

Functional Block Diagram

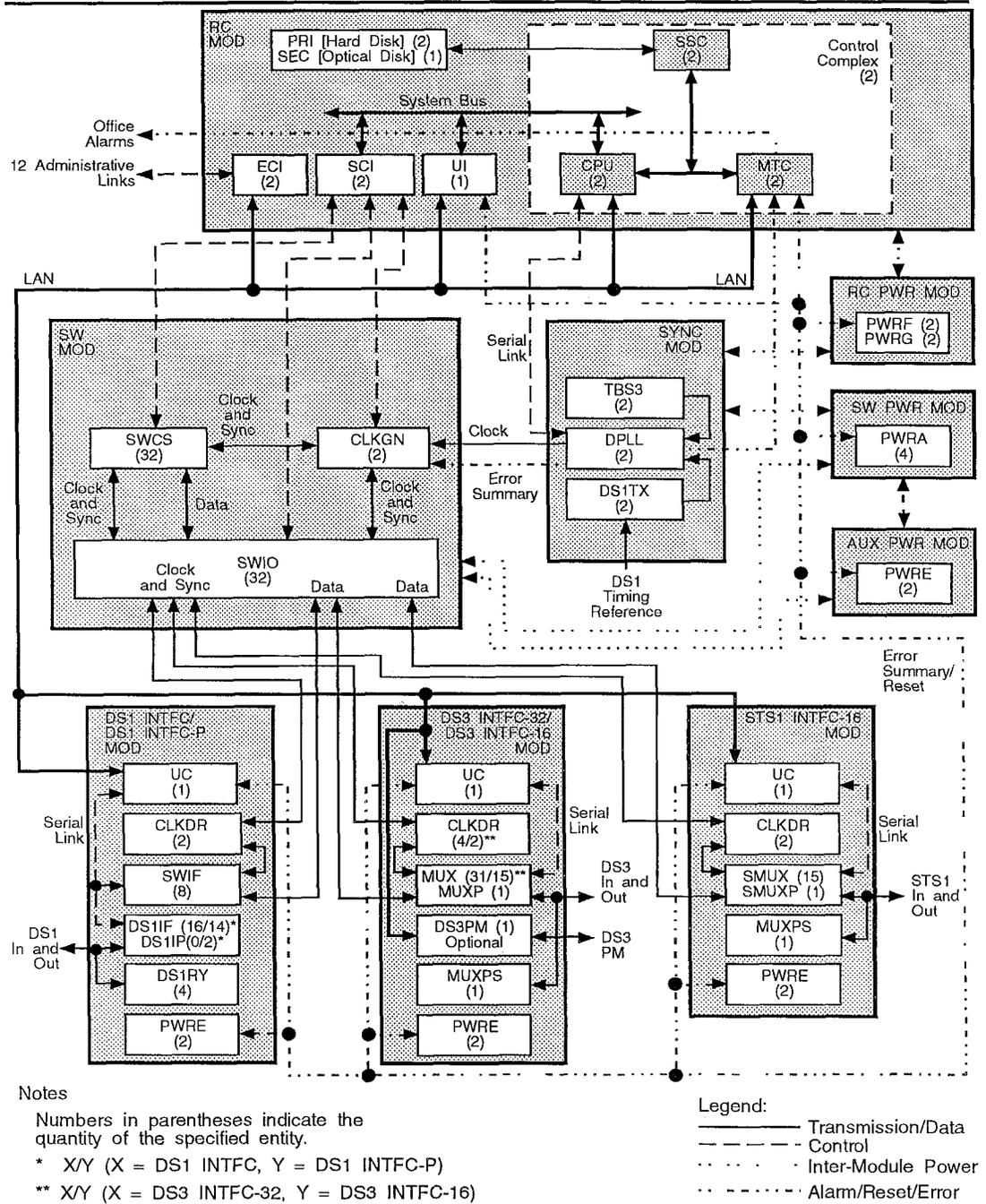


Figure 1. DACS IV-2000 (256) Release 4.0 Functional Block Diagram

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Unit Numbering

Figures 2, 3, and 4 illustrate the physical association of bays, units (the shelf positions of interface modules), and interbay cables in a fully-equipped system with all DS1 interfaces, DS3 interfaces, and STS-1 interfaces, respectively. For example, using Figure 2, look at Unit 11, located in the third column of the second row. The first label in Unit 11 is *SWIO 7*. This represents the Switch Input/Output (SWIO) circuit pack in the Switch Module that is associated with Unit 11. The designation *N-Rate D* indicates half of an N-rate cable (labeled *D*) that connects this interface module to the Switch Module. The number *9* indicates the DS1 Interface-Protection Module (located in Unit 9) responsible for providing protection for this interface module. Finally, the number *J-7* shows the control cable for this interface module in the bay lineup. Each unit shown in this sample configuration is labeled with the same information

The unit numbers and control cable numbers shown in Figures 2, 3, and 4 are the same for any DACS IV-2000 configuration. The examples pictured are based on maximum configurations, but the same numbers are used for other configurations.

4 SWIO 16 N-Rate H 1 J-16	8 SWIO 12 N-Rate F 5 J-12	12 SWIO 8 N-Rate D 9 J-8	16 SWIO 4 N-Rate B 13 J-4	External Misc T/S Fuse & Alarm Switch Power Module			20 SWIO 20 N-Rate K 17 J-20	24 SWIO 24 N-Rate M 21 J-24	28 SWIO 28 N-Rate P 25 J-28	32 SWIO 32 N-Rate T 29 J-32
3 SWIO 15 N-Rate H 1 J-15	7 SWIO 11 N-Rate F 5 J-11	11 SWIO 7 N-Rate D 9 J-7	15 SWIO 3 N-Rate B 13 J-3	Sync Mod	RC Pwr Mod	Aux Pwr Mod	19 SWIO 19 N-Rate K 17 J-19	23 SWIO 23 N-Rate M 21 J-23	27 SWIO 27 N-Rate P 25 J-27	31 SWIO 31 N-Rate T 29 J-31
2 SWIO 14 N-Rate G 1 J-14	6 SWIO 10 N-Rate E 5 J-10	10 SWIO 6 N-Rate C 9 J-6	14 SWIO 2 N-Rate A 13 J-2	Switch Module			18 SWIO 18 N-Rate J 17 J-18	22 SWIO 22 N-Rate L 21 J-22	26 SWIO 26 N-Rate N 25 J-26	30 SWIO 30 N-Rate R 29 J-30
1 SWIO 13 N-Rate G 1 J-13	5 SWIO 9 N-Rate E 5 J-9	9 SWIO 5 N-Rate C 9 J-5	13 SWIO 1 N-Rate A 13 J-1				Fan Assembly			17 SWIO 17 N-Rate J 17 J-17
1	2	3	4	5			6	7	8	9

Note: Units 1, 5, 9, 13, 17, 21, 25, and 29 are all DS1 Interface-Protection Modules. All other units are DS1 Interface Modules.

Figure 2. Physical Associations of Bays, Units, and Interbay Cables in a Maximum Configuration of DS1 Interface Modules

12	16	External Misc T/S			20	24
		Fuse & Alarm				
		Switch Power Module				
11 SWIO 13-16 N-Rate G/H (J16) J-7	15 SWIO 5-8 N-Rate C/D (J14) J-3	Sync Mod	RC Pwr Mod	Aux Pwr Mod	19 SWIO 21-24 N-Rate L/M (J30) J-19	23 SWIO 29-32 N-Rate R/T (J32) J-23
Redundant Controller Module						
10 SWIO 9-12 N-Rate E/F (J15) J-6	14 SWIO 1-4 N-Rate A/B (J13) J-2	Switch Module			18 SWIO 17-20 N-Rate J/K (J29) J-18	22 SWIO 25-28 N-Rate N/P (J31) J-22
9	13				17	21
Fan Assembly						
3	4	5			6	7

Note: The J-cable ID shown in parentheses indicate the control cable for the optional DS3PM circuit pack. In the above figure, it is assumed each DS3 Interface-32 Module contains a DS3PM circuit pack

Figure 3. Physical Associations of Bays, Units, and Interbay Cables in a Maximum Configuration of DS3 Interface-32 Modules

12 SWIO 15/16 N-Rate H J-8	16 SWIO 7/8 N-Rate D J-4	External Misc T/S			20 SWIO 23/24 N-Rate M J-20	24 SWIO 31/32 N-Rate T J-24
		Fuse & Alarm				
		Switch Power Module				
11 SWIO 13/14 N-Rate G J-7	15 SWIO 5/6 N-Rate C J-3	Sync Mod	RC Pwr Mod	Aux Pwr Mod	19 SWIO 21/22 N-Rate L J-19	23 SWIO 29/30 N-Rate R J-23
Redundant Controller Module						
10 SWIO 11/12 N-Rate F J-6	14 SWIO 3/4 N-Rate B J-2	Switch Module			18 SWIO 19/20 N-Rate K J-18	22 SWIO 27/28 N-Rate P J-22
9 SWIO 9/10 N-Rate E J-5	13 SWIO 1/2 N-Rate A J-1				17 SWIO 17/18 N-Rate J J-17	21 SWIO 25/26 N-Rate N J-21
Fan Assembly						
3	4	5			6	7

Figure 4. Physical Associations of Bays, Units, and Interbay Cables in a Maximum Configuration of STS1 Interface-16 Modules

Commands and Messages

Command	Command	Command	Command
ABT-CMD	ED-STATE-EQPT	RLS-TSTPT-T1	RTRV-NE
ACT-ECHO-LINK	ED-T1	RLS-TSTPT-VT1	RTRV-PATH-STS1
ACT-USER	ED-T3	RMV-EQPT	RTRV-PATH-T1
ALW-LPBK-EC1	ED-VT1	RMV-LINK	RTRV-PATH-VT1
ALW-LPBK-T1	ENT-AUTOCMPN-T1	RST-EQPT	RTRV-PM-EC1
ALW-LPBK-T3	ENT-CONF-STS1	RST-LINK	RTRV-PM-T1
ALW-LPBK-VT1	ENT-CONF-T1	RTRV-ALM-ALL	RTRV-PM-T3
ALW-MSG-EC1	ENT-CONF-VT1	RTRV-ALM-COM	RTRV-PM-VT1
ALW-MSG-VT1	ENT-CRS-STS1	RTRV-ALM-EC1	RTRV-PMCNFGRN-T1
ALW-PMREPT-EC1	ENT-CRS-T1	RTRV-ALM-EQPT	RTRV-PMMODE-EC1
ALW-PMREPT-T1	ENT-CRS-VT1	RTRV-ALM-LINK	RTRV-PMMODE-VT1
ALW-PMREPT-T3	ENT-EQPT	RTRV-ALM-T1	RTRV-PMSCHEDE-EC1
ALW-PMREPT-VT1	ENT-FAN-FILTER	RTRV-ALM-T2	RTRV-PMSCHEDE-T1
ALW-SW-EQPT	ENT-ROLL-STS1	RTRV-ALM-T3	RTRV-PMSCHEDE-T3
CANC-ECHO-LINK	ENT-ROLL-T1	RTRV-ALM-VT1	RTRV-PMSCHEDE-VT1
CANC-USER	ENT-ROLL-VT1	RTRV-ATTR-EC1	RTRV-PORT
CHG-ACCMD-EC1	ENT-SECU-USER	RTRV-ATTR-EQPT	RTRV-PRMTR-LINK
CHG-ACCMD-T1	ENT-TSTPT-EC1	RTRV-ATTR-T1	RTRV-PRMTR-SFTWR
CHG-ACMD-VT1	ENT-TSTPT-T1	RTRV-ATTR-T2	RTRV-SCANTH-NE
CHG-TACC-EC1	ENT-TSTPT-VT1	RTRV-ATTR-T3	RTRV-SECU-AUD
CHG-TACC-T1	EX-EQPT	RTRV-ATTR-VT1	RTRV-SECU-LINK
CHG-TACC-VT1	INH-LPBK-EC1	RTRV-CMD-STAT	RTRV-SECU-USER
CONN-PM-T1	INH-LPBK-T1	RTRV-COND-EC1	RTRV-STATE-EC1
CONN-TACC-EC1	INH-LPBK-T3	RTRV-COND-EQPT	RTRV-STATE-EQPT
CONN-TACC-T1	INH-LPBK-VT1	RTRV-COND-LINK	RTRV-STATE-T1
CONN-TACC-VT1	INH-MSG-EC1	RTRV-COND-T1	RTRV-STATE-VT1
CPY-MEM	INH-MSG-VT1	RTRV-COND-T2	RTRV-SYCN
CPY-TH-T1	INH-PMREPT-EC1	RTRV-COND-T3	RTRV-SYSID
DGN-DET-EQPT	INH-PMREPT-T1	RTRV-COND-VT1	RTRV-T1
DISC-PM-T1	INH-PMREPT-T3	RTRV-CONF-STS1	RTRV-T3
DISC-TACC	INH-PMREPT-VT1	RTRV-CONF-T1	RTRV-TACC-EC1
DLT-CONF-STS1	INH-SW-EQPT	RTRV-CONF-VT1	RTRV-TACC-T1
DLT-CONF-T1	INIT-REG-EC1	RTRV-CRS	RTRV-TACC-VT1
DLT-CONF-VT1	INIT-REG-T1	RTRV-CRS-STS1	RTRV-TH-EC1
DLT-CRS-STS1	INIT-REG-T3	RTRV-CRS-T1	RTRV-TH-NE
DLT-CRS-T1	INIT-REG-VT1	RTRV-CRS-VT1	RTRV-TH-T1
DLT-CRS-VT1	INIT-SYS	RTRV-DROPCRS-STS1	RTRV-TH-T3
DLT-EQPT	LGN-USER	RTRV-DROPCRS-T1	RTRV-TH-VT1
DLT-SECU-AUD	LGT-USER	RTRV-DROPCRS-VT1	RTRV-VT1
DLT-SECU-USER	OPR-ACO-ALL	RTRV-EC1	SCHED-PMREPT-EC1
ED-DATE	OPR-LPBK-EC1	RTRV-ECHO-LINK	SCHED-PMREPT-T1
ED-EC1	OPR-LPBK-T1	RTRV-EQPT	SCHED-PMREPT-T3
ED-EQPT	OPR-LPBK-T3	RTRV-HDR	SCHED-PMREPT-VT1
ED-NE	OPR-LPBK-VT1	RTRV-LPBK-EC1	SET-ATTR-EC1
ED-PORT	RLS-LPBK-EC1	RTRV-LPBK-T1	SET-ATTR-EQPT
ED-PRMTR-LINK	RLS-LPBK-T1	RTRV-LPBK-T3	SET-ATTR-T1
ED-SECU-LINK	RLS-LPBK-T3	RTRV-LPBK-VT1	SET-ATTR-T2
ED-SECU-PID	RLS-LPBK-VT1	RTRV-MSG-EC1	SET-ATTR-T3
ED-SECU-USER	RLS-TSTPT-EC1	RTRV-MSG-VT1	SET-ATTR-VT1

