

297-8001-547

DMS-100 Family

North American DMS-100

Card Replacement Procedures

Volume 1 of 7

LEC0015 and up Standard 14.02 May 2001

DMS-100 Family

North American DMS-100

Card Replacement Procedures

Volume 1 of 7

Publication number: 297-8001-547

Product release: LEC0015 and up

Document release: Standard 14.02

Date: May 2001

Copyright © 1996-2001 Nortel Networks,
All Rights Reserved

Printed in the United States of America

NORTEL NETWORKS CONFIDENTIAL: The information contained herein is the property of Nortel Networks and is strictly confidential. Except as expressly authorized in writing by Nortel Networks, the holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information, in whole or in part, from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information, but with no less than reasonable care. Except as expressly authorized in writing by Nortel Networks, the holder is granted no rights to use the information contained herein.

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant. Changes or modification to the DMS-100 without the express consent of Nortel Networks may void its warranty and void the user's authority to operate the equipment.

Nortel Networks, the Nortel Networks logo, the Globemark, How the World Shares Ideas, Unified Networks, DMS, DMS-100, Helmsman, MAP, Meridian, Nortel, Northern Telecom, NT, and SuperNode are trademarks of Nortel Networks.

Contents

Card Replacement Procedures Volume 1 of 7

NTP Summary Contents vii

About this document xxvii

How to check the version and issue of this document	xxvii
References in this document	xxvii
What precautionary messages mean	xxviii
How commands, parameters, and responses are represented	xxix
Input prompt (>)	xxix
Commands and fixed parameters	xxix
Variables	xxix
Responses	xxix

1 Breaker interface panel card replacement procedures 1-1

Introduction	1-1
Application	1-1
Common procedures	1-1
Action	1-1
Recording card replacement activities	1-2
Circuit breaker in a BIP	1-3
NTNY24 in a BIP	1-7
NTNY25 in a BIP	1-11

2 SuperNode computing module card replacement procedures 2-1

Introduction	2-1
Application	2-1
Common procedures	2-1
Action	2-2
Recording card replacement activities	2-2
SuperNode CM shelf layouts	2-3
NT9X20 in a SuperNode CM	2-5
System cards in a SuperNode CM	2-22

3 SuperNode SE computing module and system load module card replacement procedures 3-1

- Introduction 3-1
- Application 3-1
- Common procedures 3-1
- Action 3-2
- Recording card replacement activities 3-2
- SuperNode SE CM/SLM shelf layouts 3-3
- NT9X44 in a SuperNode SE CM/SLM 3-5
- NT9X46 in a SuperNode SE CM/SLM 3-27
- NT9X62 in a SuperNode SE CM/SLM 3-45
- Power converter cards in a SuperNode SE CM/SLM 3-67
- Replace system cards in a SuperNode SE CM/SLM 3-85

4 Digital carrier module card replacement procedures 4-1

- Introduction 4-1
- Application 4-1
- Common procedures 4-1
- Action 4-1
- Recording card replacement activities 4-2
- DCM shelf layouts 4-3
- Control complex cards in a digital carrier module 4-8
- NT2X35 in a digital carrier module 4-13
- NT2X36 in a digital carrier module 4-27
- NT3X65 in a digital echo suppressor 4-37
- Power converter cards in a digital carrier module 4-47

5 Enhanced link peripheral processor card replacement procedures 5-1

- Introduction 5-1
- Application 5-1
- Common procedures 5-1
- Action 5-1
- Recording card replacement activities 5-2
- ELPP shelf layouts 5-3
- Common fill paddle boards in an ELPP LIS 5-9
- HLIU cards in an ELPP LIS 5-17
- HSLR cards in an ELPP LIS 5-27
- NT9X13 in an ELPP LIM unit 5-36
- System and power cards in an ELPP LIM unit 5-48

6 SuperNode SE enhanced network card replacement procedures 6-1

- Introduction 6-1
- Application 6-1
- Common procedures 6-1
- Action 6-2
- Recording card replacement activities 6-2
- SuperNode SE ENET shelf designs 6-3

Crosspoint and interface cards in a SuperNode SE 16k ENET	6-7
Crosspoint and interface cards in a SuperNode SE 32k ENET	6-31
Power converter cards in a SuperNode SE 16k ENET	6-53
System cards in a SuperNode SE 16k ENET	6-77
System cards in a SuperNode SE 32k ENET	6-100

7 File processor card replacement procedures 7-1

Introduction	7-1
Application	7-1
Common procedures	7-1
Action	7-1
Recording card replacement activities	7-2
SuperNode Multicomputing Base shelf layouts	7-3
NT9X89 in a storage device shelf in a file processor	7-6
NT9X90 in a storage device shelf in a file processor	7-18
NT9X91 in a storage device shelf in a file processor	7-33
System cards in a file processor	7-43

8 Frame supervisory panel and modular supervisory panel card replacement procedures 8-1

Introduction	8-1
Application	8-1
Common procedures	8-1
Action	8-1
Recording card replacement activities	8-2
FSP cards in a 42-in. (106.7-cm) SuperNode cabinet	8-3
NT0X36 in a cabinetized input/output equipment frame	8-8
NT0X36 in a cabinetized trunk module equipment frame	8-29
NT0X36 in an input/output equipment frame	8-53
NT0X36 in an international cabinet auxiliary module	8-74
NT0X91 in a CPCE frame	8-98
NT0X91 in a digital carrier equipment frame	8-112
NT0X91 in a line module equipment frame	8-123
NT0X91 in an MS6E	8-133
NT0X91 in an MS7E, ST7E, or ST6E	8-147
NT0X91 in a network equipment frame	8-159
NT0X91 in a trunk module equipment frame	8-172
NT6X36 in LCE-type frames and CLCE	8-192
NTRX41 in MSP in streamline B cabinets	8-197

9 Input/output device card replacement procedures 9-1

Introduction	9-1
Application	9-1
Common procedures	9-1
Action	9-1
Recording card replacement activities	9-2
IOD shelf layouts	9-3
Disk drive and magnetic tape controller cards in an IOC	9-10
NT1X67 in an IOC	9-21
NT1X78 in an IOE DDU shelf	9-28

NT1X89 in an IOC shelf	9-37
NT2X70 in an IOC	9-44
NTFX30 in an ISM	9-61
NTFX31 in an ISM	9-77
NTFX32AA in an ISM	9-92
System cards in an IOC	9-97

NTP Summary Contents

Card Replacement Procedures Volume 1 of 7

About this document **Vol. 1, xxvii**

- How to check the version and issue of this document Vol. 1, xxvii
- References in this document Vol. 1, xxvii
- What precautionary messages mean Vol. 1, xxviii
- How commands, parameters, and responses are represented Vol. 1, xxix
 - Input prompt (>) Vol. 1, xxix
 - Commands and fixed parameters Vol. 1, xxix
 - Variables Vol. 1, xxix
 - Responses Vol. 1, xxix

1 Breaker interface panel card replacement procedures **Vol. 1, 1-1**

- Introduction Vol. 1, 1-1
 - Application Vol. 1, 1-1
 - Common procedures Vol. 1, 1-1
 - Action Vol. 1, 1-1
- Recording card replacement activities Vol. 1, 1-2
- Circuit breaker in a BIP Vol. 1, 1-3
- NTNY24 in a BIP Vol. 1, 1-7
- NTNY25 in a BIP Vol. 1, 1-11

2 SuperNode computing module card replacement procedures **Vol. 1, 2-1**

- Introduction Vol. 1, 2-1
 - Application Vol. 1, 2-1
 - Common procedures Vol. 1, 2-1
 - Action Vol. 1, 2-2
- Recording card replacement activities Vol. 1, 2-2
- SuperNode CM shelf layouts Vol. 1, 2-3
- NT9X20 in a SuperNode CM Vol. 1, 2-5
- System cards in a SuperNode CM Vol. 1, 2-22

3 SuperNode SE computing module and system load module card replacement procedures Vol. 1, 3-1

Introduction Vol. 1, 3-1
Application Vol. 1, 3-1
Common procedures Vol. 1, 3-1
Action Vol. 1, 3-2
Recording card replacement activities Vol. 1, 3-2
SuperNode SE CM/SLM shelf layouts Vol. 1, 3-3
NT9X44 in a SuperNode SE CM/SLM Vol. 1, 3-5
NT9X46 in a SuperNode SE CM/SLM Vol. 1, 3-27
NT9X62 in a SuperNode SE CM/SLM Vol. 1, 3-45
Power converter cards in a SuperNode SE CM/SLM Vol. 1, 3-67
Replace system cards in a SuperNode SE CM/SLM Vol. 1, 3-85

4 Digital carrier module card replacement procedures Vol. 1, 4-1

Introduction Vol. 1, 4-1
Application Vol. 1, 4-1
Common procedures Vol. 1, 4-1
Action Vol. 1, 4-1
Recording card replacement activities Vol. 1, 4-2
DCM shelf layouts Vol. 1, 4-3
Control complex cards in a digital carrier module Vol. 1, 4-8
NT2X35 in a digital carrier module Vol. 1, 4-13
NT2X36 in a digital carrier module Vol. 1, 4-27
NT3X65 in a digital echo suppressor Vol. 1, 4-37
Power converter cards in a digital carrier module Vol. 1, 4-47

5 Enhanced link peripheral processor card replacement procedures Vol. 1, 5-1

Introduction Vol. 1, 5-1
Application Vol. 1, 5-1
Common procedures Vol. 1, 5-1
Action Vol. 1, 5-1
Recording card replacement activities Vol. 1, 5-2
ELPP shelf layouts Vol. 1, 5-3
Common fill paddle boards in an ELPP LIS Vol. 1, 5-9
HLIU cards in an ELPP LIS Vol. 1, 5-17
HSLR cards in an ELPP LIS Vol. 1, 5-27
NT9X13 in an ELPP LIM unit Vol. 1, 5-36
System and power cards in an ELPP LIM unit Vol. 1, 5-48

6 SuperNode SE enhanced network card replacement procedures Vol. 1, 6-1

Introduction Vol. 1, 6-1
Application Vol. 1, 6-1
Common procedures Vol. 1, 6-1
Action Vol. 1, 6-2
Recording card replacement activities Vol. 1, 6-2

SuperNode SE ENET shelf designs Vol. 1, 6-3
 Crosspoint and interface cards in a SuperNode SE 16k ENET Vol. 1, 6-7
 Crosspoint and interface cards in a SuperNode SE 32k ENET Vol. 1, 6-31
 Power converter cards in a SuperNode SE 16k ENET Vol. 1, 6-53
 System cards in a SuperNode SE 16k ENET Vol. 1, 6-77
 System cards in a SuperNode SE 32k ENET Vol. 1, 6-100

7 File processor card replacement procedures Vol. 1, 7-1

Introduction Vol. 1, 7-1
 Application Vol. 1, 7-1
 Common procedures Vol. 1, 7-1
 Action Vol. 1, 7-1
 Recording card replacement activities Vol. 1, 7-2
 SuperNode Multicomputing Base shelf layouts Vol. 1, 7-3
 NT9X89 in a storage device shelf in a file processor Vol. 1, 7-6
 NT9X90 in a storage device shelf in a file processor Vol. 1, 7-18
 NT9X91 in a storage device shelf in a file processor Vol. 1, 7-33
 System cards in a file processor Vol. 1, 7-43

8 Frame supervisory panel and modular supervisory panel card replacement procedures Vol. 1, 8-1

Introduction Vol. 1, 8-1
 Application Vol. 1, 8-1
 Common procedures Vol. 1, 8-1
 Action Vol. 1, 8-1
 Recording card replacement activities Vol. 1, 8-2
 FSP cards in a 42-in. (106.7-cm) SuperNode cabinet Vol. 1, 8-3
 NT0X36 in a cabinetized input/output equipment frame Vol. 1, 8-8
 NT0X36 in a cabinetized trunk module equipment frame Vol. 1, 8-29
 NT0X36 in an input/output equipment frame Vol. 1, 8-53
 NT0X36 in an international cabinet auxiliary module Vol. 1, 8-74
 NT0X91 in a CPCE frame Vol. 1, 8-98
 NT0X91 in a digital carrier equipment frame Vol. 1, 8-112
 NT0X91 in a line module equipment frame Vol. 1, 8-123
 NT0X91 in an MS6E Vol. 1, 8-133
 NT0X91 in an MS7E, ST7E, or ST6E Vol. 1, 8-147
 NT0X91 in a network equipment frame Vol. 1, 8-159
 NT0X91 in a trunk module equipment frame Vol. 1, 8-172
 NT6X36 in LCE-type frames and CLCE Vol. 1, 8-192
 NTRX41 in MSP in streamline B cabinets Vol. 1, 8-197

9 Input/output device card replacement procedures Vol. 1, 9-1

Introduction Vol. 1, 9-1
 Application Vol. 1, 9-1
 Common procedures Vol. 1, 9-1
 Action Vol. 1, 9-1
 Recording card replacement activities Vol. 1, 9-2
 IOD shelf layouts Vol. 1, 9-3

Disk drive and magnetic tape controller cards in an IOC Vol. 1, 9-10
NT1X67 in an IOC Vol. 1, 9-21
NT1X78 in an IOE DDU shelf Vol. 1, 9-28
NT1X89 in an IOC shelf Vol. 1, 9-37
NT2X70 in an IOC Vol. 1, 9-44
NTFX30 in an ISM Vol. 1, 9-61
NTFX31 in an ISM Vol. 1, 9-77
NTFX32AA in an ISM Vol. 1, 9-92
System cards in an IOC Vol. 1, 9-97

Card Replacement Procedures

Volume 2 of 7

1 Line concentrating module card replacement procedures **Vol. 2, 1-1**

Introduction Vol. 2, 1-1
Application Vol. 2, 1-1
Common procedures Vol. 2, 1-1
Action Vol. 2, 1-1
Recording card replacement activities Vol. 2, 1-2
LCM shelf layouts Vol. 2, 1-3
Bus interface cards in an LCD Vol. 2, 1-13
Control complex cards in LCM-type PMs Vol. 2, 1-31
Line cards in an LCE line drawer Vol. 2, 1-39
NT6X30 in LCE-type frames Vol. 2, 1-47
NTBX71 in an LCME Vol. 2, 1-62
Power cards in an LCE line drawer Vol. 2, 1-73
Power cards in LCM-type PMs Vol. 2, 1-79

2 Line module card replacement procedures **Vol. 2, 2-1**

Introduction Vol. 2, 2-1
Application Vol. 2, 2-1
Common procedures Vol. 2, 2-1
Action Vol. 2, 2-1
Recording card replacement activities Vol. 2, 2-2
LM shelf layouts Vol. 2, 2-3
Control complex cards in a line module controller Vol. 2, 2-9
Interface and power converter cards in an LM line drawer Vol. 2, 2-16
Line cards in an LM line drawer Vol. 2, 2-24
NT2X05 in a line module controller Vol. 2, 2-30
NT2X70 in a line module controller Vol. 2, 2-36

3 Link peripheral processor card replacement procedures **Vol. 2, 3-1**

Introduction Vol. 2, 3-1
Application Vol. 2, 3-1
Common procedures Vol. 2, 3-1

Action Vol. 2, 3-1
Recording card replacement activities Vol. 2, 3-2
LPP shelf layouts Vol. 2, 3-3
APU cards in an LPP LIS Vol. 2, 3-9
Common fill paddle boards in an LPP LIS Vol. 2, 3-36
EIU cards in an LPP LIS Vol. 2, 3-47
LIU7 cards in an LPP LIS Vol. 2, 3-57
FRIU cards in an LPP LIS Vol. 2, 3-68
NIU processor and controller cards in an LPP LIS Vol. 2, 3-82
NT9X13 in an LPP LIM unit Vol. 2, 3-89
NT9X30 in an LPP LIS Vol. 2, 3-100
NT9X74 in an LPP LIS Vol. 2, 3-126
NTDX16 in an LPP LIS Vol. 2, 3-140
NTEX28 in an NIU in an LPP LIS Vol. 2, 3-145
System and power cards in an LPP LIM unit Vol. 2, 3-155
VPU cards in an LPP LIS Vol. 2, 3-168
XLIU cards in an LPP LIS Vol. 2, 3-177

4 SuperNode SE LIS or ENI card replacement procedures

Vol. 2, 4-1

Introduction Vol. 2, 4-1
Application Vol. 2, 4-1
Common procedures Vol. 2, 4-1
Action Vol. 2, 4-1
Recording card replacement activities Vol. 2, 4-2
SuperNode SE link interface shelf layouts Vol. 2, 4-3
Common fill cards in a SuperNode SE LIS or ENI shelf Vol. 2, 4-6
EIU cards in a SuperNode SE LIS Vol. 2, 4-13
FRIU cards in a SuperNode SE LIS Vol. 2, 4-24
LIU7 cards in a SuperNode SE LIS or ENI shelf Vol. 2, 4-38
NIU cards in a SuperNode SE LIS Vol. 2, 4-49
NT9X30 in a SuperNode SE LIS Vol. 2, 4-64
XLIU cards in a SuperNode SE LIS Vol. 2, 4-91

5 SuperNode message switch card replacement procedures

Vol. 2, 5-1

Introduction Vol. 2, 5-1
Application Vol. 2, 5-1
Common procedures Vol. 2, 5-1
Action Vol. 2, 5-2
Recording card replacement activities Vol. 2, 5-2
SuperNode MS shelf layouts Vol. 2, 5-3
Interface cards in a SuperNode MS Vol. 2, 5-5
Manually busying LIM-to-MS SR128 links Vol. 2, 5-26
Returning LIM-to-MS SR128 links to service Vol. 2, 5-33
System cards in a SuperNode MS Vol. 2, 5-39

6 SuperNode SE message switch card replacement procedures Vol. 2, 6-1

Introduction Vol. 2, 6-1
Application Vol. 2, 6-1
Common procedures Vol. 2, 6-1
Action Vol. 2, 6-2
Recording card replacement activities Vol. 2, 6-2
SuperNode SE message switch shelf layouts Vol. 2, 6-3
Interface paddle boards in a SuperNode SE MS Vol. 2, 6-5
System cards in a SuperNode SE MS Vol. 2, 6-25

7 Message switch and buffer card replacement procedures Vol. 2, 7-1

Introduction Vol. 2, 7-1
Application Vol. 2, 7-1
Common procedures Vol. 2, 7-1
Action Vol. 2, 7-1
Recording card replacement activities Vol. 2, 7-2
MSB shelf layouts Vol. 2, 7-3
Control complex cards in an MSB Vol. 2, 7-12
NT2X70 in an MSB Vol. 2, 7-20
NT2X70 in an ST7G or STCM Vol. 2, 7-35
NT6X40 in an MSB Vol. 2, 7-48
NT6X68 in an MSB Vol. 2, 7-55
Processor and memory cards in an MSB Vol. 2, 7-62
Signaling terminal cards in an MSB Vol. 2, 7-70

8 SuperNode network card replacement procedures Vol. 2, 8-1

Introduction Vol. 2, 8-1
Application Vol. 2, 8-1
Common procedures Vol. 2, 8-1
Action Vol. 2, 8-2
Recording card replacement activities Vol. 2, 8-2
Network shelf layouts Vol. 2, 8-3
Crosspoint and interface cards in a 64k or 128k ENET Vol. 2, 8-15
Power converter cards in JNET shelves Vol. 2, 8-40
System cards in a 64k or 128k ENET Vol. 2, 8-49
System, interface, and crosspoint cards in JNET shelves Vol. 2, 8-72

9 Office alarm unit card replacement procedures Vol. 2, 9-1

Introduction Vol. 2, 9-1
Application Vol. 2, 9-1
Common procedures Vol. 2, 9-1
Action Vol. 2, 9-1
Recording card replacement activities Vol. 2, 9-2
OAU shelf layouts Vol. 2, 9-3
Control and circuit cards in the office alarm unit Vol. 2, 9-7
Power converter cards in the office alarm unit Vol. 2, 9-14

10 Remote line module card replacement procedures

Vol. 2, 10-1

- Introduction Vol. 2, 10-1
- Application Vol. 2, 10-1
- Common procedures Vol. 2, 10-1
- Action Vol. 2, 10-1
- Recording card replacement activities Vol. 2, 10-2
- RLM shelf layouts Vol. 2, 10-3
- Control complex cards in a remote line controller Vol. 2, 10-9
- Line cards in an RLM line drawer Vol. 2, 10-16
- NT2X05 in a remote line controller Vol. 2, 10-22
- NT2X70 in a remote line controller Vol. 2, 10-28

Card Replacement Procedures Volume 3 of 7

1 Remote oscillator shelf card replacement procedures

Vol. 3, 1-1

- Introduction Vol. 3, 1-1
- Application Vol. 3, 1-1
- Common procedures Vol. 3, 1-1
- Action Vol. 3, 1-1
- Recording card replacement activities Vol. 3, 1-2
- Remote oscillator shelf layouts Vol. 3, 1-3
- NT1X78 in a remote oscillator shelf Vol. 3, 1-5
- NT3X16 in a remote oscillator shelf Vol. 3, 1-14

2 Single shelf link peripheral processor card replacement procedures

Vol. 3, 2-1

- Introduction Vol. 3, 2-1
- Application Vol. 3, 2-1
- Common procedures Vol. 3, 2-1
- Action Vol. 3, 2-1
- Recording card replacement activities Vol. 3, 2-2
- SSLPP shelf layouts Vol. 3, 2-3
- Common fill cards in an SSLPP Vol. 3, 2-7
- EIU cards in an SSLPP Vol. 3, 2-17
- FRIU cards in an SSLPP Vol. 3, 2-29
- LIU7 cards in an SSLPP Vol. 3, 2-44
- NIU cards in an SSLPP Vol. 3, 2-57
- Power converter cards in an SSLPP Vol. 3, 2-74
- XLIU cards in an SSLPP Vol. 3, 2-105

3 SuperNode system load module card replacement procedures Vol. 3, 3-1

Introduction Vol. 3, 3-1
Application Vol. 3, 3-1
Common procedures Vol. 3, 3-1
Action Vol. 3, 3-2
Recording card replacement activities Vol. 3, 3-2
SuperNode SLM shelf layouts Vol. 3, 3-3
NT9X44 in a SuperNode SLM Vol. 3, 3-5
SPM NTLX60AA FIL with DSP RM DMS-Spectrum Peripheral Module Vol. 3, 3-26
SPM NTLX61AA SIM card DMS-Spectrum Peripheral Module Vol. 3, 3-37
SPM NTLX63AA CEM card DMS-Spectrum Peripheral Module Vol. 3, 3-45
SPM NTLX65BA DSP RM DMS-Spectrum Peripheral Module Vol. 3, 3-64
SPM NTLX71AA OC3 card DMS-Spectrum Peripheral Module Vol. 3, 3-78
SPM NTLX82AA CEM card DMS-Spectrum Peripheral Module Vol. 3, 3-99
SPM NTLX82BA CEM card DMS-Spectrum Peripheral Module Vol. 3, 3-118
System cards in a SuperNode SLM Vol. 3, 3-137

4 Trunk module card replacement procedures Vol. 3, 4-1

Introduction Vol. 3, 4-1
Application Vol. 3, 4-1
Common procedures Vol. 3, 4-1
Action Vol. 3, 4-1
Recording card replacement activities Vol. 3, 4-2
TM shelf layouts Vol. 3, 4-3
Control complex cards in trunk and service modules Vol. 3, 4-27
Enhanced digital test unit or digital test unit cards in trunk and service modules Vol. 3, 4-37
Metallic test unit cards in trunk and service modules Vol. 3, 4-44
Power converter cards in trunk and service modules Vol. 3, 4-64
Single-card PMs in trunk and service modules Vol. 3, 4-79
Trunk, maintenance, and service cards in trunk and service modules Vol. 3, 4-88

5 Universal Edge 9000 card replacement procedures Vol. 3, 5-1

Introduction Vol. 3, 5-1
Application Vol. 3, 5-1
Common procedures Vol. 3, 5-1
Action Vol. 3, 5-1
Recording card replacement activities Vol. 3, 5-2
UEN shelf layout Vol. 3, 5-3
Control cards in a UEN shelf Vol. 3, 5-5
Line cards in a UEN shelf Vol. 3, 5-14
NTNP20 in a UEN shelf Vol. 3, 5-19

6 XPM card replacement procedures Vol. 3, 6-1

Introduction Vol. 3, 6-1
Application Vol. 3, 6-1
Common procedures Vol. 3, 6-1
Action Vol. 3, 6-1
Recording card replacement activities Vol. 3, 6-2
XPM shelf layouts Vol. 3, 6-3
Back plane cards in an XPM Vol. 3, 6-19
Control complex cards in an XPM Vol. 3, 6-31
NT2X70 in an XPM Vol. 3, 6-42
NT6X40 in an XPM Vol. 3, 6-59
NT6X48 in LGC, PLGC, LTC, PLTC Vol. 3, 6-72
NT6X48 in MSB7 Vol. 3, 6-82
NT6X78 in an XPM Vol. 3, 6-90
NT7X03 in an XPM Vol. 3, 6-97
NT7X07AA in an LTCI Vol. 3, 6-106
NTBX02 in an XPM Vol. 3, 6-115
P-side interface cards in an XPM Vol. 3, 6-124
Processor and memory cards in an XPM Vol. 3, 6-147

7 Card replacement common procedures Vol. 3, 7-1

Introduction Vol. 3, 7-1
Application Vol. 3, 7-1
Action Vol. 3, 7-1
Activating CCS7 links Vol. 3, 7-2
Activity switch with memory match Vol. 3, 7-11
Cleaning fiber-optic components and assemblies Vol. 3, 7-19
Correcting a load mismatch Vol. 3, 7-27
Deactivating CCS7 links Vol. 3, 7-42
Failure to switch clock mastership Vol. 3, 7-50
Loading a PM Vol. 3, 7-59
Manually busying LIM-to-MS DS30 links Vol. 3, 7-71
Manually busying Series II PM and CPM C-side links Vol. 3, 7-77
Manually busying SMA C-side links Vol. 3, 7-84
Manually busying SMA2 C-side links Vol. 3, 7-90
Memory extension in the SuperNode CM Vol. 3, 7-96
Memory extension in the SuperNode SE CM Vol. 3, 7-114
Moving an XSG to a spare XLIU Vol. 3, 7-132
Removing and replacing a card Vol. 3, 7-140
Replacing a card Vol. 3, 7-144
Replacing a card STAR or RLD Vol. 3, 7-150
Replacing a line card Vol. 3, 7-156
Reseating cards in equipment shelves Vol. 3, 7-163
Returning a card for repair or replacement Vol. 3, 7-168
Returning LIM-to-MS DS30 links to service Vol. 3, 7-172
Switching the clock source Vol. 3, 7-177
Unseating cards in equipment shelves Vol. 3, 7-184
Verifying load compatibility of SuperNode cards Vol. 3, 7-188

Card Replacement Procedures

Volume 4 of 7

1	XPM card replacement procedures	Vol. 4, 1-1
	NT0X10 in an IOPAC RMM	Vol. 4, 1-2
	NT0X10 in an OPM RMM	Vol. 4, 1-6
	NT0X10 in an RLCM-EDC RMM	Vol. 4, 1-10
	NT0X10 in an RLCM RMM	Vol. 4, 1-14
	NT0X10 in an RSC RMM	Vol. 4, 1-18
	NT0X10 in an RSC-S (DS-1) Model A RMM	Vol. 4, 1-25
	NT0X10 in an RSC-S (DS-1) Model B RMM	Vol. 4, 1-31
	NT0X10 in an RSC-S (PCM-30) Model A RMM	Vol. 4, 1-37
	NT0X10 in an RSC-S (PCM-30) Model B RMM	Vol. 4, 1-43
	NT0X91 in an IOPAC FSP	Vol. 4, 1-49
	NT0X91 in an RLCM	Vol. 4, 1-61
	NT0X91 in an RSC	Vol. 4, 1-74
	NT0X91AA in an OPM	Vol. 4, 1-90
	NT0X91AE in an OPM	Vol. 4, 1-96
	NT0X91AE in an RLCE	Vol. 4, 1-105
	NT2X06 in an IOPAC RMM	Vol. 4, 1-114
	NT2X06 in an OPM RMM	Vol. 4, 1-121
	NT2X06 in an RLCM RMM	Vol. 4, 1-129
	NT2X06 in an RSC RMM	Vol. 4, 1-136
	NT2X06 in an RSC-S (DS-1) Model A RMM	Vol. 4, 1-144
	NT2X06 in an RSC-S (DS-1) Model B RMM	Vol. 4, 1-153
	NT2X06 in an RSC-S (PCM-30) Model A RMM	Vol. 4, 1-162
	NT2X09 in an IOPAC RMM	Vol. 4, 1-171
	NT2X09 in an OPM RMM	Vol. 4, 1-178
	NT2X09 in an RLCM RMM	Vol. 4, 1-186
	NT2X09 in an RSC RMM	Vol. 4, 1-194
	NT2X09 in an RSC-S (DS-1) Model A RMM	Vol. 4, 1-202
	NT2X09 in an RSC-S (DS-1) Model B RMM	Vol. 4, 1-211
	NT2X09 in an RSC-S (PCM-30) Model A RMM	Vol. 4, 1-220
	NT2X10 in an OPM RMM	Vol. 4, 1-229
	NT2X10 in an RLCM RMM	Vol. 4, 1-233
	NT2X10 in an RSC RMM	Vol. 4, 1-237
	NT2X10 in an RSC-S (DS-1) Model A RMM	Vol. 4, 1-244
	NT2X10 in an RSC-S (DS-1) Model B RMM	Vol. 4, 1-251
	NT2X10 in an RSC-S (PCM-30) Model A RMM	Vol. 4, 1-258
	NT2X11 in an OPAC RMM	Vol. 4, 1-265
	NT2X11 in an OPM RMM	Vol. 4, 1-270
	NT2X11 in an RLCM-EDC RMM	Vol. 4, 1-274
	NT2X11 in an RLCM RMM	Vol. 4, 1-278
	NT2X11 in an RSC RMM	Vol. 4, 1-282
	NT2X11 in an RSC-S (DS-1) Model A RMM	Vol. 4, 1-289
	NT2X11 in an RSC-S (DS-1) Model B RMM	Vol. 4, 1-298
	NT2X11 in an RSC-S (PCM-30) Model A RMM	Vol. 4, 1-307
	NT2X48 in an IOPAC RMM	Vol. 4, 1-316
	NT2X48 in an OPM RMM	Vol. 4, 1-321

NT2X48 in an RLCM RMM Vol. 4, 1-326
NT2X55 in an RSC RMM Vol. 4, 1-331
NT2X57 in an IOPAC RMM Vol. 4, 1-338
NT2X57 in an OPM RMM Vol. 4, 1-342
NT2X57 in an RLCM-EDC RMM Vol. 4, 1-346
NT2X57 in an RLCM RMM Vol. 4, 1-350
NT2X57 in an RSC RMM Vol. 4, 1-355
NT2X57 in an RSC-S (DS-1) Model A RMM Vol. 4, 1-362
NT2X57 in an RSC-S (DS-1) Model B RMM Vol. 4, 1-369
NT2X57 in an RSC-S (PCM-30) Model A RMM Vol. 4, 1-376
NT2X59 in an IOPAC RMM Vol. 4, 1-383
NT2X59 in an OPM RMM Vol. 4, 1-387
NT2X59 in an RLCM-EDC RMM Vol. 4, 1-394
NT2X59 in an RLCM RMM Vol. 4, 1-401
NT2X59 in an RSC RMM Vol. 4, 1-406
NT2X59 in an RSC-S (DS-1) Model A RMM Vol. 4, 1-413
NT2X59 in an RSC-S (DS-1) Model B RMM Vol. 4, 1-420
NT2X59 in an RSC-S (PCM-30) Model A RMM Vol. 4, 1-427
NT2X70 in an IOPAC HIE Vol. 4, 1-434
NT2X70 in an OPM HIE Vol. 4, 1-441
NT2X70 in an RLCM-EDC HIE Vol. 4, 1-455
NT2X70 in an RLCM HIE Vol. 4, 1-464
NT2X70 in an RSC Vol. 4, 1-478
NT2X70 in an SMA Vol. 4, 1-490
NT2X70 in an SMA-MVI-20 Vol. 4, 1-498
NT2X70 in an SMS Vol. 4, 1-506
NT2X70 in an SMS-R Vol. 4, 1-517
NT2X70 in an SMU Vol. 4, 1-526
NT2X90 in an IOPAC RMM Vol. 4, 1-533
NT2X90 in an OPAC RMM Vol. 4, 1-538
NT2X90 in an OPM RMM Vol. 4, 1-543
NT2X90 in an RLCM-EDC RMM Vol. 4, 1-551
NT2X90 in an RLCM RMM Vol. 4, 1-557
NT2X90 in an RSC RMM Vol. 4, 1-562
NT2X90 in an RSC-S (DS-1) Model A RMM Vol. 4, 1-569
NT2X90 in an RSC-S (DS-1) Model B RMM Vol. 4, 1-576
NT3X04 in an RSC RMM Vol. 4, 1-583
NT3X09 in an IOPAC RMM Vol. 4, 1-590
NT3X09 in an OPAC RMM Vol. 4, 1-596
NT3X09 in an OPM RMM Vol. 4, 1-601
NT3X09 in an RLCM-EDC RMM Vol. 4, 1-607
NT3X09 in an RLCM RMM Vol. 4, 1-612
NT3X09 in an RSC RMM Vol. 4, 1-617
NT3X09 in an RSC-S (DS-1) Model A RMM Vol. 4, 1-624
NT3X09 in an RSC-S (DS-1) Model B RMM Vol. 4, 1-634
NT3X09 in an RSC-S (PCM-30) Model B RMM Vol. 4, 1-644
NT3X82 in an RSC RMM Vol. 4, 1-653
NT3X83 in an RSC RMM Vol. 4, 1-660
NT4X97 in an IOPAC RMM Vol. 4, 1-668
NT4X97 in an RSC-S (PCM-30) Model A RMM Vol. 4, 1-673
NT4X97 in an RSC-S (PCM-30) Model B RMM Vol. 4, 1-680

NT4X98 in an IOPAC RMM	Vol. 4, 1-687
NT4X98 in an RSC-S (PCM-30) Model B RMM	Vol. 4, 1-694
NT6X17 in an IOPAC ILCM	Vol. 4, 1-703
NT6X17 in an OPM	Vol. 4, 1-707
NT6X17 in an RLCM	Vol. 4, 1-711
NT6X17 in an RSC LCM	Vol. 4, 1-715
NT6X17 in an RSC-S (DS-1) Model A LCME	Vol. 4, 1-723
NT6X17 in an RSC-S (DS-1) Model B LCME	Vol. 4, 1-731
NT6X17 in a STAR or RLD	Vol. 4, 1-739
NT6X18 in an IOPAC ILCM	Vol. 4, 1-743
NT6X18 in an OPAC LCM	Vol. 4, 1-747
NT6X18 in an OPM	Vol. 4, 1-751
NT6X18 in an RLCM	Vol. 4, 1-755
NT6X18 in an RSC LCM	Vol. 4, 1-759
NT6X18 in an RSC-S (DS-1) Model A LCME	Vol. 4, 1-767
NT6X18 in an RSC-S (DS-1) Model B LCME	Vol. 4, 1-775
NT6X18 in a STAR or RLD	Vol. 4, 1-783
NT6X19 in an IOPAC ILCM	Vol. 4, 1-787
NT6X19 in an OPM	Vol. 4, 1-791
NT6X19 in an RLCM	Vol. 4, 1-795
NT6X19 in an RSC LCM	Vol. 4, 1-799
NT6X19 in an RSC-S (DS-1) Model A LCME	Vol. 4, 1-807
NT6X19 in an RSC-S (DS-1) Model B LCME	Vol. 4, 1-815
NT6X19 in a STAR or RLD	Vol. 4, 1-823
NT6X20 in an IOPAC ILCM	Vol. 4, 1-827
NT6X20 in an OPM	Vol. 4, 1-831
NT6X20 in an RLCM	Vol. 4, 1-835
NT6X20 in an RSC LCM	Vol. 4, 1-839
NT6X20 in an RSC-S (DS-1) Model A LCME	Vol. 4, 1-847
NT6X20 in an RSC-S (DS-1) Model B LCME	Vol. 4, 1-855
NT6X20 in a STAR or RLD	Vol. 4, 1-863
NT6X21 in an IOPAC ILCM	Vol. 4, 1-867
NT6X21 in an OPM	Vol. 4, 1-871
NT6X21 in an RLCM	Vol. 4, 1-875
NT6X21 in an RLCM-EDC LCM	Vol. 4, 1-879
NT6X21 in an RSC-S (DS-1) Model A LCME	Vol. 4, 1-883
NT6X21 in an RSC-S (DS-1) Model B LCME	Vol. 4, 1-893
NT6X21 in an RSC-S (PCM-30) Model A LCME	Vol. 4, 1-902
NT6X21 in an RSC-S (PCM-30) Model B LCME	Vol. 4, 1-911
NT6X21 in a STAR or RLD	Vol. 4, 1-920
NT6X27 in an IOPAC HIE	Vol. 4, 1-924
NT6X27 in an OPM HIE	Vol. 4, 1-931
NT6X27 in an RLCM HIE	Vol. 4, 1-938
NT6X30 in an RSC LCM	Vol. 4, 1-945
NT6X30 in an RSC-S (DS-1) Model A LCME	Vol. 4, 1-960
NT6X30 in an RSC-S (DS-1) Model B LCME	Vol. 4, 1-974
NT6X30 in an RSC-S (PCM-30) Model A LCME	Vol. 4, 1-988
NT6X30 in an RSC-S (PCM-30) Model B LCME	Vol. 4, 1-1002
NT6X36 in an IOPAC FSP	Vol. 4, 1-1016

NT6X36 in an OPM Vol. 4, 1-1021
NT6X36 in an RLCM-EDC FSP Vol. 4, 1-1026
NT6X36 in an RLCM FSP Vol. 4, 1-1031
NT6X36 in an RSC-S FSP for CRSC or CEXT Vol. 4, 1-1036

Card Replacement Procedures

Volume 5 of 7

1 XPM card replacement procedures (continued) Vol. 5, 1-1

NT6X40 in an SMA Vol. 5, 1-2
NT6X40 in an SMA-MVI-20 Vol. 5, 1-14
NT6X40 in an SMA2 Vol. 5, 1-26
NT6X40 in an SMS Vol. 5, 1-38
NT6X40 in an SMU Vol. 5, 1-51
NT6X41 in an SMA Vol. 5, 1-64
NT6X41 in an SMA-MVI-20 Vol. 5, 1-71
NT6X41 in an SMS Vol. 5, 1-78
NT6X41 in an SMS-R Vol. 5, 1-87
NT6X41 in an SMU Vol. 5, 1-95
NT6X42 in an SMA Vol. 5, 1-101
NT6X42 in an SMA-MVI-20 Vol. 5, 1-107
NT6X42 in an SMS Vol. 5, 1-114
NT6X42 in an SMS-R Vol. 5, 1-122
NT6X44 in an RSC Vol. 5, 1-130
NT6X44 in an SMA Vol. 5, 1-138
NT6X44 in an SMA-MVI-20 Vol. 5, 1-144
NT6X44 in an SMS Vol. 5, 1-150
NT6X44 in an SMS-R Vol. 5, 1-158
NT6X45 in an IOPAC HIE Vol. 5, 1-166
NT6X45 in an OPAC HIE Vol. 5, 1-172
NT6X45 in an OPM HIE Vol. 5, 1-178
NT6X45 in an RLCM HIE Vol. 5, 1-184
NT6X47 in an IOPAC HIE Vol. 5, 1-190
NT6X47 in an OPM HIE Vol. 5, 1-196
NT6X47 in an RLCM HIE Vol. 5, 1-202
NT6X48 in an RSC Vol. 5, 1-208
NT6X50 in an OPAC HIE Vol. 5, 1-216
NT6X50 in an OPM HIE Vol. 5, 1-223
NT6X50 in an RLCM-EDC HIE Vol. 5, 1-230
NT6X50 in an RLCM HIE Vol. 5, 1-237
NT6X50 in an RSC Vol. 5, 1-244
NT6X50 in an SMA Vol. 5, 1-259
NT6X50 in an SMA-MVI-20 Vol. 5, 1-275
NT6X51 in an IOPAC ILCM Vol. 5, 1-291
NT6X51 in an OPAC LCM Vol. 5, 1-298
NT6X51 in an OPM Vol. 5, 1-305
NT6X51 in an RLCM Vol. 5, 1-312
NT6X51 in an RLCM-EDC Vol. 5, 1-319

NT6X51 in an RSC-S (DS-1) Model A LCM Vol. 5, 1-324
NT6X51 in an RSC-S (DS-1) Model B LCME Vol. 5, 1-332
NT6X51 in an RSC-S (PCM-30) Model A LCM Vol. 5, 1-339
NT6X51 in an RSC-S (PCM-30) Model B LCM Vol. 5, 1-347
NT6X52 in an IOPAC ILCM Vol. 5, 1-355
NT6X52 in an OPAC LCM Vol. 5, 1-361
NT6X52 in an OPM Vol. 5, 1-367
NT6X52 in an RLCM Vol. 5, 1-373
NT6X52 in an RLCM-EDC Vol. 5, 1-379
NT6X52 in an RSC LCM Vol. 5, 1-384
NT6X52 in an RSC-S (DS-1) Model A LCME Vol. 5, 1-392
NT6X52 in an RSC-S (DS-1) Model B LCME Vol. 5, 1-401
NT6X52 in an RSC-S (PCM-30) Model A LCME Vol. 5, 1-410
NT6X53 in an IOPAC ILCM Vol. 5, 1-418
NT6X53 in an OPAC LCM Vol. 5, 1-425
NT6X53 in an OPM Vol. 5, 1-432
NT6X53 in an RLCM Vol. 5, 1-444
NT6X53 in an RLCM-EDC Vol. 5, 1-453
NT6X53 in an RSC LCM Vol. 5, 1-460
NT6X53 in an RSC-S (DS-1) Model A LCM(E) Vol. 5, 1-469
NT6X53 in an RSC-S (DS-1) Model B LCM(E) Vol. 5, 1-478
NT6X53 in a STAR Vol. 5, 1-487
NT6X54 in an IOPAC ILCM Vol. 5, 1-493
NT6X54 in an OPAC LCM Vol. 5, 1-500
NT6X54 in an OPM Vol. 5, 1-509
NT6X54 in an RLCM Vol. 5, 1-518
NT6X54 in an RLCM-EDC Vol. 5, 1-527
NT6X54 in an RSC Vol. 5, 1-533
NT6X54 in an RSC-S (DS-1) Model A LCM(E) Vol. 5, 1-542
NT6X54 in an RSC-S (DS-1) Model B LCM(E) Vol. 5, 1-549
NT6X54 in a STAR Vol. 5, 1-556
NT6X60 in an IOPAC HIE Vol. 5, 1-565
NT6X60 in an OPAC HIE Vol. 5, 1-572
NT6X60 in an OPM HIE Vol. 5, 1-579
NT6X60 in an RLCM HIE Vol. 5, 1-587
NT6X69 in an RSC-M Vol. 5, 1-595
NT6X69 in an RSC RCC/RCC2 Vol. 5, 1-605
NT6X69 in an RSC-S (DS-1) Model A RCC2 Vol. 5, 1-613
NT6X69 in an RSC-S (DS-1) Model B RCC2 Vol. 5, 1-622
NT6X69 in an RSC-S (PCM-30) Model A RCO2 Vol. 5, 1-630
NT6X69 in an RSC-S (PCM-30) Model B RCO2 Vol. 5, 1-639
NT6X69 in an SMA Vol. 5, 1-648
NT6X69 in an SMA-MVI-20 Vol. 5, 1-654
NT6X69 in an SMS Vol. 5, 1-661
NT6X69 in an SMS-R Vol. 5, 1-670
NT6X69 in an SMU Vol. 5, 1-678
NT6X71 in an IOPAC ILCM Vol. 5, 1-684
NT6X71 in an OPM Vol. 5, 1-688
NT6X71 in an RLCM Vol. 5, 1-692
NT6X71 in an RSC LCM Vol. 5, 1-696
NT6X71 in an RSC-S (DS-1) Model A LCME Vol. 5, 1-705

NT6X71 in an RSC-S (DS-1) Model B LCME	Vol. 5, 1-713
NT6X71 in a STAR or RLD	Vol. 5, 1-721
NT6X72 in an RSC	Vol. 5, 1-725
NT6X73 in an IOPAC HIE	Vol. 5, 1-734
NT6X73 in an OPAC HIE	Vol. 5, 1-738
NT6X73 in an OPM HIE	Vol. 5, 1-742
NT6X73 in an RLCM-EDC HIE	Vol. 5, 1-746
NT6X73 in an RLCM HIE	Vol. 5, 1-751
NT6X74 in an IOPAC RMM	Vol. 5, 1-755
NT6X74 in an OPM RMM	Vol. 5, 1-761
NT6X74 in an RLCM-EDC RMM	Vol. 5, 1-768
NT6X74 in an RLCM RMM	Vol. 5, 1-775
NT6X74 in an RSC RMM	Vol. 5, 1-782
NT6X74 in an RSC-S (DS-1) Model A RMM	Vol. 5, 1-790
NT6X74 in an RSC-S (DS-1) Model B RMM	Vol. 5, 1-799
NT6X74 in an RSC-S (PCM-30) Model A RMM	Vol. 5, 1-808
NT6X75 in an IOPAC HIE	Vol. 5, 1-817
NT6X75 in an OPAC HIE	Vol. 5, 1-824
NT6X75 in an OPM HIE	Vol. 5, 1-831
NT6X75 in an RLCM HIE	Vol. 5, 1-838
NT6X76 in an RSC LCME	Vol. 5, 1-845
NT6X76 in an RSC-S (DS-1) Model A LCME	Vol. 5, 1-853
NT6X76 in an RSC-S (DS-1) Model B LCME	Vol. 5, 1-861
NT6X76 in a STAR or RLD	Vol. 5, 1-869
NT6X78 in an RSC-M	Vol. 5, 1-876
NT6X78 in an RSC RCC/RCC2	Vol. 5, 1-883
NT6X78 in an RSC-S (DS-1) Model A RCC2	Vol. 5, 1-891
NT6X78 in an RSC-S (DS-1) Model B RCC2	Vol. 5, 1-898
NT6X78 in an RSC-S (PCM-30) Model A RCO2	Vol. 5, 1-905
NT6X78 in an RSC-S (PCM-30) Model B RCO2	Vol. 5, 1-912
NT6X78 in an SMA	Vol. 5, 1-919
NT6X78 in an SMA-MVI-20	Vol. 5, 1-925
NT6X78 in an SMA2	Vol. 5, 1-932
NT6X78 in an SMS	Vol. 5, 1-939
NT6X78 in an SMU	Vol. 5, 1-946
NT6X80 in an SMA	Vol. 5, 1-951
NT6X80 in an SMA-MVI-20	Vol. 5, 1-957
NT6X80 in an SMS	Vol. 5, 1-964
NT6X80 in an SMS-R	Vol. 5, 1-972
NT6X80 in an SMU	Vol. 5, 1-981

Card Replacement Procedures

Volume 6 of 7

1	XPM card replacement procedures (continued)	Vol. 6, 1-1
	NT6X85 in an SMS	Vol. 6, 1-2
	NT6X85 in an SMS-R	Vol. 6, 1-13
	NT6X85 in an SMU	Vol. 6, 1-24

NT6X86 in an SMS	Vol. 6, 1-30
NT6X86 in an SMS-R	Vol. 6, 1-39
NT6X87 in an RSC LCME	Vol. 6, 1-48
NT6X87 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-56
NT6X92 in an RSC-M	Vol. 6, 1-64
NT6X92 in an RSC RCC/RCC2	Vol. 6, 1-71
NT6X92 in an RSC-S (DS-1) Model A RCC2	Vol. 6, 1-79
NT6X92 in an RSC-S (DS-1) Model B RCC2	Vol. 6, 1-87
NT6X92 in an RSC-S (PCM-30) Model A RCO2	Vol. 6, 1-95
NT6X92 in an RSC-S (PCM-30) Model B RCO2	Vol. 6, 1-104
NT6X92 in an SMA	Vol. 6, 1-112
NT6X92 in an SMA-MVI-20	Vol. 6, 1-118
NT6X92 in an SMA2	Vol. 6, 1-125
NT6X92 in an SMS	Vol. 6, 1-132
NT6X92 in an SMU	Vol. 6, 1-140
NT6X99 in an IOPAC ILCM	Vol. 6, 1-146
NT6X99 in an OPAC LCM	Vol. 6, 1-150
NT6X99 in an OPM	Vol. 6, 1-154
NT6X99 in an RLCM	Vol. 6, 1-158
NT6X99 in an RSC LCM	Vol. 6, 1-162
NT6X99 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-170
NT6X99 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-178
NT6X99 in a STAR or RLD	Vol. 6, 1-186
NT7X05 in an RSC RCC/RCC2	Vol. 6, 1-190
NT7X05 in an RSC-S (DS-1) Model A RCC2	Vol. 6, 1-198
NT7X05 in an RSC-S (DS-1) Model B RCC2	Vol. 6, 1-207
NT7X05 in an RSC-S (PCM-30) Model A RCO2	Vol. 6, 1-216
NT7X05 in an RSC-S (PCM-30) Model B RCO2	Vol. 6, 1-225
NT7X05 in an SMS	Vol. 6, 1-234
NT7X05 in an SMS-R	Vol. 6, 1-243
NT7X05 in an SMU	Vol. 6, 1-252
NT8X02 in an OPAC BCU	Vol. 6, 1-261
NT8X02 in an OPM BCU	Vol. 6, 1-265
NT8X18 in an SMS-R	Vol. 6, 1-270
NTAX74 in an RSC-S (DS-1) Model A RCC2	Vol. 6, 1-281
NTAX74 in an RSC-S (DS-1) Model B RCC2	Vol. 6, 1-292
NTAX74 in an RSC-S (PCM-30) Model A RCO2	Vol. 6, 1-303
NTAX74 in an RSC-S (PCM-30) Model B RCO2	Vol. 6, 1-315
NTAX74 in an SMA	Vol. 6, 1-327
NTAX74 in an SMA-MVI-20	Vol. 6, 1-337
NTAX74 in an SMA2	Vol. 6, 1-347
NTAX78 in an SMA	Vol. 6, 1-355
NTAX78 in an SMA-MVI-20	Vol. 6, 1-362
NTAX78 in an SMU	Vol. 6, 1-369
NTBX01 in an RSC RCC2	Vol. 6, 1-374
NTBX01 in an RSC-S (DS-1) Model A RCC2	Vol. 6, 1-381
NTBX01 in an RSC-S (DS-1) Model B RCC2	Vol. 6, 1-390
NTBX01 in an RSC-S (PCM-30) Model A RCO2	Vol. 6, 1-399
NTBX01 in an RSC-S (PCM-30) Model B RCO2	Vol. 6, 1-408
NTBX01 in an SMA	Vol. 6, 1-417
NTBX01 in an SMA-MVI-20	Vol. 6, 1-423

NTBX01 in an SMA2	Vol. 6, 1-430
NTBX01 in an SMU	Vol. 6, 1-437
NTBX02 in an RSC RCC2	Vol. 6, 1-443
NTBX02 in an RSC-S (DS-1) Model A RCC2	Vol. 6, 1-456
NTBX02 in an RSC-S (DS-1) Model B RCC2	Vol. 6, 1-469
NTBX02 in an RSC-S (PCM-30) Model A RCO2	Vol. 6, 1-482
NTBX02 in an RSC-S (PCM-30) Model B RCO2	Vol. 6, 1-495
NTBX02 in an SMA	Vol. 6, 1-508
NTBX02 in an SMA-MVI-20	Vol. 6, 1-515
NTBX02 in an SMA2	Vol. 6, 1-523
NTBX02 in an SMU	Vol. 6, 1-529
NTBX26 in an RSC LCME	Vol. 6, 1-538
NTBX26 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-546
NTBX26 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-554
NTBX27 in an RSC LCME	Vol. 6, 1-562
NTBX27 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-570
NTBX27 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-578
NTBX27 in a STAR or RLD	Vol. 6, 1-586
NTBX34 in an RSC LCME	Vol. 6, 1-593
NTBX34 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-601
NTBX34 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-611
NTBX34 in an RSC-S (PCM-30) Model A LCME	Vol. 6, 1-621
NTBX35 in an RSC LCME	Vol. 6, 1-630
NTBX35 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-638
NTBX35 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-648
NTBX35 in an RSC-S (PCM-30) Model A LCME	Vol. 6, 1-658
NTBX36 in an RSC LCME	Vol. 6, 1-667
NTBX36 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-677
NTBX36 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-687
NTBX72 in an RSC LCME	Vol. 6, 1-697
NTBX72 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-706
NTBX72 in an RSC-S (DS-1) Model B LCME	Vol. 6, 1-715
NTBX72 in an RSC-S (PCM-30) Model A LCME	Vol. 6, 1-724
NTEX17 in an RLCM	Vol. 6, 1-733
NTEX17 in an RSC LCM	Vol. 6, 1-743
NTEX17 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-753
NTEX17 in an RSC-S (DS-1) Model B LCM	Vol. 6, 1-763
NTEX17 in a STAR	Vol. 6, 1-773
NTEX54 in an RLCM	Vol. 6, 1-783
NTEX54 in an RSC LCM	Vol. 6, 1-800
NTEX54 in an RSC-S (DS-1) Model A LCME	Vol. 6, 1-817
NTEX54 in an RSC-S (DS-1) Model B LCM	Vol. 6, 1-834
NTEX54 in a STAR	Vol. 6, 1-851
NTMX45 in an IOPAC HIE	Vol. 6, 1-868
NTMX45 in an OPAC HIE	Vol. 6, 1-878
NTMX45 in an OPM HIE	Vol. 6, 1-888
NTMX45 in an RLCM HIE	Vol. 6, 1-898
NTMX71 in an RSC	Vol. 6, 1-908
NTMX71 in an SMA	Vol. 6, 1-916
NTMX71 in an SMA-MVI-20	Vol. 6, 1-924
NTMX71 in an SMS	Vol. 6, 1-932

NTMX71 in an SMU Vol. 6, 1-940
NTMX72 in an RSC-M Vol. 6, 1-949
NTMX72 in an RSC RCC2 Vol. 6, 1-957
NTMX72 in an RSC-S (DS-1) Model A RCC2 Vol. 6, 1-966
NTMX72 in an RSC-S (DS-1) Model B RCC2 Vol. 6, 1-975
NTMX72 in an RSC-S (PCM-30) Model A RCO2 Vol. 6, 1-984
NTMX72 in an RSC-S (PCM-30) Model B RCO2 Vol. 6, 1-993
NTMX72 in an SMA2 Vol. 6, 1-1002

Card Replacement Procedures

Volume 7 of 7

1 XPM card replacement procedures (continued) Vol. 7, 1-1

NTMX73 in an RSC-M Vol. 7, 1-2
NTMX73 in an RSC RCC2 Vol. 7, 1-9
NTMX73 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-17
NTMX73 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-26
NTMX73 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-36
NTMX73 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-45
NTMX73 in an SMA2 Vol. 7, 1-54
NTMX74 in an RSC-M Vol. 7, 1-60
NTMX74 in an RSC RCC2 Vol. 7, 1-69
NTMX74 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-77
NTMX74 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-86
NTMX74 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-95
NTMX74 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-104
NTMX75 in an RSC-M Vol. 7, 1-113
NTMX75 in an RSC RCC2 Vol. 7, 1-120
NTMX75 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-128
NTMX75 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-136
NTMX75 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-144
NTMX75 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-153
NTMX75 in an SMA2 Vol. 7, 1-162
NTMX76 in an RSC-M Vol. 7, 1-168
NTMX76 in an RSC RCC2 Vol. 7, 1-175
NTMX76 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-182
NTMX76 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-188
NTMX76 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-195
NTMX76 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-205
NTMX76 in an SMA2 Vol. 7, 1-214
NTMX77 in an RSC Vol. 7, 1-221
NTMX77 in an RSC-M Vol. 7, 1-234
NTMX77 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-241
NTMX77 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-254
NTMX77 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-267
NTMX77 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-280
NTMX77 in an SMS Vol. 7, 1-293
NTMX77 in an SMS-R Vol. 7, 1-306

NTMX77 in an SMU	Vol. 7, 1-318
NTMX79 in an RSC EXT	Vol. 7, 1-333
NTMX79 in an RSC-M	Vol. 7, 1-343
NTMX79 in an RSC-S (DS-1) Model A EXT	Vol. 7, 1-349
NTMX79 in an RSC-S (DS-1) Model B EXT	Vol. 7, 1-359
NTMX79 in an RSC-S (PCM-30) Model A EXT	Vol. 7, 1-370
NTMX79 in an RSC-S (PCM-30) Model B EXT	Vol. 7, 1-380
NTMX79 in an SMA2	Vol. 7, 1-390
NTMX81 in an RSC RCC2	Vol. 7, 1-397
NTMX81 in an RSC-S (DS-1) Model A RCC2	Vol. 7, 1-409
NTMX81 in an RSC-S (DS-1) Model B RCC2	Vol. 7, 1-421
NTMX81 in an SMA2	Vol. 7, 1-435
NTMX81 in a STAR	Vol. 7, 1-451
NTMX82 in an RSC-M	Vol. 7, 1-465
NTMX82 in an RSC-S (PCM-30) Model A RCO2	Vol. 7, 1-476
NTMX82 in an RSC-S (PCM-30) Model B RCO2	Vol. 7, 1-486
NTMX87 in an RSC-M	Vol. 7, 1-496
NTMX87 in an RSC RCC2	Vol. 7, 1-508
NTMX87 in an RSC-S (DS-1) Model A RCC2	Vol. 7, 1-528
NTMX87 in an RSC-S (DS-1) Model B RCC2	Vol. 7, 1-548
NTMX87 in an RSC-S (PCM-30) Model A RCO2	Vol. 7, 1-571
NTMX87 in an RSC-S (PCM-30) Model B RCO2	Vol. 7, 1-592
NTMX87 in an SMA2	Vol. 7, 1-613
NTRX41 in an IOPAC MSP	Vol. 7, 1-630
NTRX41 in an OPAC MSP	Vol. 7, 1-635
NTRX41 in an RSC-M/MSP	Vol. 7, 1-640
NTRX41 in an RSC MSP	Vol. 7, 1-645
NTRX41 in an RSC-S (DS-1) Model B MSP	Vol. 7, 1-650
NTRX41 in an SMA2 MSP	Vol. 7, 1-655
NTRX42 in an IOPAC MSP	Vol. 7, 1-660
NTRX42 in an OPAC MSP	Vol. 7, 1-677
NTRX42 in an RSC-M/MSP	Vol. 7, 1-695
NTRX42 in an RSC MSP	Vol. 7, 1-707
NTRX42 in an RSC-S (DS-1) Model B MSP	Vol. 7, 1-726
NTRX42 in an RSC-S (PCM-30) Model B MSP	Vol. 7, 1-746
NTRX42 in an SMA2 MSP	Vol. 7, 1-766
NTRX43 in an IOPAC MSP	Vol. 7, 1-778
NTRX43 in an OPAC MSP	Vol. 7, 1-785
NTRX43 in an RSC-M/MSP	Vol. 7, 1-792
NTRX43 in an RSC MSP	Vol. 7, 1-800
NTRX43 in an RSC-S (DS-1) Model B MSP	Vol. 7, 1-808
NTRX43 in an SMA2 MSP	Vol. 7, 1-816
NTRX44 in an IOPAC MSP	Vol. 7, 1-824
NTRX44 in an OPAC MSP	Vol. 7, 1-836
NTRX44 in an RSC MSP	Vol. 7, 1-848
NTRX44 in an RSC-S (DS-1) Model B MSP	Vol. 7, 1-858
NTRX54 in an RSC-M/MSP	Vol. 7, 1-868
NTRX54 in an RSC MSP	Vol. 7, 1-875
NTRX54 in an RSC-S (DS-1) Model B MSP	Vol. 7, 1-882
NTRX54 in an SMA2 MSP	Vol. 7, 1-889
NTRX66 MSP	Vol. 7, 1-896

NTTR46 in an RLD	Vol. 7, 1-902
NTTR47 in an RLD	Vol. 7, 1-908
NTTR60 in a STAR	Vol. 7, 1-914
NTTR66 in an RLD	Vol. 7, 1-921
NTTR67 in an RLD	Vol. 7, 1-927
NTTR70 in an RLD	Vol. 7, 1-934
NTTR71 in an RLD	Vol. 7, 1-941
NTTR72 in an RLD	Vol. 7, 1-946
NTTR73 in a STAR	Vol. 7, 1-952
NTTR74 in a STAR	Vol. 7, 1-956
NTTR75 in a STAR	Vol. 7, 1-962
NTTR76 in a STAR	Vol. 7, 1-970
NTTR77 in a STAR	Vol. 7, 1-979
NTTR87 in a STAR	Vol. 7, 1-986

About this document

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the *same* software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in *Product Documentation Directory*, 297-8991-001.

References in this document

The following documents are referred to in this document:

- *1-Meg Modem Service Network Implementation Manual*, 297-8063-200
- *Alarm Clearing and Performance Monitoring Procedures*
- *Customer Data Schema Reference Manual*, 297-8001-351
- *Digital Recorded Announcement Machine DRAM and EDRAM Guide*, 297-1001-527
- *Routine Maintenance Procedures*

As of NA0011 (LEC and LET) and EUR010 (EUR) releases, any references to the data schema section of the Translations Guide will be mapped to the *Customer Data Schema Reference Manual*.

What precautionary messages mean

The types of precautionary messages used in NT documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

ATTENTION - Information needed to perform a task

ATTENTION

If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

DANGER - Possibility of personal injury



DANGER

Risk of electrocution

Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high-voltage lines. Until the fuses are removed, the high-voltage lines are active, and you risk being electrocuted.

WARNING - Possibility of equipment damage



WARNING

Damage to the backplane connector pins

Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

CAUTION - Possibility of service interruption or degradation**CAUTION****Possible loss of service**

Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

>BSY

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

>BSY CTRL

Variables

Variables are shown in lowercase letters:

>BSY CTRL ctrl_no

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different type:

FP 3 Busy CTRL 0: Command request has been submitted.

FP 3 Busy CTRL 0: Command passed.

1 Breaker interface panel card replacement procedures

Introduction

This chapter contains card replacement procedures for the Universal Edge 9000 (UEN) breaker interface panel (BIP).

Each procedure contains the following sections:

- Application
- Common procedures
- Action

Application

This section identifies the BIP card(s) included in the replacement procedure.

Common procedures

This section lists common procedures for the BIP card replacement procedure. A common procedure is a series of steps that repeat in maintenance procedures. The removal and replacement of a card is an example of a common procedure. Common procedures are in the common procedures chapter in this NTP.

Do not use common procedures unless the step-action procedure directs you to do so.

Action

This section contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

Recording card replacement activities

When you replace a card, record the following information in office records:

- the serial number of the card you replaced
- the date you replaced the card
- the reason you replaced the card

Circuit breaker in a BIP

Application

Use this procedure to replace the breakers in the NTNY17 breaker interface panel (BIP) identified in the table that follows.

Part number	Name
A0829305	10 Amp plug-in circuit breaker
A0829380	15 Amp plug-in circuit breaker

Common procedures

This procedure does not refer to any common procedures.

Next level of maintenance

Repeat this procedure if it is not successful when you first perform the procedure.

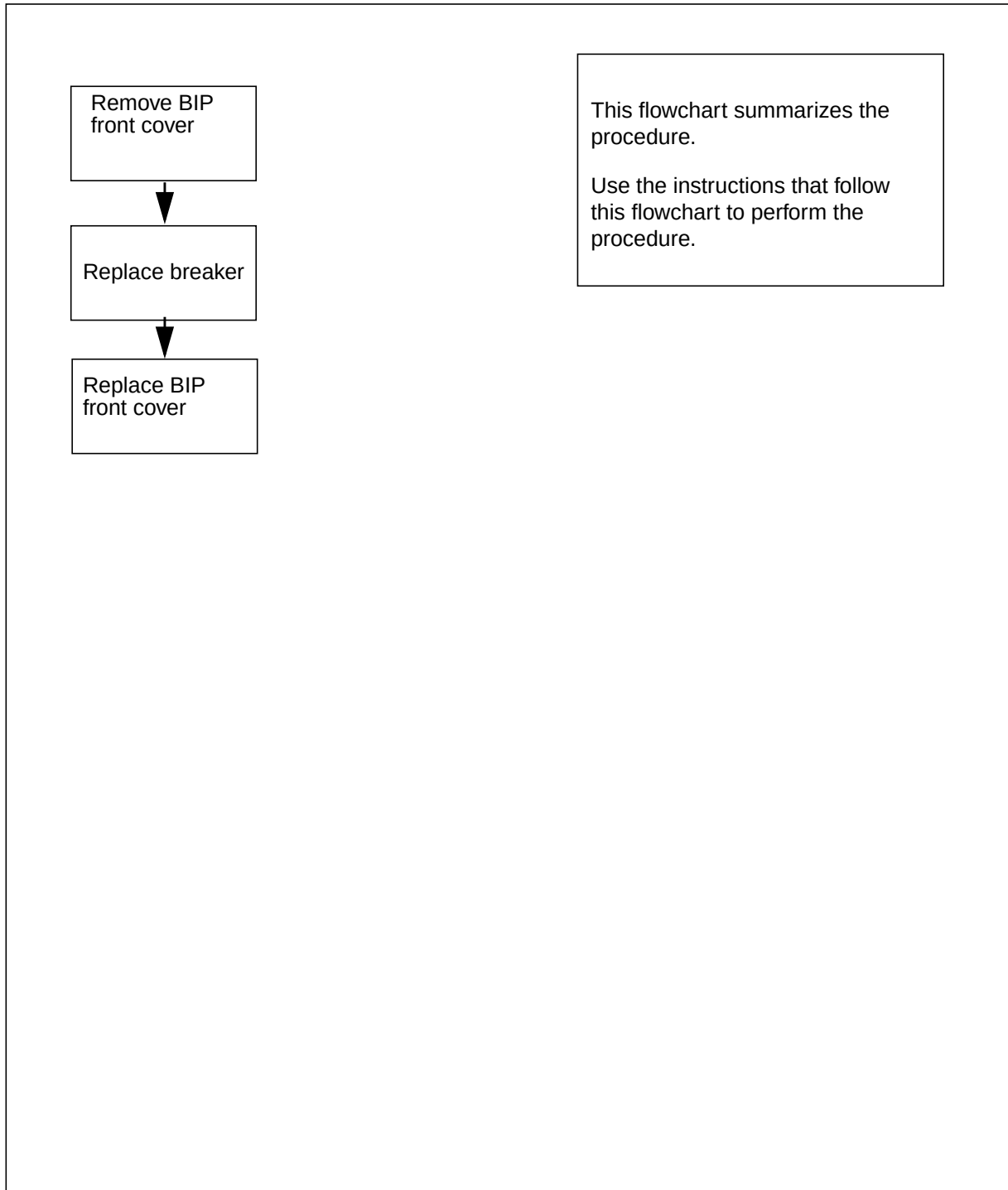
A problem can occur that requires the help of the local maintenance personnel. Gather all important logs, reports, and system information (that is, product type and current software load) for analysis. The related logs, maintenance notes, and system information help make sure that the next level of maintenance and support can find the problem. More detail about logs appears in the *Log Report Reference Manual*.

Action

The flowchart that follows provides a summary of this procedure. Use the instructions in the step action procedure that follows the flowchart to replace the card.

Circuit breaker in a BIP (continued)

Summary of replacing alarm Circuit breaker in BIP



Circuit breaker in a BIP (continued)

Replacing a Circuit breaker module in a BIP

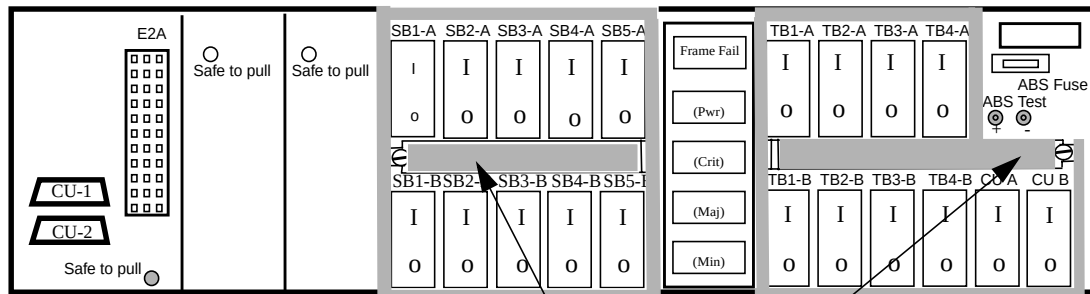
At your current location

- 1 Proceed only if you have been directed to this card replacement procedure from a step in a maintenance procedure, are using the procedure for verifying or accepting cards, or have been directed to this procedure by your maintenance support group.
- 2 Obtain a replacement breaker. Verify that the replacement breaker has the same product equipment code (PEC), including suffix, as the breaker that is to be removed.

At the UEN frame

- 3 Make sure the UEN shelf components are redundantly powered from the PDC feeds.

Breaker interface panel



Breaker retaining bracket with captive screw

Note: This procedure can be performed on equipment in service without the need to power down the shelves. However, it is recommended that this procedure be performed during periods of low traffic.

- 4 Remove the BIP front cover by pulling it towards you.
- 5 Record the position (on or off) of the circuit breaker to be replaced (SB1A to SB5A, SB1B to SB5B, TB1-A to TB4-A, TB1-B to TB4-B, CUA and CUB) depending on the circuit breaker being replaced.

Note: Turning off the circuit breaker generates a minor alarm because the circuit breaker A or B power failure alarm points are enabled. If an audible alarm is generated, press the alarm cut-off (ACO) button.

- 6 At the BIP, turn off the circuit breaker noted in step 5 that needs to be replaced.

Circuit breaker in a BIP (end)

- 7 Remove the breaker retaining bracket that runs between and around the outside of the two rows of breakers by loosening the captive screw on the right or left side of the bar, depending on the breaker to be replaced. See the "Breaker interface panel" figure.
- 8 Pull the breaker out.
- 9 Insert the replacement circuit breaker into the empty slot.
- 10 Replace the breaker retaining bracket by locking the left or right side of the bar into place, then swinging the bar into place until the captive screw aligns with the screw hole.
- 11 Use a slot screwdriver to fasten the captive screw on the retaining bar into place.
- 12 Switch the circuit breaker to the On position.
- 13 Replace the BIP cover.
- 14 Verify that the alarm generated in step 5 clears.
- 15 The procedure is complete.

**NTNY24
in a BIP**

Application

Use this procedure to replace the NTNY24 card in the NTNY17 breaker interface panel (BIP) identified in the table that follows.

PEC	Suffixes	Name
NTNY24	AA	Alarm card assembly

If you cannot identify the PEC, suffix, and shelf or frame for the card you want to replace, refer to the “Index” in this document. The index lists the cards, shelves, and frames in this card replacement NTP.

Common procedures

This procedure refers to the “Returning a card for repair or replacement” common procedure.

Do not go to the common procedure unless the step-action procedure directs you to do so.

Next level of maintenance

Repeat this procedure if it is not successful when you first perform the procedure.

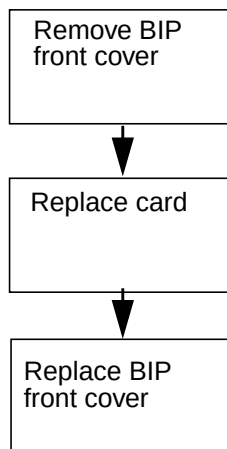
A problem can occur that requires the help of the local maintenance personnel. Gather all important logs, reports, and system information (that is, product type and current software load) for analysis. The related logs, maintenance notes, and system information help make sure that the next level of maintenance and support can find the problem. More detail about logs appears in the *Log Report Reference Manual*.

Action

The flowchart that follows provides a summary of this procedure. Use the instructions in the step action procedure that follows the flowchart to replace the card.

NTNY24 in a BIP (continued)

Summary of replacing alarm NTNY24 in BIP



This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.

NTNY24 in a BIP (continued)

Replacing alarm NTNY24 in a BIP

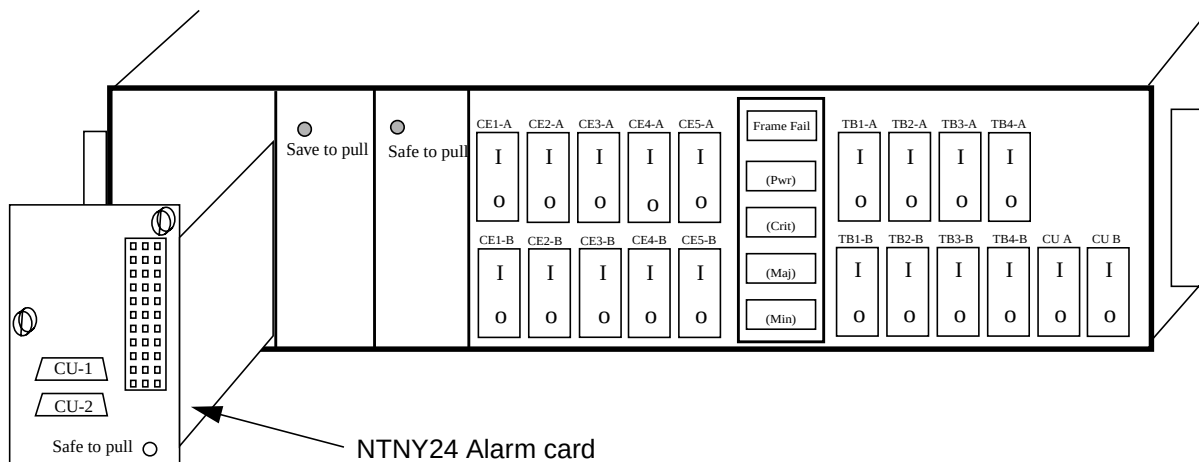
At your current location

- 1 Proceed only if you have been directed to this card replacement procedure from a step in a maintenance procedure, are using the procedure for verifying or accepting cards, or have been directed to this procedure by your maintenance support group.
- 2 Obtain a replacement card. Verify that the replacement card has the same product equipment code (PEC), including suffix, as the card that is to be removed.

At the UEN frame

- 3 Remove the BIP front cover.
- 4 Loosen the two hold-down screws on the faceplate of the alarm card
- 5 Disconnect the two cooling unit alarm connectors on the face of the alarm card and if equipped, use a tie-wrap tool to remove the alarm leads from the E2A connector.
- 6 Remove the card from the BIP, as shown in the following figure.

Front view of BIP with the alarm card extended



- 7 Insert a replacement alarm card in the BIP and fasten the card into place with the two hold-down screws.
- 8 Reconnect the two cooling unit alarm cables to the connectors on the face of the alarm card. Use a tie-wrap tool to reconnect the alarm leads to the E2A connector.
- 9 Replace the BIP front cover.

