can not correct a Read error in DATA field with Multi-Symbol Soft Correction.
1/3	12 00	No Address Mark Found in ID Field	No address mark cannot be detected in the ID field.
1/3	13 00	No Address Mark Found in Data Field	No address mark cannot be detected in the DATA field.
1/3	13 80	Sprit Data AM Not Found	AM in Sprit Data is not found.
1	13 E1	VFO Data AM Recovered (Read Gate Delay:4, PLL:8)	Data AM Error is recovered with Read Gate Delay:4 byte, PLL:6 byte.
1	13 E2	VFO Data AM Recovered (Read Gate Delay:0, PLL:6)	Data AM Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1	13 E3	VFO Data AM Recovered (Read Gate Delay:8, PLL:6)	Data AM Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
1	13 E4	Split Data AM Recovered (Read Gate Delay:4, PLL:8)	Split Data AM Error is recovered with Read Gate Delay:4 byte, PLL:8 byte.
1	13 E5	Split Data AM Recovered (Read Gate Delay:0, PLL:6)	Split Data AM Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1	13 E6	Split Data AM Recovered (Read Gate Delay:8, PLL:6)	Split Data AM Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
1/3	14 01	No Record Found	A block with a consistent ID field cannot be detected.
3	14 03	Write Fault (Require Reassign)	Write Fault of Drive is detected. (Require Reassign)
1/3	14 80	Flag Error	The flag in the ID field is inconsistent.
1/3	14 81	Drive Fault with ATN OFF	A drive fault was detected when ESDI ATN is off.
1/3	14 82	Mismatch Sector ID	The sector address in the ID field is inconsistent.
1/3	14 83	Drive Error with no Factor	A drive error was detected, but all error cause were off.
3	14 84	ID Check Code Error at ID ON the Fly	Check Code error is detected in ID On the Fly.
3	14 91	Uncorrectable Data Error using previous sector ID	A data error was recovered by a previous sector ID retry, but the data is uncorrectable error by ECC.
3	14 93	Data AM not found using previous Sector ID	A previous sector ID retry was attempted, but the data AM of the data cannot be detected.
3	14 94	Sprit Data AM Not Found using Previous Sector ID	A previous sector ID retry was attempted, but the Sprit data AM of the data cannot be detected.
1	14 98	ECC Correctable Error using previous Sector ID	A data error was recovered using previous sector ID retry, but the data is recovered data by ECC.

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (3/9)

Sense key	Code	Error name	Description
3	14 A0	Reassign Fault because of Reserve Sector No REC	A reassign command failed. (The reserved sector is No REC.)
3	14 A1	Previous Sector Error with Previous Sector ID retry	A previous sector ID retry was attempted, but an error occurred in previous ID.
3	14 B1	Error too much to recover using previous ID	A previous sector ID retry cannot execute. (Number of error ID ≥ 2)
1/3	14 C0	ID On the Fly Correction Error	ID error is detected with ID On the Fly correction and CCH not coincident.
1/3	14 E1	VFO ID Error Recovered (Read Gate Delay:4, PLL:8)	VFO ID Error is recovered with Read Gate Delay:4 byte, PLL:8 byte.
1/3	14 E2	VFO ID Error Recovered (Read Gate Delay:0, PLL:6)	VFO ID Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1/3	14 E3	VFO ID Error Recovered (Read Gate Delay:8, PLL:6)	VFO ID Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
3	15 00	Seek Positioning Error	The target address cannot be sought.
1/3	15 01	Mechanical Positioning Error	A seek error has occurred.
1/3	15 02	Positioning Error Detected by Read of Medium	A seek ended normally but the address was not the target address.
1/3	15 B0	Drive Check Code Error	The drive found a check code error (Read).
1/3	15 DA	SCTSTUS Register Error	An error has occurred in SCTSTUS register.
3	15 DB	SCTSTUS Register Error (Index Pulse Error)	An index pulse error has occurred in SCTSTUS register.
1/3	17 XX	Recovered Data with Retries	Retry Succeeded in error recovery. XX depends on retry method.
1	17 00	Recovered Data with No Error Correction Applied	Indicates that a retry has succeeded in error recovery with no Error Correction Applied. (Retries: max. 3 times)
1	17 01	Recovered Data with Retries	A retry has succeeded in error recovery with change of data strobe offset, slice level, etc.
1	17 02	Recovered Data with Positive Head Offset	A retry with a positive head offset has succeeded in error recovery.
1	17 03	Recovered Data with Negative Head Offset	A retry with a negative head offset has succeeded in error recovery.
1	17 05	Recovered Data Using Previous Sector ID	A data recovery has been executed by a previous ID retry.
1	17 06	Recovered Data without ECC-Data Auto Reallocation	Recovered with Auto Reallocation, without Error Correction Applied.
1	17 85	Recovered Data with Physical SCT Pulse Read	Error is recovered with Physical Sector pulse read.
1	17 86	Auto REA Exhausted without ECC Correction	Auto Reallocation (with no Error Correction Applied) Exhausted.
1/3	17 D6	Drive Overrun Occurred Recovered:RTRY Recovered	Drive Overrun occurred by hardware failure. Recovered by retry.

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (4/9)

Sense key	Code	Error name	Description
1	17 E1	Data Error Recovered by VFO (Read Gate Delay:4, PLL:8)	Data Error is recovered with Read Gate Delay:4 byte, PLL:8 byte.
1	17 E2	Data Error Recovered by VFO (Read Gate Delay:0, PLL:6)	Data Error is recovered with Read Gate Delay:0 byte, PLL:6 byte.
1	17 E3	Data Error Recovered by VFO (Read Gate Delay:8, PLL:6)	Data Error is recovered with Read Gate Delay:8 byte, PLL:6 byte.
1	18 00	Recovered Data with Error Correction Applied	Error recovery has been accomplished with ECC correction (no retry).
1	18 01	Recovered Data with ECC and Retries Applied	Indicates that a retry has succeeded in error recovery with ECC correction.
1	18 02	Recovered Data with ECC and/or Retries Data Auto Reallocated	Recovered Data with ECC and/or Retries Data Auto Reallocated.
1	18 80	Recovered Data without Retries or Multi-Symbol Soft Correction	Recovered Data without Retries or Multi-Symbol Soft Correction.
1	18 81	Recovered Data with Retries and Multi-Symbol Soft Correction	Recovered Data with Retries and Multi-Symbol Soft Correction.
1	18 82	Auto REA Exhausted with ECC Correction	After recovering data with ECC correction, Auto reassignment resulted in failure because of over-threshold.
1/3	19 02	Defect List Error in Primary List	An error has occurred during Primary (P) list access.
1/3	19 03 04 05 06	Defect List Error in Grown List	An error has occurred during Grown (G) list access.
5	1A 00	Parameter List Length Error	Parameter list length is invalid.
1/3	1C 01	Primary Defect List Not Found	Positioning to the Primary (P) list failed.
1/3	1C 02	Grown Defect List Not Found	Positioning to the Grown (G) list failed.
E	1D 00	Miscompare During Verify Operation	Indicates that a data compare error has occurred during Verify operation.
5	20 00	Invalid Command Operation Code	The operation code is invalid.
5	21 00	Logical Block Address out of Volume Range	A logical address (LBA) beyond the capacity of the medium has been pointed out.
5	21 44	Logical Block Address out of Zone Range	Illegal access is made over a zone in LBA Mapping.
5	24 00	Illegal Field in CDB	An error is in the CDB command.

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (5/9)

Sense key	Code	Error name	Description
5	24 81	Odd Byte Data Out Request in Wide Transfer	Odd Byte Data Out is requested in Wide Transfer.
5	24 82	Odd Byte Data Out Request	Odd bytes data out requirement has occurred.
5	25 00	Invalid LUN	The LUN indicated in the CDB command or IDENTIFY message is not supported.
5	26 00	Invalid Field in Parameter List	An error is in the parameter list.
5	26 01	Parameter Not Supported	An unsupported parameter has been received.
5	26 02	Parameter Value Invalid	A parameter value is invalid.
5	26 03	Threshold Parameters Not Supported	Received threshold parameters that not supported.
5	26 80	Microprogram Download Error	Illegal Product type name is detected in the download file.
7	27 00	Write Protected	The drive is write-protected.
6	29 00	Power On, Reset or Bus Device Reset or Reboot Occurred	• A Power On Reset has occurred. • A Bus Device Reset has occurred. • A SCSI Bus Reset has occurred. • Reboot has occurred.
6	2A 00	Parameter Changed	• Mode/Log parameters changed. • Parameters were changed by MODE SELECT command. • Set Mode/Log parameters because drive condition changed from not ready to ready.
6	2A 01	Mode Parameters Changed	• Mode/Log parameters changed. • Key = 2 : Format Mode Parameters Changed (Page 3, 4).
6	2A 02	Log Parameters Changed	Log Parameters Changed.
6	2F 00	Command Cleared by Another Initiator	Command Cleared by Another Initiator.

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (6/9)

Sense key	Code	Error name	Description
2/3	31 00	Medium Format Corrupted	The medium is not correctly formatted. It must be reformatted by the FORMAT command.
3	31 01	Format Command Failed	The FORMAT command has ended abnormally.
1	31 F0	ETF Cylinder Read Error	ETF Cylinder Read Error has occurred in Initial Formatting, and treats as it has no P-list.
1	31 F1	ETF Cylinder ESDI Defect List Check Error	ETF Cylinder ESDI Defect List Check Error has occurred in Initial Formatting, and treats as it has no P-list.
1	31 F2	M-List Write Error	M-List Write Error has occurred in Initial Formatting.
1/4	32 00 32 8X	No Defect Spare Location Available	Reallocation is impossible because of alternate area shortage.
1/3	32 01	Defect List Update Failure	Updating the Grown (G) list failed.
1	37 00	Rounded Parameter	The parameter value has been rounded because it cannot be handled as it is
1	3D 00	Invalid Bits in Identify Message	Invalid bits have been detected in the Identify message.
2	3E 00	Logical Unit Has Not Self-Configured Yet.	The self-configuration of the drive has not been determined yet. Initial Formatting has not completed.
2	3E 01	Program Load Error	Program Load Error.
2	3E 02	Program Load Error at CSN	Program Load Error at CSN.
4	3E 03	Can’t found Program with Program Loader	A program (loaded by program loader) cannot be found.
4	3E 04	Check SUM Error with Program Loader	A SUM check error detected during a program loading.
4	3E 05	Can’t found end Mark with Program Loader	An end mark of partitioned file cannot be found when a program load. (Does not occur.)
6	3F 00	Target Operating Conditions Have Changed	Target Operating Conditions Have Changed.
6	3F 01	Microcode Has been Changed	A microcode has been changed by downloading microcode.
6	3F 03	Inquiry Data Has Changed	Inquiry data has changed. (by switching ROM-RAM)

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (7/9)

Sense key	Code	Error name	Description
4	40 00	RAM Failure	RAM failure detected.
4	42 00	Power On or Self test Failure	Indicates that an error has occurred during Power On Diagnostic. _ MPU error _ TIMER error _ ROM error _ Disk controller error _ Initial Formatting Failure _ RAM diagnostic error _ Buffer error
4	42 80	Hard Register Error in Send Diag Self Test	Hardware Register diag error is detected in Send Diag Self Test.
B	43 00	Message Error	The message is rejected and operation cannot continue.
4	44 00	Internal Target Error	A hardware/firmware error has been detected in the controller during execution of a command.
B	44 00	Write ABORT with Array Mode	Received ABORT message in writing with Array Mode.
4	44 80	Pin occurred with Forced Write After	A PIN occurred at forcible write after. (only in case 8MB cache)
4	44 90	Management Data Read Error	A read process for management data in a management area was failed.
4	44 91	Multi Track R/W Error	A read/write process for multi track in a management area was failed.
4	44 97	Master Data Read Error	A read process for the master data in a management area was failed.
4	44 98	Can't Multi Track Write Remain Trackless	A write process for a management area was failed because remain track is one.
4	44 99	Multi Track Write Error	All write operations for a management area were failed.
4	44 9E	Master Data Write Error	A write process for master data of management area was failed.
4	44 9F	Time Out in CTL Area Access	Time Out Error is detected when Control Area is accessed.
4	44 A0	REA Sector not found	The sector for reassignment cannot be found.
4	44 A1	Reassign Data Restore Fail	Reassign Data Restore Failed.
4	44 A2	Reassign Sector ID Not Found (ID Misscompare)	Sector ID to be reassigned can not be found.
4	44 A3	No Defect Spare Location Available at Skip REA.	No Spare Sector is available for Skip Reassign.
4	44 A4	ID String Check Error	Reassign failed due to ID String check error.
4	44 A5	Reassign Data Save Error	Reassign Data Save Error.
4	44 A6	Reassign ID Write Error	Source sector ID for Reassign can not be updated.
4	44 A9 AD	BASM acceding order error	BASM acceding order error has occurred during reassignment.