Table continued on next page.

Command	Autonomous Message	Autonomous Message	Autonomous Message
SET-PMODE-EC1	REPT ALM COM	REPT DROPCRS VT1	REPT RSTCRS VT1
SET-PMODE-VT1	REPT ALM EC1	REPT EVT EC1	REPT SW
SET-SCANTH-NE	REPT ALM EQPT	REPT EVT T1	REPT TRMSN T1
SET-SID	REPT ALM LINK	REPT EVT T3	
SET-TH-EC1	REPT ALM T1	REPT EVT VT1	
SET-TH-NE	REPT ALM T2	REPT EXCPTN SYS	
SET-TH-T1	REPT ALM T3	REPT FAN FILTER	
SET-TH-T3	REPT ALM VT1	REPT LOCL IN	
SET-TH-VT1	REPT BKUP	REPT PM EC1	
STA-SCANPM-T1	REPT CMPR MEM	REPT PM T1	
STP-SCANPM-T1	REPT DBCHG	REPT PM T3	
SW-DX-EQPT	REPT DGNDDET EQPT	REPT PM VT1	
SW-TOPROTN-EQPT	REPT DISC TACC	REPT RMV EQPT	
SW-TOWKG-EQPT	REPT DLTCRS STS1	REPT RMV LINK	
TEST-CABLE	REPT DLTCRS T1	REPT RST EQPT	
TEST-SW-CONTROL	REPT DLTCRS VT1	REPT RST LINK	
TEST-TRMSN-T1	REPT DROPCRS STS1	REPT RSTCRS STS1	
TEST-UNIT-CABLE	REPT DROPCRS T1	REPT RSTCRS T1	

Facility Address (EID)

STS-1 Ports

The port EID (Equipment Identification) code, expressed as: {unit number}-{port number} (Unit-STS-1 Port) for the STS-1 ports must be addressed as follows:

- Individually or as a range:
For STS1 Interface-16 Modules, only: {1-32} - {1-15}
- As all ports in an STS1 Interface Module: **UNIT- {1-32}**

DS1 and VT1.5 Mappings

Asynchronous DACS IV-2000 to DDM-1000		Synchronous			
		DACS IV-2000		DDM-2000	
DS1 Within DS3	DS2, DS1	VT1.5 Within STS-1	VT Group, VT	VT Group, VT	VT1.5 Within STS-1
1	1,1	1	1,1	1,1	1
2	1,2	2	2,1	1,2	8
3	1,3	3	3,1	1,3	15
4	1,4	4	4,1	1,4	22
5	2,1	5	5,1	2,1	2
6	2,2	6	6,1	2,2	9
7	2,3	7	7,1	2,3	16
8	2,4	8	1,2	2,4	23
9	3,1	9	2,2	3,1	3
10	3,2	10	3,2	3,2	10
11	3,3	11	4,2	3,3	17
12	3,4	12	5,2	3,4	24
13	4,1	13	6,2	4,1	4
14	4,2	14	7,2	4,2	11
15	4,3	15	1,3	4,3	18
16	4,4	16	2,3	4,4	25
17	5,1	17	3,3	5,1	5
18	5,2	18	4,3	5,2	12
19	5,3	19	5,3	5,3	19
20	5,4	20	6,3	5,4	26
21	6,1	21	7,3	6,1	6
22	6,2	22	1,4	6,2	13
23	6,3	23	2,4	6,3	20
24	6,4	24	3,4	6,4	27
25	7,1	25	4,4	7,1	7
26	7,2	26	5,4	7,2	14
27	7,3	27	6,4	7,3	21
28	7,4	28	7,4	7,4	28

For more information on DS1 and VT1.5 mappings, refer to the "Cross Connections" section in Chapter 2 of the *DACS IV-2000 (256) Release 4.0 Reference Manual (AT&T 365-340-700)*.

VT1.5 Ports

The port EID (Equipment Identification) code, expressed as: {unit number}-{slot number}-{port number} (Unit-STS-1 Equivalent-VT1.5 Port) for the VT1.5 ports must be addressed as follows:

- Individually or as a range:
For STS1 Interface-16 Modules, only: {1-32} - {1-15} - {1-28}
- As an individual or a range of VT1GRPs (group of 28 VT1.5 tributaries):
For STS1 Interface-16 Modules: {1-32} - {1-15}
- As all ports in an STS1 Interface Module: UNIT- {1-32}

DS1 Ports

The port EID (Equipment Identification) code, expressed as: {unit number}-{slot number}-{port number} (Unit-DS3 Equivalent-DS1 Port) for the DS1 ports must be addressed as follows:

- Individually or as a range:
For STS1 Interface-16 Modules: {1-32} - {1-15} - {1-28}
For DS3 Interface-32 Modules: {1-32} - {1-31} - {1-28}
For DS3 Interface-16 Modules: {1-32} - {1-15} - {1-28}
For DS1 Interface Modules: {1-32} - {1-8} - {1-28}
For DS1 Interface-P Modules: {1-32} - {1-7} - {1-28}
- As an individual or a range of DS1GRPs (group of 28 DS1 ports functioning as a DS3 equivalent):
For STS1 Interface-16 Modules: {1-32} - {1-15}
For DS3 Interface-32 Modules: {1-32} - {1-31}
For DS3 Interface-16 Modules: {1-32} - {1-15}
For DS1 Interface Modules: {1-32} - {1-8}
For DS1 Interface-P Modules: {1-32} - {1-7}
- As all ports in an interface module: UNIT- {1-32}

Allowable Commands for Various Main Controller States

Most system functions are not allowed when the main controller (MC) is not in service. Certain functions, however, either can be performed with the MC out of service, or require the MC to be out of service to be performed. The following lists the allowable commands for the given state of the MC:

■ **OOS-FLT state:**

DGN-DET-EQPT (on MC, and MC subentities* in the IS state)
INIT-SYS (Initialization Level 9)
RTRV-CMD-STAT
RTRV-STATE-EQPT (on MC)
RST-EQPT (on MC)

■ **OOS-MTCE state:**

DGN-DET-EQPT (on MC, and MC subentities* in the IS state)
INIT-SYS (Initialization Level 9)
RTRV-CMD-STAT
RTRV-STATE-EQPT (on the MC)
RST-EQPT (on the MC, PRI, and SEC)
RMV-EQPT (on SEC)
CPY-MEM†

■ **OOS-MCOND state:**

DGN-DET-EQPT (on MC, and MC subentities* in the IS state)
INIT-SYS (Initialization Level 9)
RTRV-CMD-STAT
RTRV-STATE-EQPT (on the MC)
RST-EQPT (on the MC, PRI, and SEC)
RMV-EQPT (on the PRI and SEC)
RTRV-SYSID
CPY-MEM†
SET-SID

■ **IS state** the following commands are **not** allowed:

RMV-EQPT (on the only in-service PRI)
CPY-MEM†

* MC subentities include: CPU-0, CPU-1, UI, MTC-0, MTC-1, SSC-0, SSC-1, PRI-1, PRI-2, SEC, ECI-1, ECI-2, SCI-1, SCI-2, CC-0, and CC-1

† See CPY-MEM command entry in the *DACS IV-2000 (256) Release 4.0 Commands and Messages* manual (AT&T 365-340-702) for details.

Error Codes

Error Code	Error Condition	Error Code	Error Condition
EHNS	Equipment hierarchy not satisfied	SAIN	Status, already inhibited
ENEQ	Equipage, not equipped	SAIS	Status, already in-service
ENMB	Equipage, not a multipoint bridge	SAOP	Status, already operated
ENMD	Equipage, no media present	SAOS	Status, already out-of-service
ENRD	Equipage, not red-lined	SAPS	Status, already in protection state
ENRE	Equipage, not recognized equipage	SAPV	Status, already provisioned
ENRI	Equipage, not equipped for retrieving specified information	SARB	Status, all resources busy
ERLC	Equipage, a red-lined circuit	SARL	Status, already released
IBEX	Input, extra block	SASW	Status, already in switched state
IBNC	Input, block not consistent	SAWS	Status, already in working state
		SCCF	Status, SEC cartridge checksum failure
IDMS	Input, data missing	SCAT	Status, circuit is already connected to another TAP
IDNC	Input, data not consistent	SDNC	Status, data in input message is not consistent with the provisioned object entity
IDNV	Input, data not valid	SEIP	Status, entity is protected
IDRG	Input, data, range error		
IISP	Input, invalid syntax or punctuation		
IITA	Input, invalid target identifier (TID)	SMVF	Status, media validation failed
ISCH	Input, syntax character error in input command	SNAS	Status, not assigned
ISPC	Input, syntax punctuation error in input command	SNCC	Status, not cross-connected
MRAS	Maximum reports already scheduled	SNDA	Status, no data available
		SNDB	Status, no database on the device
		SNIS	Status, not in-service
PICC	Privilege, illegal command code	SNML	Status, no monitor line established
PIOC	Privilege, illegal operations channel	SNOS	Status, not out-of-service
PIPW	Privilege, illegal password/user id code	SNPV	Status, not provisioned
PIRC	Privilege, illegal record control	SNST	Status, execution could not be started
PIUI	Privilege, illegal user identity	SNVS	Status, not in valid state
PKOR	Pack out of range	SOSF	Status, out-of-service, failed
PLNA	Privilege, login not active	SOST	Status, out-of-service, testing
SAAL	Status, already allowed	SPFA	Status, protection entity failed
SAAS	Status, already assigned	SRIP	Status, request inconsistent with provisioning
SABT	Status, execution stopped abruptly before completion	SROF	Status, requested operation failed
SACC	Status, already cross-connected	SSTP	Status, execution stopped gracefully before completion
SADC	Status, already disconnected	SWFA	Status, working entity failed

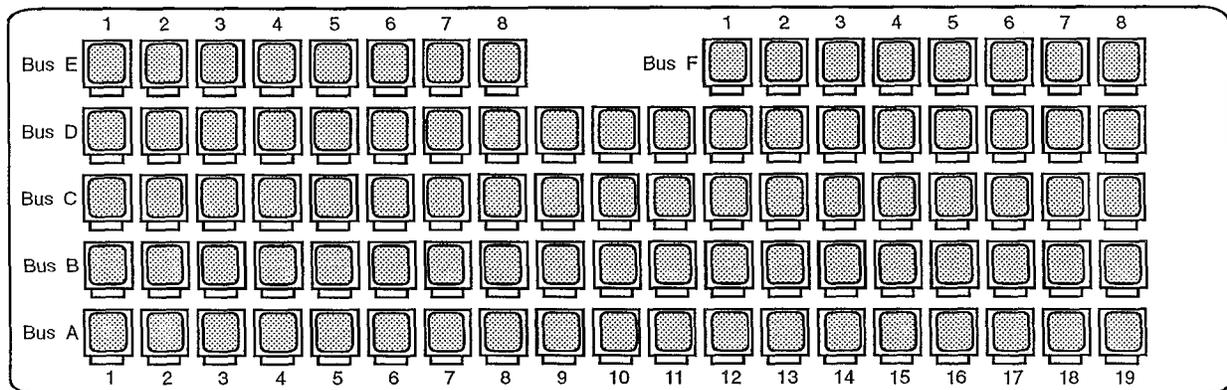
Main Fuse Panels and Charts

Tables 1 (Interface Bays) and 2 (Switch Bay) relate DACS IV-2000 (256) fuses for bays, interface modules, and fan assemblies to their physical location on the fuse and alarm panel (see Figure 5 [ED-2C940-30 Fuse and Alarm Panel] or Figure 6 [ED-9C114-30 Fuse and Alarm Panel]) at the top of the Switch Bay.