NTNY24
in a BIP (end)

10	The next action depends on the reason that you perform this procedure.						
	<table border="0"><tr><td style="padding-right: 20px;">If a maintenance procedure</td><td>Do</td></tr><tr><td>directed you to this procedure</td><td>step 11</td></tr><tr><td>did not direct you to this procedure</td><td>step 12</td></tr></table>	If a maintenance procedure	Do	directed you to this procedure	step 11	did not direct you to this procedure	step 12
If a maintenance procedure	Do						
directed you to this procedure	step 11						
did not direct you to this procedure	step 12						
11	Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.						
12	Perform the "Returning a card for repair or replacement" procedure in this document and return to this step.						
13	The procedure is complete.						

**NTNY25
in a BIP**

Application

Use this procedure to replace the NTNY25 card in the NTNY17 breaker interface panel (BIP) identified in the table that follows.

PEC	Suffixes	Name
NTNY25	AA	Talk battery filter

If you cannot identify the PEC, suffix, and shelf or frame for the card you want to replace, refer to the “Index” in this document. The index lists the cards, shelves, and frames in this card replacement NTP.

Common procedures

This procedure refers to the “Returning a card for repair or replacement” common procedure.

Do not go to the common procedure unless the step-action procedure directs you to do so.

Next level of maintenance

Repeat this procedure if it is not successful when you first perform the procedure.

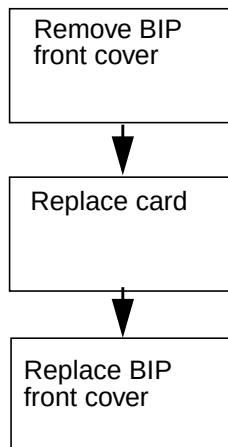
A problem can occur that requires the help of the local maintenance personnel. Gather all important logs, reports, and system information (that is, product type and current software load) for analysis. The related logs, maintenance notes, and system information help make sure that the next level of maintenance and support can find the problem. More detail about logs appears in the *Log Report Reference Manual*.

Action

The flowchart that follows provides a summary of this procedure. Use the instructions in the step action procedure that follows the flowchart to replace the card.

NTNY25 in a BIP (continued)

Summary of replacing an NTNY25 in a BIP



This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.

NTNY25 in a BIP (continued)

Replacing an NTNY25 in a BIP

At your current location

- 1 Proceed only if you have been directed to this card replacement procedure from a step in a maintenance procedure, are using the procedure for verifying or accepting cards, or have been directed to this procedure by your maintenance support group.
- 2 Obtain a replacement card. Verify that the replacement card has the same product equipment code (PEC), including suffix, as the card that is to be removed.

At the UEN frame

- 3 Remove the BIP front cover.

Note: The talk battery filter (TBF) card should always be engaged and disengaged from a powered up BIP for proper circuit reset and fast discharge of the talk battery filter card's capacitors.

4



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point to handle cards. The wrist-strap grounding point is on the local craft access panel (LCAP). The wrist strap protects the cards against static electricity damage.



DANGER

Risk of electrical shock

To avoid possible shock hazard when removing the talk battery filter card, handle the card only by the faceplate. Risk of electrical shock is no longer present after 3 minutes, at which time the internal capacitor has fully discharged.

NTNY25 in a BIP (continued)



DANGER

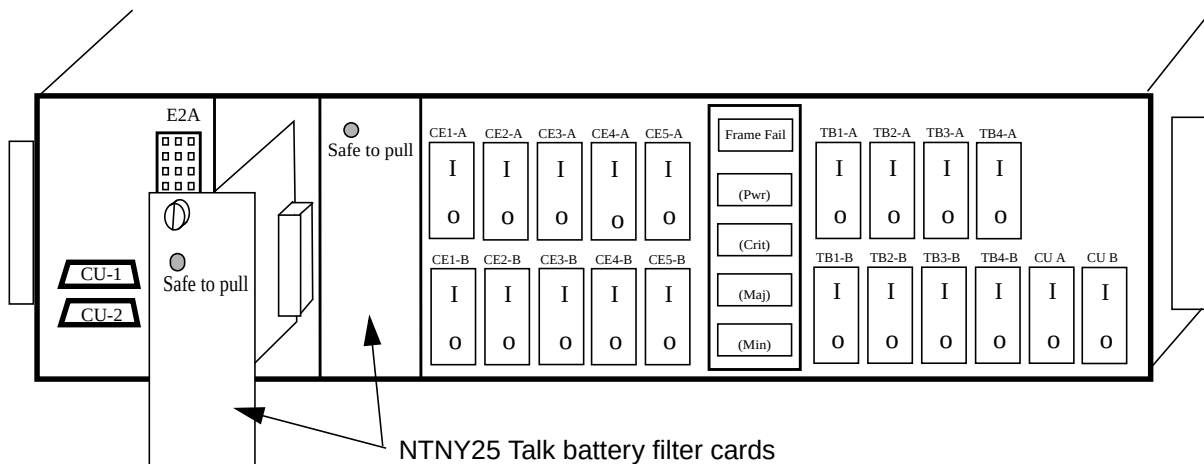
Risk of equipment damage

Do not place the talk battery filter card on a conductive surface, as it contains a large capacitor that can discharge. Place the card on a nonconductive surface for 3 minutes until the capacitor has had a chance to fully discharge internally.

Do not reinsert the same card until it has had a chance to fully discharge, which takes approximately 3 minutes. Reinserting a card that has not fully discharged may cause voltage transients on the talk battery leads.

- 5 Loosen the hold-down screw on the faceplate of the talk battery filter card.
Hold the talk battery filter card by its faceplate and carefully remove the card from the BIP, as shown in the following figure. Do not place the card on a conductive surface.

Front view of BIP with talk battery card extended



- 6 Insert a replacement talk battery filter card in the BIP and fasten the card into place with the hold-down screw.
- 7 Replace the BIP front cover.
- 8 The next action depends on the reason that you perform this procedure.

If a maintenance procedure	Do
directed you to this procedure	step 9
did not direct you to this procedure	step 10

NTNY25
in a BIP (end)

- 9** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.
- 10** Perform the “Returning a card for repair or replacement” procedure in this document and return to this step.
- 11** The procedure is complete.

2 SuperNode computing module card replacement procedures

Introduction

This chapter provides card replacement procedures for the SuperNode computing module (CM). The first section in this chapter provides designs that show SuperNode CM shelf designs.

Card replacement procedures for the SuperNode SE CM appear in the chapter "SuperNode SE computing module and system load module card replacement procedures".

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) are in the chapter "Frame supervisory panel and maintenance supervisory panel card replacement procedures".

Each procedure contains the following sections:

- Application
- Common procedures
- Action

Application

This section identifies the CM card(s) covered by the replacement procedure.

Common procedures

This section lists common procedures included in the CM card replacement procedure. A common procedure is a series of steps repeated within maintenance procedures. Common procedures include procedures like the steps for the removal and replacement of a card. Common procedures appear in the common procedures chapter in this NTP.

Do not go to the common procedure unless the step-action procedure directs you.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

Recording card replacement activities

When you replace a card, record the following information in office records:

- the serial number of the card replaced
- the date you replaced the card
- the reason you replaced the card

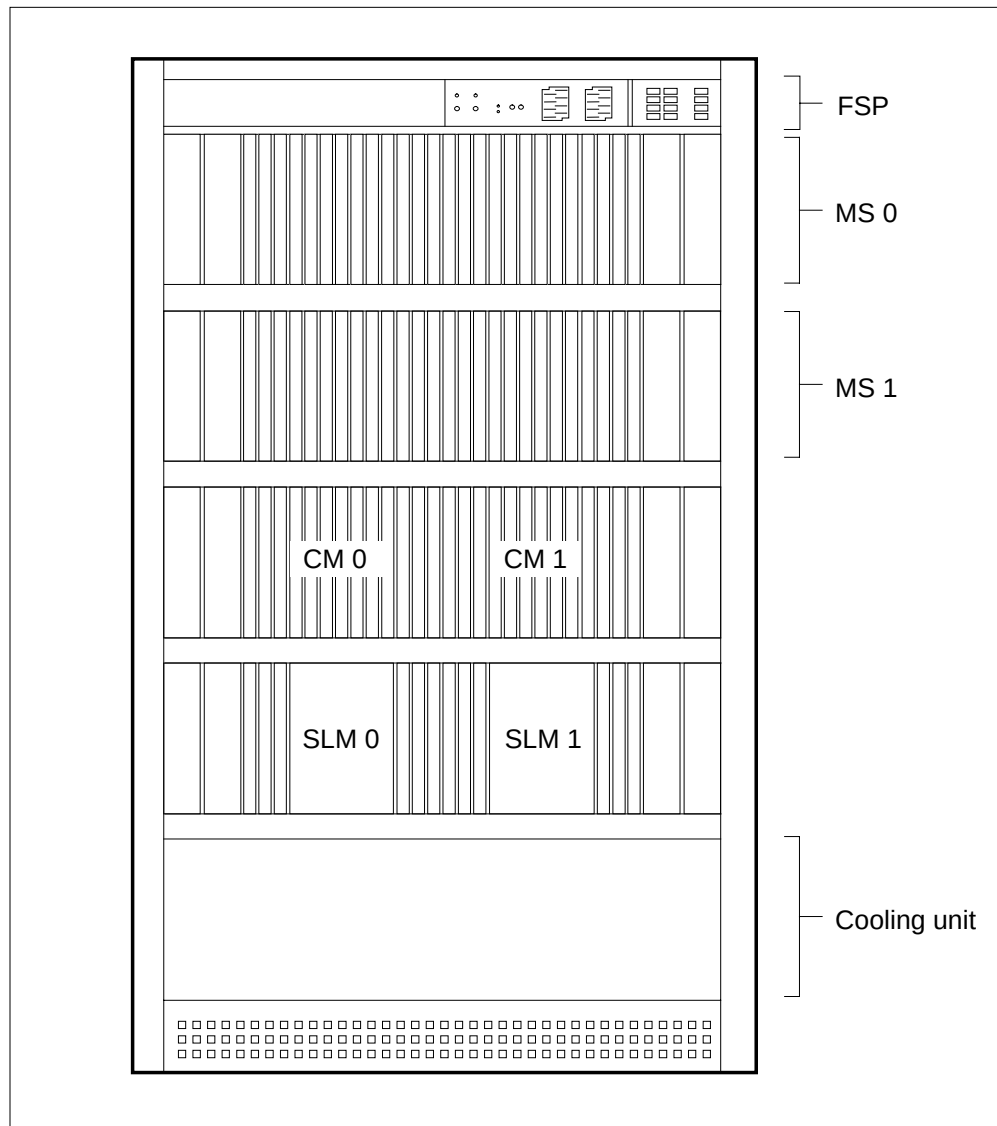
SuperNode CM shelf layouts

Application

This procedure provides the following design diagrams:

- two-plane combined core cabinet (DPCC)
- SuperNode computing module (CM)

Dual-plane combined core cabinet



SuperNode CM shelf layouts (end)

SuperNode computing module

<i>Paddle boards</i>		<i>Cards</i>	
		NT9X30 +5V 86-A power converter card	36F
		NT9X31 -5V 20-A power converter card	33F
32R	NT9X21 CM-bus terminator PB	NT9X14 Memory card	32F
31R	NT9X27AA CM-bus extender PB	NT9X14 Memory card	31F
30R	NT9X19 Filler faceplate	NT9X14 Memory card	30F
29R	NT9X19 Filler faceplate	NT9X14 Memory card	29F
28R	NT9X19 Filler faceplate	NT9X14 Memory card	28F
27R	NT9X19 Filler faceplate	NT9X14 Memory card	27F
26R	NT9X19 Filler faceplate	NT9X14 Memory card	26F
25R	NT9X19 Filler faceplate	NT9X14 Memory card	25F
24R	NT9X19 Filler faceplate	NT9X14 Memory card	24F
23R	NT9X22 CM subsystem clock PB	NT9X14 Memory card	23F
22R	NT9X20 DS512 PB	NT9X12 CPU port card	22F
21R	NT9X20 DS512 PB	NT9X12 CPU port card	21F
20R	NT9X26 RTIF PB	NT9X10/NT9X13 CPU card	20F
19R	NT9X26 RTIF PB	NT9X10/NT9X13 CPU card	19F
18R	NT9X20 DS512 PB	NT9X12 CPU port card	18F
17R	NT9X20 DS512 PB	NT9X12 CPU port card	17F
16R	NT9X22 CM subsystem clock PB	NT9X14 Memory card	16F
15R	NT9X19 Filler faceplate	NT9X14 Memory card	15F
14R	NT9X19 Filler faceplate	NT9X14 Memory card	14F
13R	NT9X19 Filler faceplate	NT9X14 Memory card	13F
12R	NT9X19 Filler faceplate	NT9X14 Memory card	12F
11R	NT9X19 Filler faceplate	NT9X14 Memory card	11F
10R	NT9X19 Filler faceplate	NT9X14 Memory card	10F
09R	NT9X19 Filler faceplate	NT9X14 Memory card	09F
08R	NT9X27AA CM-bus extender PB	NT9X14 Memory card	08F
07R	NT9X21 CM-bus terminator PB	NT9X14 Memory card	07F
		NT9X30 +5V 86-A power converter card	04F
		NT9X31 -5V 20-A power converter card	01F

 *Rear*
Front 

NT9X20 in a SuperNode CM

Application

Use this procedure to replace a NT9X20 in a SuperNode computing module (CM), as listed in the following table.

PEC	Suffix	Card name	Shelf or frame name
NT9X20	AA	DS512 paddle board	CM
NT9X20	BB	DS512 interface CM-MS EN-MS paddle board	CM

Refer to the Index if you cannot identify the following features for the card you want to replace:

- the product engineering code (PEC)
- the PEC suffix
- the provisioned shelf or frame

The Index provides a list of the cards, shelves, and frames in this card replacement book.

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Activity switch with memory match*
- *Switching the clock source*

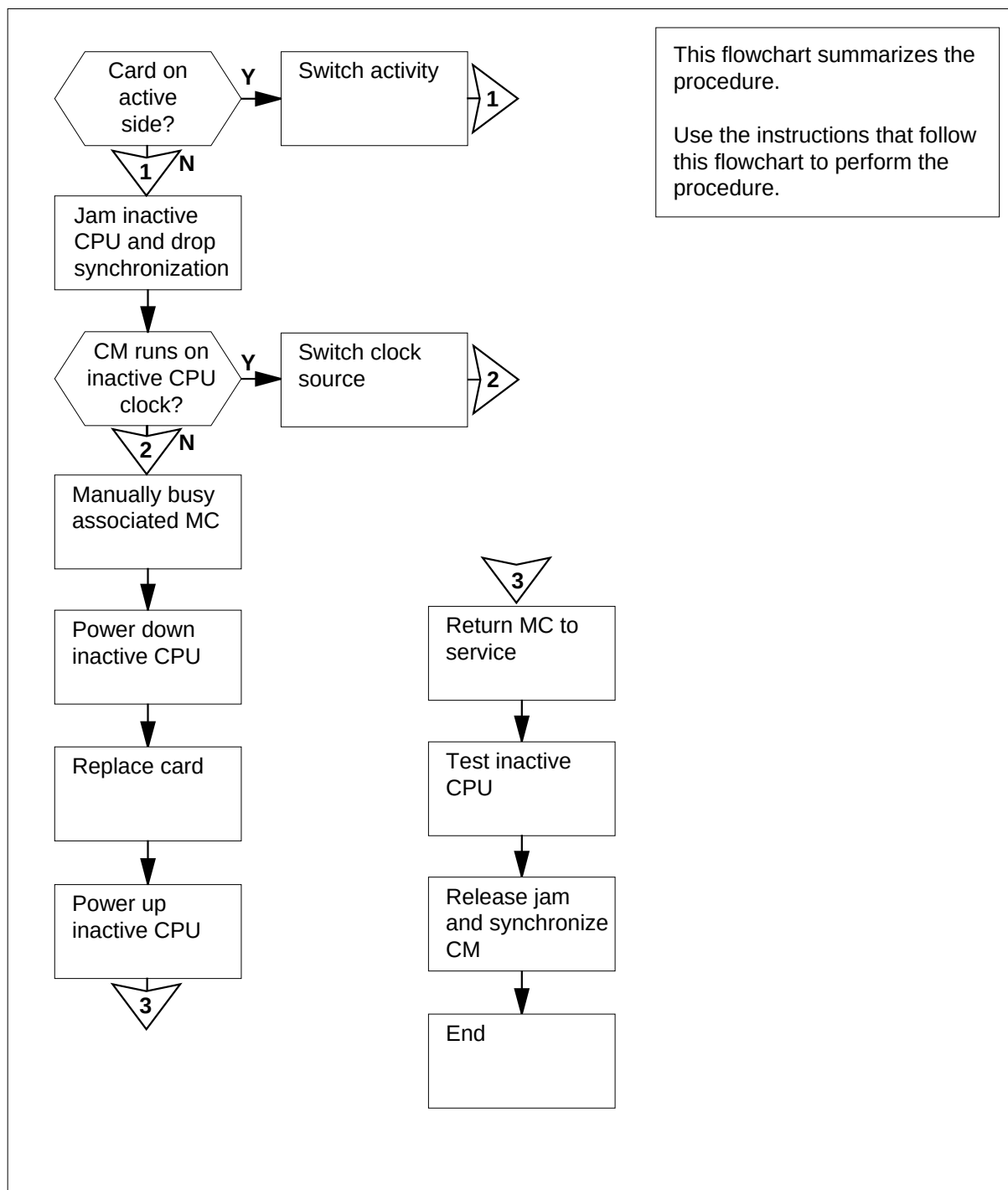
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NT9X20 in a SuperNode CM (continued)

Summary of replacing NT9X20 in a SuperNode CM



NT9X20 in a SuperNode CM (continued)

NT9X20 in a SuperNode CM

At the MAP terminal

- 1 Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card you want to replace.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.
- 3 To access the CM level of the MAP display, type
>MAPCI;MTC;CM
 and press the Enter key.

Example of a MAP display:

CM	Sync	Act	CPU0	CPU1	Jam	Memory	CMMnt	MC	PMC
0	no	cpu 1	.	.	yes	.	.	mbsy	.

- 4 Determine if the card that you replace associates with the active CPU or the inactive CPU.

Note: The active CPU appears under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1

If the card	Do
associates with the inactive CPU	step 5
associates with the active CPU	step 12

- 5 Determine if the inactive CPU jammed.

Note: The word yes under the Jam header indicates that the inactive CPU jammed. A blank field indicates that the CPU is not jammed.

If the inactive CPU	Do
is not jammed	step 6
is jammed	step 8

NT9X20 in a SuperNode CM (continued)

At the CM reset terminal for the inactive CPU

6



DANGER

Loss of service

Make sure that you do not jam the active CPU. If you jam the active CPU while the CM is not in sync, a cold restart occurs. The word Active on the top of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

>\JAM

and press the Enter key.

RTIF response:

Please confirm: (YES/NO)

7

To confirm the command, type

>YES

and press the Enter key.

RTIF response:

JAM DONE

At the MAP terminal

8

Determine if the CM is synchronized.

Note: A dot (.) or EccOn under the Sync header indicates that the CM is synchronized. The word NO means that the CM is not synchronized.

If the CM	Do
is synchronized	step 9
is not synchronized	step 13

9

To drop synchronization, type

>DPSYNC

NT9X20 in a SuperNode CM (continued)

and press the Enter key.

	If the response	Do
	is About to drop sync with CPU n active. The inactive CPU is JAMMED. Do you want to continue? Please confirm ("YES", "Y", "NO", or "N"):	step 10
	is other than listed here	step 42
10	To confirm the command, type >YES and press the Enter key. <i>Example of a MAP response:</i> Maintenance action submitted. Running in simplex mode with active CPU n.	

At the CM reset terminal for the inactive CPU

11	Wait until A1 flashes on the reset terminal for the inactive CPU. Note: Allow 5-min for A1 to begin to flash.	
	If A1	Do
	flashes	step 13
	does not flash	step 42
12	Perform the procedure <i>Activity switch with memory match</i> in this document. Complete the procedure and return to this point.	

NT9X20
in a SuperNode CM (continued)

At the MAP terminal

13



WARNING

Loss of service

Make sure that the CM runs on the clock of the inactive CPU. A cold restart or a system image reload can occur if you power down the inactive side of the CM. Do not power down the inactive side of the CM while the CM runs on the clock of the inactive CPU.

To determine if the CM runs on the clock of the inactive CPU, type

>INSYNC

and press the Enter key.

Example of a MAP response:

CPU pair is NOT insync, CPU 0 is active.
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

If the CM	Do
runs on the clock of the inactive CPU	step 14
runs on the clock of the active CPU	step 15

14 To run the CM on the clock of the active CPU, perform the procedure *Switching the clock source*. This procedure is in this document. Complete the procedure and return to this point.

15 To access the MC level of the MAP display, type

>MC

and press the Enter key.

Example of a MAP display:

MC 0 MC 1
mbsy .

NT9X20 in a SuperNode CM (continued)

- 16** Determine the state of the message controller (MC) on the inactive CPU.

Note: The word mbsy under the MC header means that the MC is manually busy.

If the state of the MC	Do
is mbsy	step 18
is not mbsy	step 17

- 17**



WARNING

Loss of service

Make sure that you busy the MC that corresponds to the inactive CPU. A warm restart occurs if you power down the plane with the wrong MC busied.

To manually busy the MC, type

>BSY mc_number

and press the Enter key.

where

mc_number

is the number of the MC on the inactive side (0 or 1)

Example of a MAP response:

Maintenance action submitted.
MC busied OK.

If the MC	Do
busied	step 18
did not busy	step 42

NT9X20 in a SuperNode CM (continued)

At the CM shelf

18



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist strap grounding point is on a frame supervisory panel (FSP) or modular supervisory panel (MSP). The wrist strap protects the cards against static electricity damage.

Power down the inactive CPU as follows:

- a Press down and release the power switch on the faceplate of the NT9X30 power converter on the inactive side of the CM shelf.

Note: For CPU 0, the power converter is in slots 4F through 6F. For CPU 1, the power converter is in slots 36F through 38F.

- b Press down and release the power switch on the faceplate of the NT9X31 power converter on the inactive side of the CM shelf.

Note: For CPU 0, the power converter is in slots 1F through 3F. For CPU 1, the power converter is in slots 33F through 35F.

19 Locate the card on the shelf.

20



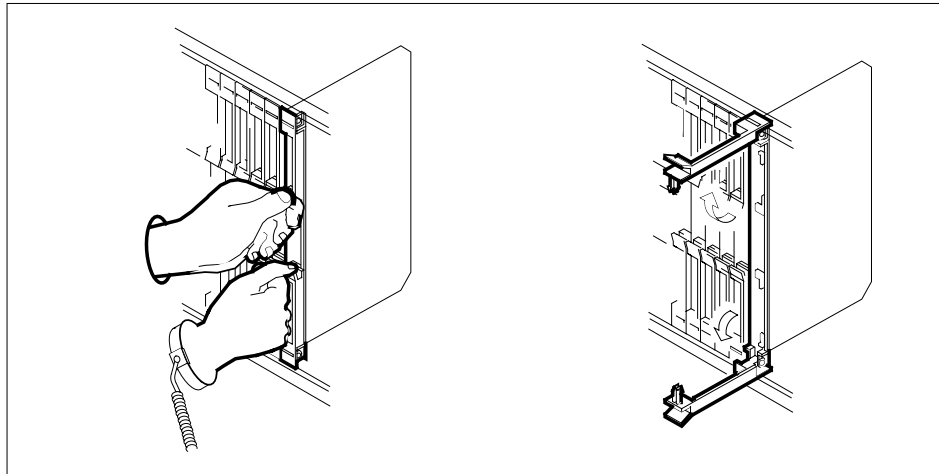
DANGER

Do not hold card by levers only

If you hold a card only by the levers, you can break the levers. When you pull the card half way out of the shelf, carefully grasp the card from below. Provide support while you continue to remove the card from the shelf. Make sure you do not touch any wires or internal parts on the card.

Open the locking levers on the card that you want to replace.

NT9X20 in a SuperNode CM (continued)



21



DANGER

Damage to fiber cables

When you handle fiber cables, make sure you do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

Label each fiber cable. Use Transmit for the top cable and Receive for the bottom cable.

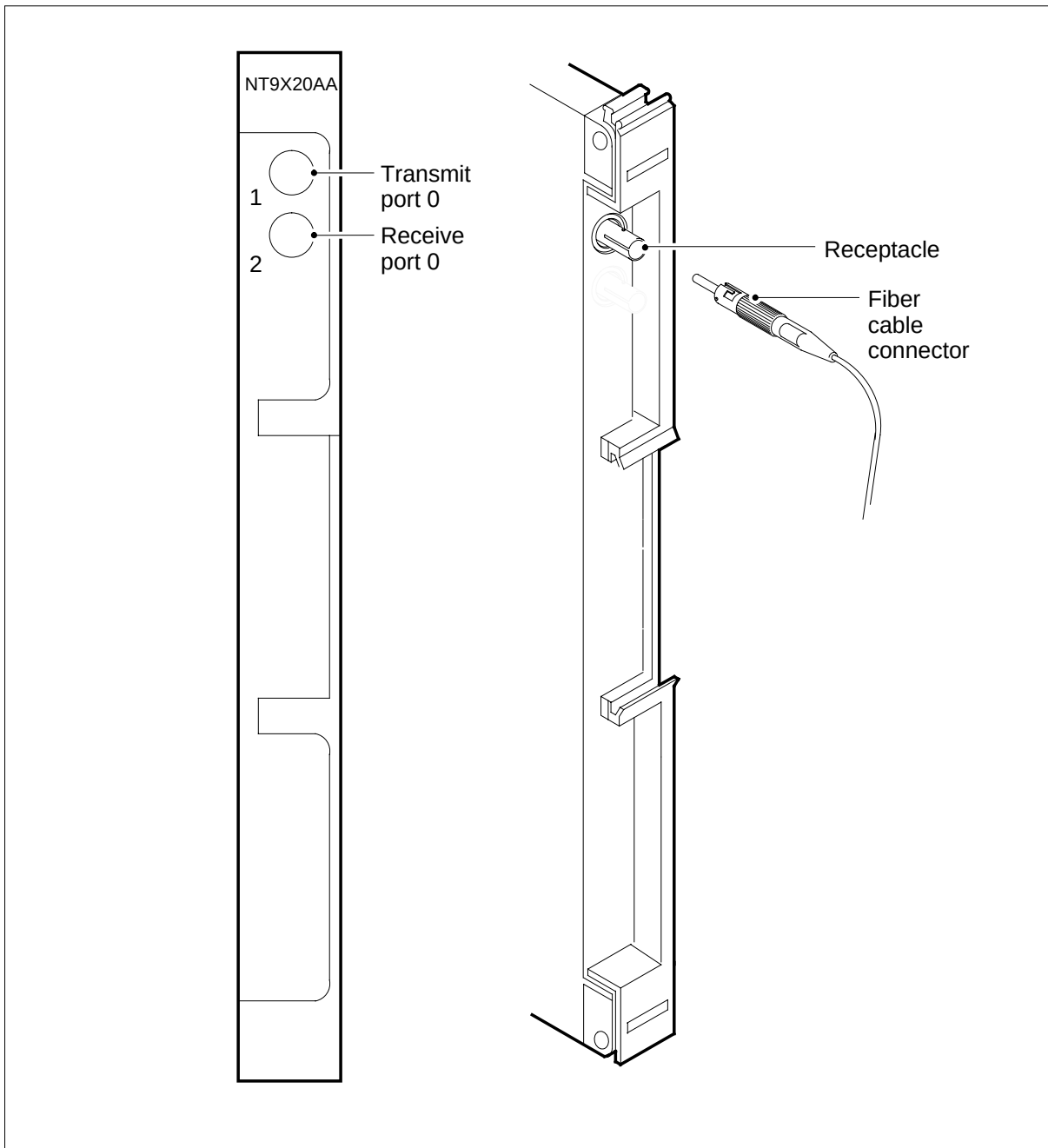
22

Disconnect the fiber cables from the faceplate of the card as follows:

- a Loosen the fiber connections, with the locking levers open.
- b Carefully push in and turn the fiber cable connector counter clockwise one half turn until the connector slides from its receptacle.

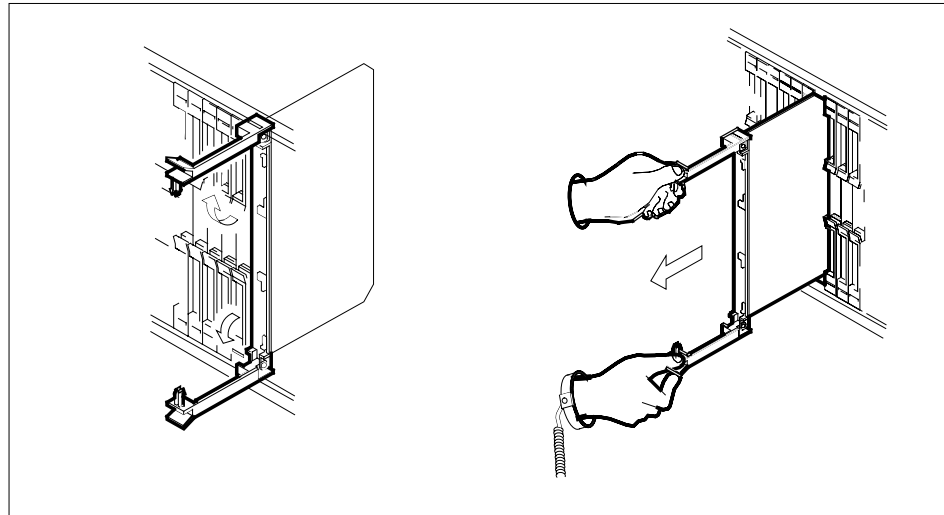
Note: Refer to the figure on the next page.

NT9X20 in a SuperNode CM (continued)

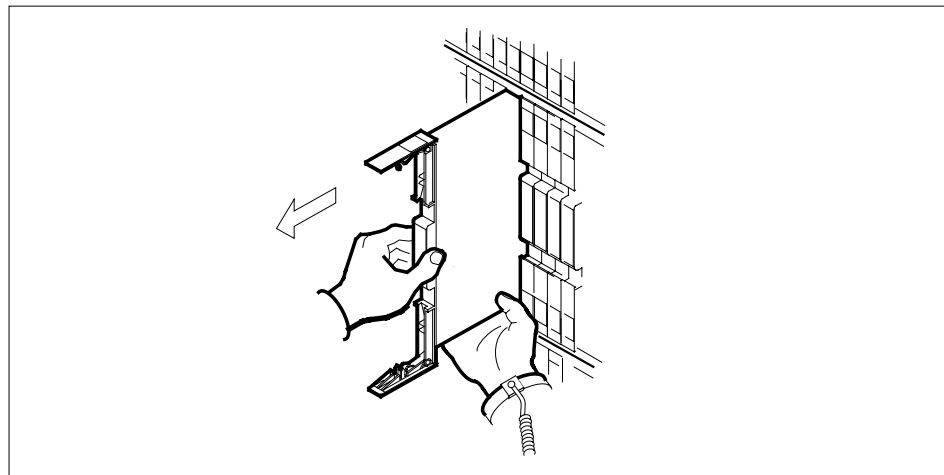


- 23** While you grasp the locking levers, carefully pull the card toward you until the card protrudes 2 in. (5.1 cm) from the equipment shelf.

NT9X20 in a SuperNode CM (continued)

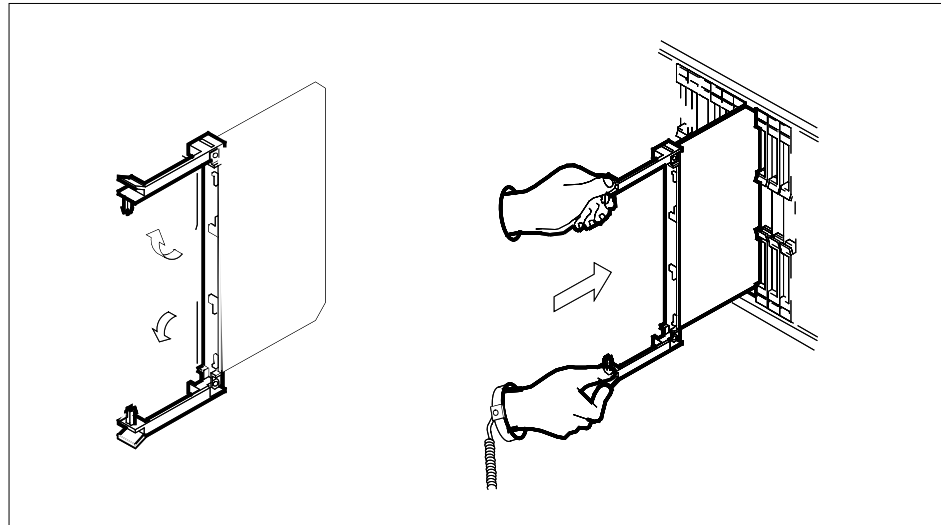


- 24** Hold the card by the face plate with one hand while you support the card from below with the other hand. Carefully pull the card toward you until the card clears the shelf.



- 25** Place the card you removed in an electrostatic discharge (ESD) protective container.
- 26** Make sure that the replacement card has the same PEC, including PEC suffix, as the card you removed.
- 27** Insert the replacement card into the shelf.
- a** Open the locking levers on the card.
 - b** Hold the card by the face plate with one hand while you support the card from below with the other hand. Carefully slide the card into the shelf.

NT9X20 in a SuperNode CM (continued)



28



DANGER

Damage to fiber cables

When you handle fiber cables, do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

Reconnect the fiber cables as follows:

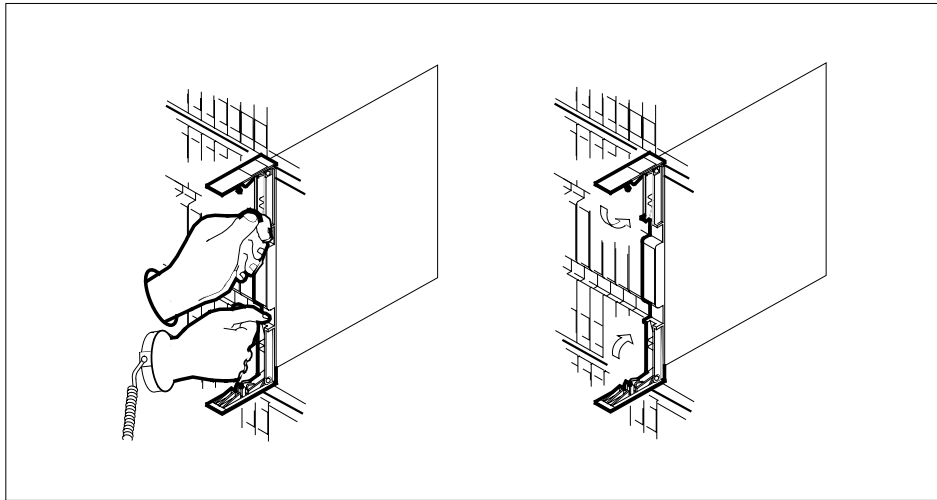
- a** Tighten the cable connections, with the locking levers open.
- b** Carefully guide the cable connector into the receptacle notches of the connector.
- c** Push in and turn the cable connector clockwise half a turn until the connection is tight.

29

Seat and lock the card.

- a** Use your fingers or thumbs to push on the upper and lower edges of the faceplate. Make sure that the card sits completely in the shelf.
- b** Close the locking levers to secure the card.

NT9X20 in a SuperNode CM (continued)



- 30** Power up the inactive CPU as follows:
- Lift and release the power switch on the faceplate of the NT9X30 power converter on the inactive side of the CM shelf.
Note: For CPU 0, the power converter is in slots 4F through 6F. For CPU 1, the power converter is in slots 36F through 38F.
 - Lift and release the power switch on the faceplate of the NT9X31 power converter on the inactive side of the CM shelf.
Note: For CPU 0, the power converter is in slots 1F through 3F. For CPU 1, the power converter is in slots 33F through 35F.

At the CM reset terminal for the inactive CPU

31



WARNING

Firmware tests must be completed

If firmware tests are not completed, the CPUs cannot synchronize.

Wait for the switch to complete firmware tests.

Example of an RTIF response:

NT9X20 in a SuperNode CM (continued)

```
Shelf      Slot
00         12      NT9X14DB...
00         13      NT9X14DB...
Waiting for activity...
```

Note: When firmware testing is in progress, dots appear on the right side of the PEC. The PEC is in the firmware testing status line of the RTIF response. As you complete each firmware test, another dot appears until firmware testing for the card is complete. When the firmware test sequence stops, the dots do not appear. The display does not show another firmware testing status line or the prompt Waiting for activity when the firmware test sequence stops.

- 32 Determine if the firmware tests are complete.

Note: If the firmware tests are complete and the CPU powered up, the display shows the message Waiting for activity.

If the inactive CPU	Do
powered up	step 33
did not power up	step 42

At the MAP terminal

- 33 Your next step depends on the reason for performing this procedure.

If you	Do
perform this procedure as a result of an MC Tbl alarm	step 37
perform this procedure as a result of a PMCFIt alarm	step 37
perform this procedure as a result of a PMCTbl alarm	step 37
perform this procedure as a result of a NoTOD alarm	step 37
perform this procedure as a result of an SBsyMC alarm	step 37
perform this procedure as a result of an MBsyMC alarm	step 37
perform this procedure as a result of a CBsyMC alarm	step 37
perform this procedure for any reason other than listed here	step 34

NT9X20 in a SuperNode CM (continued)

- 34** To access the MC level of the MAP display, type

>MC

and press the Enter key.

- 35** To return the manual busy MC to service, type

>RTS mc_number

and press the Enter key.

where

mc_number

is the number of the manual-busy MC (0 or 1)

Example of a MAP response:

Maintenance action submitted.

MC RTS OK.

If the RTS command	Do
passed	step 36
failed	step 42

- 36** The next action depends on the reason for performing this procedure.

If you	Do
perform this procedure as a result of a CM alarm clearing procedure	step 37
perform this procedure for any reason other than listed here	step 38

- 37** Return to the alarm clearing procedure that directed you to this procedure and continue as directed.

- 38** To test the inactive CPU, type

>CM;TST

and press the Enter key.

Example of a MAP response:

NT9X20 in a SuperNode CM (continued)

The test(s) listed below will destroy
the software load in inactive CPU:

Static RAM test

Do you want to do the test(s) anyway?
Please confirm: ("YES", "Y", "NO", or "N"):

39 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

Maintenance action submitted.
Test passed.

If the TST command	Do
passed	step 40
is other than listed here	step 42

At the CM reset terminal for the inactive CPU

40 To release the jam on the inactive CPU, type

>\RELEASE JAM

and press the Enter key.

RTIF response:

JAM RELEASE DONE

At the MAP terminal

41 To synchronize the CM, type

>SYNC

and press the Enter key.

Example of a MAP response:

NT9X20
in a SuperNode CM (end)

Maintenance action submitted.
Synchronization successful.

If the response	Do
indicates the SYNC command was successful	step 43
is other than listed here	step 42

- 42** For additional help, contact the next level of support.
- 43** The procedure is complete.

System cards in a SuperNode CM

Application

Use this procedure to replace the following cards in a SuperNode computing module (CM).

If you cannot identify the product engineering code (PEC), PEC suffix, or shelf or frame for the card to replace, refer to the "Index". The "Index" provides a list of the cards, shelves, and frames in this card replacement book.

(Sheet 1 of 2)

PEC	Suffix	Card name	Shelf or frame name
NT9X10	AA	33-MHz 88100 BRISC CPU card	CM
NT9X10	BA, CA	60-MHz 88110 BRISC CPU card	CM
NT9X10	DA	66-MHz 88110 BRISC CPU card	CM
NT9X12	AB, AC, AD	CPU port card	CM
NT9X13	BB, BC, BD	CPU processor card	CM
NT9X13	DB, DC	CPU 20-MHz card	CM
NT9X13	GA	DMS-core 33-MHz 68030 HPM-based CPU card	CM
NT9X13	HB	CPU (68030) 40-MHz card	CM
NT9X13	JA	CPU (68020) processor card	CM
NT9X14	BB	6-Mbyte memory card	CM
NT9X14	DB	24-Mbyte memory card	CM
NT9X14	EA, FA	96-Mbyte memory card	CM
NT9X21	AA	CM bus terminator paddle board	CM
NT9X21	AB	Bus terminator paddle board	CM
NT9X22	CA	CM subsystem clock paddle board	CM
NT9X26	AA, AB	Remote terminal interface paddle board	CM

System cards in a SuperNode CM (continued)

(Sheet 2 of 2)

PEC	Suffix	Card name	Shelf or frame name
NT9X26	DA, DB, DC, EA, FA, GA	BRISC RTIF paddle board	CM
NT9X27	AA, BA	CM bus extender paddle board	CM
NT9X30	AA, AB	+5V 86-A power converter	CM
NT9X31	AA, AB	-5V 20-A power converter	CM

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Activity switch with memory match*
- *Switching the clock source*
- *Replacing a card*

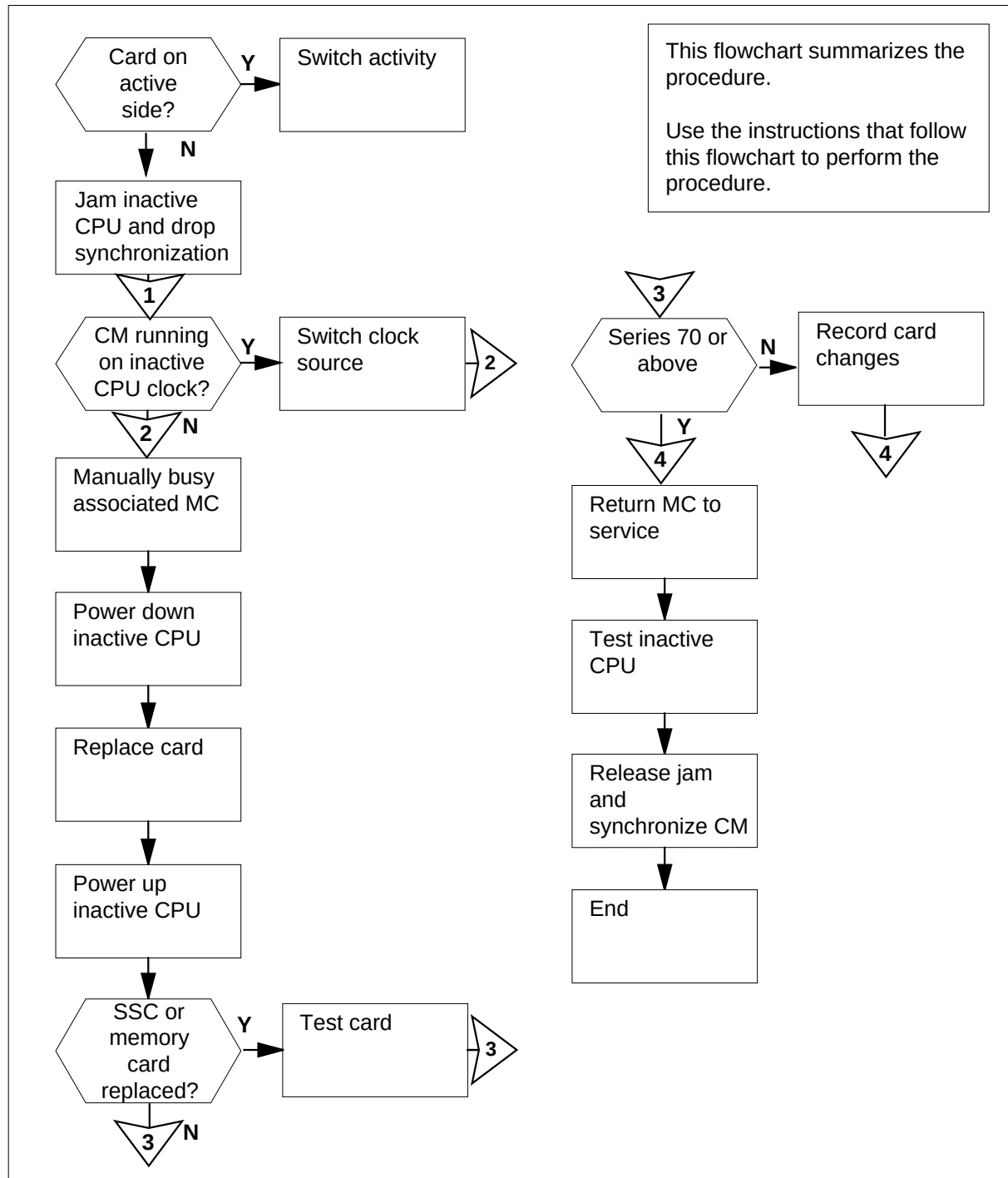
Do not go to the common procedure unless the step-action procedure directs you.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

System cards in a SuperNode CM (continued)

Summary of replacing System cards in a SuperNode CM



System cards in a SuperNode CM (continued)

Replacing System cards in a SuperNode CM

**DANGER****Possible invalid memory configuration**

Do not leave empty slots between memory cards or between the first memory card and a dual-port message controller card. Empty slots can cause an invalid memory configuration.

**DANGER****Possible invalid memory configuration**

Contact your next level of support if you replace an NT9X14DB card with an NT9X14EA card. This replacement can cause an invalid memory configuration.

**DANGER****Possible invalid memory configuration**

The NT9X10DA processor card, the NT9X26GA RTIF card, and the optional NT9X14FA memory card are designed to be used together. The NT9X10DA CPU card functions only with the NT9X26GA RTIF paddle board and the optional NT9X14FA extended memory card. Do not combine an NT9X14FA card with any other memory card. This results in an invalid memory configuration. Do not use the NT9X14FA memory card with any processor other than the NT9X10DA processor card.

At your current location

- 1 Obtain a replacement card. Make sure that the replacement card and the card to remove have the same product engineering code (PEC) and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards*. Complete the procedure and return to this point.

System cards in a SuperNode CM (continued)

At the MAP terminal

- 3 To access the CM level of the MAP display, type

>MAPCI;MTC;CM

and press the Enter key.

Example of a MAP display:

CM	Sync	Act	CPU0	CPU1	Jam	Memory	CMMnt	MC	PMC
0	no	cpu 1	.	.	yes	.	.	mbsy	.

- 4 Determine if the card you replace associates with the active CPU or the inactive CPU.

Note: The active CPU appears under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1.

If the card	Do
associates with the inactive CPU	step 5
associates with the active CPU	step 12

- 5 Determine if the inactive CPU has a jam.

Note: The word yes under the Jam header means that the inactive CPU has a jam. The area remains blank if the CPU does not have a jam.

If the inactive CPU	Do
is not jammed	step 6
is jammed	step 8

At the CM reset terminal for the inactive CPU

- 6



DANGER

Loss of service

Make sure that you do not jam the active CPU. If you jam the active CPU while the CM is not in sync, a cold restart occurs. The word Active on the top banner of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

>\JAM

and press the Enter key.

RTIF response:

System cards in a SuperNode CM (continued)

Please confirm: (YES/NO)

- 7 To confirm the command, type

>YES

and press the Enter key.

RTIF response:

JAM DONE

At the MAP terminal

- 8 Determine if the CM is synchronized.

Note: A dot (.) or EccOn under the Sync header means that the CM is synchronized. The word no means that the CM is not synchronized.

If the CM	Do
is synchronized	step 9
is not synchronized	step 13

- 9 To drop synchronization, type

>DPSYNC

and press the Enter key.

If the response	Do
is About to drop sync with CPU n active. The inactive CPU is JAMMED. Do you want to continue? Please confirm ("YES", "Y", "NO", or "N"):	step 10
is other than listed here	step 44

- 10 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

Maintenance action submitted.

Running in simplex mode with active CPU n.

System cards in a SuperNode CM (continued)

At the CM reset terminal for the inactive CPU

- 11 Wait until A1 flashes on the reset terminal for the inactive CPU.

Note: Allow 5 min for A1 to begin to flash.

If A1	Do
flashes	step 13
does not flash	step 44

- 12 Perform the procedure *Activity switch with memory match* in this document. Complete the procedure and return to this point.

At the MAP terminal

13



WARNING

Loss of service

Make sure that the CM runs on the clock of the active CPU. A cold restart or a system image reload can occur if you power down the inactive side of the CM. Do not power down the inactive side of the CM while the CM runs on the clock of the inactive CPU.

To determine if the CM runs on the clock of the inactive CPU, type

>INSYNC

and press the Enter key.

Example of a MAP response:

CPU pair is NOT insync, CPU 0 is active.
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

If the CM	Do
runs on the clock of the inactive CPU	step 14
runs on the clock of the active CPU	step 15

System cards in a SuperNode CM (continued)

- 14** To run the CM on the clock of the active CPU, perform the procedure *Switching the clock source* in this document. Complete the procedure and return to this point.

- 15** To access the MC level of the MAP display, type

>MC

and press the Enter key.

Example of a MAP display:

```
MC 0      MC 1
mbsy      .
```

- 16** Determine the state of the message controller (MC) on the inactive CPU.

Note: The word mbsy under the MC header means that the MC is manual busy.

If the state of the MC	Do
is mbsy	step 18
is not mbsy	step 17

- 17**



WARNING

Loss of service

Make sure that you busy the MC that corresponds to the inactive CPU. A warm restart occurs if you power down the surface with the wrong MC busy.

To manually busy the MC that associates with the inactive CPU, type

>BSY mc_number

and press the Enter key.

where

mc_number

is the number of the MC on the inactive side (0 or 1)

Example of a MAP response:

```
Maintenance action submitted.
MC busied OK.
```

If the MC	Do
busied	step 18

System cards in a SuperNode CM (continued)

	If the MC	Do
	did not busy	step 44
18	The next action depends on the type of card you replace.	
	If the card being replaced	Do
	is an NT9X22	step 19
	is other than listed here	step 21
19	To access the Clock level of the MAP display, type >CLOCK and press the Enter key. <i>Example of a MAP display:</i>	
	<pre> TOD MC0 MC1 Link 0 . . Link 1 . . SSC f . </pre>	
20	To determine the location of the NT9X22 card, type >LOCATE ssc_number and press the Enter key. <i>where</i> ssc_number is the number of the subsystem clock (0 or 1) <i>Example of a MAP response:</i>	
	<pre> Site Flr RPos Bay_id Shf Description Slot EqPEC HOST 00 A00 CMDC:00 18 SSC:00:0:0 16 9X22CA BACK </pre>	

System cards in a SuperNode CM (continued)

At the CM shelf

21

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle cards. The wrist strap protects the cards against static electricity damage.

Power down the inactive CPU as follows:

- a Press down and release the power switch on the faceplate of the NT9X30 power converter on the inactive side of the CM shelf.

Note: For CPU 0, the power converter is in slots 4F through 6F. For CPU 1, the power converter is in slots 36F through 38F.

- b Press down and release the power switch on the faceplate of the NT9X31 power converter on the inactive side of the CM shelf.

Note: For CPU 0, the power converter is in slots 1F through 3F. For CPU 1, the power converter is in slots 33F through 35F.

- 22 Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

- 23 Power up the inactive CPU, as follows:

- a Lift and release the power switch on the faceplate of the NT9X30 power converter on the inactive side of the CM shelf.

Note: For CPU 0, the power converter is in slots 4F through 6F. For CPU 1, the power converter is in slots 36F through 38F.

- b Lift and release the power switch on the faceplate of the NT9X31 power converter on the inactive side of the CM shelf.

Note: For CPU 0, the power converter is in slots 1F through 3F. For CPU 1, the power converter is in slots 33F through 35F.

System cards in a SuperNode CM (continued)

At the CM reset terminal for the inactive CPU

24



CAUTION

Firmware tests must be completed

If you do not complete the firmware tests, you can not synchronize the CPUs.

Wait for the switch to complete firmware tests.

Example of an RTIF response:

```
Shelf      Slot
00         12      NT9X14DB...
00         13      NT9X14DB...
Waiting for activity...
```

Note: When firmware testing is in progress, dots appear on the right side of the PEC. The PEC is in the firmware testing status line of the RTIF response. As each firmware test is complete, another dot appears, until firmware testing for the card is complete. If the dots do not appear and another firmware testing status line does not appear, firmware tests do not progress. If the dots do not appear and the prompt Waiting for activity does not appear, firmware tests do not progress.

25 Determine if the firmware tests were completed.

Note: If the firmware tests are complete and CPU has powered up, the display shows the Waiting for activity message.

If the inactive CPU	Do
powered up	step 26
did not power up	step 44

26 The next action depends on the type of card you replace.

If the card being replaced	Do
is an NT9X14	step 29
is an NT9X22	step 27
is an NT9X26	step 31
is other than listed here	step 32

System cards in a SuperNode CM (continued)

At the MAP terminal

- 27 To test the subsystem clock, type

>TST SSC ssc_number

and press the Enter key.

where

ssc_number

is the number of the subsystem clock (0 or 1)

Example of a MAP response:

A complete test will include temporary loss of two links.
Please confirm ("YES", "Y", "NO", or "N"):

- 28 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

Maintenance action submitted.

SSC 0 test passed. No faults detected by hardware.

If the TST command	Do
passed	step 32
failed	step 44

At the MAP terminal

- 29 To access the Memory level of the MAP display, type

>MEMORY

and press the Enter key.

Example of a MAP display:

```
CM 0   Plane 0 | Plane 1
      |
0987654321 P|P 1234567890
-----
```

- 30 To test the replacement card, type

>TST CARD card_number

and press the Enter key.

where

card_number

is the number of the replaced memory card (1 to 10).

System cards in a SuperNode CM (continued)

Example of a MAP response:

Maintenance action submitted.
Memory test OK.

If the TST command	Do
passed	step 32
failed	step 44

At the CM reset terminal for the inactive CPU

- 31** To determine the result of the last self-test, type

>\SELF TEST

and press the Enter key.

Example of a MAP response:

SELF TEST RESULTS: ROM OK RAM OK 9X26 OK

If the self test	Do
passed	step 32
failed	step 44

- 32** Your next step depends on the reason for the performance of this procedure.

If you	Do
perform this procedure as a result of an MC Tbl alarm	step 46
perform this procedure as a result of a PMCFIt alarm	step 46
perform this procedure as a result of a PMCTbl alarm	step 46
perform this procedure as a result of a NoTOD alarm	step 46
perform this procedure as a result of an SBsyMC alarm	step 46
perform this procedure as a result of an MBsyMC alarm	step 46
perform this procedure as a result of a CBsyMC alarm	step 46

System cards in a SuperNode CM (continued)

	If you	Do
	perform this procedure for any reason different from those listed here	step 33
33	The next action depends on the series of your SuperNode CM hardware.	
	If	Do
	below Series 70 SuperNode CM hardware	step 34
	Series 70 or above	step 36
34	To record all the card changes in the history database for each card, type >SWAPHW shelf_no slot_no side_no and press the Enter key. <i>where</i> shelf_no is the number of the shelf (0 or 1) slot_no is the number of the slot (1 to 38) side_no is the side of the CM (front or back) <i>Example of a MAP response:</i> WARNING: You have indicated that the following circuit pack has been replaced. Please verify that this accurately reflects which circuit pack has been changed, and that the displayed PEC code matches what is currently equipped in that slot: Site Flr RPOs Shf Description Slot EQPEC HOST 00 A00 DPCC 0 18 CM 0;0;0 19 9X13BC Do you wish to continue? Please confirm ("YES", "Y", "NO" "N") "Y" or "YES", Card replacement has been recorded.	
	If the response	Do
	is Card replacement has been recorded.	step 36
	is Aborted. Card replacement has NOT been recorded.	step 35

System cards in a SuperNode CM (continued)

	If the response	Do
	is different from those listed here	step 44
	Note: The specified card joins the list of the cards that you replaced. The actual updates to the mismatch history database do not occur until the next manual SYNC attempt.	
35	Enter the SWAPHW command as you did in step 34. If the command aborts a second time, contact the next level of support.	
36	To access the MC level of the MAP display, type >MC and press the Enter key.	
37	To return the manual busy MC to service, type >RTS mc_number and press the Enter key. <i>where</i> mc_number is the number of the manual-busy MC (0 or 1) <i>Example of a MAP response:</i> Maintenance action submitted. MC RTS OK.	
38	The next action depends on the reason for performing this procedure.	
	If	Do
	a CM alarm clearing procedure	step 42
	anything else	step 39
39	Test the inactive CPU by typing >CM;TST and pressing the Enter key. <i>Example of a MAP response:</i> The test(s) listed below will destroy the software load in inactive CPU: Static RAM test Do you want to do the test(s) anyway? Please confirm: ("YES", "Y", "NO", or "N"):	

System cards in a SuperNode CM (continued)

- 40** Confirm the command by typing
>YES
 and pressing the Enter key.
Example of a MAP response:
- The PCCAB DRAM test will take
 up to 10 minutes to run.
- Do you wish to run this test anyway?
 Please confirm: ("YES", "Y", "NO", or "N"):
>YES
- 41** Confirm the command by typing
>YES
 and pressing the Enter key.
Example of a MAP response:
- Maintenance action submitted.
 Test passed.

If the TST command	Do
passed	step 42
anything else	step 44

At the CM reset terminal for the inactive CPU

- 42** Release the jam on the inactive CPU by typing
>\RELEASE JAM
 and pressing the Enter key.
RTIF response:
- JAM RELEASE DONE

At the MAP terminal

- 43** Synchronize the CM by typing
>SYNC
 and pressing the Enter key.
Example of a MAP response:

System cards in a SuperNode CM (end)

Maintenance action submitted.
Synchronization successful.

	If	Do
	the SYNC command was successful	step 45
	anything else	step 44
44	For additional help, contact the next level of support.	
45	The next action depends on the reason for performance of this procedure.	
	If	Do
	a CM alarm clearing procedure	step 46
	anything else	step 47
46	Return to the alarm clearing procedure that sent you to this procedure and continue as directed.	
47	You have completed the procedure.	

3 SuperNode SE computing module and system load module card replacement procedures

Introduction

This chapter provides card replacement procedures for the SuperNode SE computing module (CM) and system load module (SLM). The first section in the chapter provides diagrams of SuperNode SE CM/SLM shelf designs.

Card replacement procedures for the SuperNode CM are in the chapter “SuperNode computing module card replacement procedures”.

Card replacement procedures for the SuperNode SLM are in the chapter “SuperNode system load module card replacement procedures”.

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) are in the chapter “Frame supervisory panel and maintenance supervisory panel card replacement procedures”.

Each procedure contains the following sections:

- Application
- Common procedures
- Action

Application

This section identifies the CM and SLM card(s) discussed in the replacement procedure.

Common procedures

This section lists common procedures for the replacement of a CM or SLM card. A common procedure is a series of steps that repeats within maintenance procedures. For example, a card removal and replacement procedure is a common procedure. Common procedures are in the common procedures chapter in this NTP.

Do not use common procedures unless the step-action procedure directs you.

Action

This section contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

Recording card replacement activities

When you replace a card, record the following information in office records:

- the serial number of the card that you replaced
- the date of the card replacement
- the reason that you replaced the card

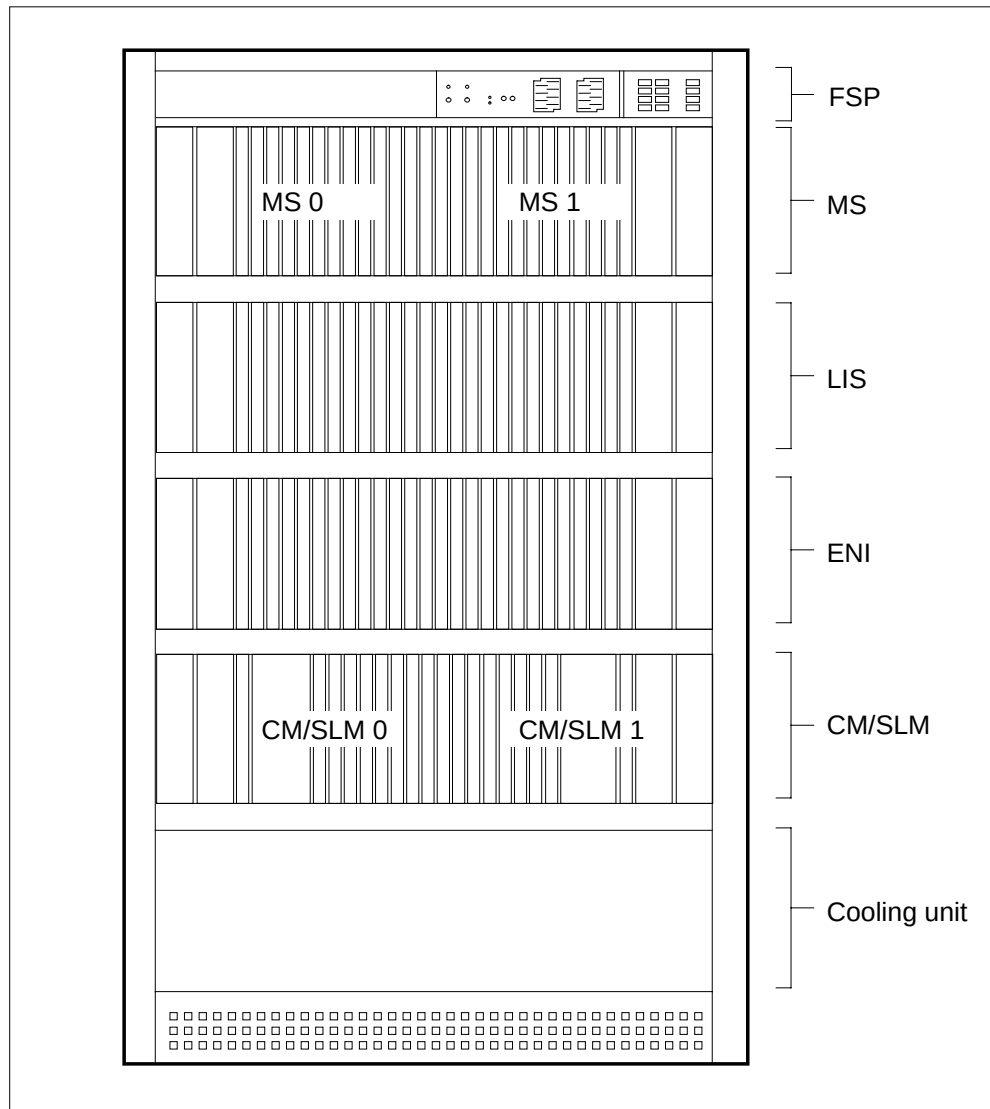
SuperNode SE CM/SLM shelf layouts

Application

This procedure provides the following design diagrams:

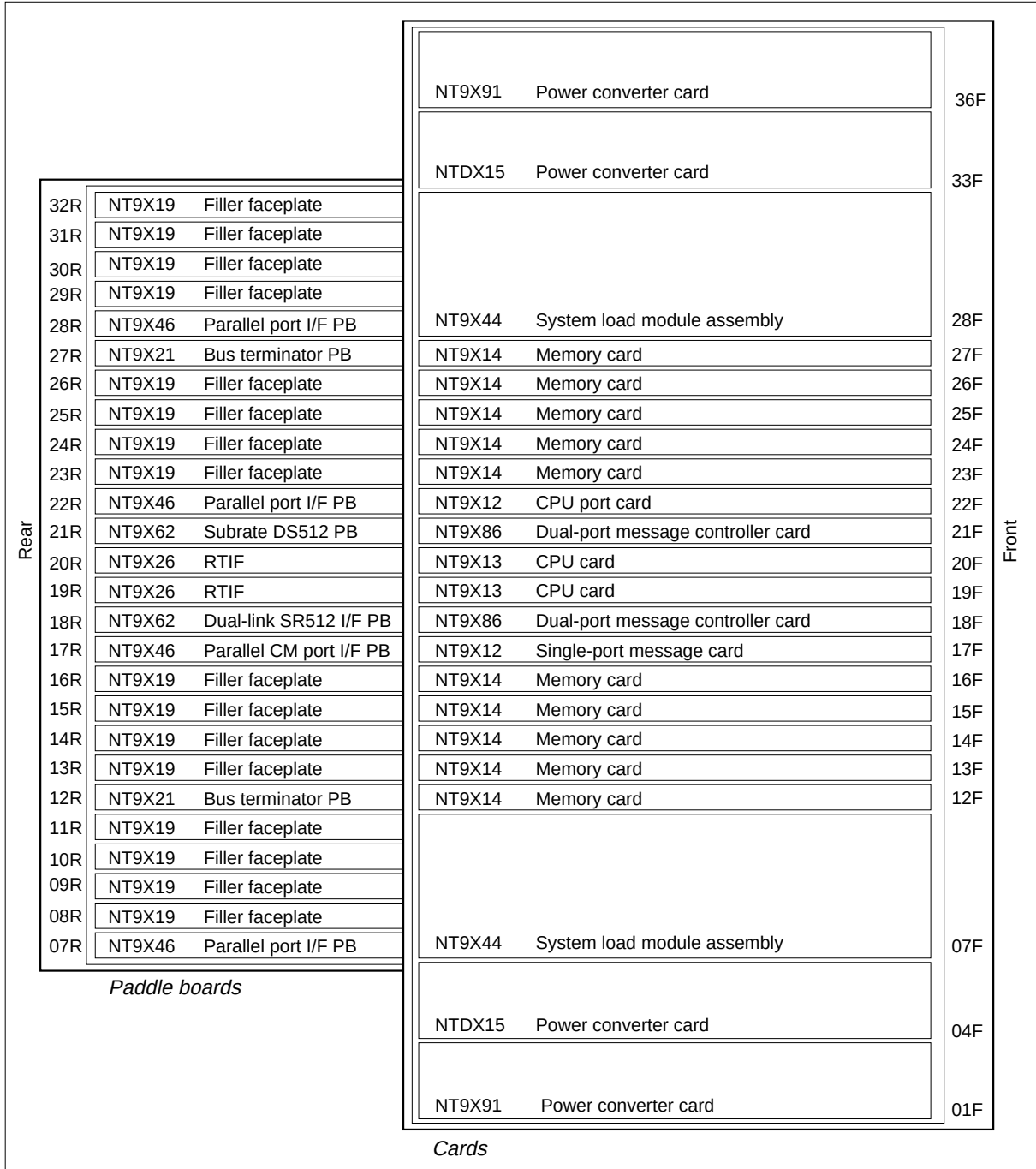
- single core cabinet (SCC)
- SuperNode SE computing module/system load module (CM/SLM)

Figure Single core cabinet



SuperNode SE CM/SLM shelf layouts (end)

Figure SuperNode SE CM/SLM



NT9X44 in a SuperNode SE CM/SLM

Application

Use this procedure to replace an NT9X44 in a SuperNode SE system load module (SLM).

PEC	Suffix	Card name	Shelf or frame name
NT9X44	AC	System load module IA assembly	CM/SLM
NT9X44	AD	System load module III assembly	CM/SLM

Refer to the "Index", if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

Sparing and field returns can cause SLM IIIs to have a combination of the current Connor and the new Tandberg drives. The SLM IIIs are in SuperNode and SuperNode SE switches. You can easily identify the drives with the new Tandberg drive that has a tape door.

Use the recommended tape cartridge as follows:

- DC600 for SLM I tape drive
- DC6250 for SLM IA and II tape drives
- DC6525 for SLM III tape drive

Common procedures

This procedure refers to the following common procedures:

- *Activity switch with memory match*
- *Switching the clock source*

NT9X44

in a SuperNode SE CM/SLM (continued)

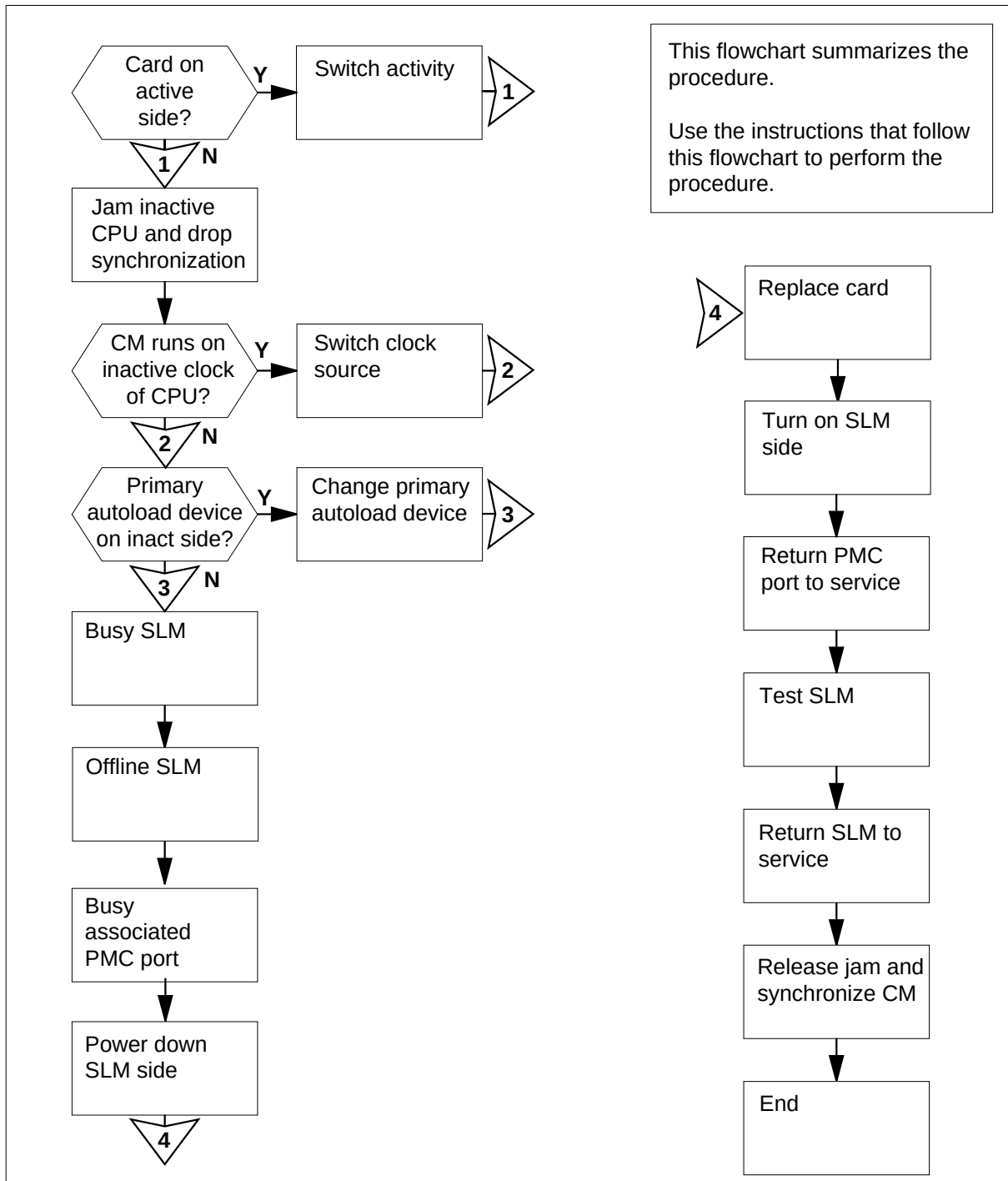
Do not go to the common procedure unless the step-action procedure directs you.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NT9X44 in a SuperNode SE CM/SLM (continued)

Summary of Replacing a NT9X44 in a SuperNode SE CM/SLM



NT9X44 in a SuperNode SE CM/SLM (continued)

Replacing a NT9X44 in a SuperNode SE CM/SLM

At your current location

1



CAUTION

Loss of data recording services

This procedure removes the SLM from service. Make sure that another device assumes the data recording services of the SLM that you remove from service, before you attempt this procedure. Make sure that the other device has the data storage capacity to assume the recording.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix, as the card that you replace.

2

Make sure that you have a backup SLM tape.

If you	Do
have a backup SLM tape	step 3
do not have a backup SLM tape	step 84

Note: The backup tape must contain copies of all of the disk files on the SLM that you will replace.

At the MAP terminal

3

To access the CM level of the MAP display, type

>MAPCI ; MTC ; CM

and press the Enter key.

Example of a MAP display:

CM	Sync	Act	CPU0	CPU1	Jam	Memory	CMMnt	MC	PMC
0	no	cpu 1	.	.	yes	.	.	.	.

4

Determine if the computing module (CM) plane that contains the SLM you want to replace also contains the inactive CPU.

Note: The active CPU is the CPU shown under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1.

If the CM plane contains the	Do
inactive CPU	step 5

NT9X44

in a SuperNode SE CM/SLM (continued)

	If the CM plane contains the	Do
	active CPU	step 12
5	Determine if the inactive CPU is jammed.	
	Note: The word yes under the Jam header indicates that the inactive CPU is jammed. A blank field indicates that the CPU is not jammed.	
	If the inactive CPU is	Do
	not jammed	step 6
	jammed	step 8

At the CM reset terminal for the inactive CPU

6



DANGER

Loss of service

Make sure that you do not jam the active CPU. A cold restart occurs when you jam the active CPU while the CM is not in sync. The word Active on the top banner of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

>\JAM

and press the Enter key.

RTIF response:

Please confirm: (YES/NO)

7

To confirm the command, type

>YES

and press the Enter key.

RTIF response:

JAM DONE

NT9X44

in a SuperNode SE CM/SLM (continued)

At the MAP terminal

- 8 Determine if the CM is synchronized.

Note: A dot (.) or EccOn under the Sync header indicates that the CM is synchronized. The word no indicates that the CM is not synchronized.

If the CM is	Do
synchronized	step 9
not synchronized	step 13

- 9 To drop synchronization, type
>DPSYNC
and press the Enter key.

If the response is	Do
About to drop sync with CPU n active. The inactive CPU is JAMMED. Do you want to continue? Please confirm ("YES", "Y", "NO", or "N"):	step 10
other than listed here	step 84

- 10 To confirm the command, type
>YES
and press the Enter key.

Example of a MAP response:

Maintenance action submitted.
Running in simplex mode with active CPU n.

At the CM reset terminal for the inactive CPU

- 11 Wait until A1 flashes on the reset terminal for the inactive CPU.

Note: Allow approximately 5 min for A1 to start to flash.

If A1	Do
flashes	step 13
does not flash	step 84

- 12 Perform the procedure *Activity switch with memory match* in this document. Complete the procedure and return to this point.

NT9X44

in a SuperNode SE CM/SLM (continued)

At the MAP terminal

13



WARNING

Loss of service

Make sure that the CM runs on the clock of the active CPU. A cold restart or a system image reload can occur if you power down the inactive side of the CM. Do not power down the inactive side of the CM while the CM runs on the clock of the inactive CPU.

To determine if the CM runs on the clock of the inactive CPU, type

>INSYNC

and press the Enter key.

Example of a MAP response:

CPU pair is NOT insync, CPU 0 is active.
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

If the CM runs on the clock of the	Do
inactive CPU	step 14
active CPU	step 15

14 To run the CM on the clock of the active CPU, perform the procedure *Switching the clock source* in this document. Complete the procedure and return to this point.

15 To access the CMMNT level of the MAP display, type

>CMMNT

and press the Enter key.