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (8/9)

Sense key	Code	Error name	Description
4	44 AB AC	G List irregular Order	G List acceding order error has occurred.
4	44 AE	BATM irregular Order	BATM acceding order error has occurred.
4	44 B0	HDC FIFO Error (Check Code Error etc.)	HDC FIFO Error is detected.
4	44 B1	SCSI FIFO Error (Check Code Error etc.)	SCSI FIFO Error is detected.
4	44 C0	HDC DMAC Error	HDC DMAC Error is detected.
4	44 C1	SCSI DMAC Error	SCSI DMAC Error is detected.
4	44 D0	HDC Sequencer Setting Mismatch	HDC Sequencer setting values have compare check error.
4	44 D1	HDC DMA Next Condition Full	Can not set DMA due to Next being full after Current is finished.
4	44 D2	Offline ECC Correction Time Out	Time out is detected after initiating HDC for Offline one burst error correction.
4	44 D3	HDC Time Out	Time out is detected after initiating HDC for R/W.
4	44 D4	HDC Illegal Stop	HDC Stopped illegally.
4	44 D5	STRD Register Error	Error is detected in STRD Register.
4	44 D6	EERD Register Error	Error is detected in EERD Register.
4	44 D7	ESDIERR Register Error	Error is detected in ESDIERR Register.
4	44 D8	ECSTR Register Error	Error is detected in ECSTR Register.
4	44 D9	SST Register Error	Error is detected in SST Register.
4	44 DA	SCTSTUS Register Error	An error has occurred in SCTSTUS register.
4	44 DF	Error Factor Analysis Error	Error factor can not be identified.
4	44 F0	Spare Head Select Error	Wrong Jumper setting for Spare Head is made.
4	44 F1	Invalid Logical Cylinder Count	Number of Logical Cylinders returned from Drive ROM is out of Extent.
4	44 FF	Multi Track R/W Parameter Error	An internal parameter is detected in multi track R/W operation.
B	45 00	Select/Reselect Failed	_ Reselection Time Over has been detected. _ Invalid Select On has been detected.
B	47 00	SCSI Parity Error	A SCSI bus parity error has occurred.
B	48 00	Initiator Detected Error Message Received	The INITIATOR DETECTED ERROR message has been received from the initiator.
B	49 00	Invalid Message Error	An invalid message has been received.
B	4A 00	Command Phase Error	An error occurred in the COMMAND phase.
B	4B 00	Data Phase Error	An error occurred in the DATA phase.
4	4C 00	Logical Unit Failed Self-Configured	Microcode or parameter loading failed at the startup of the controller.
4	4C 80	RAM Configuration Load Error	A loading process for configuration information for RAM initialization was failed.
4	4C 90	Program Change Error	Incompatible micro code exchange was attempt.
4	4E 00	Overlapped Commands Attempted	(Does not occur.)

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Byte36 : bit0-3 = E & Byte2C : bit0-7 ≠ 5X/6X (Drive Error)

(Note 2) Additionel sense code + AdAdditional sense code qualifier (9/9)

Sense key	Code	Error name	Description
1	5B 00	Log Exception	Log Exception detected.
6	5B 01	Threshold Condition Met	Threshold Condition Met.
1	5B 02	Log Counter at Maximum	Log Counter has reached at Maximum.
1	5B 03	Log List Codes Exhausted	Log List Codes Exhausted.
4/6	5C 00	RPL Status Change	RPL Status has changed.
6	5C 01	Spindles Synchronized	Spindles Synchronized.
1/4/6	5C 02	Spindles Not Synchronized	Spindles Not Synchronized.
1	80 00	Read with Pin Hit	Read with Pin Hit. (only in case 8MB cache)
4	81 00	LA Check Error	LA Error is detected within Drive.
4	94 00	Auto-Reallocation Fail at No REC Sector	Auto reassignment failed on No REC sector.
1	AE 00	Spare Sector less then Threshold	There are few spare sector for alternate sector.
3	C2 00	Reassign required 11, 13, 14 Error Occurred with ORM	Reassign required error (code = 11,13,14) occurred in ORM. (Only in ORM Logging)
3	C4 00	Reassign required 11, 13, 14, 18 Error Occurred with ORM	Reassign required error (code = 11,13,14,18) occurred in ORM. (Only in ORM Logging)
3	E0 00	Read Error with 10 Retry SHR LOG Only	Read Error with 10 Retry (without Uncorrectable Error, without Error in Correction Applied and without AM Not Found). (SHR LOG Only)
3/4	E1 00	Uncorrectable Error with 10 Retry SHR LOG Only	Uncorrectable Error with 10 Retry. (SHR LOG Only)
3	E2 00	Uncorrectable Error with 10 Retry SHR LOG Only	Uncorrectable Error with 10 Retry. (SHR LOG Only)
3/4	E3 00	AM Not Found Error with 10 Retry SHR LOG Only	AM Not Found Error with 10 Retry, and Auto Reallocation Applied. Key = 4 : Auto Reallocation Failed. (SHR LOG Only)
3	E4 00	Correctable Error Sector No Same with 10 Retry SHR LOG Only	Correctable Error Sector No Same with 10 Retry. (SHR LOG Only)
4	E5 00	10 Retry Error Sector Auto Reallocation Failed SHR LOG Only	10 Retry Error Sector, and Auto Reallocation Failed. (SHR LOG Only)
3	E6 00	Another Sector Error with 10 Retry SHR LOG Only	Another Sector Error with 10 Retry. (SHR LOG Only)

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Byte36:bit0-3 = E & Byte2C:bit0-7 ≠ 5X/6X (Drive Error)

(Note 4) Threshold type

Code	Meanning
00	CHA CHK1A failure
01	CHA CHK1B failure
02	CHA CHK3 failure
03	CHA CHK2 failure
04	CHA ADP temporary failure
05	LCM hardware error
06	BSA F bus open
07	BSA LIVEINS
08	BSA check error
09	SMP M bus open
0A	SMP M bus check error
0B	SMP H/L check error
10	DKA CHK1A failure
11	DKA CHK1B failure
12	DKA CHK3 failure
13	DKA SCA temporary failure
14	DKA DRR temporary failure
16	BSA F bus open
17	BSA LIVEINS
18	BSA check error
19	SMP M bus open
1A	SMP M bus check error
1B	SMP H/L check error
20	Shared memory correctable error
21	Shared memory uncorrectable error
22	SMC M bus open
23	SMC H/L bus open
30	Cache one bit correctable error
31	Cache uncorrectable error
32	Cache two bits correctable error
33	CPC check error
40	SCSI port failure
41	Drive recovered error (mechanism)
42	Drive unrecovered error (mechanism)
43	Drive recovered error (media)
44	Drive unrecovered error (media)
45	Drive recovered error (read/write)
46	Drive unrecovered error (read/write)
47	Drive interface recovered error
48	Drive interface unrecovered error
49	Controller recovered error
4A	Controller unrecovered error
4B	SCSI interface recovered error
4C	SCSI interface unrecovered error
4D	Drive I/O read error
4E	Drive I/O write error
60	SVP interface error
FF	Invalid threshold type

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Byte36 = E0 & Byte2C = 5X/6X & Byte20 : b3 = 1 (LDEV blokckade/Pin VOL detected/Write inhibited) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cace DKC)							
23	Count							
24	Device address							
25	Device type							
26	Unit flag	DEV ADR V	TRK ADR V	Not used	Format (x‘1’)			
27	Type code (b‘000’)			Not used	Not used			
28	Ready	Enable	SSB pending	Not used				
29	Not used							
2A	M.M. RSV	PIN VOL	Write INH	Not used				
2B	Not used							
2C	Module ID (Note 1)							
2D	Routine ID (Note 1)							
2E	Not used							
2F	Drive serial number (x‘0C’) + (x‘69’) + (DKU sequence number)							
30								
31								
32								
33								
34	SSID of self subsystem							
35								
36	Exception code (x‘E000’)							
37								
38	Log and message control (x‘08’)							
39	Program action code (x‘92’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

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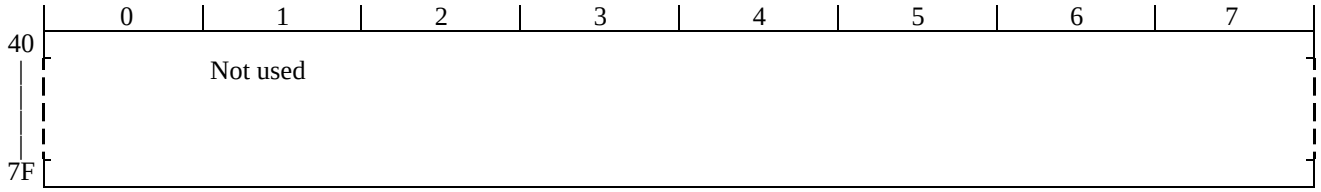
Byte36 = E0 & Byte 2C = 5X/6X & Byte20 : b3 = 1 (LDEV blokckade/Pin VOL detected/Write inhibited) (2/2)



(Note 1) Module ID·Routine ID

x‘5011/501C/5202’	; LDEV blockade
x‘501A/501B’	; Pin VOL detected
x‘6605/6697/6705/6784/6805/6853/6909/6953’	; Write inhibited

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Byte36-37 = E210 & Byte 2C = 5X/6X & Byte20 : b1 = 1 (Intervention requested : LDEV not ready) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB							
21								
22	Storage control type (x‘06’ : Cace DKC)							
23	Count							
24	Device address							
25	Device type							
26	Unit flag	DEV ADR V	TRK ADR V	Not used	Format (x‘2’)			
27	Type code (b‘000’)			Not used	Not used			
28	Ready	Enable	SSB PEND	0	0	0	0	0
29	x‘00’							
2A	M.M RSV	PIN VOL	0	0	0	0	0	0
2B	Host type	DKC type	0	0		DKU type		
2C	Module ID¥Routine ID							
2D	(x‘501C/5202’ : LDEV not ready)							
2E	Command code							
2F	Drive serial number (x‘0C’) +							
30	(x‘69’) +							
31	(DKU sequence number)							
32								
33								
34	SSID of self subsystem							
35								
36	Exception code (x‘E210’)							
37								
38	Log and message control (x‘01’)							
39	Program action code (x‘02’)							
3A	Configuration information							
3B								
3C	Message code							
3D	Cylinder address							
3E								
3F	Head address							

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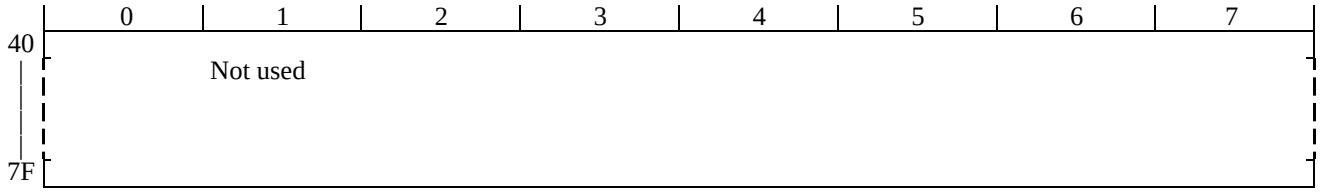
Byte36-37 = E210 & Byte 2C = 5X/6X & Byte20 : b1 = 1 (Intervention requested : LDEV not ready) (2/2)



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Byte26 : b4-7 = F & Byte3C = F1 (DKC SIM) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB*							
21								
22	Storage control type (x‘06’ : Cache DKC)*							
23	Count (x‘00’)*							
24	Device address*							
25	Device type*							
26	Content (Note 1)				Format (x‘F’)			
27	SIM sense record ID (x‘E0’)							
28	Range subject to the error (Note 2)				Range affected by repair (Note 3)			
29	Failure level (Note 4)		Failure SPs (Note 5)	SPs in SSID (Note 6)	Failure SSIDs (Note 7)	Affected SSIDs (Note 8)	Status (Note 9)	0
2A	Resent SIM (Note 10)	‘0000000’						
2B	Hardware level (Note 11)							
2C								
2D	Isoration code (Note 12)							
2E	SSB ID (Note 13)	SIM sequence number						SVP ID (Note 14)
2F	DKC serial number(x‘0C’) +							
30	(x‘69’) +							
31	(x‘00’) +							
32	(DKC sequence number : high) +							
33	(DKC sequence number : low)*							

* : This information is not fixed until DKC reports SIM to HOST.