Bus C	C2-2	C3-2	C4-2	C5-2	C6-2	C7-2	C8-2	C9-2	C10-2	C11-2	C12-2	Bus D	D2-2	D3-2	D4-2	D5-2	D6-2	D7-2	D8-2	D9-2	D10-2	D11-2	D12-2	Bus E	E6	E7	E8	
	C1-1	C2-1	C3-1	C4-1	C5-1	C6-1	C7-1	C8-1	C9-1	C10-1	C11-1	C12-1	D1-1	D2-1	D3-1	D4-1	D5-1	D6-1	D7-1	D8-1	D9-1	D10-1	D11-1	D12-1	E1	E2	E3	E4
Bus A	A2-2	A3-2	A4-2	A5-2	A6-2	A7-2	A8-2	A9-2	A10-2	A11-2	A12-2	Bus B	B2-2	B3-2	B4-2	B5-2	B6-2	B7-2	B8-2	B9-2	B10-2	B11-2	B12-2	B13-2	B14-2	B15-2	B16-2	
	A1-1	A2-1	A3-1	A4-1	A5-1	A6-1	A7-1	A8-1	A9-1	A10-1	A11-1	A12-1	B1-1	B2-1	B3-1	B4-1	B5-1	B6-1	B7-1	B8-1	B9-1	B10-1	B11-1	B12-1	B13-1	B14-1	B15-1	B16-1
Bus A	A13-2	A14-2	A15-2	A16-2	A17-2	A18-2	A19-2	Bus B	B17-2	B18-2	B19-2	Bus C	C13-2	C14-2	C15-2	C16-2	C17-2	C18-2	C19-2	Bus D	D13-2	D14-2	D15-2	D16-2	D17-2	D18-2	D19-2	
	A13-1	A14-1	A15-1	A16-1	A17-1	A18-1	A19-1	Bus B	B17-1	B18-1	B19-1	Bus C	C13-1	C14-1	C15-1	C16-1	C17-1	C18-1	C19-1	Bus D	D13-1	D14-1	D15-1	D16-1	D17-1	D18-1	D19-1	

Note: Fuses for power buses A, B, C, and D come in pairs with the load fuse labeled with -1 and the indicator fuse labeled with -2. Fuses for power bus E do not have dual fuses (one load and one indicator); they are all indicator fuses.

Figure 5. Main Fuse Panel (ED-2C940-30 Fuse Panel)



Note: Fuses A1, A2, B2, C1, C2, and D2 are rated at 12A, fuse D1 is rated at 2A, and all other fuses are rated at 10A. All fuses contain a red alarm lamp to indicate failure. Fuse B1 is not connected.

Figure 6. Main Fuse Panel (ED-9C114-30 Fuse Panel)

Table 1. Fuse Chart Interface Bays (Bay 1-4 and 6-9)

Shelf	PWR Circuit Pack	Bay 1	Bay 2	Bay 3	Bay 4	Bay 6	Bay 7	Bay 8	Bay 9
Standard Power (ED-2C940-30 Fuse Panel)									
4	PWRE-2	C17	D14	D4	D10	C12	D6	B15	C19
	PWRE-1	A17	C15	B4	C10	B12	B6	C8	A19
3	PWRE-2	D16	D13	C4	B10	D12	C6	B8	D18
	PWRE-1	A16	A14	A4	A10	A12	A6	A8	C18
2	PWRE-2	B18	C14	D3	C9	D11	D5	C7	D19
	PWRE-1	A15	B17	C3	B9	B11	C5	B7	A18
1	PWRE-2	D15	C13	B3	D9	C11	B5	D7	D17
	PWRE-1	C16	A13	A3	A9	A11	A5	A7	B19
Fan	Main	—	A16	B18	A17	C19	D17	D19	—
	Auxiliary	—	D16	D15	C17	C19	D17	D19	—

Note: All load fuses are 10A and all indicator fuses are 0.5A.

Duplex Power (ED-9C114-30 Fuse Panel)

4	PWRE-2	F4	D14	D4	D10	D12	D6	D8	F8
	PWRE-1	E4	B14	B4	B10	B12	B6	B8	E8
3	PWRE-2	F3	C14	C4	C10	C12	C6	C8	F7
	PWRE-1	E3	A14	A4	A10	A12	A6	A8	E7
2	PWRE-2	D15	D13	D3	D9	D11	D5	D7	D18
	PWRE-1	B15	B13	B3	B9	B11	B5	B7	B18
1	PWRE-2	F2	C13	C3	C9	C11	C5	C7	F6
	PWRE-1	E2	A13	A3	A9	A11	A5	A7	E6
Fan	Main	E1	A15	A16	B16	B19	A19	A18	E5
	Auxiliary	F1	C15	C16	D16	D19	C19	C18	F5

Note: All fuses are rated at 10A and contain a red alarm lamp to indicate failure.

Table 2. Fuse Chart Switch Bay (Bay 5)

Auxiliary Power PWRE		Switch Power PWRA				Fan Assembly	
1	2	1	2	3	4	Main	Auxiliary
Standard Power (ED-2C940-30 Fuse Panel)							
B14	D8	A2	B2	C2	D2	E6	B13-2
Note: Fuses A2-1, B2-1, C2-1, and D2-1 are 12A and fuses B14-1 and D8-1 are 10A. Fuses A2-2, B2-2, B14-2, C2-2, D2-2, and D8-2 (indicator fuses) are 0.5A. The fan assembly fuses E6 and B13-2 are indicator fuses rated at 5A							
Duplex Power (ED-9C114-30 Fuse Panel)							
B14	D8	A2	B2	C2	D2	A17	C17
PWRF-1, PWRG-1, TBS3-0 (SYNC-0)			PWRF-2, PWRG-2, TBS3-1 (SYNC-1)			Header Designation Assembly	
A1			C1			D1	
Note: Fuses A1, A2, B2, C1, C2, and D2 are rated at 12A, fuse D1 is rated at 2A, and all other fuse are rated at 10A. All fuses contain a red alarm lamp to indicate failure.							

Secondary Fuses

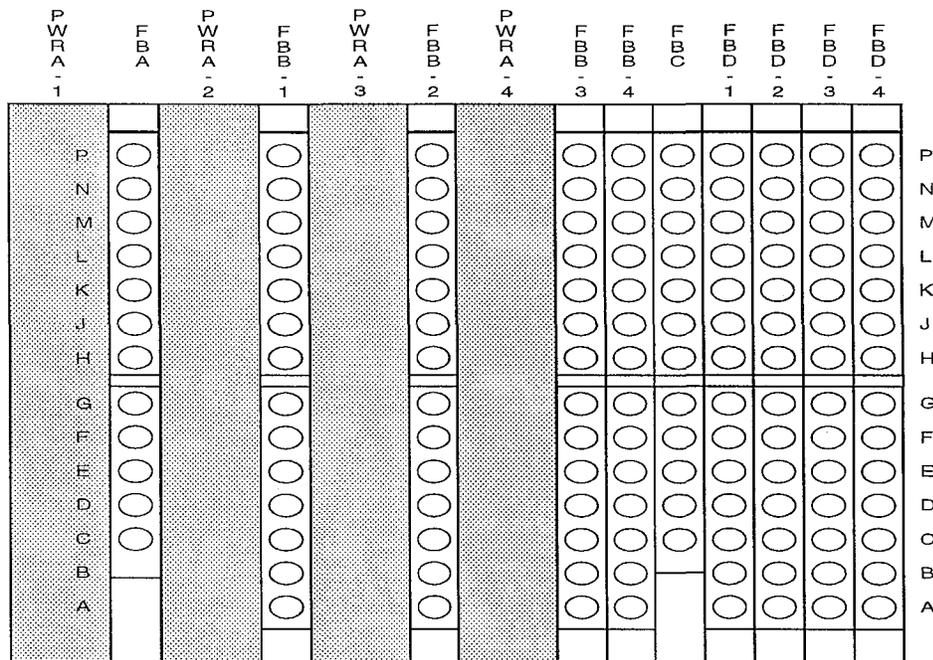


Figure 7. Secondary Fuses (FBA, FBB, FBC, and FBD)

Table 3. Secondary Fuse Chart for the DACS IV-2000 (256)

Location	Type 77D (10A) Fuse for +5V Supply				
	FBA	FBB-1	FBB-2	FBB-3	FBB-4
P	SWIO-11	SWCS-9	SWCS-23	SWIO-21	SYNC-1*
N	SWIO-10	SWCS-8	SWCS-22	SWIO-20	SYNC-0*
M	SWIO-9	SWCS-7	SWCS-21	SWIO-19	SWIO-32
L	CLKGN-0	SWCS-6	SWCS-20	SWIO-18	SWIO-31
K	SWIO-8	SWCS-5	SWCS-19	SWIO-17	SWIO-30
J	SWIO-7	SWCS-4	SWCS-18	SWCS-32	SWIO-29
H	SWIO-6	SWCS-3	SWCS-17	SWCS-31	SWIO-28
G	SWIO-5	SWCS-2	SWCS-16	SWCS-30	SWIO-27
F	SWIO-4	SWCS-1	SWCS-15	SWCS-29	SWIO-26
E	SWIO-3	SWIO-16	SWCS-14	SWCS-28	SWIO-25
D	SWIO-2	SWIO-15	SWCS-13	SWCS-27	SWIO-24
C	SWIO-1	SWIO-14	SWCS-12	SWCS-26	SWIO-24
B	-	SWIO-13	SWCS-11	SWCS-25	SWIO-23
A	-	SWIO-12	SWCS-10	SWCS-24	SWIO-22
Location	Type 78J (7.5A) Fuse for -5V Supply				
	FBC	FBD-1	FBD-2	FBD-3	FBD-4
P	SWIO-11	SWCS-9	SWCS-23	SWIO-21	SYNC-1*
N	SWIO-10	SWCS-8	SWCS-22	SWIO-20	SYNC-0*
M	SWIO-9	SWCS-7	SWCS-21	SWIO-19	SWIO-32
L	CLKGN-0	SWCS-6	SWCS-20	SWIO-18	SWIO-31
K	SWIO-8	SWCS-5	SWCS-19	SWIO-17	SWIO-30
J	SWIO-7	SWCS-4	SWCS-18	SWCS-32	SWIO-29
H	SWIO-6	SWCS-3	SWCS-17	SWCS-31	SWIO-28
G	SWIO-5	SWCS-2	SWCS-16	SWCS-30	SWIO-27
F	SWIO-4	SWCS-1	SWCS-15	SWCS-29	SWIO-26
E	SWIO-3	SWIO-16	SWCS-14	SWCS-28	SWIO-25
D	SWIO-2	SWIO-15	SWCS-13	SWCS-27	SWIO-24
C	SWIO-1	SWIO-14	SWCS-12	SWCS-26	SWIO-24
B	-	SWIO-13	SWCS-11	SWCS-25	SWIO-23
A	-	SWIO-12	SWCS-10	SWCS-24	SWIO-22

* SYNC fuses provide fuse protection for all three circuit packs (DPLL, TBS3, and DS1TX) associated with a synchronizer side.