Example of a MAP display:

NT9X44

in a SuperNode SE CM/SLM (continued)

```
CM      Sync  Act  CPU0  CPU1  Jam  Memory  CMMnt  MC  PMC
0       no   cpu 0   .    .    yes   .    .    .
```

```
Traps:                Per minute =      0      Total =      5
```

```
AutoLdev:             Primary = SLM 0 DISK  Secondary =  SLM 1
DISK
```

```
Image Restartable = No image test since last restart
```

```
Next image restart type =  WARM
```

```
Last CM REXTST executed
```

```
System memory in kbytes as of 14:39:07
Memory (kbytes): Used = 105984 Avail = 12800 Total =
118784
```

- 16** Determine if the primary autoload device is on the same side of the switch as the active CPU or the inactive CPU.

Note: The primary autoload device appears on the right of the Primary header. In the example in step 15, the primary autoload device is the disk of SLM 0.

If the primary autoload device is on the same side of the switch as the	Do

active CPU	step 23

inactive CPU	step 17

- 17** To change the primary autoload device to a device on the same side of the switch as the active CPU, type

>AUTOLD SLM slm_number device_type

and press the Enter key.

where

slm_number

is the number of the active CPU (0 or 1)

device_type

is the type of SLM device (DISK or TAPE)

Example of a MAP response:

New autoload route has been set.

NT9X44

in a SuperNode SE CM/SLM (continued)

- 18** To access the DIRP level of the MAP display, type
>IOD;DIRP
 and press the Enter key.
- 19** To determine if there are any active files for each subsystem on the SLM to be made busy, type
>query ssys
 and press the Enter key.
where
ssys
 is the active subsystem (AMA, OM, or JF)
- 20** To close any active files for each subsystem on the SLM to be made busy, type
>close ssys [active]
 and press the Enter key.
where
ssys
 is the active subsystem (AMA, OM, or JF)
- 21** Demount the volume by typing
>DMNT ssys vol_name [paralel]
 and pressing the Enter key.
where
ssys
 is the subsystem (AMA, OM, or JF)
vol_name
 is the name of the volume to be demounted
[paralel]
 indicates that the volume is a parallel volume
Example of a MAP response:

 UPDATING VOLUME INFORMATION FOR
 vol_name: vol_no IN pool_type POOL
 pool_no, pool_name
 PLEASE CONFIRM ("YES" OR "NO"): .
- 22** Confirm the demount by typing
>YES
 and pressing the Enter key.
Example of a MAP response:

NT9X44

in a SuperNode SE CM/SLM (continued)

REGULAR VOLUME vol_name WILL BE
TAKEN OUT OF DIRP AS SOON AS
POSSIBLE..

- 23** To access the SLM that corresponds to the inactive CPU, type

>IOD;SLM slm_number

and press the Enter key.

where

slm_number

is the number of the inactive CPU (0 or 1)

Example of a MAP display:

```
IOD
IOC  0  1  2  3
STAT .  .  .  .
```

```
DIRP:  .  XFER:  .  DVI :  .  DPPP:  .  DPPU:  .
NOP :  .  SLM :  .  NX25:  .  MLP :  .  SCAI:  .
```

```
SLM  0  1
Stat  .  .
```

SLM 0	device	TAPE	DISK
	status	.	.
	drive	idle	on line
	user		SYSTEM

Note: Dots on the right of the SLM Stat header indicate that the associated SLMs are in service.

- 24** To manually busy the SLM, type

>BSY

and press the Enter key.

Example of a MAP response:

SLM 0 busy passed.

Example of a MAP display:

```
SLM  0  1
Stat  M  .
```

Note: The letter M on the right of the SLM Stat header indicates that the associated SLM is manual busy.

NT9X44

in a SuperNode SE CM/SLM (continued)

- 25 To offline the SLM, type
>OFFL
and press the Enter key.
Note: Wait for the light on the faceplate of the SLM to turn off before you continue this procedure.
Example of a MAP response:
- SLM 0 now offline. Do not remove SLM card
until disk drive is spun down! This will be
indicated when the SLM card light turns off.
- 26 To access the PMC level of the MAP display, type
>CM;PMC
and press the Enter key.
Example of a MAP display:
- PMC 0
.

PORT0: .
PORT1: .
- 27 To manually busy the port that corresponds to the inactive CPU, type
>BSY 0 PORT port_number
and press the Enter key.
where
port_number
is the number of the inactive CPU (0 or 1)
Example input
>BSY 0 PORT 0
Example of a MAP response:
- Maintenance action submitted.
Passed.

NT9X44 in a SuperNode SE CM/SLM (continued)

At the CM/SLM shelf

28



DANGER

Equipment damage and possible loss of service

Make sure that you do not switch off the NTDX15 power converter. If you switch off the NTDX15 power converter, the associated CPU plane powers down. The SLM does not power down. The NT9X91 power converter powers the SLM.



WARNING

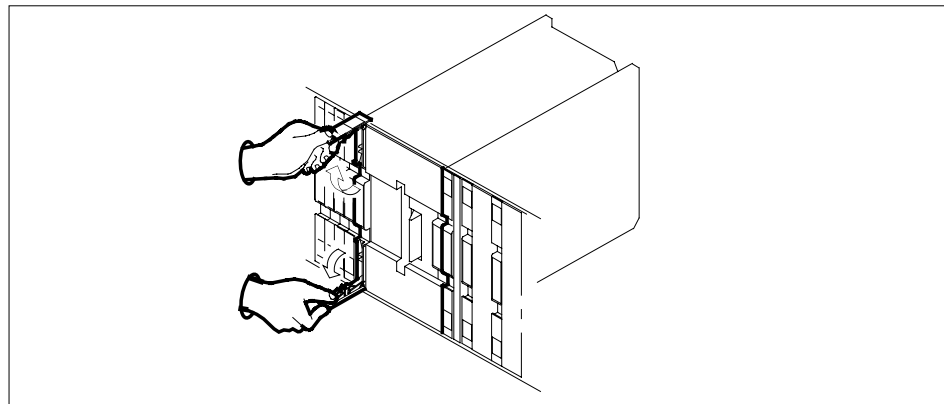
Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Power down the inactive SLM side. To switch off the NT9X91 power converter, press down and release the power switch. The power switch is on the faceplate of the converter.

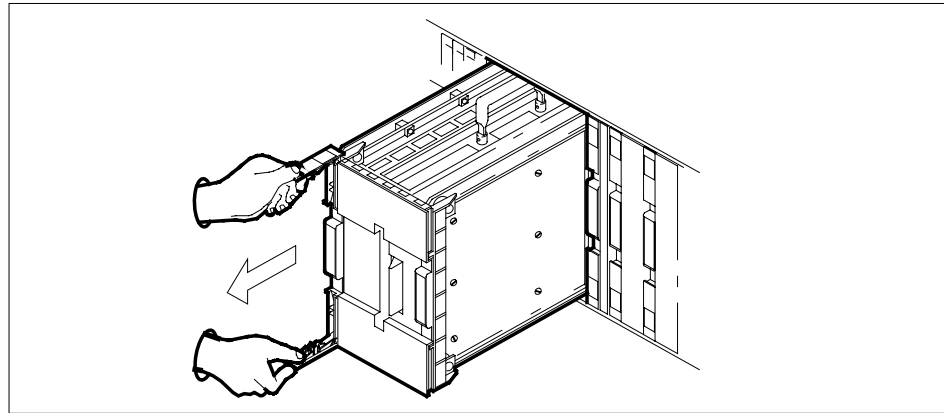
Note: For CPU 0, NT9X91 the power converter is in slots 1F to 3F. For CPU 1, the NT9X91 power converter is in slots 36F to 38F.

- 29 Pull open the locking levers on the SLM until the levers are horizontal.

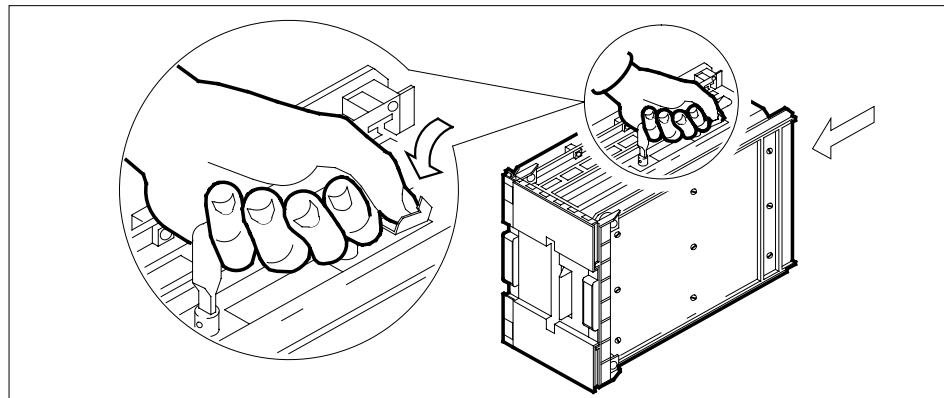


- 30 Grasp the locking levers. Pull the SLM toward you. Perform this procedure until the locking latch does not allow the SLM to clear the shelf. The locking latch is at the back of the SLM assembly.

NT9X44 in a SuperNode SE CM/SLM (continued)



- 31 Close the locking levers.
- 32 Grasp the carrying handle. Use your thumb to press the locking latch while you slide the SLM from the shelf.



- 33 Place the SLM you removed in an electrostatic discharge (ESD) protective container.
- 34 Lift the replacement SLM by the carrying handle.
- 35 Pull open the locking levers until the levers are horizontal.
- 36 Use your free hand to align the SLM with the slots in the shelf. Carefully slide the SLM into the shelf until the locking latch at the back of the SLM locks.
Note: You do not need to use excessive force to slide the SLM into the shelf.
- 37 Slide the SLM completely into the shelf.
- 38 Use your fingers or thumbs to push on the upper and lower edges of the faceplate. Make sure that the SLM sits completely in the shelf.
- 39 Close the locking levers.

NT9X44

in a SuperNode SE CM/SLM (continued)

- 40** Turn on the inactive SLM side. To switch on the NT9X91 SLM power converter, lift and release the power switch. The power switch is on the faceplate of the converter.

Note: For CPU 0, the NT9X91 power converter is in slots 1F to 3F. For CPU 1, the NT9X91 power converter is in slots 36F to 38F.

If the SLM has a	Do
Connor tape drive	step 41
Tandberg tape drive	step 43

- 41** Insert a scratch tape into the SLM. Use the tape cartridge specified in the application section at the beginning of this procedure.

Note: Insert a tape cartridge with the metal plate to the left. The tape access opening faces towards the top.

- 42** To lock the tape in place, press down on the locking lever.

Go to step 44.

- 43** To open the drive door, push on the Tandberg drive door button. Insert a scratch tape with the read and write tape facing the bottom of the drive. Close the drive door.

At the MAP terminal

- 44** To access the PMC level of the MAP display, type

>CM;PMC

and press the Enter key.

- 45** To return the manual busy PMC port to service, type

>RTS 0 PORT port_number

and press the Enter key.

where

port_number

is the number of the inactive CPU (0 or 1)

Example of a MAP response:

Maintenance action submitted.

Passed.

If the RTS command	Do
passed	step 46
failed	step 84

- 46** To access the MAP level for the SLM that you replaced, type

>IOD;SLM slm_number

NT9X44

in a SuperNode SE CM/SLM (continued)

and press the Enter key.

where

slm_number

is the number of the SLM (0 or 1) that you replaced

- 47 To manually busy the SLM, type

>BSY

and press the Enter key.

If the BSY command	Do
passed	step 48
failed	step 84

- 48 To spin up the SLM disk, type

>SPIN UP

and press the Enter key.

Note: Wait for the light on the faceplate of the SLM to turn on before you continue this procedure.

Example of a MAP response:

Disk of SLM 0 is ready.

- 49 To test the replacement SLM, type

>TST ALL

and press the Enter key.

MAP response:

The tape test will write on the tape media.
It is recommended to insert a scratch tape,
otherwise data on the current tape may be
destroyed. Are you ready to continue?
Please confirm ("YES", "Y", "NO", or "N"):

- 50 To confirm the command, type

>YES

and press the Enter key.

If the response indicates	Do
the TST command passed	step 53
the TST command failed, and the system generated a card list	step 51

NT9X44

in a SuperNode SE CM/SLM (continued)

	If the response indicates	Do
	other than listed here	step 84
51	Record the location, description, slot number, PEC and the PEC suffix, of the cards on the list.	
52	To replace each card on the list, perform the correct card replacement procedure in this document. Replace all the cards on the list and return to this point.	

At the CM reset terminal for the inactive CPU

- 53 To release the jam on the inactive CPU, type
- ```
>\RELEASE JAM
```
- and press the Enter key.
- RTIF response:*
- ```
JAM RELEASE DONE
```

At the MAP terminal

- 54 To synchronize the CM, type
- ```
>CM;SYNC
```
- and press the Enter key.
- Example of a MAP response:*

```
Maintenance action submitted.
Synchronization successful.
```

|    | If the response                                                                          | Do      |
|----|------------------------------------------------------------------------------------------|---------|
|    | indicates the SYNC command was successful                                                | step 55 |
|    | other than listed here                                                                   | step 84 |
| 55 | To access the disk administration utility, type                                          |         |
|    | <pre>&gt;DISKADM disk_name</pre>                                                         |         |
|    | and press the Enter key.                                                                 |         |
|    | <i>where</i>                                                                             |         |
|    | <b>disk_name</b>                                                                         |         |
|    | is the name of the disk in the SLM that you replaced (S00D for SLM 0, or S01D for SLM 1) |         |
|    | <i>Example of a MAP response:</i>                                                        |         |

---

## NT9X44 in a SuperNode SE CM/SLM (continued)

---

Start up command sequence is in progress.  
This may take a few minutes.  
Administration of device S00D on CM is now active.  
DISKADM; CM

- 56 To format the disk, type  
**>FORMATDISK disk\_name**

and press the Enter key.

where

**disk\_name**

is the name of the disk in the SLM replaced (S00D for SLM 0, or S01D for SLM 1)

*Example of a MAP response:*

\*\*\*\*\* WARNING \*\*\*\*\*

Formatting of S00D  
will destroy the contents of the disk.

The formatting will:  
allocate 3 spare or alternate sectors per track,  
allocate 16 spare or alternate tracks per disk,  
use the G defect list,  
assign S00D as the name for the disk.  
perform quick format,  
exclude force option.

Do you want to continue?  
Please confirm ("YES", "Y", "NO", or "N"):

- 57 To confirm the command, type  
**>YES**

and press the Enter key.

*Example of a MAP response:*

Formatting of disk has started.This may take 10 to 30 minutes.Formatting of disk has finished.

- 58 To obtain a list of all the volumes required on the SLM disk, consult office records or operating company personnel.

- 59 To create a volume, type  
**>CREATEVOL volume\_name volume\_size STD**

and press the Enter key.

where

## NT9X44

### in a SuperNode SE CM/SLM (continued)

---

**volume\_name**

is the name of the volume (maximum of eight characters)

**volume\_size**

is the size of the volume in megabytes

*Example input:*

**>CREATEVOL VOL1 20 STD**

*Example of a MAP response:*

STD volume VOL1 will be created on S00D.

Volume size: 20 megabytes

File Directory size: 128 files

Volume Free Space Map size: 64 segments

Do you want to continue?

Please confirm ("YES", "Y", "NO", or "N"):

**60** To confirm the command, type

**>YES**

and press the Enter key.

*MAP response:*

Creation of the volume is completed.

**61** Repeat steps 59 and 60 for each volume on the list that you obtained in step 58.

**62** To quit the disk administration utility, type

**>QUIT**

and press the Enter key.

**63** To access the replacement SLM, type

**>IOD;SLM slm\_number**

and press the Enter key.

*where*

**slm\_number**

is the number of the replacement SLM (0 or 1)

**64** To return the SLM to service, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

## NT9X44

### in a SuperNode SE CM/SLM (continued)

SLM 0 return to service passed.

|           | <b>If the RTS command</b>                             | <b>Do</b> |
|-----------|-------------------------------------------------------|-----------|
|           | passed                                                | step 65   |
|           | failed                                                | step 84   |
| <b>65</b> | Obtain the backup tape for the SLM that you replaced. |           |
|           | <b>If the SLM has a</b>                               | <b>Do</b> |
|           | Connor tape drive                                     | step 66   |
|           | Tandberg tape drive                                   | step 68   |

#### ***At the CM/SLM shelf***

- 66** Remove the scratch tape and insert the backup tape into the SLM.  
**Note:** Insert a tape cartridge with the metal plate to the left. The tape access opening faces upwards.
- 67** To lock the tape in place, press down on the locking lever.  
 Go to step 70.
- 68** To open the drive door, push on the Tandberg drive door button. To release the tape cartridge, continue to push on the button. To withdraw the scratch tape, pull the scratch tape straight out of the drive unit.
- 69** Insert the backup tape with the read and write tape that faces the bottom of the drive. To close the door, push on the drive door to close the door.  
**Note:** A diagram on the inside of the Tandberg drive door indicates the position of the tape.

#### ***At the MAP terminal***

- 70** To access the disk utility, type  
**>DISKUT**  
 and press the Enter key.  
*MAP response:*  
  
 Disk utility is now active.  
 DISKUT:
- 71** To mount the backup tape cartridge, type  
**>INSERTTAPE tape\_device\_name**  
 and press the Enter key.  
*where*

## NT9X44

### in a SuperNode SE CM/SLM (continued)

---

**tape\_device\_name**

is the name of the tape device that contains the backupSLM tape (S00T for SLM 0, or S01T for SLM 1)

*Example of a MAP response:*

The INSERT operation may take up to 5 minutes to tension the tape.

- 72 To list the files stored on the back-up SLM tape, type

**>LISTFL tape\_device\_name**

and press the Enter key.

*where*

**tape\_device\_name**

is the name of the tape device containing the back-upSLM tape (S00T for SLM0 or S01T for SLM1)

- 73 The next action depends on the name of the disk volume on tape.

| If the disk volume name is                       | Do      |
|--------------------------------------------------|---------|
| the same on the backup tape and the SLM disk     | step 74 |
| not the same on the backup tape and the SLM disk | step 76 |

- 74 To copy the backup files to the disk in the SLM that you replaced, type

**>RESTORE STDVOL disk\_volume\_name tape\_device\_name  
tape\_file\_name**

and press the Enter key.

*where*

**disk\_volume\_name**

is the name of the disk (S00D or S01D), and the name of the volume on the disk where you will restore the backup files

**tape\_device\_name**

is the name of the tape device (S00T or S01T) that contains the backup SLM tape

**tape\_file\_name**

is the name of the tape file that contains the backup files

*Example input*

**>RESTORE STDVOL ROOTDIR.S00DPMLoads S00T S00DPMLoads**

- 75 Repeat step 74 for each disk volume that you created. Go to step 78.

- 76 To copy the backup files to the disk in the SLM that you replaced, type

**>RESTORE STDVOL disk\_volume\_name tape\_device\_name  
tape\_file\_name**

and press the Enter key.

*where*

## NT9X44

### in a SuperNode SE CM/SLM (continued)

**disk\_volume\_name**

is the name of the disk (S00D or S01D), and the name of the volume on the disk where you will restore the backup files

**tape\_device\_name**

is the name of the tape device (S00T or S01T) that contains the backup SLM tape

**tape\_file\_name**

is the name of the tape file that contains the backup files

*Example input*

**>RESTORE STDVOL S00DPMLoads S00T PMLoads**

77 Repeat step 76 for each disk volume that you created.

78 To demount the tape cartridge, type

**>EJECTTAPE tape\_device\_name**

and press the Enter key.

*where***tape\_device\_name**

is the name of the tape device (S00T or S01T) that contains the backup SLM tape

*Example of a MAP response:*

The eject operation may take up to 5 minutes to position the tape to the beginning.

79 To quit the disk utility, type

**>QUIT**

and press the Enter key.

80 Determine if an ITOC alarm is present under the IOD header of the alarm banner.

| <b>If an ITOC alarm is</b> | <b>Do</b> |
|----------------------------|-----------|
| present                    | step 81   |
| not present                | step 82   |

81 Perform the correct ITOC alarm clearing procedure in *Alarm and Performance Monitoring Procedures*. Complete the procedure and return to this point.

82 Your next step depends on the reason that you perform this procedure.

| <b>If you perform this procedure as a result of</b> | <b>Do</b> |
|-----------------------------------------------------|-----------|
| another maintenance procedure                       | step 83   |

**NT9X44**  
**in a SuperNode SE CM/SLM (end)**

---

|           | <b>If you perform this procedure as a result of</b>                                               | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------|-----------|
|           | other than listed here                                                                            | step 85   |
| <b>83</b> | Return to the maintenance procedure that directed you to this procedure and continue as directed. |           |
| <b>84</b> | For additional help, contact the next level of support.                                           |           |
| <b>85</b> | The procedure is complete.                                                                        |           |



## NT9X46 in a SuperNode SE CM/SLM

---

### Application

Use this procedure to replace an NT9X46 in a SuperNode SE (SNSE) computing module (CM) or system load module (SLM), as listed in the following table.

| PEC    | Suffix | Card name                               | Shelf or frame name |
|--------|--------|-----------------------------------------|---------------------|
| NT9X46 | AA     | Parallel port interface<br>paddle board | CM/SLM              |

Refer to the “Index”, if you cannot identify the following features for the card you want to replace:

- the product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Activity switch with memory match*
- *Replacing a card*
- *Switching the clock source*
- *Verifying load compatibility of SuperNode cards*

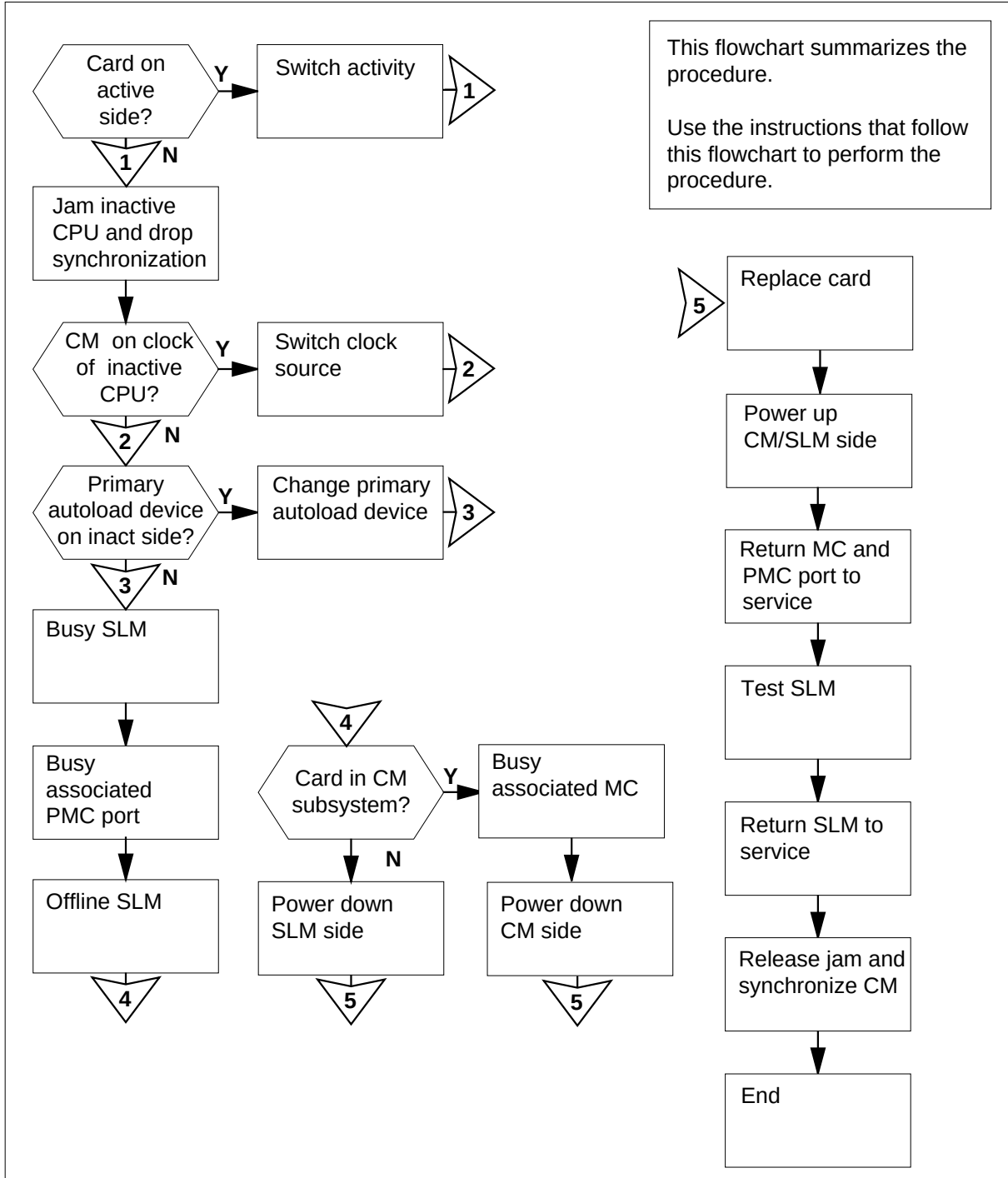
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT9X46 in a SuperNode SE CM/SLM (continued)

### Summary of Replacing an NT9X46 in a SuperNode SE CM/SLM



## NT9X46

### in a SuperNode SE CM/SLM (continued)

#### Replacing an NT9X46 in a SuperNode SE CM/SLM

##### *At your current location*

1



#### **WARNING**

##### **Possible loss of data recording services**

This procedure manually busies the SLM on the same plane as the card that you will replace. Make sure that the SLM on the opposite plane from the card you replace assumes data recording services, before you attempt this procedure.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card that you will replace.

- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.

##### *At the MAP terminal*

- 3 To access the CM level of the MAP display, type

**>MAPCI;MTC;CM**

and press the Enter key.

*Example of a MAP display:*

```
CM Sync Act CPU0 CPU1 Jam Memory CMMnt MC PMC
0 no cpu 1 . . yes
```

- 4 Determine if the SLM assembly that you replaced associates with the active CPU or the inactive CPU.

**Note:** The active CPU appears under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1.

| If the SLM assembly              | Do      |
|----------------------------------|---------|
| associates with the inactive CPU | step 5  |
| associates with the active CPU   | step 12 |

## NT9X46

### in a SuperNode SE CM/SLM (continued)

---

- 5 Determine if the inactive CPU is jammed.

**Note:** The word yes under the Jam header indicates that the inactive CPU is jammed. A blank field indicates that the CPU is not jammed.

| If the inactive CPU | Do     |
|---------------------|--------|
| is not jammed       | step 8 |
| is jammed           | step 6 |

#### *At the CM reset terminal for the inactive CPU*

- 6



#### **DANGER**

##### **Loss of service**

Make sure that you do not jam the active CPU. A cold restart occurs when you jam the active CPU while the CM is not in sync. The word Active on the top banner of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

**>\JAM**

and press the Enter key.

*RTIF response:*

Please confirm: (YES/NO)

- 7 To confirm the command, type

**>YES**

and press the Enter key.

*RTIF response:*

JAM DONE

#### *At the MAP terminal*

- 8 Determine if the CM is synchronized.

**Note:** A dot (.) or EccOn under the Sync header indicates that the CM is synchronized. The word no indicates that the CM is not synchronized.

| If the CM       | Do     |
|-----------------|--------|
| is synchronized | step 9 |

## NT9X46

### in a SuperNode SE CM/SLM (continued)

|                                                      |                                                                                                                                                                                                    |           |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                      | <b>If the CM</b>                                                                                                                                                                                   | <b>Do</b> |
|                                                      | is not synchronized                                                                                                                                                                                | step 13   |
| 9                                                    | To drop synchronization, type<br><b>&gt;DPSYNC</b><br>and press the Enter key.                                                                                                                     |           |
|                                                      | <b>If the response</b>                                                                                                                                                                             | <b>Do</b> |
|                                                      | is About to drop sync with CPU n active.<br>The inactive CPU is JAMMED.<br>Do you want to continue? Please confirm ("YES",<br>"Y", "NO", or "N"):                                                  | step 10   |
|                                                      | is other than listed here                                                                                                                                                                          | step 61   |
| 10                                                   | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>Maintenance action submitted.<br>Running in simplex mode with active CPU n. |           |
| <b>At the CM reset terminal for the inactive CPU</b> |                                                                                                                                                                                                    |           |
| 11                                                   | Wait until A1 flashes on the reset terminal for the inactive CPU.<br><b>Note:</b> Allow approximately 5 min for A1 to start to flash.                                                              |           |
|                                                      | <b>If A1</b>                                                                                                                                                                                       | <b>Do</b> |
|                                                      | flashes                                                                                                                                                                                            | step 13   |
|                                                      | does not flash                                                                                                                                                                                     | step 61   |
| 12                                                   | Perform the procedure <i>Activity switch with memory match</i> in this document.<br>Complete the procedure and return to this point.                                                               |           |

## NT9X46

### in a SuperNode SE CM/SLM (continued)

---

*At the MAP terminal*

13



#### **WARNING**

##### **Loss of service**

Make sure that the CM runs on the active clock of the CPU. Do not power down the inactive side of the CM while the CM runs on the clock of the inactive CPU. A cold restart or system image reload can occur which results in loss of service.

To determine if the CM runs on the inactive clock of the CPU, type

**>INSYNC**

and press the Enter key.

*Example of a MAP response:*

CPU pair is NOT insync, CPU 0 is active.  
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

---

| <b>If the CM</b>                      | <b>Do</b> |
|---------------------------------------|-----------|
| runs on the inactive clock of the CPU | step 14   |
| runs on the active clock of the CPU   | step 15   |

---

**14** To run the CM on the active clock of the CPU, perform the procedure *Switching the clock source* in this document. Complete the procedure and return to this point.

**15** To access the CMMNT level of the MAP display, type

**>CMMNT**

and press the Enter key.

*Example of a MAP display:*

## NT9X46

### in a SuperNode SE CM/SLM (continued)

```
CM Sync Act CPU0 CPU1 Jam Memory CMMnt MC PMC
0 no cpu 0 . . yes . . .
```

```
Traps: Per minute = 0 Total = 5
```

```
AutoLdev: Primary = SLM 0 DISK Secondary = SLM 1
DISK
```

```
Image Restartable = No image test since last restart
```

```
Next image restart type = WARM
```

```
Last CM REXTST executed
```

```
System memory in kbytes as of 14:39:07
Memory (kbytes): Used = 105984 Avail = 12800 Total =
118784
```

- 16** Determine if the primary autoload device is on the side of the switch with the active CPU or the inactive CPU.

**Note:** The primary autoload device appears on the right side of the Primary header. In the example in step 15, the primary autoload device is the disk of SLM 0.

| If the primary autoload device                     | Do      |
|----------------------------------------------------|---------|
| is on the side of the switch with the active CPU   | step 18 |
| is on the side of the switch with the inactive CPU | step 17 |

- 17** To change the primary autoload device to a device on the same side of the switch as the active CPU, type

**>AUTOLD SLM slm\_number device\_type**

and press the Enter key.

where

**slm\_number**

is the number of the active CPU (0 or 1)

**device\_type**

is the type of SLM device (DISK or TAPE)

*Example of a MAP response:*

```
New autoload route has been set.
```

- 18** To access the SLM that corresponds to the inactive CPU, type

**>IOD;SLM slm\_number**

and press the Enter key.

## NT9X46

### in a SuperNode SE CM/SLM (continued)

---

where

**slm\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP display:*

```

IOD
IOC 0 1 2 3
STAT

DIRP: . XFER: . DVI : . DPPP: . DPPU: .
NOP : . SLM : . NX25: . MLP : . SCAI: .

SLM 0 1
Stat . .

SLM 0 device TAPE DISK
 status
 drive idle on line
 user SYSTEM

```

**Note:** Dots on the right side of the SLM Stat header indicate that the associated SLMs are in service.

- 19** To manually busy the SLM, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

SLM 0 busy passed.

*Example of a MAP display:*

```

SLM 0 1
Stat M .

```

**Note:** The letter M on the right of the SLM Stat header indicates that the associated SLM is manual busy.

- 20** To access the PMC level of the MAP display, type

**>CM;PMC**

and press the Enter key.

*Example of a MAP display:*



## NT9X46

### in a SuperNode SE CM/SLM (continued)

PMC 0

.

PORT0: .

PORT1: .

- 21** To manually busy the port that corresponds to the inactive CPU, type

**>BSY 0 PORT port\_number**

and press the Enter key.

where

**port\_number**

is the number of the inactive CPU (0 or 1)

*Example input*

**>BSY 0 PORT 0**

*Example of a MAP response:*

Maintenance action submitted.

Passed.

- 22** To spin down the SLM disk, type

**>SPIN DOWN**

and press the Enter key.

**Note:** The light on the faceplate of the SLM starts to blink. After 1 min, the light turns off. Wait for the light to turn off before you continue this procedure.

*Example of a MAP response:*

Disk of SLM 0 is not ready.

- 23** To offline the SLM, type

**>OFFL**

and press the Enter key.

*Example of a MAP response:*

SLM 0 now offline. Do not remove SLM card until disk drive is spun down! This will be indicated when the SLM card light turns off.

## NT9X46

### in a SuperNode SE CM/SLM (continued)

- 24 The next action depends on if the card that you replaced is part of the CM subsystem or the SLM subsystem.

| If the card                                              | Do      |
|----------------------------------------------------------|---------|
| is part of the CM subsystem (card is in slot 17R or 22R) | step 25 |
| is part of the SLM subsystem (card is in slot 7R or 28R) | step 32 |

- 25 To access the MC level of the MAP display, type

**>MC**

and press the Enter key.

*Example of a MAP display:*

```
MC 0 MC 1
 . .
```

**Note:** In the example, dots under the MC headers indicate that the associated MCs are in service.

- 26 Determine the state of the message controller (MC) on the inactive CPU.

**Note:** The term mbsy under the MC header indicates that the MC is manual busy.

| If the state of the MC | Do      |
|------------------------|---------|
| is mbsy                | step 28 |
| is not mbsy            | step 27 |

- 27



#### WARNING

##### Possible loss of service

Make sure that you do not manually busy the MC that corresponds to the active CPU. Do not power down the inactive CPU plane with the MC that associates with the active busied CPU. This action will cause a warm restart.

To manually busy the MC that corresponds to the inactive CPU, type

**>BSY mc\_number**

and press the Enter key.

*where*

## NT9X46

### in a SuperNode SE CM/SLM (continued)

**mc\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.  
MC busied OK.

| If the MC    | Do      |
|--------------|---------|
| busied       | step 28 |
| did not busy | step 61 |

**At the CM/SLM shelf**

**28**

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To power down the inactive CPU plane, press down and release the power switch on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the NTDX15 power converter is in slots 33F to 35F.

- 29** Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- 30** To power up the inactive CPU plane, lift and release the power switch on the faceplate of the NTDX15 power converter.
- Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the power converter is in slots 33F to 35F.
- 31** Go to step 37.

## NT9X46 in a SuperNode SE CM/SLM (continued)

---

### At the CM/SLM shelf

32



#### **DANGER**

##### **Equipment damage and possible loss of service**

Make sure that you do not switch off the NTDX15 power converter. If you switch off the NTDX15 power converter, the associated CPU plane powers down. The SLM does not power down. The NT9X91 power converter powers the SLM.

Power down the inactive SLM side. To switch off the NT9X91 power converter, press down and release the power switch on the faceplate of the converter.

**Note:** For CPU 0, NT9X91 the power converter is in slots 1F to 3F. For CPU 1, the NT9X91 power converter is in slots 36F to 38F.

33



#### **WARNING**

##### **Equipment damage and possible loss of service**

Make sure that you remove the interconnect cable from the NT9X46 card on the inactive side only. Make sure that you disconnect the cable in the correct sequence.

Remove the interconnect cable from the NT9X46 cards on the inactive plane as follows:

- a For plane 0:
  - i Disconnect the cable from the card in slot 17R.
  - ii Disconnect the cable from the card in slot 07R.
- b For plane 1:
  - i Disconnect the cable from the card in slot 22R.
  - ii Disconnect the cable from the card in slot 28R.

**34** Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**35** Connect the interconnect cable to the NT9X46 cards on the inactive plane as follows:

- a For plane 0:
  - i Connect the cable to the card in slot 07R.
  - ii Connect the cable to the card in slot 17R.
- b For plane 1:

## NT9X46

### in a SuperNode SE CM/SLM (continued)

- i Connect the cable to the card in slot 28R.
  - ii Connect the cable to the card in slot 22R.
- 36 To power up the inactive SLM side, lift and release the power switch on the faceplate of the NT9X91 power converter.

**Note:** For plane 0, the power converter is in slots 1F to 3F. For plane 1, the power converter is in slots 36F to 38F.

#### **At the CM reset terminal for the inactive CPU**

37



#### **WARNING**

**You must complete the firmware tests**

If you do not complete the firmware tests, the CPUs cannot synchronize.

Wait for the switch to complete firmware tests.

*Example of an RTIF response:*

Testing Memory:

| Shelf | Slot | PEC Module Status |
|-------|------|-------------------|
| 00    | 15   | NT9X14EA .....    |
| 00    | 16   | NT9X14EA .....    |

Waiting for activity...

**Note:** When firmware testing is in progress, dots appear on the right of the PEC in the firmware testing status line of the RTIF response. As each firmware test is complete, another dot appears until firmware testing for the card is complete. If the dots do not continue to appear and another firmware testing status line does not appear, firmware tests stop. If the dots do not continue to appear and the prompt Waiting for activity does not appear, firmware tests stop.

- 38 Determine if the firmware tests completed.

**Note:** If the firmware tests completed and the CPU powered up, the Waiting for activity message appears.

| If the inactive CPU | Do      |
|---------------------|---------|
| powered up          | step 39 |
| did not turn on     | step 61 |

## NT9X46

### in a SuperNode SE CM/SLM (continued)

---

*At the MAP terminal*

**39** To make sure that you are at the PMC level of the MAP display, type  
**>CM;PMC**  
and press the Enter key.

**40** To return the manual busy PMC port to service, type  
**>RTS 0 PORT port\_number**  
and press the Enter key.

*where*

**port\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.  
Passed.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 41 |
| failed             | step 61 |

---

**41** To access the SLM that associates with the card that you replaced, type  
**>IOD;SLM slm\_number**  
and press the Enter key.

*where*

**slm\_number**

is the number of the SLM (0 or 1)

**42** To manually busy the SLM, type  
**>BSY**  
and press the Enter key.

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 43 |
| failed             | step 61 |

---

**43** To spin up the SLM disk, type  
**>SPIN UP**  
and press the Enter key.

**Note:** Wait for the light on the faceplate of the SLM to turn on before you continue this procedure.

## NT9X46

### in a SuperNode SE CM/SLM (continued)

*Example of a MAP response:*

Disk of SLM 0 is ready.

- 44** To test the SLM, type  
**>TST**  
and press the Enter key.

*Example of a MAP response:*

Minimum SLM 0 tests passed.

| If the TST command                           | Do      |
|----------------------------------------------|---------|
| passed                                       | step 47 |
| failed, and the system generated a card list | step 45 |
| is other than listed here                    | step 61 |

- 45** Record the location, description, slot number, PEC and the PEC suffix of the cards on the list.
- 46** To replace each card on the list, perform the correct card replacement procedure in this document. Complete the procedure and return to this point.
- 47** To return the SLM to service, type  
**>RTS**  
and press the Enter key.

*Example of a MAP response:*

SLM 0 return to service passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 48 |
| failed             | step 61 |

- 48** The next action depends on if the card that you replaced is part of the CM subsystem or the SLM subsystem.

| If the card                                              | Do      |
|----------------------------------------------------------|---------|
| is part of the CM subsystem (card is in slot 17R or 22R) | step 49 |

## NT9X46

### in a SuperNode SE CM/SLM (continued)

|    | If the card                                                           | Do      |
|----|-----------------------------------------------------------------------|---------|
|    | is part of the SLM subsystem (card is in slot 7R or 28R)              | step 57 |
| 49 | Your next step depends on the reason that you perform this procedure. |         |
|    | If you                                                                | Do      |
|    | perform this procedure as a result of a MC Tbl alarm                  | step 53 |
|    | perform this procedure as a result of a PMCFIt alarm                  | step 53 |
|    | perform this procedure as a result of a NoTOD alarm                   | step 53 |
|    | perform this procedure as a result of a SBsyMC alarm                  | step 53 |
|    | perform this procedure as a result of a MBsyMC alarm                  | step 53 |
|    | perform this procedure as a result of a CBsyMC alarm                  | step 53 |
|    | perform this procedure for any reason other than listed here          | step 50 |

#### *At the MAP terminal*

50 To access the MC level of the MAP display, type

**>CM;MC**

and press the Enter key.

51 To return the manual busy MC to service, type

**>RTS mc\_number**

and press the Enter key.

where

**mc\_number**

is the number of the manual busy MC (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.

MC RTS ok.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 52 |



## NT9X46

### in a SuperNode SE CM/SLM (continued)

|    | If the RTS command                                                                                                                                                                                                                                                                                                   | Do      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | failed                                                                                                                                                                                                                                                                                                               | step 61 |
| 52 | The next action depends on the reason that you performed this procedure.                                                                                                                                                                                                                                             |         |
|    | If you                                                                                                                                                                                                                                                                                                               | Do      |
|    | perform this procedure as a result of a CM alarm clearing procedure                                                                                                                                                                                                                                                  | step 53 |
|    | perform this procedure for any reason other than listed here                                                                                                                                                                                                                                                         | step 54 |
| 53 | Return to the alarm clearing procedure that directed you to this procedure and continue as directed.                                                                                                                                                                                                                 |         |
| 54 | To access the CM level of the MAP display, type<br><b>&gt;CM</b><br>and press the Enter key.                                                                                                                                                                                                                         |         |
| 55 | To test the inactive CPU, type<br><b>&gt;TST</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>The test(s) listed below will destroy the software load in inactive CPU:<br><br>Static RAM test<br><br>Do you want to do the test(s) anyway?<br>Please confirm: ("YES", "Y", "NO", or "N"): |         |
| 56 | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>Maintenance action submitted.<br>Test passed.                                                                                                                                                 |         |
|    | If the TST command                                                                                                                                                                                                                                                                                                   | Do      |
|    | passed                                                                                                                                                                                                                                                                                                               | step 57 |

## NT9X46

### in a SuperNode SE CM/SLM (end)

---

| If the TST command        | Do      |
|---------------------------|---------|
| is other than listed here | step 61 |

#### *At the CM reset terminal for the inactive CPU*

57 To release the jam on the inactive CPU, type

>\RELEASE JAM

and press the Enter key.

*RTIF response:*

JAM RELEASE DONE

#### *At the MAP terminal*

58 To synchronize the CM, type

>SYNC

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.  
Synchronization successful.

| If the response                           | Do      |
|-------------------------------------------|---------|
| indicates the SYNC command was successful | step 59 |
| is other than listed here                 | step 61 |

59 The next action depends on the reason that you perform this procedure.

| If you                                                              | Do      |
|---------------------------------------------------------------------|---------|
| perform this procedure as a result of another maintenance procedure | step 60 |
| perform this procedure for any reason other than listed here        | step 62 |

60 Return to the maintenance procedure that directed you to this procedure and continue as directed.

61 For additional help, contact the next level of support.

62 The procedure is complete.

## NT9X62 in a SuperNode SE CM/SLM

---

### Application

Use this procedure to replace an NT9X62 in a SuperNode SE (SNSE) computing module (CM) or system load module (SLM).

| PEC    | Suffix | Card name                                 | Shelf or frame name |
|--------|--------|-------------------------------------------|---------------------|
| NT9X62 | AA     | Two-port substrate<br>DS512 paddle board  | CM/SLM              |
| NT9X62 | BA     | Four-port substrate<br>DS512 paddle board | CM/SLM              |

Refer to the “Index”, if you cannot identify the following features for the card you want to replace:

- the product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Activity switch with memory match*
- *Switching the clock source*
- *Verifying load compatibility of SuperNode cards*

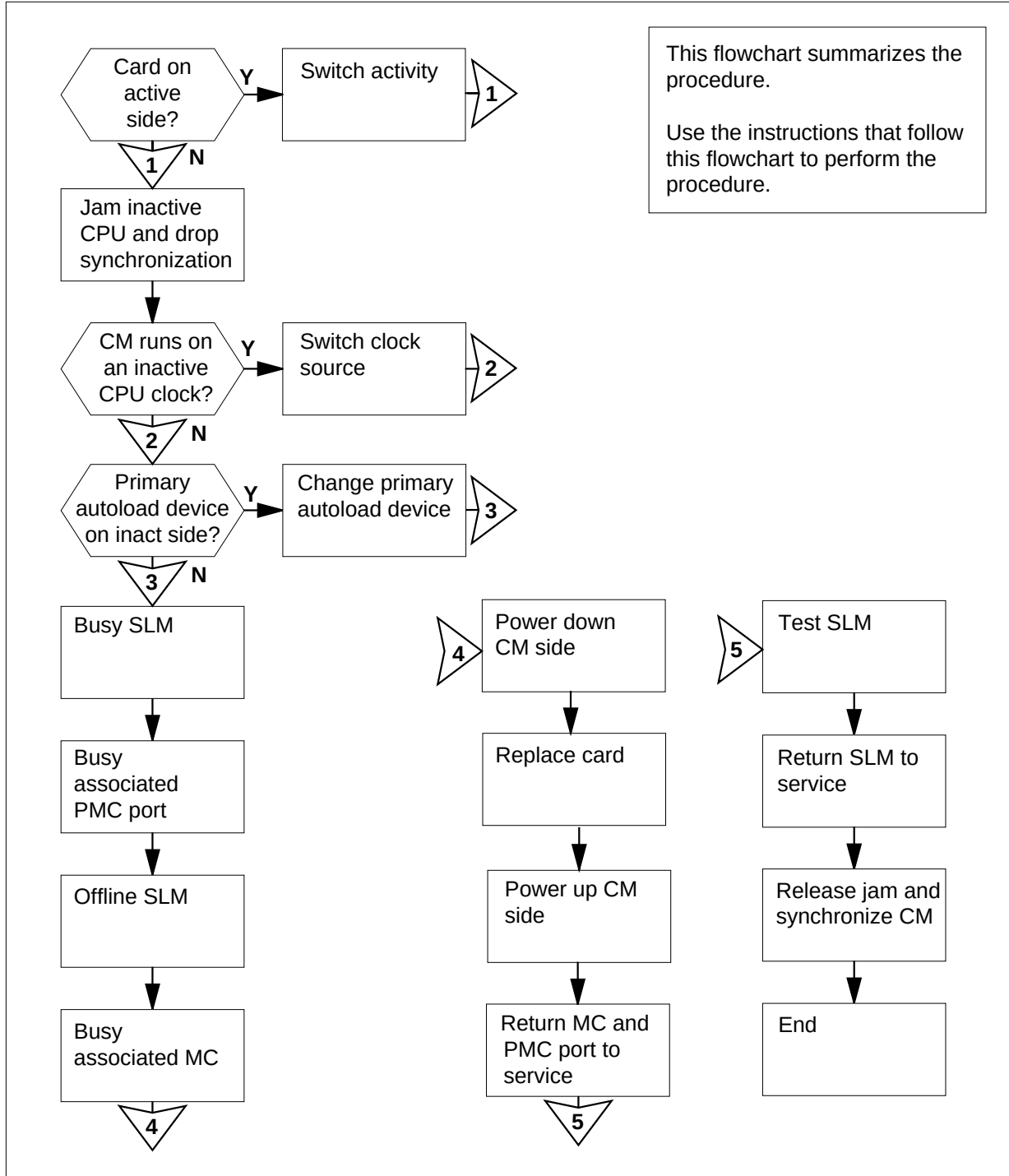
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT9X62 in a SuperNode SE CM/SLM (continued)

### Summary of Replacing an NT9X62 in a SuperNode SE CM/SLM



## NT9X62

### in a SuperNode SE CM/SLM (continued)

#### Replacing NT9X62 in a SuperNode SE CM/SLM

##### *At your current location*

1



#### **WARNING**

##### **Possible loss of data recording services**

This procedure manually busies the SLM on the same plane as the card that you replace. Make sure that the SLM on the opposite plane assumes data recording services of the SLM that you remove from service, before you attempt this procedure.

Obtain a replacement card. Make sure that the replacement card has the same PEC and the PEC suffix as the card that you will replace.

- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.

##### *At the MAP terminal*

- 3 To access the CM level of the MAP display, type

**>MAPCI;MTC;CM**

and press the Enter key.

*Example of a MAP display:*

| CM | Sync | Act   | CPU0 | CPU1 | Jam | Memory | CMMnt | MC | PMC |
|----|------|-------|------|------|-----|--------|-------|----|-----|
| 0  | no   | cpu 1 | .    | .    | yes | .      | .     | .  | .   |

- 4 Determine if the SLM assembly that you replace associates with the active CPU or the inactive CPU.

**Note:** The active CPU appears under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1.

| If the SLM assembly              | Do      |
|----------------------------------|---------|
| associates with the inactive CPU | step 5  |
| associates with the active CPU   | step 12 |

- 5 Determine if the inactive CPU is jammed.

**Note:** The word yes under the Jam header indicates that the inactive CPU is jammed. A blank field indicates that the CPU is not jammed.

| If the inactive CPU | Do     |
|---------------------|--------|
| is not jammed       | step 6 |

## NT9X62

### in a SuperNode SE CM/SLM (continued)

| If the inactive CPU | Do     |
|---------------------|--------|
| is jammed           | step 8 |

**At the CM reset terminal for the inactive CPU**

6



#### **DANGER**

##### **Loss of service**

Make sure that you do not jam the active CPU. A cold restart occurs when you jam the active CPU while the CM is not in sync. The word Active on the top banner of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

**>\JAM**

and press the Enter key.

*RTIF response:*

Please confirm: (YES/NO)

7 To confirm the command, type

**>YES**

and press the Enter key.

*RTIF response:*

JAM DONE

**At the MAP terminal**

8 Determine if the CM is synchronized.

**Note:** A dot (.) or EccOn under the Sync header indicates that the CM is synchronized. The word no indicates that the CM is not synchronized.

| If the CM           | Do      |
|---------------------|---------|
| is synchronized     | step 9  |
| is not synchronized | step 13 |

9 To drop synchronization, type

**>DPSYNC**

## NT9X62

### in a SuperNode SE CM/SLM (continued)

and press the Enter key.

| If the response                                                                                                                                  | Do      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| is About to drop sync with CPU n active.<br>The inactive CPU is JAMMED.<br>Do you want to continue?<br>Please confirm ("YES", "Y", "NO", or "N") | step 10 |
| is other than listed here                                                                                                                        | step 62 |

- 10** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.  
Running in simplex mode with active CPU n.

#### **At the CM reset terminal for the inactive CPU**

- 11** Wait until A1 flashes on the reset terminal for the inactive CPU.

**Note:** Allow approximately 5 min for A1 to start to flash.

| If A1          | Do      |
|----------------|---------|
| flashes        | step 13 |
| does not flash | step 62 |

- 12** Perform the procedure *Activity switch with memory match* in this document. Complete the procedure and return to this point.

## NT9X62

### in a SuperNode SE CM/SLM (continued)

---

*At the MAP terminal*

13



#### **WARNING**

##### **Loss of service**

Make sure that the CM runs on the active clock of the CPU. Do not power down the the inactive side of the CM while the CM runs on the inactive CPU clock. A cold restart or system image reload can occur which results in loss of service.

To determine if the CM runs on the inactive clock of the CPU, type

**>INSYNC**

and press the Enter key.

*Example of a MAP response:*

CPU pair is NOT insync, CPU 0 is active.  
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

---

| If the CM                             | Do      |
|---------------------------------------|---------|
| runs on the incative clock of the CPU | step 14 |
| runs on the active clock of the CPU   | step 15 |

---

**14** To run the CM on the active clock of the CPU, perform the procedure *Switching the clock source* in this document. Complete the procedure and return to this point.

**15** To access the CMMNT level of the MAP display, type

**>CMMNT**

and press the Enter key.

*Example of a MAP display:*



## NT9X62

### in a SuperNode SE CM/SLM (continued)

```
CM Sync Act CPU0 CPU1 Jam Memory CMMnt MC PMC
0 no cpu 0 . . yes . . .
```

```
Traps: Per minute = 0 Total = 5
```

```
AutoLdev: Primary = SLM 0 DISK Secondary = SLM 1
DISK
```

```
Image Restartable = No image test since last restart
```

```
Next image restart type = WARM
```

```
Last CM REXTST executed
```

```
System memory in kbytes as of 14:39:07
Memory (kbytes): Used = 105984 Avail = 12800 Total =
118784
```

- 16** Determine if the primary autoload device is on the same side of the switch as the active CPU or the inactive CPU.

**Note:** The primary autoload device appears on the right of the Primary header. In the example in step 15, the primary autoload device is the disk of SLM 0.

---

| If the primary autoload device | Do |
|--------------------------------|----|
|--------------------------------|----|

---

|                                                        |         |
|--------------------------------------------------------|---------|
| is on the same side of the switch<br>as the active CPU | step 18 |
|--------------------------------------------------------|---------|

|                                                                      |         |
|----------------------------------------------------------------------|---------|
| is on the side of the same side of<br>the switch as the inactive CPU | step 17 |
|----------------------------------------------------------------------|---------|

---

- 17** To change the primary autoload device to a device on the same side of the switch as the active CPU, type

```
>AUTOLD SLM slm_number device_type
```

and press the Enter key.

where

**slm\_number**  
is the number of the active CPU (0 or 1)

**device\_type**  
is the type of SLM device (DISK or TAPE)

*Example of a MAP response:*

New autoload route has been set.

## NT9X62

### in a SuperNode SE CM/SLM (continued)

---

- 18** To access the SLM that corresponds to the inactive CPU, type  
**>IOD;SLM slm\_number**  
 and press the Enter key.

where

**slm\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP display:*

```
IOD
IOC 0 1 2 3
STAT

DIRP: . XFER: . DVI : . DPPP: . DPPU: .
NOP : . SLM : . NX25: . MLP : . SCAI: .

SLM 0 1
Stat . .

SLM 0 device TAPE DISK
 status .
 drive idle on line
 user SYSTEM
```

**Note:** Dots on the right of the SLM Stat header indicate that the associated SLMs are in service.

- 19** To manually busy the SLM, type  
**>BSY**  
 and press the Enter key.

*Example of a MAP response:*

SLM 0 busy passed.

*Example of a MAP display:*

```
SLM 0 1
Stat M .
```

**Note:** The letter M on the right of the SLM Stat header indicates that the associated SLM is manual busy.

- 20** To access the PMC level of the MAP display, type  
**>CM;PMC**  
 and press the Enter key.

*Example of a MAP display:*

## NT9X62

### in a SuperNode SE CM/SLM (continued)

- ```

                PMC 0
                .
PORT0:         .
PORT1:         .

```
- 21** To manually busy the port that corresponds to the inactive CPU, type
>BSY 0 PORT port_number
 and press the Enter key.
where
 port_number
 is the number of the inactive CPU (0 or 1)
Example input
>BSY 0 PORT 0
Example of a MAP response:
- ```

Maintenance action submitted.
Passed.

```
- 22** To offline the SLM, type  
**>OFFL**  
 and press the Enter key.  
**Note:** Wait for the light on the faceplate of the SLM to turn off before you continue this procedure.  
*Example of a MAP response:*
- ```

SLM 0 now offline. Do not remove SLM card
until disk drive is spun down! This will be
indicated when the SLM card light turns off.

```
- 23** To access the MC level of the MAP display, type
>MC
 and press the Enter key.
Example of a MAP display:
- ```

MC 0 MC 1
. .

```
- Note:** In the preceding example, dots under the MC headers indicate that the associated MCs are in service.

## NT9X62

### in a SuperNode SE CM/SLM (continued)

---

- 24 Determine the state of the message controller (MC) on the inactive CPU.

**Note:** The term mbsy under the MC header indicates that the MC is manual busy.

---

| If the state of the MC | Do      |
|------------------------|---------|
| is mbsy                | step 26 |
| is not mbsy            | step 25 |

---

- 25



**WARNING**

**Possible loss of service**

Make sure that you do not manually busy the MC that corresponds to the active CPU. Do not power down the inactive CPU plane with the MC that associates with the active busied CPU. This action causes a warm restart.

To manually busy the MC that corresponds to the inactive CPU, type

**>BSY mc\_ number**

and press the Enter key.

where

**mc\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.

MC busied OK.

---

| If the MC    | Do      |
|--------------|---------|
| busied       | step 26 |
| did not busy | step 62 |

---

## NT9X62 in a SuperNode SE CM/SLM (continued)

### At the CM/SLM shelf

26



#### WARNING

##### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To power down the inactive CPU plane, press down and release the power switch on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the NTDX15 power converter is in slots 33F to 35F.

27 Locate the card on the shelf.

28

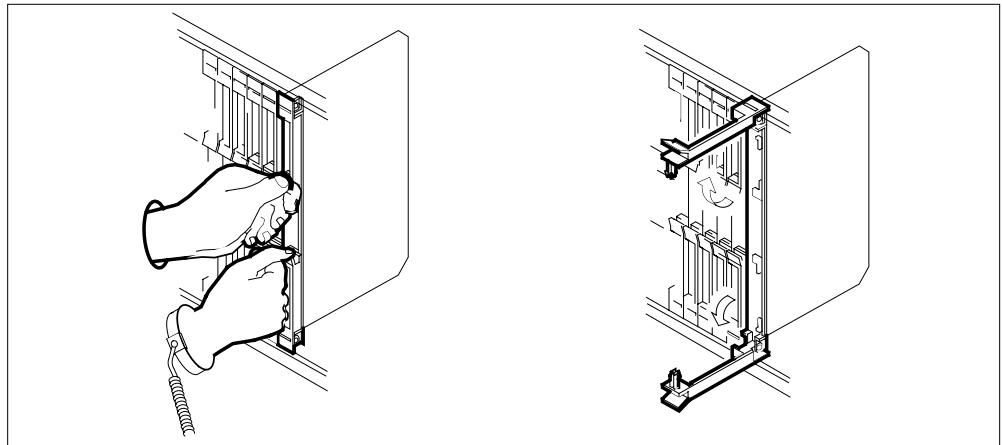


#### DANGER

##### Do not hold card by levers only

If you hold a card only by the levers, you can break the levers. When you pull the card half way out of the shelf, carefully grasp the card below for more support. While you continue to remove the card from the shelf, make sure that you do not touch any wires or internal parts on the card.

Open the locking levers on the card that you will replace.



## NT9X62

### in a SuperNode SE CM/SLM (continued)

---

29



#### **DANGER**

##### **Damage to fiber cables**

When you handle fiber cables, make sure you do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

Label each fiber cable. Use Transmit for the top cable and Receive for the bottom cable.

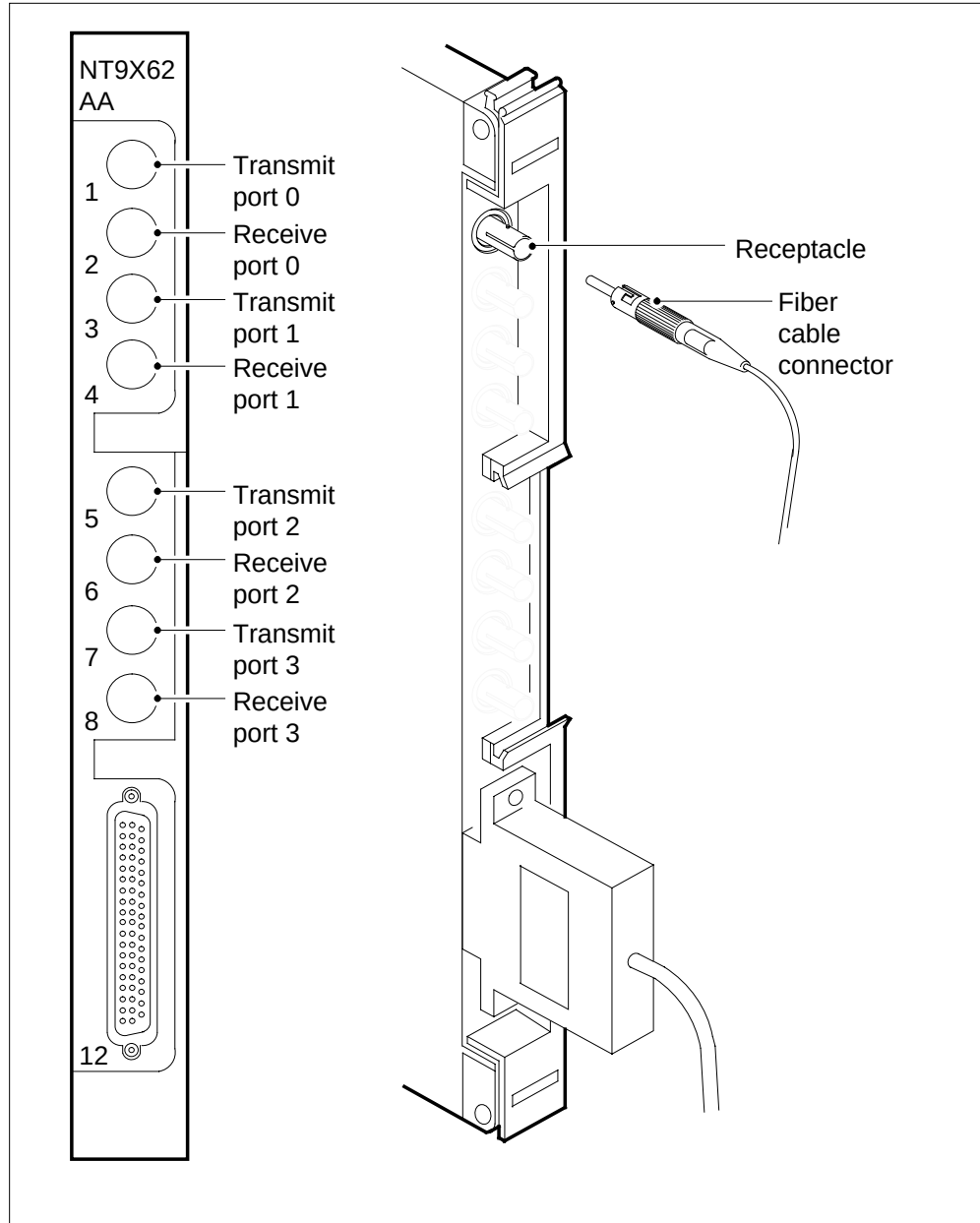
30

Disconnect the fiber cables from the faceplate of the card, as follows:

- a Loosen the fiber connections with the locking levers open.
- b Carefully push in and turn the fiber cable connector counterclockwise halfway until the connector slides out of the receptacle.

**Note:** Refer to the following diagram.

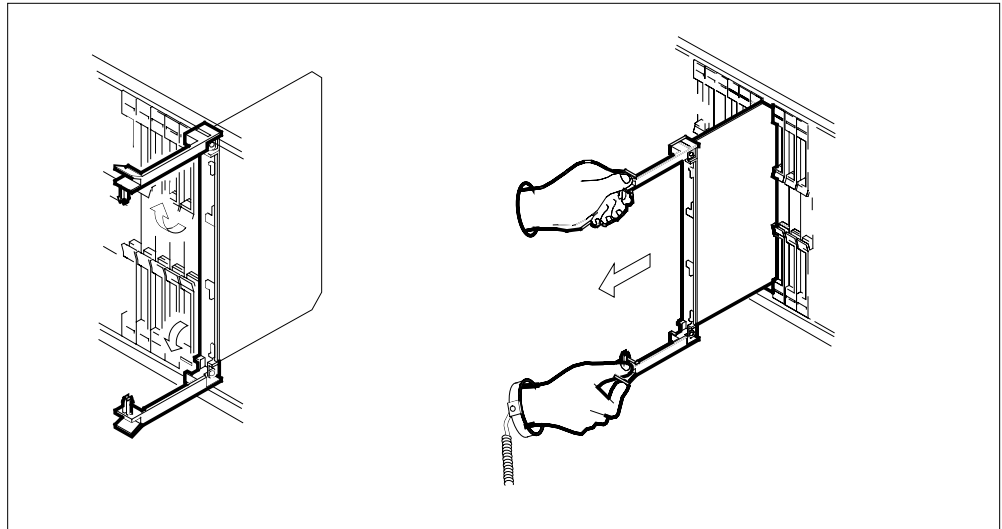
## NT9X62 in a SuperNode SE CM/SLM (continued)



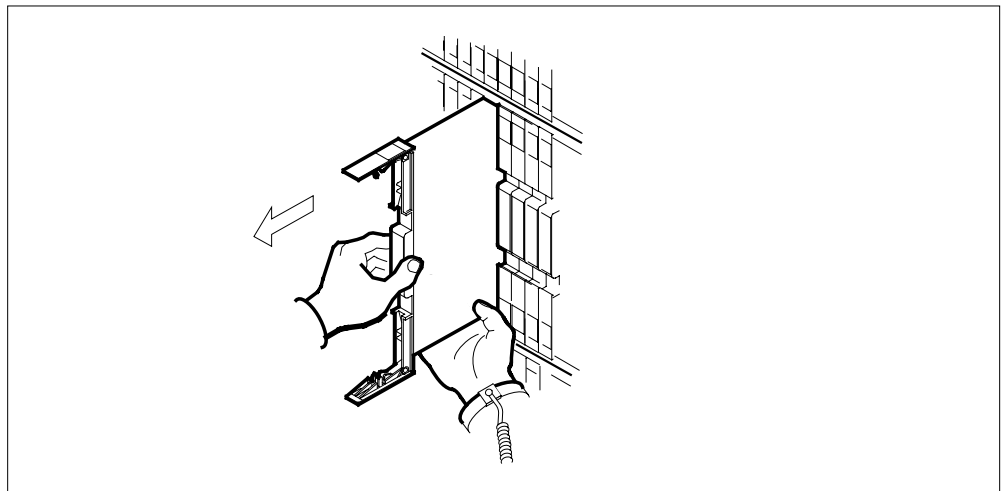
- 31** While you grasp the locking levers, carefully pull the card toward you until the card protrudes approximately 2 in. (5.1 cm) from the equipment shelf.

## NT9X62 in a SuperNode SE CM/SLM (continued)

---



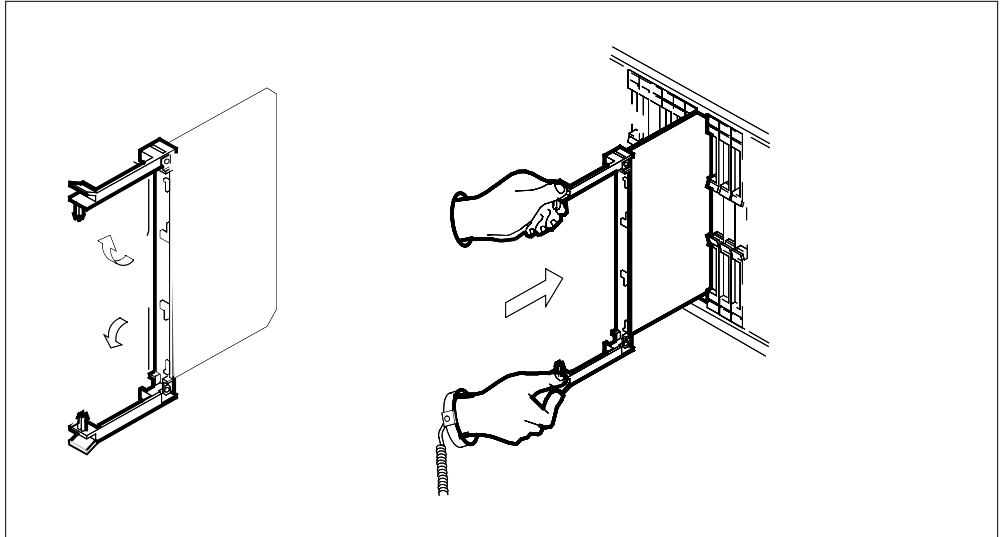
- 32** Hold the card by the faceplate with one hand while you support the bottom edge with the other hand. Carefully pull the card toward you until the card is clear of the shelf.



- 33** Place the card that you removed in an electrostatic discharge (ESD) protective container.
- 34** Make sure that the replacement card has the same PEC and PEC suffix as the card that you just removed.
- 35** Insert the replacement card into the shelf, as follows.
- a** Open the locking levers on the card.
  - b** Hold the card by the faceplate with one hand while you support the bottom edge with the other hand. Carefully slide the card into the shelf.



## NT9X62 in a SuperNode SE CM/SLM (continued)



36



### **DANGER**

#### **Damage to fiber cable**

When you handle fiber cables, make sure that you do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

Connect the fiber cables, as follows:

- a Tighten the cable connections with the locking levers open.
- b Carefully guide the cable connector into the receptacle notches.
- c Push in and turn the cable connector clockwise halfway until the connection is secure.

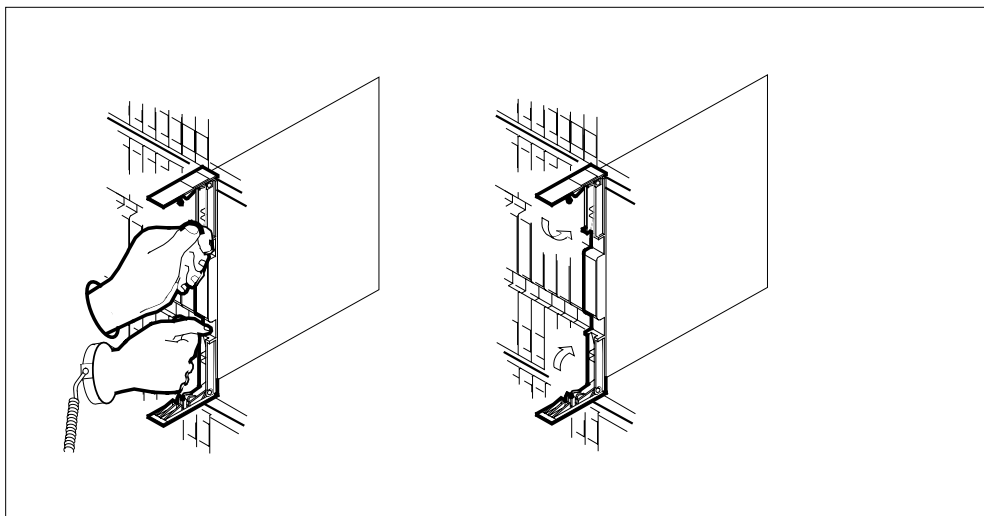
37

Seat and lock the card.

- a Use your fingers or thumbs to push on the upper and lower edges of the faceplate. Make sure that the card sits completely in the shelf.
- b Close the locking levers to secure the card.

## NT9X62 in a SuperNode SE CM/SLM (continued)

---



- 38 To power up the inactive CPU plane, lift and release the power switch located on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the power converter is in slots 33F to 35F.

### *At the CM reset terminal for the inactive CPU*

39



#### **WARNING**

**You must complete the firmware tests**

If you do not complete the firmware tests, the CPUs cannot synchronize.

Wait for the switch to complete firmware tests.

*Example of an RTIF response:*

```
Testing Memory:
Shelf Slot PEC Module Status
00 15 NT9X14EA
00 16 NT9X14EA
Waiting for activity...
```

**Note:** When firmware testing is in progress, dots appear on the right side of the PEC in the firmware testing status line of the RTIF response. As each firmware test is complete, another dot appears until firmware testing for the card is complete. If the dots do not continue to appear and another firmware testing status line does not appear, firmware tests stop. If the

## NT9X62

### in a SuperNode SE CM/SLM (continued)

dots do not appear and the prompt Waiting for activity does not appear, firmware tests stop.

- 40** Determine if the firmware tests completed.

**Note:** If the firmware tests completed and the CPU powered up, the Waiting for activity message appears.

| If the inactive CPU | Do      |
|---------------------|---------|
| powered up          | step 41 |
| did not power up    | step 62 |

#### *At the MAP terminal*

- 41** To access the PMC level of the MAP display, type

**>CM;PMC**

and press the Enter key.

- 42** To return the manual busy PMC port to service, type

**>RTS 0 PORT port\_number**

and press the Enter key.

where

**port\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.  
Passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 43 |
| failed             | step 62 |

- 43** To access the SLM that associates with the card that you replaced, type

**>IOD;SLM slm\_number**

and press the Enter key.

where

**slm\_number**

is the number of the SLM (0 or 1)

- 44** To manually busy the SLM, type

**>BSY**

and press the Enter key.

## NT9X62

### in a SuperNode SE CM/SLM (continued)

*Example of a MAP response:*

SLM 0 busy passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 45 |
| failed             | step 62 |

- 45** To spin up the SLM disk, type  
**>SPIN UP**  
 and press the Enter key.

**Note:** Wait for the light on the faceplate of the SLM to turn on before you continue this procedure.

*Example of a MAP response:*

Disk of SLM 0 is ready.

- 46** To test the SLM, type  
**>TST**  
 and press the Enter key.

*Example of a MAP response:*

Minimum SLM 0 tests passed.

| If the TST command                           | Do      |
|----------------------------------------------|---------|
| passed                                       | step 49 |
| failed, and the system generated a card list | step 47 |
| is other than listed here                    | step 62 |

- 47** Record the location, description, slot number, PEC and PEC suffix of the first card on the list.
- 48** To replace each card on the list, perform the appropriate card replacement procedure in this document. Complete the procedure and return to this point.
- 49** To return the SLM to service, type  
**>RTS**  
 and press the Enter key.

*Example of a MAP response:*

## NT9X62

### in a SuperNode SE CM/SLM (continued)

SLM 0 return to service passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 50 |
| failed             | step 62 |

**50** Your next step depends on the reason that you perform this procedure.

| If you                                                       | Do      |
|--------------------------------------------------------------|---------|
| perform this procedure as a result of a MC Tbl alarm         | step 54 |
| perform this procedure as a result of a PMCFlt alarm         | step 54 |
| perform this procedure as a result of a NoTOD alarm          | step 54 |
| perform this procedure as a result of a SBsyMC alarm         | step 54 |
| perform this procedure as a result of a MBsyMC alarm         | step 54 |
| perform this procedure as a result of a CBsyMC alarm         | step 54 |
| perform this procedure for any reason other than listed here | step 51 |

#### ***At the MAP terminal***

**51** To access the MC level of the MAP display, type

**>CM;MC**

and press the Enter key.

**52** To return the manual busy MC to service, type

**>RTS mc\_number**

and press the Enter key.

*where*

**mc\_number**

is the number of the manual busy MC (0 or 1)

*Example of a MAP response:*

## NT9X62

### in a SuperNode SE CM/SLM (continued)

---

Maintenance action submitted.  
MC RTS ok.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 53 |
| failed             | step 62 |

---

- 53 The next action depends on the reason that you perform this procedure.

---

| If you                                                             | Do      |
|--------------------------------------------------------------------|---------|
| perform the procedure as a result of a CM alarm clearing procedure | step 54 |
| perform the procedure for any reason other than listed here        | step 55 |

---

- 54 Return to the alarm clearing procedure that directed you to this procedure and continue as directed.

- 55 To access the CM level of the MAP display, type  
**>CM**  
and press the Enter key.

- 56 To test the inactive CPU, type  
**>TST**  
and press the Enter key.

*Example of a MAP response:*

The test(s) listed below will destroy  
the software load in inactive CPU:

Static RAM test

Do you want to do the test(s) anyway?  
Please confirm: ("YES", "Y", "NO", or "N"):

- 57 To confirm the command, type  
**>YES**  
and press the Enter key.