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Byte26 : b4-7 = F & Byte3C = F1 (DKC SIM) (2/3)

	0	1	2	3	4	5	6	7	
34	SSID of self subsystem								
35									
36	Exception code (See “Reference code “ table)								
37									
38	Log and message control (Note 15’)*								
39	Program action code (x‘10’)*								
3A	Dual frame	EDCC mode	0	0	NONSYNC operation	Seial channel	Report output	Permanent path ERR	*
3B	32Byte SSB (0)	0	0	0	0	Extended path	Storage path number		*
3C	SIM message code (x‘F1’)								
3D	Affected SSID*								
3E									
3F	Not used								
40	Not used								
7F									

* : This information is not fixed until DKC reports SIM to HOST.

(Note 1) Content
- bit0 : Serial number valid (0:Invalid,1:Valid)
- bit1 : Device address valid (0:Invalid,1:Valid)
- bit2 : Track address valid (0:Invalid,1:Valid)
- bit3 : Not used (0)

(Note 2) Range subject to the error
- x‘0’ : Not used
- x‘1’ : Error range not known
- x‘2’ : SP error
- x‘3’ : CHL-I error
- x‘4’ : Not affect performance
- x‘5~F’ : Not used

(Note 3) Range affecte by repair
- x‘0’ : Not used
- x‘1’ : Repair range not known
- x‘2’ : Repair dose not affect performance
- x‘3’ : SP disabled during repair
- x‘4’ : SSID disabled during repair
- x‘5~F’ : Not used

(Note 4) Failure level
- 00 : Service Alert
- 01 : Moderate Alert
- 10 : serious Alert
- 11 : Acute Alert

(Note 5) Failure SPs
- 0 : 1SP
- 1 : 2SP

(Note 6) SPs in SSID
- 0 : 2SP
- 1 : 4SP

(Note 7) Failure SSIDs
- 0 : 1SSID
- 1 : 2SSID

(Note 8) Affected SSIDs
- 0 : 1SSID
- 1 : 2SSID

(Note 9) Status
- 0 : Reduction
- 1 : Stop

(Note 10) Resent SIM
- 0 :Unresent SIM
- 1 : Resent SIM

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Byte26 : b4-7 = F & Byte3C = F1 (DKC SIM) (3/3)

(Note 11) Hardware level

① When bit 0 is 0.

Bit 1 : Not used
Bit 2-3 : SP number
Bit 4-5 : CHLs PER CLUSTER
- 00 : 4
- 01 : 8
- 10 : Not used
- 10 : Not used
- 11 : Not used

Bit 6 :NVS
- 0 : Without NVS
- 1 : With NVS

Bit 8-10 : Cache size
- 000 : Non cache
- 001 : 256MB
- 010 : 512MB
- 011 : 768MP
- 100 : 1024MB
- 101 : 1280MB
- 110 : 1536MB
- 111 : Over 1536MB

Bit 11-13 : Cluster hardware level (‘000’)
Bit 14-15 : Cache/NVS hardware level (‘000’)

② When bit 0 is 1,

Bit 1 : Not used
Bit 2-3 : SP number
Bit 4-5 : CHLs per cluster
- 0000 : Parallel=4, serial=0
- 0001 : Parallel=8, serial=0
- 0010 : Parallel=4, serial=2
- 0100 : Parallel=4, serial=4
- 0110 : Parallel=0, serial=2
- 1000 : Parallel=0, serial=4
- 1010 : Parallel=0, serial=8
- 1100 : Parallel=0, serial=6

Bit 8 : Dual frame
- 0 : Dual frame
- 1 : Single frame

Bir 9-11 : Cache size
- 000 : Non cache
- 001 : 256MB
- 010 : 512MB
- 011 : 768MB
- 100 : 1024MB
- 101 : 1280MB
- 110 : 1536MB
- 111 : Over 1536MB

Bit 12-13 : Cluster hardware level (‘00’)
Bit 14-15 : Cache/NVS hardware level (‘00’)

(Note 12) Isolation code

Byte 2D ≠ x’ 00’ : Byte 36 and 37 are a sympton code.
Byte 2D = x’ 00’ : Byte 36 and 37 are a sympton code.
This byte is byte 2 of the isorarion code.

(Note 13) SSB ID

0 : SVP
1 : SP

(Note 14) SVP ID

0 : SVP1
1 : SVP2

(Note 15) Log and message control

bit 0-2 : Not used
bit 3 : Log mode (0)
bit 4-5 : Logging action
- 00 :Don’t log
- 01 : Unconditional log
- 10 : Log only once
- 11 : Log only if persistent

bit 6-7 : Operator message
- 00 : No message
- 01 : Unconditional message
- 10 : Send only once
- 11 : Send only if persistent

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Byte26 : b4-7 = F & Byte3C = F2 (CACHE SIM) (1/3)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB*							
21								
22	Storage control type (x‘06’ : Cache DKC)*							
23	Count (x‘00’)*							
24	Device address*							
25	Device type*							
26	Content (Note 1)				Format (x‘F’)			
27	SIM sense record ID (x‘E0’)							
28	Range subject to the error (Note 2)				Range affected by repair (Note 3)			
29	Failure level (Note 4)		Failure Sps (Note 5)	Sps in SSID (Note 6)	Failure SSIDs (Note 7)	Affected SSIDs (Note 8)	Status (Note 9)	0
2A	Resent SIM (Note 10)	‘0000000’						
2B	Hardware level (Note 11)							
2C								
2D	Isoration code (Note 12)							
2E	SSB ID (Note 13)	SIM sequence number						SVP ID (Note 14)
2F	DKC serial number(x‘0C’) + (x‘69’) + (x‘00’) + (DKC sequence number : high) + (DKC sequence number : low)*							
30								
31								
32								
33								

* : This information is not fixed until DKC reports SIM to HOST.

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Byte26 : b4-7 = F & Byte3C = F2 (CACHE SIM) (2/3)

	0	1	2	3	4	5	6	7	
34	SSID of self subsystem								
35									
36	Exception code (See “Reference code” table)								
37									
38	Log and message control (Note 15’)*								
39	Program action code (x‘10’)*								
3A	Dual frame	EDCC mode	0	0	NONSYNC operation	Seial channel	Report output	Permanent path ERR	*
3B	32Byte SSB (0)	0	0	0	0	Extended path	Storage path number		*
3C	SIM message code (x‘F1’)								
3D	Affected SSID*								
3E									
3F	Not used*								
40	Not used								
7F									

* : This information is not fixed until DKC reports SIM to HOST.

(Note 1) Content
- bit0 : Serial number valid (0:Invalid,1:Valid)
- bit1 : Device address valid (0:Invalid,1:Valid)
- bit2 : Track address valid (0:Invalid,1:Valid)
- bit3 : Not used (0)

(Note 2) Range subject to the error
- x‘0’ : Not used
- x‘1’ : Error range not known
- x‘2’ : SP error
- x‘3’ : CHL-I error
- x‘4’ : Not affect performance
- x‘5~F’ : Not used

(Note 3) Range affecte by repair
- x‘0’ : Not used
- x‘1’ : Repair range not known
- x‘2’ : Repair dose not affect performance
- x‘3’ : SP disabled during repair
- x‘4’ : SSID disabled during repair
- x‘5~F’ : Not used

(Note 4) Failure level
- 00 : Service Alert
- 01 : Moderate Alert
- 10 : serious Alert
- 11 : Acute Alert

(Note 5) Failure SPs
- 0 : 1SP
- 1 : 2SP

(Note 6) SPs in SSID
- 0 : 2SP
- 1 : 4SP

(Note 7) Failure SSIDs
- 0 : 1SSID
- 1 : 2SSID

(Note 8) Affected SSIDs
- 0 : 1SSID
- 1 : 2SSID

(Note 9) Status
- 0 : Reduction
- 1 : Stop

(Note 10) Resent SIM
- 0 :Unresent SIM
- 1 : Resent SIM

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Byte26 : b4-7 = F & Byte3C = F2 (CACHE SIM) (3/3)

(Note 11) Hardware level

① When bit 0 is 0.

Bit 1 : Not used
Bit 2-3 : SP number
Bit 4-5 : CHLs PER CLUSTER
- 00 : 4
- 01 : 8
- 10 : Not used
- 10 : Not used
- 11 : Not used

Bit 6 :NVS
- 0 : Without NVS
- 1 : With NVS

Bit 8-10 : Cache size
- 000 : Non cache
- 001 : 256MB
- 010 : 512MB
- 011 : 768MP
- 100 : 1024MB
- 101 : 1280MB
- 110 : 1536MB
- 111 : Over 1536MB

Bit 11-13 : Cluster hardware level (‘000’)
Bit 14-15 : Cache/NVS hardware level (‘000’)

② When bit 0 is 1,

Bit 1 : Not used
Bit 2-3 : SP number
Bit 4-5 : CHLs per cluster
- 0000 : Parallel = 4, serial = 0
- 0001 : Parallel = 8, serial = 0
- 0010 : Parallel = 4, serial = 2
- 0100 : Parallel = 4, serial = 4
- 0110 : Parallel = 0, serial = 2
- 1000 : Parallel = 0, serial = 4
- 1010 : Parallel = 0, serial = 8
- 1100 : Parallel = 0, serial = 6

Bit 8 : Dual frame
- 0 : Dual frame
- 1 : Single frame

Bir 9-11 : Cache size
- 000 : Non cache
- 001 : 256MB
- 010 : 512MB
- 011 : 768MB
- 100 : 1024MB
- 101 : 1280MB
- 110 : 1536MB
- 111 : Over 1536MB

Bit 12-13 : Cluster hardware level (‘00’)
Bit 14-15 : Cache/NVS hardware level (‘00’)

(Note 12) Isolation code

Byte 2D ≠ x‘00’ : Byte 36 and 37 are a sympton code.
Byte 2D = x‘00’ : Byte 36 and 37 are a sympton code.
This byte is byte 2 of the isorarion code.

(Note 13) SSB ID

0 : SVP
1 : SP

(Note 14) SVP ID

0 : SVP1
1 : SVP2

(Note 15) Log and message control

bit 0-2 : Not used
bit 3 : Log mode (0)
bit 4-5 : Logging action
- 00 :Don’t log
- 01 : Unconditional log
- 10 : Log only once
- 11 : Log only if persistent

bit 6-7 : Operator message
- 00 : No message
- 01 : Unconditional message
- 10 : Send only once
- 11 : Send only if persistent

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Byte26 : b4-7 = F & Byte3C = FE (Device SIM) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB*							
21								
22	Storage control type (x‘06’ : Cache DKC)*							
23	Count (x‘00’)*							
24	Device address*							
25	Device type*							
26	Content (Note 1)				Format (x‘F’)			
27	SSB ID (Note 2)	SIM sequence number						SVP ID (Note 3)
28	Device exception (x‘1’)				Service message (x‘1’ : Action, x‘C’ : No action)			
29	Failure level (Note 4)	‘000000’						
2A	Resent SIM (Note 5)	‘0000000’						
2B	Exception class FRU list code (x‘80’)							
2C	Harware and microcode corequisite indicator (x‘01’)							
2D	Device address (See reference code)							
2E	Action flag (x‘05’)							
2F	Drive serial number* (x‘0C’) + (x‘69’) + (DKU sequence number)							
30								
31								
32								
33								

* : This information is not fixed until DKC reports SIM to HOST.