Redundant Controller Power Module Fuses

FBF	FBG	FBH	FBI
○ ALM	○ ALM	○ ALM	○ ALM
▨ ECI (1) 5A	▨ ECI (2) 5A	▨ UI 5A	▨ PWRF (1) 7.5A
▨ CPU (0) 5A	▨ CPU (1) 5A	▨ SCI (1) 5A	▨ PWRG (1) 7.5A
▨ MTC (0) 5A	▨ MTC (1) 5A	▨ SCI (2) 5A	▨ SPRF 20 5A
▨ SSC (0) 5A	▨ SSC (1) 5A	▨ STPNL 2A	▨ SYNCF 2A
▨ PRI (1) 5A	▨ PRI (2) 5A	▨ SEC 5A	▨ PWRF (2) 7.5A
▨ ECI (1) 1A	▨ ECI (2) 1A	▨ SEC 5A	▨ PWRG (2) 7.5A
▨ PRI (1) 5A	▨ PRI (2) 5A	▨ SPR 5A	▨ SPRG 0 5A
▨ ECI (1) 1A	▨ ECI (2) 1A	▨ SPR 5A	▨ SYNCG 2A

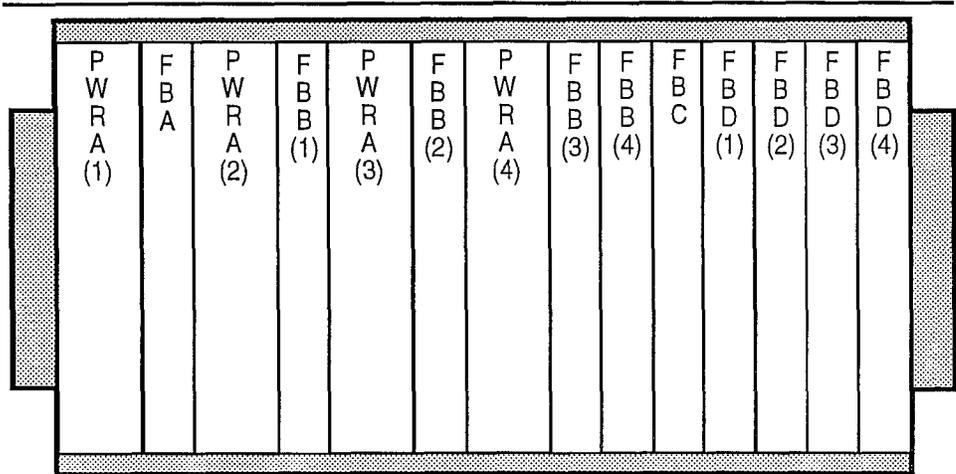
Notes:

- Numbers in parentheses are circuit pack position numbers in the Redundant Controller Module. Fuse ratings are listed below the circuit pack identifier.
- The 7.5A fuses are the load fuses to the PWRF and PWRG power circuit packs.
- The 5A (2A for the Status Panel) fuses are the secondary fuses (or the +5V supply) to the circuit packs contained in the Redundant Controller Module.
- The 1A fuses associated with the ECI circuit packs are for +12V and -12V supplied to the CILINKs. When these fuses blow, communication with the CILINKs can be interrupted.
- The 5A fuses for the optical disk drive (SEC) is for the +5V and +12V supply.
- The 5A fuses for the hard disk drives (PRI) are for the +5V and +12V supply.
- The 2A fuses for SYNCF (TBS3-0) and SYNCG (TBS3-1) are for the -48V supply to the TBS3 circuit packs.
- The labels SPR, SPRF, and SPRG denote spare fuses that are not connected to any circuit pack.

Figure 8. Redundant Controller Power Module Fuses (FBF, FBG, FBH, and FBI)

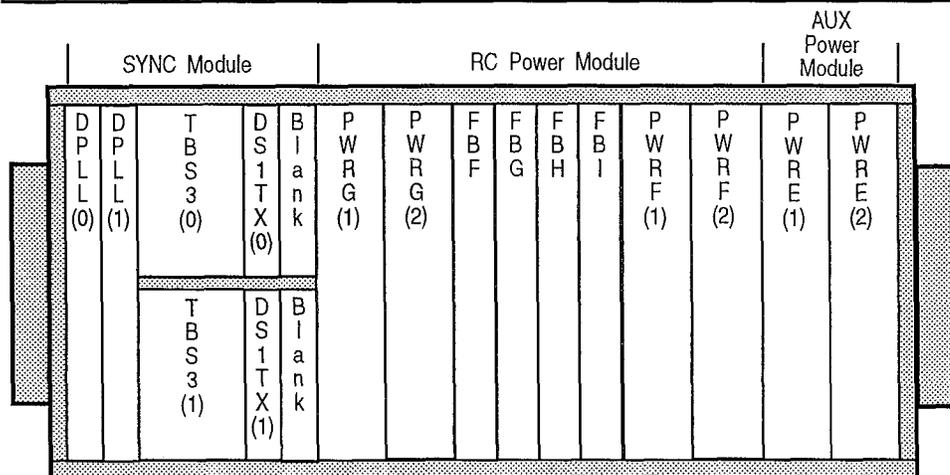
Equipment Module Diagrams

Switch Power Module



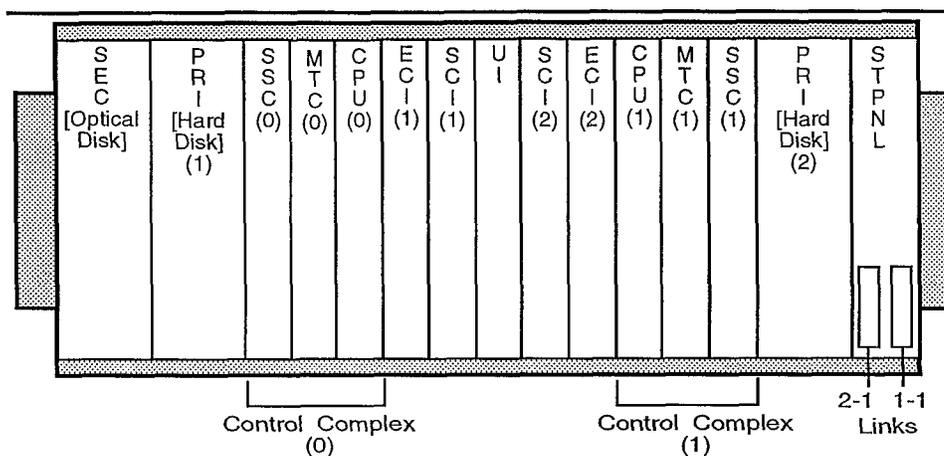
Note: Number in parentheses is circuit pack position in module

Auxiliary and Redundant Controller Power and Synchronizer Modules



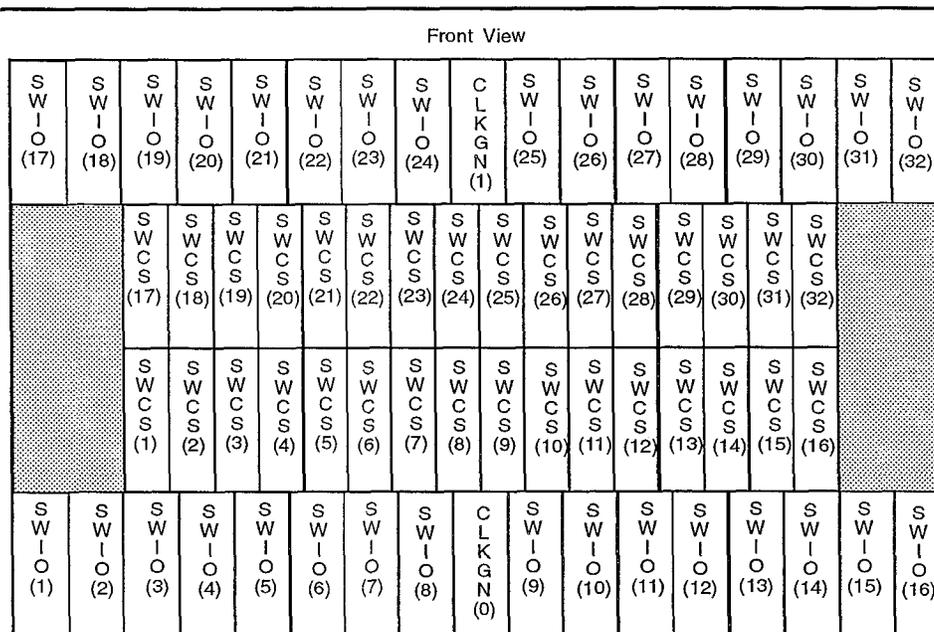
Note: Number in parentheses is circuit pack position in module.

Redundant Controller Module



Note: Number in parentheses is circuit pack position in module.

Switch Module



Note: Number in parentheses is circuit pack position in module.

DS1 Interface/Interface-Protection Module

SWIF (5)	DS1IF (5A)	DS1IF (5B)	DS1RY (3)	DS1IF / DS1IP (6/P) (A)	DS1IF / DS1IP (6/P) (B)	SWIF (6/P)	UC	CLKDR (2)	SWIF (7/6)	DS1IF (7/6) (A)	DS1IF (7/6) (B)	DS1RY (4)	DS1IF (8/7) (A)	DS1IF (8/7) (B)	SWIF (8/7)	PWRE (2)
SWIF (1)	DS1IF (1A)	DS1IF (1B)	DS1RY (1)	DS1IF (2A)	DS1IF (2B)	SWIF (2)	BXA	CLKDR (1)	SWIF (3)	DS1IF (3A)	DS1IF (3B)	DS1RY (2)	DS1IF (4A)	DS1IF (4B)	SWIF (4)	PWRE (1)

Note: Number in parentheses is circuit pack position in module. For entries with slashes (/), the entry before the slash corresponds to the DS1 Interface Module and the entry after the slash corresponds to the DS1 Interface-Protection Module.

For provisioned DS1 Interface and DS1 Interface-Protection Modules, see minimum equipage tables on next page. For unprovisioned DS1 Interface Modules within a DS1 interface protection group associated with a provisioned DS1 Interface-Protection Module, all DS1IF circuit pack slots must be equipped with either BX A or DS1IF circuit packs and all SWIF circuit packs slots must be equipped with either BX A or SWIF circuit packs if the DS1 Interface Module has been cabled (that is, an DS1 Interface Module that is not cabled can be left empty). If the DS1 Interface-Protection Module within an DS1 interface protection group is unprovisioned, no circuit packs are required in any of the interface modules associated with the DS1 Interface-Protection Module. However, interface or BX A circuit packs are recommended to keep out dust and other foreign matter.

Table 4. DS1 Interface-Protection Module Minimum Equipage

Functional Name	Circuit Pack Code	Minimum Quantity
UC2	AKM59B	1
CLKDR1	AKM56	2
DS1RY1	AKM48	4
DS1IP1	AKM47	2
DS1IF1	AKM46	2
SWIF1/SWIF2	AKM49/AKM50	2
BXA1	AKM64	19
SWIO1	AWR6	2
PWRE3	556C	2

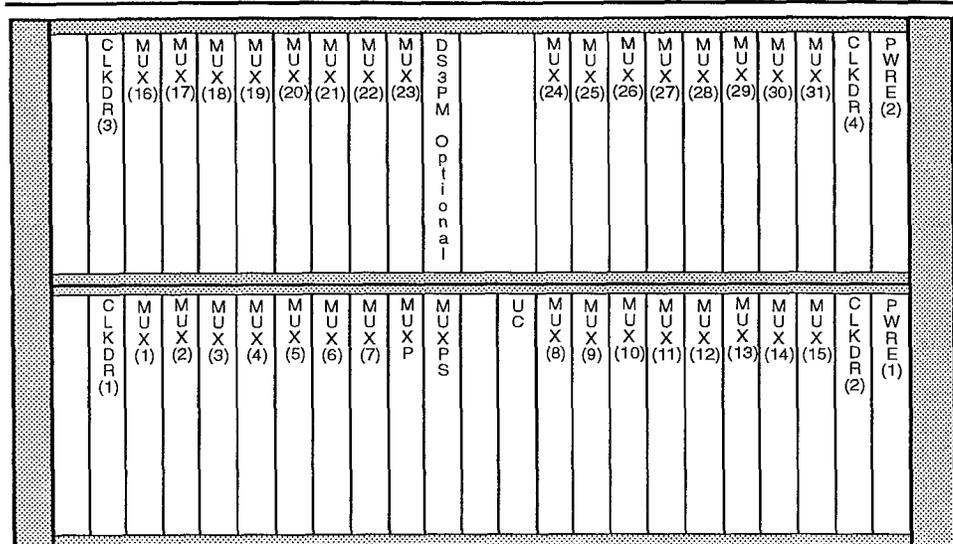
Note: PMGR circuit packs (AKM66), when used, replace SWIF circuit packs associated with interface groups (not the protection group). Refer to Table 15 for maximum allowable PMGR circuit packs. BXA circuit packs must be inserted into unused interface group circuit pack (DS1IF and SWIF) slots and the slot between CLKDR-1 and SWIF-2 only, and must not be inserted in any other circuit pack slot (for example, DS1RY slots must never contain BXA circuit packs).

Table 5. DS1 Interface Module Minimum Equipage

Functional Name	Circuit Pack Code	Minimum Quantity
UC2	AKM59B	1
CLKDR1	AKM56	2
DS1RY1	AKM48	4
DS1IF1	AKM46	2
SWIF1/SWIF2	AKM49/AKM50	1
BXA1	AKM64	22
SWIO1	AWR6	2
PWRE3	556C	2

Note: PMGR circuit packs (AKM66), when used, replace SWIF circuit packs. Refer to Table 15 for maximum allowable PMGR circuit packs. BXA circuit packs must be inserted into unused interface group circuit pack (DS1IF and SWIF) slots and the slot between CLKDR-1 and SWIF-2 only, and must not be inserted in any other circuit pack slot (for example, DS1RY slots must never contain BXA circuit packs).