*Example of a MAP response:*

## NT9X62

### in a SuperNode SE CM/SLM (continued)

Maintenance action submitted.  
Test passed.

| If the TST command        | Do      |
|---------------------------|---------|
| passed                    | step 58 |
| is other than listed here | step 62 |

#### ***At the CM reset terminal for the inactive CPU***

**58** To release the jam on the inactive CPU, type

**>\RELEASE JAM**

and press the Enter key.

*RTIF response:*

JAM RELEASE DONE

#### ***At the MAP terminal***

**59** To synchronize the CM, type

**>SYNC**

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.  
Synchronization successful.

| If the response                                  | Do      |
|--------------------------------------------------|---------|
| indicates the SYNC command was successful        | step 60 |
| indicates the command was other than listed here | step 62 |

**60** The next action depends on the reason that you perform this procedure.

| If you                                                              | Do      |
|---------------------------------------------------------------------|---------|
| perform this procedure as a result of another maintenance procedure | step 61 |
| perform this procedure for any reason other than listed here        | step 63 |

## **NT9X62**

### **in a SuperNode SE CM/SLM (end)**

---

- 61** Return to the maintenance procedure that directed you to this procedure and continue as directed.
- 62** For additional help, contact the next level of support.
- 63** The procedure is complete.



## Power converter cards in a SuperNode SE CM/SLM

---

### Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) computing module (CM) or system load module (SLM).

| PEC    | Suffix | Card name                          | Shelf or frame name |
|--------|--------|------------------------------------|---------------------|
| NT9X91 | AA     | Storage device power converter     | CM/SLM              |
| NTDX15 | AA, AB | Global power converter<br>$\pm 5V$ | CM/SLM              |

Refer to the "Index", if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Activity switch with memory match*
- *Replacing a card*
- *Switching the clock source*
- *Verifying load compatibility of SuperNode cards*

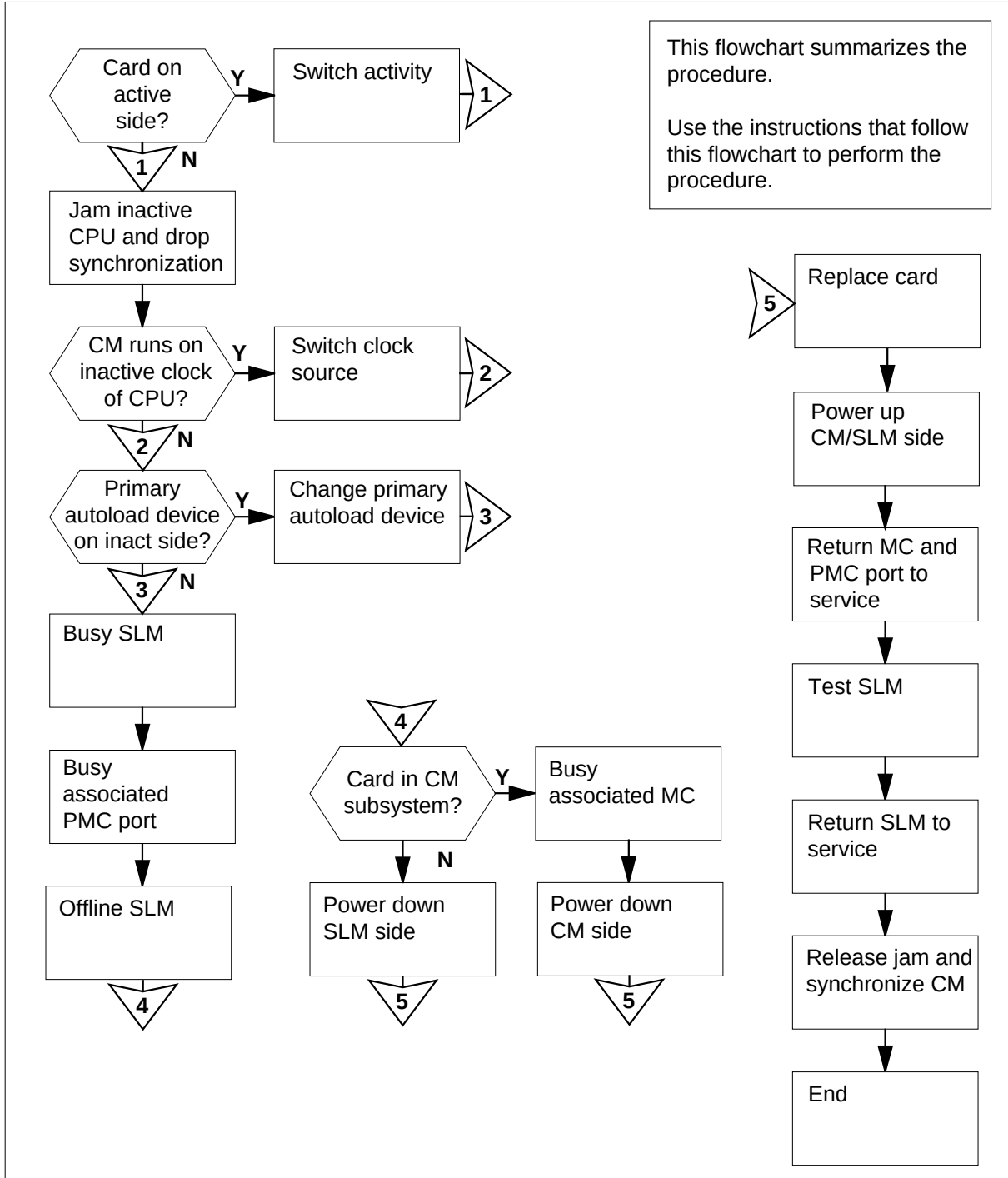
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## Power converter cards in a SuperNode SE CM/SLM (continued)

### Summary of replacing Power converter cards in a SuperNode SE CM/SLM



## Power converter cards in a SuperNode SE CM/SLM (continued)

### Replacing Power converter cards in a SuperNode SE CM/SLM

#### At your current location

1



#### WARNING

##### Possible loss of data recording services

This procedure manually busies the SLM on the same plane as the card you will replace. Make sure that the SLM on the opposite plane from the card you replace assumes data recording services, before you attempt this procedure.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card that you will replace.

- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.

#### At the MAP terminal

- 3 To access the CM level of the MAP display, type  
**>MAPCI;MTC;CM**  
and press the Enter key.

*Example of a MAP display:*

```
CM Sync Act CPU0 CPU1 Jam Memory CMMnt MC PMC
0 no cpu 1 . . yes
```

- 4 Determine if the SLM assembly that you will replace associates with the active CPU or the inactive CPU.

**Note:** The active CPU appears under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1.

| If the SLM assembly              | Do      |
|----------------------------------|---------|
| associates with the inactive CPU | step 5  |
| associates with the active CPU   | step 12 |

## Power converter cards in a SuperNode SE CM/SLM (continued)

---

- 5 Determine if the inactive CPU is jammed.

**Note:** The word yes under the Jam header indicates that the inactive CPU is jammed. A blank field indicates that the CPU is not jammed.

| If the inactive CPU | Do     |
|---------------------|--------|
| is not jammed       | step 8 |
| is jammed           | step 6 |

### *At the CM reset terminal for the inactive CPU*

- 6



#### **DANGER**

##### **Loss of service**

Make sure that you do not jam the active CPU. A cold restart occurs when you jam the active CPU while the CM is not in sync. The word Active on the top banner of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

**>\JAM**

and press the Enter key.

*RTIF response:*

Please confirm: (YES/NO)

- 7 To confirm the command, type

**>YES**

and press the Enter key.

*RTIF response:*

JAM DONE

### *At the MAP terminal*

- 8 Determine if the CM is synchronized.

**Note:** A dot (.) or EccOn under the Sync header indicates that the CM is synchronized. The word no indicates that the CM is not synchronized.

| If the CM       | Do     |
|-----------------|--------|
| is synchronized | step 9 |

## Power converter cards in a SuperNode SE CM/SLM (continued)

|                                                      |                                                                                                                                                                                                    |           |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                      | <b>If the CM</b>                                                                                                                                                                                   | <b>Do</b> |
|                                                      | is not synchronized                                                                                                                                                                                | step 13   |
| 9                                                    | To drop synchronization, type<br><b>&gt;DPSYNC</b><br>and press the Enter key.                                                                                                                     |           |
|                                                      | <b>If the response</b>                                                                                                                                                                             | <b>Do</b> |
|                                                      | is About to drop sync with CPU n active.<br>The inactive CPU is JAMMED.<br>Do you want to continue?<br>is Please confirm ("YES", "Y", "NO", or "N"):                                               | step 10   |
|                                                      | is other than listed here                                                                                                                                                                          | step 58   |
| 10                                                   | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>Maintenance action submitted.<br>Running in simplex mode with active CPU n. |           |
| <b>At the CM reset terminal for the inactive CPU</b> |                                                                                                                                                                                                    |           |
| 11                                                   | Wait until A1 flashes on the reset terminal for the inactive CPU.<br><b>Note:</b> Allow approximately 5 min for A1 to start to flash.                                                              |           |
|                                                      | <b>If A1</b>                                                                                                                                                                                       | <b>Do</b> |
|                                                      | flashes                                                                                                                                                                                            | step 13   |
|                                                      | does not flash                                                                                                                                                                                     | step 58   |
| 12                                                   | Perform the procedure <i>Activity switch with memory match</i> in this document.<br>Complete the procedure and return to this point.                                                               |           |

## Power converter cards in a SuperNode SE CM/SLM (continued)

---

*At the MAP terminal*

13



### **WARNING**

#### **Loss of service**

Make sure that the CM runs on the active clock of the CPU. Do not power down the inactive side of the CM while the CM runs on the clock of the inactive CPU. A cold restart or system image reload can occur which results in loss of service.

To determine if the CM runs on the inactive clock of the CPU, type

**>INSYNC**

and press the Enter key.

*Example of a MAP response:*

CPU pair is NOT insync, CPU 0 is active.  
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

|           | <b>If the CM</b>                                                                                                                                                         | <b>Do</b> |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | runs on the inactive clock of the CPU                                                                                                                                    | step 14   |
|           | runs on the active clock of the CPU                                                                                                                                      | step 15   |
| <b>14</b> | To run the CM on the active clock of the CPU, perform the procedure <i>Switching the clock source</i> in this document. Complete the procedure and return to this point. |           |
| <b>15</b> | To access the CMMNT level of the MAP display, type<br><b>&gt;CMMNT</b><br>and press the Enter key.<br><i>Example of a MAP display:</i>                                   |           |

## Power converter cards in a SuperNode SE CM/SLM (continued)

```
CM Sync Act CPU0 CPU1 Jam Memory CMMnt MC PMC
0 no cpu 0 . . yes . . .
```

```
Traps: Per minute = 0 Total = 5
```

```
AutoLdev: Primary = SLM 0 DISK Secondary = SLM 1
DISK
```

```
Image Restartable = No image test since last restart
```

```
Next image restart type = WARM
```

```
Last CM REXTST executed
```

```
System memory in kbytes as of 14:39:07
Memory (kbytes): Used = 105984 Avail = 12800 Total =
118784
```

- 16** Determine if the primary autoload device is on the same side of the switch as the active CPU or the inactive CPU.

**Note:** The primary autoload device appears on the right of the Primary header. In the example in step 15, the primary autoload device is the disk of SLM 0.

| If the primary autoload device                        | Do      |
|-------------------------------------------------------|---------|
| is on the same side of the switch as the active CPU   | step 18 |
| is on the same side of the switch as the inactive CPU | step 17 |

- 17** To change the primary autoload device to a device on the same side of the switch as the active CPU, type

```
>AUTOLD SLM slm_number device_type
```

and press the Enter key.

where

**slm\_number**

is the number of the active CPU (0 or 1)

**device\_type**

is the type of SLM device (DISK or TAPE)

*Example of a MAP response:*

```
New autoload route has been set.
```

- 18** To access the SLM that corresponds to the inactive CPU, type

```
>IOD;SLM slm_number
```

and press the Enter key.

## Power converter cards in a SuperNode SE CM/SLM (continued)

---

where

**slm\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP display:*

```

IOD
IOC 0 1 2 3
STAT

DIRP: . XFER: . DVI : . DPPP: . DPPU: .
NOP : . SLM : . NX25: . MLP : . SCAI: .

SLM 0 1
Stat . .

SLM 0 device TAPE DISK
 status .
 drive idle on line
 user SYSTEM

```

**Note:** Dots on the right of the SLM Stat header indicate that the associated SLMs are in service.

- 19** To manually busy the SLM, type  
**>BSY**

and press the Enter key.

*Example of a MAP response:*

```
SLM 0 busy passed.
```

*Example of a MAP display:*

```

SLM 0 1
Stat M .

```

**Note:** The letter M on the right of the SLM Stat header indicates that the associated SLM is manual busy.

- 20** To access the PMC level of the MAP display, type  
**>CM;PMC**

and press the Enter key.

*Example of a MAP display:*



## Power converter cards in a SuperNode SE CM/SLM (continued)

- PMC 0  
.
- PORT0: .  
PORT1: .
- 21** To manually busy the port that corresponds to the inactive CPU, type  
**>BSY 0 PORT port\_number**  
 and press the Enter key.  
*where*  
**port\_number**  
 is the number of the inactive CPU (0 or 1)  
*Example input*  
**>BSY 0 PORT 0**  
*Example of a MAP response:*  
 Maintenance action submitted.  
 Passed.
- 22** To offline the SLM, type  
**>OFFL**  
 and press the Enter key.  
**Note:** Wait for the light on the faceplate of the SLM to turn off before you continue this procedure.  
*Example of a MAP response:*  
 SLM 0 now offline. Do not remove SLM card until disk drive is spun down! This will be indicated when the SLM card light turns off.
- 23** The next action depends on if the card that you replaced is part of the CM subsystem or the SLM subsystem.
- | If the card                           | Do      |
|---------------------------------------|---------|
| is part of the CM subsystem (NT9X91)  | step 24 |
| is part of the SLM subsystem (NTDX15) | step 31 |
- 24** To access the message controller (MC) level of the MAP display, type  
**>MC**  
 and press the Enter key.

## Power converter cards in a SuperNode SE CM/SLM (continued)

*Example of a MAP display:*

```
MC 0 MC 1
 . .
```

**Note:** In the example, dots under the MC headers indicate that the associated MCs are in service.

- 25 Determine the state of the MC on the inactive CPU.

**Note:** The term mbsy under the MC header means that the MC is manual busy.

| If the state of the MC | Do      |
|------------------------|---------|
| is mbsy                | step 27 |
| is not mbsy            | step 26 |

- 26



### WARNING

#### Possible loss of service

Make sure that you do not manually busy the MC that corresponds to the active CPU. Do not power down the inactive CPU plane with the MC that associates with the active busied CPU. This action will cause a warm restart.

To manually busy the MC that corresponds to the inactive CPU, type

**>BSY mc\_ number**

and press the Enter key.

where

**mc\_ number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

```
Maintenance action submitted.
MC busied OK.
```

| If the MC    | Do      |
|--------------|---------|
| busied       | step 27 |
| did not busy | step 58 |

## Power converter cards in a SuperNode SE CM/SLM (continued)

---

*At the CM/SLM shelf*

27



### **WARNING**

#### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To power down the inactive CPU plane, press down and release the power switch on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the NTDX15 power converter is in slots 33F to 35F.

28 Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

29 To power up the inactive CPU plane, lift and release the power switch located on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the power converter is in slots 33F to 35F.

30 Go to step 34.

## Power converter cards in a SuperNode SE CM/SLM (continued)

---

### *At the CM/SLM shelf*

31



#### **DANGER**

##### **Equipment damage and possible loss of service**

Make sure that you do not switch off the NTDX15 power converter. If you switch off the NTDX15 power converter, the associated CPU plane powers down. The SLM does not power down. The NT9X91 power converter powers the SLM.



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Power down the inactive SLM side. Press down and release the power switch located on the faceplate of the converter to switch off the NT9X91 power converter.

**Note:** For CPU 0, NT9X91 the power converter is in slots 1F to 3F. For CPU 1, the NT9X91 power converter is in slots 36F to 38F.

- 32 Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

- 33 Lift and release the power switch on the faceplate of the NT9X91 power converter to power up the inactive SLM side.

**Note:** For plane 0, the power converter is in slots 1F to 3F. For plane 1, the power converter is in slots 36F to 38F.

### *At the CM reset terminal for the inactive CPU*

34



#### **WARNING**

##### **You must complete the firmware tests**

If you do not complete the firmware tests, the CPUs cannot synchronize.

Wait for the switch to complete firmware tests.

*Example of an RTIF response:*

## Power converter cards in a SuperNode SE CM/SLM (continued)

```
Testing Memory:
Shelf Slot PEC Module Status
00 15 NT9X14EA
00 16 NT9X14EA
Waiting for activity...
```

**Note:** When firmware testing is in progress, dots appear on the right of the PEC in the firmware testing status line of the RTIF response. As each firmware test is complete, another dot appears until firmware testing for the card is complete. If the dots do not continue to appear and another firmware testing status line does not appear, firmware tests stop. If the dots do not appear and the prompt Waiting for activity does not appear, firmware tests stop.

- 35 Determine if the firmware tests completed.

**Note:** If the firmware tests completed and the CPU powered up, the Waiting for activity message appears.

| If the inactive CPU | Do      |
|---------------------|---------|
| powered up          | step 36 |
| did not power up    | step 58 |

### At the MAP terminal

- 36 To access the PMC level of the MAP display, type

```
>CM;PMC
```

and press the Enter key.

- 37 To return the manual busy PMC port to service, type

```
>RTS 0 PORT port_number
```

and press the Enter key.

where

**port\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

```
Maintenance action submitted.
```

```
Passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 38 |
| failed             | step 58 |

## Power converter cards in a SuperNode SE CM/SLM (continued)

- 38** To access the SLM that associates with the card that you replaced, type  
**>IOD;SLM slm\_number**  
 and press the Enter key.  
*where*

**slm\_number**  
 is the number of the SLM (0 or 1)

- 39** To manually busy the SLM, type  
**>BSY**  
 and press the Enter key.  
*Example of a MAP response:*

SLM 0 busy passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 40 |
| failed             | step 58 |

- 40** To spin up the SLM disk, type  
**>SPIN UP**  
 and press the Enter key.  
**Note:** Wait for the light on the faceplate of the SLM to turn on before you continue this procedure.  
*Example of a MAP response:*

Disk of SLM 0 is ready.

- 41** To test the SLM, type  
**>TST**  
 and press the Enter key.  
*Example of a MAP response:*

Minimum SLM 0 tests passed.

| If the TST command                                                        | Do                 |
|---------------------------------------------------------------------------|--------------------|
| passed                                                                    | step 44            |
| failed, and the system generated a card list<br>is other than listed here | step 42<br>step 58 |

## Power converter cards in a SuperNode SE CM/SLM (continued)

- 42** Record the location, description, slot number, PEC and PEC suffix of the first card on the list.
- 43** To replace each card on the list, perform the appropriate card replacement procedure in this document. Complete the procedure and return to this point.
- 44** To return the SLM to service, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

SLM 0 return to service passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 45 |
| failed             | step 58 |

- 45** The next action depends on if the card that you replaced is part of the CM subsystem or the SLM subsystem.

| If the card                           | Do      |
|---------------------------------------|---------|
| is part of the CM subsystem (NT9X91)  | step 46 |
| is part of the SLM subsystem (NTDX15) | step 54 |

- 46** Your next step depends on the reason that you perform this procedure.

| If you                                                       | Do      |
|--------------------------------------------------------------|---------|
| perform this procedure as a result of a MC Tbl alarm         | step 50 |
| perform this procedure as a result of a PMCFlt alarm         | step 50 |
| perform this procedure as a result of a NoTOD alarm          | step 50 |
| perform this procedure as a result of a SBsyMC alarm         | step 50 |
| perform this procedure as a result of a MBsyMC alarm         | step 50 |
| perform this procedure as a result of a CBsyMC alarm         | step 50 |
| perform this procedure for any reason other than listed here | step 47 |

## Power converter cards in a SuperNode SE CM/SLM (continued)

### *At the MAP terminal*

- 47 To access the MC level of the MAP display, type

**>CM;MC**

and press the Enter key.

- 48 To return the manual busy MC to service, type

**>RTS mc\_number**

and press the Enter key.

where

**mc\_number**

is the number of the manual busy MC (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.

MC RTS ok.

| <b>If the RTS command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 49   |
| failed                    | step 58   |

- 49 The next action depends on the reason that you perform this procedure.

| <b>If you</b>                                                       | <b>Do</b> |
|---------------------------------------------------------------------|-----------|
| perform this procedure as a result of a CM alarm clearing procedure | step 50   |
| performed this procedure for any reason other than listed here      | step 51   |

- 50 Return to the alarm clearing procedure that directed you this procedure and continue as directed.

- 51 To access the CM level of the MAP display, type

**>CM**

and press the Enter key.

- 52 To test the inactive CPU, type

**>TST**

and press the Enter key.

*Example of a MAP response:*



## Power converter cards in a SuperNode SE CM/SLM (continued)

The test(s) listed below will destroy the software load in inactive CPU:

### Static RAM test

Do you want to do the test(s) anyway?  
Please confirm: ("YES", "Y", "NO", or "N"):

**53** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.  
Test passed.

| If the TST command        | Do      |
|---------------------------|---------|
| passed                    | step 54 |
| is other than listed here | step 58 |

### ***At the CM reset terminal for the inactive CPU***

**54** To release the jam on the inactive CPU, type

**>\RELEASE JAM**

and press the Enter key.

*RTIF response:*

JAM RELEASE DONE

### ***At the MAP terminal***

**55** To synchronize the CM, type

**>SYNC**

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.  
Synchronization successful.

| If the response                           | Do      |
|-------------------------------------------|---------|
| indicates the SYNC command was successful | step 56 |

## Power converter cards in a SuperNode SE CM/SLM (end)

---

|    | If the response                                                                                   | Do      |
|----|---------------------------------------------------------------------------------------------------|---------|
|    | is other than listed here                                                                         | step 58 |
| 56 | The next action depends on the reason that you perform this procedure.                            |         |
|    | If you                                                                                            | Do      |
|    | perform this procedure for another maintenance procedure                                          | step 57 |
|    | perform this procedure for any reason other than listed here                                      | step 59 |
| 57 | Return to the maintenance procedure that directed you to this procedure and continue as directed. |         |
| 58 | For additional help, contact the next level of support.                                           |         |
| 59 | The procedure is complete.                                                                        |         |

## Replace system cards in a SuperNode SE CM/SLM

### Application

Use this procedure to replace the following cards in a Supernode SE computing module (CM) or system load module (SLM).

| PEC    | Suffix             | Card Name                                     | Shelf or frame name |
|--------|--------------------|-----------------------------------------------|---------------------|
| NT9X10 | AA                 | 33-MHz 88100 BRISC CPU card                   | CM/SLM              |
| NT9X10 | BA, CA             | 60-MHz 88100 BRISC CPU card                   | CM/SLM              |
| NT9X12 | AA, AB, AC, AD     | CPU port card                                 | CM/SLM              |
| NT9X13 | MA, MB             | Supernode SE core processor card              | CM/SLM              |
| NT9X14 | DB                 | 24-Mbyte memory card                          | CM/SLM              |
| NT9X14 | EA                 | 96-Mbyte memory card                          | CM/SLM              |
| NT9X21 | AA                 | CM-bus terminator paddle board                | CM/SLM              |
| NT9X21 | AB                 | Bus terminator paddle board                   | CM/SLM              |
| NT9X26 | AB, CA             | Remote terminal interface paddle (RTIF) board | CM/SLM              |
| NT9X26 | DA, DB, DC, EA, FA | BRISC RTIF paddle board                       | CM/SLM              |
| NT9X86 | AA/AB              | Dual-port message controller card             | CM/SLM              |

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Activity switch with memory match*
- *Replacing a card*
- *Switching the clock source*
- *Verifying load compatibility of SuperNode cards*

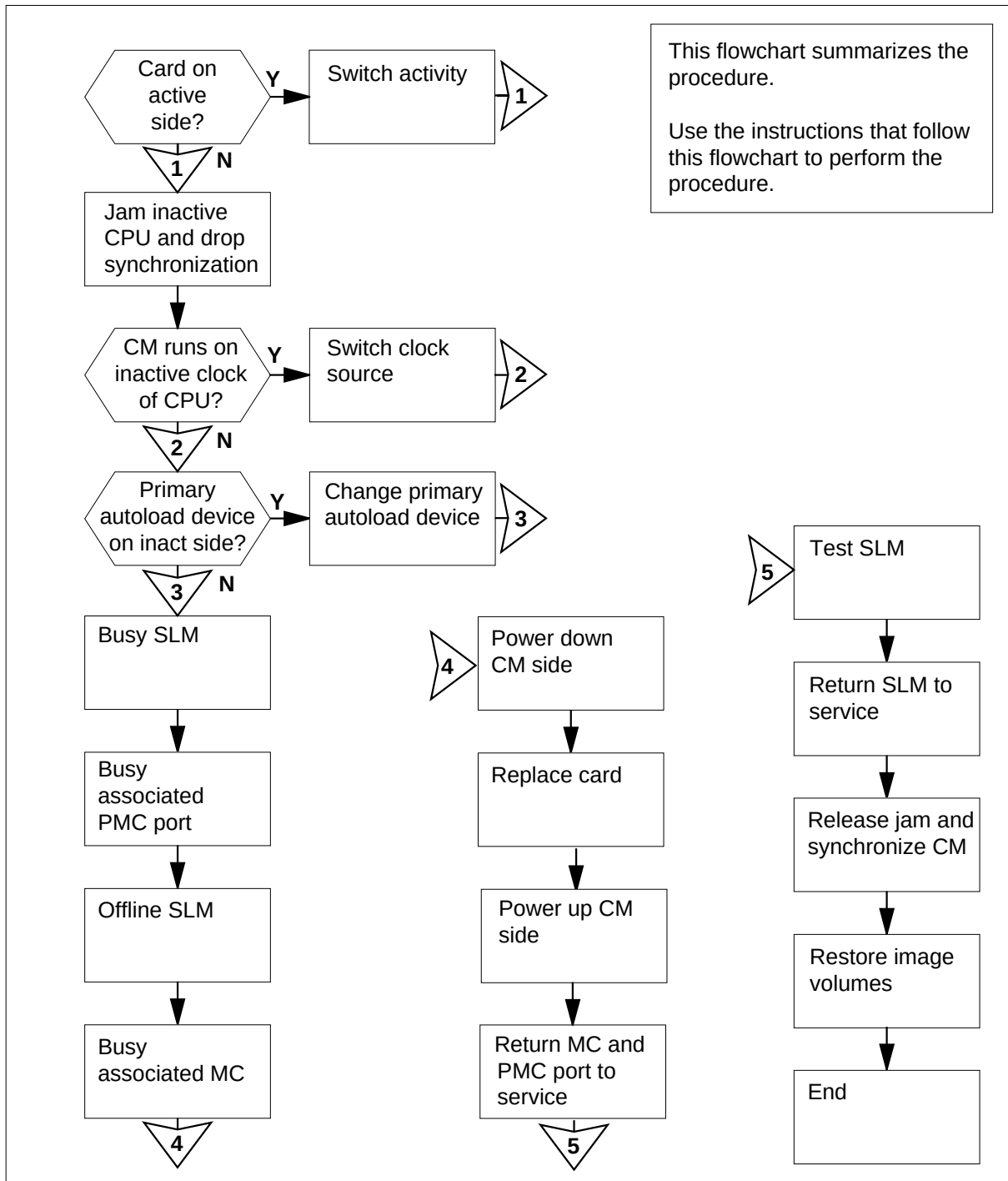
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## Replace system cards in a SuperNode SE CM/SLM (continued)

### Summary of Replace system cards in a SuperNode SE CM/SLM



## Replace system cards in a SuperNode SE CM/SLM (continued)

---

### Replace system cards in a SuperNode SE CM/SLM

#### *At your current location*

1



#### **DANGER**

##### **Possible loss of data recording services**

This procedure manually busies the SLM on the same plane as the card that you replace. Make sure that the SLM on the opposite plane from the card you replace assumes data recording services, before you attempt this procedure.



#### **DANGER**

##### **Possible incorrect memory configuration**

Replacement of an NT9X14DB with an NT9X14EA can result in a memory configuration that is not supported. If you replace an NT9X14DB with an NT9X14EA, contact the next level of support.



#### **DANGER**

##### **Possible incorrect memory configuration**

Do not leave empty slots between memory cards or between the first memory card and a two-port message controller card. The empty slots result in a memory configuration that is not supported.



#### **DANGER**

##### **Possible incorrect memory configuration**

Do not mix NT9X14DB and NT9X14EA cards. Mixed cards result in a memory configuration that is not supported. Keep NT9X14EA cards together. Place the NT9X14EA cards next to the CPU card.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card that you will replace.

2

Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.

## Replace system cards in a SuperNode SE CM/SLM (continued)

### *At the MAP terminal*

- 3 To access the CM level of the MAP display, type

**>MAPCI;MTC;CM**

and press the Enter key.

*Example of a MAP display:*

| CM | Sync | Act   | CPU0 | CPU1 | Jam | Memory | CMMnt | MC | PMC |
|----|------|-------|------|------|-----|--------|-------|----|-----|
| 0  | no   | cpu 1 | .    | .    | yes | .      | .     | .  | .   |

- 4 Determine if the SLM assembly that you replace associates with the active CPU or the inactive CPU.

**Note:** The active CPU appears under the Act header on the MAP display. In the example in step 3, the active CPU is CPU 1.

| If the SLM assembly              | Do      |
|----------------------------------|---------|
| associates with the inactive CPU | step 5  |
| associates with the active CPU   | step 12 |

- 5 Determine if the inactive CPU is jammed.

**Note:** The word yes under the Jam header indicates that the inactive CPU is jammed. A blank field indicates that the CPU is not jammed.

| If the inactive CPU | Do     |
|---------------------|--------|
| is not jammed       | step 6 |
| is jammed           | step 8 |

### *At the CM reset terminal (RTIF) for the inactive CPU*

- 6



#### **DANGER**

##### **Loss of service**

Make sure that you do not jam the active CPU. A cold restart occurs when you jam the active CPU while the CPU is not in sync. The word Active on the top banner of the display identifies the reset terminal for the active CPU.

To jam the inactive CPU, type

**>\JAM**

and press the Enter key.

*RTIF response:*

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

Please confirm: (YES/NO)

- 7 To confirm the command, type

**>YES**

and press the Enter key.

*RTIF response:*

JAM DONE

### ***At the MAP terminal***

- 8 Determine if the CM is synchronized

**Note:** A dot (.) or EccOn under the Sync header indicates that the CM is synchronized. The word no indicates that the CM is not synchronized.

| If the CM           | Do      |
|---------------------|---------|
| is synchronized     | step 9  |
| is not synchronized | step 13 |

- 9 To drop synchronization, type

**>DPSYNC**

and press the Enter key.

| If the response                                                                                                                                   | Do      |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| is About to drop sync with CPU 1 active.<br>The inactive CPU is JAMMED.<br>Do you want to continue?<br>Please confirm ("YES", "Y", "NO", or "N"): | step 10 |
| is other than listed here                                                                                                                         | step 70 |

- 10 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.

Running in simplex mode with active CPU 1.



## Replace system cards in a SuperNode SE CM/SLM (continued)

### At the CM reset terminal (RTIF) for the inactive CPU

- 11** Wait until A1 flashes on the reset terminal for the inactive CPU.

**Note:** Allow approximately 5 min for A1 to start to flash.

| If A1          | Do      |
|----------------|---------|
| flashes        | step 13 |
| does not flash | step 70 |

- 12** Perform the procedure *Activity switch with memory match* in this document. Complete the procedure and return to this point.

### At the MAP terminal

**13**



#### WARNING

##### Loss of service

Make sure that the CM runs on the active clock of the CPU. Do not power down the inactive side of the CM while the CM runs on the clock of the inactive CPU. A cold restart or system image reload can occur which results in loss of service.

Determine if the CM runs on the inactive clock of the CPU, type

**>INSYNC**

and press the Enter key.

*Example of a MAP response:*

CPU pair is NOT insync, CPU 0 is active.  
CM is running on active CPU clock.

Memory Error Correction is ENABLED.

The Inactive CPU is Jammed.

| If the CM                             | Do      |
|---------------------------------------|---------|
| runs on the clock of the inactive CPU | step 14 |
| runs on the clock of the active CPU   | step 15 |

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

- 14** To run the CM on the clock of the active CPU, perform the procedure *Switch the clock source* in this document. Complete the procedure and return to this point.

- 15** To access the CMMNT level of the MAP display, type  
**>CMMNT**  
and press the Enter key.

*Example of a MAP display:*

```
CM Sync Act CPU0 CPU1 Jam Memory CMMnt MC PMC
0 no cpu 0 . . yes . . .
```

```
Traps: Per minute = 0 Total = 5
```

```
AutoLdev: Primary = SLM 0 DISK Secondary = SLM 1 DISK
```

```
Image Restartable = No image test since last restart
```

```
Next image restart type = WARM
```

```
Last CM REXTST executed
```

```
System memory in kbytes as of 14:39:07
```

```
Memory (kbytes): Used = 105984 Avail = 12800 Total =
118784
```

- 16** Determine if the primary autoloader device is on the side of the switch with the active CPU or the inactive CPU.

**Note:** The primary autoloader device appears on the right of the Primary header. In the example in step 15, the primary autoloader device is the disk of SLM 0.

---

| If the primary autoloader device                      | Do      |
|-------------------------------------------------------|---------|
| is on the same side of the switch as the active CPU   | step 18 |
| is on the same side of the switch as the inactive CPU | step 17 |

---

- 17** To change the primary autoloader device to a device on the same side of the switch as the active CPU, type

**>AUTOLD SLM slm\_number device\_type**

and press the Enter key.

*where*

**slm\_number**

is the number of the active CPU (0 or 1)

**device\_type**

is the type of SLM device (DISK or TAPE)

## Replace system cards in a SuperNode SE CM/SLM (continued)

*Example of a MAP response:*

New autoloader route has been set.

- 18** To access the SLM that corresponds to the inactive CPU, type

**>IOD;SLM slm\_number**

and press the Enter key.

where

**slm\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP display:*

```
IOD
IOC 0 1 2 3
STAT
```

```
DIRP: . XFER: . DVI : . DPPP: . DPPU: .
NOP : . SLM : . NX25: . MLP : . SCAI: .
```

```
SLM 0 1
Stat . .
```

```
SLM 0 primary device TAPE DISK
 status .
 drive idle on line
 user SYSTEM
```

**Note:** Dots on the right of the SLM Stat header indicate that the associated SLMs are in service.

| If the SLM Stat header    | Do      |
|---------------------------|---------|
| has dots                  | step 19 |
| is other than listed here | step 70 |

- 19** To manually busy the SLM, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

SLM 0 busy passed.

*Example of a MAP display:*

```
SLM 0 1
Stat M .
```

## Replace system cards in a SuperNode SE CM/SLM (continued)

**Note:** The letter M on the right of the SLM Stat header indicates that the associated SLM is manual busy.

|    | If the SLM                                                                                                                                                                                                                                                                                                                                                                                        | Do      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | busied                                                                                                                                                                                                                                                                                                                                                                                            | step 22 |
|    | did not busy                                                                                                                                                                                                                                                                                                                                                                                      | step 70 |
| 20 | <p>To access the PMC level of the MAP display, type<br/> <b>&gt;CM;PMC</b><br/> and press the Enter key.<br/> <i>Example of a MAP display:</i></p> <pre>                 PMC  0                 .  PORT0:         . PORT1:         . </pre>                                                                                                                                                       |         |
| 21 | <p>To manually busy the port that corresponds to the inactive CPU, type<br/> <b>&gt;BSY  0  PORT  port_number</b><br/> and press the Enter key.<br/> <i>where</i><br/> <b>port_number</b><br/> is the number of the inactive CPU (0 or 1)<br/> <i>Example input</i><br/> <b>&gt;BSY  0  PORT  0</b><br/> <i>Example of a MAP response:</i></p> <pre> Maintenance action submitted. Passed. </pre> |         |
| 22 | <p>To offline the SLM, type<br/> <b>&gt;OFFL</b><br/> and press the Enter key.<br/> <b>Note:</b> Wait for the light on the faceplate of the SLM to turn off before you continue this procedure.<br/> <i>Example of a MAP response:</i></p>                                                                                                                                                        |         |

## Replace system cards in a SuperNode SE CM/SLM (continued)

SLM 0 now offline. Do not remove SLM card until disk drive is spun down! This will be indicated when the SLM card light turns off.

| If the SLM      | Do      |
|-----------------|---------|
| offlined        | step 23 |
| did not offline | step 70 |

- 23 To access the MC level of the MAP display, type  
**>MC**  
and press the Enter key.

*Example of a MAP display:*

```
CM 0
 MC 0 MC 1
 . .
```

**Note:** In the example, dots under the MC headers indicate that the associated MCs are in service.

- 24 Determine the state of the message controller (MC) on the inactive CPU.  
**Note:** The term mbsy under the MC header indicates that the MC is manual busy.

| If the state of the MC | Do      |
|------------------------|---------|
| is mbsy                | step 26 |
| is not mbsy            | step 25 |

25



### WARNING

#### Possible loss of service

Make sure that you do not manually busy the MC that corresponds to the active CPU. Do not power down the inactive CPU plane with the MC that associates with the active busied CPU. This action will cause a warm restart.

To manually busy the MC that corresponds to the inactive CPU, type

**>BSY mc\_ number**

and press the Enter key.

*where*

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

**mc\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.  
MC busied OK.

---

| If the MC    | Do      |
|--------------|---------|
| busied       | step 26 |
| did not busy | step 70 |

---

**At the CM/SLM shelf**

26



**WARNING**

**Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To power down the inactive CPU plane, press down and release the power switch on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the NTDX15 power converter is in slots 33F to 35F.

**27** Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**28** To power up the inactive CPU, lift and release the power switch on the faceplate of the NTDX15 power converter.

**Note:** For CPU 0, the NTDX15 power converter is in slots 4F to 6F. For CPU 1, the power converter is in slots 33F to 35F.

## Replace system cards in a SuperNode SE CM/SLM (continued)

*At the CM reset terminal (RTIF) for the inactive CPU*

29



### WARNING

**You must complete the firmware tests**

If you do not complete the firmware tests, the CPUs cannot synchronize.

Wait for the switch to complete firmware tests.

*Example of an RTIF response:*

```
Testing Memory:
Shelf Slot PEC Module Status
 00 15 NT9X14EA ...
 00 16 NT9X14EA ...
Waiting for activity...
```

**Note:** When firmware testing is in progress, dots appear on the right of the PEC in the firmware testing status line of the RTIF response. As each firmware test is complete, another dot appears until firmware testing for the card is complete. If the dots do not continue to appear and another firmware testing status line does not appear, firmware tests stop. If the dots do not appear and the prompt Waiting for activity does not appear, firmware tests stop.

30 Determine if the firmware tests completed.

**Note:** If the firmware tests completed and CPU powered up, the Waiting for activity message appears.

| If the inactive CPU | Do      |
|---------------------|---------|
| powered up          | step 31 |
| did not turn on     | step 70 |

*At the MAP terminal*

31 To access the PMC level of the MAP display, type

**>CM;PMC**

and press the Enter key.

32 To return the manual busy PMC port to service, type

**>RTS 0 PORT port\_number**

and press the Enter key.

*where*

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

**port\_number**

is the number of the inactive CPU (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.  
Passed.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 33 |
| failed             | step 70 |

---

- 33** To access the SLM that associates with the card that you replaced, type  
**>IOD;SLM slm\_number**  
and press the Enter key.  
*where*

**slm\_number**

is the number of the SLM (0 or 1)

- 34** To return the SLM to service, type  
**>RTS**  
and press the Enter key.

*Example of a MAP response:*

SLM 0 return to service passed.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 35 |
| failed             | step 70 |

---

- 35** The next action depends on the type of card that you replaced.

---

| If the card that you replaced | Do      |
|-------------------------------|---------|
| is an NT9X14                  | step 36 |
| is an NT9X26                  | step 38 |
| is other than listed here     | step 39 |

---

- 36** To access the Memory level of the MAP display, type  
**>CM;MEMORY**  
and press the Enter key.

*Example of a MAP display:*



## Replace system cards in a SuperNode SE CM/SLM (continued)

```

CM 0 Plane 0 | Plane 1
 |
 54321 P|P 12345


```

- 37** To test the card that you replaced, type

**>TST CARD card\_number**

and press the Enter key.

where

**card\_number**

is the number of the memory card that you replaced(0 to 5)

*Example of a MAP response:*

Maintenance action submitted.  
Memory test OK.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 39 |
| failed             | step 70 |

### **At the CM reset terminal (RTIF) for the inactive CPU**

- 38** To determine the result of the last self test, type

**>\SELF TEST**

and press the Enter key.

*Example of a MAP response:*

SELF TEST RESULTS: ROM OK RAM OK 9X26 OK

| If the self test | Do      |
|------------------|---------|
| passed           | step 39 |
| failed           | step 70 |

- 39** Your next step depends on the reason that you perform this procedure.

| If you                                               | Do      |
|------------------------------------------------------|---------|
| perform this procedure as a result of a MC Tbl alarm | step 43 |
| perform this procedure as a result of a PMCFIt alarm | step 43 |

## Replace system cards in a SuperNode SE CM/SLM (continued)

| If you                                                       | Do      |
|--------------------------------------------------------------|---------|
| perform this procedure as a result of a PMCTbl alarm         | step 43 |
| perform this procedure as a result of a NoTOD alarm          | step 43 |
| perform this procedure as a result of a SBsyMC alarm         | step 43 |
| perform this procedure as a result of a MBsyMC alarm         | step 43 |
| perform this procedure as a result of a CBsyMC alarm         | step 43 |
| perform this procedure for any reason other than listed here | step 40 |

### *At the MAP terminal*

**40** To access the MC level of the MAP display, type

**>CM;MC**

and press the Enter key.

**41** To return the manual busy MC to service, type

**>RTS mc\_number**

and press the Enter key.

where

**mc\_number**

is the number of the manual busy MC (0 or 1)

*Example of a MAP response:*

Maintenance action submitted.

MC RTS ok.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 42 |
| failed             | step 70 |

## Replace system cards in a SuperNode SE CM/SLM (continued)

- 42 The next step depends on the type of switch and the software load.

| If the switch                                                  | Do      |
|----------------------------------------------------------------|---------|
| is a SuperNode SE Series 20 or 60 with software release BASE06 | step 43 |
| is other than listed here                                      | step 45 |

- 43 To record all the card changes in the history database for each card, type  
**>SWAPHW shelf\_no slot\_no side\_no**  
 and press the Enter key.

where

**shelf\_no**  
 is the number of the shelf (0 or 1)  
**slot\_no**  
 is the number of the slot (1 to 38)  
**side\_no**  
 is the side of the CM (front or back)

*Example of a MAP response:*

WARNING: You have indicated that the following circuit pack has been replaced. Please verify that this accurately reflects which circuit pack has been changed, and that the displayed PEC code matches what is currently equipped in that slot:

```
Site Flr RPOs Shf Description Slot EQPEC
HOST 00 A00 DPCC 0 18 CM 0;0;0 19 9X13BC
```

Do you wish to continue?  
 Please confirm (YES", Y", NO" N") Y" or YES",

Card replacement has been recorded.

| If the response                                     | Do      |
|-----------------------------------------------------|---------|
| is Card replacement has been recorded.              | step 45 |
| is Aborted. Card replacement has NOT been recorded. | step 44 |
| is other than listed here                           | step 70 |

## Replace system cards in a SuperNode SE CM/SLM (continued)

**Note:** The specified card joins the list of the cards that you replaced. The actual updates to the mismatch history database do not occur until the next manual SYNC attempt.

**44** Enter the SWAPHW command as you did in step 43.

**45** Determine the reason for the return of the circuit card.

| If the fault                                      | Do      |
|---------------------------------------------------|---------|
| is memory fault correctable mismatches            | step 46 |
| is mismatches other than memory fault correctable | step 46 |
| is REx test failures: manual or auto              | step 50 |
| is manual test failures                           | step 50 |
| is other failures                                 | step 50 |

**46** To retrieve the mismatch logs that associate with the mismatches, type  
**>LOGUTIL**  
and press the Enter key.

**47** Collect or print all MM and MFC logs.

| If software         | Do      |
|---------------------|---------|
| is BCS33 or earlier | step 50 |
| is BCS34 or later   | step 48 |

**48** To retrieve the MMINFO logs that associate with the memory fault correctable mismatches, type  
**>MMINFO DECODE ALL**  
and press the Enter key.

**49** Print out all MMINFO logs.

**50** Obtain associated failure logs.

**51** Write the PEC and serial number of the returned card on the first page of the log printout.

**Note:** If a minimum of two cards on a card list are returned, you only need one set of logs. If the failures are not the same, use separate logs as required for each card. On the return label of cards that do not have logs attached, indicate the card PEC code and serial number that the logs accompany.

Example: Logs returned with card NT9X13BC, serial number bnt123455mm

| If the fault                             | Do      |
|------------------------------------------|---------|
| is a memory fault correctable mismatches | step 52 |

## Replace system cards in a SuperNode SE CM/SLM (continued)

|           | <b>If the fault</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | is mismatches other than memory fault correctable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | step 54   |
|           | is REX failures: manual or auto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | step 56   |
|           | is manual test failures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | step 58   |
|           | is other than listed here                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | step 60   |
| <b>52</b> | Complete one return label (form 24-115) for each card that returns. Make sure that you include the following information: <ul style="list-style-type: none"> <li>• NT PEC</li> <li>• serial number</li> <li>• release number</li> <li>• return authorization number from customer service</li> <li>• BCS software release used at the time of replacement</li> <li>• name of your company</li> <li>• office identifier code</li> <li>• your name</li> <li>• site name</li> </ul>                                                                                                                                                                        |           |
| <b>53</b> | Enter the following in the failure description section of the label: <ul style="list-style-type: none"> <li>• reason for failure(failure caused by a memory fault correctable (MFC) ``nn" faults in "dd" days (example: 5 MFC in 4 days)</li> <li>• the slot and CPU number(example: slot 23, CPU 1)</li> <li>• that the logs are retrieved with the cards(example: logs are attached)</li> <li>• for software release Base 06, include associated MFC logs</li> <li>• if you removed other cards at the same time as the returned card(example: NT9X13BC, slot 20, CPU 1, #bnt12345mmm NT9x14DB, slot 14, CPU 0, #dgh744ggg)</li> </ul> Go to step 62. |           |
| <b>54</b> | Complete one return label (form 24-115) for each card returns. Make sure that you include the following information: <ul style="list-style-type: none"> <li>• NT PEC</li> <li>• serial number</li> <li>• release number</li> <li>• return authorization number from customer service</li> <li>• BCS software release used at the time of replacement</li> <li>• name of your company</li> <li>• office identifier code</li> </ul>                                                                                                                                                                                                                       |           |

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

- your name
  - site name
- 55** Enter the following in the failure description section of the label:
- reason for failure(example: failure occurred during manual/auto Rex)
  - the slot and CPU number(example: slot 23, CPU 1)
  - that the logs are retrieved with the cards(example: logs are attached)
  - if the card is on the recommended card list and in what order(example: first on card list or did not appear on card list)
  - if you remove other cards at the same time as the returned card(example: NT9X13BC, slot 20, CPU 1, #bnt12345mmm #2 on card list  
NT9x14DB, slot 14, CPU 0, #dgh744ggg, not on card list)
- Go to step 62.
- 56** Complete one return label (form 24-115) to return for each card. Make sure that you include the following information:
- NT PEC
  - serial number
  - release number
  - return authorization number from customer service
  - BCS software release used at the time of replacement
  - name of your company
  - office identifier code
  - your name
  - site name
- 57** Enter the following in the failure description section of the label:
- failure due to memory fault correctable (MFC) ``nn" faults in "dd" days (example: 5 MFC in 4 days)
  - the slot and CPU number(example: slot 23, CPU 1)
  - that the logs are retrieved with the cards(example: logs are attached)
  - if you removed other cards at the same time as the returned card(example: NT9X13BC, slot 20, CPU 1, #bnt12345mmm  
NT9x14DB, slot 14, CPU 0, #dgh744ggg)
- Go to step 62.
- 58** Complete one return label (form 24-115) for each card that will return. Make sure that you include the following information:
- NT PEC
  - serial number
  - release number
  - return authorization number from customer service

## Replace system cards in a SuperNode SE CM/SLM (continued)

---

- BCS software release used at the time of replacement
  - name of your company
  - office identifier code
  - your name
  - site name
- 59** Enter the following in the failure description section of the label:
- reason for failure. Provide a short summary of occurrences and conditions.(example: Manual tests failed. Card reported in card list)
  - the slot and CPU number(example: slot 23, CPU 1)
  - that the logs are retrieved with the cards(example: logs are attached)  
**Note:** Include any available past logs. Past logs can indicate the possible fault.
  - if the card is on the recommended card list and in what order(example: first on card list or did not appear on card list)
  - if you removed other cards at the same time as the returned card(example: NT9X13BC, slot 20, CPU 1, #bnt12345mmm, #2 on card list NT9x14DB, slot 14, CPU 0, #dgh744ggg, not on card list)
- Go to step 62.
- 60** Complete one return label (form 24-115) for each card that you remove. Make sure that you include the following information:
- NT PEC
  - serial number
  - release number
  - return authorization number from customer service
  - BCS software release used at the time of replacement
  - name of your company
  - office identifier code
  - your name
  - site name
- 61** Enter the following in the failure description section of the label:
- reason for failure. Provide a short summary of occurrences and conditions.(example: Cannot sync. manual tests failed. Rotated cards. Able to sync with this card removed)
  - the slot and CPU number(example: slot 23, CPU 1)
  - that the logs are retrieved with the cards(example: attached logs)  
**Note:** Include any available past logs. Past logs can indicate the possible fault).

## Replace system cards in a SuperNode SE CM/SLM (continued)

- if the card is on the recommended card list and in what order(example: first on card list or did not appear on card list)
- if you removed other cards at the same time as the returned card(example: NT9X13BC, slot 20, CPU 1, #bnt12345mmm, #2 on card list NT9x14DB, slot 14, CPU 0, #dgh744ggg, not on card list)

**62** When you complete this procedure, return the cards and associated documentation. To return the cards and associated documentation, refer to the procedure *Returning a card or assembly*.

**63** Your next step depends on the reason that you perform this procedure.

| If you                                                                | Do      |
|-----------------------------------------------------------------------|---------|
| perform this procedure as a result of the CM alarm clearing procedure | step 64 |
| perform this procedure for any reason other than listed here          | step 65 |

**64** Return to the alarm clearing procedure that directed you this procedure and continue as directed.

**65** To access the CM level of the MAP display, type  
**>CM**

and press the Enter key.

**66** To test the inactive CPU, type  
**>TST**

and press the Enter key.

*Example of a MAP response:*

The test(s) listed below will destroy  
the software load in inactive CPU:

Static RAM test

Do you want to do the test(s) anyway?  
Please confirm: ("YES", "Y", "NO", or "N"):

**67** To confirm the command, type  
**>YES**

and press the Enter key.

| If the TST command        | Do      |
|---------------------------|---------|
| passed                    | step 68 |
| is other than listed here | step 70 |



## Replace system cards in a SuperNode SE CM/SLM (end)

---

### *At the CM reset terminal (RTIF) for the inactive CPU*

**68** To release the jam on the inactive CPU, type

**>\RELEASE JAM**

and press the Enter key.

*RTIF response:*

JAM RELEASE DONE

### *At the MAP terminal*

**69** To synchronize the CM, type

**>SYNC**

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.  
Synchronization successful.

---

| If the response                           | Do      |
|-------------------------------------------|---------|
| indicates the SYNC command was successful | step 71 |
| is other than listed here                 | step 70 |

---

**70** For additional help, contact the next level of support.

**71** The procedure is complete.



---

## 4 Digital carrier module card replacement procedures

---

### Introduction

This chapter provides card replacement procedures for the digital carrier module (DCM) and the digital echo suppressor (DES). The first section in the chapter provides diagrams of DCM and DES shelf designs.

Each procedure contains the following sections:

- Application
- Common procedures
- Action

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) are in the chapter "Frame supervisory panel and maintenance supervisory panel card replacement procedures".

### Application

This section identifies the DCM or DES card(s) discussed in the replacement procedure.

### Common procedures

This section lists common procedures in the DCM or DES card replacement procedure. A common procedure is a series of steps that you repeat within maintenance procedures. The procedure for the removal and replacement of a card. Common procedures are in the common procedures chapter in this NTP.

Do not go to the common procedures unless the step-action procedure directs you.

### Action

This procedure provides a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

### **Recording card replacement activities**

When you replace a card, record the following information in office records:

- the serial number of the card that you replaced
- the date that you replaced the card
- the reason that you replaced the card

## DCM shelf layouts

---

### Application

This module provides a frame design diagram for the digital carrier equipment (DCE) frame. The module also provides shelf diagrams for the following:

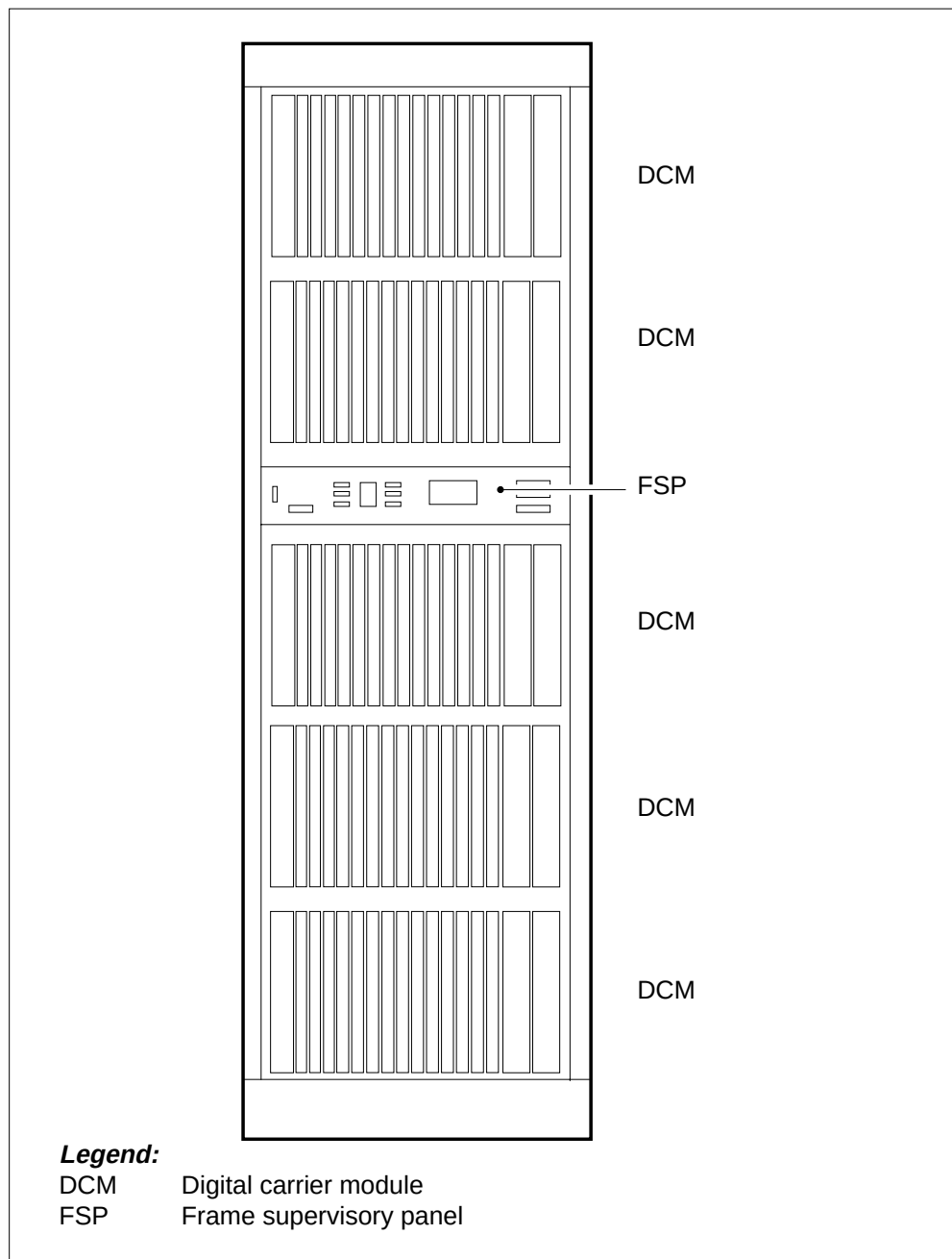
- digital carrier module (DCM), with two power converters
- DCM, with one power converter
- digital echo suppressor (DES)

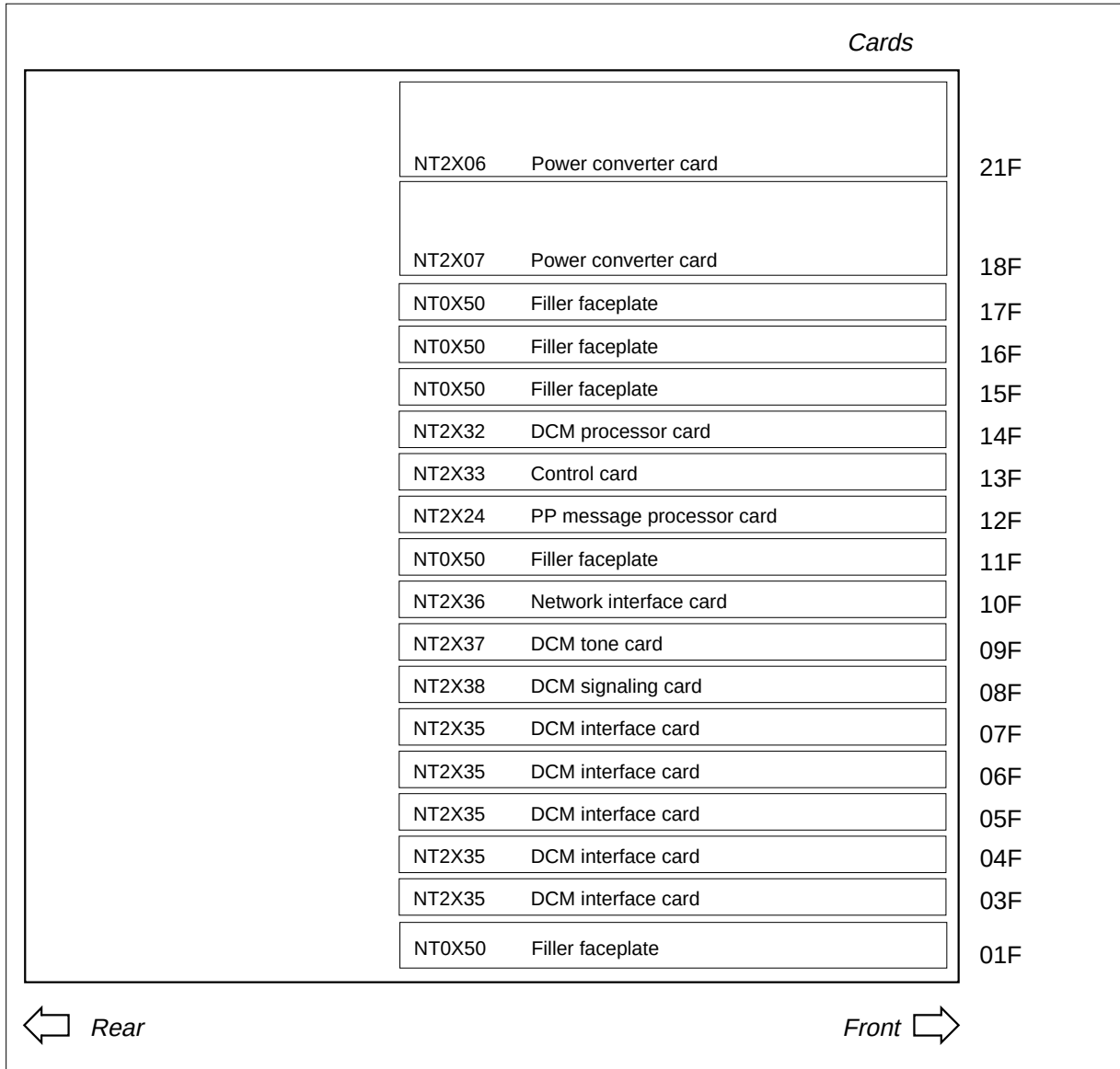
**Note:** The frame and shelf designs on the following pages are common. The shelves in your office can have differences.

## DCM shelf layouts (continued)

---

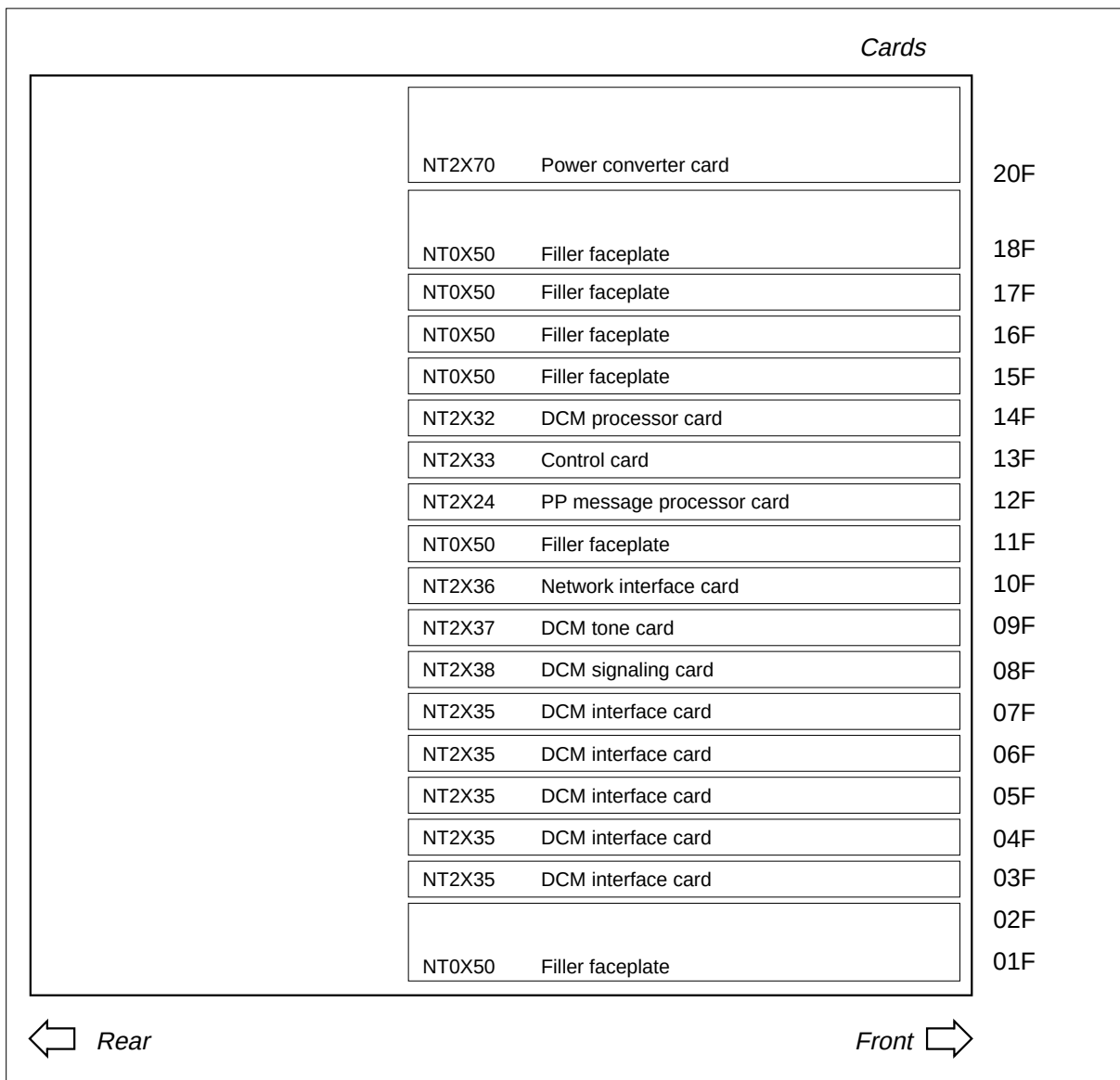
DCE frame



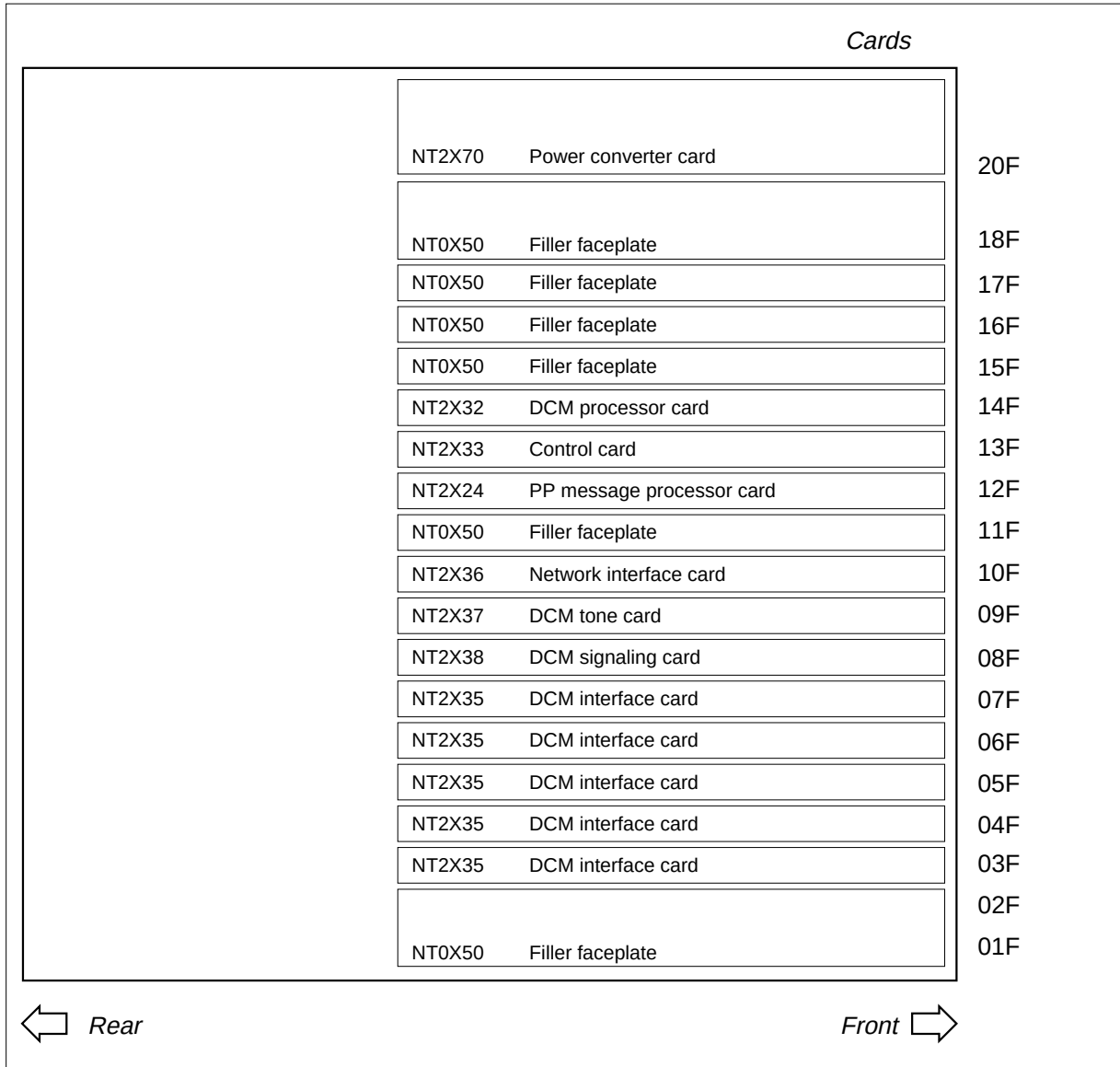
**DCM shelf layouts** (continued)**DCM, with two power converters**

## DCM shelf layouts (continued)

### DCM, with one power converter





**DCM shelf layouts (end)****Digital echo suppressor (DES)**

## Control complex cards in a digital carrier module

---

### Application

Use this procedure to replace the following cards in the shelves or frames listed.

| PEC    | Suffix | Card name                   | Shelf or frame name                                           |
|--------|--------|-----------------------------|---------------------------------------------------------------|
| NT2X32 | AA     | Master processor card       | Digital carrier module (DCM),<br>Digital echo supressor (DES) |
| NT2X33 |        | Control card                | DCM, DES                                                      |
| NT2X34 |        | Message supervision<br>card | DCM, DES                                                      |
| NT2X37 |        | Tone card                   | DCM, DES                                                      |
| NT2X38 |        | Signaling timing card       | DCM, DES                                                      |

Refer to the "Index", if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

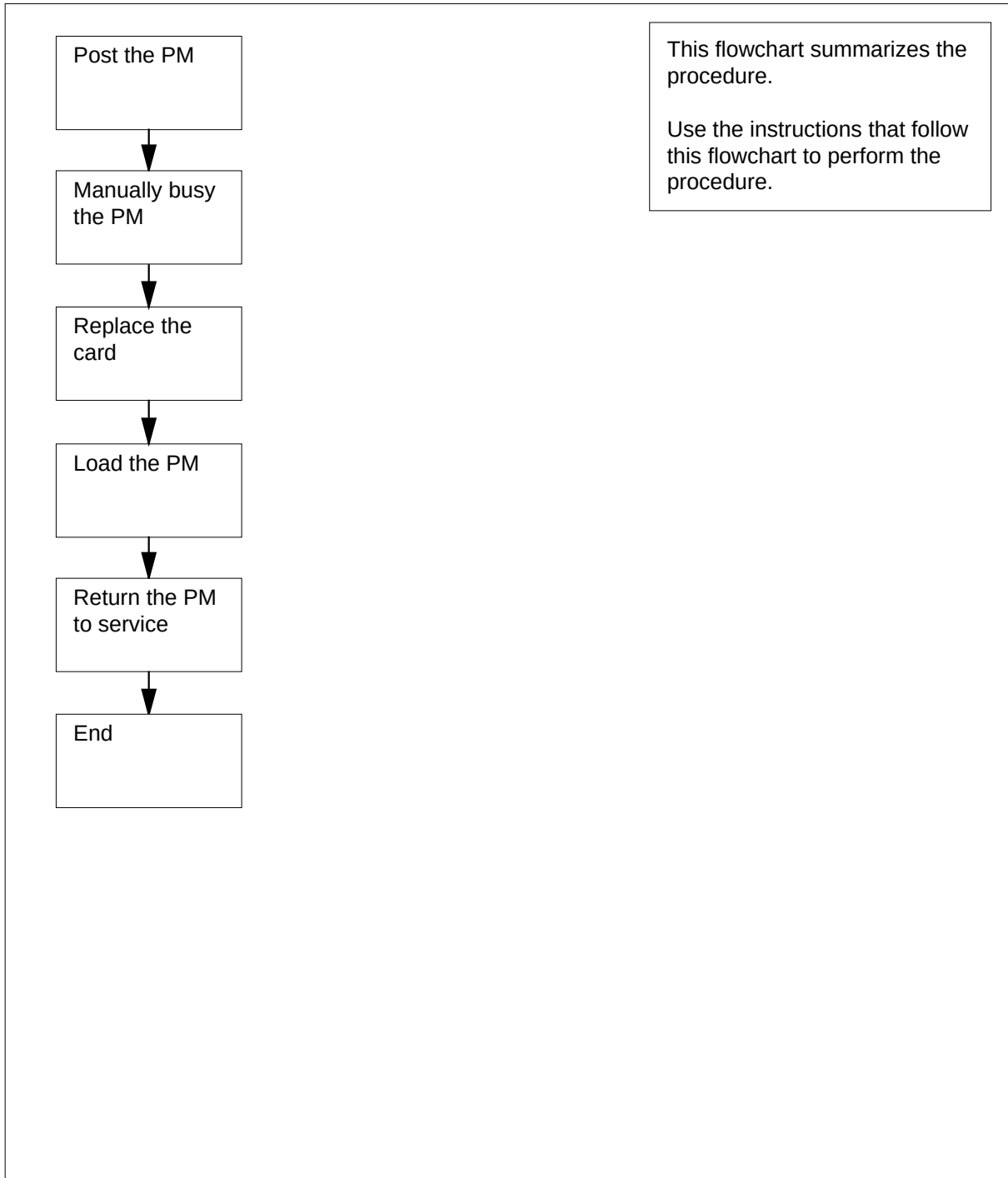
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## Control complex cards in a digital carrier module (continued)

### Summary of replacing Control complex cards in a digital carrier module



## Control complex cards in a digital carrier module (continued)

### Replacing Control complex cards in a digital carrier module

#### At the MAP terminal

1



#### CAUTION

##### Loss of service

This procedure includes directions to manually busy a DCM or DES. If you manually busy a DCM or DES, service degradation can occur. Perform this procedure only if you need to restore out-of-service components. In other events, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix, as the card that you remove.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |           |           |           |           |            |            |
|----|-----------|-----------|-----------|-----------|------------|------------|
| PM | SysB<br>6 | ManB<br>1 | OffL<br>0 | CBsy<br>0 | ISTb<br>23 | InSv<br>24 |
|----|-----------|-----------|-----------|-----------|------------|------------|

3

To post the PM associated with the card that you replace, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

**pm\_type**

is the type of PM (DCM, DES)

**pm\_no**

is the PM number (0 to 511)

*Example of a MAP display:*

|           |           |           |           |           |            |            |
|-----------|-----------|-----------|-----------|-----------|------------|------------|
|           | SysB<br>6 | ManB<br>1 | OffL<br>0 | CBsy<br>0 | ISTb<br>23 | InSv<br>24 |
| PM<br>DCM | 1         | 0         | 0         | 0         | 1          | 4          |
| DCM 0     | InSv      |           |           |           |            |            |

## Control complex cards in a digital carrier module (continued)

- 4 Determine the state of the PM unit that associates with the card you want to replace.

| If the state of the PM unit  | Do      |
|------------------------------|---------|
| is ISTb, InSv, SysB, or CBSy | step 5  |
| is ManB                      | step 7  |
| is OffL                      | step 13 |

- 5 A maintenance flag (Mtce) can appear. The flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before you proceed to the next step.

- 6 To manually busy the PM, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

OK.  
DCM 0 Bsy

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 7  |
| failed             | step 15 |

### *At the shelf*

7



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

## Control complex cards in a digital carrier module (end)

- 8 The next action depends on your reason that you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 9  |
| did not direct you to this procedure | step 10 |

- 9 Return to the maintenance procedure that directed you to this procedure and continue as directed.

### *At the MAP terminal*

- 10 To load the PM, type  
**>LOADPM**  
and press the Enter key.

| If the LOADPM command | Do      |
|-----------------------|---------|
| failed                | step 11 |
| passed                | step 12 |

- 11 Perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 12 To return the PM to service, type  
**>RTS**  
and press the Enter key.

| If the RTS command                                                     | Do      |
|------------------------------------------------------------------------|---------|
| passed                                                                 | step 16 |
| passed, but the PM is ISTb as a result of a command protocol violation | step 14 |
| failed                                                                 | step 15 |

- 13 To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

- 14 A minor problem is present, but the PM can process traffic. For additional help, contact the next level of support.

- 15 For additional help, contact the next level of support.

- 16 The procedure is complete.

## NT2X35 in a digital carrier module

---

### Application

Use this procedure to replace an NT2X35 card in a digital carrier module (DCM), as listed in the following table.

| PEC    | Suffix | Card name          | Shelf or frame name |
|--------|--------|--------------------|---------------------|
| NT2X35 | AA     | DCM interface card | DCM                 |

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Replace a card*
- *Loading a PM*

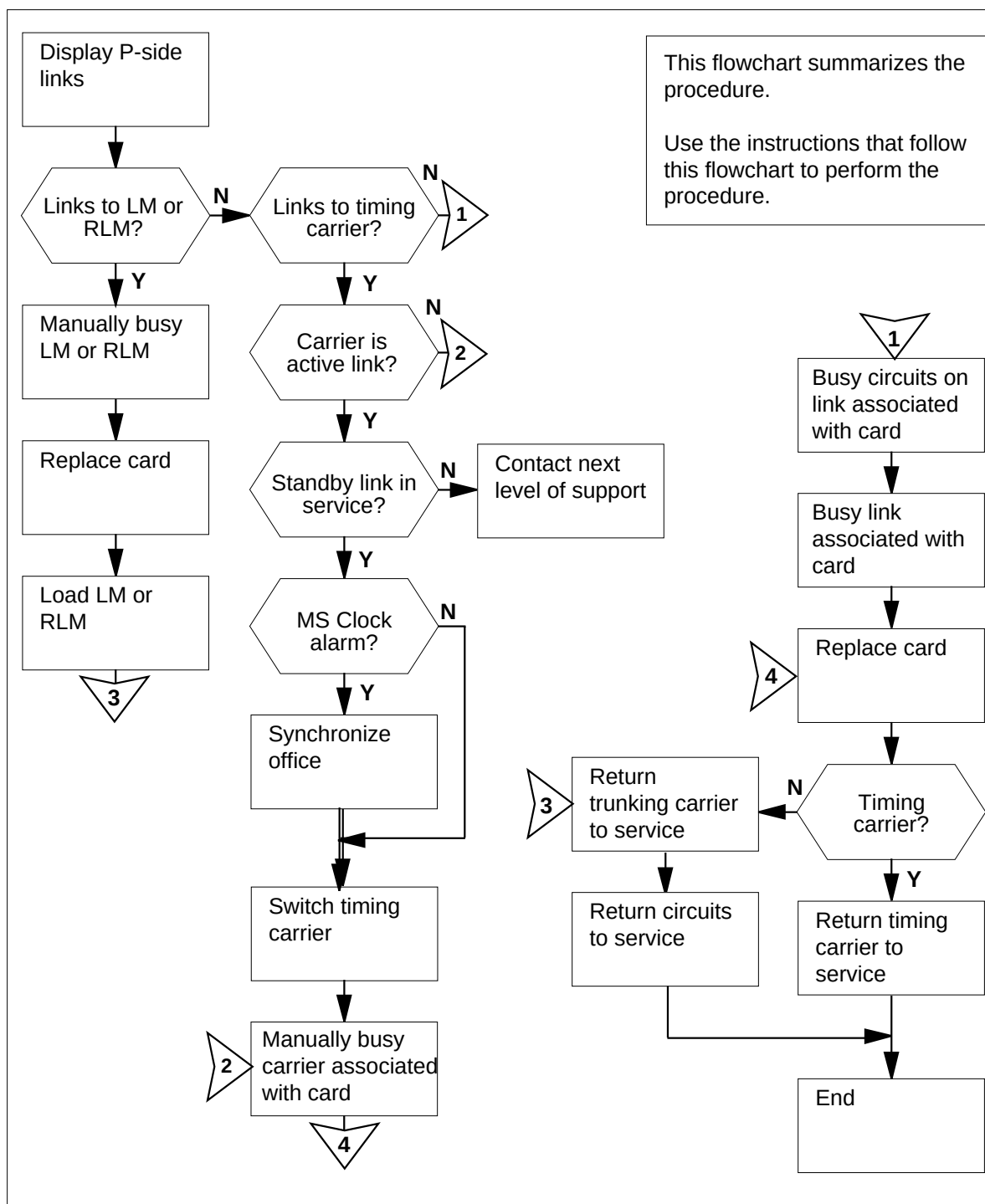
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT2X35 in a digital carrier module (continued)

### Summary of replacing an NT2X35 in a digital carrier module





## NT2X35 in a digital carrier module (continued)

### Replacing an NT2X35 in a digital carrier module

#### At the MAP terminal

1



#### **WARNING**

##### **Loss of service**

This procedure includes directions to manually busy a DCM DS1 trunk, a timing carrier, or a P-side node. Service degradation or service power failure can occur if you manually busy any of these components. Perform this procedure only if you need to restore out-of-service components. In other events, perform this procedure during periods of low traffic.



#### **WARNING**

##### **Loss of service**

If you insert a defective NT2X35 card, the system can take the DCM out of service. Test the replacement card before you insert the card or use a tested spare.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card that you remove.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 6    | 1    | 0    | 0    | 23   | 24   |

3

To post the DCM for the card that you replace, type

**>POST DCM pm\_no**

and press the Enter key.

*where*

**pm\_no**

is the PM number (0 to 511)

*Example of a MAP display:*

## NT2X35 in a digital carrier module (continued)

|     |  |      |      |      |      |      |      |
|-----|--|------|------|------|------|------|------|
|     |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  |  | 6    | 1    | 0    | 0    | 23   | 24   |
| DCM |  | 1    | 0    | 0    | 0    | 1    | 4    |

DCM 0 ISTb

- 4 To display a list of P-side links, type

**>TRNSL P**

and press the Enter key.

*Example #1 of a MAP response:*