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Byte26 : b4-7 = F & Byte3C = FE (Device SIM) (2/2)

	0	1	2	3	4	5	6	7	
34	SSID of self subsystem								
35									
36	Exception code (See “Reference code” table)								
37									
38	Log and message control (Note 6’)*								
39	Program action code (x‘10’)*								
3A	Dual frame	EDCC mode	0	0	NONSYNC operation	Seial channel	Report output	Permanent path ERR	*
3B	32Byte SSB (0)	0	0	0	0	Extended path	Storage path number		*
3C	SIM message code (x‘FE’)								
3D	Affected SSID*								
3E									
3F	Not used*								
40	Not used								
7F									

* : This information is not fixed until DKC reported SIM to HOST.

(Note 1) Content

bit0 : Serial number valid (0:Invalid,1:Valid)
bit1 : Device address valid (0:Invalid,1:Valid)
bit2 : Track address valid (0:Invalid,1:Valid)
bit3 : Not used (0)

(Note 2)SSB ID

0 : SVP
1 : SP

(Note 3) SVP ID

0 : SVP1
1 : SVP2

(Note 4) Failure level

00 : Service Alert
01 : Moderate Alert
10 : serious Alert
11 : Acute Alert

(Note 5) Resent SIM

0 : Unresent SIM
1 : Resent SIM

(Note 6) Log and message control

bit 0-2 : Not used
bit 3 : Log mode (0)
bit 4-5 : Logging action
00 :Don’t log
01 : Unconditional log
10 : Log only once
11 : Log only if persistent
bit 6-7 : Operator message
00 : No message
01 : Unconditional message
10 : Send only once
11 : Send only if persistent

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Byte26 : b4-7 = F & Byte3C = FF (Media SIM) (1/2)

	0	1	2	3	4	5	6	7
00	Time stamp							
05								
06	Format Message							
07	PCB type		Processor ID (Note)					
08	System error code							
09								
0A	JCB ID							
0B								
0C	REQ ID							
0D	24CMPAT	ECKD32	SCSI-RAID	RCOPY	SEPARATE	Host report	SVP report	Force log
0E	LDEV#VLD	PDEV#VLD	SSB#VLD	LOG#VLD	SIM#VLD	RSSB#VLD	0	0
0F	RCV SIM	0	0	0	0	0	0	0
10	LDEV number							
11								
12	CDEV number				RDEV number			
13	SEMI-SYNC	RCU SIM	0	0	RCV number			
14	RCU LDEV number							
15								
16	SSB log number							
17								
18	Related failure log number							
19								
1A	Related SIM log number							
1B								
1C	Related SSB log number							
1D								
1E	(Reserved)							
1F	SCB							
20	Basic SSB*							
21								
22	Storage control type (x‘06’ : Cache DKC)*							
23	Count (x‘00’)*							
24	Device address*							
25	Device type*							
26	Content (Note 1)				Format (x‘F’)			
27	SSB ID (Note 2)	SIM sequence number						SVP ID (Note 3)
28	Device exception (x‘1’)				Service message (x‘1’)			
29	Failure level (Note 4)	Media maintenance procedure number (Correctable : x‘07’, Uncorrectable : x‘05’)						
2A	Resend SIM (Note 5)	‘0000000’						
2B	Exception class FRU list code (x‘80’)							
2C	Harware and microcode corequisite indicator (x‘01’)							
2D	Device address (See reference code)							
2E	Action flag (Correctable : x‘87’ , Uncorrectable : x‘85’)							
2F	Drive serial number* (x‘0C’) + (x‘69’) + (DKU sequence number)							
30								
31								
32								
33								

* : This information is not fixed until DKC reports SIM to HOST.

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Byte26 : b4-7 = F & Byte3C = FF (Media SIM) (2/2)

	0	1	2	3	4	5	6	7	
34	SSID of self subsystem								
35									
36	Exception code (See “Reference code” table)								
37									
38	Log and message control (Note 6’)*								
39	Program action code (x‘10’)*								
3A	Dual frame	EDCC mode	0	0	NONSYNC operation	Seial channel	Report output	Permanent path ERR	*
3B	32Byte SSB (0)	0	0	0	0	Extended path	Storage path number		*
3C	SIM message code (x‘FF’)								
3D	Cylinder addres*								
3E									
3F	Head address*								
40	Not used								
7F									

* : This information is not fixed until DKC reports SIM to HOST.

(Note 1) Content

bit0 : Serial number valid (0:Invalid,1:Valid)
bit1 : Device address valid (0:Invalid,1:Valid)
bit2 : Track address valid (0:Invalid,1:Valid)
bit3 : Not used (0)

(Note 2) SSB ID

0 : SVP
1 : SP

(Note 3) SVP ID

0 : SVP1
1 : SVP2

(Note 4) Failure level

00 : Service Alert
01 : Moderate Alert
10 : serious Alert
11 : Acute Alert

(Note 5) Resent SIM

0 : Unresent SIM
1 : Resent SIM

(Note 6) Log and message control

bit 0-2 : Not used
bit 3 : Log mode (0)
bit 4-5 : Logging action
00 :Don’t log
01 : Unconditional log
10 : Log only once
11 : Log only if persistent
bit 6-7 : Operator message
00 : No message
01 : Unconditional message
10 : Send only once
11 : Send only if persistent

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SIM Reference Codes Detected by the Processor (1/6)

Error		REF CODE			SIM	Level of	Host	Remarks
		36	37	2D	3C	error	report	
LCP/MCP error	LCM Hardware error	21	3Z	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: LCP#/MCP#1 (*3) Z: LCP#/MCP#2 (*3)
	ADP permanent error	21	70	X0	F1	Moderate	Yes	X: CHA PCB# (*1)
	ADP temporary error	21	71	XY	F1	Service	No	X: CHA PCB# (*1) Y: LCP#/MCP#0 (*3)
	ADP blocking	21	72	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: LCP#/MCP#0 (*3)
	AL_PA value conflict	21	90	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
CHA Processor error	CHK1A threshold over	30	70	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHK1B threshold over	30	71	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHK3 threshold over	30	72	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	Processor blocking	30	73	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: MP# in PCB
	FM threshold over	30	74	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	FM error	30	75	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: MP# in PCB
	Incorrect SUM value of FM	30	76	XY	F1	(*27)	No	X: CHA PCB# (*1) Y: MP# in PCB
	LDEV blockade (Effect of processor blockade)	30	90	XY	F1	Serious	Yes	X: CHA PCB# (*1) Y: MP# in PCB
	CHF PCB exchange impossible (No PERFORMANCE FIBRE)	31	97	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHF PCB exchange impossible (No supported Micro-Program)	31	98	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	P/S OFF impossible	38	8F	00	F1	Moderate	No	
	P/S OFF impossible (Device reserved)	38	9F	00	F1	Moderate	No	
	Undefined Package is mounted	39	90	XY	F1	Moderate	No	X: CHA PCB# (*1,5) Y: MP# in PCB
	V-R or serial number is inconsistent	39	91	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: MP# in PCB
	Replace failed	39	93	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: MP# in PCB
	Micro-program version up	39	94	X0	F1	Service	No	X: MP version after replacing (*23)
	Micro-program version up impossible	39	95	XY	F1	Service	No	X: Present MP version (*23) Y: reason code (*13)
	Package type changed	39	96	XY	F1	Service	No	X: CHA PCB# (*1) Y: Change type# (*14)
	CHF PCB exchange impossible (No PERFORMANCE FIBRE)	39	97	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	CHF PCB exchange impossible (No supported Micro-Program)	39	98	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB
	(CHF PCB is exchanged to PERFORMANCE FIBRE	39	99	XY	F1	Service	No	X: CHA PCB# (*1) Y: MP# in PCB

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SIM Reference Codes Detected by the Processor (1/6)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
CHA Processor error	CHT PCB exchange impossible (4GL ↔ 4GS)	39	9F	X0	F1	Moderate	No	X: CHA PCB# (*1)

[Note] REF CODE = 3998

CHF PCB is 'PERFORMANCE FIBRE'. SIM message says 'cannot analyzed', because the version of the installed micro-program does not support 'PERFORMANCE FIBRE'.

You must replace this PCB by no 'PERFORMANCE FIBRE' CHF PCB.

REF CODE = 3999

After this, if you replace 'PERFORMANCE FIBRE' CHF PCB by no 'PERFORMANCE FIBRE' CHF PCB, you must follow 'Installation and De-Installation' procedure. Do not follow 'Replace'procedure.

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SIM Reference Codes Detected by the Processor (2/6)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
DKA Processor error	CHK1A threshold over	31	70	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	CHK1B threshold over	31	71	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	CHK3 threshold over	31	72	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	Processor blocking	31	73	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	FM threshold over	31	74	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	FM error	31	75	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	Incorrect SUM value of FM	31	76	XY	F1	(*27)	No	X: DKA PCB# (*1) Y: MP# in PCB
	LDEV blockade (Effect of processor blockade)	31	90	XY	F1	Serious	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	P/S OFF impossible	3C	8F	00	F1	Moderate	No	
	P/S OFF impossible (Device reserved)	3C	9F	00	F1	Moderate	No	
	Undefined Package is mounted	3D	90	XY	F1	Moderate	No	X: DKA PCB# (*1,5) Y: MP# in PCB
	V-R or serial number is inconsistent	3D	91	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: MP# in PCB
	Replace failed	3D	93	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: MP# in PCB
	Micro-program version up	3D	94	X0	F1	Service	No	X: MP version after replacing (*23)
	Micro-program version up impossible	3D	95	XY	F1	Service	No	X: Present MP version (*23) Y: reason code (*13)
M-bus error	Warning of M bus open (SMC detected)	FF	D0	XY	F1	Moderate	No	X: 0 = Side A, 1 = Side B (*2) Y: 0 = L, 1 = H
	Bus blocking	FF	EA	0X	F1	Serious	Yes	Y: 0 = L, 1 = H
	CHK3 threshold over	FF	EB	0X	F1	Service	No	Y: 0 = L, 1 = H
M-bus error (CHA side)	Warning of M bus open (SMP detected)	FF	D1	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (A) (SMP detected)	FF	D2	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (B) (SMP detected)	FF	D4	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus DISABLE (SMP detected)	FF	D5	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus ABTRST (SMP detected)	FF	D6	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of SM DISABLE (SMP detected)	FF	D7	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = Side A, 1 = Side B (*2)
	M-bus arbiter enable off	FF	D8	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H

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SIM Reference Codes Detected by the Processor (3/6)

Error		REF CODE			SIM	Level of	Host	Remarks
		36	37	2D	3C	error	report	
M-bus error (DKA side)	Warning of M bus open (SMP detected)	FF	51	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (A) (SMP detected)	FF	52	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus CHK error (B) (SMP detected)	FF	54	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus DISABLE (SMP detected)	FF	55	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of M bus ABTRST (SMP detected)	FF	56	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of SM DISABLE (SMP detected)	FF	57	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = Side A, 1 = Side B (*2)
	M-bus arbiter enable off	FF	58	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
F-bus error	Bus blocking	FF	FA	0X	F1	Serious	Yes	X: 0 = L, 1 = H (*21)
F-bus error (CHA side)	Warning of F bus DISABLE (BSA detected)	FF	B0	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	F-bus arbiter enable off	FF	B1	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of F bus open (BSA detected)	FF	FC	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of LIVEINS (BSA detected)	FF	FD	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
	Warning of CHK error (BSA detected)	FF	FE	XY	F1	Moderate	No	X: CHA PCB# (*1) Y: 0 = L, 1 = H
F-bus error (DKA side)	Warning of F bus DISABLE (BSA detected)	FF	30	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	F-bus arbiter enable off	FF	31	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of F bus open (BSA detected)	FF	7C	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of LIVEINS (BSA detected)	FF	7D	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
	Warning of CHK error (BSA detected)	FF	7E	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: 0 = L, 1 = H
CHA, CHK2 (processor)	RCHA temporary error	3F	84	X0	F1	Service	No	X: CHA PCB# (*1)
	RCHA blocking	3F	85	X0	F1	Serious	Yes	X: CHA PCB# (*1)
CHS, CHK2 (processor)	SCP path temporary error	3F	86	XY	F1	Service	No	X: CHA PCB# (*1) Y: SCP#
	SCP path blockade	3F	87	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: SCP#
DKA CHK2 (processor)	Pinned slot	CF	4X	XX	F1	Moderate	No	XXX: LDEV#
	DRR temporary error	CF	80	XY	F1	Service	No	X: DKA PCB# (*1) Y: MP# in PCB
	SCA temporary error	CF	81	XY	F1	Service	No	X: DKA PCB# (*1) Y: Port# (*4)
	DRR blocking	CF	82	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: MP# in PCB
	SCA blocking (0-3)	CF	83	XY	F1	Moderate	Yes	X: DKA PCB# (*1) Y: Port# (*4)