DS3 Interface-32 Module



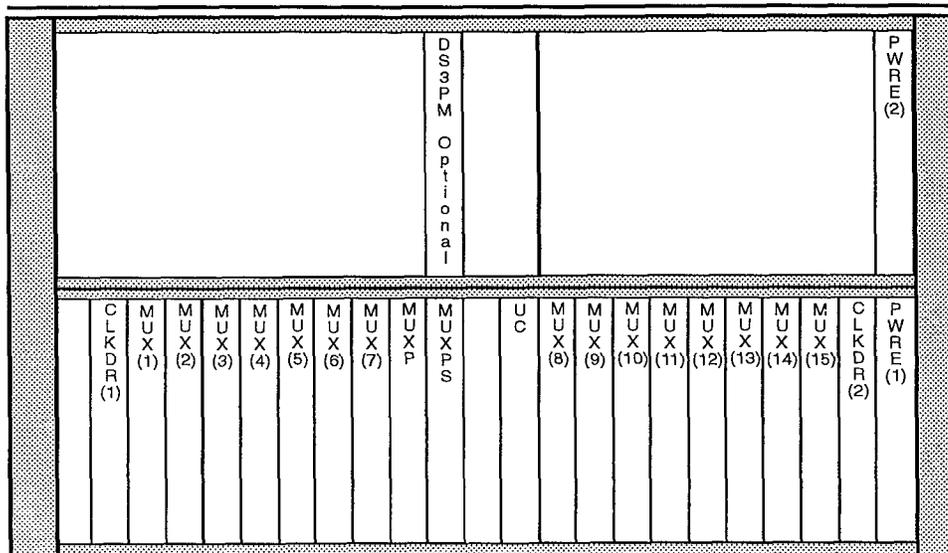
Note: Number in parentheses is circuit pack position in module

Table 6. DS3 Interface-32 Module Minimum Equipage

Functional Name	Circuit Pack Code	Minimum Quantity
UC2	AKM59B	1
CLKDR1	AKM56	4
MUXPS1	AKM53	1
MUXP1/MUXP2	AKM55/AKM70	1
MUX1/MUX2	AKM52/AKM68	1
BXA1	AKM64	31
SWIO1	AWR6	4
PWRE3	556C	2

Note: PMGR circuit packs (AKM66), when used, replace MUX1/MUX2 circuit packs. Refer to Table 15 for maximum allowable PMGR circuit packs. BX A circuit packs must be inserted into unused MUX or DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BX A circuit packs). An optional DS3PM circuit pack (AKM62) can be used in any DS3 Interface-32 Module. Interface modules ordered without the DS3PM circuit pack come with a BX A circuit pack in the DS3PM slot.

DS3 Interface-16 Module



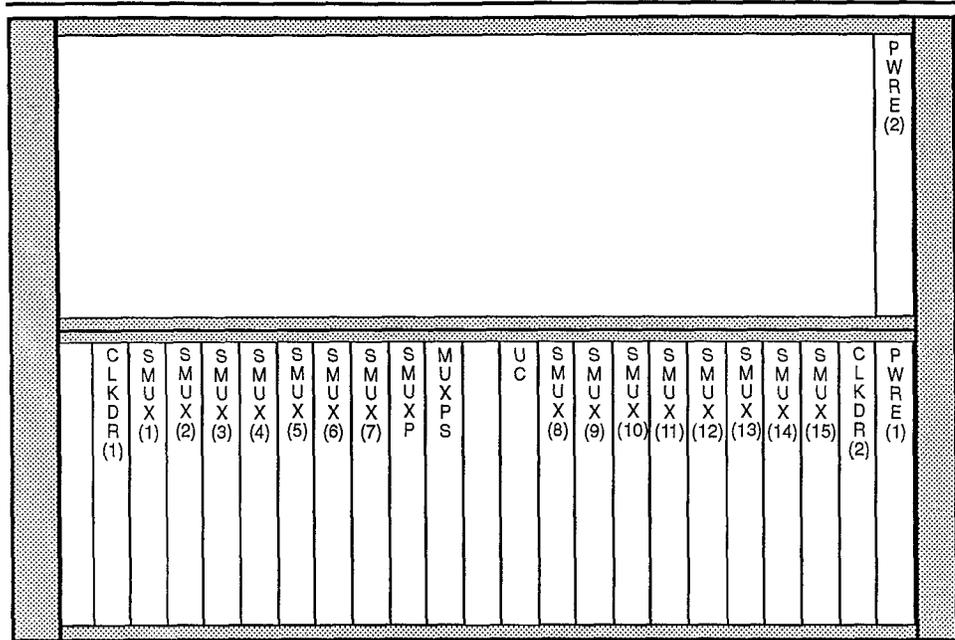
Note: Number in parentheses is circuit pack position in module.

Table 7. DS3 Interface-16 Module Minimum Equipage

Functional Name	Circuit Pack Code	Minimum Quantity
UC2	AKM59B	1
CLKDR1	AKM56	2
MUXPS1	AKM53	1
MUXP1/MUXP2	AKM55/AKM70	1
MUX1/MUX2	AKM52/AKM68	1
BXA1	AKM64	15
SWIO1	AWR6	2
PWRE3	556C	2

Note: PMGR circuit packs (AKM66), when used, replace MUX1/MUX2 circuit packs. Refer to Table 15 for maximum allowable PMGR circuit packs. BXA circuit packs must be inserted into unused MUX or DS3PM circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs). An optional DS3PM circuit pack (AKM62) can be used in any DS3 Interface-16 Module. Interface modules ordered without the DS3PM circuit pack come with a BXA circuit pack in the DS3PM slot.

STS1 Interface-16 Module



Note: Number in parentheses is circuit pack position in module.

Table 8. STS1 Interface-16 Module Minimum Equipage

Functional Name	Circuit Pack Code	Minimum Quantity
UC2	AKM59B	1
CLKDR1	AKM56	2
MUXPS1	AKM53	1
SMUXP1	AKM85	1
SMUX1	AKM84	1
BXA1	AKM64	14
SWIO1	AWR6	2
PWRE3	556C	2

Note: BXA circuit packs must be inserted into unused SMUX circuit pack slots only, and must not be inserted in any other circuit pack slot (for example, MUXPS slots must never contain BXA circuit packs).

Circuit Pack Cross-Reference

Module	Circuit Pack	Code	System Address	
RC Module	CPU2	AWP6	CPU-{0,1}	
	ECI3	AWP8	ECI-{1,2}	
	MTC3	AWR10	MTC-{0,1}	
	PRI5	ERB5	PRI-{1,2}	
	SCI3	AWR2C	SCI-{1,2}	
	SEC5	ERB6	SEC	
	SSC5	AWP14	SSC-{0,1}	
	STPNL	ED-9C046	STPNL	
	UI2	AWR12	UI	
SYNC Module	DPLL1/DPLL2	AWP9/AWP15	DPLL-{0,1}	
	DS1TX1/DS1TX2	AWS5/AWS9	TX-{0,1}	
	TBS31/TBS32	AWS3AWS8	TB-{0,1}	
RC Power Module	PWRF	427AA	PWRF-{1,2}	
	PWRG	428AA	PWRG-{1,2}	
	FBF	ED-9C051	—	
	FBG	ED-9C052	—	
	FBH	ED-9C053,G2	—	
FBI	ED-9C055	—		
	SW Module	SWIO1	AWR6	SWIO-{1-32}
		SWCS1	AWS1B	SWCS-{1-32}
		CLKGN2	AWR7	CLKGN-{0,1}
SW Power Module	PWRA1/PWRA2	552A/566A	PWRA-{1-4}	
	FBA	ED-2C962-30,G1	—	
	FBB	ED-2C960-30,G1	—	
	FBC	ED-2C963-30,G1	—	
	FBD	ED-2C961-30,G1	—	
AUX Power Module	PWRE3	556C	PWRE2-SW-{1,2}	
DS1 Interface Modules	CLKDR1	AKM56	CLKDR-{1-32}-{1-4}	
	DS1IF1	AKM46/AKM46B	DS1IF-{1-32}-{1A-8B}	
	DS1IP1	AKM47	DS1IP-{1-32}-{PA,PB}	
	DS1RY1	AKM48	DS1RY-{1-32}-{1-4}	
	PMGR1	AKM66	SWIF-{1-32}-{1-8}	
	SWIF1/SWIF2	AKM49/AKM50	SWIF-{1-32}-{1-8,P}	
	UC1/UC2	AKM59/AKM59B	UC-{1-32}	
	PWRE3	556C	PWRE-{1-32}-{1,2}	
	BXA1	AKM64	—	

Table continued on next page.

Module	Circuit Pack	Code	System Address
DS3 Interface Modules	CLKDR1	AKM56	CLKDR-{1-32}-{1-4}
	DS3PM1	AKM62	DS3PM-{1-32}
	MUX1/MUX2	AKM52/AKM68B	MUX-{1-32}-{1-31}
	MUXP1/MUXP2	AKM55/AKM70B	MUXP-{1-32}
	MUXPS1	AKM53	MUXPS-{1-32}
	PMGR1	AKM66	MUX-{1-32}-{1-31}
	UC1/UC2	AKM59/AKM59B	UC-{1-32}
	PWRE3	556C	PWRE-{1-32}-{1,2}
	BXA1	AKM64	—
STS1 Interface Modules	CLKDR1	AKM56	CLKDR-{1-32}-{1-4}
	SMUX1	AKM84	SMUX-{1-32}-{1-15}
	SMUXP1	AKM85	SMUXP-{1-32}
	MUXPS1	AKM53	MUXPS-{1-32}
	UC1/UC2	AKM59/AKM59B	UC-{1-32}
	PWRE3	556C	PWRE-{1-32}-{1,2}
	BXA1	AKM64	—

Expendable Equipment Cross-Reference

Equipment (Location)	Part Number	Expected Life
Optical Drive Lens Cleaning Kit	406942102	N/A
Optical Cartridge Emergency Eject Tool	406923292	N/A
Cleaning Kit Refill	406646851	N/A
Filter, Fan Assembly ED2C816-30,G1 (SW Bay)	405056078	3 -6 Months
Filter, Fan Assembly ED2C906-30 (SW Bay)	405470808	3-6 Months
Filter, Fan Assembly ED-9C130, G1/G2	WP-92310,L4A	3-6 Months
LEDs, Fan Assembly ED-9C130,G1/G2 (Order from McLean Engineering, Inc., Princeton-Junction, NJ)	N/A	N/A
Blank Optical Disk Cartridge	J98786SD-5,List 3	N/A
Fuse Extractor Tool	WP-90247,L201	N/A
Fuses:		
2 A Main Fuse (ED-9C114-30 Fuse Panel)	WP91768.L107	N/A
10 A Main Fuse (ED-9C114-30 Fuse Panel)	WP91768,L114	N/A
12 A Main Fuse (ED-9C114-30 Fuse Panel)	WP91768,L115	N/A
12 A Main Fuse (ED-2C940-30 Fuse Panel)	KS19780,L8	N/A
10 A Main Fuse (ED-2C940-30 Fuse Panel)	KS19780,L2	N/A
5 A 70D Indicator Fuse (ED-2C940-30 Fuse Panel)	100203355	N/A
2 A 70B Indicator Fuse (ED-2C940-30 Fuse Panel)	100203330	N/A
0.5 A 70G Indicator Fuse (ED-2C940-30 Fuse Panel)	100203389	N/A
10 A SW PWR MOD 77D Fuse (FBA and FBB)	KS-23543L77D	N/A
7.5 A SW PWR MOD 78J Fuse (FBC and FBD)	KS-23543L78J	N/A
7.5 A RC PWR MOD Fuse (FBI)	WP-90247L314	N/A
5 A RC PWR MOD Fuse (FBF, FBG, and FBH)	WP-90247L313	N/A
2 A RC PWR MOD Fuse (FBH and FBI)	WP-90247L309	N/A
1 A RC PWR MOD Fuse (FBF and FBG)	WP-90247L306	N/A
0.5 A RC PWR MOD Fuse (FBI)	WP-90247L303	N/A

Provisioning Sequence

Entity	Number of Circuit Packs Required	Supporting Entity
CC (1)	8	none
PRI (2)	1	none
SEC	2	none
SYNC (3)	6	none
CLKGN	2	none or SYNC (4)
ECI (2)	2	CC
SWCS	32	CLKGN
SWIO (5)	2	CLKGN
UNIT (7)	1	none
DS3PM	1	UNIT
CLKDR (5)	2 or 4 (6)	UNIT, SWIO
PMGR	1	CLKDR
MUXP	1	CLKDR
MUX	1	MUXP
SMUXP	1	CLKDR
SMUX	1	SMUXP
DS1RY	1	UNIT
SWIF	1	CLKDR
DS1IP	1	SWIF-P, DS1RY
DS1IF	2	SWIF, DS1IP (8)

Notes:

- 1 Must be provisioned as a group (CPU, MTC, SSC, UI, SCI). If both controller sides are not provisioned, an alarm is raised.
- 2 If both ECIs or PRIs are not provisioned, an alarm is raised
3. SYNC is provisioned as a group (DPLL, DS1TX [TX], and TBS3 [TB]). If all circuit packs on both SYNC sides are not present, alarms are raised
- 4 SYNC is required if CLKGN3 circuit packs are present (to support SONET).
5. Must be provisioned in pairs.
6. Depending on the type of interface module.
7. DS1 Interface Module requires supporting DS1 Interface-Protection Module.
- 8 The supporting DS1IP circuit pack can be in another DS1 Interface Module.