```
No P-side node.
LINK 0: Carrier of Class - Timing
LINK 1: Carrier of Class - Trunk
LINK 2: Carrier of Class - Trunk
LINK 3: Carrier of Class - Trunk
LINK 4: Carrier of Class - Trunk
```

*Example #2 of a MAP response:*

```
LINK 0: LM REM1 00 0 0;CAP:MS;STATUS:MBsy ;MsgCond:CLS
LINK 1: LM REM1 00 0 1;CAP:MS;STATUS:OK ;MsgCond:OPN
LINK 2: LM REM1 00 0 2;CAP: S;STATUS:OK
LINK 3: Carrier of Class - Trunk
LINK 4: Carrier of Class - Trunk
```

- 5 Record the following information for links to P-side nodes:

- link number for carrier links
- carrier class for carrier links
- link number
- node type
- node site name
- frame number
- unit number

**Note 1:** Links correspond to NT2X35 cards as follows: link 0 = slot 3, link 1 = slot 4, link 2 = slot 5, link 3 = slot 6, and link 4 = slot 7. Links are carriers of a class or links to P-side nodes (line modules or remote line modules).

**Note 2:** Link number and carrier class identify the carrier links. In example #1 in step 4, link 0 is a carrier of class - timing. Note that example #1 shows that the DCM does not connect to a P-side node. P-side node links are identified by link number, node type, node site name, frame

## NT2X35

### in a digital carrier module (continued)

number, and unit number. In example #2 in step 4, link 0 is a message link to a line module (LM), site name REM1, frame 00, and unit 0.

| If the link                          | Do      |
|--------------------------------------|---------|
| is an LM or remote line module (RLM) | step 6  |
| is a carrier of class - timing       | step 8  |
| is a carrier of class - trunk        | step 21 |

- 6 To post the LM that associates with the link, type  
**>POST pm\_type site frame\_no unit\_no**  
 and press the Enter key.

where

**pm\_type**  
 is the type of PM (LM, RLM)

**site**  
 is the LM site name (alphanumeric)

**frame\_no**  
 is the number of the frame (0 to 511)

**unit\_no**  
 is the number of the unit (0 to 9)

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 2    | 0    | 4    | 71   |
| LM | 0    | 0    | 0    | 0    | 2    | 2    |

LM REM1 00 0 ISTb TSTFAIL LINKS  
 RGen : 0 InSv 1 InSv  
 POST:

| If the PM                    | Do      |
|------------------------------|---------|
| is InSv, ISTb, SysB, or CBsy | step 7  |
| is ManB or OffL              | step 28 |

- 7 To manually busy the PM, type  
**>BSY**  
 and press the Enter key.

*Example of a MAP display:*

## NT2X35

### in a digital carrier module (continued)

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 1    | 2    | 0    | 3    | 71   |
| LM | 0    | 1    | 0    | 0    | 1    | 2    |

LM REM1 00 0 ManB  
RGen : 0 Standby 1 InSv  
bsy  
OK.

Go to step 28.

- 8** To access the CARRIER level of the MAP display, type

**>TRKS;CARRIER**

and press the Enter key.

*Example of a MAP display:*

|        |    |    |       |      |      |      |      |      |      |      |
|--------|----|----|-------|------|------|------|------|------|------|------|
| CLASS  | ML | OS | ALARM | SYSB | MANB | UNEQ | OFFL | CBSY | PBSY | INSV |
| TRUNKS | 4  | 0  | 4     | 0    | 0    | 0    | 3    | 0    | 0    | 186  |
| REMOTE | 0  | 0  | 1     | 0    | 1    | 0    | 0    | 0    | 2    | 6    |
| TIMING | 0  | 0  | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 2    |

CARRIER:

- 9** To post the timing carriers, type

**>POST TIMING**

and press the Enter key.

*Example of a MAP display:*

|        |    |    |       |      |      |      |      |      |      |      |
|--------|----|----|-------|------|------|------|------|------|------|------|
| CLASS  | ML | OS | ALARM | SYSB | MANB | UNEQ | OFFL | CBSY | PBSY | INSV |
| TRUNKS | 4  | 0  | 4     | 0    | 0    | 0    | 3    | 0    | 0    | 186  |
| REMOTE | 0  | 0  | 1     | 0    | 1    | 0    | 0    | 0    | 2    | 6    |
| TIMING | 0  | 0  | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 2    |

|    |        |      |     |     |   |       |      |       |       |         |
|----|--------|------|-----|-----|---|-------|------|-------|-------|---------|
| NO | CLASS  | SITE | PM  | CKT | D | ALARM | SLIP | STATE | TLINK | MODE    |
| 0  | TIMING | HOST | DCM | 0   | 0 | C     | 0    | INSV  | 0     | ACTIVE  |
| 1  | TIMING | HOST | DCM | 1   | 0 | C     | 0    | INSV  | 1     | STANDBY |

POSTED BY CONDITION : TIMING

CARRIER:

POST:

- 10** Determine if the carrier that associates with the card you are working on is the active or the standby link. Determine the service state of both links.

**Note:** The PM type in column 4 identifies the link. The PM number in column 5 and the circuit number in column 6 identify the link. In the

## NT2X35

### in a digital carrier module (continued)

example in step 9, link 0 for DCM 0 is the active time link. The service state appears under the STATE header on the MAP display.

| If the carrier                                                              | Do      |
|-----------------------------------------------------------------------------|---------|
| supports the active link, and the standby link is in service (INSV or ISTB) | step 11 |
| supports the active link, and the standby link is not in service            | step 41 |
| supports the standby link (one or both links are standby)                   | step 19 |

- 11** To access the CLOCK level of the MAP display, type  
**>MS;CLOCK**  
 and press the Enter key.

*Example of a MAP display:*

```

Message Switch Clock Shelf 0 Inter-MS Link 0 1
MS 0 Master : :
MS 1 Slave : :

Shelf 0
Card 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Chain
MS 0 - - - - -
MS 1 - - - - -

Card 02 Alm Stat %Adj Src | Car Stat Sp PM CCT
MS 0 . . Syn +11.3 Lk0 | Lk0 Lck 0 DTC 000 00
MS 1 . . Syn -11.9 Ms0 | Lk1 Smp 0 DTC 001 00
Links Slipping: 6 out of 200
MS:
CLOCK:

```

- 12** Determine if a CLOCK alarm under the MS alarm banner is present.

| If a CLOCK alarm | Do      |
|------------------|---------|
| is present       | step 13 |
| is not present   | step 14 |

- 13** To synchronize the office, type  
**>SYNC**  
 and press the Enter key.

*Example of a MAP response:*

## NT2X35

### in a digital carrier module (continued)

---

```
Request to TEST INSV MS: 0 shelf: 0 card: 2 submitted.
Request to TEST INSV MS: 0 shelf: 0 card: 2 passed.
Request to TEST INSV MS: 1 shelf: 0 card: 2 submitted.
Request to TEST INSV MS: 1 shelf: 0 card: 2 passed.
Request to Synchronize Clock 0: Submitted
Request to Synchronize Clock 0: Passed
Clock synchronization started ...
```

- 14** To switch the timing carrier, type

**>SWCARR**

and press the Enter key.

*Example of a MAP response:*

```
Inactive link is not in SYNC and may cause carrier slips
Do you wish to continue ?
Please confirm ("YES", "Y", "NO", or "N"):
```

- 15** To make sure that you can safely switch active timing carriers, consult with operating company personnel or with the next level of support. When you have permission, continue this procedure.

- 16** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
Request to Switch Timing Links: Submitted
Request to Switch Timing Links: Passed
```

- 17** To access the CARRIER level of the MAP display, type

**>TRKS;CARRIER**

and press the Enter key.

- 18** To post the timing carriers, type

**>POST TIMING**

and press the Enter key.

- 19** To manually busy the carrier that associates with the card you replace, type

**>BSY list\_no**

and press the Enter key.

*where*

**list\_no**

is the list number (0 to 4) for the link

*Example of a MAP response:*

## NT2X35

### in a digital carrier module (continued)

DCM 1 CCT 0 is a TIMING link.  
Do you want to busy this carrier ?  
Please confirm ("YES", "Y", "NO", or "N"):

- 20 To confirm the command, type

**>YES**

and press the Enter key.

**Note:** For all maintenance commands at the CARRIER level, the list number in the far-left column under the N header refers to links.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 28 |
| failed             | step 43 |

- 21 To access the TTP level of the MAP display, type

**>TRKS;TTP**

and press the Enter key.

- 22 To post the link that associates with the card you replace, type

**>POST D DCM pm\_no link\_no**

and press the Enter key.

where

**pm\_no**

is the PM number (0 to 999)

**link\_no**

is the number of the link (0 to 19) that associates with the card you replace

| If                                   | Do      |
|--------------------------------------|---------|
| a set of circuits is posted          | step 23 |
| the response is NO CKT, SET IS EMPTY | step 24 |

- 23 To manually busy all circuits on the link, type

**>BSY ALL**

and press the Enter key.

**Note:** Make sure that all circuits are manual busy before you proceed.

- 24 To access the CARRIER level of the MAP display, type

**>CARRIER**

and press the Enter key.

## NT2X35

### in a digital carrier module (continued)

*Example of a MAP display:*

| CLASS  | ML | OS | ALARM | SYSB | MANB | UNEQ | OFFL | CBSY | PBSY | INSV |
|--------|----|----|-------|------|------|------|------|------|------|------|
| TRUNKS | 4  | 2  | 9     | 2    | 28   | 0    | 0    | 15   | 0    | 41   |
| REMOTE | 0  | 0  | 0     | 0    | 12   | 0    | 0    | 2    | 0    | 3    |
| TIMING | 0  | 1  | 1     | 0    | 1    | 0    | 0    | 0    | 0    | 1    |

CARRIER:

- 25** To post the carriers for the PM, type

**>POST DCM pm\_no**

and press the Enter key.

where

**pm\_no**

is the PM number (0 to 511)

*Example of a MAP display:*

| CLASS  | ML | OS | ALARM | SYSB | MANB | UNEQ | OFFL | CBSY | PBSY | INSV |
|--------|----|----|-------|------|------|------|------|------|------|------|
| TRUNKS | 4  | 0  | 4     | 0    | 0    | 0    | 3    | 0    | 0    | 186  |
| REMOTE | 0  | 0  | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 9    |
| TIMING | 0  | 0  | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 2    |

DS1

| N | CLASS  | SITE | DCM | CK | D | ALRM | SLIP | FRME | BER | ES | SES | STATE |
|---|--------|------|-----|----|---|------|------|------|-----|----|-----|-------|
| 0 | REMOTE | HOST | 0   | 0  | C |      | 0    | 0    | 0   | 0  | 0   | INSV  |
| 1 | REMOTE | HOST | 0   | 1  | C |      | 0    | 0    | 0   | 0  | 0   | INSV  |
| 2 | REMOTE | HOST | 0   | 2  | C |      | 0    | 0    | 0   | 0  | 0   | INSV  |
| 3 | TRUNKS | HOST | 0   | 3  | C |      | 0    | 0    | 0   | 0  | 0   | INSV  |
| 4 | TRUNKS | HOST | 0   | 4  | C |      | 0    | 0    | 0   | 0  | 0   | INSV  |

SIZE OF POSTED SET : 5

CARRIER:

POST:

- 26** Determine the state of the carrier that associates with the card you replace.

| If the link            | Do      |
|------------------------|---------|
| is INSV, ISTB, or SYSB | step 27 |
| is MANB                | step 28 |
| is OFFL                | step 40 |

- 27** To manually busy the link, type

**>BSY list\_no**

and press the Enter key.

where

**list\_no**

is the list number (0 to 4) for the link



## NT2X35

### in a digital carrier module (continued)

**Note:** For all maintenance commands at the CARRIER level, the list number in the far-left column under the N header refers to links.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 28 |
| failed             | step 43 |

#### **At the shelf**

28



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.

29 The next action depends on the reason that you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 30 |
| did not direct you to this procedure | step 31 |

30 Return to the maintenance procedure that directed you to this procedure and continue as directed.

#### **At the MAP terminal**

31 The next action depends on the type of link supported by the card that you replaced.

| If the link                     | Do      |
|---------------------------------|---------|
| is to a line module (LM or RLM) | step 32 |
| is a carrier of class - timing  | step 35 |
| is a carrier of class - trunk   | step 36 |

**NT2X35**  
**in a digital carrier module** (continued)

---

- 32** To load the PM, type  
**>LOADPM**  
and press the Enter key.  
*Example of a MAP response:*  
  
LM REM1 00 0 LoadPM PASSED  
Load ESA passed

---

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 44 |
| failed                | step 33 |

---

- 33** To load the PM unit, use the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 34** To return the PM to service, type  
**>RTS**  
and press the Enter key.  
*Example of a MAP response:*

rts  
OK.  
InSvc Tests Initiated  
OK.

---

| If RTS command | Do      |
|----------------|---------|
| passed         | step 44 |
| failed         | step 43 |

---

- 35** To return the timing carrier to service, type  
**>RTS list\_no**  
and press the Enter key.  
*where*  
**list\_no**  
is the list number (0 to 4) for the carrier

*Example of a MAP response:*

OK.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 44 |

---

## NT2X35

### in a digital carrier module (continued)

|           | If the RTS command                                                                                                                                                                                                                                                                                    | Do      |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | failed                                                                                                                                                                                                                                                                                                | step 43 |
| <b>36</b> | To return the trunking carrier to service, type<br><b>&gt;RTS list_no</b><br>and press the Enter key.<br><i>where</i><br><b>list_no</b><br>is the list number (0 to 4) for the carrier<br><i>Example of a MAP response:</i><br>OK.                                                                    |         |
|           | If the RTS command                                                                                                                                                                                                                                                                                    | Do      |
|           | passed                                                                                                                                                                                                                                                                                                | step 37 |
|           | failed                                                                                                                                                                                                                                                                                                | step 43 |
| <b>37</b> | To access the TTP level of the MAP display, type<br><b>&gt;TTP</b><br>and press the Enter key.                                                                                                                                                                                                        |         |
| <b>38</b> | To post the link that associates with the card you replace, type<br><b>&gt;POST D DCM pm_no link_no</b><br>and press the Enter key.<br><i>where</i><br><b>pm_no</b><br>is the PM number (0 to 999)<br><b>link_no</b><br>is the number of the link (0 to 19) that associates with the card you replace |         |
|           | If                                                                                                                                                                                                                                                                                                    | Do      |
|           | a set of circuits is posted                                                                                                                                                                                                                                                                           | step 39 |
|           | the response is NO CKT, SET IS EMPTY                                                                                                                                                                                                                                                                  | step 44 |
| <b>39</b> | To return all circuits to service, type<br><b>&gt;RTS ALL</b><br>and press the Enter key.                                                                                                                                                                                                             |         |

## **NT2X35**

### **in a digital carrier module (end)**

---

- 40** To determine why the component is offline, consult operating company personnel. Continue this procedure as directed by office personnel.
- 41** To determine if you can remove the active timing link from service, consult the next level of support. Continue this procedure as directed by your next level of support.
- 42** A minor problem is present, but the DCM can process traffic. For additional help, contact the next level of support.
- 43** For additional help, contact the next level of support.
- 44** The procedure is complete.

## NT2X36 in a digital carrier module

---

### Application

Use this procedure to replace the NT2X36 card in a digital carrier module (DCM), as listed in the following table.

| PEC    | Suffix | Card name              | Shelf or frame name |
|--------|--------|------------------------|---------------------|
| NT2X36 | AA     | Network interface card | DCM                 |

Refer to the “Index”, if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames this card replacement book documents.

### Common procedures

This common procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

Do not go to the common procedure unless the step-action procedure directs you.

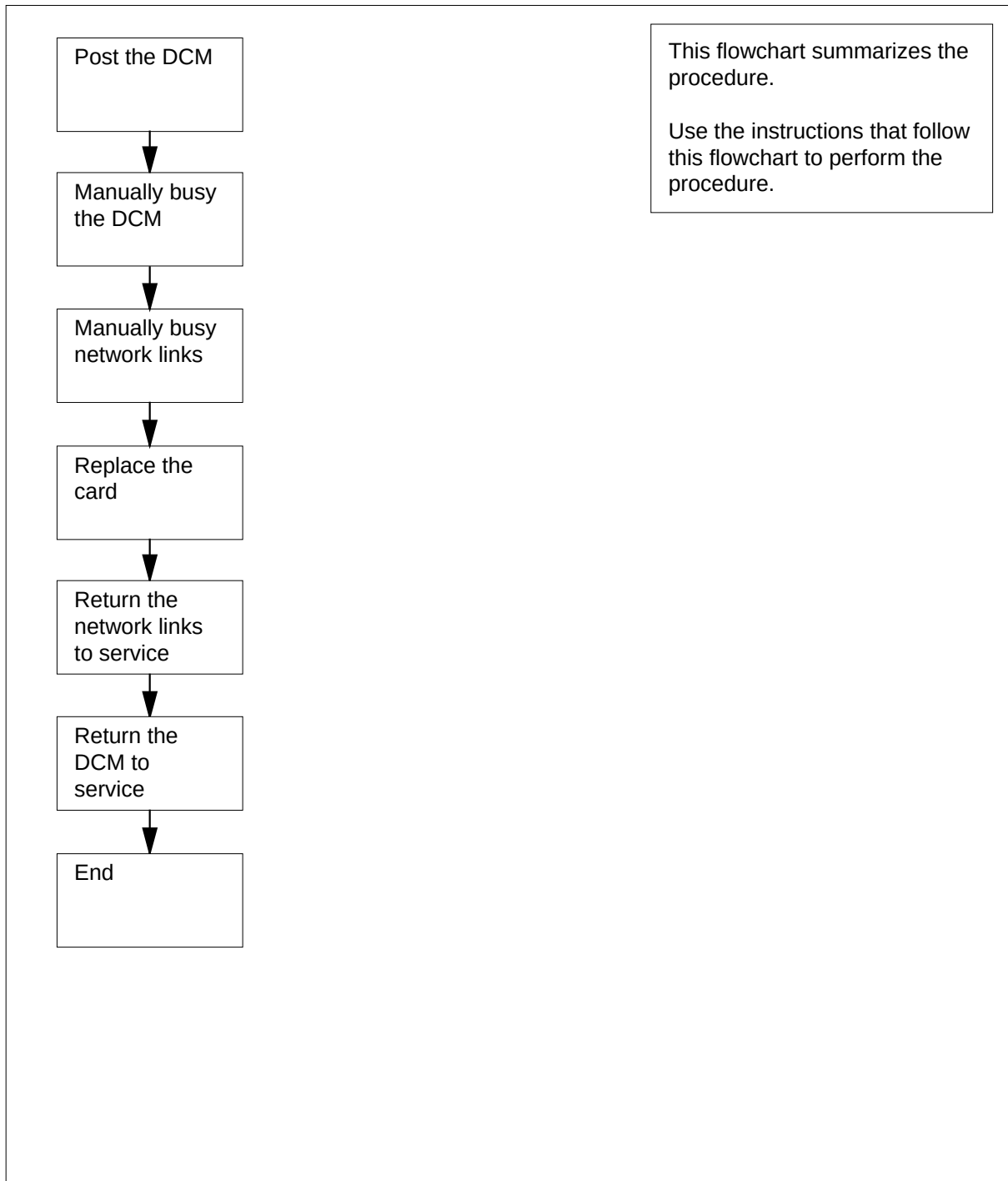
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT2X36 in a digital carrier module (continued)

---

### Summary of replacing an NT2X36 in a digital carrier module



## NT2X36 in a digital carrier module (continued)

### Replacing an NT2X36 in a digital carrier module

#### At the MAP terminal

1



#### WARNING

##### Loss of service

This procedure includes directions to manually busy a DCM. Service degradation can occur if you manually busy a DCM. Perform this procedure only if you need to restore out-of-service components. In other events, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card that you remove.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 6    | 1    | 0    | 0    | 23   | 24   |

3

To post the PM that associates with the card you replace, type

**>POST DCM pm\_no**

and press the Enter key.

*where*

**pm\_no**

is the PM number (0 to 511)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 6    | 1    | 0    | 0    | 23   | 24   |
| DCM | 1    | 0    | 0    | 0    | 1    | 4    |
| DCM | 0    | InSv |      |      |      |      |

## NT2X36

### in a digital carrier module (continued)

- 4 Determine the state of the PM unit that associates with the card you want to replace.

| If the state of the PM unit  | Do      |
|------------------------------|---------|
| is ISTb, InSv, SysB, or CBSy | step 5  |
| is ManB                      | step 7  |
| is OffL                      | step 31 |

- 5 A maintenance flag (Mtce) can appear. A Mtce flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before you proceed to the next step.

- 6 To manually busy the DCM, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

```
OK.DCM 0 Bsy
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 7  |
| failed             | step 33 |

- 7 To display a list of C-side links, type

**>TRNSL C**

and press the Enter key.

*Example #1 of a MAP response:*

```
LINK 0: NET 0 1 1;CAP:MS;STATUS:OK ,P;MsgCond:OPN
LINK 0: NET 1 1 1;CAP:MS;STATUS:OK ,P;MsgCond:OPN
LINK 1: NET 0 1 5;CAP: S;STATUS:OK ,P
LINK 1: NET 1 1 5;CAP: S;STATUS:OK ,P
LINK 2: NET 0 1 9;CAP: S;STATUS:OK ,P
LINK 2: NET 1 1 9;CAP: S;STATUS:OK ,P
LINK 3: NET 0 1 13;CAP: S;STATUS:OK ,P
LINK 3: NET 1 1 13;CAP: S;STATUS:OK ,P
```

*Example #2 of a MAP response:*



## NT2X36

### in a digital carrier module (continued)

```

LINK 0: ENET 0 0 18 04 ;CAP:MS;STATUS:OK ,C ;MsgCond:OPN
LINK 0: ENET 1 0 28 04 ;CAP:MS;STATUS:OK ,C ;MsgCond:OPN
LINK 1: ENET 0 0 18 05 ;CAP: S;STATUS:OK ,C
LINK 1: ENET 1 0 28 05 ;CAP: S;STATUS:OK ,C
LINK 2: ENET 0 0 18 06 ;CAP: S;STATUS:OK ,C
LINK 2: ENET 1 0 28 06 ;CAP: S;STATUS:OK ,C
LINK 3: ENET 0 0 18 07 ;CAP: S;STATUS:OK ,C
LINK 3: ENET 1 0 28 07 ;CAP: S;STATUS:OK ,C

```

| If the network                | Do      |
|-------------------------------|---------|
| is a junctored network (JNET) | step 8  |
| is a enhanced network (ENET)  | step 13 |

- 8** Record the JNET plane, pair, and link for each C-side link.

**Note 1:** The NT2X36 network interface card supports eight C-side links for each card - four links to each network plane.

**Note 2:** The network plane, pair, and link are in columns 4, 5, and 6 of the response to a TRNSL command at the PM level. Example #1 in step 7 demonstrates this response. For example, C-side link 3 at the bottom of the display is on network plane 1, pair 1, link 13.

- 9** To access the NET level of the MAP display, type

**>NET**

and press the Enter key.

*Example of a MAP display:*

```

Net 11111 11111 22222 22222 33
Plane 01234 56789 01234 56789 01234 56789 01
0 L..
1 ...

```

- 10** To access the LINKS level of the MAP display, type

**>LINKS pair\_no**

and press the Enter key.

*where*

**pair\_no**

is the number of the pair (0 to 31) that connects to the C-side links

*Example of a MAP display:*

## NT2X36 in a digital carrier module (continued)

```

Net
Plane 0 1234 56789 11111 11111 22222 22222 33
 0 L..
 1 ...
Net 1 Links
Plane 0123 4567 8901 2345 6789 0123 4567 8901
 0 P. P.. .P.. .P.. .P..
 1 P. P.. .P.. .P.. .P..
Links 3333 3333 4444 4444 4455 5555 5555 6666
Plane 2345 6789 0123 4567 8901 2345 6789 0123
 0 .P.. .P.. .P.. .P.. ..P. ...- ...- ...-
 1 .P.. .P.. .P.. .P.. ..P. ...- ...- ...-

```

- 11** To manually busy one of the links you recorded in step 8, type

**>BSY plane\_no link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane for the link (0 or 1)

**link\_no**

is the link number (0 to 63)

*Example of a MAP response:*

```
BSY 0 300K
```

- 12** Repeat step 11 for all C-side links.

Go to step 19.

- 13** Record the ENET plane, shelf, card, and link for each C-side link.

**Note 1:** The NT2X36 network interface card supports eight C-side links for each card - four links to each network plane.

**Note 2:** The network plane, shelf, card, and link are in columns 4, 5, 6, and 7 of the response to a TRNSL command at the PM level. In example #2 in step 7 demonstrates this response. For example, C-side link 3 at the bottom of the display is on network plane 1, shelf 0, card 28, link 07.

- 14** To access the NET level of the MAP display, type

**>NET**

and press the Enter key.

*Example of a MAP display:*

```

ENET System Matrix Shelf 0 1 2 3
Plane 0 CSLink . F - - -
Plane 1 CSLink . F - - -ENET:

```

## NT2X36

### in a digital carrier module (continued)

- 15** To access the SHELF level of the MAP display, type

**>SHELF shelf\_no**

and press the Enter key.

where

**shelf\_no**

is the number of the shelf (0 to 7) that connects to the C-side links

*Example of a MAP display:*

```
ENET System Matrix Shelf 0 1 2 3
Plane 0 CSLink . F - - -
Plane 1 CSLink . F - - -

SHELF 00 Slot 1111111 11122222 22222333 333333
 123456 78 90123456 78901234 56789012 345678
Plane 0 . . IF
Plane 1 . . IF

```

- 16** To access the CARD level of the MAP display, type

**>CARD card\_no**

and press the Enter key.

where

**card\_no**

is the number of the card (1 to 38) that connects to the C-side links

*Example of a MAP display:*

```
ENET System Matrix Shelf 0 1 2 3
Plane 0 CSLink . F - - -
Plane 1 CSLink . F - - -

SHELF 00 Slot 1111111 11122222 22222333 333333
 123456 78 90123456 78901234 56789012 345678
Plane 0 . . IF
Plane 1 . . IF

CARD 32 Front: Back: DS-512 Links
 Xpt I/F 0 1 2 3
Plane 0 -
Plane 1 -

```

- 17** To manually busy the link that you recorded in step 13, type

**>BSY plane\_no LINK link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane (0 or 1) for the link

## NT2X36 in a digital carrier module (continued)

**link\_no**  
is the link number (0 to 63)

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:32 Link:01 submitted.  
Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:32 Link:01 passed.

- 18** Repeat step 17 for each link that you recorded in step 13. Go to step 19.

***At the shelf***

**19**



### **WARNING**

#### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.

- 20** The next action depends on the reason that you perform this procedure.

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 21   |
| did not direct you to this procedure | step 22   |

- 21** Return to the maintenance procedure that directed you to this procedure and continue as directed.

***At the MAP terminal***

- 22** The next action depends on the type of network in the office.

| <b>If you</b>          | <b>Do</b> |
|------------------------|-----------|
| are working on a JNET  | step 23   |
| are working on an ENET | step 25   |

## NT2X36

### in a digital carrier module (continued)

- 23** To return to service one of the network links that associates with the PM unit, type  
**>RTS plane\_no link\_no**  
 and press the Enter key.  
*where*

**plane\_no**  
 is the number of the plane (0 or 1) for the link  
**link\_no**  
 is the link number (0 to 63)

| If the link                                                    | Do      |
|----------------------------------------------------------------|---------|
| returned to service and more manual busy links are present     | step 24 |
| returned to service and more manual busy links are not present | step 27 |
| did not return to service                                      | step 33 |

- 24** Repeat step 23 for all C-side links to the DCM.  
 Go to step 26.

- 25** To return the link to service, type  
**>RTS plane\_no LINK link\_no**  
 and press the Enter key.  
*where*

**plane\_no**  
 is the number of the plane (0 or 1) for the link  
**link\_no**  
 is the link number (0 to 63)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 submitted.  
 Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 passed.

| If the link               | Do      |
|---------------------------|---------|
| returned to service       | step 26 |
| did not return to service | step 33 |

- 26** Repeat step 25 for all C-side links to the DCM. Complete the procedure and go to step 27.

**NT2X36**  
**in a digital carrier module (end)**

---

- 27** To access the PM level of the MAP display, type  
**>PM**  
and press the Enter key.
- 28** To load the DCM, type  
**>LOADPM**  
and press the Enter key.
- | <b>If the LOADPM command</b> | <b>Do</b> |
|------------------------------|-----------|
| failed                       | step 29   |
| passed                       | step 30   |
- 29** Perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.
- 30** To return the DCM to service, type  
**>RTS**  
and press the Enter key.
- | <b>If the RTS command</b>                                               | <b>Do</b> |
|-------------------------------------------------------------------------|-----------|
| passed                                                                  | step 34   |
| passed, but the DCM is ISTb as a result of a command protocol violation | step 32   |
| failed                                                                  | step 33   |
- 31** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 32** A minor problem is present, but the DCM can process traffic. For additional help, contact the next level of support.
- 33** For additional help, contact the next level of support.
- 34** The procedure is complete.

## NT3X65 in a digital echo suppressor

---

### Application

Use this procedure to replace a NT3X65 card in a digital carrier module (DCM) digital echo suppressor (DES), as the following table shows.

| PEC    | Suffix | Card name                           | Shelf or frame name         |
|--------|--------|-------------------------------------|-----------------------------|
| NT3X65 | AA     | Digital echo suppressor<br>tone CPU | DCM digital echo suppressor |

Refer to the “Index”, if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames this card replacement book.

### Common procedures

This procedure refers to *Replacing a card*.

Do not go to the common procedure unless the step-action procedure directs you to go.

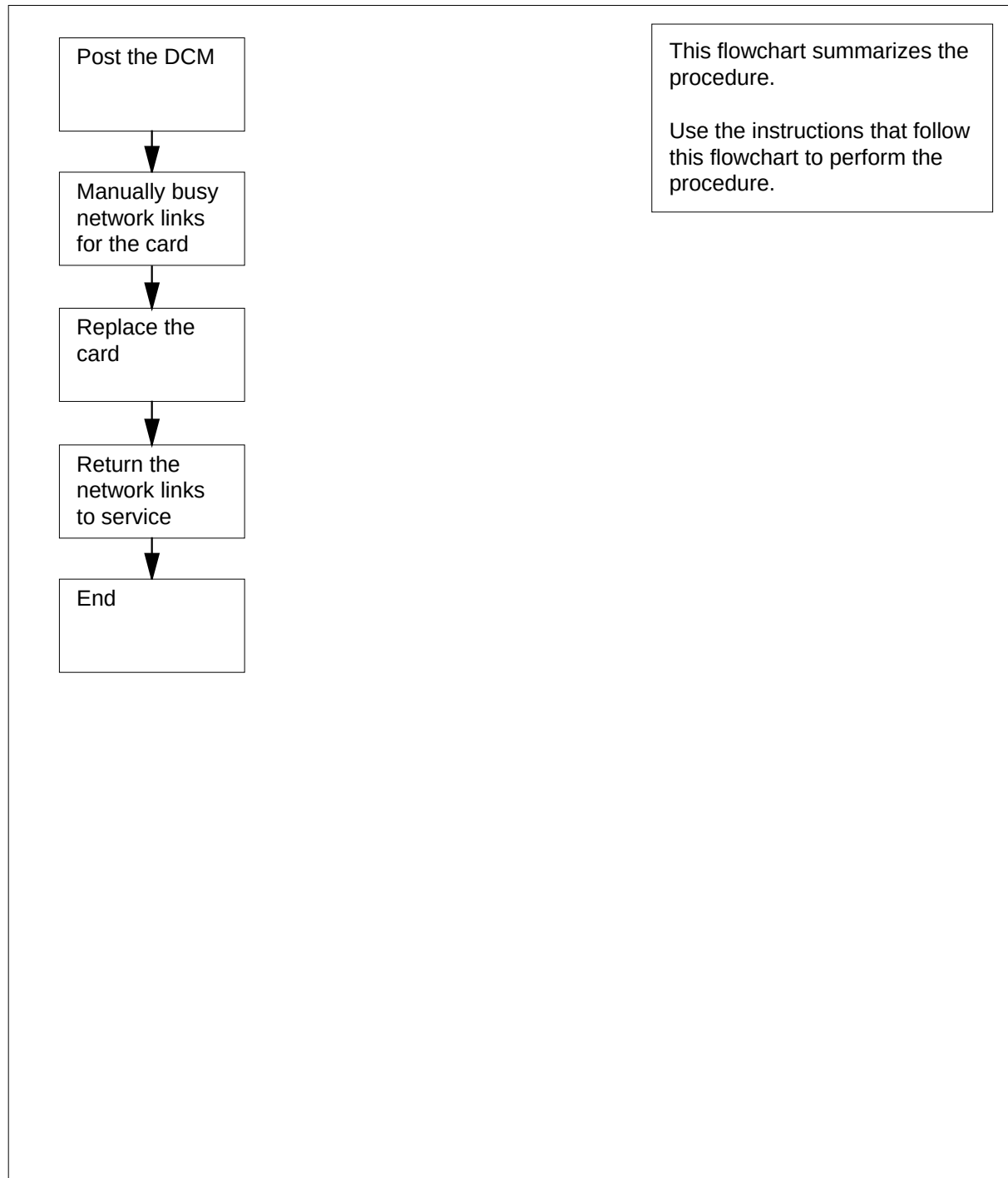
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT3X65 in a digital echo suppressor (continued)

---

### Summary of replacing an NT3X65 in a digital echo suppressor





## NT3X65 in a digital echo suppressor (continued)

### Replacing NT3X65 in a digital echo suppressor

#### At the MAP terminal

1



#### CAUTION

##### Potential loss of service

This procedure includes directions to manually busy network links. Service degradation can occur if you manually busy a network link. Perform this procedure only if you need to restore out-of-service components. In other events, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card you remove.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 6    | 1    | 0    | 0    | 23   | 24   |

3

To post the PM that associates with the card you replace, type

**>POST DCM pm\_no**

and press the Enter key.

*where*

**pm\_no**

is the PM number (0 to 511)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 6    | 1    | 0    | 0    | 23   | 24   |
| DCM | 1    | 0    | 0    | 0    | 1    | 4    |
| DCM | 0    | InSv |      |      |      |      |

4

To display a list of C-side links, type

**>TRNSL C**

## NT3X65 in a digital echo suppressor (continued)

and press the Enter key.

*Example #1 of a MAP response:*

```
LINK 0: NET 0 1 1;CAP:MS;STATUS:OK ,P;MsgCond:OPN
LINK 0: NET 1 1 1;CAP:MS;STATUS:OK ,P;MsgCond:OPN
LINK 1: NET 0 1 5;CAP: S;STATUS:OK ,P
LINK 1: NET 1 1 5;CAP: S;STATUS:OK ,P
LINK 2: NET 0 1 9;CAP: S;STATUS:OK ,P
LINK 2: NET 1 1 9;CAP: S;STATUS:OK ,P
LINK 3: NET 0 1 13;CAP: S;STATUS:OK ,P
LINK 3: NET 1 1 13;CAP: S;STATUS:OK
```

*Example #2 of a MAP response:*

```
LINK 0: ENET 0 0 18 04 ;CAP:MS;STATUS:OK ,C ;MsgCond:OPN
LINK 0: ENET 1 0 28 04 ;CAP:MS;STATUS:OK ,C ;MsgCond:OPN
LINK 1: ENET 0 0 18 05 ;CAP: S;STATUS:OK ,C
LINK 1: ENET 1 0 28 05 ;CAP: S;STATUS:OK ,C
LINK 2: ENET 0 0 18 06 ;CAP: S;STATUS:OK ,C
LINK 2: ENET 1 0 28 06 ;CAP: S;STATUS:OK ,C
LINK 3: ENET 0 0 18 07 ;CAP: S;STATUS:OK ,C
LINK 3: ENET 1 0 28 07 ;CAP: S;STATUS:OK
```

- 5 Identify the links that associate with the card that you replace.

**Note:** Links correspond to NT3X65 cards as follows: link 0 = slot 3, link 1 = slot 4, link 2 = slot 5, link 3 = slot 6, link 4 = slot 7, and link 5 = slot 8.

- 6 The next step depends on the type of network in your office.

| If the network                | Do      |
|-------------------------------|---------|
| is a junctor network (JNET)   | step 7  |
| is an enhanced network (ENET) | step 12 |

- 7 Record the JNET plane, pair, and link number for both links that associate with the card you replace.

**Note:** The network plane, pair, and link are in columns 4, 5, and 6 of the response to a TRNSL command at the PM level. Example #1 in step 4 demonstrates this response. For example, C-side link 3 at the bottom of the display is on network plane 1, pair 1, link 13.

- 8 To access the NET level of the MAP display, type

**>NET**

and press the Enter key.

*Example of a MAP display:*

## NT3X65

### in a digital echo suppressor (continued)

```

Net 11111 11111 22222 22222 33
Plane 01234 56789 01234 56789 01234 56789 01
 0 L..
 1 ...

```

- 9** To access the LINKS level of the MAP display, type

**>LINKS pair\_no**

and press the Enter key.

where

**pair\_no**

is the number of the pair (0 to 31) that connects to the C-side links

*Example of a MAP display:*

```

Net 11111 11111 22222 22222 33
Plane 01234 56789 01234 56789 01234 56789 01
 0 L..
 1 ...
Net 1 Links
 Plane 0123 4567 8901 2345 6789 0123 4567 8901
 0 P. P.. ..P.. ..P.. ..P..
 1 P. P.. ..P.. ..P.. ..P..
 Links 3333 3333 4444 4455 5555 5555 6666
 Plane 2345 6789 0123 4567 8901 2345 6789 0123
 0 ..P.. ..P.. ..P.. ..P.. ..P.. ..-.. ..-.. ..-..
 1 ..P.. ..P.. ..P.. ..P.. ..P.. ..-.. ..-.. ..-..

```

- 10** To manually busy one of the links that you recorded in step 7, type

**>BSY plane\_no link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane for the link (0 or 1)

**link\_no**

is the link number (0 to 63)

*Example of a MAP response:*

```
BSY 0 300K
```

- 11** Repeat step 10 for the other C-side links.  
Complete the procedure and go to step 18.



## NT3X65

### in a digital echo suppressor (continued)

```

ENET System Matrix Shelf 0 1 2 3
Plane 0 CSLink . F - - -
Plane 1 CSLink . F - - -

SHELF 00 Slot 1111111 11122222 22222333 333333
 123456 78 90123456 78901234 56789012 345678
Plane 0 . . IF
Plane 1 . . IF

CARD 32 Front: Back: DS-512 Links
 Xpt I/F 0 1 2 3
Plane 0 -
Plane 1 -

```

- 16** To manually busy the link that you recorded in step 12, type

**>BSY plane\_no LINK link\_no**

and press the Enter key.

*where*

**plane\_no**

is the number of the plane (0 or 1) for the link

**link\_no**

is the link number (0 to 63)

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:32 Link:01  
submitted.

Request to MAN BUSY ENET Plane:0 Shelf:00  
Slot:32 Link:01 passed.

- 17** Repeat step 16 for the other link that associates with the card you replace.  
Go to step 18.

## NT3X65 in a digital echo suppressor (continued)

---

### *At the shelf*

18



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

19 The next action depends on the reason that you perform this procedure.

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 20   |
| did not direct you to this procedure | step 21   |

20 Return to the maintenance procedure that directed you to this procedure and continue as directed.

### *At the MAP terminal*

21 The next action depends on the type of network in the office.

| <b>If you</b>          | <b>Do</b> |
|------------------------|-----------|
| are working on a JNET  | step 22   |
| are working on an ENET | step 24   |

22 To return to service one of the JNET links that associates with the PM unit, type

**>RTS plane\_no link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane (0 or 1) for the link

## NT3X65

### in a digital echo suppressor (continued)

**link\_no**  
is the link number (0 to 63)

|           | <b>If the link</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | returned to service and one more manual-busy link is present                                                                                                                                                                                                                                                                                                                                                                                                                | step 23   |
|           | returned to service and more manual busy links are not present                                                                                                                                                                                                                                                                                                                                                                                                              | step 29   |
|           | did not return to service                                                                                                                                                                                                                                                                                                                                                                                                                                                   | step 28   |
| <b>23</b> | Repeat step 22 for the other link.<br>Go to step 29.                                                                                                                                                                                                                                                                                                                                                                                                                        |           |
| <b>24</b> | Return to service one of the ENET links that associates with the PM unit, type<br><b>&gt;RTS plane_no LINK link_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the number of the plane (0 or 1) for the link<br><b>link_no</b><br>is the link number (0 to 63)<br><i>Example of a MAP response:</i><br><br>Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 submitted.<br><br>Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 passed. |           |
|           | <b>If the link</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Do</b> |
|           | returned to service and one more manual-busy link is present                                                                                                                                                                                                                                                                                                                                                                                                                | step 25   |
|           | returned to service and more manual-busy links are not present                                                                                                                                                                                                                                                                                                                                                                                                              | step 29   |
|           | did not return to service                                                                                                                                                                                                                                                                                                                                                                                                                                                   | step 28   |
| <b>25</b> | Repeat step 24 for the other link. Complete the procedure and go to step 29.                                                                                                                                                                                                                                                                                                                                                                                                |           |
| <b>26</b> | To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.                                                                                                                                                                                                                                                                                                                                        |           |

**NT3X65**  
**in a digital echo suppressor (end)**

---

- 27 A minor problem is present, but the DCM can process traffic. For additional help, contact the next level of support.
- 28 For additional help, contact the next level of support.
- 29 The procedure is complete.



## Power converter cards in a digital carrier module

---

### Application

Use this procedure to replace the following cards in the shelves or frames listed.

| PEC    | Suffix            | Card name                    | Shelf or frame name                                            |
|--------|-------------------|------------------------------|----------------------------------------------------------------|
| NT2X06 | AA                | Power converter card         | Digital carrier module (DCM),<br>Digital echo suppressor (DES) |
| NT2X07 | AA                | Power converter card         | DCM, DES                                                       |
| NT2X70 | AA, AB,<br>AC, AD | -48V power converter<br>card | DCM, DES                                                       |

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The Index contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

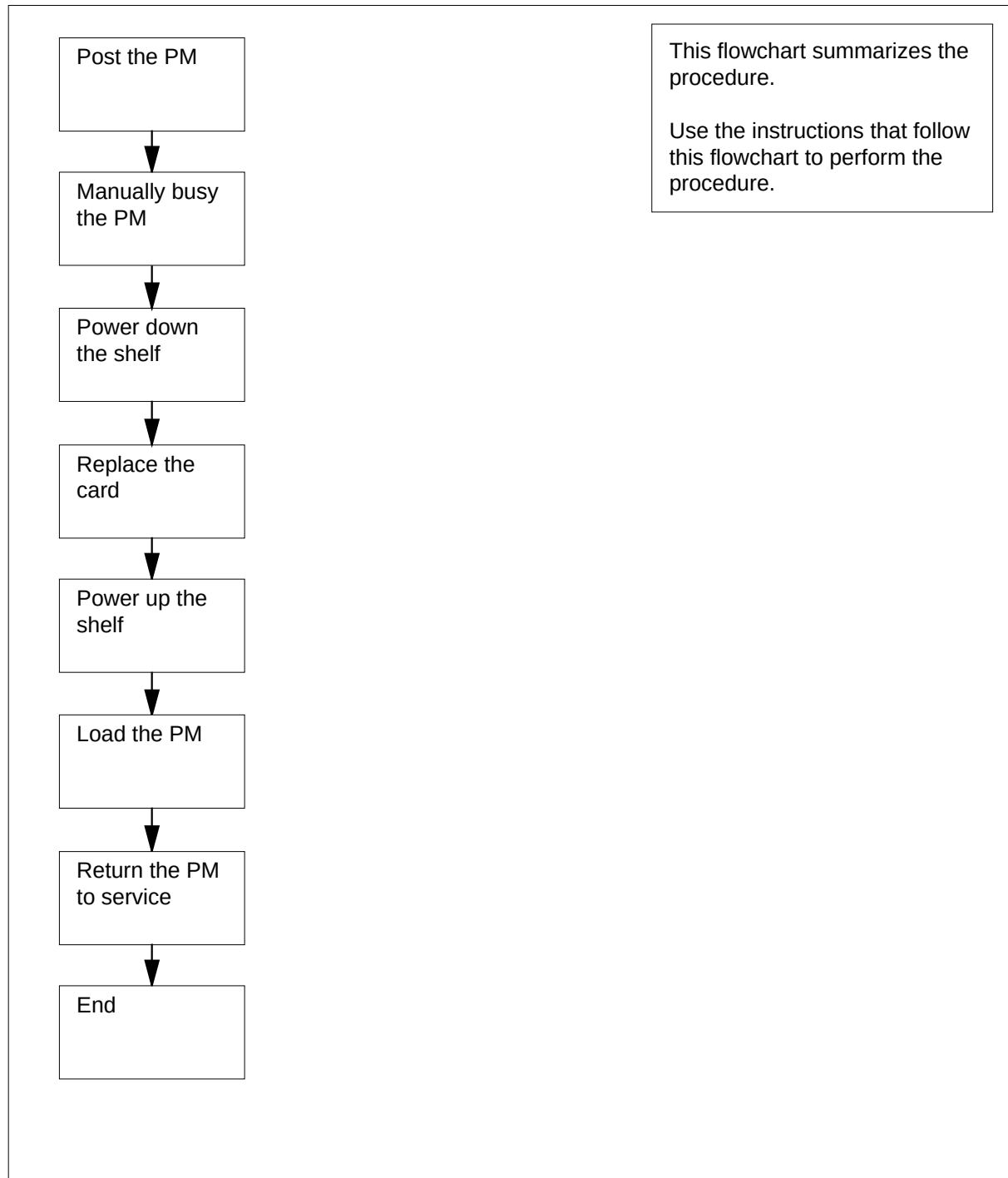
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## Power converter cards in a digital carrier module (continued)

### Summary of replacing Power converter cards in a digital carrier module



## Power converter cards in a digital carrier module (continued)

### Replacing Power converter cards in a digital carrier module

#### At the MAP terminal

1



#### WARNING

##### Loss of service

This procedure includes directions to manually busy a DCM or DES. Service power failure can occur if you manually busy a DCM or DES. Perform this procedure only if you need to restore out-of-service components. In other events, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix, as the card that you remove.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |           |           |           |           |            |            |
|----|-----------|-----------|-----------|-----------|------------|------------|
| PM | SysB<br>6 | ManB<br>1 | OffL<br>0 | CBsy<br>0 | ISTb<br>23 | InSv<br>24 |
|----|-----------|-----------|-----------|-----------|------------|------------|

3

To post the PM that associates with the card you replace, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

#### **pm\_type**

is the type of PM (DCM, DES)

#### **pm\_no**

is the PM number (0 to 511)

*Example of a MAP display:*

|     |           |           |           |           |            |            |
|-----|-----------|-----------|-----------|-----------|------------|------------|
| PM  | SysB<br>6 | ManB<br>1 | OffL<br>0 | CBsy<br>0 | ISTb<br>23 | InSv<br>24 |
| DCM | 1         | 0         | 0         | 0         | 1          | 4          |
| DCM | 0         | InSv      |           |           |            |            |

## Power converter cards in a digital carrier module (continued)

- 4 Determine the state of the PM unit that associates with the card you want to replace.

| If the state of the PM unit  | Do      |
|------------------------------|---------|
| is ISTb, InSv, SysB, or CBSy | step 5  |
| is ManB                      | step 7  |
| is OffL                      | step 23 |

- 5 A maintenance flag (Mtce) can appear. A Mtce flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before you proceed to the next step.

- 6 To manually busy the PM, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

OK.DCM 0 Bsy

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 7  |
| failed             | step 25 |

### At the shelf

7



#### WARNING

##### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

For the power converter you replace, pull down and set the handle of the POWER switch to the OFF position.

- 8 The next action depends on the power configuration of the shelf.

| If the shelf        | Do      |
|---------------------|---------|
| has a single NT2X70 | step 10 |

## Power converter cards in a digital carrier module (continued)

|    | If the shelf                                                                                                                          | Do      |
|----|---------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | has an NT2X06 and an NT2X07                                                                                                           | step 9  |
| 9  | For the mate power converter, pull down and set the handle of the POWER switch to the OFF position.                                   |         |
| 10 | To replace the card, perform the procedure <i>Replacing a card</i> in this document. Complete the procedure and return to this point. |         |
|    | <b>Note 1:</b> Make sure that the handle of the POWER switch on the replacement power converter is in the OFF position.               |         |
|    | <b>Note 2:</b> If the card you replace has switches, make sure that the switches on the replacement card have the same settings.      |         |
| 11 | The next action depends on the reason that you perform this procedure.                                                                |         |
|    | If a maintenance procedure                                                                                                            | Do      |
|    | directed you to this procedure                                                                                                        | step 12 |
|    | did not direct to this procedure                                                                                                      | step 13 |
| 12 | Return to the maintenance procedure that directed you to this procedure and continue as directed.                                     |         |
| 13 | The next action depends on the power converter version and the type of supervisory panel.                                             |         |
|    | If you                                                                                                                                | Do      |
|    | replace an NT2X70AE card and the FSP or MSP has circuit breakers                                                                      | step 14 |
|    | replace an NT2X70AE card and the FSP or MSP does not have circuit breakers                                                            | step 15 |
|    | do not replace an NT2X70AE card and the FSP or MSP has circuit breakers                                                               | step 16 |
|    | do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers                                                     | step 17 |
| 14 | Power up the converter.                                                                                                               |         |
|    | a Pull up and set the handle of the POWER switch to the RESET position and hold the POWER switch.                                     |         |
|    | b Set the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.                            |         |
|    | c Release the handle of the POWER switch.                                                                                             |         |
|    | d Go to step 20.                                                                                                                      |         |

## Power converter cards in a digital carrier module (continued)

- 15** Power up the converter, as follows.
- a** Pull up and set the handle of the POWER switch to the RESET position. Hold the switch until the CONVERTER FAIL LED goes off.
  - b** Release the handle of the POWER switch.
  - c** Go to step 20.
- 16** Power up the converter, as follows.
- a** Pull up and set the handle of the POWER switch to the ON position.
  - b** Press and hold the RESET button on the power converter.
  - c** Set the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.
  - d** Release the RESET button.
  - e** Go to step 20.
- 17** Power up the converter.
- a** Pull up and set the handle of the POWER switch to the ON position.
  - b** Press the RESET button on the power converter until the CONVERTER FAIL LED goes off.
  - c** Release the RESET button.
- 18** The next action depends on the number of power converters on the shelf.
- | If                                                                                    | Do      |
|---------------------------------------------------------------------------------------|---------|
| one power converter is present                                                        | step 20 |
| two power converters are present, and you powered up both power converters            | step 20 |
| two power converters are present, and you powered up only one of the power converters | step 19 |
- 19** Repeat steps 13 to 18 for the other power converter on the shelf.

### ***At the MAP terminal***

- 20** To load the PM, type  
**>LOADPM**  
and press the Enter key.

| If the LOADPM command | Do      |
|-----------------------|---------|
| failed                | step 21 |
| passed                | step 22 |

- 21** Perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

## Power converter cards in a digital carrier module (end)

- 22** To return the PM to service, type

**>RTS**

and press the Enter key.

---

**If the RTS command**

**Do**

passed

step 26

passed, but the PM is **ISTb** as a result of a command protocol violation

step 24

failed

step 25

- 23** To determine why the component is offline, consult operating company personnel. Continue this procedure as directed by operating company personnel.

- 24** A minor problem is present, but the PM can process traffic. For additional help, contact the next level of support.

- 25** For additional help, contact the next level of support.

- 26** The procedure is complete.





---

## 5 Enhanced link peripheral processor card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the enhanced link peripheral processor (ELPP). The first section in the chapter provides diagrams that show ELPP shelf designs.

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) appear in the chapter "Frame supervisory panel and modular supervisory panel card replacement procedures."

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

This section identifies the ELPP cards that this procedure covers.

### Common procedures

This section lists common procedures that you use during the ELPP card replacement procedure. A common procedure is a series of steps that repeat in maintenance procedures. An example of a common procedure is the removal and replacement of a card. Common procedures appear in the common procedures chapter in this NTP.

Do not go to common procedures unless the step-action procedure instructs you to go.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

### **Recording card replacement activities**

Record the following information in office records when you replace a card.

- the serial number of the card you replaced
- the date you replaced the card
- the reason you replaced the card

## ELPP shelf layouts

---

### Application

This section shows frame layouts for the enhanced link peripheral processor (ELPP), as follows:

- triple F-bus configuration in an ELPP cabinet
- a link interface module (LIM) with LMS units 0 and 1
- a link interface shelf (LIS) with common fill cards
- a LIS with a dual link interface unit (DLIU)

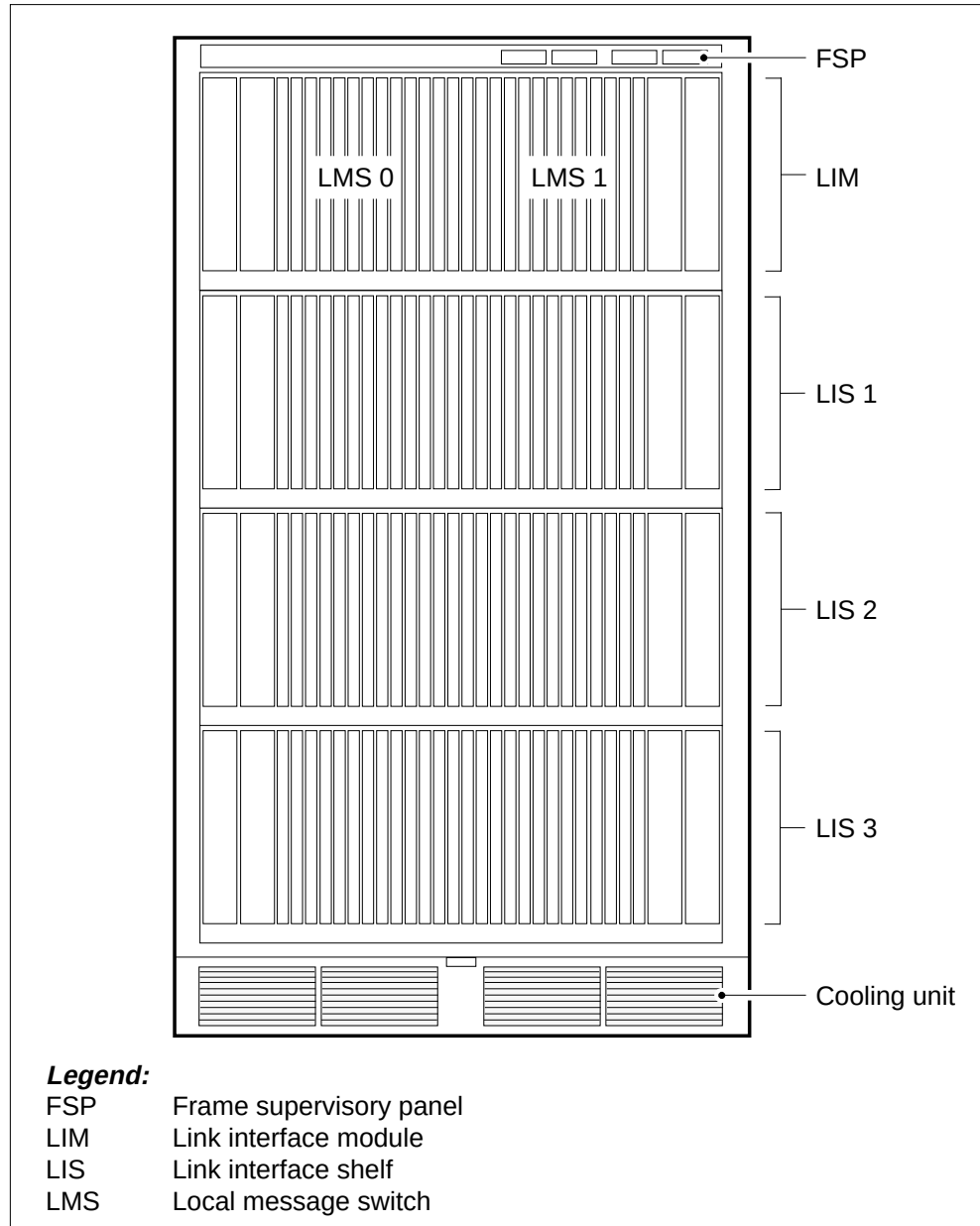
A DLIU is a set of high-speed link (HSL) termination hardware. Each set consists of:

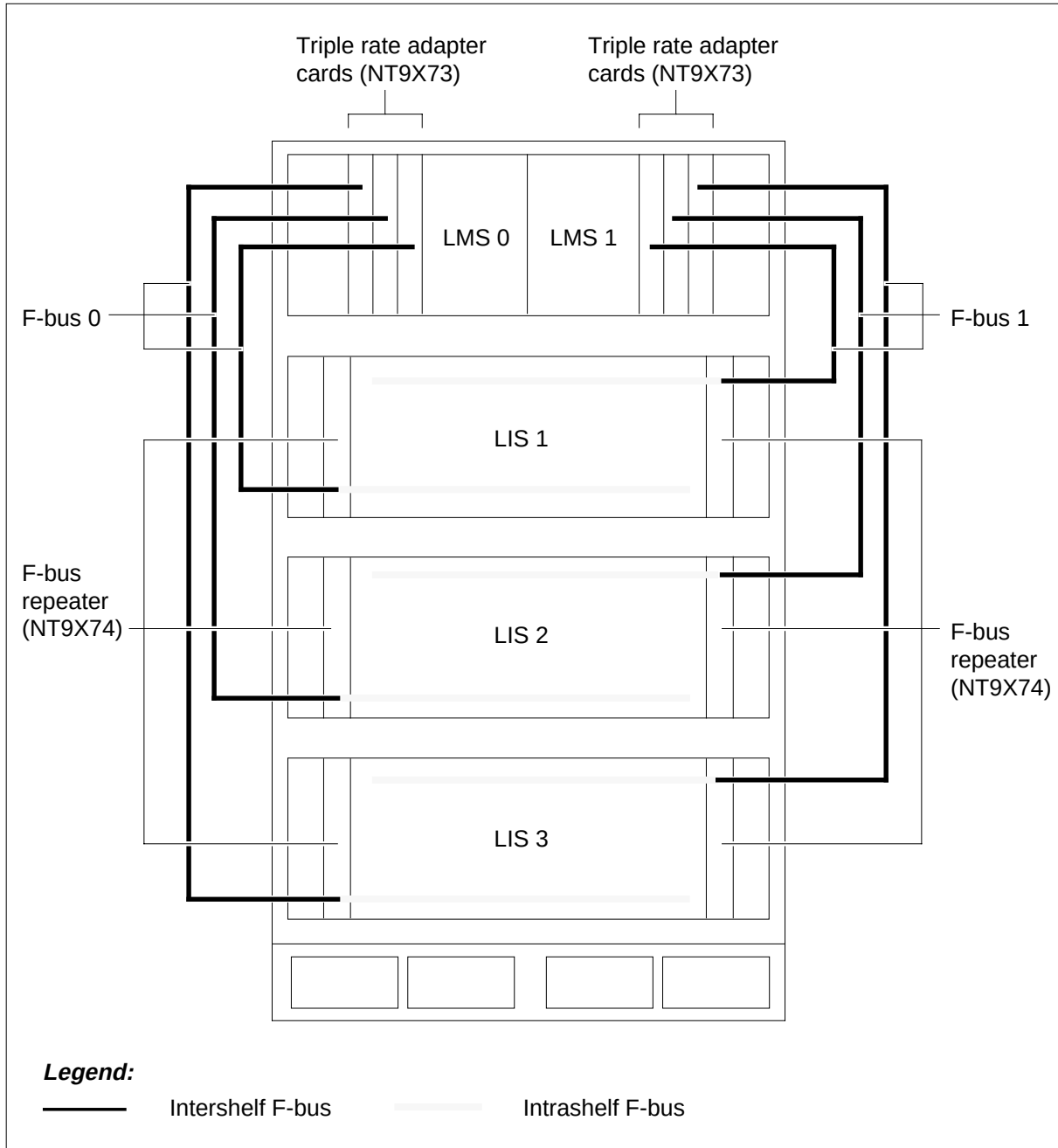
- a high-speed link interface unit (HLIU)
- a high-speed link router (HSLR)

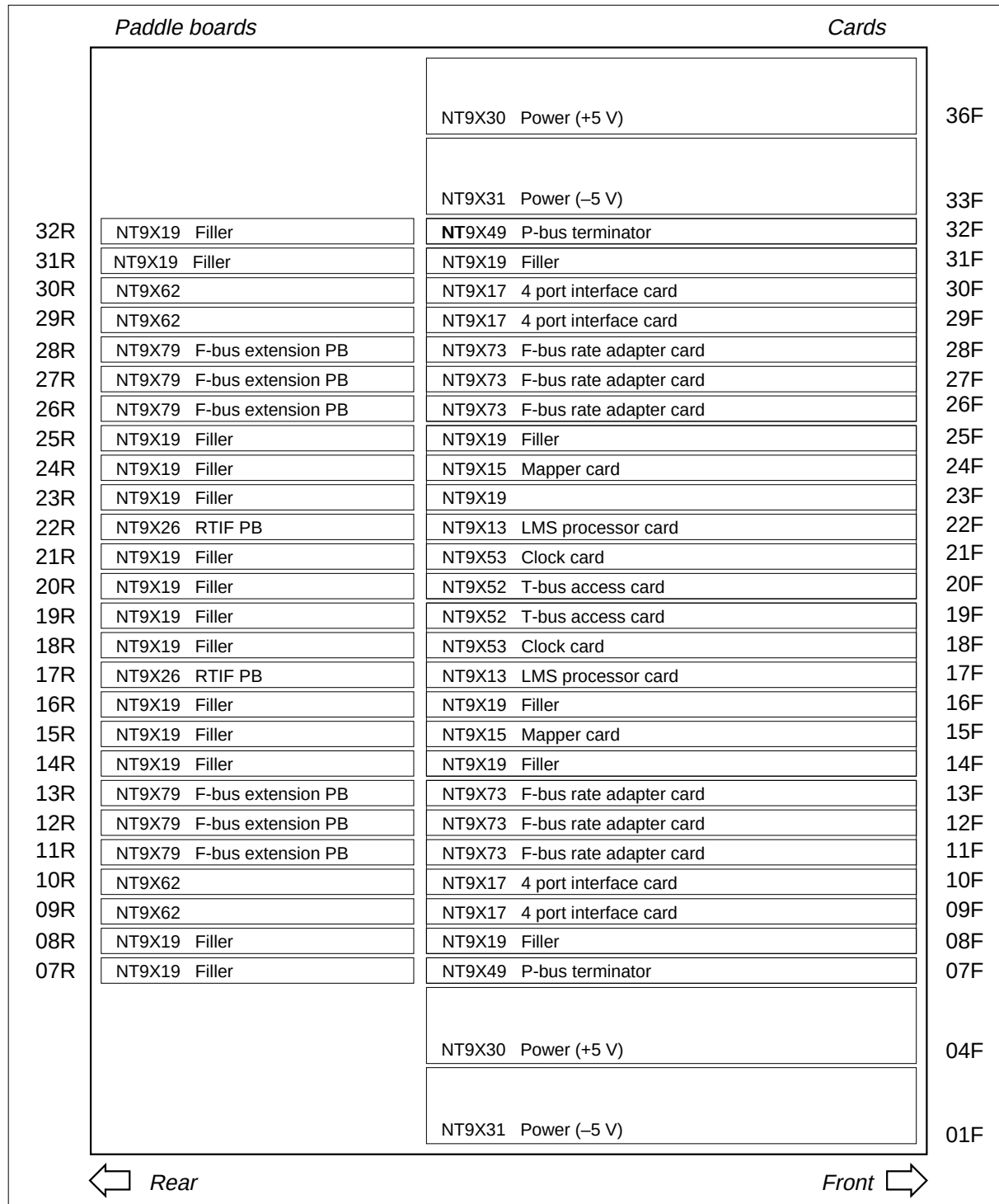
**Note:** The diagrams that follow show standard frame and shelf layouts. Minor differences can occur in different offices.

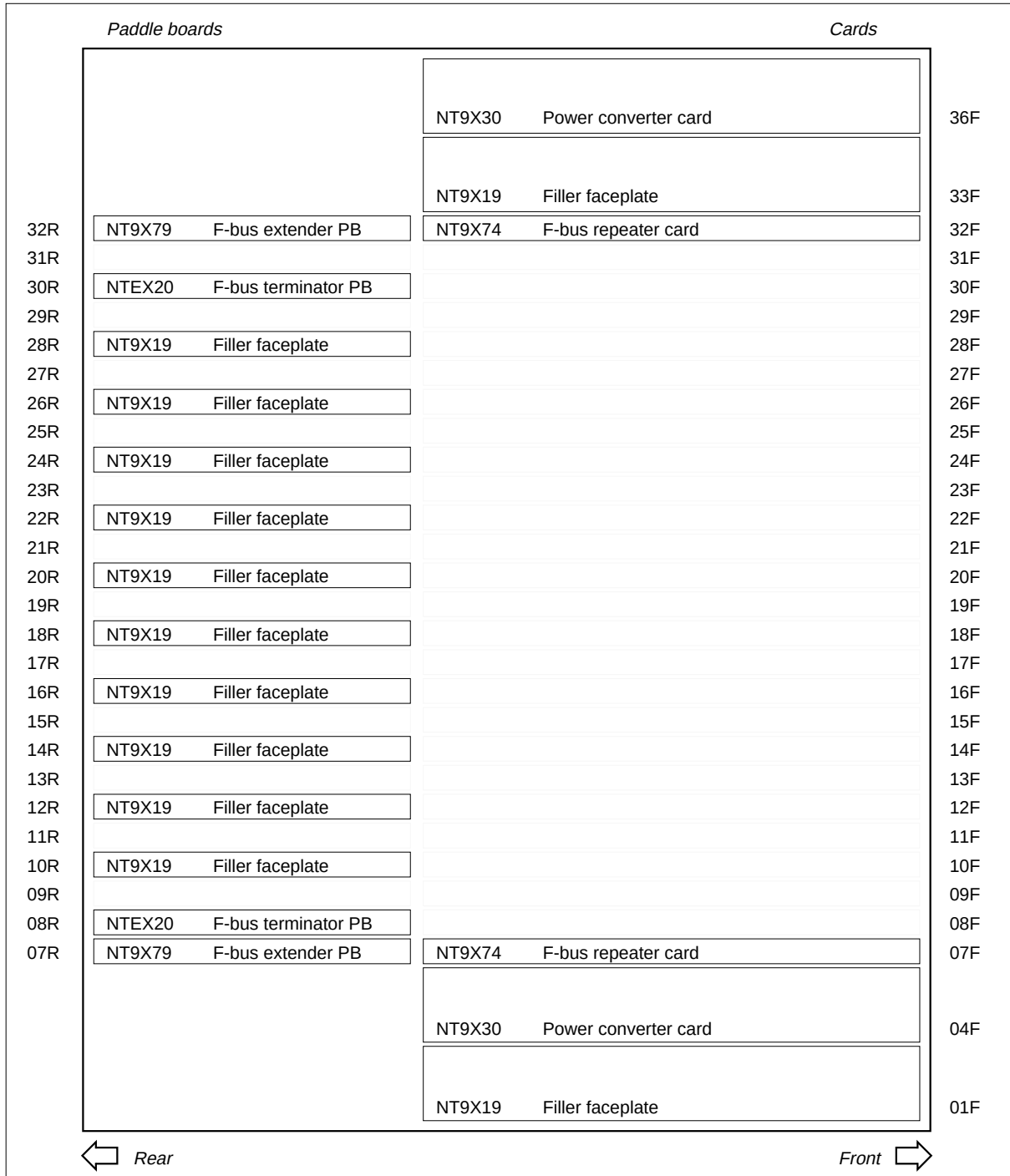
## ELPP shelf layouts (continued)

Figure Enhanced link peripheral processor



**ELPP shelf layouts** (continued)**Figure Triple F-bus configuration in an ELPP cabinet**

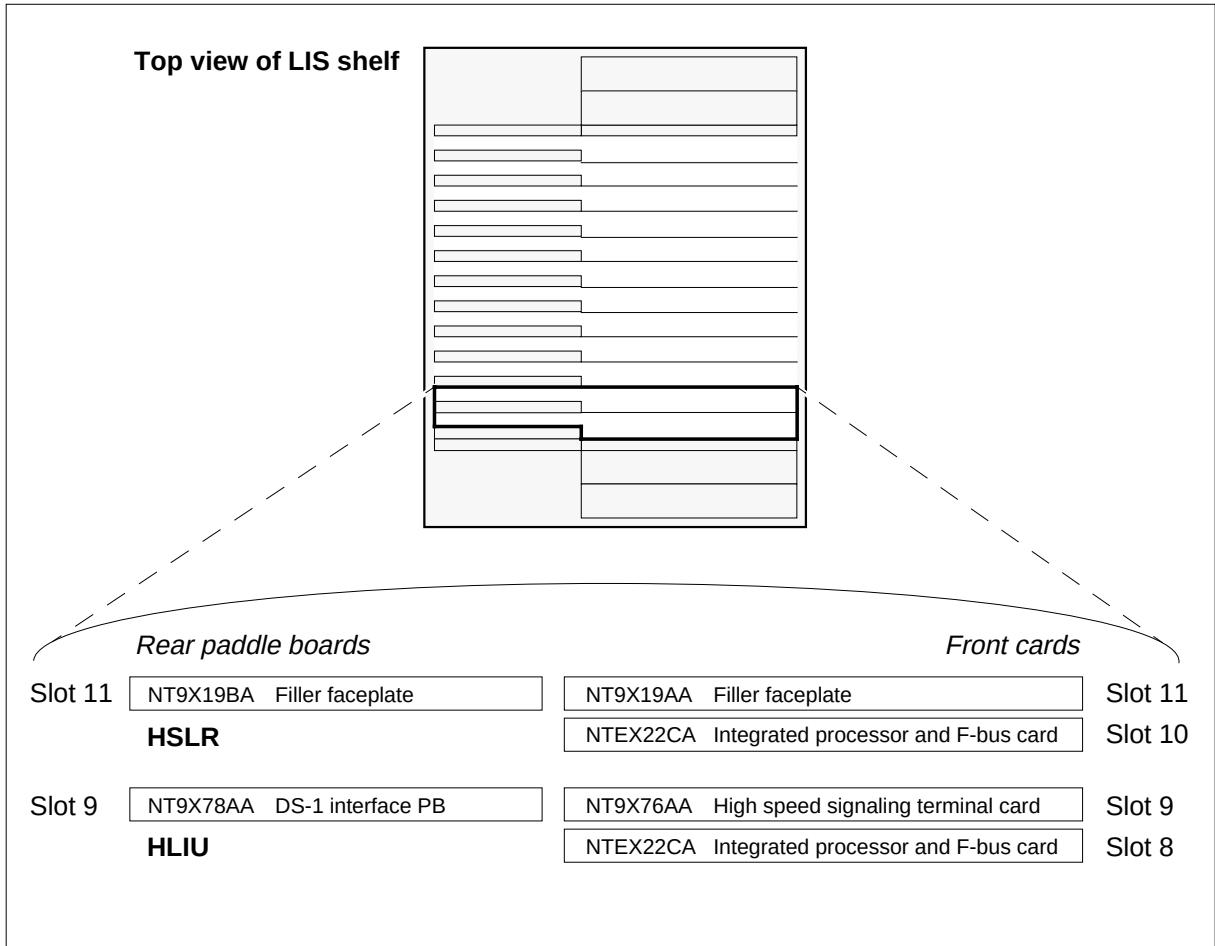
**ELPP shelf layouts** (continued)**Figure Link interface module with LMS 0 and LMS 1 (triple F-bus configuration)**

**ELPP shelf layouts** (continued)**Figure Link interface shelf with common fill cards****Note 1:** Slots for ASUs are outlined in gray.

ELPP shelf layouts (end)

**Note 2:** Instead of NT9X30 card, you can use an NT9X16 power converter card. If you do that, you also must use NT9X16 card instead of NT9X19 card.

Link interface shelf with a DLIU



**Note:** The DLIU set, which consists of three HLIU cards and one HSLR card, must start in slot number 8, 12, 16, 20, 24, or 28.



---

## Common fill paddle boards in an ELPP LIS

---

### Application

Use this procedure to replace the following cards in a link interface shelf (LIS) in an enhanced link peripheral processor (ELPP).

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the "Index" for a list of the cards, shelves, and frames documented in this card replacement book.

#### Common fill paddle boards for an ELPP LIS

| PEC    | Suffix | Card name                              | Shelf or frame name |
|--------|--------|----------------------------------------|---------------------|
| NT9X74 | DA     | F-bus repeater                         | LIS in an ELPP      |
| NT9X79 | BA     | F-bus termination<br>paddle board      | LIS in an ELPP      |
| NTEX20 | AA, BA | Intrashelf termination<br>paddle board | LIS in an ELPP      |

**Note 1:** A link interface module (LIM) is also referred to as a local message switch (LMS) in some documentation. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to designate an LMS.

**Note 2:** The ELPP is referred to as a LIM when the entire ELPP is meant, paralleling how the LISs in the ELPP are closely associated with the LIM. MAP displays and data schema tables also refer to the ELPP as a LIM.

### Common procedures

*Replacing a card* is referenced in this procedure.

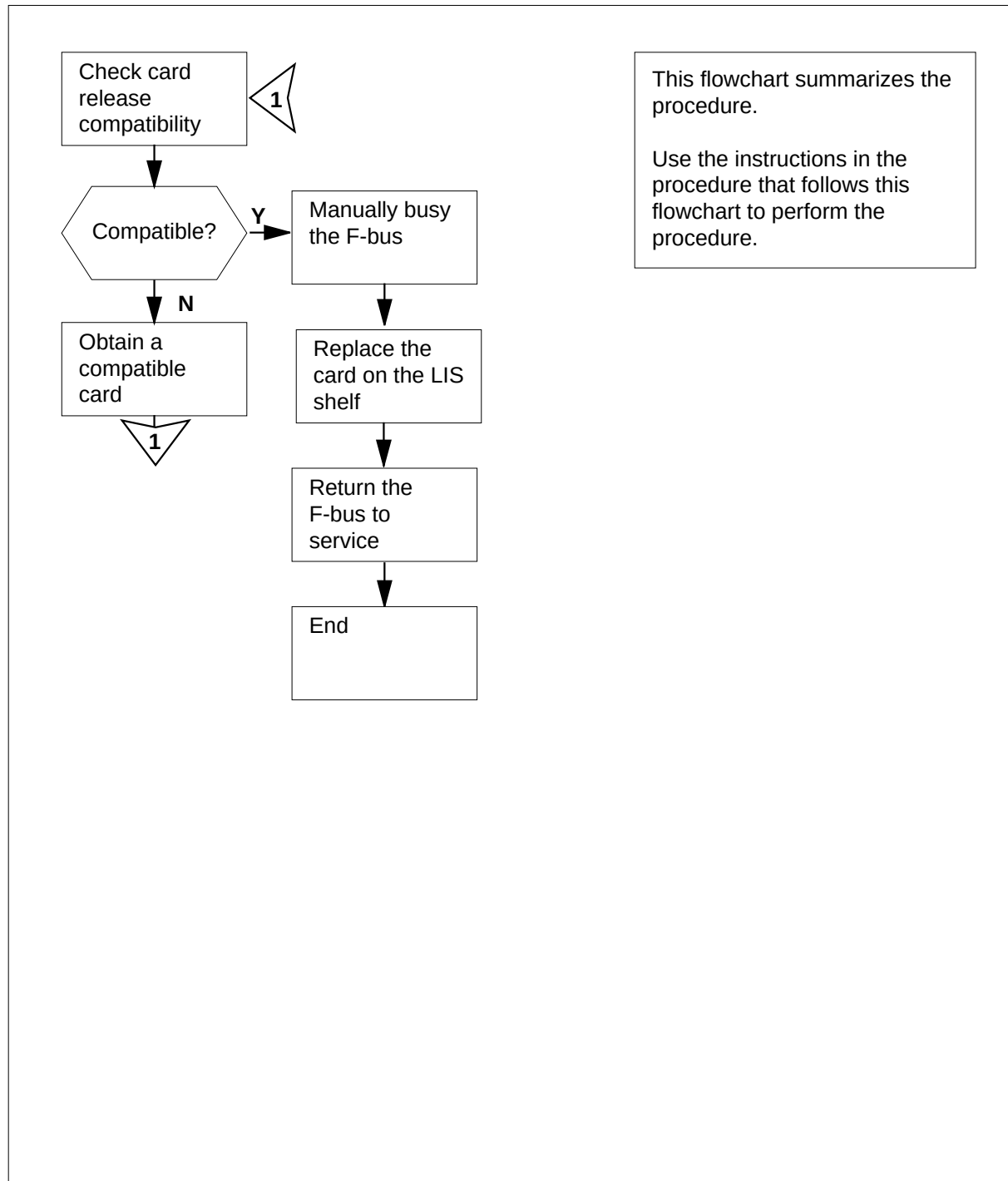
Do not go to the common procedure unless directed to do so in the step-action procedure.

### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## Common fill paddle boards in an ELPP LIS (continued)

### Summary of Replacing Common fill paddle boards in an ELPP LIS



## Common fill paddle boards in an ELPP LIS (continued)

### Replacing Common fill paddle boards in an ELPP LIS

#### At your current location

1



#### CAUTION

##### Loss of service

This procedure provides instructions for removing an F-bus from service, thereby removing redundancy from the ELPP. Perform this procedure only if it is necessary to return the F-buses to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

#### At the MAP terminal

2 Ensure that the replacement card is compatible with the software load by typing

**>CHECKREL LIS pec release**

and pressing the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

Example input:

**>CHECKREL LIS NT9X74DA 2Z**

Example of a MAP response:

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NT9X74DA | 09       | None   | 2Z      | YES        |

OK. Card release is above baseline.

| If the replacement card is | Do     |
|----------------------------|--------|
| below baseline             | step 3 |
| on or above baseline       | step 6 |

## Common fill paddle boards in an ELPP LIS (continued)

- 3 From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).
- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is one that is
  - greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.
- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 21 |

- 6 Access the PM level of the MAP display by typing

**>MAPCI ; MTC ; PM**

and pressing the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 28   | 0    | 0    | 18   |

- 7 Post the LIM associated with the card you are replacing by typing

**>POST LIM lim\_no**

and pressing the Enter key.

*where*

**lim\_no**

is the number of the LIM (0 to 16)

**Note:** Refer to the table located at the end of this document to identify the LIM unit associated with the card you are replacing.

*Example of a MAP display:*

|        |      |      |      |      |      |
|--------|------|------|------|------|------|
|        | SysB | ManB | OffL | CBsy | ISTb |
| PM     | 0    | 0    | 28   | 0    | 0    |
| LIM    | 0    | 0    | 1    | 0    | 0    |
| 0 InSv |      |      | 00S  | 00S  | Taps |

- 8 Determine the state of the LIM.

**Note:** The state of the LIM is shown to the right of the LIM number on the MAP display.

| If the state of the LIM is | Do      |
|----------------------------|---------|
| Offl                       | step 20 |

## Common fill paddle boards in an ELPP LIS (continued)

- |  | If the state of the LIM is                   | Do     |
|--|----------------------------------------------|--------|
|  | any other in-service or out-of-service state | step 9 |
- 9** Determine the state of the mate LIM unit. Refer to the table located at the end of this document to identify the LIM associated with the card you are replacing.
- Note:** The state of the LIM units is shown to the right of the LIM unit number on the MAP display.
- |  | If the state of the mate LIM unit is | Do      |
|--|--------------------------------------|---------|
|  | InSv                                 | step 10 |
|  | anything else                        | step 18 |
- 10** Access the LIS level of the MAP display by typing  
**>LIS lis\_no**  
 and pressing the Enter key.  
 where  
**lis\_no**  
 is the number of the LIS (1, 2, or 3)  
*Example of a MAP display:*