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SIM Reference Codes Detected by the Processor (4/6)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
DKA CHK2 (processor)	SCSI port blocking (Effect of PATH INLINE failed)	CF	84	XY	F1	Moderate	No	X: DKA PCB# (*1) Y: Port# (*4)
	LDEV blockade (Effect of SCA blockade)	CF	90	XY	F1	Serious	Yes	X: DKA PCB# (*1) Y: Port# (*4)
Cache data error	Pinned slot	FF	4X	XX	F2	Moderate	No	XXX: LDEV#
Cache error	Coexistence of cache SIMM sizes (*24)	FF	CC	XY	F2	Service	No	X: Replacement content 1: 512MB→128MB, 2:128MB→512MB Y: Non-replaced side 1: Side A, 2: Side B
	Area is volatiled	FF	CD	0X	F2	Service	No	X: 0 = Side A, 1 = Side B (*2)
	Package is volatiled	FF	CE	0X	F2	Service	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd
	Module group is volatiled	FF	CF	YX	F2	Service	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Correctable error	FF	F0	YX	F2	Service	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Cache temporary error	FF	F1	YX	F2	Service	Yes	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Module group blocking	FF	F2	YX	F2	Moderate	Yes	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd Y: Module group# (*10,11)
	Package blocking	FF	F3	0X	F2	Moderate	Yes	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd
	Area blocking	FF	F4	0X	F2	Serious	Yes	X: 0 = Side A, 1 = Side B (*2)
	Both area failed	FF	F5	0X	F2	Moderate	No	X: PCB#: 0 ~ 3 (*1) Side A:Even, Side B:Odd
Shared memory error	Loss of duplicated information	FF	DE	XX	F1	Service	No	XX: Lost information type (*25)
	One side Area is volatiled	FF	DF	0X	F1	Service	No	X: 0 = Side A, 1 = Side B (*2)
	Correctable error	FF	E0	YX	F1	Service	No	X: 0 = Side A, 1 = Side B Y: Module# (*2,10)
	Uncorrectable error	FF	E1	0X	F1	Service	Yes	X: 0 = Side A, 1 = Side B (*2,10)
	Area blocking	FF	E2	0X	F1	Serious	Yes	X: 0 = Side A, 1 = Side B (*2,10)
	Real memory size inconsistent	FF	E3	XY	F1	Serious	No	X:Number of module (side A) Y:Number of module (side B) (*8)
	Replace failed (*20)	FF	E4	0X	F1	Serious	No	X: 0 = Side A, 1 = Side B (*2)
	Both side invalid	FF	E5	00	F1	Acute	No	
	Configuration information compare error (*22)	FF	E6	00	F1	Acute	No	
	Shared memory is volatiled.	FF	E7	00	F1	Serious	No	
	Configration unmatch	FF	E8	00	F1	Acute	No	
	CHK3 threshold over	FF	EC	0X	F1	Service	No	X: 0 = Side A, 1 = Side B (*2)
	Area temporary blocking (*19)	FF	EE	0X	F1	Service	Yes	X: 0 = Side A, 1 = Side B (*2)
	Rebooted without volatilization after an instantaneous down	FF	EF	00	F1	Service	No	

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SIM Reference Codes Detected by the Processor (5/6)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
Drive error (normal R/W)	SCSI temporary error	DF	7Y	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	Drive temporary error	EF	1A	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive media error	43	40	XX	FF	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
	SCSI blockade	DF	8Y	XX	FE	Moderate	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	LDEV blockade (Effect of SCSI blockade) *15	DF	9Y	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	SCSI ID error	DF	A0	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive serial number check error	EF	50	XX	FE	Serious	Yes	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive blockade (drive)	EF	10	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive blockade (Effect of Dynamic sparing normal end)	EF	11	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	LDEV blockade (Effect of drive blockade) *15	EF	90	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive blockade (media)	43	C0	XX	FF	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Correction copy start *7	45	10	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy normal end *7	45	20	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy abnormal end *7	45	21	XX	FE	Serious	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy discontinued *7	45	22	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Correction copy warning end* *7 (With blockade LDEV or some error)	45	24	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4d+RDEV#:4b) (Source side drive)
	Dynamic sparing start *7 (Drive copy)	46	10	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing normal end *7 (Drive copy)	46	20	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)

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SIM Reference Codes Detected by the Processor (6/6)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
Drive error (normal R/W)	Dynamic sparing abnormal end (Drive copy) *7	46	21	XX	FE	Moderate	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing discontinued *7	46	22	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Dynamic sparing warning end* (With blockade LDEV or some error) (Drive copy) *7	46	24	XX	FE	Service	Yes **	XX: Drive number (CDEV#:4b+RDEV#:4b) (Source side drive)
	Pinned slot	EF	4X	XX	FE	Moderate	No	XXX: LDEV#
	LDEV read only	EF	3X	XX	FE	Serious	Yes **	XXX: LDEV#
Drive error (ORM)	SCSI temporary error	50	0Y	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b) Y: Drive path 0: Boundary 0 1: Boundary 1
	Drive temporary error	50	10	XX	FE	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
	Drive media error	50	20	XX	FF	Service	No	XX: Drive number (CDEV#:4b+RDEV#:4b)
SVP interface error (CHA side)	Ethernet error for SVP	14	00	X0	F1	Moderate	Yes	X: CHA PCB# (*1)
	SIM transfer failure to SVP	14	01	X0	F1	Serious	Yes	X: CHA PCB# (*1)
SVP interface error (DKA side)	Ethernet error for SVP	15	00	X0	F1	Moderate	Yes	X: DKA PCB# (*1)
	SIM transfer failure to SVP	15	01	X0	F1	Serious	Yes	X: DKA PCB# (*1)
Power error	HDU power off	AC	50	XY	F1	Moderate	Yes	X: DKU number (*12) Y: HDU number (*12)
	HDU power recovered	AC	51	XY	F1	Service	No	X: DKU number (*12) Y: HDU number (*12)

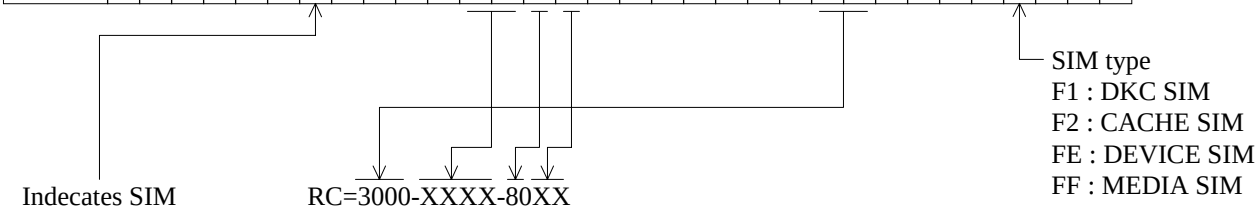
* : Warning end : (1) LDEV blockade status is detected, and copy process for the LDEV is skipped.
(2) Some failure is detected, and copy process is complete.

** : When the drive is 3880 emulation mode, the SIM is not reported to host.

A three-byte reference code (RC) is provided for a SIM (Service Informaition Message) to identify an error and error section.

The following shows 32 SIM bytes and reference code.

Byte	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
SIM SSB	00	90	10	00	00	00	8F	E0	44	10	00	04	00	80	04	0C	69	00	00	00	00	02	30	00	05	10	42	0C	F1	00	02	00



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SIM Reference Codes Detected by the Processor for HRC/HODM (1/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
RCP error	Logical path(s) on the remote copy connections was logically blocked (Due to an error conditions)	21	80	XY	F1	Moderate	Yes	X: CHA PCB# (*1) Y: LCP#1 (*3)
	The logical path has been recovered from blocked condition on the remote copy conditions.	21	81	XY	F1	Service	Yes (*17)	X: CHA PCB# (*1) Y: LCP#1 (*3)
Pair volume status error	HRC started the initial copy or out of sync for this volume.	D0	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC completed the initial copy for this volume.	D0	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was deleted. (Operation from an SVP/remote console or a host processor)	D0	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	MCU changed volume pair status. (Operation from an SVP/remote console or a host processor)	D0	3X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL is changed.	D1	YX	XX	FE	Service	Yes (*17)	XXX: LDEV# Y: (*16)
	RCU changed status of R-VOL to suspend. (Operation from an SVP/remote console or a host processor.)	D2	0X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from suspend to simplex. (Operation from an SVP/remote console or a host processor.)	D2	1X	XX	FE	Service	No	XXX: LDEV#
	Status of R-VOL was changed from duplex to simplex. (Operation from an SVP/remote console or a host processor.)	D2	2X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from pendingduplex to simplex. (Operation from an SVP/remote console or a host processor.)	D2	3X	XX	FE	Service	No	XXX: LDEV#
	HODM started the migration copy or out of sync for this volume.	D3	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HODM completed the migration copy for this volume.	D3	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HODM for this volume was deleted. (Operation from an SVP/remote console)	D3	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HODM started the erase operation for the R-VOL.	D3	AX	XX	FE	Service	No (*17)	XXX: LDEV#
	HODM completed the erase operation for the R-VOL.	D3	BX	XX	FE	Service	No (*17)	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the remote copy connections.)	D4	0X	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC/HODM (2/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
Pair volume status error	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the M-VOL or the remote copy connections)	D4	1X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the R-VOL)	D4	2X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Caused by DFW to the R-VOL was prohibited)	D4	3X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Due to an internal error condition detected by the RCU)	D4	4X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Caused by Delete pair operation was issued to the R-VOL)	D4	5X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	Erase operation for this volume was not completed. (Due to anerror conditions)	D4	8X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	MCU detected a Moderate Level SIM for RCU.	D4	DX	XX	FE	Moderate	Yes (*18)	XXX: LDEV#
	MCU detected an Acute or Serious Level SIM for RCU.	D4	EX	XX	FE	Serious	Yes (*18)	XXX: LDEV#
	Status of the M-VOL was not consistent with the R-VOL.	D4	FX	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC (Semi-synchronous) (1/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
Pair volume status error	HRC started the initial copy or out of sync for this volume.	D8	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC completed the initial copy for this volume.	D8	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was deleted. (Operation from an SVP/remote console or a host processor)	D8	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	MCU changed volume pair status. (Operation from an SVP/remote console or a host processor)	D8	3X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL is changed.	D9	YX	XX	FE	Service	Yes (*17)	XXX: LDEV# Y: (*16)
	RCU changed status of R-VOL to suspend. (Operation from an SVP/remote console or a host processor.)	DA	0X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from suspend to simplex. (Operation from an SVP/remote console or a host processor.)	DA	1X	XX	FE	Service	No	XXX: LDEV#
	Status of R-VOL was changed from duplex to simplex. (Operation from an SVP/remote console or a host processor.)	DA	2X	XX	FE	Service	No	XXX: LDEV#
	Status of the R-VOL was changed from pendingduplex to simplex. (Operation from an SVP/remote console or a host processor.)	DA	3X	XX	FE	Service	No	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the remote copy connections.)	DC	0X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the M-VOL or the remote copy connections)	DC	1X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC/HODM for this volume was suspended (Due to an unrecoverable failure on the R-VOL)	DC	2X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Caused by DFW to the R-VOL was prohibited)	DC	3X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	HRC for this volume was suspended (Due to an internal error condition detected by the RCU)	DC	4X	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC (Semi-synchronous) (2/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
Pair volume status error	HRC for this volume was suspended (Caused by Delete pair operation was issued to the R-VOL)	DC	5X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	Status of the M-VOL was not consistent with the R-VOL.	DC	FX	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC/HORC (Asynchronous) (1/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	HRC started the initial copy or out of sync for this volume.	D5	0X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC completed the initial copy for this volume.	D5	1X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was accepted delete pair operation. (Operation from an SVP/remote console or a host processor)	D5	2X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	HRC for this volume was accepted suspend pair operation. (Operation from an SVP/remote console or a host processor)	D5	3X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	Delete pair operation for this HRC volume has completed.	D5	4X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	Suspend pair operation for this HRC volume has completed.	D5	5X	XX	FE	Service	Yes (*17)	XXX: LDEV#
	The R-VOL status has changed as requested by MCU.	D6	YX	XX	FE	Service	Yes (*17)	XXX: LDEV# Y: (*16)
	The R-VOL has accepted/completed state change as requested by operation. (Operation from an SVP/remote console or a host processor.)	D7	ZX	XX	FE	Service	No	XXX: LDEV# Z: (*26)
	The M-VOL has suspended. (Due to an unrecoverable failure on the remote copy connections.)	DB	0X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Due to an unrecoverable failure on the M-VOL or the remote copy connections)	DB	1X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Due to an unrecoverable failure on the R-VOL)	DB	2X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Caused by DFW to the R-VOL was prohibited)	DB	3X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The M-VOL has suspended. (Caused by Suspend pair operation was issued to the R-VOL)	DB	4X	XX	FE	Serious	Yes (*17)	XXX: LDEV#