Loopbacks

The DACS IV-2000 provides DS1 signal loopback, DS3 line loopback, STS-1 signal loopback, and VT1.5 wideband (terminal) loopback features that can be used to facilitate testing and trouble isolation. DS1 facilities and DS1 tributaries on DS3 facilities and EC-1 facilities can be looped back. STS-1 and VT1.5 loopbacks are performed through EC-1 facilities only. Figure 9 shows examples of the possible loopback features available in the DACS IV-2000. The following is a list of the different loopback types available:

- DS1 Loopbacks — can be operated on a specified DS1 port or range of DS1 ports, towards the facility, towards the switch, or through the switch fabric of a DS1 Interface, a DS3 Interface (tributary of a DS3), or an STS1 Interface (as a VT1.5 tributary) Module within the system. DS1 loopbacks can be one of the following four types:
 - LPBKL (Line Loopback) — loops the signal from the input port to the output port (towards the facility) at the DS1 Interface Module.
 - LPBKT (Terminal Loopback) — loops the signal from the input port to the output port (through the switch fabric) in the switch module DS1 terminal loopbacks are valid for near-end on DS1 interface (DS1IF), DS3 interface (MUX or MUX2), or SONET interface (SMUX) circuit packs.
 - LPBKI (Internal Loopback) — loops the signal from the output port to the input port (towards the switch) at the DS1 Interface Module
 - LPBKM (DS1 Tributary Loopback) — loops a DS1 tributary signal within a DS3 interface circuit pack from the input port to the output port (towards the facility) at the DS3 Interface Module DS1 tributary loopbacks are valid for either near-end or far-end on MUX2 circuit packs only.
- DS3 Line Loopbacks — connect (or loopback) incoming DS3 signals directly to the outgoing direction of the same port. This loopback happens directly in the MUX2 circuit pack. This keeps the signal from entering the switch matrix and thus keeps the amount of hardware encountered to a minimum. Because the signal is not demultiplexed, it retains all its control bits, overhead bits, and bipolar violations, and preserves the timing of the looped back signal. The only modification of the DS3 signal occurs when the system regenerates the signal to meet the specifications for an outgoing DS3 signal.
- STS-1 Loopbacks — can be operated on a specified STS-1 port or range of STS-1 ports, either towards the facility or through the switch fabric of an STS1 Interface Module. STS-1 loopbacks can be one of the following two types:
 - LPBKL (Line Loopback) — loops the signal from the input port to the output port (towards the facility) at the STS1 Interface Module.

- LPBKT (Terminal Loopback) — loops the signal from the input port to the output port through the switch fabric in the switch module.
 STS-1 terminal loopbacks are valid for near-end on SMUX circuit packs.
- VT1.5 Wideband (Terminal) Loopbacks — can be operated on a specified VT tributary of an STS-1 signal as a terminal loopback (LPBKT), which loops the VT1.5 signal from the input port to the output port through the switch fabric in the switch module.

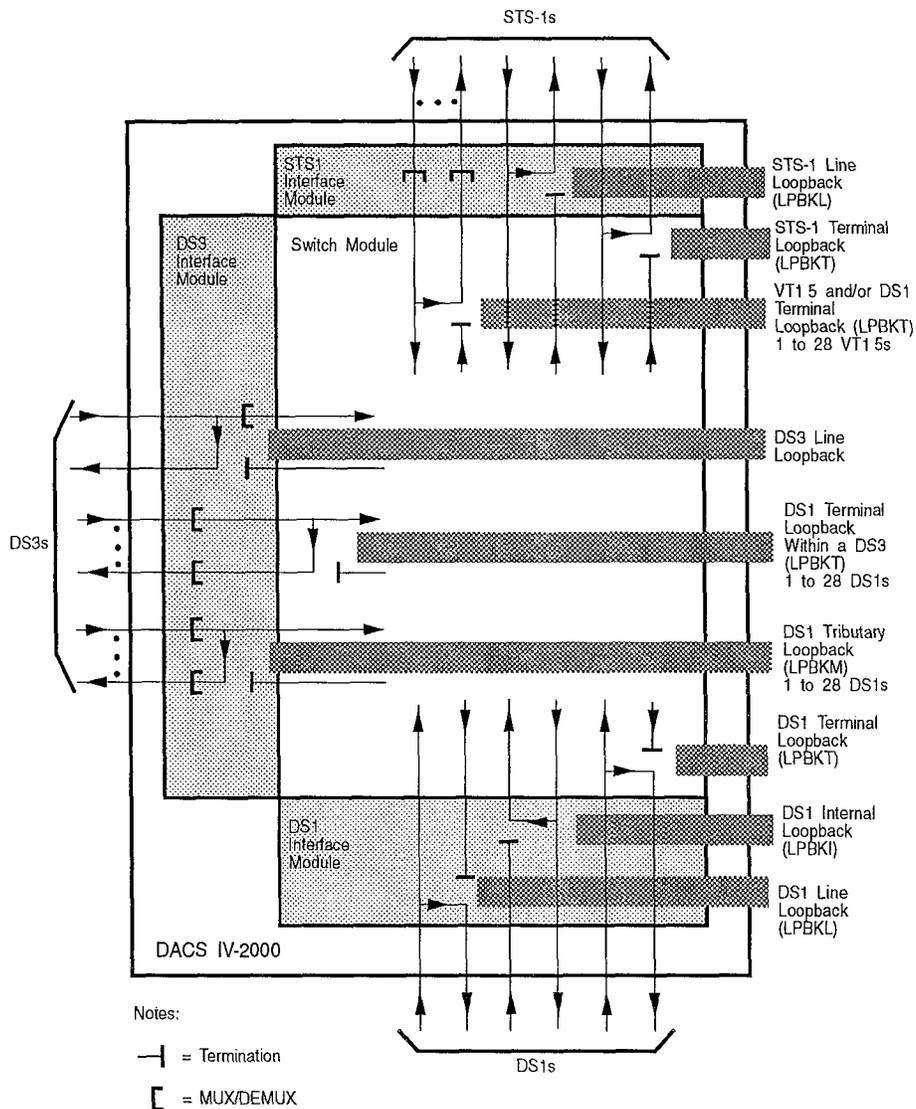


Figure 9. DS1, DS3, STS-1, and VT1.5 Loopbacks

Test Access

When working with test access connections, you need to be familiar with terms such as E-End, F-End, and A and B direction (see Figure 10). The E-End and F-End are arbitrarily designated for a one-way or a two-way cross-connection. For example, the E-End can be designated to correspond to a *short haul* transmission path to a piece of equipment (for example, a DACS III-2000) within the same Central Office and the F-End can be designated to correspond to a *long haul* transmission path to another Central Office¹. The E-End and F-End signals are terminated at DS1 or DS3 Interface Modules. Test access can be established at either the E-End or the F-End through a test access port (TAP), which is also referred to as a facility access digroup (FAD). As signals travel through the frame, the path through the frame from the E-End to the F-End is referred to as the A direction and the path from the F-End to the E-End is the B direction. In a one-way cross-connection, the signal travels in the A direction. The In and Out designations indicate the direction to/from the E-End and F-End. After selecting designations of E-End and F-End, these designations must not change during the test access session.

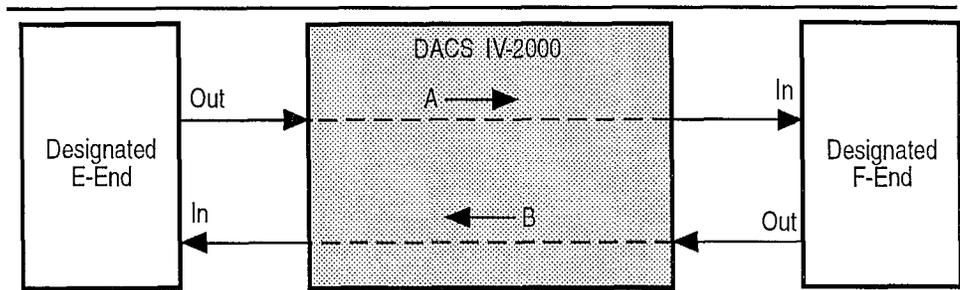


Figure 10. Test Access Conventions

There are ten modes of test access in the DACS IV-2000. These modes are:

MONE	SPLTE
MONF	SPLTF
MONEF	SPLTEF
SPLTA	LOOPE
SPLTB	LOOPF

Each mode is described in the following sections.

1. Traditionally E-End and F-End mean equipment and facility end, respectively. However, you can designate any port as E-End or F-End.

Monitor Test Access Connections

MONE Mode

The MONE mode (Figure 11) of test access monitors the E-End of an idle port, a one-way cross-connection, or a two-way cross-connection. It reads the incoming signal in direction A.

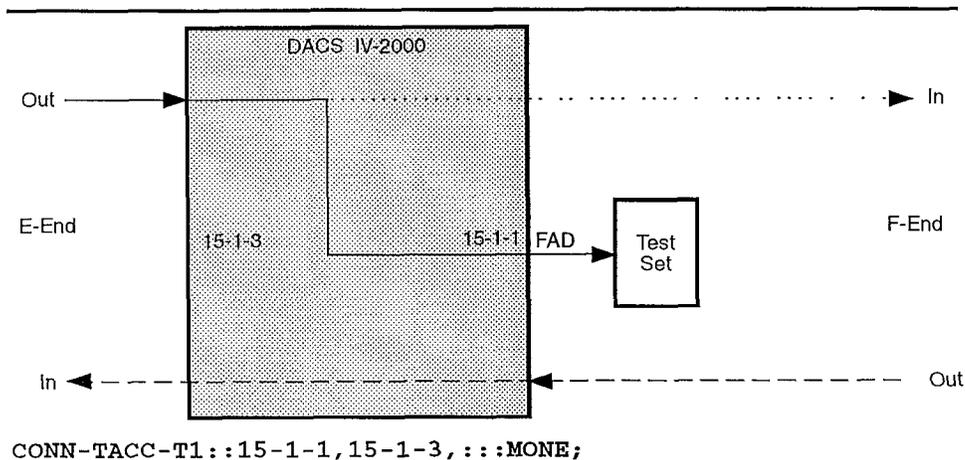


Figure 11. MONE Mode of Test Access

MONF Mode

The MONF mode (Figure 12) of test access monitors the F-End of a two-way cross-connection. It reads the incoming signal in direction B.

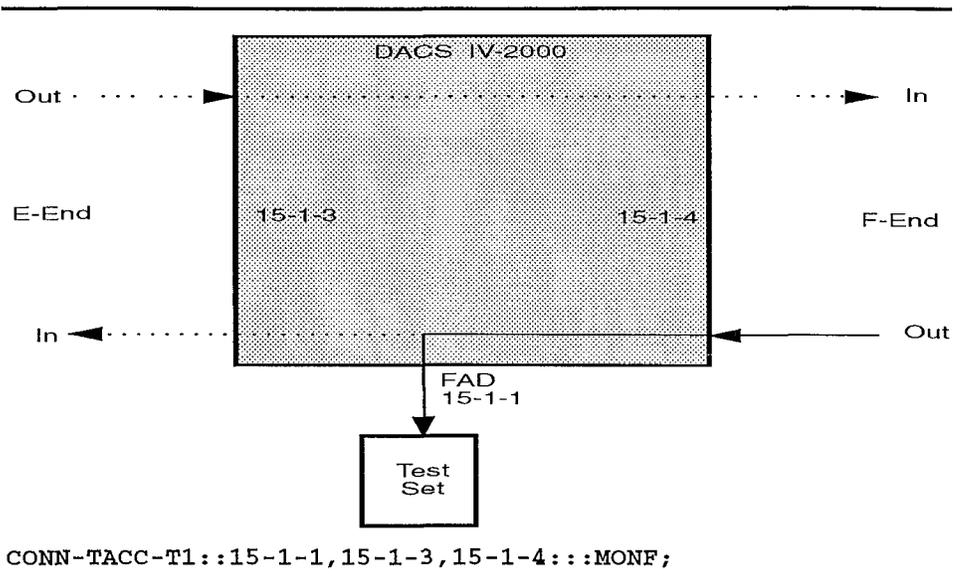


Figure 12 MONF Mode of Test Access

MONEF Mode

The MONEF mode (Figure 13) of test access monitors both directions of a two-way cross-connection. This mode of test access requires two FADs. It reads the incoming signals in directions A and B.