```

 SysB ManB OffL CBsy ISTb InSv
 PM 0 0 28 0 0 18
 LIM 0 0 1 0 0 1
LIM 0 InSv

 00S 00S_Taps
 Links LIS1 LIS2 LIS3
Unit0: InSv
Unit1: InSv

 LIS2 Tap: 0 4 8
FBus0: InSv
FBus1: InSv

```

## Common fill paddle boards in an ELPP LIS (continued)

11



### CAUTION

#### Potential loss of service

Ensure that the mate F-bus, and the F-bus taps on the mate are in service before manually busying the F-bus associated with the card to be replaced. Manually busying the F-bus isolates nodes on the LIS if the mate resources are out of service.

Determine the states of the F-bus and the provisioned F-bus taps for the mate LIM unit.

**Note:** The state of the F-buses is shown to the right of the F-bus numbers on the MAP display. Refer to the table located at the end of this document to identify the LIM and F-bus components associated with the card you are replacing.

| If the states are                                                                                             | Do      |
|---------------------------------------------------------------------------------------------------------------|---------|
| in-service (state of the F-bus is InSv and all F-bus taps are either . (dot) or - (dash).                     | step 12 |
| any other state (state of the F-bus is not InSv and one or more F-bus taps are not either . (dot) or - (dash) | step 19 |

12

Manually busy the F-bus associated with the card to be replaced by typing

**>BSY FBUS fbus\_no**

and pressing the Enter key.

where

**fbus\_no**

is the number of the F-bus (0 or 1)

**Note:** Refer to the table located at the end of this document to identify the F-bus components associated with the card you are replacing.

*Example of a MAP response:*

```
LIM 0 LIS 1 FBus 0 Busy requires confirmation
Please confirm ("YES", "Y", "NO", or "N"):
```

| If                           | Do      |
|------------------------------|---------|
| the command passes           | step 14 |
| you must confirm the command | step 13 |

## Common fill paddle boards in an ELPP LIS (continued)

- 13 Confirm the command by typing

>YES

and pressing the Enter key.

*Example of a MAP response:*

```
LIM 0 LIS 2 FBus 0 Busy initiated.
LIM 0 LIS 2 FBus 0 Busy passed.
```

### At the shelf

- 14



#### WARNING

##### Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Replace the card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.

**Note:** If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.

- 15 The next action depends on your reason for performing this procedure.

| If you were                                                   | Do      |
|---------------------------------------------------------------|---------|
| sent to this procedure from another maintenance procedure     | step 16 |
| not sent to this procedure from another maintenance procedure | step 17 |

- 16 Return to the maintenance procedure that sent you to this procedure and continue as directed.

- 17 Return the F-bus to service by typing

>RTS FBUS fbus\_no

and pressing the Enter key.

*where*

**fbus\_no**

is the number of F-bus (0 or 1)

*Example of a MAP response:*

## Common fill paddle boards in an ELPP LIS (end)

LIM 0 LIS 2 FBus 0 Return to Service initiated.  
LIM 0 LIS2 FBus 0 Return to Service passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 22 |
| failed             | step 21 |

- 18** Continuing with this procedure removes the entire LIM from service, thereby isolating application specific units (ASU) on the LIS. Consult office personnel or your next level of support to determine if you should continue with this procedure, and proceed as directed.
- 19** Continuing with this procedure isolates one or more application specific units (ASU) on the LIS. Consult office personnel or your next level of support to determine if you should continue with this procedure, and proceed as directed.
- 20** Consult office personnel to determine why the component is offline. Continue as directed by office personnel.
- 21** For further assistance, contact the personnel responsible for the next level of support.
- 22** You have completed this procedure.

### Common fill paddle boards and associated LIM components

| PEC                                                                                                                                                                                                                                                                                                | Slot | Associated LIM and F-buses |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------|---|
| NT9X74                                                                                                                                                                                                                                                                                             | 07F  |                            |   |
| NT9X79                                                                                                                                                                                                                                                                                             | 07R  | LIM unit number:           | 0 |
|                                                                                                                                                                                                                                                                                                    |      | Mate LIM unit number:      | 1 |
| NTEX20                                                                                                                                                                                                                                                                                             | 30R  | F-bus number:              | 0 |
|                                                                                                                                                                                                                                                                                                    |      | Mate F-bus number:         | 1 |
| NT9X74                                                                                                                                                                                                                                                                                             | 32F  |                            |   |
| NT9X79                                                                                                                                                                                                                                                                                             | 32R  | LIM unit number:           | 1 |
|                                                                                                                                                                                                                                                                                                    |      | Mate LIM unit number:      | 0 |
| NTEX20                                                                                                                                                                                                                                                                                             | 08R  | F-bus number:              | 1 |
|                                                                                                                                                                                                                                                                                                    |      | Mate F-bus number:         | 0 |
| <b>Note:</b> A LIM unit is also referred to as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to mean an LMS. The term LIM is also used to include the ELPP where the entire ELPP cabinet is meant. |      |                            |   |



---

## HLIU cards in an ELPP LIS

---

### Application

Use this procedure to replace the following cards in a high-speed link interface unit (HLIU) in an enhanced link peripheral processor (ELPP) link interface shelf (LIS).

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the Index for a list of the cards, shelves, and frames documented in this card replacement NTP.

| PEC    | Suffix | Card name                                     | Shelf or frame name |
|--------|--------|-----------------------------------------------|---------------------|
| NTEX22 | CA     | Integrated processor and F-bus interface card | HLIU in an ELPP LIS |
| NTEX76 | AA     | High-speed signaling terminal card            | HLIU in an ELPP LIS |
| NTEX78 | AA     | DS-1 interface paddle board                   | HLIU in an ELPP LIS |

### Common procedures

The following common procedures are referenced:

- *Activating CCS7 links*
- *Deactivating CCS7 links*
- *Loading a PM*
- *Replacing a card*
- *Reseating cards in equipment shelves*
- *Unseating cards in equipment shelves*

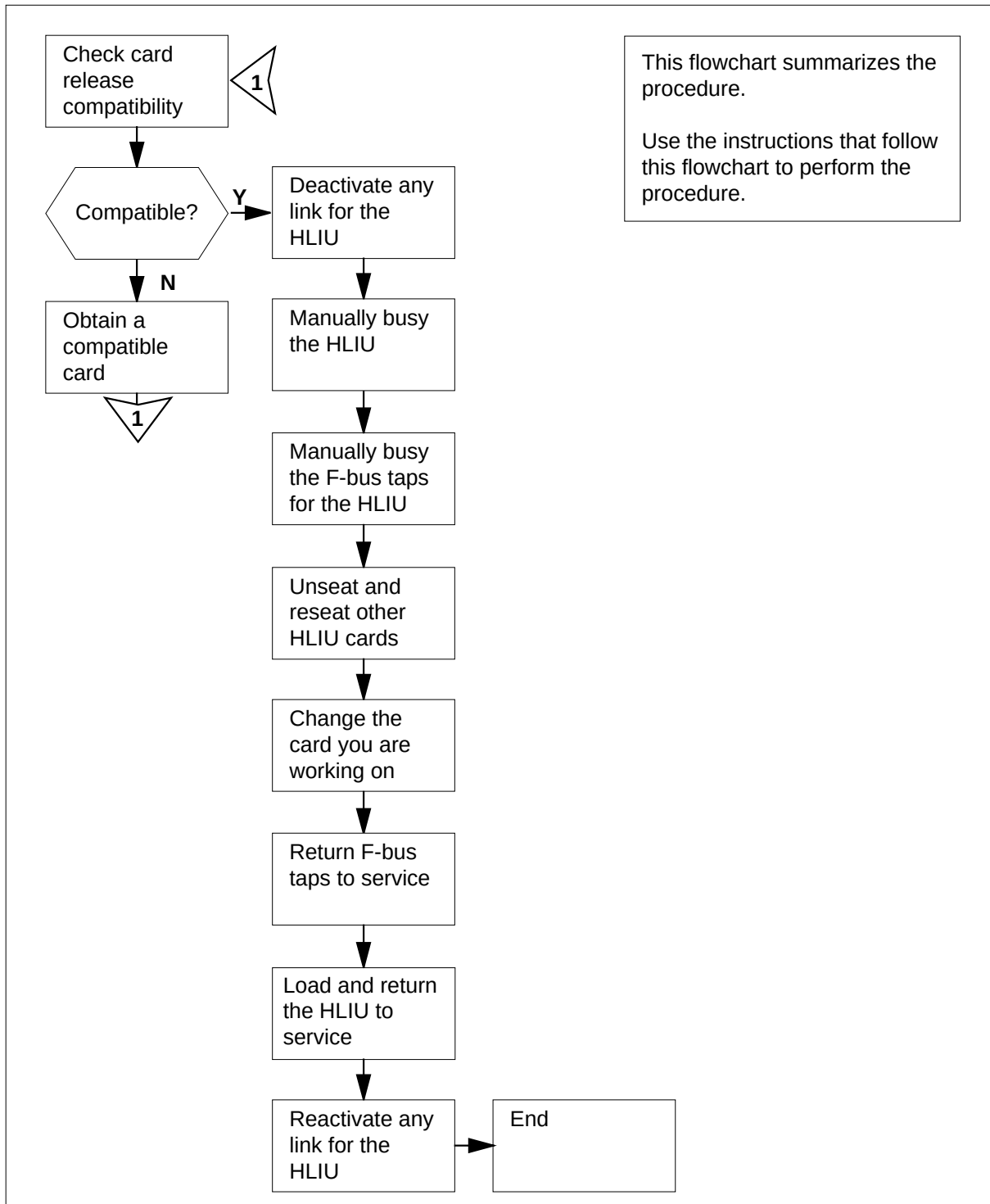
Do not go to the common procedure unless directed to do so in the step-action procedure.

### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## HLIU cards in an ELPP LIS (continued)

### Summary of Replacing HLIU cards in an ELPP LIS



---

## HLIU cards in an ELPP LIS (continued)

---

### Replacing HLIU cards in an ELPP LIS

#### *At your current location*

1



#### **CAUTION**

##### **Loss of service**

This procedure removes an HLIU from service and temporarily interrupts messaging on the associated CCS7 link. Perform this procedure only if necessary to return the HLIU to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

#### *At the MAP terminal*

2 Ensure that the replacement card is compatible with the software load by typing

**>CHECKREL LIM pec release**

and pressing the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

*Example input:*

**>CHECKREL LIM NTEX22CA 2Z**

*Example of a MAP response:*

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NTEX22CA | 01       | None   | 2Z      | YES        |

OK. Card release is above baseline.

---

**If the replacement card is**

**Do**

below baseline

step 3

on or above baseline

step 6

---

3 From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).

## HLIU cards in an ELPP LIS (continued)

- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is one that is
  - greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.

- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 38 |

- 6 Access the PM level of the MAP display by typing

**>MAPCI;MTC;PM**

and pressing the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 1    | 0    | 2    | 0    | 3    | 6    |

- 7 Post the HLIU that contains the card to be replaced by typing

**>POST HLIU hliu\_no**

and pressing the Enter key.

*where*

**hliu\_no**

is the number of the HLIU (0 to 511)

*Example of a MAP display:*

|               |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|
|               | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM            | 1    | 0    | 2    | 0    | 3    | 6    |
| HLIU          | 1    | 0    | 0    | 0    | 0    | 3    |
| HLIU 208 InSv |      | Rsvd |      |      |      |      |

- 8 Determine the state of the HLIU.

| If the state of the HLIU is    | Do      |
|--------------------------------|---------|
| SysB, SysB (NA), ISTb, or InSv | step 9  |
| ManB or ManB (NA)              | step 12 |
| OffL                           | step 37 |

- 9 Deactivate the CCS7 link (if there is one) associated with the HLIU using the procedure *Deactivating CCS7 links* in this document. When you have completed the procedure, return to this point.

---

**HLIU cards in an ELPP LIS** (continued)

---

- 10** Manually busy the HLIU by typing

**>BSY FORCE**

and pressing the Enter key.

| If                              | Do      |
|---------------------------------|---------|
| you need to confirm the command | step 11 |
| the command passed              | step 12 |

- 11** Confirm the command by typing

**>YES**

and pressing the Enter key.

- 12** Display information about the HLIU by typing

**>QUERYPM**

and pressing the Enter key.

*Example of a MAP response:*

```

PM type: HLIU PM No.: 208 Status: InSv
LIM: 2 Shelf: 2 Slot:10 LIU FTA: 4247 1000
Default Load: HCA04BD
Running Load: HCA04BD
LMS States: ISTb ISTb
Auditing: Yes Yes
Msg Channels: Acc Acc
TAP 8: . .
Reserved HLIU forms part of CCS7 Linkset:SSP208_LS SLC:0
LIU is not allocated

```

- 13** Record the number of the link interface module (LIM), link interface shelf (LIS), and the taps that are associated with the HLIU you are working on.

**Note:** The LIM number follows the word LIM on the second line of the display. In the example in step 12, the LIM number is 2. The LIS number follows the word shelf on the second line of the display. In the example in step 12, the LIS number is 2. The tap number follows the word TAP on the line below Msg Channels. In the example in step 12, the TAP number is 8.

- 14** Post the LIM by typing

**>POST LIM lim\_no**

and pressing the Enter key.

*where*

**lim\_no**

is the number of the LIM you recorded in step 13

*Example of a MAP display:*

---

**HLIU cards in an ELPP LIS** (continued)

---

```

 SysB ManB OffL CBSy ISTb InSv
 PM 1 0 2 0 3 6
 LIM 0 0 0 0 1 0

LIM 2 ISTb
 OOS OOS_Taps
 Links LIS1 LIS2 LIS3
Unit0: ISTb
Unit1: InSv

```

- 15** Access the LIS level of the MAP display by typing  
**>LIS lis\_no**  
 and pressing the Enter key.  
*where*  
**lis\_no**  
 is the number of the LIS you recorded in step 13  
*Example of a MAP display:*

```

 LIS2 Tap: 0 4 8
FBus0: InSv
FBus1: ManB

```

- 16** Manually busy the HLIU tap on F-bus 0 by typing  
**>BSY FBUS 0 tap\_no**  
 and pressing the Enter key.  
*where*  
**tap\_no**  
 is the number of the HLIU tap recorded in step 13

| If                                     | Do      |
|----------------------------------------|---------|
| you need to confirm the command        | step 17 |
| you do not need to confirm the command | step 18 |

- 17** Confirm the command by typing  
**>YES**  
 and pressing the Enter key.  
*Example of a MAP response:*

```

Confirmed ...LIM 2 LIS 2 FBus 0 Tap 8 Busy initiated.
 LIM2 LIS 2 FBus 0 Tap 8 Busy passed.

```

- 18** Manually busy the HLIU tap on F-bus 1 by typing  
**>BSY FBUS 1 tap\_no**  
 and pressing the Enter key.
-

---

**HLIU cards in an ELPP LIS (continued)**


---

where

**tap\_no**

is the number of the HLIU tap recorded in step 13

*Example of a MAP response:*

```
LIM 2 FBus 1 Tap 8 Busy requires confirmation because
a SEVERE system
OUTAGE may occur if the following node is isolated:
HLIU 208
Do you wish to proceed with this operation?
Please confirm ("YES", "Y", "NO", or "N"):
```

- 19** Confirm the command by typing

**>YES**

and pressing the Enter key.

*Example of a MAP response:*

```
Confirmed ...LIM 2 LIS 2 FBus 1 Tap 8 Busy initiated.
 LIM2 LIS 2 FBus 1 Tap 8 Busy
passed.
```

**At the shelf**

**20**



**DANGER**

**Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Determine your next step based on the card you are replacing.

| If you are replacing an | Do      |
|-------------------------|---------|
| NTEX76                  | step 21 |
| NTEX22                  | step 23 |
| NTEX78                  | step 26 |

- 21** To begin changing an NTEX76 card, unseat and reseat cards in the HLIU using the following sub-steps. To unseat a card, use the procedure *Unseating cards in equipment shelves* in this document. To reseat a card, use the procedure *Reseating cards in equipment shelves* in this document.
- Unseat the NTEX76 high-speed signaling terminal card.
  - Unseat the NTEX22 link general processor card.
  - Reseat the NTEX22 link general processor card.

---

**HLIU cards in an ELPP LIS (continued)**


---

- 22 Replace the NTEX76 card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.  
Go to step 27.
- 23 To begin changing an NTEX22 card, unseat the NTEX76 high-speed signaling terminal card using the procedure *Unseating cards in equipment shelves* in this document. When you have finished the procedure, return to this point.
- 24 Replace the NTEX22 card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.  
**Note:** If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.
- 25 Reseat the NTEX76 HLIU high-speed signaling terminal card using the procedure *Reseating cards in equipment shelves* in this document. When you have finished the procedure, return to this point.  
Go to step 27.
- 26 Replace the card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.
- 27 The next action depends on your reason for performing this procedure.

| If you were                                                       | Do      |
|-------------------------------------------------------------------|---------|
| directed to this procedure from another maintenance procedure     | step 28 |
| not directed to this procedure from another maintenance procedure | step 29 |

- 28 Return to the maintenance procedure that sent you to this procedure and continue as directed.

**At the MAP terminal**

- 29 Return the HLIU tap on F-bus 0 to service by typing  
**>RTS FBUS 0 tap\_no**  
and pressing the Enter key.  
where  
**tap\_no**  
is the number of the HLIU tap you recorded in step 13

*Example of a MAP response:*

```
LIM 1 LIS 2 FBus 0 Tap 8 Return to Service initiated.
LIM 1 LIS 2 FBus 0 Tap 8 Return to Service passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 30 |

---



---

**HLIU cards in an ELPP LIS (continued)**


---

|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                                                            | <b>Do</b> |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                                                                                                                                                                                                               | step 38   |
| <b>30</b> | Return the HLIU tap on F-bus 1 to service by typing<br><b>&gt;RTS FBUS 1 tap_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>tap_no</b><br>is the number of the HLIU tap you recorded in step 13<br><i>Example of a MAP response:</i><br><br>LIM 1 LIS 2 FBus 1 Tap 8 Return to Service initiated.<br>LIM 1 LIS 2 FBus 1 Tap 8 Return to Service passed. |           |
|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                                                            | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                                               | step 31   |
|           | failed                                                                                                                                                                                                                                                                                                                                                               | step 38   |
| <b>31</b> | Quit from the F-bus level of the MAP display by typing<br><b>&gt;QUIT</b><br>and pressing the Enter key.                                                                                                                                                                                                                                                             |           |
| <b>32</b> | Post the HLIU you are working on by typing<br><b>&gt;POST HLIU hliu_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>hliu_no</b><br>is the number of the HLIU (0 to 511)                                                                                                                                                                                  |           |
| <b>33</b> | Load the HLIU by typing<br><b>&gt;LOADPM</b><br>and pressing the Enter key.<br><i>Example of a MAP response:</i><br><br>HLIU 208 LOADPM Passed                                                                                                                                                                                                                       |           |
|           | <b>If the LOADPM command</b>                                                                                                                                                                                                                                                                                                                                         | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                                               | step 35   |
|           | failed                                                                                                                                                                                                                                                                                                                                                               | step 34   |

---

## HLIU cards in an ELPP LIS (end)

---

**34** Load the PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

**35** Return the HLIU to service by typing

**>RTS**

and pressing the Enter key.

*Example of a MAP response:*

HLIU 100 RTS Passed

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 36 |
| failed             | step 38 |

---

**36** Activate the CCS7 link (if there is one) associated with the HLIU using the procedure *Activating CCS7 links* in this document. When you have completed the procedure, return to this point.

Go to step 39.

**37** Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

**38** For further assistance, contact the personnel responsible for the next level of support.

**39** You have completed this procedure.

## HSLR cards in an ELPP LIS

---

### Application

Use this procedure to replace the following cards in a high-speed link router (HSLR) in an enhanced link peripheral processor (ELPP) link interface shelf (LIS).

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the Index for a list of the cards, shelves, and frames documented in this card replacement NTP.

| PEC    | Suffix | Card name                                     | Shelf or frame name |
|--------|--------|-----------------------------------------------|---------------------|
| NTEX22 | CA     | Integrated processor and F-bus interface card | HSLR in an ELPP LIS |

### Common procedures

The following common procedures are referenced:

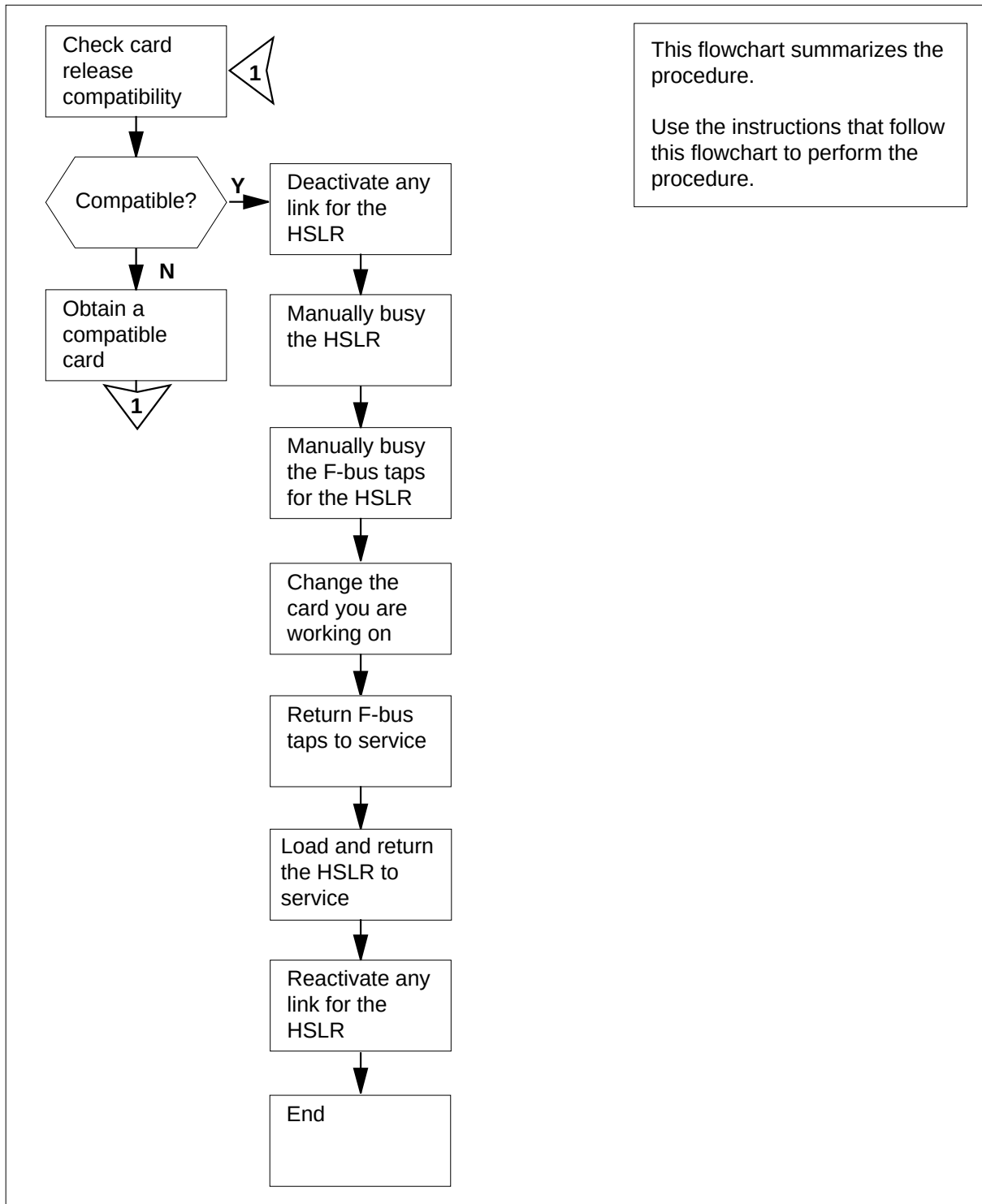
- *Activating CCS7 links*
- *Deactivating CCS7 links*
- *Loading a PM*
- *Replacing a card*

### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## HSLR cards in an ELPP LIS (continued)

### Summary of Replacing HSLR cards in an ELPP LIS



---

**HSLR cards in an ELPP LIS** (continued)
 

---

**Replacing HSLR cards in an ELPP LIS*****At your current location*****1****CAUTION****Loss of service**

This procedure removes an HSLR from service and temporarily interrupts messaging on the associated CCS7 link. Perform this procedure only if necessary to return the HSLR to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

***At the MAP terminal***

**2** Ensure that the replacement card is compatible with the software load by typing

**>CHECKREL LIM pec release**

and pressing the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

*Example input:*

**>CHECKREL LIM NTEX22CA 2Z**

*Example of a MAP response:*

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NTEX22CA | 01       | None   | 2Z      | YES        |

OK. Card release is above baseline.

---

**If the replacement card is**
**Do**

below baseline

step 3

on or above baseline

step 6

**3** From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).

---

**HSLR cards in an ELPP LIS (continued)**


---

- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is one that is
- greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.

- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 32 |

- 6 Access the PM level of the MAP display by typing

**>MAPCI;MTC;PM**

and pressing the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 1    | 0    | 2    | 0    | 3    | 6    |

- 7 Post the HSLR that contains the card to be replaced by typing

**>POST HSLR hslr\_no**

and pressing the Enter key.

*where*

**hslr\_no**

is the number of the HSLR (0 to 511)

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   | 1    | 0    | 2    | 0    | 3    | 6    |
| HSLR | 1    | 0    | 0    | 0    | 0    | 3    |

|      |     |      |      |
|------|-----|------|------|
| HSLR | 208 | InSv | Rsvd |
|------|-----|------|------|

- 8 Determine the state of the HSLR.

| If the state of the HSLR is    | Do      |
|--------------------------------|---------|
| SysB, SysB (NA), ISTb, or InSv | step 9  |
| ManB or ManB (NA)              | step 12 |
| OffL                           | step 31 |

---

---

**HSLR cards in an ELPP LIS (continued)**

---

- 9 Deactivate the CCS7 link (if there is one) associated with the HSLR using the procedure *Deactivating CCS7 links* in this document. When you have completed the procedure, return to this point.

- 10 Manually busy the HSLR by typing

**>BSY FORCE**

and pressing the Enter key.

| If                              | Do      |
|---------------------------------|---------|
| you need to confirm the command | step 11 |
| the command passed              | step 12 |

- 11 Confirm the command by typing

**>YES**

and pressing the Enter key.

- 12 Display information about the HSLR by typing

**>QUERYPM**

and pressing the Enter key.

*Example of a MAP response:*

```
PM type: HSLR PM No.: 208 Status: InSv
LIM: 2 Shelf: 2 Slot:10 LIU FTA: 4247 1000
Default Load: HCA04BD
Running Load: HCA04BD
LMS States: ISTb ISTb
Auditing: Yes Yes
Msg Channels: Acc Acc
TAP 8: . .
Reserved HSLR forms part of CCS7 Linkset:SSP208_LS SLC:0
LIU is not allocated
```

- 13 Record the number of the link interface module (LIM), link interface shelf (LIS), and the taps that are associated with the HSLR you are working on.

**Note:** The LIM number follows the word LIM on the second line of the display. In the example in step 12, the LIM number is 2. The LIS number follows the word Shelf on the second line of the display. In the example in step 12, the LIS number is 2. The tap number follows the word TAP on the line below Msg Channels. In the example in step 12, the TAP number is 8.

- 14 Post the LIM by typing

**>POST LIM lim\_no**

and pressing the Enter key.

*where*

**lim\_no**

is the number of the LIM you recorded in step 13

## HSLR cards in an ELPP LIS (continued)

*Example of a MAP display:*

```

 SysB ManB OffL CBsy ISTb InSv
 PM 1 0 2 0 3 6
 LIM 0 0 0 0 1 0

 LIM 2 ISTb

 OOS OOS_Taps
 Links LIS1 LIS2 LIS3
 Unit0: ISTb
 Unit1: InSv

```

- 15** Access the LIS level of the MAP display by typing

**>LIS lis\_no**

and pressing the Enter key.

where

**lis\_no**

is the number of the LIS you recorded in step 13

*Example of a MAP display:*

```

 LIS2 Tap: 0 4 8
 FBus0: InSv
 FBus1: ManB BBBB BBBB BBBB

```

- 16** Manually busy the HSLR tap on F-bus 0 by typing

**>BSY FBUS 0 tap\_no**

and pressing the Enter key.

where

**tap\_no**

is the number of the HSLR tap recorded in step 13

| If                                     | Do      |
|----------------------------------------|---------|
| you need to confirm the command        | step 17 |
| you do not need to confirm the command | step 18 |

- 17** Confirm the command by typing

**>YES**

and pressing the Enter key.

*Example of a MAP response:*

```

 Confirmed ...LIM 2 LIS 2 FBus 0 Tap 8 Busy initiated.
 LIM2 LIS 2 FBus 0 Tap 8 Busy passed.

```

- 18** Manually busy the HSLR tap on F-bus 1 by typing

**>BSY FBUS 1 tap\_no**



---

**HSLR cards in an ELPP LIS (continued)**


---

and pressing the Enter key.

where

**tap\_no**

is the number of the HSLR tap recorded in step 13

*Example of a MAP response:*

LIM 2 FBus 1 Tap 8 Busy requires confirmation because  
a SEVERE system OUTAGE may occur if the following  
node is isolated:

HSLR 208

Do you wish to proceed with this operation?

Please confirm ("YES", "Y", "NO", or "N"):

- 19** Confirm the command by typing

**>YES**

and pressing the Enter key.

*Example of a MAP response:*

Confirmed ...LIM 2 LIS 2 FBus 1 Tap 8 Busy initiated.  
LIM2 LIS 2 FBus 1 Tap 8 Busy passed.

### ***At the shelf***

**20**



#### **DANGER**

##### **Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Replace the NTEX22 card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.

**Note:** If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.

- 21** The next action depends on your reason for performing this procedure.

| <b>If you were</b>                                                | <b>Do</b> |
|-------------------------------------------------------------------|-----------|
| directed to this procedure from another maintenance procedure     | step 22   |
| not directed to this procedure from another maintenance procedure | step 23   |

**HSLR cards in an ELPP LIS (continued)**

---

- 22 Return to the maintenance procedure that sent you to this procedure and continue as directed.

**At the MAP terminal**

- 23 Return the HSLR tap on F-bus 0 to service by typing

**>RTS FBUS 0 tap\_no**

and pressing the Enter key.

where

**tap\_no**

is the number of the HSLR tap you recorded in step 13

*Example of a MAP response:*

```
LIM 1 LIS 2 FBus 0 Tap 8 Return to Service initiated.
LIM 1 LIS 2 FBus 0 Tap 8 Return to Service passed.
```

---

| If the RTS command | Do |
|--------------------|----|
|--------------------|----|

|        |         |
|--------|---------|
| passed | step 24 |
|--------|---------|

|        |         |
|--------|---------|
| failed | step 32 |
|--------|---------|

- 
- 24 Return the HSLR tap on F-bus 1 to service by typing

**>RTS FBUS 1 tap\_no**

and pressing the Enter key.

where

**tap\_no**

is the number of the HSLR tap you recorded in step 13

*Example of a MAP response:*

```
LIM 1 LIS 2 FBus 1 Tap 8 Return to Service initiated.
LIM 1 LIS 2 FBus 1 Tap 8 Return to Service passed.
```

---

| If the RTS command | Do |
|--------------------|----|
|--------------------|----|

|        |         |
|--------|---------|
| passed | step 25 |
|--------|---------|

|        |         |
|--------|---------|
| failed | step 32 |
|--------|---------|

- 
- 25 Quit from the F-bus level of the MAP display by typing

**>QUIT**

and pressing the Enter key.

- 26 Post the HSLR you are working on by typing

**>POST HSLR hslr\_no**

and pressing the Enter key.

---

**HSLR cards in an ELPP LIS (end)**

---

where

**hslr\_no**

is the number of the HSLR (0 to 511)

- 27** Load the HSLR by typing

**>LOADPM**

and pressing the Enter key.

*Example of a MAP response:*

HSLR 208 LOADPM Passed

---

| If the LOADPM command | Do |
|-----------------------|----|
|-----------------------|----|

---

|        |         |
|--------|---------|
| passed | step 29 |
|--------|---------|

|        |         |
|--------|---------|
| failed | step 28 |
|--------|---------|

---

- 28** Load the PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

- 29** Return the HSLR to service by typing

**>RTS**

and pressing the Enter key.

*Example of a MAP response:*

HSLR 100 RTS Passed

---

| If the RTS command | Do |
|--------------------|----|
|--------------------|----|

---

|        |         |
|--------|---------|
| passed | step 30 |
|--------|---------|

|        |         |
|--------|---------|
| failed | step 32 |
|--------|---------|

---

- 30** Activate the CCS7 link (if there is one) associated with the HSLR using the procedure *Activating CCS7 links* in this document. When you have completed the procedure, return to this point.

Go to step 33.

- 31** Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

- 32** For further assistance, contact the personnel responsible for the next level of support.

- 33** You have completed this procedure.

## NT9X13 in an ELPP LIM unit

---

### Application

Use this procedure to replace an NT9X13 in a link interface module (LIM) unit of an enhanced link peripheral processor (ELPP).

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the Index for a list of the cards, shelves, and frames documented in this card replacement book.

| PEC    | Suffixes | Card name       | Shelf/frame name    |
|--------|----------|-----------------|---------------------|
| NT9X13 | DE       | CPU 20-MHz card | LIM unit of an ELPP |

**Note 1:** A link interface module (LIM) unit is also referred to as a local message switch (LMS) in some documentation. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to designate an LMS.

**Note 2:** The ELPP is referred to as a link interface module (LIM) where the entire ELPP is indicated, paralleling how the LISs in the ELPP are closely associated with the LIM. MAP displays and data schema tables also refer to the ELPP as a LIM.

### Common procedures

The following common procedures are referenced:

- *Loading a PM*
- *Replacing a card*
- *Unseating cards in equipment shelves*

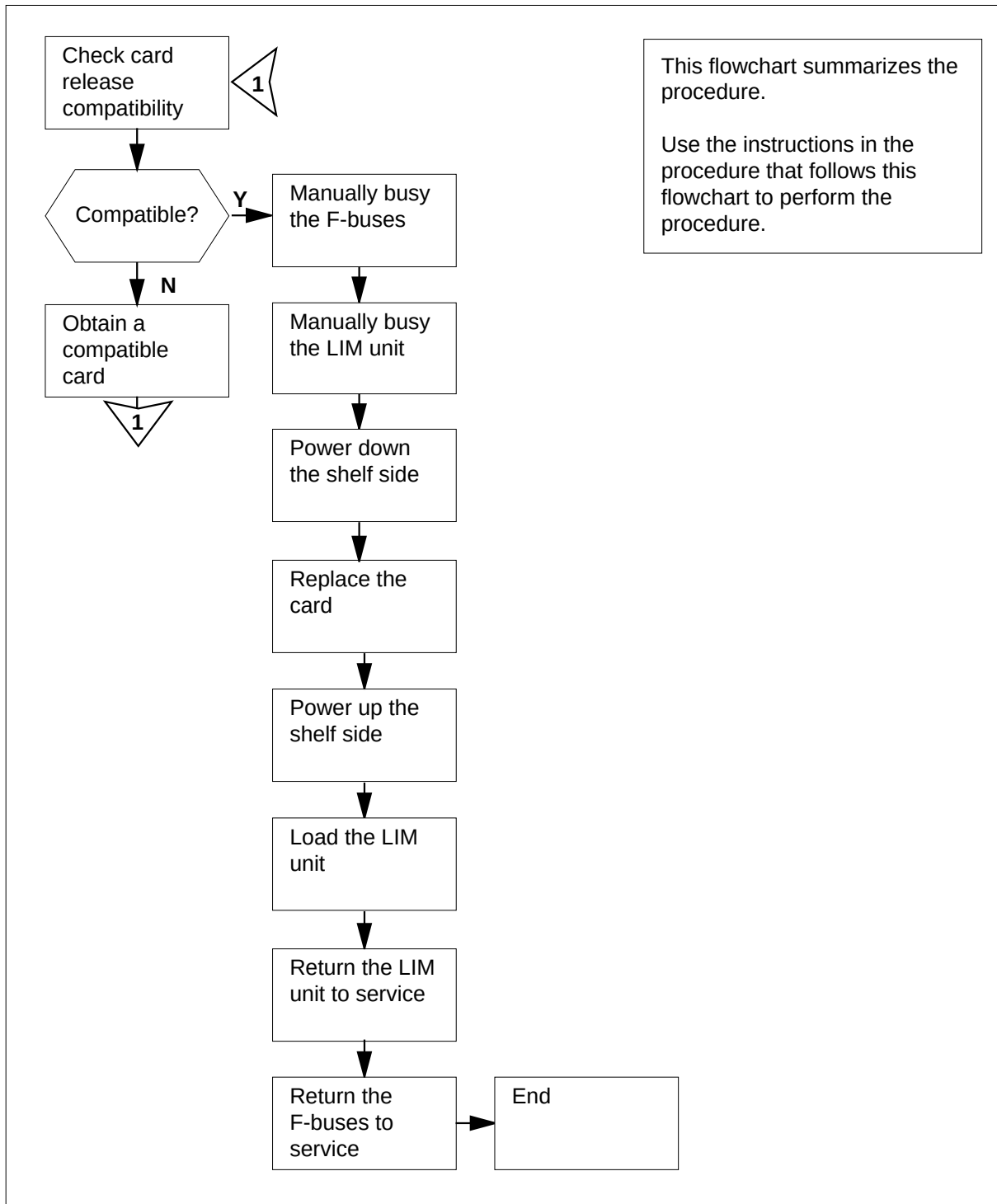
Do not go to the common procedure unless directed to do so in the step-action procedure.

### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## NT9X13 in an ELPP LIM unit (continued)

### Summary of Replacing an NT9X13 in an ELPP LIM unit



## NT9X13 in an ELPP LIM unit (continued)

### Replacing NT9X13 in an ELPP LIM unit

#### *At your current location*

1



#### **CAUTION**

##### **Loss of service**

This procedure provides instructions to remove a LIM unit from service, thereby removing redundancy from the ELPP. Perform this procedure only if necessary to return the LIM unit to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

#### *At the MAP terminal*

2 Ensure that the replacement card is compatible with the software load by typing

**>CHECKREL LIM pec release**

and pressing the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

Example input:

**>CHECKREL LIM NT9X13DE 2Z**

Example of a MAP response:

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NT9X13DE | 01       | None   | 2Z      | Yes        |

OK. Card release is above baseline.

| If the replacement card is | Do     |
|----------------------------|--------|
| below baseline             | step 3 |
| on or above baseline       | step 6 |

## NT9X13

### in an ELPP LIM unit (continued)

- 3 From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).
- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is one that is
  - greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.

- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 31 |

- 6 Access the PM level of the MAP display by typing

**>MAPCI ;MTC ;PM**

and pressing the Enter key.

*Example of a MAP display:*

|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
|----|------|------|------|------|------|------|
| PM | 0    | 0    | 28   | 0    | 0    | 18   |

- 7 Post the LIM that contains the card to be replaced by typing

**>POST LIM lim\_no**

and pressing the Enter key.

*where*

**lim\_no**

is the number of the LIM to be posted (0 to 16)

*Example of a MAP display:*

|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

LIM 0 InSv

|             | 00S<br>Links | 00S_Taps<br>LIS1 | LIS2 | LIS3 |
|-------------|--------------|------------------|------|------|
| Unit0: InSv | .            | .                | .    | .    |
| Unit1: InSv | .            | .                | .    | .    |

## NT9X13

### in an ELPP LIM unit (continued)

- 8 Determine the state of the LIM.
- Note:** The state of the LIM is shown to the right of the LIM number on the MAP display.

| If the state of the LIM is                   | Do      |
|----------------------------------------------|---------|
| Off l                                        | step 30 |
| any other in-service or out-of-service state | step 9  |

- 9 Determine the state of the LIM units. Refer to the table at the end of this document to identify the LIM unit, the F-bus, and the mates associated with the card you are replacing.

**Note:** The state of the LIM units is shown to the right of the LIM unit number on the MAP display.

| If the state of the mate LIM unit is                                                                               | Do      |
|--------------------------------------------------------------------------------------------------------------------|---------|
| InSv                                                                                                               | step 10 |
| ISTb, and the state of the LIM unit associated with the card you are replacing is InSv or ISTb                     | step 10 |
| ISTb, and the LIM unit associated with the card you are replacing is out of service                                | step 10 |
| any out-of-service state, and the state of the LIM unit associated with the card you are replacing is InSv or ISTb | step 28 |
| any out-of-service state, and the LIM unit associated with the card you are replacing is out of service            | step 10 |

**Note:** Steps 10 through 13 must be repeated for each LIS on the LIM unit.

- 10 Access the LIS level of the MAP display by typing

**>LIS lis\_no**

and pressing the Enter key.

where

**lis\_no**

is the number of the LIS (1, 2, or 3)

*Example of a MAP display:*



## NT9X13

### in an ELPP LIM unit (continued)

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBSy | ISTb | InSv |
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

LIM 0 InSv

|             |       |          |      |      |  |  |
|-------------|-------|----------|------|------|--|--|
|             | 00S   | 00S_Taps |      |      |  |  |
|             | Links | LIS1     | LIS2 | LIS3 |  |  |
| Unit0: InSv | .     | .        | .    | .    |  |  |
| Unit1: InSv | .     | .        | .    | .    |  |  |

|             |      |      |      |      |      |
|-------------|------|------|------|------|------|
|             | LIS2 | Tap: | 0    | 4    | 8    |
| FBus0: InSv |      |      | .... | .... | .... |
| FBus1: InSv |      |      | .... | .... | .... |

11

**CAUTION****Potential loss of service**

Ensure that the mate LIM unit, the mate F-bus, and the F-bus taps on the mate are in service before manually busying the LIM unit and F-bus associated with the card to be replaced. Manually busying the F-bus and the LIM unit will isolate nodes on the link interface shelves (LIS) if the mates are out of service.

Determine the states of the F-bus and the F-bus taps for the mate LIM unit.

**Note:** The state of the F-buses is shown to the right of the F-bus numbers on the MAP display. Refer to the table at the end of this document to identify the LIM unit associated with the card you are replacing.

| If the states of the mate resources are | Do |
|-----------------------------------------|----|
|-----------------------------------------|----|

in-service (state of the F-bus is InSv and all F-bus taps are . [dot])

step 10 for the next LIS  
OR  
step 12 (if steps 10 and 11 have been repeated for each LIS)

any other state (state of the F-bus is not InSv and one or more F-bus taps are not . [dot])

step 29

12

Manually busy the F-bus associated with the card to be replaced by typing

**>BSY FBUS fbus\_no**

## NT9X13

### in an ELPP LIM unit (continued)

and pressing the Enter key.

where

**fbus\_no**

is the number of the F-bus (0 or 1)

**Note:** Refer to the table at the end of this document to identify the LIM unit associated with the card you are replacing.

*Example of a MAP display:*

|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 1    | 0    |

LIM 0 ISTb

|             | OOS<br>Links | OOS_Taps<br>LIS1 | LIS2 | LIS3 |
|-------------|--------------|------------------|------|------|
| Unit0: ISTb | .            | .                | 12   | .    |
| Unit1: InSv | .            | .                | .    | .    |

|             | LIS2 | Tap: 0 | 4    | 8    |
|-------------|------|--------|------|------|
| FBus0: ManB |      | BBBB   | BBBB | BBBB |
| FBus1: InSv |      | ....   | .... | .... |

| If                           | Do                                                                                    |
|------------------------------|---------------------------------------------------------------------------------------|
| the command passes           | step 12 for the next LIS<br>OR<br>step 14 (if step 12 has been repeated for each LIS) |
| you must confirm the command | step 13                                                                               |

#### 13 Confirm the command by typing

**>YES**

and pressing the Enter key.

*Example of a MAP response:*

```
LIM 0 LIS 2 FBus 0 Busy initiated.
LIM 0 LIS 2 FBus 0 Busy passed.
```

| If                                     | Do      |
|----------------------------------------|---------|
| step 12 has been repeated for each LIS | step 14 |

## NT9X13 in an ELPP LIM unit (continued)

- |           | If                                                                                                                                                                                                                      | Do                       |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|           | step 12 has not been repeated for each LIS                                                                                                                                                                              | step 12 for the next LIS |
| <b>14</b> | Quit the LIS level of the MAP display by typing<br><b>&gt;QUIT</b><br>and pressing the Enter key.                                                                                                                       |                          |
| <b>15</b> | Manually busy the LIM unit corresponding to the card to be replaced by typing<br><b>&gt;BSY UNIT unit_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>unit_no</b><br>is the number of the LIM unit (0 or 1) |                          |

*Example of a MAP display:*

|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| PM  | 0    | 0    | 28   | 0    | 17   | 13   |
| LIM | 0    | 0    | 1    | 0    | 1    | 0    |

LIM 0 ISTb

00S00S\_Taps

|             | Links | LIS1 | LIS2 | LIS3 |
|-------------|-------|------|------|------|
| Unit0: ManB | 2     | .    | 12   | .    |
| Unit1: ISTb | 2     | .    | .    | .    |

|              | LIS2 | Tap: | 0    | 4    | 8    |
|--------------|------|------|------|------|------|
| FBus 0: ManB |      |      | BBBB | BBBB | BBBB |
| FBus 1: InSv |      |      | .... | .... | .... |

### At the shelf

16



#### WARNING

##### Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Press down and release the power switch on the faceplate of the NT9X30 power converter (slot 04F) associated with the card to be replaced. Refer to

## NT9X13 in an ELPP LIM unit (continued)

the table at the end of this document to identify the power converter associated with the LIM unit you are working on.

**Note:** The CONVERTER OFF LED is lit when the NT9X30 power converter is powered down.

| If the CONVERTER OFF LED is | Do      |
|-----------------------------|---------|
| lit                         | step 19 |
| not lit                     | step 17 |

17



### CAUTION

#### Possible loss of service

Unseating the NT9X13 card bypasses the safety interlock. Ensure that the card to be removed is in the manual-busy LIM unit.

Unseat the NT9X13 associated with the LIM unit you are working on using the procedure *Unseating cards in equipment shelves* in this document. When you have completed the procedure, return to this point.

- 18 Press down and release the power switch on the faceplate of the NT9X30 power converter (slot 36F) associated with the card to be replaced. Refer to the table at the end of this document to identify the power converter associated with the LIM unit you are working on.
- 19 Replace the card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.
- 20 Release the power switch on the faceplate of the NT9X30 power converter associated with the card you have replaced.

**Note:** The CONVERTER OFF LED is not lit when the NT9X30 power converter is powered up.

- 21 The next action depends on your reason for performing this procedure.

| If you were                                                   | Do      |
|---------------------------------------------------------------|---------|
| sent to this procedure from another maintenance procedure     | step 22 |
| not sent to this procedure from another maintenance procedure | step 23 |

- 22 Return to the maintenance procedure that sent you to this procedure and continue as directed.

## NT9X13

### in an ELPP LIM unit (continued)

**At the MAP terminal**

- 23** Load the LIM unit by typing  
**>LOADPM UNIT unit\_no**  
 and pressing the Enter key.  
*where*  
**unit\_no**  
 is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Load initiated.
LIM 0 UNIT 0 Load passed.
```

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 25 |
| failed                | step 24 |

- 24** Load the PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

- 25** Return the LIM unit to service by typing

**>RTS UNIT unit\_no**  
 and pressing the Enter key.  
*where*  
**unit\_no**  
 is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Return to Service initiated.
LIM 0 UNIT 0 Return to Service passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 31 |

**Note:** Steps 26 and 27 must be repeated for each LIS on the LIM unit.

- 26** Access the LIS level of the MAP display by typing

**>LIS lis\_no**  
 and pressing the Enter key.  
*where*

## NT9X13

### in an ELPP LIM unit (continued)

**lis\_no**

is the number of the LIS (0, 1, or 2)

*Example of a MAP display:*

```

 SysB ManB OffL CBsy ISTb InSv
PM 0 0 28 0 0 18
LIM 0 0 1 0 0 1

LIM 0 ISTb
 OOS OOS_Taps
 Links LIS1 LIS2 LIS3
Unit0: ISTb
Unit1: InSv

 LIS2 Tap:
 0 4 8
FBus0: ManB BBBB BBBB BBBB
FBus1: InSv

```

- 27 Return the F-bus to service by typing

**>RTS FBUS fbus\_no**

and pressing the Enter key.

where

**fbus\_no**

is the number of the F-bus that you busied (0 or 1)

*Example of a MAP response:*

```

LIM 0 FBus 0 Return to Service initiated.
LIM 0 FBus 0Return to Service passed.

```

| If the RTS command | Do                                                                                                      |
|--------------------|---------------------------------------------------------------------------------------------------------|
| passed             | step 26 for the next LIS                      OR<br>step 32 (if step 26 has been repeated for each LIS) |
| failed             | step 31                                                                                                 |

- 28 Continuing with this procedure will remove both LIM units from service, thereby isolating application specific units (ASU) on the link interface shelves (LIS). Consult office personnel or your next level of support to determine if you should continue with this procedure, and proceed as directed.
- 29 Continuing with this procedure may isolate one or more application specific units (ASU) on the link interface shelves (LIS). Consult office personnel or your next level of support to determine if you should continue with this procedure, and proceed as directed.
- 30 Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

## NT9X13 in an ELPP LIM unit (end)

- 31** For further assistance, contact the personnel responsible for the next level of support.
- 32** You have completed this procedure.

### NT9X13 card and associated LIM components

| PEC                                                                                                                                                                                                                                                                                              | Slot | Associated LIM hardware and F-buses        |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------|----------|
| NT9X13                                                                                                                                                                                                                                                                                           | 17F  | LIM unit number:                           | 0        |
|                                                                                                                                                                                                                                                                                                  |      | Mate LIM unit number:                      | 1        |
|                                                                                                                                                                                                                                                                                                  |      | F-bus number:                              | 0        |
|                                                                                                                                                                                                                                                                                                  |      | Mate F-bus number:                         | 1        |
|                                                                                                                                                                                                                                                                                                  |      | Location of NT9X30 (+5 V) power converter: | slot 04F |
| NT9X13                                                                                                                                                                                                                                                                                           | 22F  | LIM unit number:                           | 1        |
|                                                                                                                                                                                                                                                                                                  |      | Mate LIM unit number:                      | 0        |
|                                                                                                                                                                                                                                                                                                  |      | F-bus number:                              | 1        |
|                                                                                                                                                                                                                                                                                                  |      | Mate F-bus number:                         | 0        |
|                                                                                                                                                                                                                                                                                                  |      | Location of NT9X30 (+5 V) power converter: | slot 36F |
| <b>Note:</b> A LIM unit is also referred to as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to mean an LMS. The term LIM is also used to refer to the ELPP if the entire ELPP cabinet is meant. |      |                                            |          |

## System and power cards in an ELPP LIM unit

### Application

Use this procedure to replace the following cards in a link interface module (LIM) unit of an enhanced link peripheral processor (ELPP).

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the Index for a list of the cards, shelves, and frames documented in this card replacement book.

#### System and power cards in an ELPP LIM unit

| PEC    | Suffix     | Card name                              | Shelf or frame name      |
|--------|------------|----------------------------------------|--------------------------|
| NT9X15 | AA         | Mapper card                            | LIM unit of an ELPP      |
| NT9X17 | AD         | Message switch four-port card          | LIM unit of an ELPP      |
| NT9X26 | AA, BA, CA | Remote terminal interface paddle board | LIM unit of an ELPP      |
| NT9X30 | AA         | +5V 86-A power converter card          | LIM unit of an ELPP      |
| NT9X30 | AB         | Global +5V 86-A power converter card   | LIM unit of an ELPP      |
| NT9X31 | AB         | -5V power converter card               | LIM unit of an ELPP card |
| NT9X49 | CA         | Message switch P-bus terminator card   | LIM unit of an ELPP      |
| NT9X52 | AA         | Message switch T-bus access card       | LIM unit of an ELPP      |
| NT9X53 | AD         | Message switch system clock card       | LIM unit of an ELPP      |
| NT9X62 | BB         | Four-port sub-rate DS512 paddleboard   | LIM unit of an ELPP      |
| NT9X73 | BB         | LMS F-bus rate adapter card            | LIM unit of an ELPP      |
| NT9X79 | BB         | F-bus termination paddle board         | LIM unit of an ELPP      |



## System and power cards in an ELPP LIM unit (continued)

---

**Note 1:** A link interface module (LIM) is also referred to as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM is used to mean an LMS.

**Note 2:** The ELPP is referred to as a LIM when the entire ELPP is meant, paralleling how the LISs in the ELPP are closely associated with the LIM. MAP displays and data schema tables also refer to the ELPP as a LIM.

### Common procedures

The following common procedures are referenced:

- *Loading a PM*
- *Manually busy-ing LIM-to-MS SR128 links*
- *Replacing a card*
- *Reseating cards in equipment shelves*
- *Returning LIM-to-MS SR128 links to service*
- *Unseating cards in equipment shelves*

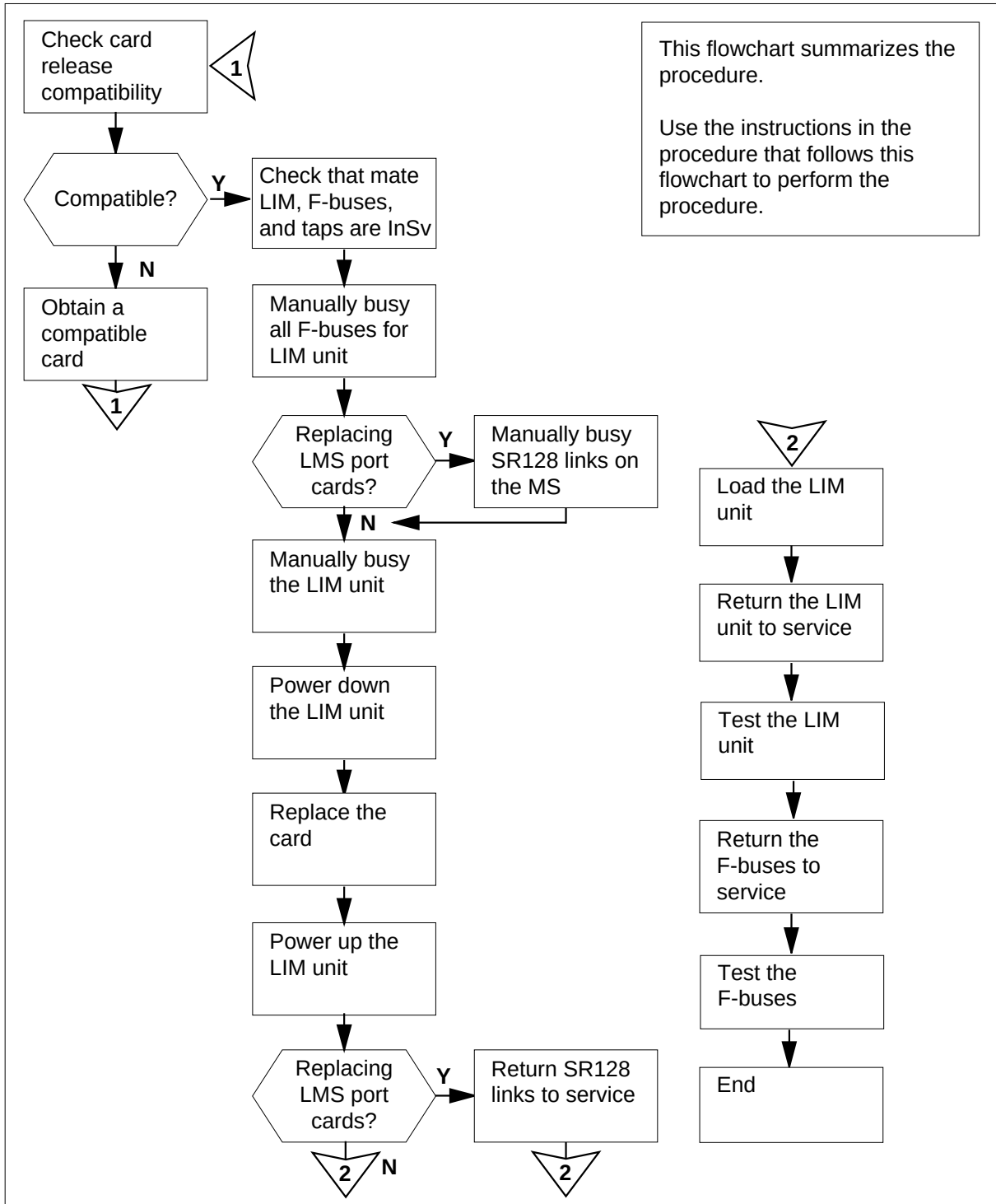
Do not go to the common procedure unless directed to do so in the step-action procedure.

### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## System and power cards in an ELPP LIM unit (continued)

### Summary of Replacing System and power cards in an ELPP LIM unit



## System and power cards in an ELPP LIM unit (continued)

### Replacing System and power cards in an ELPP LIM unit

#### At your current location

1



#### CAUTION

##### Loss of service

This procedure provides instructions for removing a LIM unit from service, thereby removing redundancy from the ELPP. Perform this procedure only if necessary to return the LIM unit to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

#### At the MAP terminal

2 Ensure that the replacement card is compatible with the software load by typing

**>CHECKREL LIM pec release**

and pressing the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

Example input:

**>CHECKREL LIM NT9X15AA 2Z**

Example of a MAP response:

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NT9X15AA | 40       | None   | 2Z      | *NO        |

Card release is below baseline.

Do not plug the card into the LIM.

| If the replacement card is | Do     |
|----------------------------|--------|
| below baseline             | step 3 |
| on or above baseline       | step 6 |

## System and power cards in an ELPP LIM unit (continued)

- 3 From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).
- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is one that is
  - greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.
- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 40 |

- 6 Access the PM level of the MAP display by typing

**>MAPCI ; MTC ; PM**

and pressing the Enter key.

*Example of a MAP display:*

```

PM SysB ManB OffL CBsy ISTb InSv
 0 0 28 0 0 18

```

- 7 Post the LIM unit that contains the card to be replaced by typing

**>POST LIM lim\_no**

and pressing the Enter key.

*where*

**lim\_no**

is the number of the LIM to be posted (0 to 16)

*Example of a MAP display:*

```

 SysB ManB OffL CBsy ISTb InSv
PM 0 0 28 0 0 18
LIM 0 0 1 0 0 1

LIM 0 InSv
Links
Unit0: InSv
Unit1: InSv

 OOS OOS_Taps
 LIS1 LIS2 LIS3

```

## System and power cards in an ELPP LIM unit (continued)

- 8 Determine the state of the LIM.

**Note:** The state of the LIM is shown to the right of the LIM number on the MAP display.

| If the state of the LIM is                   | Do      |
|----------------------------------------------|---------|
| Offl                                         | step 39 |
| any other in-service or out-of-service state | step 9  |

- 9 Determine the state of the mate LIM unit. Refer to the table at the end of this document to identify the LIM unit associated with the card you are replacing.

**Note:** The state of the LIM units is shown to the right of the LIM unit number on the MAP display.

| If the state of the mate LIM unit is                                                                               | Do      |
|--------------------------------------------------------------------------------------------------------------------|---------|
| InSv                                                                                                               | step 10 |
| ISTb, and the state of the LIM unit associated with the card you are replacing is InSv or ISTb                     | step 10 |
| ISTb, and the LIM unit associated with the card you are replacing is out of service                                | step 10 |
| any out-of-service state, and the state of the LIM unit associated with the card you are replacing is InSv or ISTb | step 37 |
| any out-of-service state, and the LIM unit associated with the card you are replacing is out of service            | step 10 |

**Note:** Steps 10 and 11 must be repeated for each LIS on the LIM unit.

- 10 Access the LIS level of the MAP display by typing

**>LIS lis\_no**

and pressing the Enter key.

where

**lis\_no**

is the number of the LIS (1, 2, or 3)

*Example of a MAP display:*

## System and power cards in an ELPP LIM unit (continued)

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

LIM 0 InSv

|             |      |       |          |      |      |
|-------------|------|-------|----------|------|------|
|             |      | 00S   | 00S_Taps |      |      |
|             |      | Links | LIS1     | LIS2 | LIS3 |
| Unit0: InSv |      | .     | .        | .    | .    |
| Unit1: InSv |      | .     | .        | .    | .    |
|             | LIS2 | Tap:  | 0        | 4    | 8    |
| FBus0: InSv |      |       | ....     | .... | .... |
| FBus1: InSv |      |       | ....     | .... | .... |

11



### CAUTION

#### Potential loss of service

Ensure that the mate LIM unit, the mate F-buses, and the F-bus taps on the mate are in service before manually busying the LIM unit and F-buses associated with the card to be replaced. Manually busying the F-buses and the LIM unit isolates nodes on the link interface shelves (LIS) if the mate resources are out of service.

Determine the states of the F-bus and the provisioned F-bus taps for the mate LIM unit.

**Note:** The state of the F-buses is shown to the right of the F-bus numbers on the MAP display. Refer to the table at the end of this document to identify the LIM and F-bus components associated with the card you are replacing.

| If the states are                                                                           | Do                                                                                             |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| in-service (state of the F-bus is InSv and all F-bus taps are . [dot])                      | step 10 for the next LIS<br>OR<br>step 12 (if steps 10 and 11 have been repeated for each LIS) |
| any other state (state of the F-bus is not InSv and one or more F-bus taps are not . [dot]) | step 38                                                                                        |

**Note:** Step 12 must be repeated for each LIS on the LIM unit.

## System and power cards in an ELPP LIM unit (continued)

- 12** Manually busy the F-bus on the LIS corresponding to the LIM that is associated with the card to be replaced, by typing
- >BSY FBUS fbus\_no**
- and pressing the Enter key.
- where
- fbus\_no**  
is the number of the F-bus (0 or 1)
- Note:** Refer to the table at the end of this document to identify the F-bus components corresponding to the LIM associated with the card you are replacing.
- Example of a MAP response:*
- ```
LIM 0 LIS 2 FBus 0 Busy requires confirmation
Please confirm ("YES", "Y", "NO", or "N"):
```
If	Do
the command passes	step 12 for the next LIS OR- step 14 (if step 12 has been re- peated for each LIS)
you must confirm the command	step 13
- 13** Confirm the command by typing
- >YES**
- and pressing the Enter key.
- Example of a MAP response:*
- ```
LIM 0 LIS 1 FBus 0 Busy initiated.
LIM 0 LIS 1 FBus 0 Busy passed.
```
- | If                                            | Do                       |
|-----------------------------------------------|--------------------------|
| step 12 has been repeated for<br>each LIS     | step 14                  |
| step 12 has NOT been repeated<br>for each LIS | step 12 for the next LIS |
- 14** Quit the LIS level of the MAP display by typing
- >QUIT**
- and pressing the Enter key.

## System and power cards in an ELPP LIM unit (continued)

---

- 15 The next step depends on the card you are replacing

| If you are replacing                   | Do      |
|----------------------------------------|---------|
| an NT9X17 or an NT9X62 (MS port cards) | step 16 |
| any other card                         | step 17 |

- 16



### CAUTION

#### Possible service impact

Manually busy only the SR128 links associated with a specific NT9X17 or NT9X62 card in the LIM unit. The remaining SR128 links associated with the LIM unit must remain in service.

Manually busy the SR128 links using the procedure *Manually busying LIM-to-MS SR128 links* in this document. When you have completed the procedure, return to this point.

- 17 Manually busy the LIM unit corresponding to the card to be replaced, by typing

**>BSY UNIT unit\_no**

and pressing the Enter key.

where

**unit\_no**

is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
bsy unit 0
LIM 0 UNIT 0 Busy initiated.
LIM 0 UNIT 0 Busy passed.
```



## System and power cards in an ELPP LIM unit (continued)

### At the shelf

18



#### DANGER

##### Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Press down and release the power switch on the faceplate of the NT9X30 and NT9X31 power converter associated with the card to be replaced. Refer to the table at the end of this document to identify the power converter associated with the LIM unit you are working on.

**Note:** The CONVERTER OFF LED is lit when the NT9X30 and NT9X31 power converter is powered down.

| If the CONVERTER OFF LED is | Do      |
|-----------------------------|---------|
| lit                         | step 21 |
| not lit                     | step 19 |

19



#### CAUTION

##### Possible loss of service

Unseating the NT9X13 card bypasses the safety interlock. Ensure that the card to be removed is in the manual-busy LIM unit.