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SIM Reference Codes Detected by the Processor for HRC/HORC (Asynchronous) (2/2)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		22	23	13	28			
Pair volume status error	The M-VOL has suspended. (Caused by Delete pair operation was issued to the R-VOL)	DB	5X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The R-VOL has suspended. (Due to an unrecoverable failure on the remote copy connections)	DB	6X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The R-VOL has suspended. (Due to an unrecoverable failure on the R-VOL)	DB	7X	XX	FE	Serious	Yes (*17)	XXX: LDEV#
	The R-VOL has suspended. (Due to an MCU power-off event)	DB	8X	XX	FE	Service	No	XXX: LDEV#
	MCU detected a Service Level SIM for RCU.	DB	CX	XX	FE	Service	Yes	XXX: LDEV#
	MCU detected a Moderate Level SIM for RCU.	DB	DX	XX	FE	Moderate	Yes	XXX: LDEV#
	MCU detected an Acute or Serious Level SIM for RCU.	DB	EX	XX	FE	Serious	Yes	XXX: LDEV#
	Status of the M-VOL was not consistent with the R-VOL.	DB	FX	XX	FE	Serious	Yes (*17)	XXX: LDEV#

Notice : SIM which REF.CODE is DB7XXX may be reported in the following case.

- When the Suspend Pair operation with the Drain option is accepted by the MCU/RCU under the host I/O.
- When the Delete Pair operation with the Group option is accepted by the RCU under the host I/O.

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SIM Reference Codes Detected by the Processor for HMRCF (1/1)

Error		REF CODE			SIM	Level of error	Host report	Remarks
		36	37	2D	3C			
HMRCF error	Copy warning end (CU#=0)	47	A0	XX	FE	Moderate	No	XX:T-Vol#
	Copy warning end (CU#=1)	47	A1	XX	FE	Moderate	No	XX:T-Vol#
	Copy warning end (CU#=2)	47	A2	XX	FE	Moderate	No	XX:T-Vol#
	Copy warning end (CU#=3)	47	A3	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=0) (S-Vol blocked)	47	B0	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=1) (S-Vol blocked)	47	B1	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=2) (S-Vol blocked)	47	B2	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=3) (S-Vol blocked)	47	B3	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=0) (T-Vol blocked)	47	C0	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=1) (T-Vol blocked)	47	C1	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=2) (T-Vol blocked)	47	C2	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=3) (T-Vol blocked)	47	C3	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=0) (others)	47	D0	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=1) (others)	47	D1	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=2) (others)	47	D2	XX	FE	Moderate	No	XX:T-Vol#
	Copy abnormal end (CU#=3) (others)	47	D3	XX	FE	Moderate	No	XX:T-Vol#
HIHSM error	HIHSM Volume Migration Abnormal End (CU#=0)	47	F0	XX	FE	Moderate	No	XX:S-Vol#
	HIHSM Volume Migration Abnormal End (CU#=1)	47	F1	XX	FE	Moderate	No	XX:S-Vol#
	HIHSM Volume Migration Abnormal End (CU#=2)	47	F2	XX	FE	Moderate	No	XX:S-Vol#
	HIHSM Volume Migration Abnormal End (CU#=3)	47	F3	XX	FE	Moderate	No	XX:S-Vol#

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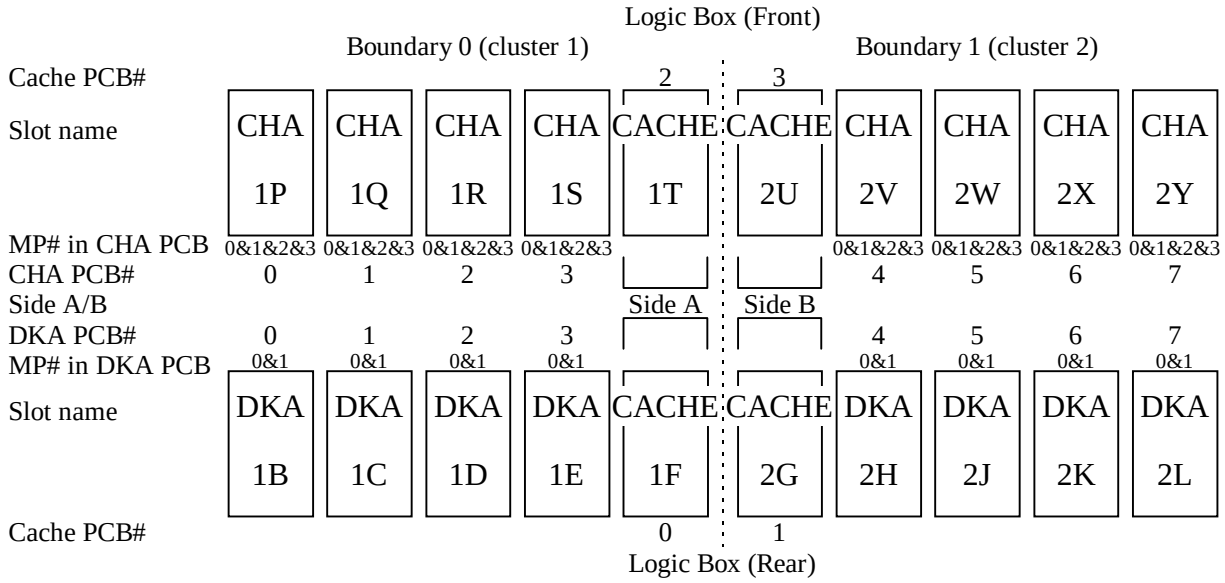
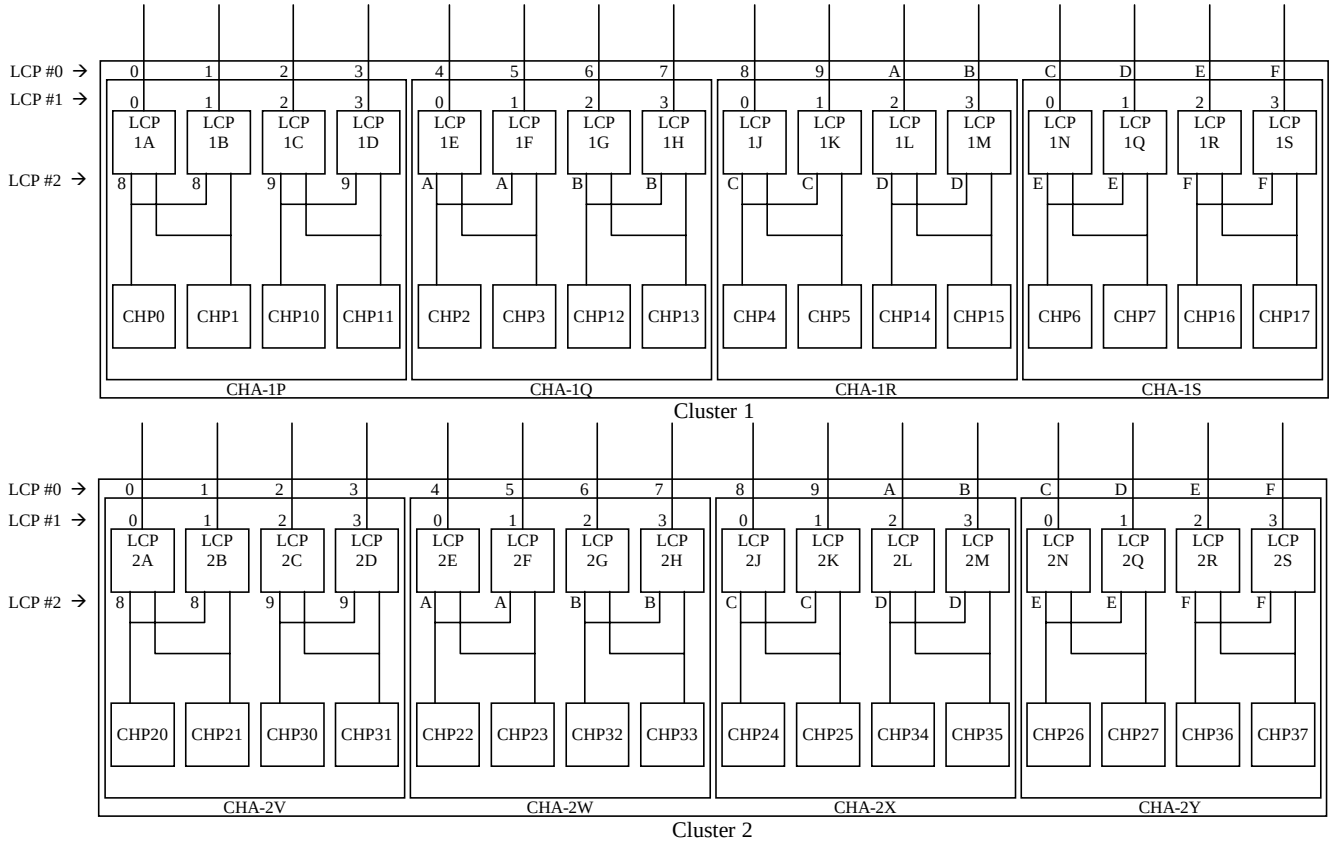
(*1) CHA PCB#: x‘0’ to x‘7’ indicates the CHA PCB number. See the figure below.
DKA PCB#: x‘0’ to x‘7’ indicates the DKA PCB number. See the figure below.
Cache PCB#: x‘0’ to x‘3’ indicates the Cache PCB number. See the figure below.

(*2) Side A/B: Indicates the side of cache/shared memory. See the figure below.



(*3) LCP #0: x‘0’ to x‘F’ indicates the LCP number.
LCP #1: x‘0’ to x‘3’ indicates the LCP number.
LCP #2: x‘8’ to x‘F’ indicates the LCP number.



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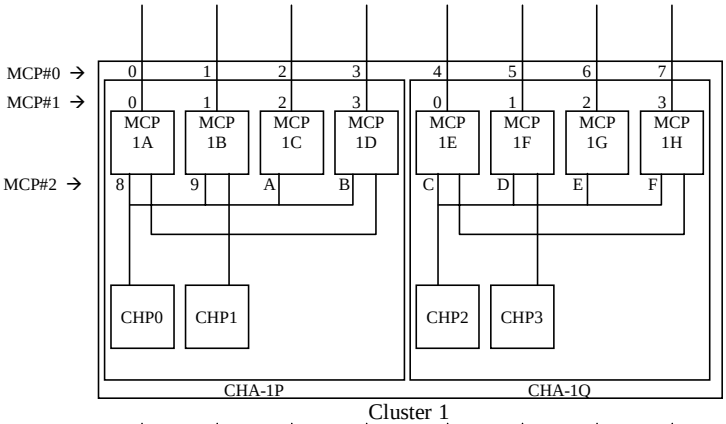
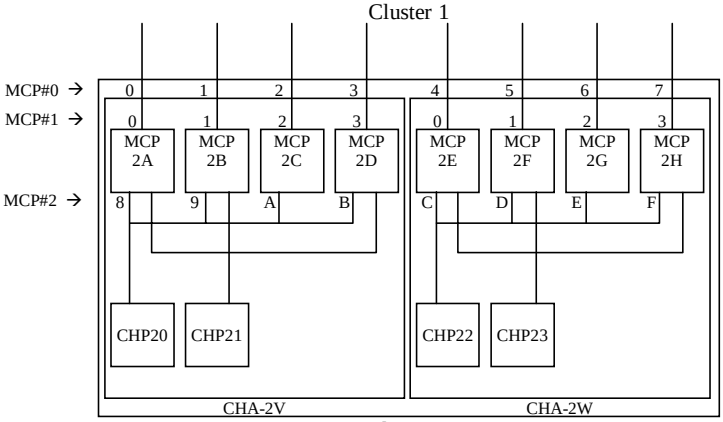
MCP #0: x‘0’ to x‘7’ indicates the MCP number.
MCP #1: x‘0’ to x‘3’ indicates the MCP number.
MCP #2: x‘8’ to x‘F’ indicates the MCP number.