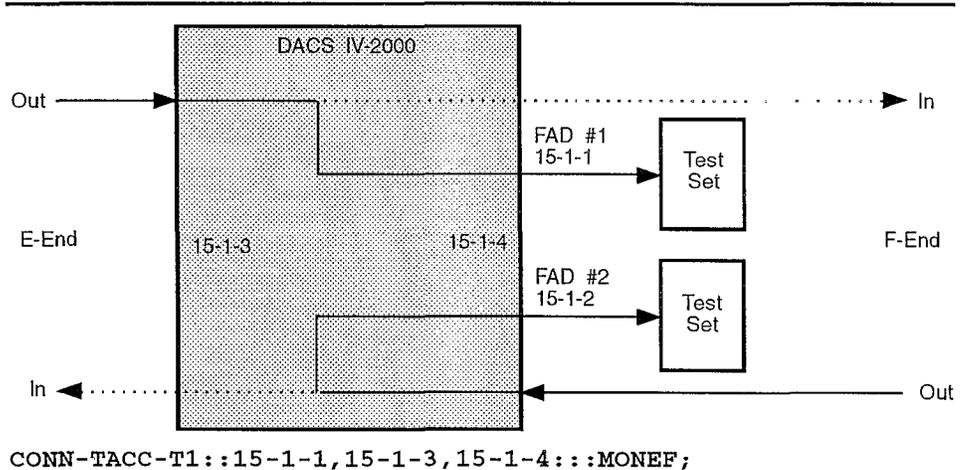


Figure 13. MONEF Mode of Test Access

Split Test Access Connections

SPLTA Mode

The SPLTA mode (Figure 14) of test access splits the E-End (to FAD) to F-End (from FAD) connection of a one-way or two-way cross-connection to allow testing in the A direction.

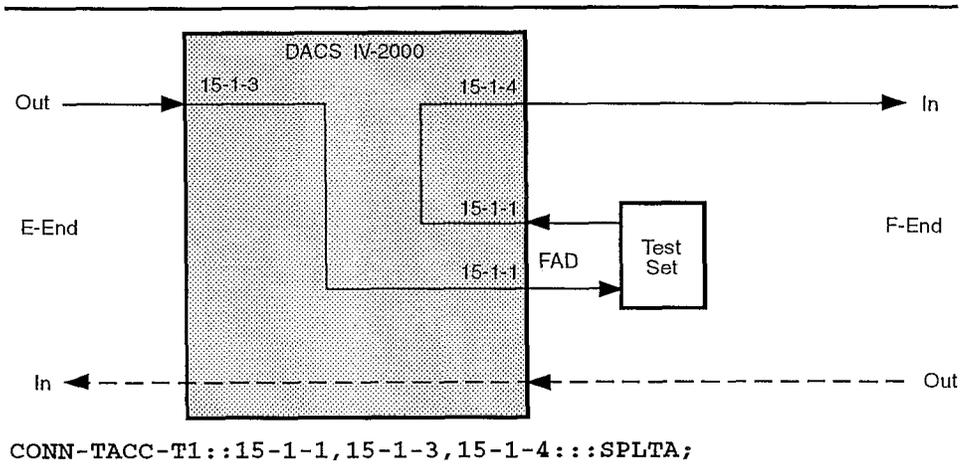


Figure 14. SPLTA Mode of Test Access

SPLTB Mode

The SPLTB mode (Figure 15) of test access splits the F-End (to FAD) to E-End (from FAD) connection of a two-way cross-connection to allow testing in the B direction.

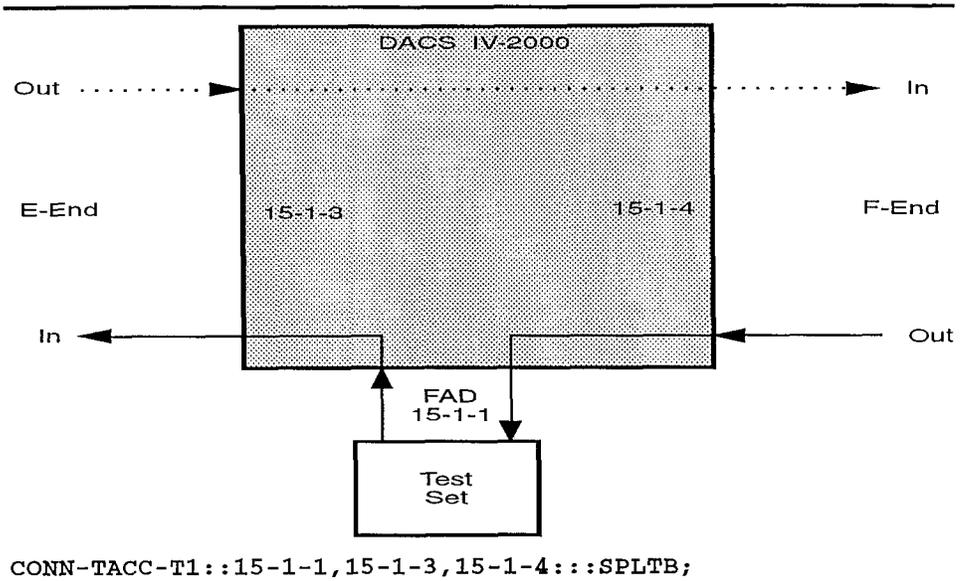


Figure 15. SPLTB Mode of Test Access

SPLTE Mode

The SPLTE mode (Figure 16) of test access splits the E-End to F-End of an idle port, a one-way cross-connection, or a two-way cross-connection to allow testing at the E-End. The incoming signal in the A direction goes to the input of the FAD and the output of the FAD is sent in the B direction.

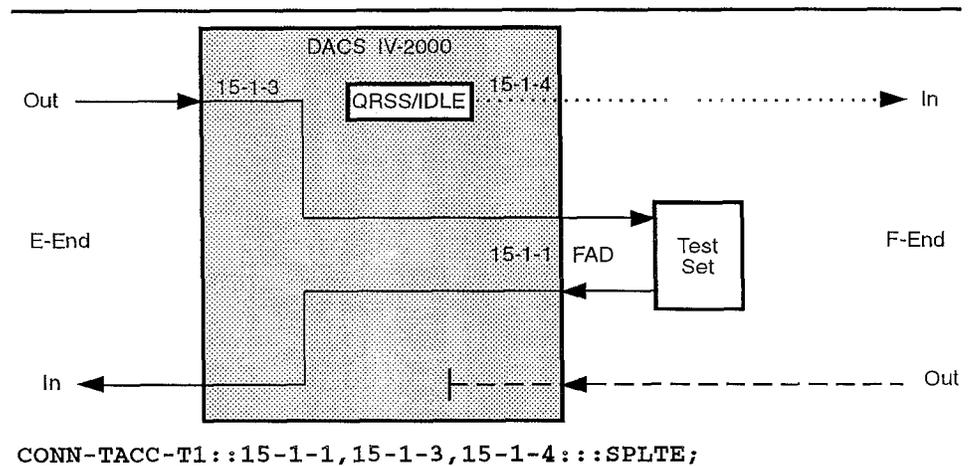


Figure 16. SPLTE Mode of Test Access

For DS1 SPLTE test access, the output mode of the F-End output port, along with any other output ports the E-End is transmitting to, is automatically set to the QRSS mode (if the ports are on DS1 and DS3 interface circuit packs and a QRSS source has been provisioned for the system) or to the IDLE mode. For VT1.5 and STS-1 SPLTE test access, the output mode of the F-End output port, along with any other output ports the E-End is transmitting to, is automatically set to the IDLE mode (path AIS).

SPLTF Mode

The SPLTF mode (Figure 17) of test access splits the F-End to E-End of a two-way cross-connection to allow testing at the F-End. The incoming signal in the B direction goes to the input of the FAD and the output of the FAD is sent in the A direction.

For DS1 SPLTF test access, the output mode of the E-End output port, along with any other output ports the F-End is transmitting to, is automatically set to the QRSS mode (if the ports are on DS1 and DS3 interface circuit packs and a QRSS source has been provisioned for the system) or to the IDLE mode. For VT1.5 and STS-1 SPLTF test access, the output mode of the E-End output port, along with any other output ports the F-End is transmitting to, is automatically set to the IDLE mode (path AIS).

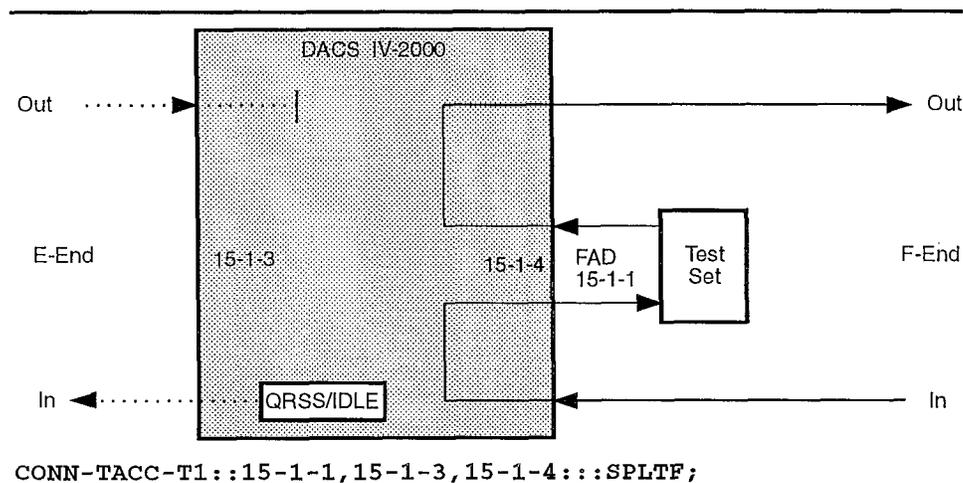
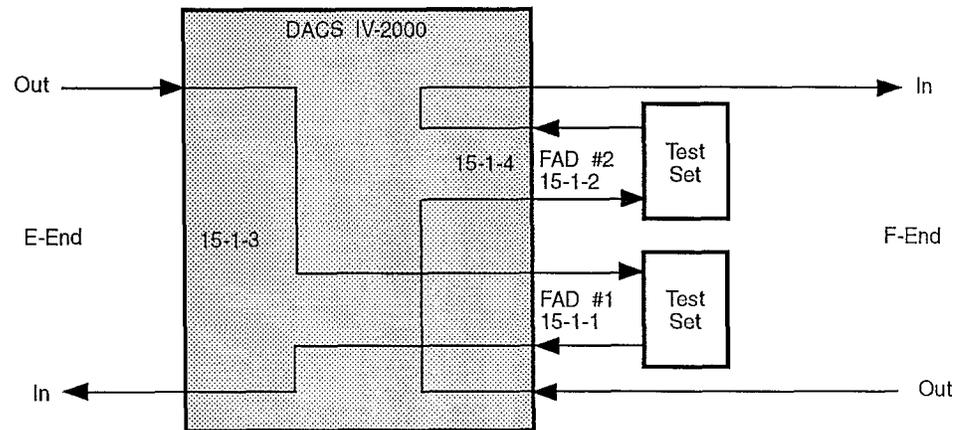


Figure 17. SPLTF Mode of Test Access

SPLTEF Mode

The SPLTEF mode (Figure 18) of test access splits both directions of a two-way cross-connection to allow testing at both the E-End and the F-End. This mode of test access requires two FADs. The incoming signal in the A direction goes to the input of FAD-1 and the output of FAD-1 is sent in the B direction. The incoming signal in the B direction goes to the input of FAD-2 and the output of FAD-2 is sent in the A direction.



CONN-TACC-T1:::15-1-1,15-1-3,15-1-4:::SPLTEF;

Figure 18. SPLTEF Mode of Test Access

Loopback Test Access Connections

LOOPE Mode

The LOOPE mode (Figure 19) of test access establishes a terminal loopback on the E-End port and monitors the loopback signal. It reads the incoming signal in the A direction.

For DS1 LOOPE test access, the output mode of the F-End output port, along with any other output ports the E-End is transmitting to, is automatically set to the QRSS mode (if the ports are on DS1 and DS3 interface circuit packs and a QRSS source has been provisioned for the system) or to the IDLE mode. For VT1.5 and STS-1 LOOPE test access, the output mode of the F-End output port, along with any other output ports the E-End is transmitting to, is automatically set to the IDLE mode (path AIS).

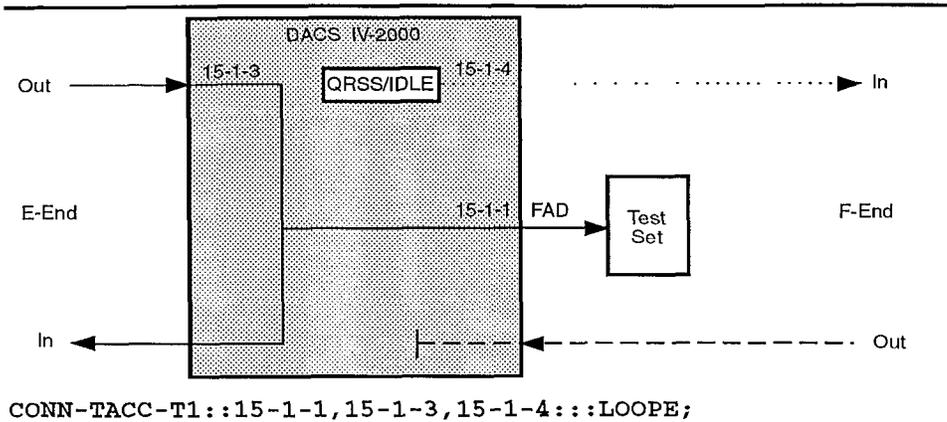


Figure 19. LOOPE Mode of Test Access

LOOPF Mode

The LOOPF mode (Figure 20) of test access establishes a terminal loopback on the F-End port and monitors the loopback signal. It reads the incoming signal in the B direction.