Unseat the NT9X13 associated with the LIM unit you are working on using the procedure *Unseating cards in equipment shelves* in this document. When you have completed the procedure, return to this point.

**Note:** Refer to the table at the end of this document to identify the NT9X13 associated with the LIM unit you are working on.

**20** Press down and release the power switch on the faceplate of the NT9X30 and NT9X31 power converter associated with the card to be replaced. Refer to the table at the end of this document to identify the power converter associated with the LIM unit you are working on.

**21** Replace the card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.

**Note 1:** Ensure that the handle of the power switch on the replacement power converter is also in the OFF position.

## System and power cards in an ELPP LIM unit (continued)

**Note 2:** If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.

- 22 The next step depends on the condition of the NT9X13 card associated with the card you have replaced.

| If the NT9X13 is | Do      |
|------------------|---------|
| seated           | step 24 |
| unseated         | step 23 |

- 23 Reseat the NT9X13 associated with the card you are replacing using the procedure *Reseating cards in equipment shelves* in this document. When you have completed the procedure, return to this point.

- 24 Release the power switch on the faceplate of the NT9X30 and NT9X31 power converter associated with the card you have replaced.

**Note:** The CONVERTER OFF LED is not lit when the NT9X30 and NT9X31 power converter is powered up.

- 25 The next action depends on your reason for performing this procedure

| If you were                                                   | Do      |
|---------------------------------------------------------------|---------|
| sent to this procedure from another maintenance procedure     | step 26 |
| not sent to this procedure from another maintenance procedure | step 27 |

- 26 Return to the maintenance procedure that sent you to this procedure and continue as directed.

### At the MAP terminal

- 27 The next step depends on the card you are replacing.

| If you are replacing                    | Do      |
|-----------------------------------------|---------|
| an NT9X17 or an NT9X62 (LMS port cards) | step 28 |
| any other card                          | step 29 |

- 28 Return the SR128 links to service using the procedure *Returning LIM-to-MS SR128 links to service* in this document. When you have completed the procedure, return to this point.

- 29 Load the LIM unit by typing  
**>LOADPM UNIT unit\_no**  
 and pressing the Enter key.  
*where*

## System and power cards in an ELPP LIM unit (continued)

**unit\_no**  
is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Load initiated.
LIM 0 UNIT 0 Load passed.
```

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 31 |
| failed                | step 30 |

- 30** Load the PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

- 31** Perform an out-of-service (OOS) test on the LIM unit by typing

**>TST UNIT unit\_no**

and pressing the Enter key.

*where*

**unit\_no**  
is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Test initiated.
LIM 0 UNIT 0 Test passed.
```

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 32 |
| failed             | step 40 |

- 32** Return the LIM unit to service by typing

**>RTS UNIT unit\_no**

and pressing the Enter key.

*where*

**unit\_no**  
is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

## System and power cards in an ELPP LIM unit (continued)

---

```
LIM 0 UNIT 0 Return to Service initiated.
LIM 0 UNIT 0Return to Service passed.
```

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 33 |
| failed             | step 40 |

---

- 33** Perform an in-service (InSv) test on the LIM unit by typing

**>TST UNIT unit\_no**

and pressing the Enter key.

where

**unit\_no**

is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Test initiated.
LIM 0 UNIT 0 Test passed.
```

---

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 34 |
| failed             | step 40 |

---

**Note:** Steps 34, 35, and 36 must be repeated for each LIS on the LIM unit.

- 34** Access the LIS level of the MAP display by typing

**>LIS lis\_no**

and pressing the Enter key.

where

**lis\_no**

is the number of the LIS (0, 1, or 2)

*Example of a MAP display:*

## System and power cards in an ELPP LIM unit (continued)

```

 SysB ManB OffL CBsy ISTb InSv
PM 0 0 28 0 0 18
LIM 0 0 1 0 1 1

LIM 0 ISTb

 00S 00S_Taps
 Links LIS1 LIS2 LIS3
Unit0: ISTb . . 12 .
Unit1: InSv

 LIS2 Tap: 0 4 8
FBus0: ManB BBBB BBBB BBBB
FBus1: InSv

```

- 35** Return the F-bus to service by typing

**>RTS FBUS fbus\_no**

and pressing the Enter key.

where

**fbus\_no**

is the number of the F-bus that you busied (0 or 1)

*Example of a MAP response:*

```

LIM 0 LIS 2 FBus 0 Return to Service initiated.LIM 0 L
2 FBus 0 Return to Service passed.

```

| If the RTS command | Do                                                                                         |
|--------------------|--------------------------------------------------------------------------------------------|
| passed             | step 36 for the next LIS<br>OR<br>step 41 (if step 36 has been re-<br>peated for each LIS) |
| failed             | step 40                                                                                    |

- 36** Perform an InSv test on the F-bus for each LIS by typing

**>TST FBUS fbus\_no**

and pressing the Enter key.

where

**fbus\_no**

is the number of the F-bus (0 or 1)

*Example of a MAP response:*

## System and power cards in an ELPP LIM unit (continued)

LIM 0 UNIT 0 Test initiated.  
LIM 0 UNIT 0 Test passed.

|    | If the TST command                                                                                                                                                                                                                                                  | Do                                                                                    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    | passed                                                                                                                                                                                                                                                              | step 36 for the next LIS<br>OR<br>step 41 (if step 36 has been repeated for each LIS) |
|    | failed                                                                                                                                                                                                                                                              | step 40                                                                               |
| 37 | Continuing with this procedure removes the entire LIM from service, isolating application specific units (ASU) on the LIS. Consult office personnel or your next level of support to determine if you should continue with this procedure, and proceed as directed. |                                                                                       |
| 38 | Continuing with this procedure isolates one or more application specific units (ASU) on the LIS. Consult office personnel or your next level of support to determine if you should continue with this procedure, and proceed as directed.                           |                                                                                       |
| 39 | Consult office personnel to determine why the component is offline. Continue as directed by office personnel.                                                                                                                                                       |                                                                                       |
| 40 | For further assistance, contact the personnel responsible for the next level of support.                                                                                                                                                                            |                                                                                       |
| 41 | You have completed this procedure.                                                                                                                                                                                                                                  |                                                                                       |

### System cards and associated LIM hardware (Sheet 1 of 3)

| PEC                                                                                                                                                                                                                                                                                             | Slot | Associated LIM hardware and F-buses |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|---|
| NT9X15                                                                                                                                                                                                                                                                                          | 15F  | LIM unit number                     | 0 |
|                                                                                                                                                                                                                                                                                                 |      | Mate LIM unit number:               | 1 |
| NT9X26                                                                                                                                                                                                                                                                                          | 17R  | F-bus number:                       | 0 |
|                                                                                                                                                                                                                                                                                                 |      | Mate F-bus number:                  | 1 |
| NT9X30                                                                                                                                                                                                                                                                                          | 04F  | F-bus number:                       | 0 |
|                                                                                                                                                                                                                                                                                                 |      | Mate F-bus number:                  | 1 |
| NT9X31                                                                                                                                                                                                                                                                                          | 01F  |                                     |   |
| <b>Note:</b> A LIM unit is also referred to as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to mean an LMS. The term LIM is also used to mean the ELPP where the entire ELPP cabinet is meant. |      |                                     |   |

## System and power cards in an ELPP LIM unit (continued)

### System cards and associated LIM hardware (Sheet 2 of 3)

| PEC                                                                                                                                                                                                                                                                                             | Slot                                 | Associated LIM hardware and F-buses       |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------|----------|
| NT9X49                                                                                                                                                                                                                                                                                          | 07F                                  | Location of NT9X13                        | slot 17F |
| NT9X52                                                                                                                                                                                                                                                                                          | 19F                                  | Location of NT9X30<br>power converter     | slot 04F |
| NT9X53                                                                                                                                                                                                                                                                                          | 18F                                  | Location of NT9X30<br>power converter     | slot 04F |
| NT9X73                                                                                                                                                                                                                                                                                          | 13F-LIS1<br>12F-LIS2<br>11F-LIS3     | Location of NT9X31<br>power converter     | slot 01F |
| NT9X79                                                                                                                                                                                                                                                                                          | 13R-LIS<br>112R-LI<br>S211R-L<br>IS3 | Location of NT9X31<br>power converter     | slot 01F |
| NT9X17                                                                                                                                                                                                                                                                                          | 10F<br>9F                            |                                           |          |
| NT9X62                                                                                                                                                                                                                                                                                          | 10R<br>9R                            |                                           |          |
| NT9X15                                                                                                                                                                                                                                                                                          | 24F                                  | LIM unit number:<br>Mate LIM unit number: | 1<br>0   |
| NT9X26                                                                                                                                                                                                                                                                                          | 22R                                  | F-bus number:<br>Mate F-bus number:       | 1<br>0   |
| NT9X30                                                                                                                                                                                                                                                                                          | 36F                                  | F-bus number:<br>Mate F-bus number        | 1<br>0   |
| NT9X31                                                                                                                                                                                                                                                                                          | 33F                                  |                                           |          |
| NT9X49                                                                                                                                                                                                                                                                                          | 32F                                  | Location of NT9X13                        | slot 22F |
| NT9X52                                                                                                                                                                                                                                                                                          | 20F                                  | Location of NT9X30<br>power converter     | slot 36F |
| <b>Note:</b> A LIM unit is also referred to as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to mean an LMS. The term LIM is also used to mean the ELPP where the entire ELPP cabinet is meant. |                                      |                                           |          |

**System cards and associated LIM hardware (Sheet 3 of 3)**

| PEC                                                                                                                                                                                                                                                                                             | Slot                                 | Associated LIM hardware and F-buses |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|----------|
| NT9X53                                                                                                                                                                                                                                                                                          | 21F                                  | Location of NT9X30 power converter  | slot 36F |
| NT9X73                                                                                                                                                                                                                                                                                          | 26F-LIS1<br>27F-LIS2<br>28F-LIS3     | Location of NT9X31 power converter  | slot 38F |
| NT9X79                                                                                                                                                                                                                                                                                          | 26R-LIS<br>127R-LI<br>S228R-L<br>IS3 | Location of NT9X31 power converter  | slot 38F |
| NT9X17                                                                                                                                                                                                                                                                                          | 29F<br>30F                           |                                     |          |
| NT9X62                                                                                                                                                                                                                                                                                          | 29R<br>30R                           |                                     |          |
| <b>Note:</b> A LIM unit is also referred to as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit is used to mean an LMS. The term LIM is also used to mean the ELPP where the entire ELPP cabinet is meant. |                                      |                                     |          |



---

## 6 SuperNode SE enhanced network card replacement procedures

---

### Introduction

This chapter provides card replacement procedures for the SuperNode SE enhanced network (ENET). The first section in the chapter provides diagrams of SuperNode SE ENET shelf designs.

Card replacement procedures for the SuperNode ENET are in the chapter “SuperNode network card replacement procedures”.

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) are in the chapter “Frame supervisory panel and maintenance supervisory panel card replacement procedures”.

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

This section identifies the ENET card(s) covered by the replacement procedure.

### Common procedures

This section lists common procedures in the ENET card replacement procedure. A common procedure is a series of steps repeated within maintenance procedures. Steps for the removal replacement of a card are examples of common procedures. Common procedures are in the common procedures chapter in this NTP.

Do not use common procedures unless the step-action procedure directs you.

**Action**

This section contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

**Recording card replacement activities**

When you replace a card, record the following information in office records:

- the serial number of the card replaced
- the date that you replaced the card
- the reason that you replaced the card

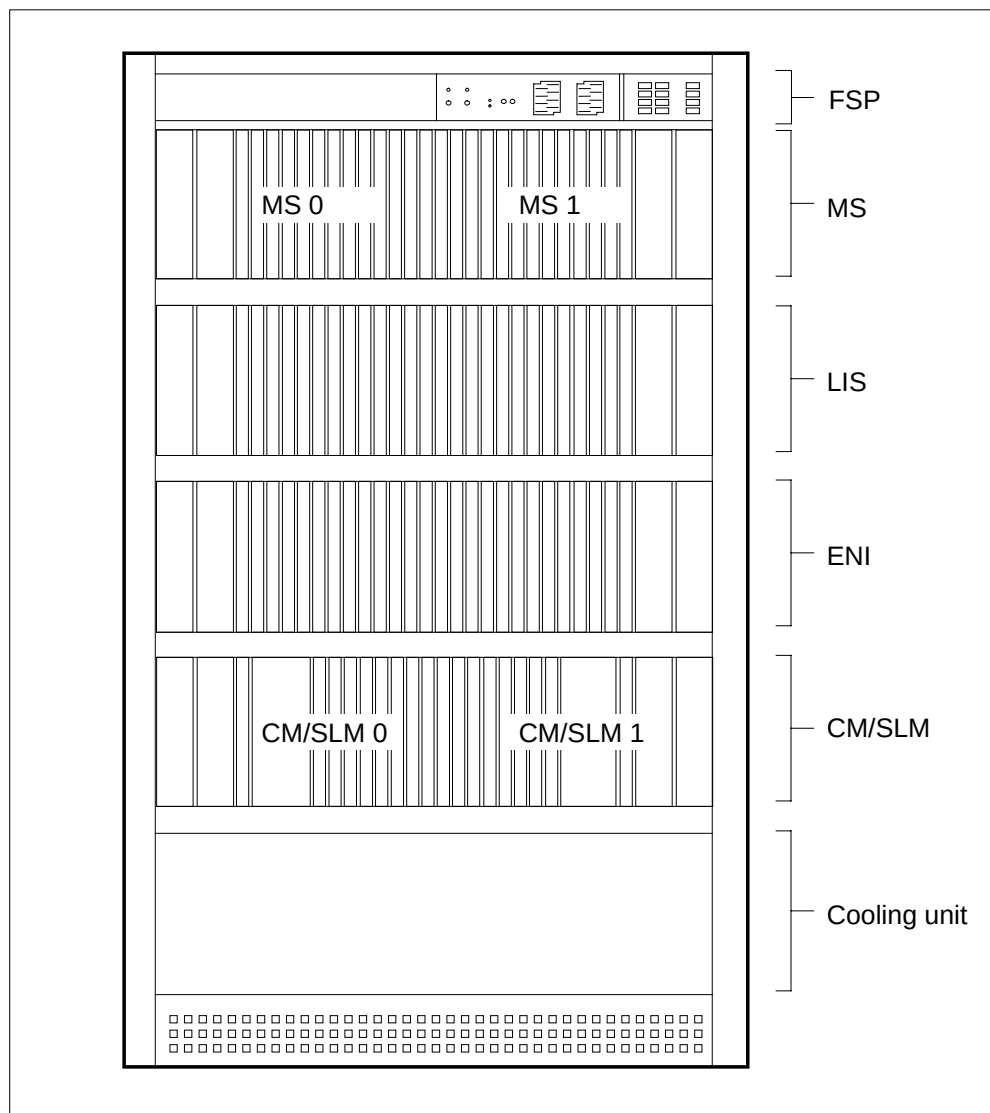
## SuperNode SE ENET shelf designs

### Application

This procedure provides the following design figures:

- single core cabinet (SCC, SuperNode SE 16k ENET)
- SuperNode SE 32k ENET cabinet
- SuperNode SE enhanced network and interface (ENI) shelf (16k ENET)
- SuperNode SE ENET shelf, 32k ENET

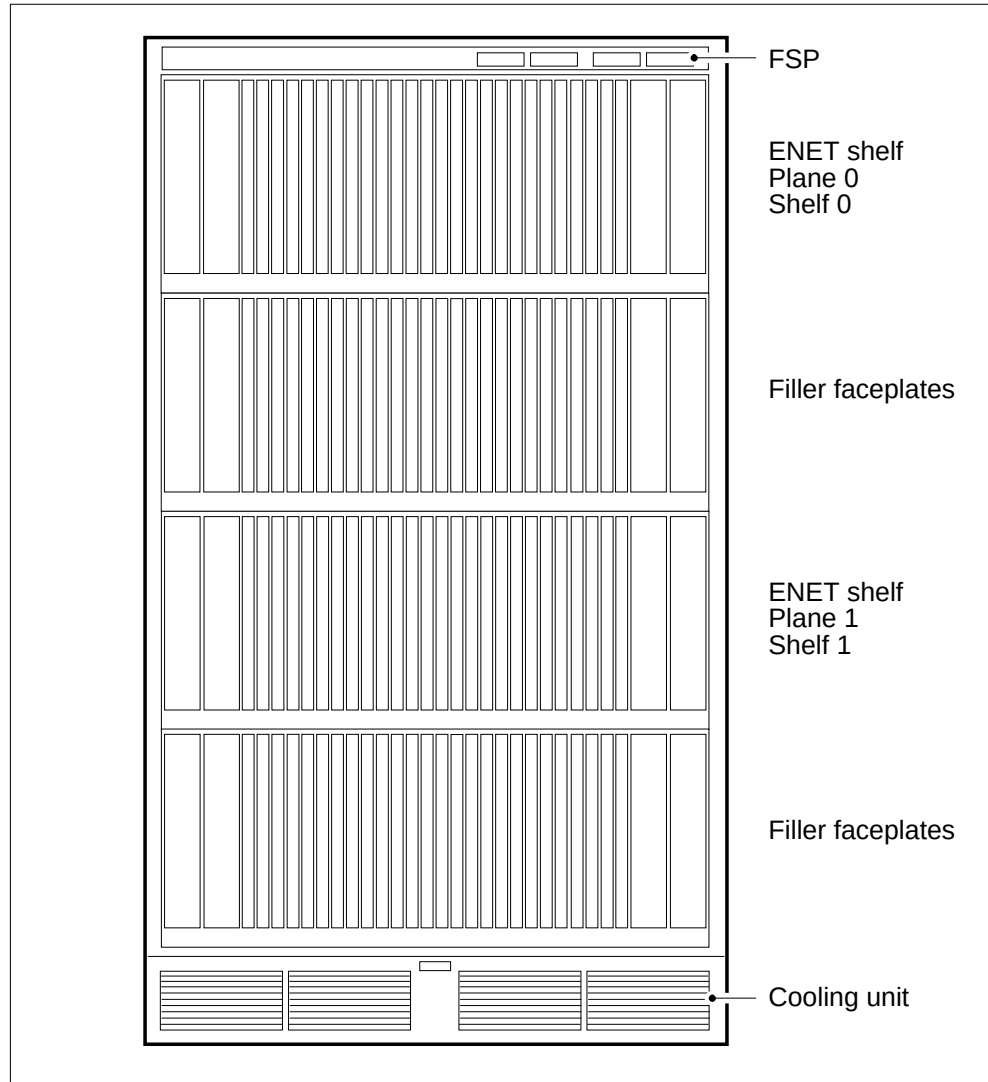
**Figure Single core cabinet**

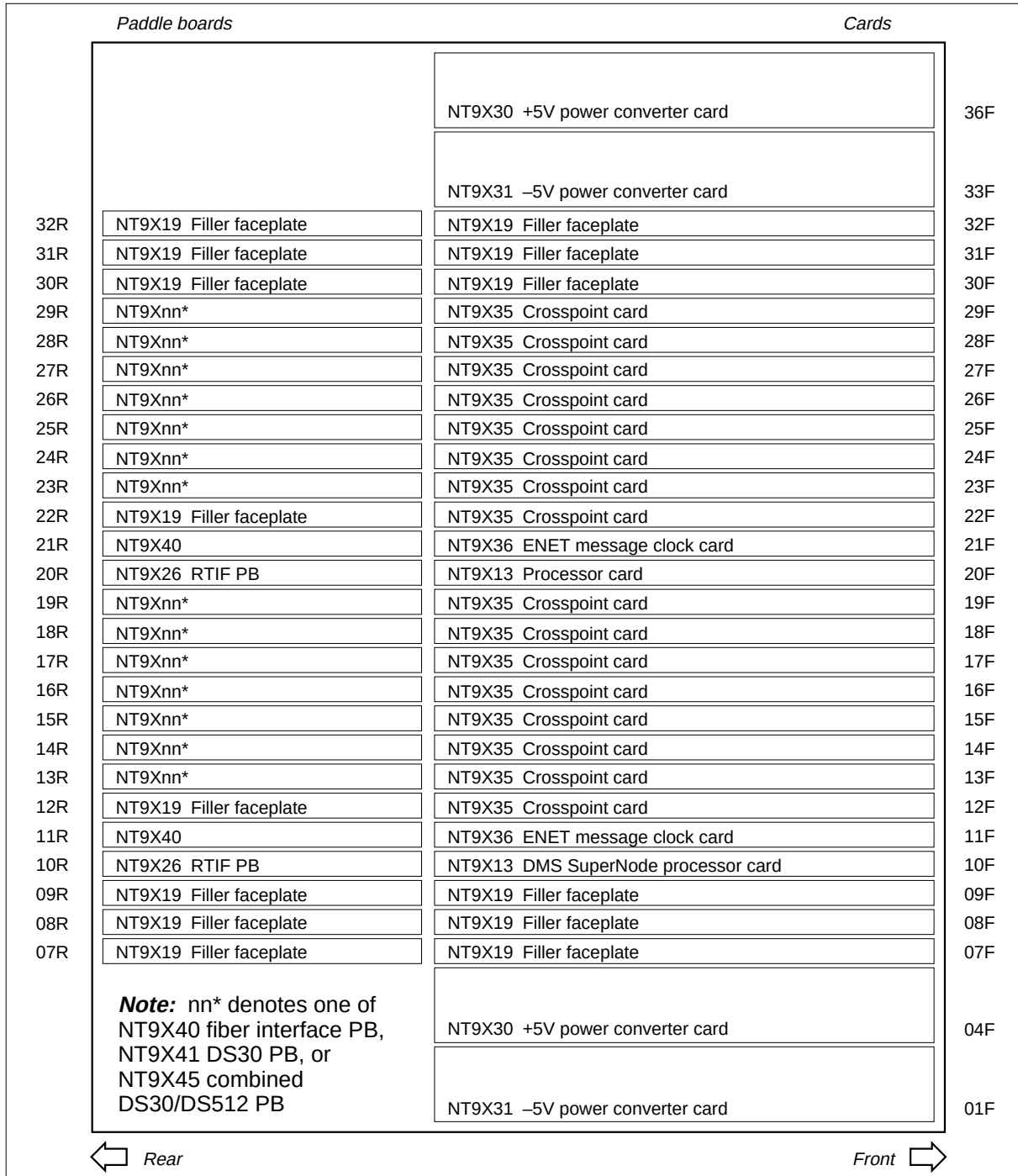


## SuperNode SE ENET shelf designs (continued)

---

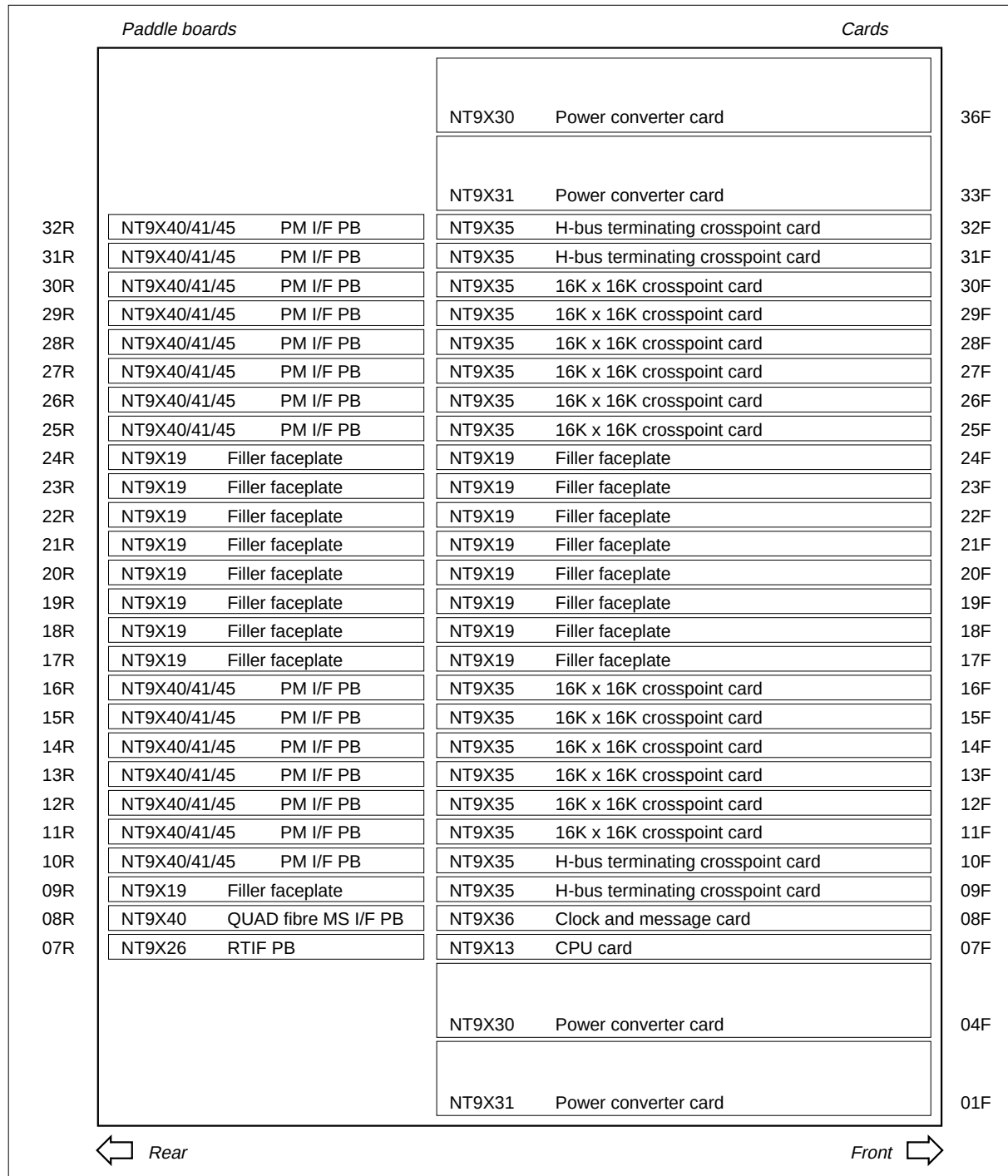
Figure SuperNode SE 32k ENET cabinet



**SuperNode SE ENET shelf designs (continued)****Figure SuperNode SE ENI shelf with 16k ENET**

## SuperNode SE ENET shelf designs (end)

Figure Shelf for SuperNode SE 32k ENET



---

## Crosspoint and interface cards in a SuperNode SE 16k ENET

---

### Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) 16k enhanced network (ENET).

| PEC    | Suffix     | Card name                                      | Shelf or frame name                  |
|--------|------------|------------------------------------------------|--------------------------------------|
| NT9X35 | FA         | DMS SuperNode processor card                   | Enhanced network and interface (ENI) |
| NT9X40 | BA, BB, DA | ENET + quad fiber paddle board                 | ENI, slots 13 to 19 and 23 to 29     |
| NT9X41 | BA         | 16-port DS30 paddle board                      | ENI                                  |
| NT9X45 | BA         | Three-DS512 link and 16-DS30 port paddle board | ENI                                  |

**Note:** Use the procedure *System cards in a Supernode SE 16k ENET* in this chapter to replace an NT9X40 in ENI shelf slots 11 or 21.

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Cleaning fiber optic components and assemblies*

Do not go to the common procedure unless the step-action procedure directs you.

## **Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)**

---

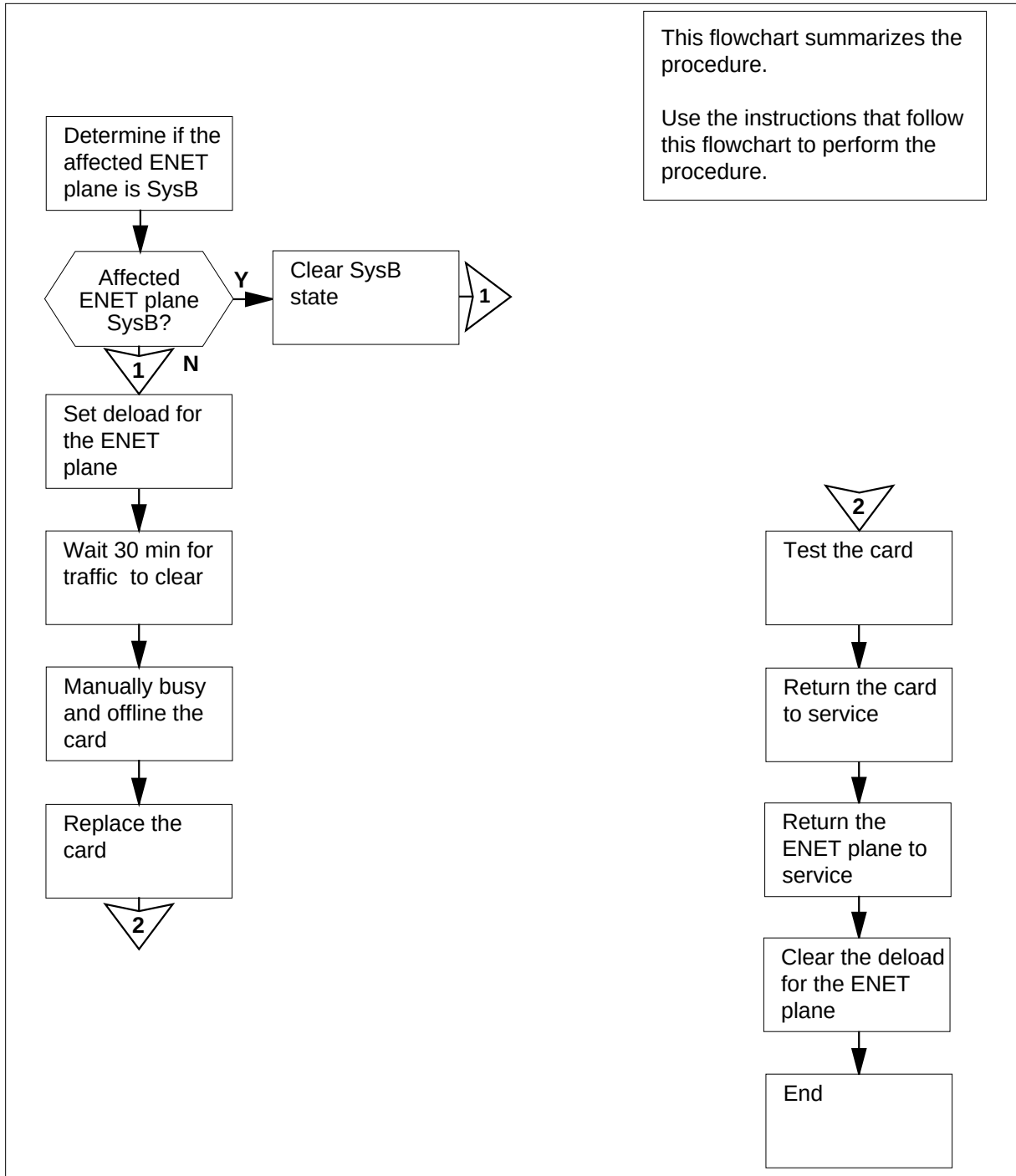
### **Action**

This procedure contains a summary flowchart and a list of terms. Use the flowchart to review the procedure. Follow the steps to perform the procedure.



## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

### Summary of Replacing Crosspoint and interface cards in a SuperNode SE 16k ENET



## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

---

### Replacing Crosspoint and interface cards in a SuperNode SE 16k ENET

#### *At your current location*

- 1 Determine the type and location of the card that you replace.

| If the card                    | Do     |
|--------------------------------|--------|
| is an NT9X40 in slots 11 or 21 | step 2 |
| is other than listed here      | step 3 |

- 2 To replace the card, perform the procedure *System cards in a SuperNode SE 16k ENET* in this chapter.

- 3



#### **CAUTION**

##### **System can drop calls**

This procedure can remove an ENET card or MS-ENET link from service, which can cause the system to drop calls that are in progress. Perform this procedure only when you need to return an interface or crosspoint card to service. If you do not need to return the interface or crosspoint card to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card you that you remove.

**Note:** For North American switches, NT9X40BA and NT9X40BB can interchange and can be present with other switches at the same time. International switches can contain only NT9X40BB.

- 4 To make sure the replacement card is compatible with the software load, perform the procedure *Verifying load compatibility of SuperNode cards*. The procedure *Verifying load compatibility of SuperNode cards* appears in this document. Complete the procedure and return to this point.

#### *At the MAP terminal*

- 5 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

*Example of a MAP display:*

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

|                       |                             |              |
|-----------------------|-----------------------------|--------------|
| SYSTEM<br>Shelf<br>00 | Plane 0<br>I CLink 1 closed | Plane 1<br>. |
|-----------------------|-----------------------------|--------------|

- 6 Determine the state of the ENET plane that contains the card that you replace. The state appears under the Plane headers on the SYSTEM level MAP display. In the MAP display example in step 5, plane 0 is in-service trouble I and plane 1 is in service.

| If the state of the ENET plane | Do      |
|--------------------------------|---------|
| is T (being tested)            | step 7  |
| is S (system busy)             | step 8  |
| is other than listed here      | step 10 |

- 7 Wait for the system to complete the system-initiated testing. To evaluate the state of the ENET plane, go to step 6.

- 8 You must clear the system busy state of the ENET plane before you attempt to replace the card. Obtain copies of recent ENET log reports. Determine from the log messages if ENET system cards or power converters require replacement.

| If                                                          | Do      |
|-------------------------------------------------------------|---------|
| any system cards or power converters require replacement    | step 9  |
| system cards or power converters do not require replacement | step 65 |

- 9 To replace the card (or cards), perform the correct procedure in this chapter. Complete the card replacement and return to step 6.

- 10 To determine if deloaded crosspoint cards are in the other ENET plane, type  
**>DELOAD plane\_no 0 QUERY**  
 and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1) for the mate node

*Example of a MAP response:*

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.

Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.

1111111 111

0123456 789

Plane:0 Shelf:00 .Y---- ---

**Note:** The letter Y under the slot number indicates a deloaded crosspoint card.

| If the other ENET plane      | Do      |
|------------------------------|---------|
| has deloaded cards           | step 64 |
| does not have deloaded cards | step 11 |

- 11** To determine if the ENET plane has any deloaded crosspoint cards, type  
**>DELOAD plane\_no 0 QUERY**  
 and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card that you replace

| If the ENET plane            | Do      |
|------------------------------|---------|
| has deloaded cards           | step 12 |
| does not have deloaded cards | step 13 |

- 12** Record the plane number slot number for any deloaded crosspoint cards in the ENET plane. Use this list to make sure that these cards are returned to the deloaded state when you complete this procedure.

- 13** To set all crosspoint cards to a deloaded status for the ENET plane that contains the card you replace, type

**>DELOAD plane\_no 0 SET**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.

Request to SET DELOAD ENET Plane:0 Shelf:00 passed.

- 14** Wait 30 min to permit network traffic on the ENET plane to clear.

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

- 15** The next action depends on the state of the ENET plane.

| If the ENET plane         | Do      |
|---------------------------|---------|
| is 0 (offline)            | step 20 |
| is M (manual busy)        | step 18 |
| is other than listed here | step 16 |

- 16** To manually busy the ENET plane, type

**>BSY plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card you replace

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:00 submitted.

Request to MAN BUSY ENET Plane:0 Shelf:00 passed.

| If the response                  | Do      |
|----------------------------------|---------|
| requests confirmation            | step 17 |
| indicates the BSY command passed | step 18 |

- 17** To confirm the command, type

**>YES**

and press the Enter key.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 18 |
| failed             | step 66 |

- 18** To offline the ENET plane, type

**>OFFL plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card you replace

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

*Example of a MAP response:*

WARNING: A power down of ENET plane:1 shelf:00 may affect LIU components.

Please confirm ("YES", "Y", "NO", or "N"):

- 19** To confirm the command, type

**>YES**

and press the Enter key.

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 26 |
| failed              | step 66 |

- 20** To locate the message switch (MS) chain head card that associates with the ENET plane, type

**>TRNSL plane\_no 0**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to TRNSL ENET Plane:0 Shelf:00 submitted.

Request to TRNSL ENET Plane:0 Shelf:00 passed.

ENET Plane:0 Shelf:00 : MS 0 and 1 Card:05 Link:00 Port:000

**Note:** In the example, the number of the chain head card is 5. The link number is 0.

- 21** Record the number of the chain head card and the link number.

- 22** To access the MS SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

|         |                           |        |         |                 |   |
|---------|---------------------------|--------|---------|-----------------|---|
|         | Message Switch            | Clock  | Shelf 0 | Inter-MS Link 0 | 1 |
| MS 0    | .                         | Slave  | .       | .               | . |
| MS 1    | .                         | M Free | .       | .               | . |
| Shelf 0 |                           |        | 1       | 1               | 1 |
| Card    | 1 2 3 4 5 6 7 8 9 0 1 2 3 |        |         |                 |   |
| Chain   |                           |        |         |                 |   |
| MS 0    | . . . . . - - . . . . .   |        |         |                 |   |
| MS 1    | . . . . . - - . . . . .   |        |         |                 |   |

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

- 23** To post the chain head card, type  
**>CHAIN card\_no**  
 and press the Enter key.  
*where*  
**card\_no**  
 is the card number that you recorded in step 21

*Example of a MAP display:*  
 Chain 05 Range Link 0 1  
 MS 0 . 05-05 DS512 ..  
 MS 1 . 05-05 DS512 ..

- 24** To manually busy the link on the chain on MS 0, type  
**>BSY 0 LINK link\_no**  
 and press the Enter key.  
*where*  
**link\_no**  
 is the link number that you recorded in step 21

*Example of a MAP response:*  
 Request to MAN BUSY MS: 0 shelf: 0 chain:05 link 0 submitted.  
 Request to MAN BUSY MS: 0 shelf: 0 chain:05 link 0 passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 25 |
| failed             | step 66 |

- 25** To manually busy the link on the chain on MS 1, type  
**>BSY 1 LINK link\_no**  
 and press the Enter key.  
*where*  
**link\_no**  
 is the link number that you recorded in step 21

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 66 |

- 26** To access the ENET SHELF level of the MAP display, type  
**>ENET;SHELF**  
 and press the Enter key.  
*Example of a MAP display:*

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

```

ENET System Matrix Shelf 0
Plane 0 : .
Plane 1 : Fault F

SHELF 00 Power LIU ENET-Plane 0 ENET-Plane 1 LIU Power
 11 11111111 22 22222222 333 333333
Slot 123456 789 01 23456789 01 23456789 012 345678
 F.. . .

```

- 27 To access the CARD level for the card you replace, type

**>CARD card\_no**

and press the Enter key.

where

**card\_no**

is the number of the card you replace

*Example of a MAP display:*

```

CARD Plane Front: Back:
 0 Xpt NIL
12 0 . -
22 1 . -

```

- 28 To confirm the command, type

**>YES**

and press the Enter key.

- 29 To offline all cards in the ENET shelf, type

**>OFFL plane\_no ALL**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card you replace

*Example of a MAP response:*

```

Request to OFFLINE ENET Plane:0 Shelf:00 Slot:12 submitted.
Request to OFFLINE ENET Plane:0 Shelf:00 Slot:12 passed.

```



## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

### At the ENET shelf

30

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

The next action depends on the card you replace.

| If you                      | Do      |
|-----------------------------|---------|
| replace an NT9X35           | step 31 |
| replace an NT9X41           | step 32 |
| replace an NT9X40 or NT9X45 | step 35 |

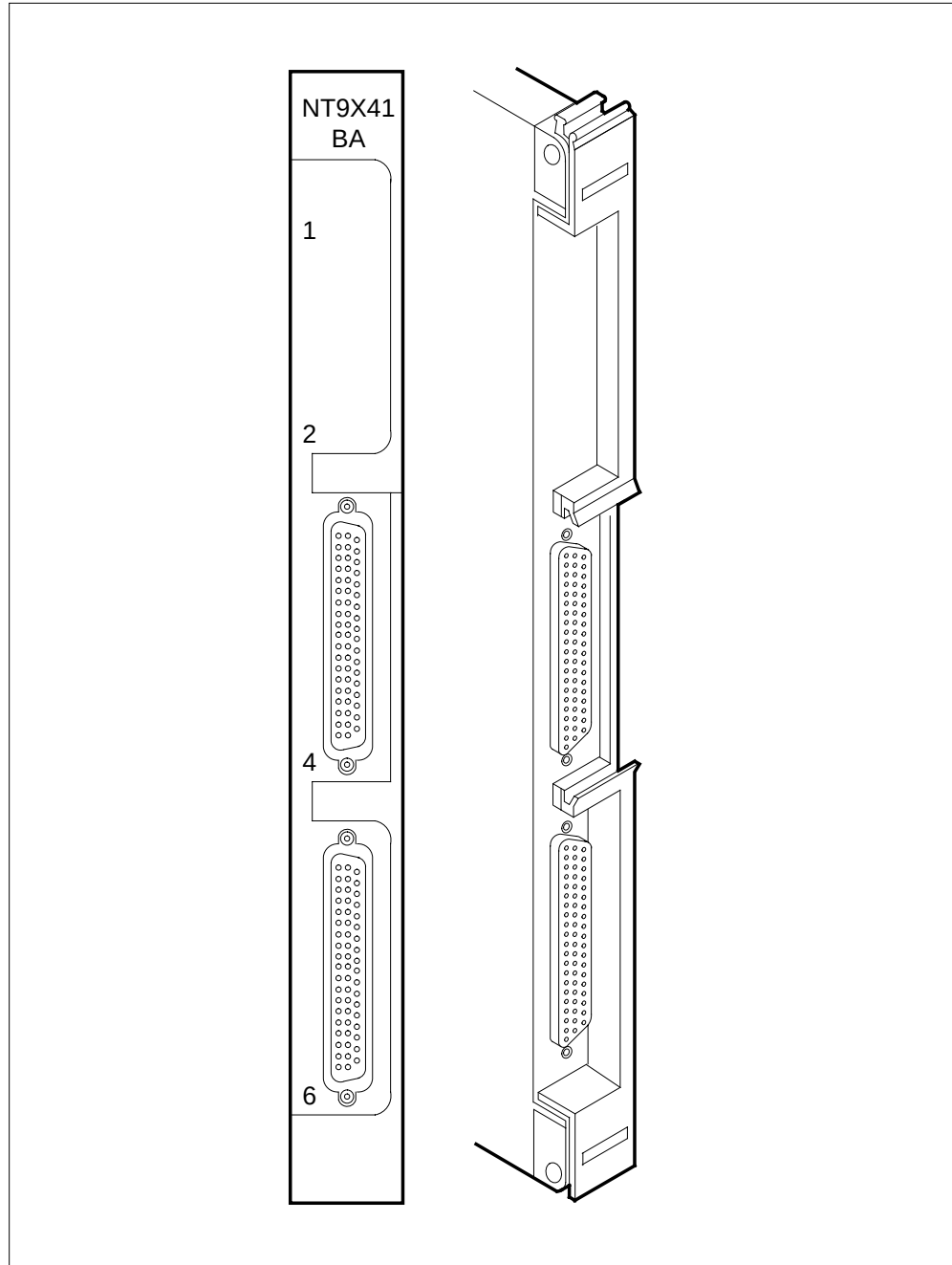
**31** To replace the card, perform the procedure *Replacing a card* in this NTP. Complete the procedure and go to step 44.

**32** Locate the NT9X41 card and disconnect the DS30 connectors.

**Note:** The DS30 connectors appear in the diagram on the next page.

- a** Loosen the screws that retain the connector.
- b** Unplug the connectors.

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)



- 33 To replace the card, perform the procedure *Replacing a card* in this NTP. Complete the procedure and return to this point.
- 34 Reconnect the DS30 connectors.
  - a Plug the connectors into the card.

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

- b** Tighten the screws that retain the connector.  
Go to step 44.

**35**

### ATTENTION

Make sure that you identify connector zone numbers correctly. To identify zone numbers, refer to figure “NT9X40BA/BB connector zone numbers” for the NT9X40 and figure “NT9X45BA connector zone numbers” for the NT9X45. Figure “NT9X40BA/BB connector zone numbers” appears at the end of this procedure. Figures “Fiber connector detail” and “Fiber connector and receptacle detail” are diagrams of fiber connector components for these cards.

Make sure that you are at the correct ENET node and the interface card, before you disconnect the fiber cables. To identify the ENET node, check the plane and shelf identification. To identify the interface card, check the slot.

- 36** Make sure that each cable has a label that contains the following information:

- ENET shelf number
- plane number
- slot numbers
- link number
- signal type

The signal type can be transmit or receive. If this information is not present, create a label and attach the label to the cable. This label provides the information that you need to connect the fiber cables to the card correctly.

*Example of a label:*

|      |     |     |
|------|-----|-----|
| ENCO | 00  | 39  |
| 10R  | 04  | 17T |
| LTE  | 000 | 18  |
| 22R  | RX  |     |

*Label field descriptions*

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

|      |                                                                 |
|------|-----------------------------------------------------------------|
| ENCO | ENET plane (0 or 1)                                             |
| 00   | cabinet number                                                  |
| 39   | ENET shelf by the base mounting position number                 |
| 10R  | slot number and position (R for rear, or F for front)           |
| 04   | zone number                                                     |
| 17T  | link number and the signal type (T for transmit, R for receive) |
| LTE  | PM that the cable terminates on                                 |
| 000  | PM frame number                                                 |
| 18   | PM shelf by the base mounting position number                   |
| 22R  | slot number and position (R for rear, or F for front)           |
| RX   | signal type at the PM end (RX for receive or TX for transmit)   |

37



### **DANGER**

#### **Avoid contamination of the fiber tip surface**

Make sure that you do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



### **DANGER**

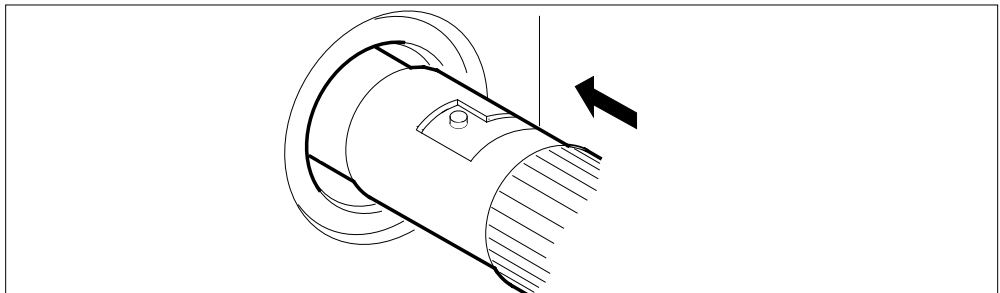
#### **Fiber cable can become defective**

Make sure that you handle fiber cables carefully. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable as follows.

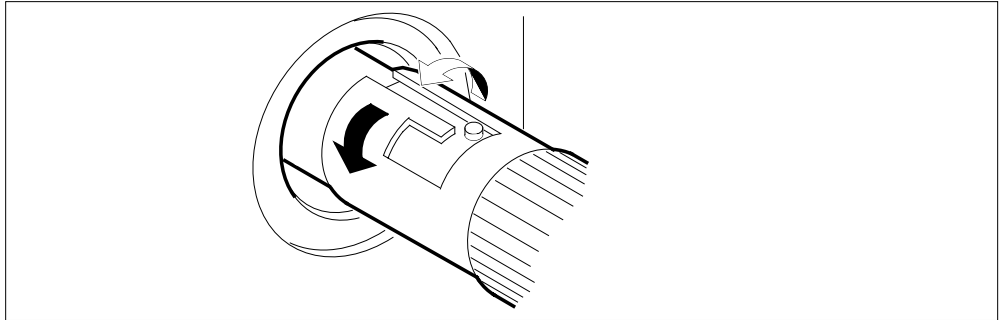
**Note:** When you disconnect the connectors, place dust caps on the ends of the connectors.

- a Grasp the sleeve with two fingers. Carefully push the sleeve toward the frame.

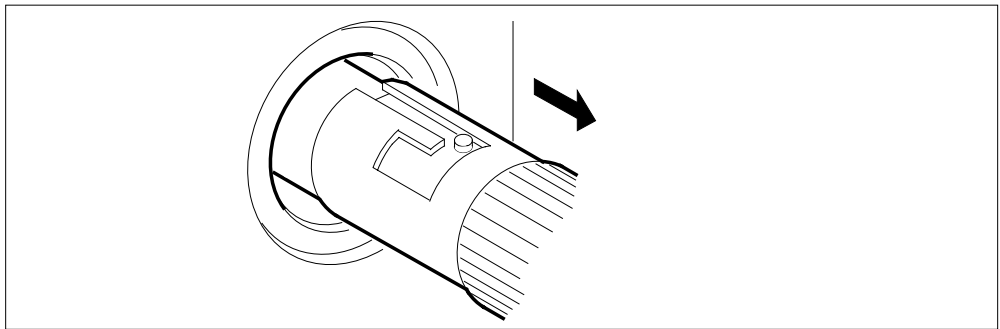


## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

- b** Turn the connector counterclockwise until the connector pin is in the position shown in the following diagram.



- c** Carefully pull the connector away from the frame.



**Note:** Perform the procedure, *Cleaning fiber optic components and assemblies* in this NTP.

- 38** The next action depends on the card that you replace.

| If you            | Do      |
|-------------------|---------|
| replace an NT9X45 | step 39 |
| replace an NT9X40 | step 40 |

- 39** Disconnect the DS30 connectors, as follows:

- a** Loosen the screws that retain the connector.
- b** Unplug the connectors.

- 40** To replace the card, perform the procedure *Replacing a card* in this NTP. Complete the procedure and return to this point.

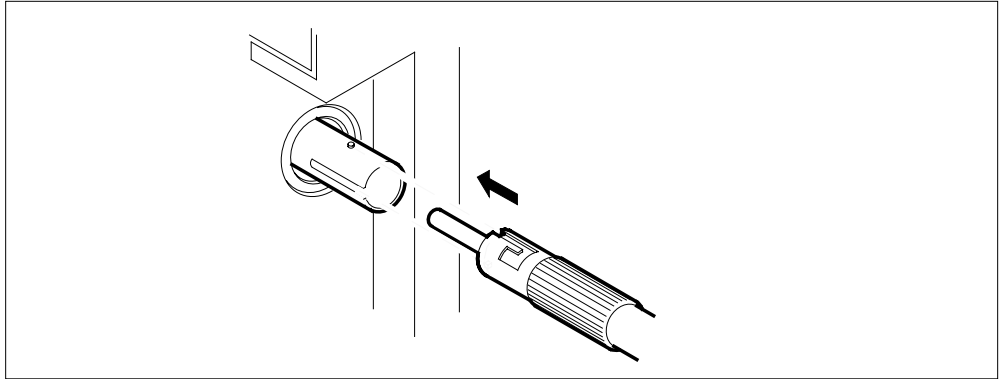
- 41** Remove the dust caps on the transmit and receive connectors as you connect the connectors to the new card.

Reconnect the transmit and receive connectors for each fiber cable, as follows.

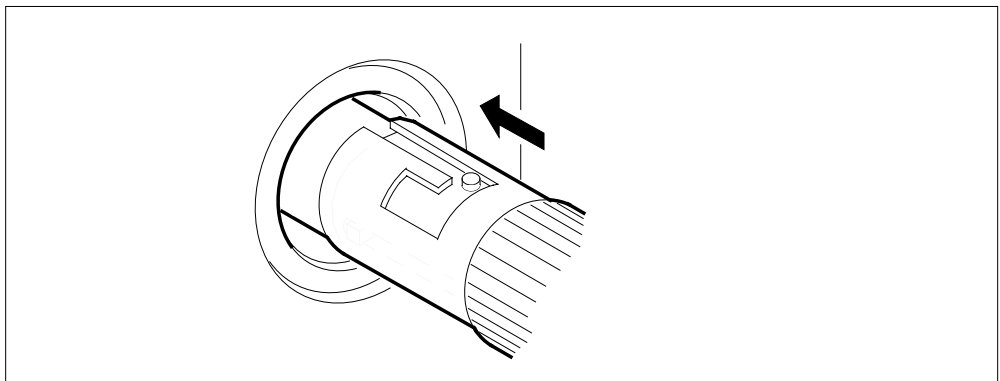
- a** Align the connector pin and slot with the receptacle slot and pin, in the sequence given, as shown.

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

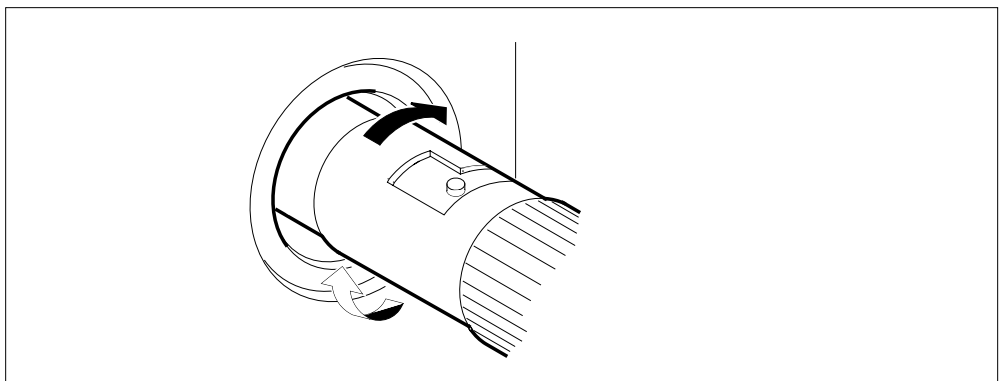
---



**b** Carefully slide the connector into the receptacle.

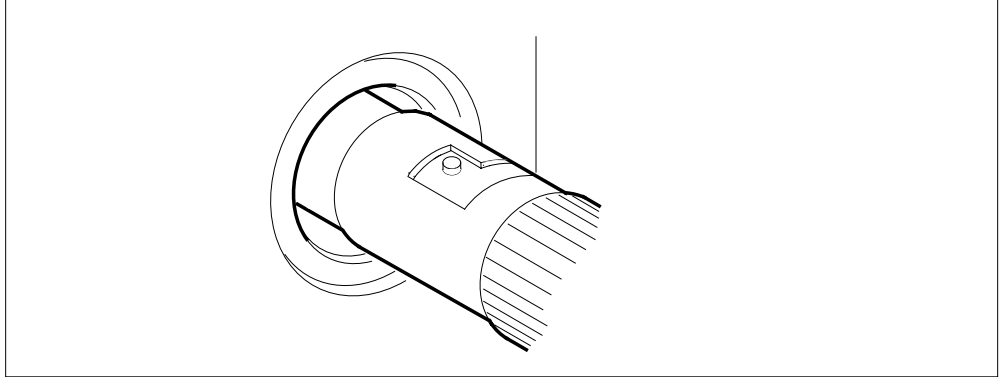


**c** Turn the connector clockwise to lock the connector in place.



**d** Release the connector. The following figure illustrates the final connector position.

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)



- 42** The next action depends on the card you replace.

| If you            | Do      |
|-------------------|---------|
| replace an NT9X45 | step 43 |
| replace an NT9X40 | step 44 |

- 43** Reconnect the DS30 connectors, as follows.
- a** Plug the connectors into the card.
  - b** Tighten the screws that retain the connector.

**At the MAP terminal**

- 44** To access the MS Chain card level of the MAP display, type  
**>MS;SHELF;CHAIN card\_no**  
 and press the Enter key.  
*where*

**card\_no**  
 is the card number that you recorded in step 21

- 45** To return the link on the chain on MS 0 to service, type  
**>RTS 0 LINK link\_no**  
 and press the Enter key.  
*where*

**link\_no**  
 is the link number that you recorded in step 21

*Example of a MAP response:*

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

---

Request to RTS MS: 0 shelf: 0 chain:05 link 0 submitted.  
Request to RTS MS: 0 shelf: 0 chain:05 link 0 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 46 |
| failed             | step 66 |

- 46** To return the link on the chain on MS 1 to service, type

**>RTS 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number that you recorded in step 21

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 47 |
| failed             | step 66 |

- 47** To access the NET;SYSTEM level of the MAP display, type

**>NET;SYSTEM**

and press the Enter key.

- 48** To manually busy the ENET plane that contains the replacement card, type

**>BSY plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card

| If the respobse           | Do      |
|---------------------------|---------|
| requests confirmation     | step 49 |
| indicates the BSY command | step 50 |
| passed                    |         |

- 49** To confirm the command, type

**>YES**



## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

and press the Enter key.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 50 |
| failed             | step 66 |

- 50** To return the ENET plane to service, type

**>RTS plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:01 submitted.  
Request to RTS ENET Plane:0 Shelf:01 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 51 |
| failed             | step 66 |

- 51** To access the SHELF level of the MAP display, type

**>SHELF**

and press the Enter key.

- 52** To manually busy all cards on the ENET shelf, type

**>BSY plane\_no ALL**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 53 |
| failed             | step 66 |

- 53** To return the card to service, type

**>RTS plane\_no**

and press the Enter key.

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 Slot:12 submitted.  
Request to RTS ENET Plane:0 Shelf:00 Slot:12 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 56 |
| failed             | step 66 |

**54** The replacement card is faulty. Obtain another replacement card.

**55** To access the SYSTEM level of the MAP display, type

**>SYSTEM**

and press the Enter key.

Go to step 16

**56** To access the NET;SYSTEM level of the MAP display, type

**>SYSTEM**

and press the Enter key.

**57** To clear the deload condition on all crosspoint cards in the ENET plane, type

**>DELOAD plane\_no 0 CLEAR**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

**58** The next action depends on if you recorded a card list in step 12.

| If you                     | Do      |
|----------------------------|---------|
| recorded a card list       | step 59 |
| did not record a card list | step 62 |

**59** To access the SHELF level of the MAP display, type

**>SHELF 0**

## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

and press the Enter key.

- 60** To set the first card on the list to the deloaded status, type

**>DELOAD plane\_no slot\_no SET**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**slot\_no**

is the number of the slot the card occupies (slots 12 to 19 on plane 0 or slots 22 to 29 on plane 1)

| <b>If all cards on the list</b> | <b>Do</b> |
|---------------------------------|-----------|
| are not set to deloaded status  | step 61   |
| are set to deloaded status      | step 62   |

- 61** Repeat step 60 for the next card on the list.

- 62** The next action depends on the reason that you perform this procedure.

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 63   |
| did not direct you to this procedure | step 67   |

- 63** Return to the maintenance procedure that directed you to this procedure and continue as directed.

- 64** This procedure instructs you to deload a node. Continue this procedure only under special conditions because the mate node has deloaded cards. Consult office personnel or the next level of support. Continue as directed.

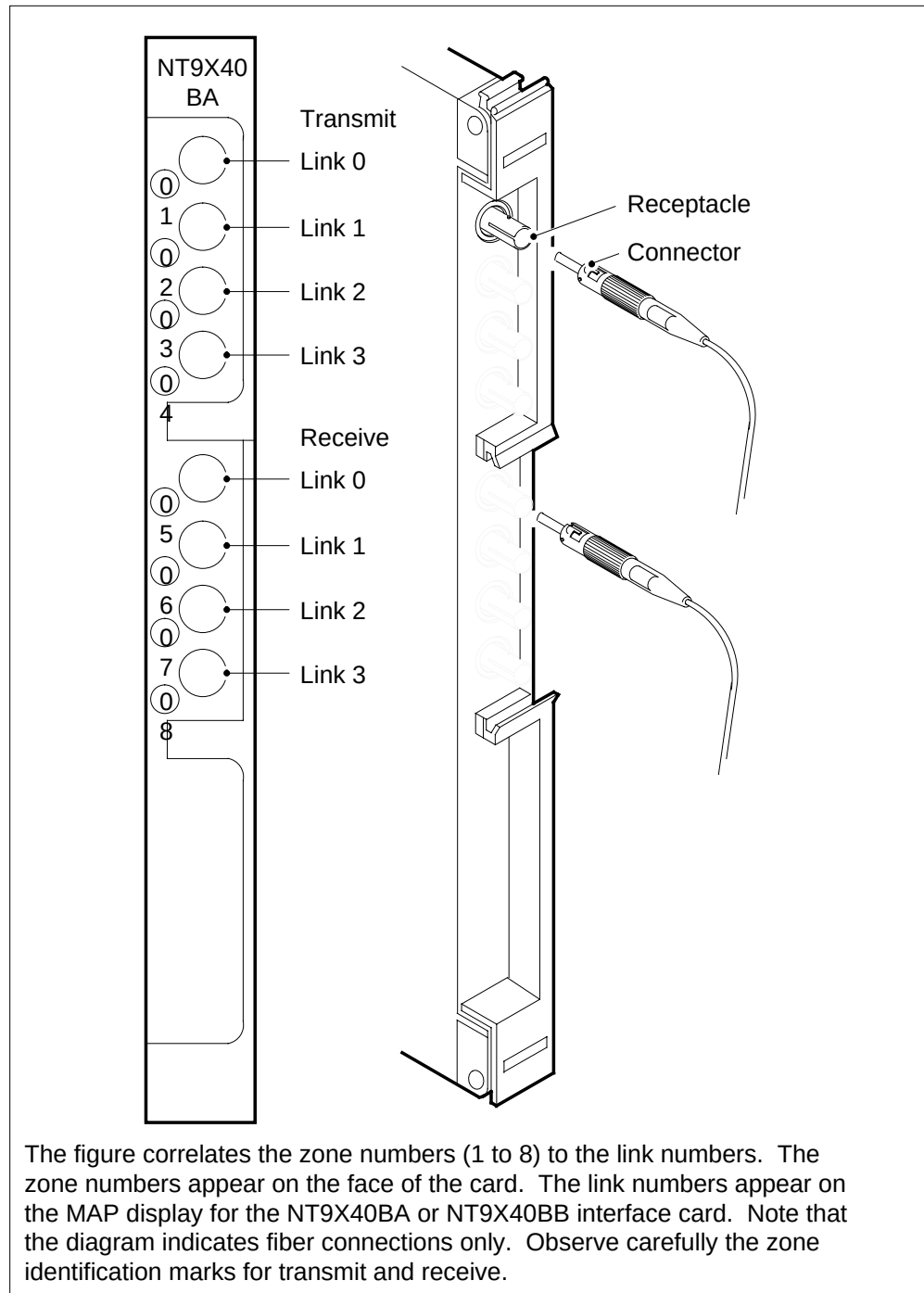
- 65** To obtain help on how to identify the cause of the system busy condition, contact the next level of support. Continue as directed.

- 66** For additional help, contact the next level of support.

- 67** The procedure is complete.

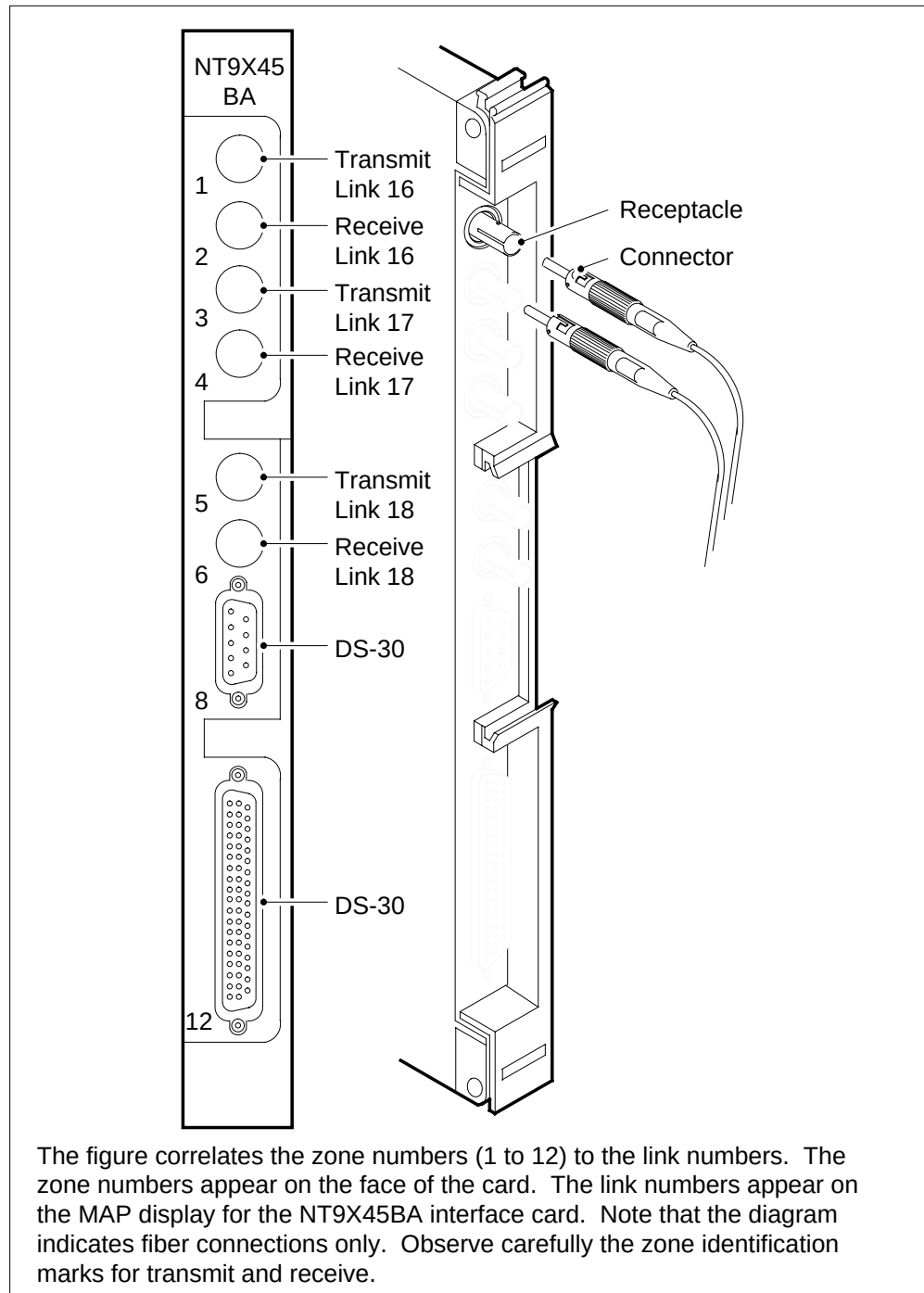
## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

### NT9X40BA/BB connector zone numbers



## Crosspoint and interface cards in a SuperNode SE 16k ENET (continued)

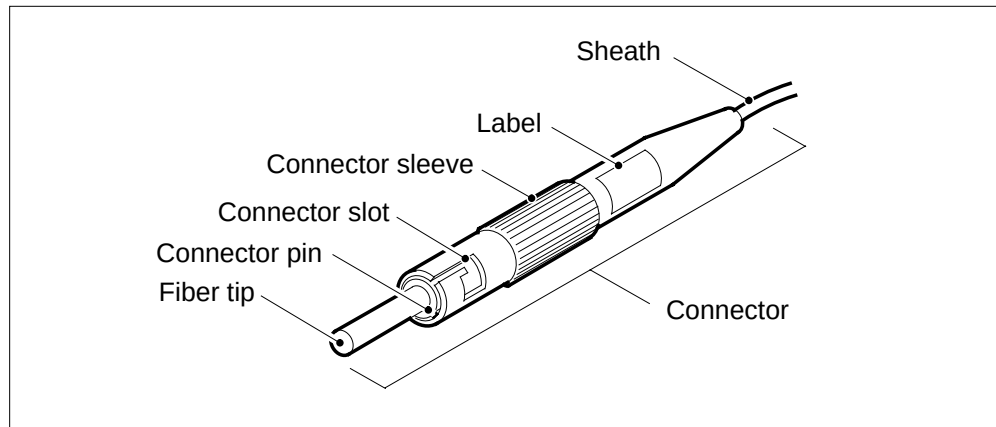
### NT9X45BA connector zone numbers



## Crosspoint and interface cards in a SuperNode SE 16k ENET (end)

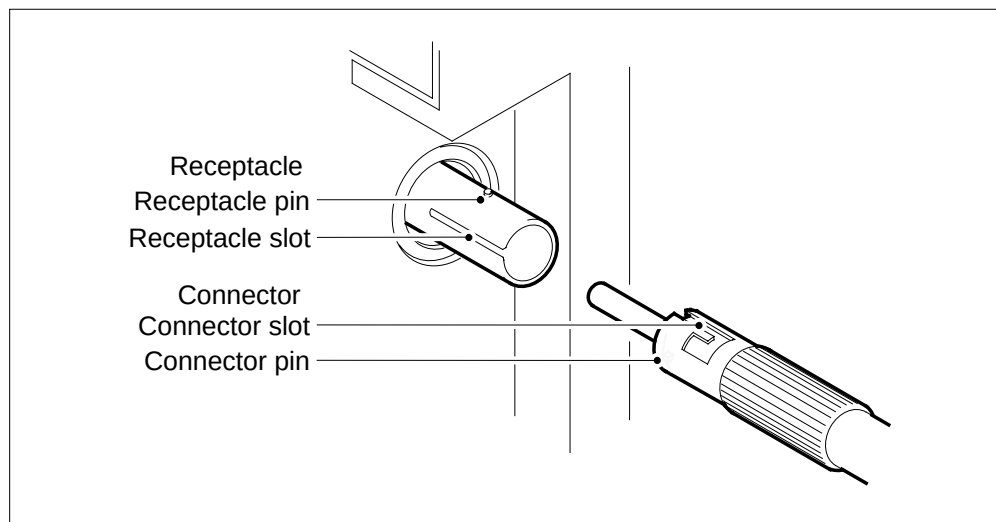
---

### Fiber connector detail



This figure shows the type of connector used to connect fiber to an NT9X40 or NT9X45 paddle board.

### Fiber connector and receptacle detail



This figure shows the different parts of the connector and receptacle.

---

## Crosspoint and interface cards in a SuperNode SE 32k ENET

---

### Application

Use this procedure to replace the following cards in a SuperNode SE 32k enhanced network (ENET) shelf.

To identify the product engineering code (PEC), suffix, the provisioned shelf or frame of the removed card, refer to the Index. The Index contains a list of cards, shelves, and frames in this card replacement book.

| PEC    | Suffix     | Card name                                        | Shelf or frame name                   |
|--------|------------|--------------------------------------------------|---------------------------------------|
| NT9X35 | BA, CA     | 128K ENET crosspoint card                        | 32k ENET                              |
| NT9X40 | BA, BB, DA | ENET quad fiber interface paddle board           | 32k ENET, slots 10 to 16 and 25 to 32 |
| NT9X41 | BA         | International 16-port DS-30 paddle board         | 32k ENET                              |
| NT9X45 | BA         | Three DS-512 link and 16 DS-30 port paddle board | 32k ENET                              |

**Note:** To replace an NT9X40 in slot 8, refer to the *System cards in a Supernode SE 32k ENET* procedure in this chapter.

### Common procedures

This document contains references to the following:

- *Replacing a card*
- *Verifying load compatibility of SuperNode cards*
- *Cleaning fiber optic components and assemblies*

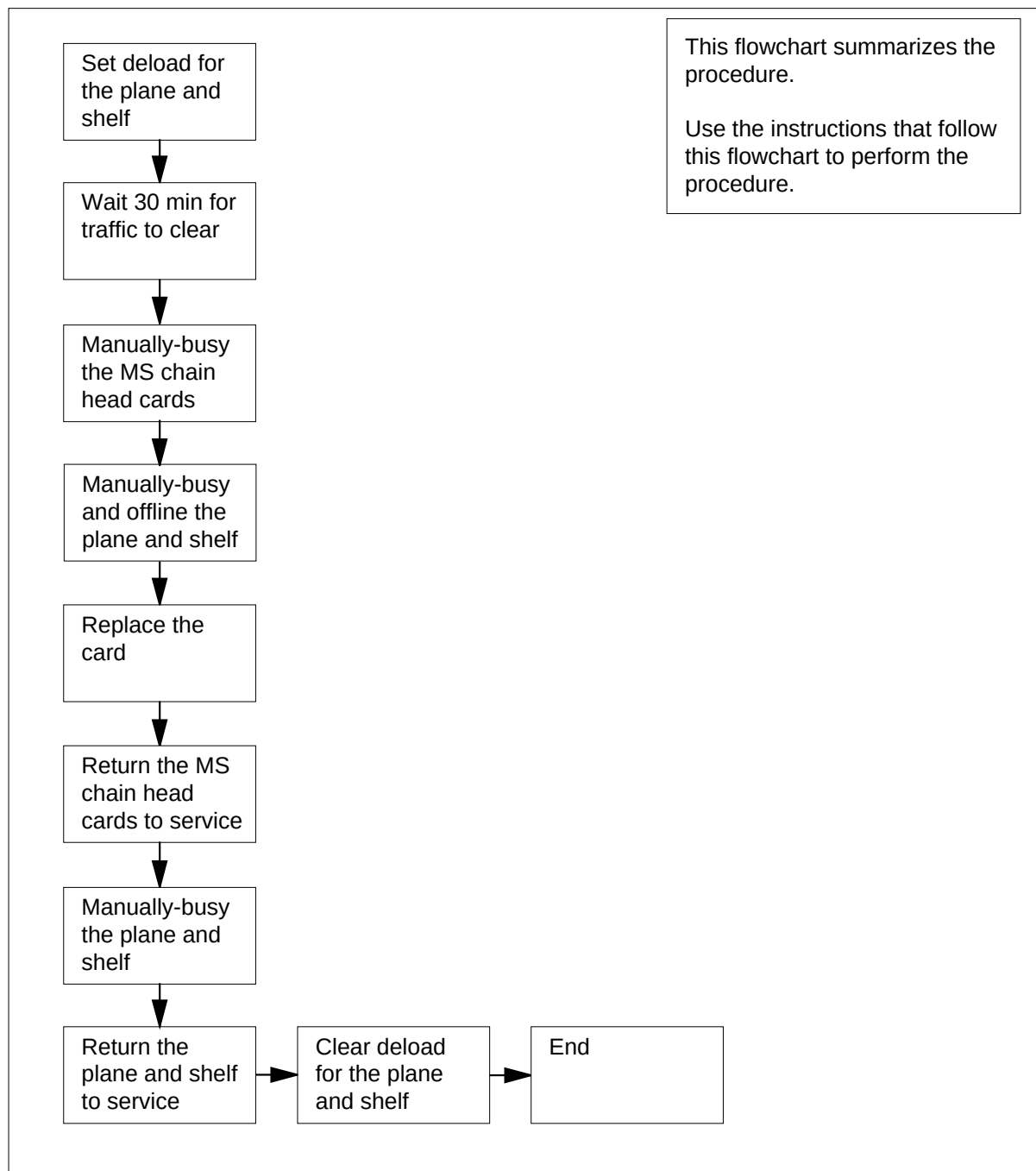
The instructions in this procedure will indicate when to refer to the common procedures.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. To replace the card, follow the instructions in the steps to perform the procedure.

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

### Summary of Replacing Crosspoint and interface cards in a SuperNode SE 32k ENET





## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

### Replacing Crosspoint and interface cards in a SuperNode SE 32k ENET

#### At your current location

- 1 Determine the type and location of the removed card.

| If the card                 | Do     |
|-----------------------------|--------|
| is an NT9X40 card in slot 8 | step 2 |
| is other than listed here   | step 3 |

- 2 To replace the card, refer to the *System cards in a SuperNode SE 32k ENET* procedure in this chapter.

- 3



#### WARNING

##### **Calls may be dropped**

This procedure removes an ENET card from service, potentially dropping calls currently in progress. Perform this procedure only if necessary to return an interface or crosspoint card to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the removed card.

**Note:** For North American switches, NT9X40BA and NT9X40BB are interchangeable and can coexist with the other switches. Only NT9X40BB are available for international switches.

- 4 Make sure that the replacement card is compatible with the software load. To verify the compatibility, refer to the *Verifying the load compatibility of SuperNode cards* procedure in this NTP. When the procedure is complete, return to this point.

#### At the MAP terminal

- 5 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

*Example of a MAP display:*