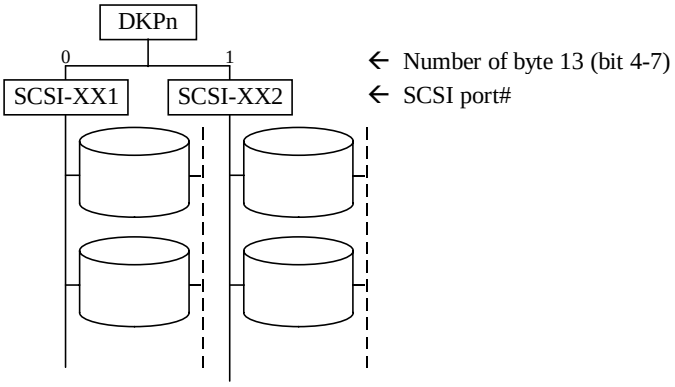


Cluster 1



Cluster 2

(*4) Port #: x‘0’ to x‘3’ indicates the SCSI port number. See the figure below.



(*5) The package that is not defined in the configuration information exists.
If it is prepared for new installation, it is necessary to do the new installation procedure.
Otherwise it should be pulled out by executing P/S off.

(*7) Isolate the error according to the procedure shown in TRBL05-170.

(*8) Recover the error according to the procedure shown in TRBL05-260.

(*10) Perform error isolation according to the procedure given in the two separate pages attached to TRBL05-280.

(*11) If memory module group (CMxx) is designated by FPC, that module may be isolated from associated SSBs. Isolate the memory module according to the procedure given in the page attached to TRBL05-290.

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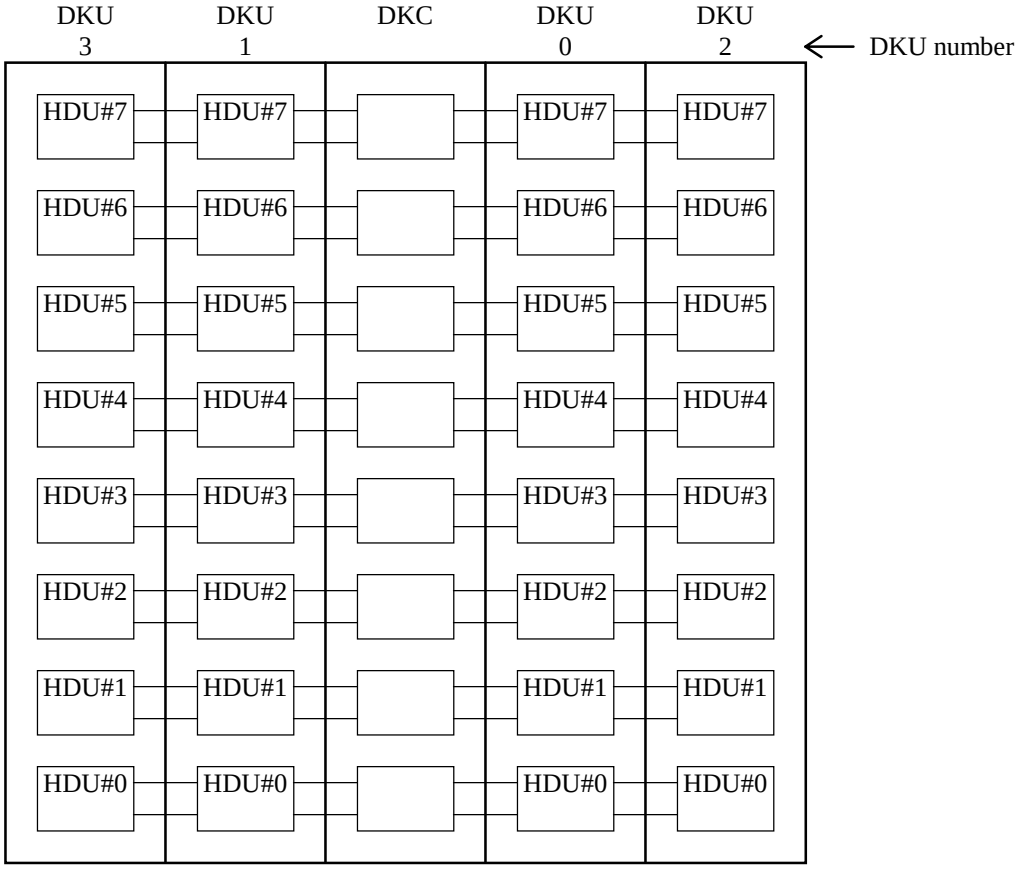
(*12) DKU#: x‘0’ to x‘3’ indicates DKU number. See the figure below.
HDU#: x‘0’ to x‘7’ indicates HDU number. See the figure below.



(*13) reason code
x‘0’ : Pinned data exist
x‘1’ : The shutdown of the power supply was occurred
x‘2’ : Invalid Version/Revision exists

(*15) Recover LDEVs according to the procedure shown in TRBL05-330.

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(*16) Change pair status number
x'0': From simplex to duplex pending
x'1': From simplex to duplex
x'2': From pending duplex to duplex
x'3': From pending duplex to suspend
x'4': From duplex to suspend
x'5': From duplex to simplex
x'6': From pending duplex to simplex
x'7': From suspend to simplex
x'8': From suspend to duplex pending

(*17) You can suppress reporting the HRC/HODM Service SIM to the HOST by RCU Option operation (PPRC support by HOST and Service SIM of HRC/HODM).

- Service level SIM -

PPRC support by HOST	Service SIM or HRC/HODM	level of error	HRC	HODM
Yes	Report	DKC_SIM	Host Report	Host Report
		DEV_SIM	Not Host Report	Host Report
	Not Report	DKC_SIM	Not Host Report	Not Host Report
		DEV_SIM	Not Host Report	Not Host Report
No	Report	DKC_SIM	Host Report	Host Report
		DEV_SIM	Host Report	Host Report
	Not Report	DKC_SIM	Not Host Report	Not Host Report
		DEV_SIM	Not Host Report	Not Host Report

- Moderate or Serious level SIM -

PPRC support by HOST	level of error	HRC	HODM
Yes	DKC_SIM	Host Report	Host Report
	DEV_SIM	Not Host Report	Host Report
No	DKC_SIM	Host Report	Host Report
	DEV_SIM	Host Report	Host Report

(*18) SIMs which REF.CODE are D4DX, D4EX are reported in case of HODM.
In case of HRC, SIMs reported from RCU are reported to the host by MCU.

Severity Level	RC of reported SIM for HRC	RC of reported SIM for HODM
Acute or Serious	No modification	D4EX
Moderate	No modification	D4DX
Service (Not HRC SIM)	No modification	Not reported
Service (HRC SIM)	Not reported	Not reported

(*19) This temporary blocking is to recover the logical table on SM and be automatically recovered.

(*20) In case of the replacement of the cache memory PCB on the side having blocked SM (see REP01-140 work ID = RCA1), insert the removed cache memory PCB again.

(*21) Isolate the error according to the procedure shown in TRBL05-20.

(*22) The LDEV is blocked because of an error (inconsistency between data on the A and B sides) of configuration information stored in the SM. Recover the error following the instruction of the Technical Support Center.

(*23) X represents the X in a program version "?X-??-??/??".

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(*24) Cache SIMM sizes of sides A and B are different because the replacement of the cache memory has been performed on one side only. Perform the replacement left referring to the description in the remark column.

(*25) Type of the lost information is reported according to the bit position. (There may be the case that two or more bits are set.)

(*26) Change pair status number
x'0': Accepted Suspend Pair operation
x'1': Accepted Delete Pair operation (The R-VOL is in suspended status)
x'2': Accepted Delete Pair operation (The R-VOL is in duplex status)
x'3': Accepted Delete Pair operation (The R-VOL is in pending duplex status)
x'4': Completed Suspend Pair operation
x'5': Completed Delete Pair operation

(*27) In the case that the error is detected in the area of ROM, the level of error is "Moderate" in other case "Service".

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SIM Reference Codes Detected by the SVP

Error		REF code			SIM	Level of	Host	Remarks
		22	23	13	28	error	report	
Environmental error	Temperature abnormal	BF	1X *1	XX *13	F1	Moderate	Yes	
	Voltage alarm	BF	2X *2	XX *13	F1	Moderate	Yes	
	Voltage warning	BF	3X *3	XX *13	F1	Moderate	Yes	
	P/S warning	BF	4X *4	XX *13	F1	Moderate	Yes	
	Battery warning	BF	5X *5	XX *13	F1	Moderate	Yes	
	AC warning	BF	6X *6	XX *13	F1	Moderate	Yes	
	Fan abnormality : CL1 logic	BF	7X *7	10	F1	Moderate	Yes	
	Fan abnormality : CL2 logic	BF	7X *8	20	F1	Moderate	Yes	
	Fan abnormality : HDU-R1X	BF	7X *9	3X *13	F1	Moderate	Yes	
	Fan abnormality : HDU-L1X	BF	7X *9	4X *13	F1	Moderate	Yes	
	Fan abnormality : HDU-R2X	BF	7X *9	5X *13	F1	Moderate	Yes	
	Fan abnormality : HDU-L2X	BF	7X *9	6X *13	F1	Moderate	Yes	
	JP remains	BF	8X *10	XX *13	F1	Moderate	Yes	
	Environment monitor error	BF	9X *11	XX *13	F1	Service	No	
	Environment monitor disagreement	BF	AX *12	XX *13	F1	Moderate	No	
	SVP P/S abnormal	BF	C0	XX *13	F1	Moderate	Yes	
SVP error	Logical inconsistency	70	XX *14	00	F1	Moderate	No	
	HEEP error	71	XX *14	00	F1	Moderate	No	
	File error	72	XX *14	00	F1	Moderate	No	
	LAN error	73	XX *14	00	F1	Moderate	No	
	S-SVP error	74	XX *14	XX *15	F1	Moderate	No	
	Windows error	75	XX *14	00	F1	Moderate	No	
	CUDG3 detected error	76	01	XX *16	F1	Moderate	No	
	LCDG3 detected error	76	10	XX *16	F1	Moderate	No	
	BOOT detected error (CHA)	79	00	XY *18	F1	Moderate	No	
	BOOT detected error (DKA)	79	01	XY *19	F1	Moderate	No	
End status of remote microprogram exchange	Normal end	7A	00	00	F1	Service	No	
	Abnormal end (SVP)	7A	01	00	F1	Service	No	
	Abnormal end (MP)	7A	02	XX *21	F1	Service	No	
	Version check error	7A	03	XX *17	F1	Service	No	
	Sum check error	7A	04	XX *17	F1	Service	No	
	LCP patch error	7A	05	XX *20	F1	Service	No	
	Warning (Configuration nconsistency)	7A	10	00	F1	Service	No	
	Warning (S-SVP busy)	7A	11	00	F1	Service	No	
	Warning (LCP busy)	7A	12	XX *20	F1	Service	No	
Dump received	WCHK1 dump(CHA)	30	80	XY *18	F1	Moderate	No	
	WCHK1 dump(DKA)	31	80	XY *19	F1	Moderate	No	
	ABEND dump(CHA)	30	81	XY *18	F1	Moderate	No	
	ABEND dump(DKA)	31	81	XY *19	F1	Moderate	No	
Backup Server	Backup Server Failure detected by SVP	BE	00	00	F1	Moderate	No	
	ATL Failure	BE	01	00	F1	Moderate	No	
	MT Failure	BE	02	00	F1	Moderate	No	
	OS Failure	BE	03	00	F1	Moderate	No	
	NetWorker Error	BE	04	00	F1	Moderate	No	
	Application Error	BE	05	00	F1	Moderate	No	

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*1 Contents of byte 23 when a temperature abnormality occurred

Byte 23	Error
10	Abnormal temperature (over 60 ºC) is detected in the front side .
11	Abnormal temperature (over 60 ºC) is detected in the back side.
12	Abnormal temperature (over 45 ºC) is detected in the front side .
13	Abnormal temperature (over 45 ºC) is detected in the back side.