For DS1 LOOPF test access, the output mode of the E-End output port, along with any other output ports the F-End is transmitting to, is automatically set to the QRSS mode (if the ports are on DS1 and DS3 interface circuit packs and a QRSS source has been provisioned for the system) or to the IDLE mode. For VT1.5 and STS-1 LOOPF test access, the output mode of the E-End output port, along with any other output ports the F-End is transmitting to, is automatically set to the IDLE mode (path AIS).

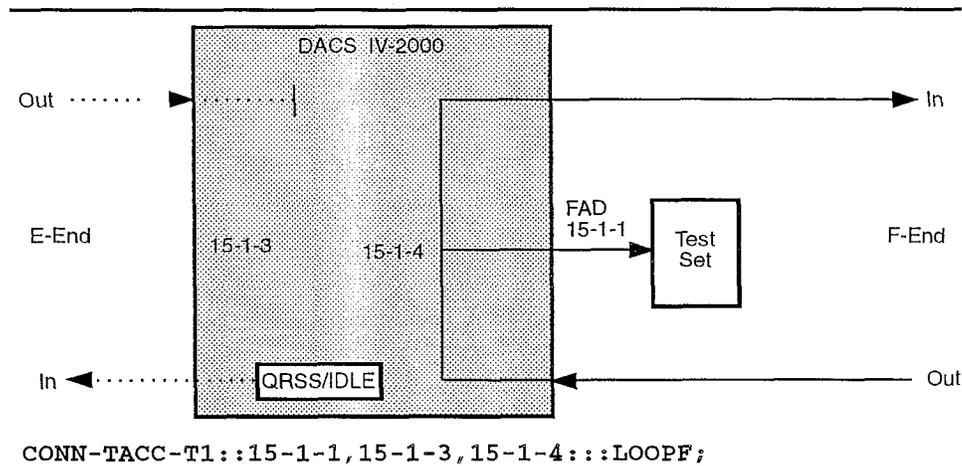


Figure 20. LOOPF Mode of Test Access

Performance Monitoring

DS1 Performance Monitoring Parameters

Table 9. DS1 Performance Parameters

Parameter	Definition	Parameter	Definition
CVP	Path Code Violation	DM	Degraded Minute
OOFS	Out-of-Frame Second	CVL	Line Code Violations
ESP	Path Errored Seconds	ESL	Line Errored Seconds
BESP	Path Bursty Errored Seconds	SESL	Line Severely Errored Seconds
SESP	Path Severely Errored Seconds	SEFS	Severely Errored Frame Seconds
UAS	Unavailable Seconds	CSS	Controlled Slipped Seconds

Table 10. DS1 Performance Monitored Parameters

Location	Monitored Parameter	Full-Time			Camp-On			Scan		
		ESF	SF	UNF	ESF	SF	UNF	ESF	SF	UNF
Near- End	CVL	✓	✓	✓	✓	✓	✓	✓	✓	-
	ESL	✓	✓	✓	✓	✓	✓	✓	✓	-
	SESL	✓	✓	✓	✓	✓	✓	✓	✓	-
	CVP	✓	✓	-	✓	✓	-	✓	✓	-
	ESP	✓	✓	-	✓	✓	-	✓	✓	-
	BESP	✓	✓	-	✓	✓	-	-	-	-
	SESP	✓	✓	-	✓	✓	-	✓	✓	-
	OOFS	✓	✓	-	✓	✓	-	✓	✓	-
	DM	✓	-	-	✓	-	-	-	-	-
	UAS	✓	✓	-	-	✓	-	-	-	-
Far- End	SEFS	✓	-	-	✓	-	-	✓	-	-
	CSS	✓	-	-	✓	-	-	-	-	-
	ESP	✓	-	-	✓	-	-	✓	-	-
	SESP	✓	-	-	✓	-	-	✓	-	-
	CVP	✓	-	-	✓	-	-	-	-	-
	BESP	✓	-	-	✓	-	-	-	-	-
	DM	✓	-	-	✓	-	-	-	-	-
	UAS	✓	-	-	✓	-	-	-	-	-

Note: ✓ denotes parameter being monitored for the given performance monitoring option and line format.

Table 11. Default Thresholds for Full-Time, Camp-On, and Line DS1 Performance Monitoring

Monitored Parameter	DS1 Framing Format							
	Extended Super Frame				Super Frame		Unframed	
	Far-End*		Near-End					
	15 Min and Hourly	Daily	15 Min and Hourly	Daily	15 Min and Hourly	Daily	15 Min and Hourly	Daily
Full Time (SWIF2 Based) and Camp-on (PMGR Based)								
CVP	53184	132960	53184	132960	6615	16540	-	-
ESP	259	648	259	648	38	95	-	-
BESP	100	600	100	600	19	90	-	-
SESP	40	100	40	100	11	27	-	-
OOFs	-	-	7	17	7	17	-	-
DM	15	360	15	360	-	-	-	-
UAS	10	10	10	10	10	10	-	-
SEFS	7	17	-	-	-	-	-	-
CSS	7	17	-	-	-	-	-	-
Line (DS1IF Based)								
CVL†	-	-	53360	133400	53360	133400	53360	133400
ESL†	-	-	259	648	259	648	259	648
SESL†	-	-	40	100	40	100	40	100

* Far-end parameters are only applicable to Extended Super Frame (ESF) DS1 signals with ports provisioned for FENDNTE = ANSI.

† Only applicable for DS1 signals terminating on DS1Interface Modules.

Table 12. Default Thresholds for Scan (PMGR Based) DS1 Performance Monitoring

Monitored Parameter	DS1 Framing Format					
	Extended Super Frame				Super Frame	
	Far-End*		Near-End			
	15 Min and Hourly	Daily	15 Min and Hourly	Daily	15 Min and Hourly	Daily
CVP	-	-	1772	4432	177	443
ESP	8	21	8	21	1	3
SESP	1	3	1	3	1	3
OOFs	-	-	1	2	1	2
SEFS	1	2	-	-	-	-

* Far-end parameters are only applicable to Extended Super Frame (ESF) DS1 signals with ports provisioned for FENDNTE = ANSI.

Table 13. Threshold Value Ranges for Full-Time, Camp-On, and Line DS1 Performance Monitoring

Monitored Parameter	Far-End*			Near-End		
	15 Min	Hourly	Daily	15 Min	Hourly	Daily
Full Time (SWIF2 Based) and Camp-on (PMGR Based)						
CVP	0-2097152	0-8388608	0-134217728	0-2097152	0-8388608	0-134217728
ESP	0-900	0-3600	0-65535	0-900	0-3600	0-65535
BESP	0-900	0-3600	0-65535	0-900	0-3600	0-65535
SESP	0-900	0-3600	0-65535	0-900	0-3600	0-65535
OOFs	-	-	-	0-900	0-3600	0-65535
DM	0-15	0-60	0-1440	0-15	0-60	0-1440
UAS	0-900	0-3600	0-65535	0-900	0-3600	0-65535
SEFS	0-900	0-3600	0-65535	-	-	-
CSS	0-900	0-3600	0-65535	-	-	-
Line (DS1IF Based)						
CVL†	-	-	-	0-2097152	0-8388608	0-134217728
ESL†	-	-	-	0-900	0-3600	0-65535
SESL†	-	-	-	0-900	0-3600	0-65535

* Far-end parameters are only applicable to Extended Super Frame (ESF) DS1 signals with ports provisioned for FENDNTE = ANSI.

† Only applicable for DS1 signals terminating on DS1 Interface Modules

Table 14. Threshold Value Ranges for Scan (PMGR Based) DS1 Performance Monitoring

Monitored Parameter	Far-End*			Near-End		
	15 Min	Hourly	Daily	15 Min	Hourly	Daily
CVP	-	-	-	0-65535	0-65535	0-65535
ESP	0-900	0-3600	0-65535	0-900	0-3600	0-65535
SESP	0-900	0-3600	0-65535	0-900	0-3600	0-65535
OOFs	-	-	-	0-900	0-3600	0-65535
SEFS	0-900	0-3600	0-65535	-	-	-

* Far-end parameters are only applicable to Extended Super Frame (ESF) DS1 signals with ports provisioned for FENDNTE = ANSI.

Maximum Allowable PMGR Circuit Packs

Table 15. Maximum Allowable PMGR Circuit Packs per Interface Module

Interface Module Type	Performance Monitoring Mode	
	Full-Time/Camp-On	Scan
DS3 Interface-32	16	0
	8	1
	2	2
DS3 Interface-16	15	0
	8	1
DS1 Interface	8	0
	7	1/0*
DS1 Interface-Protection	7	0
	6	1/0†

* Zero if there is a SCAN performance monitoring PMGR circuit pack in the associated DS1 Interface-Protection Module.

† Zero if there is a SCAN performance monitoring PMGR circuit pack in the associated DS1 Interface Module.

DS3 Performance Monitoring Parameters

Table 16. Threshold Values for DS3 Performance Monitoring

Parameter	Interval					
	Current 15 Minutes		Current 1 Hour* and Last 24 1-Hour Intervals		Current Day* and Last 7 Days of Daily Totals	
	Default	Range	Default	Range	Default	Range
PSET#1 (CB149)						
Number of Block Errors (BEC)*	4000	0-8458200	-	-	386500	0-811987200
Errored Seconds A (TPA)	30	0-900	-	-	90	0-65535
Errored Seconds B (TPB)	30	0-900	-	-	90	0-65535
Errored Seconds C (TPC)	20	0-900	-	-	60	0-65535
Out-of-Frame Seconds (OOFs)	10	0-900	-	-	30	0-65535
Unavailable Seconds (UAS)	30	0-900	-	-	90	0-65535
PSET#2 (TR820)						
Coding Violations (CV)	4000	0-8458200	16100	0-33832800	386500	0-811987200
Errored Seconds (ES)	40	0-900	40	0-3600	90	0-65535
Severely Errored Seconds (SES)	20	0-900	20	0-3600	60	0-65535
Out-of-Frame Seconds (OOFs)	10	0-900	10	0-3600	30	0-65535
Unavailable Seconds (UAS)	30	0-900	30	0-3600	90	0-65535

* Current hour is the sum of 15-minute intervals beginning on the hour and current day is the sum of hourly intervals beginning at midnight.

SONET Performance Monitoring Parameters

Table 17. STS-1 and VT1.5 Performance Monitored Parameters

Monitored Parameter		STS-1			VT1.5
		Section	Line	Path	Path
Near-End	Severely Errored Frame Seconds (SEFS)	✓	-	-	-
	Loss-of-Signal Seconds (LOSS)	✓	-	-	-
	Coding Violations (CV)	-	✓	✓	✓
	Errored Seconds (ES)	-	✓	✓	✓
	Errored Seconds A (ESA)	-	✓	✓	✓
	Errored Seconds B (ESB)	-	✓	✓	✓
	Severely Errored Seconds (SES)	-	✓	✓	✓
	AIS Seconds (AISS)	-	✓	-	-
	AIS/Loss-of-Pointer Seconds (ALS)	-	-	✓	✓
	Unavailable Seconds (UAS)	-	✓	✓	✓
Far-End	Coding Violations (CV)	-	-	✓	-
	Errored Seconds (ES)	-	-	✓	-
	Errored Seconds A (ESA)	-	-	✓	-
	Errored Seconds B (ESB)	-	-	✓	-
	Severely Errored Seconds (SES)	-	-	✓	-
	Unavailable Seconds (UAS)	-	-	✓	-

Note: ✓ means monitoring is available for the parameter specified.

Table 18. Threshold Values for STS-1 and VT1.5 Performance Monitoring

Parameter Name	Accumulation Interval			
	15 Min		Day	
	Default	Range	Default	Range
STS-1 Section Performance Monitoring Parameters (Near-End)				
SEFS	10	0-900	100	0-86400
LOSS	10	0-900	100	0-86400
STS-1 Path and Line Performance Monitoring Parameters (Near-End)				
CV	4666	0-46660	447900	0-447900
ES	65	0-900	648	0-86400
ESA	65	0-900	648	0-86400
ESB	65	0-900	648	0-86400
SES	10	0-900	100	0-86400
AISS (line only)	10	0-900	100	0-86400
ALS (path only)	10	0-900	100	0-86400
UAS	10	0-900	100	0-86400
STS-1 Path Performance Monitoring Parameters (Far-End)				
CV	4666	0-46660	447900	0-447900
ES	65	0-900	648	0-86400
ESA	65	0-900	648	0-86400
ESB	65	0-900	648	0-86400
SES	10	0-900	100	0-86400
UAS	10	0-900	100	0-86400
VT1.5 Path Performance Monitoring (Near-End)				
CV	156	0-16383	14930	0-1048575
ES	65	0-900	648	0-86400
ESA	65	0-900	648	0-86400
ESB	65	0-900	648	0-86400
SES	10	0-900	100	0-86400
ALS	10	0-900	100	0-86400
UAS	10	0-900	10	0-86400