*2 Contents of byte 23 when a voltage alarm was given

Byte 23	Error
20	5V voltage has dropped below 80%.
21	3V voltage has dropped below 80%.
22	12V voltage has dropped below 80%.

*3 Contents of byte 23 when a voltage warning was given

Byte 23	Error
30	Voltage for shared memory has dropped below 80 %.
31	Voltage for cache memory periphery has dropped below 80 %.
33	12V voltage has dropped below 80 %.

*4 Contents of byte 23 when a P/S warning was given

Byte 23	Error
40	5V PS 0 box abnormality has been detected.
41	5V PS 1 box abnormality has been detected.
42	5V PS 2 box abnormality has been detected.
43	5V PS 3 box abnormality has been detected.
44	3V PS 0 box abnormality has been detected.
45	3V PS 1 box abnormality has been detected.
46	3V PS 2 box abnormality has been detected.
47	3V PS 3 box abnormality has been detected.
48	Multi PS 0 box abnormality has been detected.
49	Multi PS 1 box abnormality has been detected.
4A	HDD P/L Multi PS 1 box abnormality has been detected.
4B	HDD P/L Multi PS 0 box abnormality has been detected.

*5 Contents of byte 23 when a battery warning was given

Byte 23	Error
50	Battery0 or BATT-CTR0 abnormality has been detected..
52	Battery1 or BATT-CTR1 abnormality has been detected.
53	Battery2 or BATT-CTR2 abnormality has been detected.
5A	Battery0 abnormality has been detected.(DIAG)
5B	Battery1 abnormality has been detected.(DIAG)
5C	Battery2 abnormality has been detected.(DIAG)

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*6 Contents of byte 23 when an AC warning was given

Byte 23	Error
60	AC power off/interruption of the breaker box occurred.

*7 Contents of byte 23 when a fan lock in a CL1 Logic Box occurred.

Byte 23	Error
70	Low rotation speed of FPSFAN12A has been detected.
71	Low rotation speed of FPSFAN12B has been detected.
72	Low rotation speed of FPSFAN11A has been detected.
73	Low rotation speed of FPSFAN11B has been detected.
74	Low rotation speed of RPSFAN11A has been detected.
75	Low rotation speed of RPSFAN11B has been detected.
76	Low rotation speed of RPSFAN12A has been detected.
77	Low rotation speed of RPSFAN12B has been detected.
78	Low rotation speed of FLGFAN12A has been detected.
79	Low rotation speed of FLGFAN12B has been detected.
7A	Low rotation speed of FLGFAN11A has been detected.
7B	Low rotation speed of FLGFAN11B has been detected.
7C	Low rotation speed of RLGFAN11A has been detected.
7D	Low rotation speed of RLGFAN11B has been detected.
7E	Low rotation speed of RLGFAN12A has been detected.
7F	Low rotation speed of RLGFAN12B has been detected.

*8 Contents of byte 23 when a fan lock in a CL2 Logic Box occurred.

Byte 23	Error
70	Low rotation speed of FPSFAN21A has been detected.
71	Low rotation speed of FPSFAN21B has been detected.
72	Low rotation speed of FPSFAN22A has been detected.
73	Low rotation speed of FPSFAN22B has been detected.
74	Low rotation speed of RPSFAN21A has been detected.
75	Low rotation speed of RPSFAN21B has been detected.
76	Low rotation speed of RPSFAN22A has been detected.
77	Low rotation speed of RPSFAN22B has been detected.
78	Low rotation speed of FLGFAN22A has been detected.
79	Low rotation speed of FLGFAN22B has been detected.
7A	Low rotation speed of FLGFAN21A has been detected.
7B	Low rotation speed of FLGFAN21B has been detected.
7C	Low rotation speed of RLGFAN21A has been detected.
7D	Low rotation speed of RLGFAN21B has been detected.
7E	Low rotation speed of RLGFAN22A has been detected.
7F	Low rotation speed of RLGFAN22B has been detected.

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*9 Contens of byte 23 when a fan lock in a HDU occurred.

Byte 23	Error
70	Low rotation speen of FAN-XXX2A-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
71	Low rotation speen of FAN-XXX1A-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
72	Low rotation speen of FAN-XXX0A-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
73	Low rotation speen of FAN-XXX2B-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
74	Low rotation speen of FAN-XXX1B-ASSY has been detected. (FAN-XXX:the part shown in byte 13)
75	Low rotation speen of FAN-XXX0B-ASSY has been detected. (FAN-XXX:the part shown in byte 13)

*10 Contents of byte 23 when warning of JP (Jumper plug) remains was given

Byte 23	Error
81	JP for LOGIC 1 remains.
82	JP for LOGIC 2 remains.
85	JP for HDU-XX0~HDU-XX3 remains.
86	JP for HDU-XX4~HDU-XX7 remains.

*11 Contents of byte 23 when an environment monitor error occurred

Byte 23	Error
90	Environment monitor register access error
91	Basic clock error of the environment monitor PCB occurred.
92	Parity error of the environment monitor PCB occurred.
93	Battery diagnostic mode setting failure.

*12 Contents of byte 23 when an environment monitors disagreement error occurred

Byte 23	Error
A0	An environment monitors disagreement error occurred.
A1	An environment monitors disagreement error of P/S occurred

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*13 Contents of byte 13 when an environmental abnormality error occurred

Byte 13	Error section	Byte 13	Error section
10	Logic 1	55	HDU-R25
20	Logic 2	56	HDU-R26
30	HDU-R10	57	HDU-R27
31	HDU-R11	60	HDU-L20
32	HDU-R12	61	HDU-L21
33	HDU-R13	62	HDU-L22
34	HDU-R14	63	HDU-L23
35	HDU-R15	64	HDU-L24
36	HDU-R16	65	HDU-L25
37	HDU-R17	66	HDU-L26
40	HDU-L10	67	HDU-L27
41	HDU-L11	70	DKUMN-R1F
42	HDU-L12	71	DKUMN-R1R
43	HDU-L13	72	DKUMN-L1F
44	HDU-L14	73	DKUMN-L1R
45	HDU-L15	74	DKUMN-R2F
46	HDU-L16	75	DKUMN-R2R
47	HDU-L17	76	DKUMN-L2F
50	HDU-R20	77	DKUMN-L2R
51	HDU-R21	80	PWRCTL-1
52	HDU-R22	81	PWRCTL-2
53	HDU-R23	90	AC BOX-R10
54	HDU-R24	91	AC BOX-R11

*14 Contents of byte 23 when a logical error, a HEEP error, a file error, a LAN ereor or Windows error occurred

Byte 23

Byte 23	Error
0x00	Dump task
0x01	DKU inline
0x02	Microprogram change (online)
0x03	Information
0x04	LOGOUT
0x05	PATH inline
0x06	Back Ground
0x07	DIAG
0x08	Install
0x09	Online
0x0A	Microprogram change (offline)
0x0B	Special PCB maintenance
0x0C	Common communication function
0xEF	Other AP

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*15 Contents of byte 23 and byte 13 when a S-SVP logical error occurred

Byte 23
S-SVP error code (High byte)
Byte 13
S-SVP error code (Low byte)

*16 Contents of byte 13 when a CUDG detection error occurred

Byte13(bit0-bit5)

Byte 13 (bit 0 - bit 5)	MPID	Byte 13 (bit 0 - bit 5)	MPID
000000	CHP00-1P	011000	CHP24-2X
000001	CHP01-1P	011001	CHP25-2X
000010	CHP10-1P	011010	CHP34-2X
000011	CHP11-1P	011011	CHP35-2X
000100	CHP02-1Q	011100	CHP26-2Y
000101	CHP03-1Q	011101	CHP27-2Y
000110	CHP12-1Q	011110	CHP36-2Y
000111	CHP13-1Q	011111	CHP37-2Y
001000	CHP04-1R	100000	DKP08-1B
001001	CHP05-1R	100001	DKP18-1B
001010	CHP14-1R	100010	DKP09-1C
001011	CHP15-1R	100011	DKP19-1C
001100	CHP06-1S	100100	DKP0A-1D
001101	CHP07-1S	100101	DKP1A-1D
001110	CHP16-1S	100110	DKP0B-1E
001111	CHP17-1S	100111	DKP1B-1E
010000	CHP20-2V	101000	DKP28-2H
010001	CHP21-2V	101001	DKP38-2H
010010	CHP30-2V	101010	DKP29-2J
010011	CHP31-2V	101011	DKP39-2J
010100	CHP22-2W	101100	DKP2A-2K
010101	CHP23-2W	101101	DKP3A-2K
010110	CHP32-2W	101110	DKP2B-2L
010111	CHP33-2W	101111	DKP3B-2L

Byte13(bit6-bit7)

Byte 13 (bit 6 - bit 7)	Section
00	CHA/DKA
01	CACHE+Shared Memory
10	CACHE PORT+Shared Memory
11	CACHE

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*17 Contents of byte 13 when a version check error or sum check error occurred

Byte 13	Micro-program type
00	RAM BOOT
01	DKC MANI
02	LCP
03	MCP
04	LCDG
05	DKU
06	SVP
07	S-SVP

*18 Contents of byte 13 when a CHP error occurred.

Contents of high byte of Byte13(X).

High byte of Byte 13	Contents
0	1st. CHA of cluster 1
1	2nd. CHA of cluster 1
2	3rd. CHA of cluster 1
3	4th. CHA of cluster 1
4	1st. CHA of cluster 2
5	2nd. CHA of cluster 2
6	3rd. CHA of cluster 2
7	4th. CHA of cluster 2

Contents of low byte of Byte13(Y).

High byte of Byte 13	Contents
0	1st. CHP of the CHA
1	2nd. CHP of the CHA
2	3rd. CHP of the CHA
3	4th. CHP of the CHA

In WCHK1 dump and ABEND dump received SIM = 3080XX, 3081XX, the system error code is indicated on the SIM log detail screen in the format [YYYY] as in Reference Code 3080X0[YYYY].

*19 Contents of byte 13 when a DKP error occurred.

Contents of high byte of Byte13(X).

High byte of Byte 13	Contents
0	1st. DKA of cluster 1
1	2nd. DKA of cluster 1
2	3rd. DKA of cluster 1
3	4th. DKA of cluster 1
4	1st. DKA of cluster 2
5	2nd. DKA of cluster 2
6	3rd. DKA of cluster 2
7	4th. DKA of cluster 2

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Contents of low byte of Byte13(Y).

High byte of Byte 13	Contents
0	1st. DKP of the DKA
1	2nd. DKP of the DKA

In WCHK1 dump and ABEND dump received SIM = 3180XX, 3181XX, the system error code is indicated on the SIM log detail screen in the format [YYYY] as in Reference Code 3180X0[YYYY].

*20 Contents of byte 13

Contents of high byte of Byte13(X).

High byte of Byte 13	Contents
0	1st. CHA of cluster 1
1	2nd. CHA of cluster 1
2	3rd. CHA of cluster 1
3	4th. CHA of cluster 1
4	1st. CHA of cluster 2
5	2nd. CHA of cluster 2
6	3rd. CHA of cluster 2
7	4th. CHA of cluster 2

Contents of low byte of Byte13(Y).

High byte of Byte 13	Contents
0	1st. LCP of the CHA
1	2nd. LCP of the CHA
2	3rd. LCP of the CHA
3	4th. LCP of the CHA

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