```
SYSTEM
Shelf Plane 0 Plane
00 I CSLink 1 closed .
```

- 6 Determine the state of the plane that contains the card. An indication of the state appears under the Plane headers on the SYSTEM level MAP display.

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

In the MAP display example shown in step 5, plane 0 is in-service trouble (I) and plane 1 in service.

| If the state of the plane | Do     |
|---------------------------|--------|
| is T , tested             | step 7 |
| is other than listed here | step 8 |

- 7 When the system initiated testing is complete, go to step 6 to evaluate the state of the ENET plane again.
- 8 To determine if there are deloaded crosspoint cards in the other plane, type  
**>DELOAD plane\_no 0 QUERY**  
 and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1) of the mate node

Example of a MAP response:

```
Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.
Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.
 1111111 11122222 22222333
 90123456 78901234 56789012
Plane:0 Shelf:00 ..Y.----- ..Y.----- ..Y.-----
```

**Note:** The letter Y under the slot number indicates a deloaded crosspoint card.

| If the plane                 | Do      |
|------------------------------|---------|
| has deloaded cards           | step 57 |
| does not have deloaded cards | step 9  |

- 9 To determine if there are deloaded crosspoint cards in the current plane, type  
**>DELOAD plane\_no 0 QUERY**  
 and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

| If the plane                 | Do      |
|------------------------------|---------|
| has deloaded cards           | step 10 |
| does not have deloaded cards | step 11 |

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

- 10** Record the plane number and slot number for any deloaded crosspoint cards in the plane. Use this list to ensure that these cards return to the deloaded state when this procedure is complete.

- 11** On the plane associated with the removed card, to set all crosspoint cards to a deloaded status, type

**>DELOAD plane\_no 0 SET**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.

Request to SET DELOAD ENET Plane:0 Shelf:00 passed.

- 12** Wait 30 min to allow network traffic on the node to clear.

- 13** The next action depends on the current state of the ENET plane.

| If the ENET plane         | Do      |
|---------------------------|---------|
| is 0,offline              | step 25 |
| is M, manually-busy       | step 15 |
| is other than listed here | step 14 |

- 14** To manually busy the current plane, type

**>BSY plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:00 submitted.

Request to MAN BUSY ENET Plane:0 Shelf:00 passed.

| If the BSY command | Do      |
|--------------------|---------|
| passes             | step 15 |
| fails              | step 58 |

- 15** To set the plane offline, type

**>OFFL plane\_no 0**

and press the Enter key.



## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

- 19** To post the chain head card, type

**>CHAIN card\_no**

and press the Enter key.

where

**card\_no**

is the card number recorded in step 17

*Example of a MAP display:*

```
Chain 16 Range Link 0 1
MS 0 . 16-17 DS512 . .
MS 1 . 16-17 DS512 . .
```

- 20** To manually busy the link on the chain on MS 0, type

**>BSY 0 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number recorded in step 17

*Example of a MAP response:*

```
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0
submitted.
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0 passed
.
```

| If the BSY command | Do      |
|--------------------|---------|
| passes             | step 21 |
| fails              | step 58 |

- 21** To manually busy the link on the chain on MS 1, type

**>BSY 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number recorded in step 17

| If the BSY command | Do      |
|--------------------|---------|
| passes             | step 22 |
| fails              | step 58 |

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

---

- 22 To access the ENET SHELF level of the MAP display, type

**>NET;SHELF 0**

and press the Enter key.

*Example of a MAP display:*

```
SHELF 01 Slot 1111111 11122222 22222333 333333
 123456 78 90123456 78901234 56789012 345678
Plane 0 0 0 00 CCCCCCCC ----- CCCCCCCC 0 0
Plane 1
```

- 23 To manually busy all cards on the ENET shelf, type

**>BSY plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

```
Request to MAN BUSY ENET Plane:0 Shelf:00 submitted.
Warning: Card replacement requires front and back bsy/rts
to prevent possible service degradation to peripherals.
Request to MAN BUSY ENET Plane:0 Shelf:01 passed.
```

- 24 To set all card on the ENET shelf offline, type

**>OFFL plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

```
Request to OFFLINE ENET Plane:0 Shelf:01 submitted.
Request to OFFLINE ENET Plane:0 Shelf:01 passed.
```

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

*At the ENET shelf*

25



### WARNING

#### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

The next action depends on the removed card.

| If you                        | Do      |
|-------------------------------|---------|
| remove an NT9X35              | step 26 |
| remove an NT9X41              | step 27 |
| remove an NT9X40 or an NT9X45 | step c  |

- 26 To replace the card, refer to the the *Replacing a card* procedure in this NTP. When the procedure is complete, go to step 38.

**Note:** Make sure that the switches on the replacement card have the same settings as the removed card.

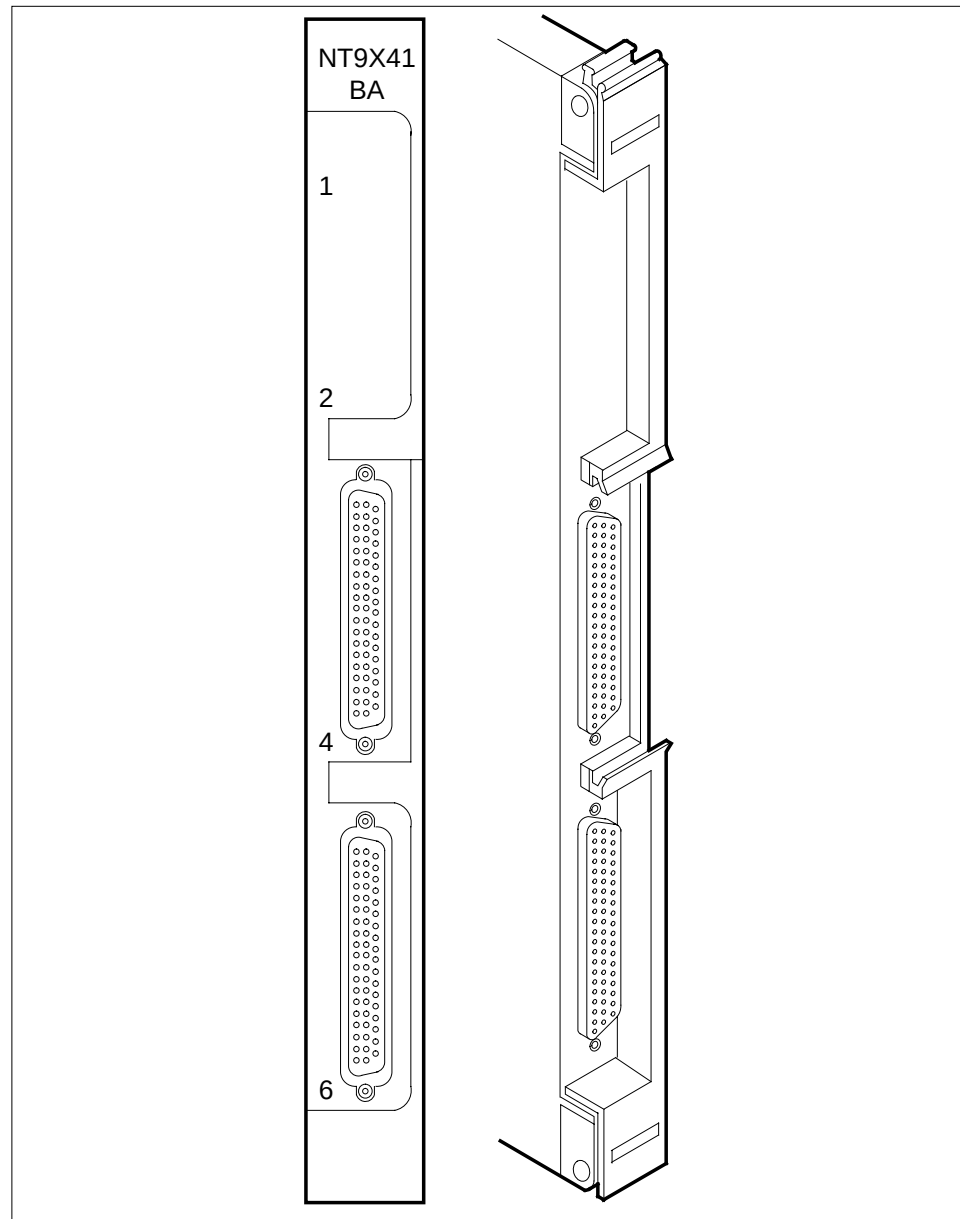
- 27 Locate the NT9X41 card and disconnect the DS30 connectors.

**Note:** The DS30 connectors appear in the figure on the next page.

- a Loosen the connector retaining screws.
- b Unplug the connectors.

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

---



- 28** To replace the card, refer to the *Replacing a card* procedure in this NTP. When the procedure is complete, return to this point.
- 29** Reconnect the DS30 connectors.
- a** Plug the connectors into the card.
  - b** Tighten the connector retaining screws.
- Go to step 38.



## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

30

### ATTENTION

Identify connector zone numbers correctly. To identify zone numbers refer to figure “NT9X40BA/BB connector zone numbers”, at the end of this procedure, for the NT9X40. Refer to figure “NT9X45BA connector zone numebrs” for the NT9X45 for the zone numbers. Illustrations of fiber connector components for these cards are provided in figures “Fiber connector detail” and “Fiber connector and receptacle detail”.

Make sure that the plane and shelf identification of the ENET node and the slot of the interface card are correct. Proceed to disconnect the fiber cables.

Check each cable for a label that contains all of the correct information. If the information is not present, create a label and attach the label to the cable. This label provides the necessary information for correctly reconnecting the fiber cables to the card. A label must include the following information:

- the ENET shelf number
- plane number
- slot number
- link number and signal type
- transmit or receive

*Example of a label:*

|      |     |     |
|------|-----|-----|
| ENCO | 00  | 39  |
| 10R  | 04  | 17T |
| LTE  | 000 | 18  |
| 22R  | RX  |     |

*Label field descriptions*

#### **ENCO**

ENET plane (0 or 1)

#### **00**

cabinet number

#### **39**

ENET shelf from the base mounting position number

#### **10R**

slot number and position (R for rear, or F for front)

#### **04**

zone number

#### **17T**

link number and the signal type (T for transmit, R for receive)

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

**LTE**

PM where the cable terminated

**000**

PM frame number

**18**

PM shelf from the base mounting position number

**22R**

slot number and position (R for rear, or F for front)

**RX**

signal type at the PM end (RX for receive or TX for transmit)

31



**DANGER**

**Do not contaminate the fiber tip surface**

Do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



**DANGER**

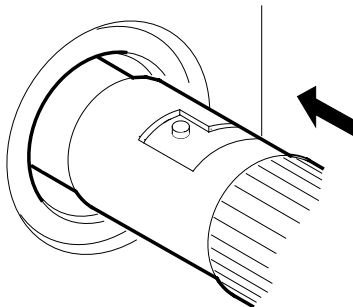
**Damage to the fiber cable**

Exercise care in handling fiber cables. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable.

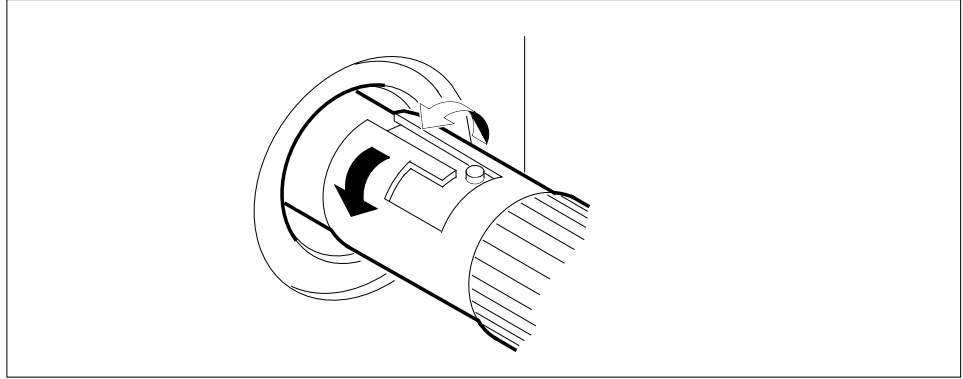
**Note:** Place dust caps on the ends of the connectors as you disconnect them.

- a Grasp the sleeve with two fingers and slowly push the sleeve toward the frame.

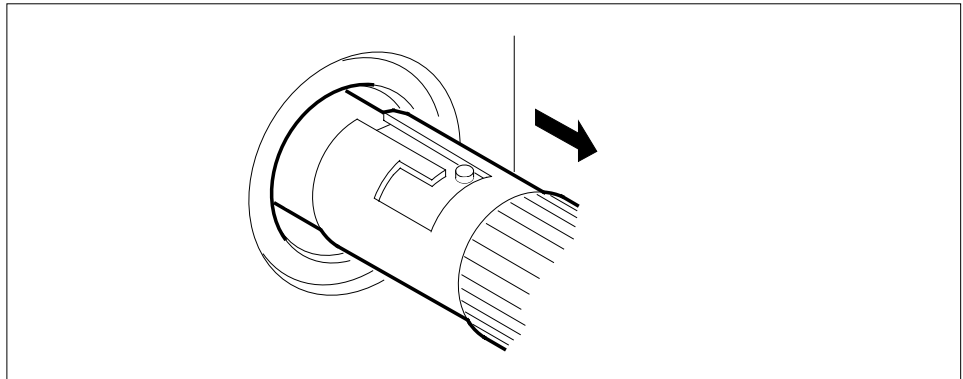


## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

- b** Turn the connector counter clockwise and the connector pin is in the position shown at the right.



- c** Slowly pull the connector away from the frame.



**Note:** Perform the procedure, *Cleaning fiber optic components and assemblies* in this NTP.

- 32** The next action depends on the replaced card.

| If you            | Do      |
|-------------------|---------|
| replace an NT9X45 | step 33 |
| replace an NT9X40 | step 34 |

- 33** Disconnect the DS30 connectors.

- a** Loosen the connector retaining screws.  
**b** Unplug the connectors.

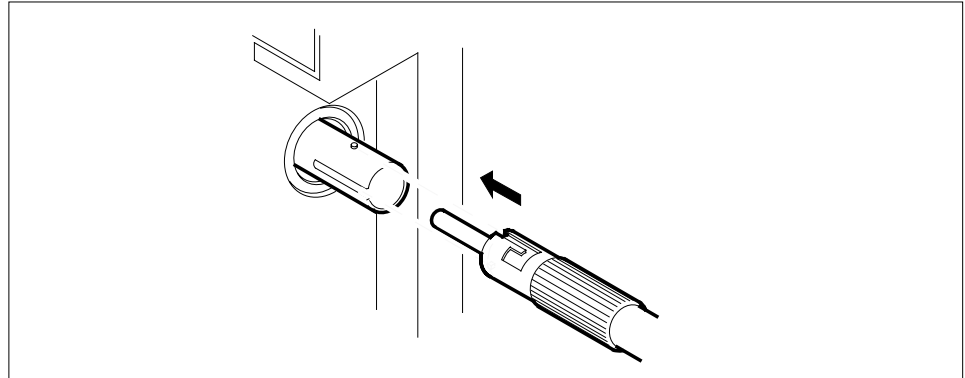
- 34** To replace the card, refer to the *Replacing a card* procedure in this NTP. When the procedure is complete, return to this point.

**Note:** Make sure that the switches on the replacement card have the same settings as the removed card.

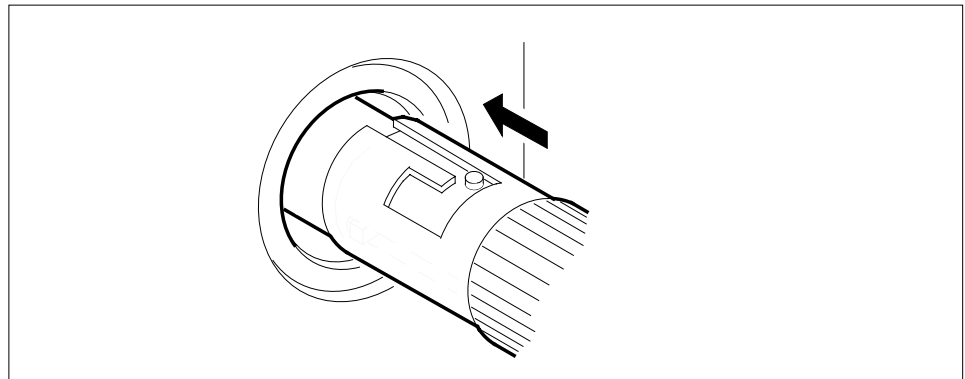
## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

---

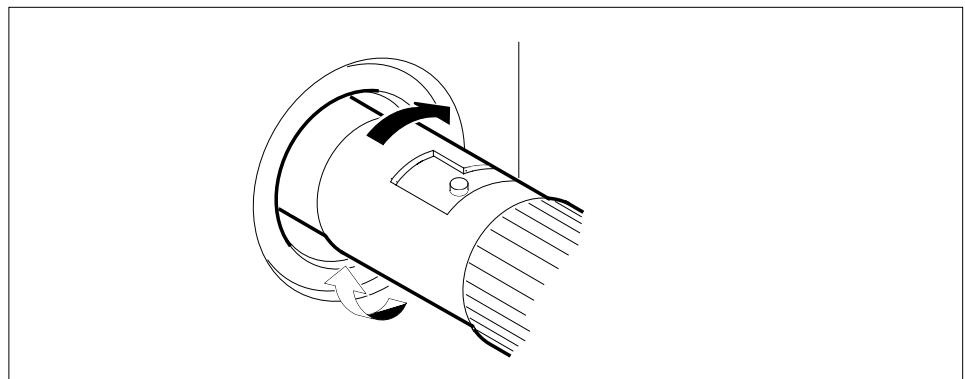
- 35** Remove the dust caps on the transmit and receive connectors as you reconnect them to the new card.
- Reconnect the transmit and receive connectors for each fiber cable.
- a** Align the connector pin and slot with the receptacle slot and pin.



- b** Slowly slide the connector into the receptacle.

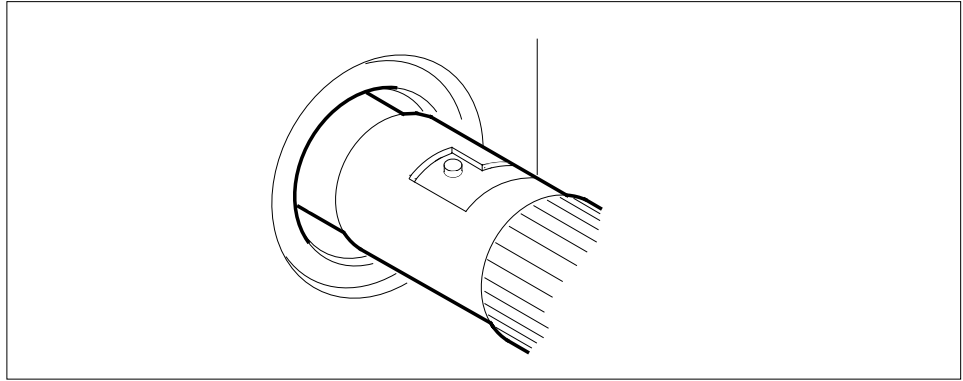


- c** Turn the connector clockwise to lock the connector in place.



## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

- d Release the connector. The following figure shows the final connector position.



- 36 The next action depends on the removed card..

| If you                | Do      |
|-----------------------|---------|
| remove an NT9X45 card | step 37 |
| remove an NT9X40 card | step 38 |

- 37 Reconnect the DS30 connectors.

- a Plug the connectors into the card.  
b Tighten the connector retaining screws.

### ***At the MAP terminal***

- 38 To access the Chain level of the MAP display, type  
**>MS;SHELF;CHAIN card\_no**  
and press the Enter key.

*where*

**card\_no**  
is the card number recorded in step 17

- 39 To return the link on the chain on MS 0 to service, type  
**>RTS 0 LINK link\_no**  
and press the Enter key.

*where*

**link\_no**  
is the link number recorded in step 17

*Example of a MAP response:*

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

Request to RTS MS: 0 shelf: 0 chain:16 submitted.  
Request to RTS MS: 0 shelf: 0 chain:16 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passes             | step 40 |
| fails              | step 58 |

- 40** To return the link on the chain on MS 1 to service, type

**>RTS 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number recorded in step 17

| If the RTS command | Do      |
|--------------------|---------|
| passes             | step 41 |
| fails              | step 58 |

- 41** To access the NET;SYSTEM level of the MAP display, type

**>NET;SYSTEM**

and press the Enter key.

- 42** To manually busy the current plane, type

**>BSY plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

| If the BSY command | Do      |
|--------------------|---------|
| passes             | step 43 |
| fails              | step 58 |

- 43** To return the plane to service, type

**>RTS plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

*Example of a MAP response:*

```
Request to RTS ENET Plane:0 Shelf:00 submitted.
Request to RTS ENET Plane:0 Shelf:00 passed.
There are no suspect cards
```

| If the RTS command | Do      |
|--------------------|---------|
| passes             | step 44 |
| fails              | step 58 |

- 44** To access the ENET SHELF level of the MAP display, type  
**>SHELF 0**

and press the Enter key.

- 45** To manually busy all cards in the ENET plane, type  
**>BSY plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**  
is the ENET plane number (0 or 1)

- 46** To return all cards in the ENET plane to service, type  
**>RTS plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

```
Request to RTS ENET Plane:0 Shelf:01 submitted.
Request to RTS ENET Plane:0 Shelf:01 passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passes             | step 49 |
| fails              | step 47 |

- 47** The replacement card has faults. Obtain another replacement card.

- 48** To access the ENET system level of the MAP display, type  
**>SYSTEM**

and press the Enter key.

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

Go to step 14.

- 49 To access the ENET system level of the MAP display, type  
**>SYSTEM**  
and press the Enter key.

- 50 To clear the deload condition on all crosspoint cards in the plane, type  
**>DELOAD plane\_no 0 CLEAR**  
and press the Enter key.

where

**plane\_no**  
is the ENET plane number (0 or 1)

Example of a MAP response:

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

- 51 The next action depends on if the deloaded cards appear in the list from step 10.

| If                   | Do      |
|----------------------|---------|
| cards are listed     | step 52 |
| cards are not listed | step 55 |

- 52 To access the SHELF level of the MAP display, type  
**>SHELF 0**  
and press the Enter key.

- 53 To set the first card on the list to deloaded state, type  
**>DELOAD plane\_no slot\_no SET**  
and press the Enter key.

where

**plane\_no**  
is the ENET plane number (0 or 1)

**slot\_no**  
is the slot number (9 to 32)

| If all the cards on the list      | Do      |
|-----------------------------------|---------|
| are not set to the deloaded state | step 54 |
| are set to the deloaded state     | step 55 |

- 54 Repeat step 53 for the next card on the list.



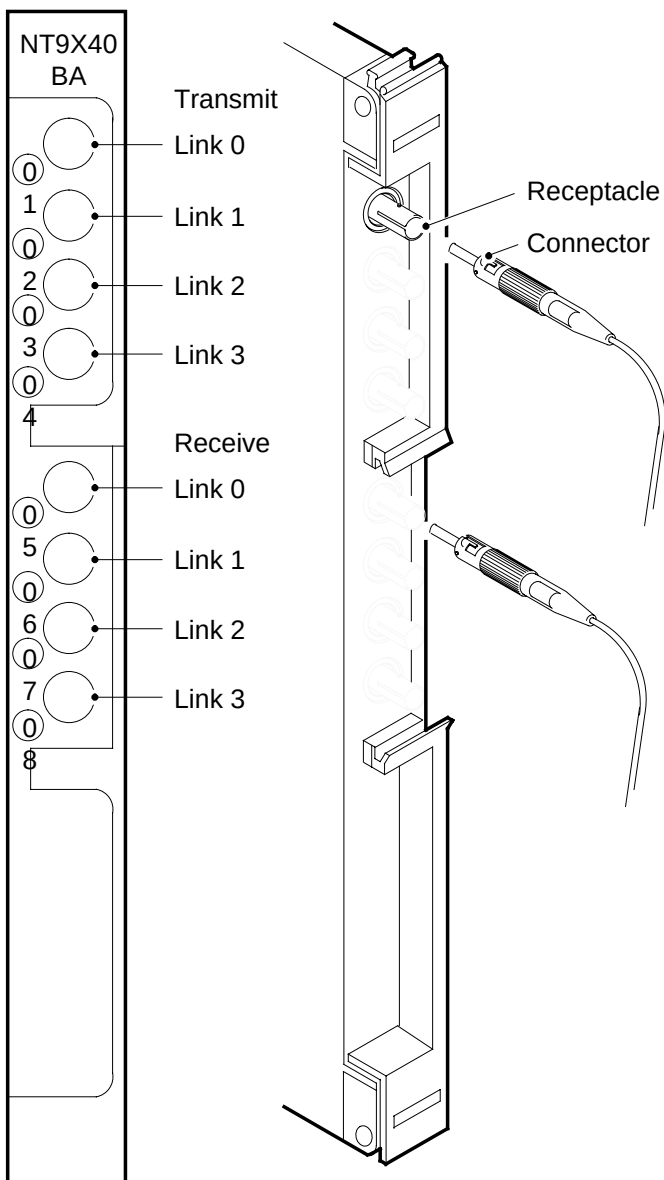
## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

---

- 55** The next action depends on the reason for this procedure.
- | <b>If</b>                                                            | <b>Do</b> |
|----------------------------------------------------------------------|-----------|
| a maintenance procedure directed you to this procedure               | step 56   |
| you were not directed to this procedure from a maintenance procedure | step 59   |
- 56** Return to the maintenance procedure and continue as directed.
- 57** This procedure contains the instructions to deload a node. When the mate node has deloaded cards, do not continue this procedure, except under special conditions. Consult office personnel or your next level of support and continue as directed.
- 58** For additional help, contact the personnel responsible for the next level of support.
- 59** This procedure is complete.

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

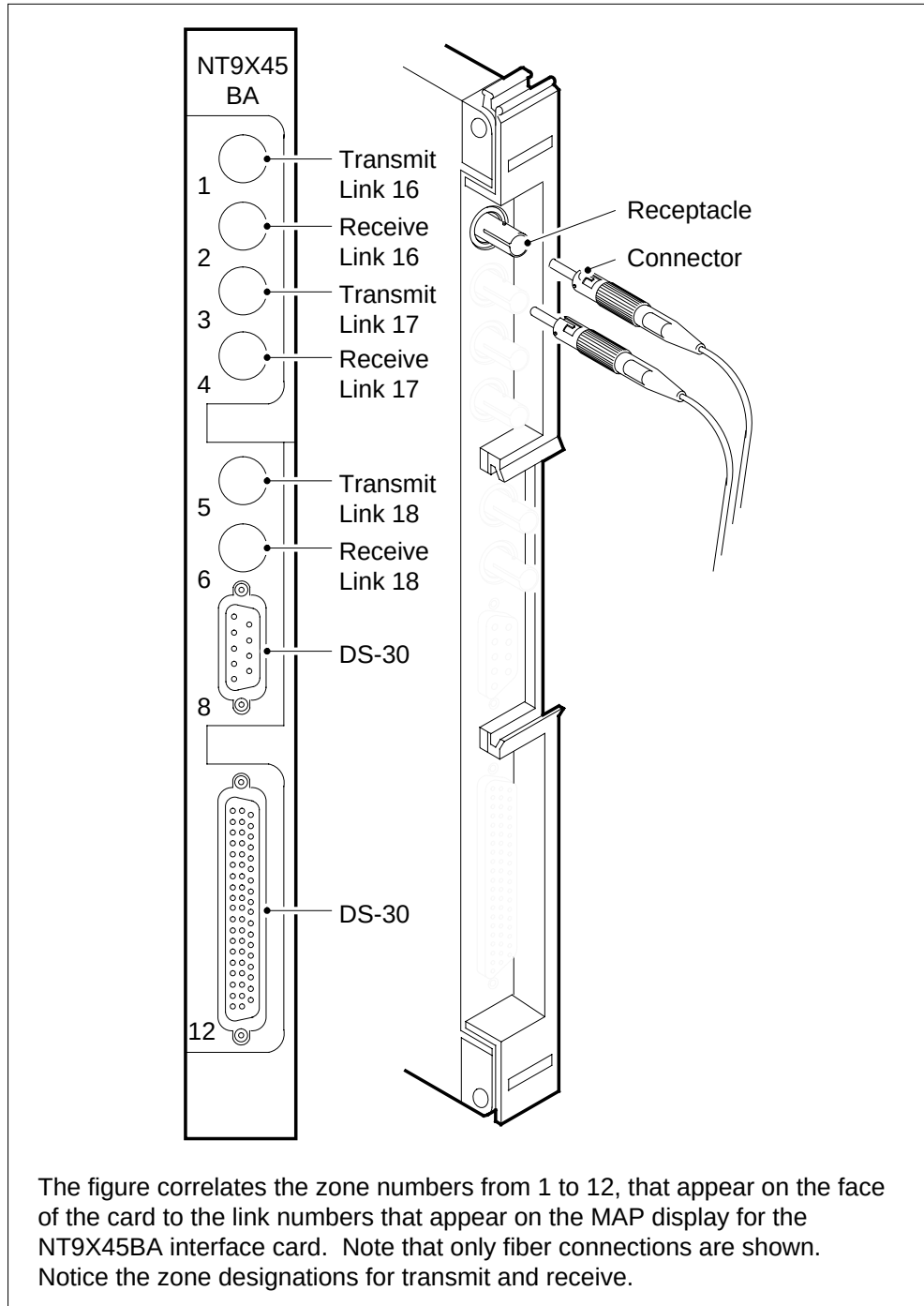
### NT9X40BA/BB connector zone numbers



The figure correlates the zone numbers from 1 to 8, that appear on the face of the card to the link numbers that appear on the MAP display for the NT9X40BA or NT9X40BB interface card. Note that only fiber connections are shown. Notice the zone designations for transmit and receive.

## Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

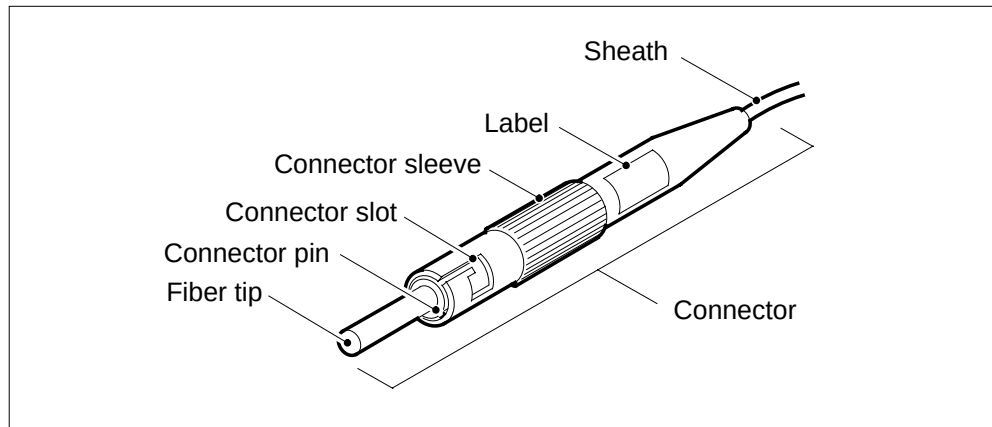
### NT9X45BA connector zone numbers



## Crosspoint and interface cards in a SuperNode SE 32k ENET (end)

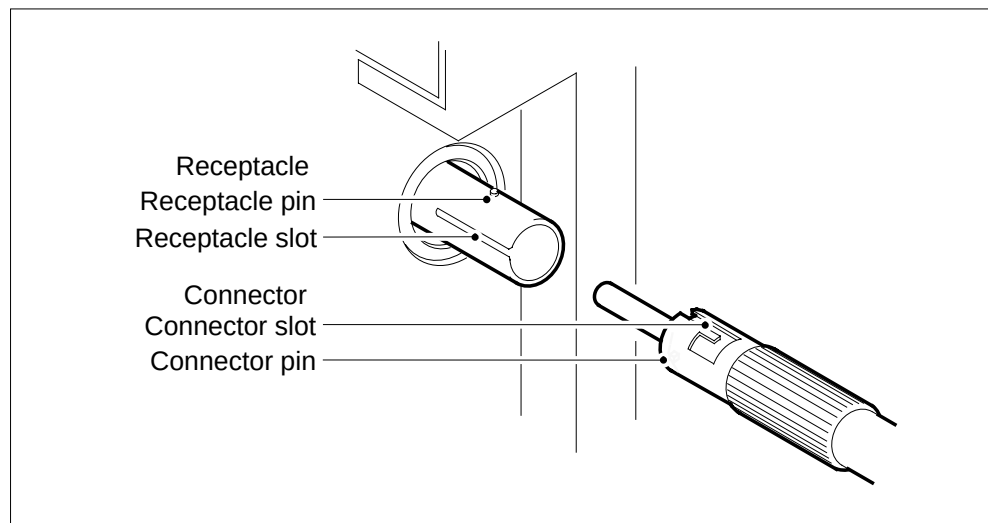
---

### Fiber connector detail



This figure shows the type of connector used for fiber connections to an NT9X40 or NT9X45 paddle board.

### Fiber connector and receptacle detail



This figure shows the different parts of the connector and receptacle.

## Power converter cards in a SuperNode SE 16k ENET

---

### Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) 16k enhanced network (ENET).

| PEC    | Suffix | Card name                      | Shelf or frame name                  |
|--------|--------|--------------------------------|--------------------------------------|
| NT9X30 | AA, AB | + 5V 86-A power converter card | Enhanced network and interface (ENI) |
| NT9X31 | AA, AB | - 5V 20-A power converter card | ENI                                  |

**Note:** You can not replace NT9X30AA with NT9X30AB, nor can you replace NT9X31AA with NT9X31AB.

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card to replace, refer to the Index. The Index provides a list of the cards, shelves, and frames documented in this card replacement book.

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

### Common procedures

This procedure refers to the following common procedures:

- *Activating CCS7 links*
- *Deactivating CCS7 links*
- *Loading a PM*
- *Replacing a card*
- *Verifying load compatibility of SuperNode cards*

Do not go to the common procedure unless the step-action procedure directs you.

## **Power converter cards in a SuperNode SE 16k ENET (continued)**

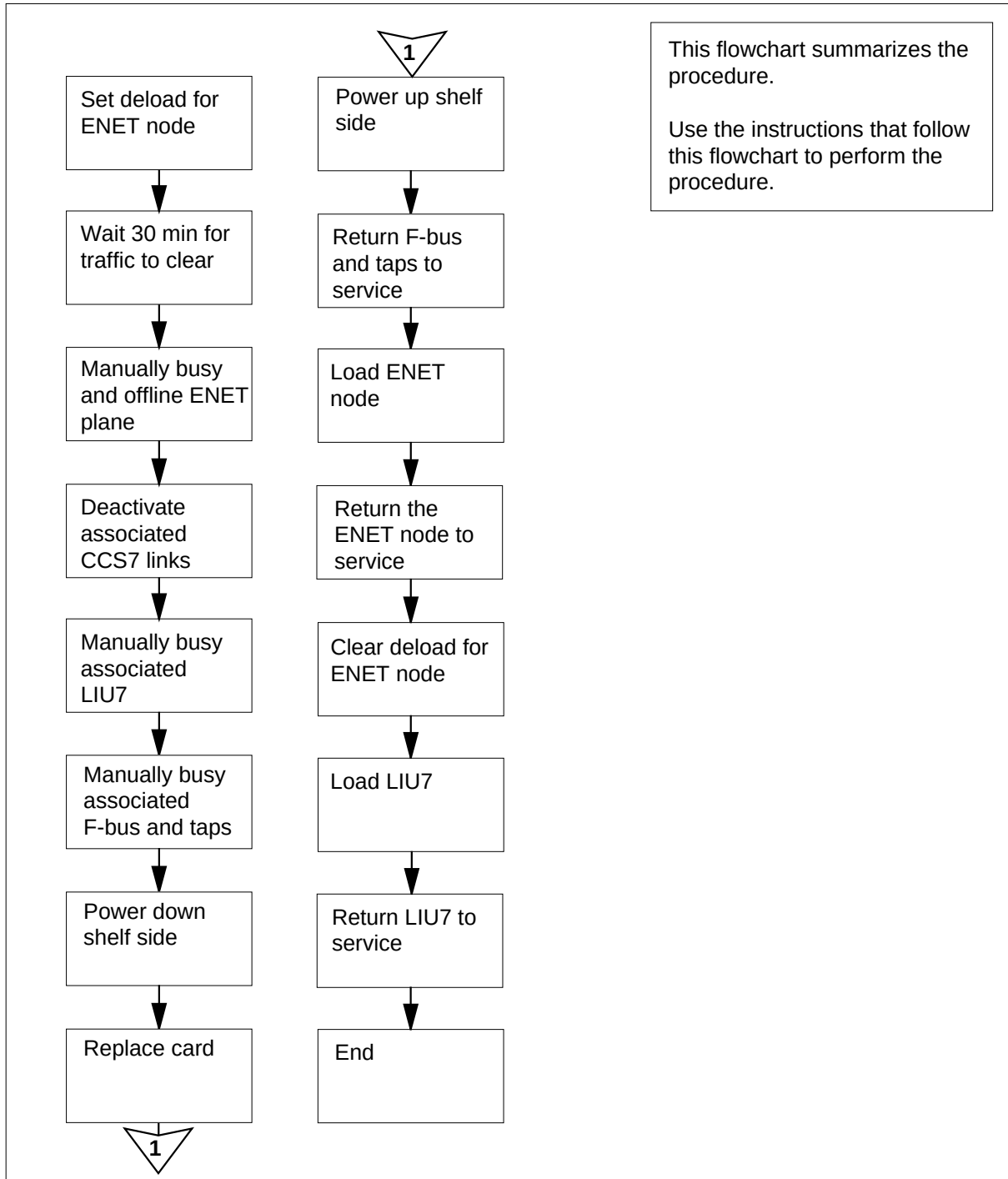
---

### **Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## Power converter cards in a SuperNode SE 16k ENET (continued)

### Summary of replacing Power converter cards in a SuperNode SE 16k ENET



## Power converter cards in a SuperNode SE 16k ENET (continued)

### Replacing Power converter cards in a SuperNode SE 16k ENET

#### At the MAP terminal

1



#### WARNING

##### System can drop calls

This procedure removes an ENET shelf from service, which can cause the system to drop calls now in progress. Perform this procedure if you need to return system cards to service. If you do not need to return system cards to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

2 To make sure that the replacement card is compatible with the software load, perform the procedure *Verifying load compatibility of SuperNode cards*. The procedure *Verifying load compatibility of SuperNode cards* appears in this NTP. Complete the procedure and return to this point.

3 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

*Example of a MAP display:*

```
SYSTEM
Shelf Plane 0 Plane 1
 00 I CSLink 1 closed .
```

4 Check the state of the ENET plane that contains the card you replace. The state appears under the Plane headers on the SYSTEM level MAP display. In the MAP display example in step 3, plane 0 is in-service trouble (I). The other plane is in service.

| If the state of the ENET plane | Do     |
|--------------------------------|--------|
| is T (being tested)            | step 5 |
| is other than listed here      | step 6 |

5 Wait for the system to complete system-initiated testing. Go to step 4 to evaluate the state of the ENET plane.



## Power converter cards in a SuperNode SE 16k ENET (continued)

- 6 To determine if deloaded crosspoint cards are in the other plane of the ENET, type

**>DELOAD plane\_no 0 QUERY**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1) for the mate node

Example of a MAP response:

Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.

```

1111111 111
0123456 789
Plane:0 Shelf:00 .Y.-----

```

**Note:** The letter Y under the slot number indicates a deloaded crosspoint card.

| If the other ENET plane      | Do      |
|------------------------------|---------|
| has deloaded cards           | step 87 |
| does not have deloaded cards | step 7  |

- 7 To determine if deloaded crosspoint cards are in the ENET plane, type

**>DELOAD plane\_no 0 QUERY**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card

| If the ENET plane            | Do     |
|------------------------------|--------|
| has deloaded cards           | step 8 |
| does not have deloaded cards | step 9 |

- 8 Record the plane number and slot number for any deloaded crosspoint cards in the node. Use the list to make sure that these cards are returned to the deloaded state when you complete this procedure.

- 9 To set all crosspoint cards for the ENET plane that contains the card that you replace to a deloaded state, type

**>DELOAD plane\_no 0 SET**

and press the Enter key.

where

## Power converter cards in a SuperNode SE 16k ENET (continued)

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to SET DELOAD ENET Plane:0 Shelf:00 passed.

- 10** Wait 30 min to allow network traffic on the ENET plane to clear.
- 11** The next step depends on the state of the ENET plane that contains the card you replace.

| If the ENET plane         | Do      |
|---------------------------|---------|
| is 0 (offline)            | step 16 |
| is M (manual busy)        | step 14 |
| is other than listed here | step 12 |

- 12** To manually busy the ENET plane, type

**>BSY plane\_no 0**

and press the Enter key.

*where*

**plane\_no**  
is the number of the ENET plane (0 or 1) that contains the card

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:00 submitted.  
Request to MAN BUSY ENET Plane:0 Shelf:00 passed.

| If the response                  | Do      |
|----------------------------------|---------|
| requests confirmation            | step 13 |
| indicates the BSY command passed | step 14 |

- 13** To confirm the command, type

**>YES**

and press the Enter key.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 14 |
| failed             | step 90 |

## Power converter cards in a SuperNode SE 16k ENET (continued)

- 14** To offline the ENET plane, type

**>OFFL plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card

*Example of a MAP response:*

WARNING: A power down of ENET plane:1 shelf:00 may affect LIU components.

Please confirm ("YES", "Y", "NO", or "N"):

| If the response                       | Do      |
|---------------------------------------|---------|
| requests confirmation                 | step 15 |
| indicates the OFFL the command passed | step 16 |

- 15** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to OFFLINE ENET Plane:1 Shelf:00 submitted.  
Request to OFFLINE ENET Plane:1 Shelf:00 passed.

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 16 |
| failed              | step 90 |

- 16** To locate the message switch (MS) chain head card that associates with the ENET plane, type

**>TRNSL plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

## Power converter cards in a SuperNode SE 16k ENET (continued)

---

Request to TRNSL ENET Plane:0 Shelf:00 submitted.  
Request to TRNSL ENET Plane:0 Shelf:00 passed.  
ENET Plane:0 Shelf:00 : MS 0 and 1 Card:05 Link:00 Port:000

**Note:** In the example, the number of the chain head card is 5. The link number is 0.

**17** Record the number of the chain head card and the link number.

**18** To access the MS;SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

|      | Message Switch | Clock  | Shelf | 0 | Inter-MS Link | 0 | 1 |
|------|----------------|--------|-------|---|---------------|---|---|
| MS 0 | .              | Slave  | .     | . | .             | . | . |
| MS 1 | .              | M Free | .     | . | .             | . | . |

| Shelf | 0 |   |   |   |   |   |   |   |   | 1 | 1 | 1 | 1 |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Card  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 |
| Chain |   |   |   |   |   |   |   |   |   |   |   |   |   |
| MS 0  | . | . | . | . | . | - | - | . | . | . | . | . | . |
| MS 1  | . | . | . | . | . | - | - | . | . | . | . | . | . |

**19** To post the chain head card, type

**>CHAIN card\_no**

and press the Enter key.

*where*

**card\_no**

is the card number you recorded in step 17

*Example of a MAP display:*

| Chain | 05 | Range | Link  | 0 | 1 |
|-------|----|-------|-------|---|---|
| MS 0  | .  | 05-05 | DS512 | . | . |
| MS 1  | .  | 05-05 | DS512 | . | . |

**20** To manually busy the link on the chain on MS 0, type

**>BSY 0 LINK link\_no**

and press the Enter key.

*where*

**link\_no**

is the link number that you recorded in step 17

*Example of a MAP response:*

## Power converter cards in a SuperNode SE 16k ENET (continued)

Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0 submitted.  
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0 passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 21 |
| failed             | step 90 |

**21** To manually busy the link on the chain on MS 1, type

**>BSY 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number that you recorded in step 17

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 22 |
| failed             | step 90 |

**22** To access the ENET SHELF level of the MAP display, type

**>NET;SHELF**

and press the Enter key.

*Example of a MAP display:*

```

ENET System Matrix Shelf 0
Plane 0 CSLink Fault F
Plane 1 CSLink . F

SHELF 00 Power LIU ENET-Plane 0 ENET-Plane 1 LIU Power
 11 11111111 22 22222222 333 333333
Slot 123456789 01 23456789 01 23456789 012 345678
 F SSSSSSSS .F

```

**23** To manually busy all crosspoint cards on the shelf side, type

**>BSY plane\_no ALL**

and press the Enter key.

*Example of a MAP response:*

## Power converter cards in a SuperNode SE 16k ENET (continued)

**WARNING:**

This action will be performed on ALL XPT slots in ENET Plane:1 that are MBSY, INSV, OFFL, SBSY, or CBSY.  
Please confirm ("YES", "Y", "NO", or "N"):

- 24** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to MAN BSY ALL ENET Plane:1 Shelf:00 submitted.  
Request to MAN BSY ALL ENET Plane:1 Shelf:00 completed.

- 25** To offline all crosspoint cards on the shelf side, type

**>OFFL plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to MAN BSY ALL ENET Plane:1 Shelf:00 submitted.  
Request to MAN BSY ALL ENET Plane:1 Shelf:00 completed.

- 26** The next action depends if the ENET shelf has CCS7 link interface units (LIU7).

| If the ENET shelf  | Do      |
|--------------------|---------|
| has LIU7           | step 27 |
| does not have LIU7 | step 33 |

- 27** To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 11   | 0    | 11   | 4    | 16   | 38   |

## Power converter cards in a SuperNode SE 16k ENET (continued)

28

**WARNING****Loss of service**

The following procedure removes an LIU7 from service. Removal of an LIU7 can temporarily interrupt messaging on the associated CCS7 link.

To post one of the LIU7s on the shelf side, type

**>POST LIU7 liu\_no**

and press the Enter key.

where

**liu\_no**

is the number of the LIU7 (0 to 511)

Example of a MAP display:

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   | 1    | 0    | 2    | 0    | 3    | 6    |
| LIU7 | 1    | 0    | 0    | 0    | 0    | 3    |

|      |     |      |      |
|------|-----|------|------|
| LIU7 | 208 | InSv | Rsvd |
|------|-----|------|------|

**29** To deactivate the CCS7 link associated with the LIU7, perform the procedure *Deactivating CCS7 links* in this document. Complete the procedure and return to this point.

**30** Determine the state of the LIU7.

**Note:** The LIU7 state appears on the right of the LIU7 number, as shown in the example MAP display in step 28.

| If the state of the LIU7          | Do      |
|-----------------------------------|---------|
| is SysB, SysB (NA), ISTb, or InSv | step 31 |
| is ManB or ManB (NA)              | step 33 |
| is OffL                           | step 88 |
| Rsvd                              | step 90 |

**31** To manually busy the LIU7, type

**>BSY FORCE**

## Power converter cards in a SuperNode SE 16k ENET (continued)

and press the Enter key.

|    | If                                                                                                                                                                                                                                                       | Do      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | the MAP display prompts you to confirm the command                                                                                                                                                                                                       | step 32 |
|    | the command passed                                                                                                                                                                                                                                       | step 33 |
| 32 | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.                                                                                                                                                                               |         |
| 33 | To access the MS level of the MAP display, type<br><b>&gt;MAPCI ; MTC ; MS</b><br>and press the Enter key.                                                                                                                                               |         |
|    | <pre>       Message Switch  Clock  Shelf 0 Inter-MS Link 0 1 MS 0      .          M Free          . . MS 1      .          Slave          . . </pre>                                                                                                     |         |
| 34 | Determine the state of the MS that controls the mate F-bus.<br><br><b>Note:</b> F-bus 0 is the mate F-bus for a card in slot 32F, 32R, or 30R. MS 0 controls F-bus 0. F-bus 1 is the mate F-bus for a card in slot 7F, 7R, or 8R. MS 1 controls F-bus 1. |         |
|    | If the MS that controls mate F-bus                                                                                                                                                                                                                       | Do      |
|    | is in service or in-service trouble                                                                                                                                                                                                                      | step 36 |
|    | is other than listed here                                                                                                                                                                                                                                | step 35 |
| 35 | To return the MS to service, perform the correct MS alarm clearing procedure in <i>Alarm and Performance Monitoring Procedures</i> . Complete the procedure and return to this point.                                                                    |         |
| 36 | To access the SHELF level of the MAP display, type<br><b>&gt;SHELF</b><br>and press the Enter key.                                                                                                                                                       |         |
| 37 | To access the F-bus level of the MAP display, type<br><b>&gt;CARD 12</b><br>and press the Enter key.<br><i>Example of a MAP display:</i>                                                                                                                 |         |



## Power converter cards in a SuperNode SE 16k ENET (continued)

```

Shelf 0 1 1 1 1
Card 1 2 3 4 5 6 7 8 9 0 1 2 3
Chain |
MS 0 - -
MS 1 - -

Card 12 FBus Tap: 0 11 12 16 20
MS 0
MS 1

```

CARD:

**Note 1:** A dot (.) under the F-bus header indicates the F-bus is in service. An S indicates the F-bus is system busy. An M indicates the F-bus is manual busy. An I indicates the F-bus is in-service trouble. An O indicates the F-bus is offline.

**Note 2:** Under the F-bus tap numbers, different characters indicate different states. The letter C indicates that the F-bus is manual busy or the MS or MS port that controls the F-bus tap is system or manual busy. An S indicates the F-bus tap is system busy. A dot indicates the F-bus tap is in service. An M indicates the F-bus tap is manual busy. An I indicates the F-bus tap is in-service trouble. A dash (-) indicates the F-bus tap is offline.

- 38 Determine the state of the mate F-bus and the mate F-bus taps.

**Note:** F-bus 0 is the mate F-bus associated with a card in slot 30R, 32R, or 32F. MS-0 controls F-bus 0. F-bus 1 is the mate associated with a card in slot 7R, 8R, or 7F. MS 1 controls F-bus 1.

| If                                                            | Do      |
|---------------------------------------------------------------|---------|
| the state of the F-bus is InSv and all F-bus taps are . (dot) | step 39 |
| the states are other than listed here                         | step 89 |

39

**WARNING****Potential loss of service**

Make sure that the mate F-bus and F-bus taps are in service before you manually busy the F-bus that associates with the card you replace. If you manually busy the F-bus while the mates are out of service, you isolate the node on the other side of the shelf.

To manually busy the F-bus that associates with the card you replace, type  
**>BSY ms\_no FBUS**

## Power converter cards in a SuperNode SE 16k ENET (continued)

and press the Enter key.

where

**ms\_no**

is the number of the MS (0 or 1) that controls the F-bus

**Note:** F-bus 0 associates with a card in slot 1 or 4. MS 0 controls F-bus 0. F-bus 1 associates with a card in slot 33 or 36. MS 1 controls F-bus 1.

*Example of a MAP response:*

```
Request MAN BSY MS: 0 shelf 0 card:12 port 0
FBus requires confirmation because
the following NIUs may be active on this bus...
NIU 001 unit 0
NIU 001 unit 1
Please confirm("YES", "Y", "NO", or "N")
```

| If the response                  | Do      |
|----------------------------------|---------|
| indicates the BSY command passed | step 41 |
| requests confirmation            | step 40 |

- 40** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
Request MAN BSY MS: 0 shelf 0 card:12 port 0FBus submitted
Request MAN BSY MS: 0 shelf 0 card:12 port 0FBus passed
```

- 41** To manually busy the mate F-bus tap that associates with the card you replace, type

**>BSY ms\_no TAP tap\_no**

and press the Enter key.

where

**ms\_no**

is the number of the MS (0 or 1) that controls the mate F-bus

**tap\_no**

is 0 if you replace a card in slots 1 or 4is 11 if you replace a card in slots 33 or 36

**Note:** F-bus 0 is the mate F-bus for a card in slot 33 or 36. MS 0 controls F-bus 0. F-bus 1 is the mate F-bus for a card in slot 1 or 4. MS 1 controls F-bus 1.

*Example of a MAP display:*

## Power converter cards in a SuperNode SE 16k ENET (continued)

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

42 To confirm the command, type

>YES

and press the Enter key.

*Example of a MAP response:*

Request to MAN BSY MS: 0 shelf: 0 card:12 tap: 0 submitted.  
Request to MAN BSY MS: 0 shelf: 0 card:12 tap: 0 passed.

### At the ENET shelf

43



#### WARNING

##### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Power down the NT9X31 card that associates with the ENET shelf side. To power down the card, press down and release the power switch on the faceplate of the card.

**Note:** The CONVERTER OFF LED turns on when the converter powers down.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is lit                   | step 44 |
| is not lit               | step 90 |

44 Power down the NT9X30 card that associates with the ENET shelf side you are working on. To power down the card, press down and release the power switch on the faceplate of the card.

**Note:** The CONVERTER OFF LED turns on when the converter powers down.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is lit                   | step 45 |
| is not lit               | step 90 |

## Power converter cards in a SuperNode SE 16k ENET (continued)

45

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the card, perform the procedure *Replacing a card* in this NTP. Complete the procedure and return to this point.

**Note 1:** Make sure that the handle of the PWR switch on the replacement power converter is in the OFF position.

**Note 2:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.

- 46 To power up the NT9X30 card, press up and release the power switch on the faceplate of the card.

**Note:** The CONVERTER OFF LED turns off when the converter powers up.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is not lit               | step 47 |
| is lit                   | step 90 |

- 47 To power up the NT9X31 card, press up and release the power switch on the faceplate of the card.

**Note:** The CONVERTER OFF LED turns off when the converter powers up.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is not lit               | step 48 |
| is lit                   | step 90 |

### At the MAP terminal

- 48 To make sure that you are at the MS;SHELF level of the MAP display, type  
**>MS;SHELF**  
and press the Enter key.
- 49 To post the chain head card that you posted in step 19, type  
**>CHAIN card\_no**  
and press the Enter key.

## Power converter cards in a SuperNode SE 16k ENET (continued)

where

**card\_no**

is the card number that you recorded in step 17

**50** To return the link on the chain on MS 0 to service, type

**>RTS 0 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number that you recorded in step 17

*Example of a MAP response:*

Request to RTS MS: 0 shelf: 0 chain:16 link 0 submitted.  
Request to RTS MS: 0 shelf: 0 chain:16 link 0 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 51 |
| failed             | step 90 |

**51** To return the link on the chain on MS 1 to service, type

**>RTS 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number that you recorded in step 17

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 52 |
| failed             | step 90 |

**52** To access the F-bus level of the MAP display, type

**>CARD 12**

and press the Enter key.

**53** To return the manual busy F-bus to service, type

**>RTS ms\_no FBUS**

and press the Enter key.

where

**ms\_no**

is 0 if you replaced a card in slots 1 or 4 is 1 if you replaced a card in slots 33 or 36

## Power converter cards in a SuperNode SE 16k ENET (continued)

---

- 54 To return the tap on the mate F-bus to service, type  
**>RTS ms\_no TAP tap\_no**  
and press the Enter key.  
*where*  
**ms\_no**  
is 0 if you replaced a card in slots 1 or 4 is 1 if you replaced a card in  
slots 33 or 36  
**tap\_no**  
is 0 if you replaced a card in slots 1 or 4 is 11 if you replaced a card in  
slots 33 or 36

*Example of a MAP response:*

Request to RTS MS: 0 shelf: 0 card:12 tap: 0 submitted.  
Request to RTS MS: 0 shelf: 0 card:12 tap: 0 passed.

- 55 To access the NET;SYSTEM level of the MAP display, type  
**>NET;SYSTEM**  
and press the Enter key.

- 56 To manually busy the ENET node, type  
**>BSY plane\_no 0**  
and press the Enter key.

*where*

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:1 Shelf:00 submitted.  
Request to MAN BUSY ENET Plane:1 Shelf:00 passed.

| <hr/>                                                                         |         |
|-------------------------------------------------------------------------------|---------|
| If the response                                                               | Do      |
| <hr/>                                                                         |         |
| requests confirmation                                                         | step 57 |
| indicates that the BSY command<br>passed                                      | step 58 |
| <hr/>                                                                         |         |
| 57 To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key. |         |
| <hr/>                                                                         |         |
| If the BSY command                                                            | Do      |
| <hr/>                                                                         |         |
| passed                                                                        | step 58 |
| <hr/>                                                                         |         |

## Power converter cards in a SuperNode SE 16k ENET (continued)

|    | If the BSY command                                                                                                                                                                                                                                                                                                                                                                                                       | Do      |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | failed                                                                                                                                                                                                                                                                                                                                                                                                                   | step 90 |
| 58 | The next action depends on the location of the load file.                                                                                                                                                                                                                                                                                                                                                                |         |
|    | If the load file                                                                                                                                                                                                                                                                                                                                                                                                         | Do      |
|    | is as specified in tables PMLOADS and ENINV                                                                                                                                                                                                                                                                                                                                                                              | step 59 |
|    | is different from the file specified in tables PMLOADS and ENINV                                                                                                                                                                                                                                                                                                                                                         | step 60 |
| 59 | <p>To load the ENET node, type</p> <p><b>&gt;LOADEN plane_no 0</b></p> <p>and press the Enter key.</p> <p>where</p> <p style="padding-left: 40px;"><b>plane_no</b></p> <p style="padding-left: 40px;">is the ENET plane number (0 or 1)</p> <p><i>Example of a MAP response:</i></p> <p>WARNING</p> <p>Any software load in the ENET will be destroyed.</p> <p>Please confirm ("YES" or "NO"):</p> <p>Go to step 66.</p> |         |
| 60 | <p>To access the CI level of the MAP display, type</p> <p><b>&gt;QUIT ALL</b></p> <p>and press the Enter key.</p>                                                                                                                                                                                                                                                                                                        |         |
| 61 | <p>To access the disk utility, type</p> <p><b>&gt;DISKUT</b></p> <p>and press the Enter key.</p> <p><i>Example of a MAP response:</i></p> <p>Disk utility is now active.DISKUT:</p>                                                                                                                                                                                                                                      |         |
| 62 | <p>To list the contents for the volume that contains the loadfile, type</p> <p><b>&gt;LISTFILE vol_name</b></p> <p>and press the Enter key.</p> <p>where</p> <p style="padding-left: 40px;"><b>vol_name</b></p> <p style="padding-left: 40px;">is the name of the volume that contains the ENET load file</p> <p><i>Example of a MAP response:</i></p>                                                                   |         |

## Power converter cards in a SuperNode SE 16k ENET (continued)

File information for volume S00DVOL1:  
{NOTE: 1 BLOCK = 512 BYTES }

| LAST<br>MODIFY<br>DATE | FILE<br>CODE | O R I O<br>R E T P<br>G C O E<br>C N | FILE<br>SIZE<br>IN<br>BLOCKS | NUM OF<br>RECORDS<br>IN<br>FILE | MAX<br>REC<br>LEN | FILE NAME        |
|------------------------|--------------|--------------------------------------|------------------------------|---------------------------------|-------------------|------------------|
| 760128                 |              | 0 0 F                                | 277                          | 3219                            | 44                | EDRMAC07         |
| 941101                 |              | 0 I F Y                              | 9494                         | 4747                            | 1020              | RAPC03AW_1101_MS |
| 760104                 |              | 0 0 V                                | 651                          | 162                             | 2048              | MPC402BX         |
| 760104                 |              | 0 0 F                                | 63                           | 424                             | 76                | TDCMPA01         |
| 760104                 |              | 0 0 F                                | 37                           | 249                             | 76                | TTMNA01          |
| 941101                 |              | 0 I F Y                              | 202934                       | 101467                          | 1020              | RAPC03AW_1101_CM |
| 941025                 |              | 0 I F                                | 9494                         | 4747                            | 1020              | RBCS35CV_1025_MS |
| 941025                 |              | 0 I F                                | 242454                       | 121227                          | 1020              | RBCS35CV_1025_CM |
| 940426                 |              | 0 0 F                                | 784                          | 392                             | 1024              | MPCX33AB         |
| 930427                 |              | 0 0 F                                | 314                          | 2006                            | 80                | MTULI01          |

**63** To quit the disk utility, type

**>QUIT**

and press the Enter key.

**64** To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

**65** To load the ENET node, type

**>LOADEN plane\_no 0 filename**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

**filename**

is the name of the load file

*Example of a MAP response:*

WARNING

Any software load in the ENET will be destroyed.  
Please confirm ("YES" or "NO"):

**66** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*



## Power converter cards in a SuperNode SE 16k ENET (continued)

Request to LOADEN ENET Plane:0 Shelf:00 submitted.  
Request to LOADEN ENET Plane:0 Shelf:00 passed.

- 67 To return the ENET node to service, type

**>RTS plane\_no 0**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 submitted.  
Request to RTS ENET Plane:0 Shelf:00 passed.  
There are no suspect cards.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 68 |
| failed             | step 90 |

- 68 To access the ENET SHELF level of the MAP display, type

**>SHELF**

and press the Enter key.

- 69 To manually busy all crosspoint cards on the shelf side, type

**>BSY plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

- 70 To confirm the command, type

**>YES**

and press the Enter key.

- 71 To return all crosspoint cards on the shelf side, type

**>RTS plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

## Power converter cards in a SuperNode SE 16k ENET (continued)

Request to RTS ENET Plane:1 Shelf:00 submitted.  
Request to RTS ENET Plane:1 Shelf:00 passed.

- 72 To access the ENET SYSTEM level of the MAP, type  
**>SYSTEM**  
and press the Enter key.
- 73 To clear the deload condition on all crosspoint cards in the node, type  
**>DELOAD plane\_no 0 CLEAR**  
and press the Enter key.

where

**plane\_no**  
is the ENET plane number (0 or 1)

Example of a MAP response:

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

- 74 The next action depends if you recorded a list of deloaded cards in step 8.

| If you                     | Do      |
|----------------------------|---------|
| recorded a card list       | step 75 |
| did not record a card list | step 78 |

- 75 To access the ENET SHELF level of the MAP display, type  
**>SHELF 0**  
and press the Enter key.

- 76 To set the first card on the list to the deloaded state, type  
**>DELOAD plane\_no slot\_no SET**  
and press the Enter key.

where

**plane\_no**  
is the number of the ENET plane (0 or 1)

**slot\_no**  
is the number of the slot the card occupies (slots 12 to 19 on plane 0,  
slots 22 to 29 on plane 1)

| If                                           | Do      |
|----------------------------------------------|---------|
| more cards on the list are not de-<br>loaded | step 77 |

## Power converter cards in a SuperNode SE 16k ENET (continued)

|    | If                                                                                                                                                                           | Do      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | all cards on the list are deloaded                                                                                                                                           | step 78 |
| 77 | Repeat step 76 for the next card on the list.                                                                                                                                |         |
| 78 | The next action depends if the ENET shelf has LIU7s.                                                                                                                         |         |
|    | If the ENET shelf                                                                                                                                                            | Do      |
|    | has LIU7s                                                                                                                                                                    | step 79 |
|    | does not have LIU7s                                                                                                                                                          | step 91 |
| 79 | To access the PM level of the MAP display, type<br><b>&gt;MAPCI;MTC;PM</b><br>and press the Enter key.                                                                       |         |
| 80 | To post the LIU7 on the shelf side, type<br><b>&gt;POST LIU7 liu_no</b><br>and press the Enter key.<br><i>where</i><br><b>liu_no</b><br>is the number of the LIU7 (0 to 511) |         |
| 81 | To load the LIU7, type<br><b>&gt;LOADPM</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>LIU7 208 LOADPM Passed                                   |         |
|    | If the LOADPM command                                                                                                                                                        | Do      |
|    | passed                                                                                                                                                                       | step 83 |
|    | failed                                                                                                                                                                       | step 82 |
| 82 | To load the LIU7, perform the procedure <i>Loading a PM</i> in this NTP. Complete the procedure and return to this point.                                                    |         |
| 83 | To return the LIU7 to service, type<br><b>&gt;RTS</b><br>and press the Enter key.<br><i>Example of a MAP response:</i>                                                       |         |

**Power converter cards  
in a SuperNode SE 16k ENET (end)**

---

LIU7 100 RTS Passed

|           | <b>If the RTS command</b>                                                                                                                                                                                                                                | <b>Do</b> |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                                                                                   | step 84   |
|           | failed                                                                                                                                                                                                                                                   | step 90   |
| <b>84</b> | To activate the CCS7 link associated with the LIU7, perform the procedure <i>Activating CCS7 links</i> in this NTP. Complete the procedure and return to this point.                                                                                     |           |
| <b>85</b> | The next action depends on the reason that you perform this procedure.                                                                                                                                                                                   |           |
|           | <b>If a maintenance procedure</b>                                                                                                                                                                                                                        | <b>Do</b> |
|           | directed you to this procedure                                                                                                                                                                                                                           | step 86   |
|           | did not direct you to this procedure                                                                                                                                                                                                                     | step 91   |
| <b>86</b> | Return to the maintenance procedure that directed you to this procedure and continue as directed.                                                                                                                                                        |           |
| <b>87</b> | This procedure instructs you to deload and manually busy an ENET node. Continue this procedure only under special conditions because the mate ENET node has deloaded cards. Consult office personnel or the next level of support. Continue as directed. |           |
| <b>88</b> | To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.                                                                                                                     |           |
| <b>89</b> | If you continue this procedure, you can isolate the LIU7 on the other side of the shelf. To determine if you must continue this procedure, contact office company personnel or the next level of support. Continue as directed.                          |           |
| <b>90</b> | For additional help, contact the next level of support.                                                                                                                                                                                                  |           |
| <b>91</b> | The procedure is complete.                                                                                                                                                                                                                               |           |

---

## System cards in a SuperNode SE 16k ENET

---

### Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) 16k enhanced network (ENET).

| PEC    | Suffix     | Card name                              | Shelf or frame name                  |
|--------|------------|----------------------------------------|--------------------------------------|
| NT9X13 | FA, KA     | DMS SuperNode processor card           | Enhanced network and interface (ENI) |
| NT9X26 | AA, AB     | Remote terminal interface paddle board | ENI                                  |
| NT9X36 | BA         | ENET message clock card                | ENI                                  |
| NT9X40 | BA, BB, DA | ENET + quad fiber paddle board         | ENI slots 11 or 21                   |

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Reseating cards in equipment shelves*
- *Unseating cards in equipment shelves*
- *Verifying load compatibility of SuperNode cards*
- *Cleaning fiber optic components and assemblies*

Do not go to the common procedure unless the step-action procedure directs you.

## **System cards in a SuperNode SE 16k ENET (continued)**

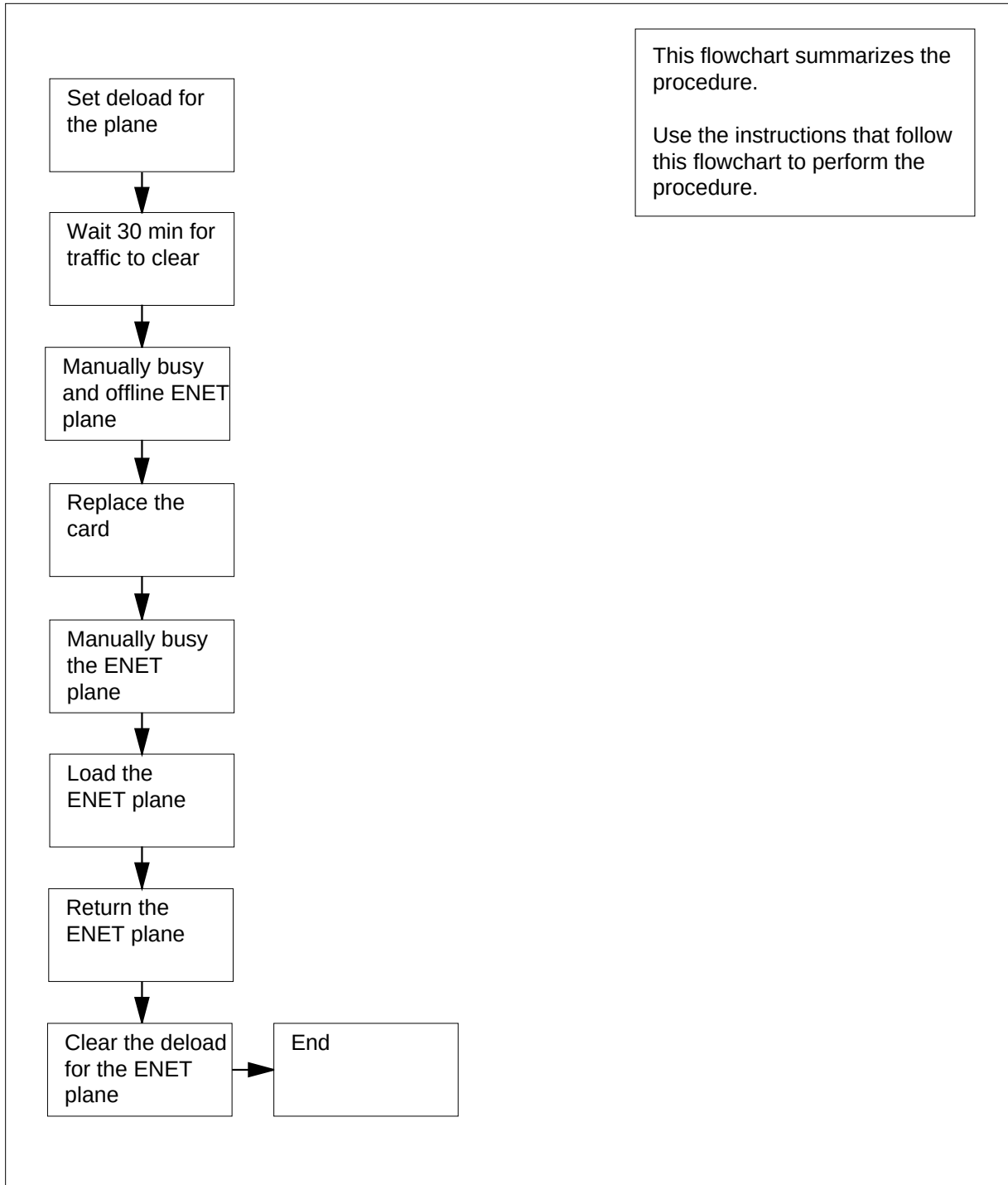
---

### **Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## System cards in a SuperNode SE 16k ENET (continued)

### Summary of replacing System cards in a SuperNode SE 16k ENET



## System cards in a SuperNode SE 16k ENET (continued)

### Replacing System cards in a SuperNode SE 16k ENET

#### At the MAP terminal

1



#### WARNING

##### System can drop calls

This procedure removes an ENET shelf from service, which can cause the system to drop calls now in progress. Perform this procedure only if you need to return system cards to service. If you do not need to return system cards to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

2 To make sure that the replacement card is compatible with the software load, perform the procedure *Verifying load compatibility of SuperNode cards*. The procedure *Verifying load compatibility of SuperNode cards* appears in this NTP. Complete the procedure and return to this point.

3 To access the NET;SYSTEM level of the MAP display, type  
**>MAPCI;MTC;NET;SYSTEM**  
and press the Enter key.

*Example of a MAP display:*

```
SYSTEM
Shelf Plane 0 Plane 1
00 I CSLink 1 closed .
```

4 Determine the state of the plane that contains the card that you replace. The state appears under the Plane headers on the SYSTEM level MAP display. In the MAP display example in step 3, plane 0 is in-service trouble (I) and plane 1 is in service.

| If the status of the node | Do     |
|---------------------------|--------|
| is T (being tested)       | step 5 |
| is other than listed here | step 6 |

5 Wait for the system to complete system-initiated testing. To evaluate the state of the node again, go to step 4.

6 To determine if deloaded crosspoint cards are in the other ENET plane, type  
**>DELOAD plane\_no 0 QUERY**  
and press the Enter key.  
*where*



## System cards in a SuperNode SE 16k ENET (continued)

**plane\_no**

is the ENET plane number (0 or 1) for the mate node

*Example of a MAP response:*

```
Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.
Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.
 1111111 111
 0123456 789
Plane:0 Shelf:00 .Y.----- ---
```

**Note:** The letter Y under the slot number indicates a deloaded crosspoint card.

| If the other ENET plane      | Do      |
|------------------------------|---------|
| has deloaded cards           | step 65 |
| does not have deloaded cards | step 7  |

- 7 To determine if deloaded crosspoint cards are in the plane, type

**>DELOAD plane\_no 0 QUERY**

and press the Enter key.

*where*

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card that you replace

| If the ENET plane            | Do     |
|------------------------------|--------|
| has deloaded cards           | step 8 |
| does not have deloaded cards | step 9 |

- 8 Record the plane number and slot number for any deloaded crosspoint cards in the plane. Use this list to make sure that these cards are returned to the deloaded state when you complete this procedure.

- 9 To set all crosspoint cards for the ENET plane that contains the card that you will replace to a deloaded state, type

**>DELOAD plane\_no 0 SET**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

```
Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.
Request to SET DELOAD ENET Plane:0 Shelf:00 passed.
```

## System cards in a SuperNode SE 16k ENET (continued)

- 10** Wait 30 min to permit network traffic on the node to clear.
- 11** The next step depends on the state of the ENET plane that contains the card that you replace.

| If the ENET plane         | Do      |
|---------------------------|---------|
| is 0 (offline)            | step 17 |
| is M (manual busy)        | step 15 |
| is other than listed here | step 12 |

- 12** To manually busy the ENET plane, type  
**>BSY plane\_no 0**  
 and press the Enter key.  
*where*  
**plane\_no**  
 is the number of the ENET plane (0 or 1) that contains the card you replace

| If the response is                                                                                                                                                                                                                     | Do      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| WARNING: This action will abort ENET dump. Please confirm ("YES", "Y", "NO", or "N"):                                                                                                                                                  | step 13 |
| Note: The above Warning message is generated when a BSY request and ENET imaging take place at the same time. As card replacement procedures are usually performed during scheduled maintenance periods this conflict may never occur. |         |
| Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:25 submitted.                                                                                                                                                                           | step 15 |
| Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:25 passed.                                                                                                                                                                              |         |

- 13** Continue procedure by

| If Responding to the message                | Do      |
|---------------------------------------------|---------|
| with YES, abort dump and continue with busy | step 14 |
| with NO, abort busy, continue with dump     | step 67 |

## System cards in a SuperNode SE 16k ENET (continued)

- 14** To abort ENET dump and continue with BSY, type

**>YES**

and press the Enter key.

- 15** To offline the ENET plane, type

**>OFFL plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the number of the ENET plane (0 or 1) that contains the card you replace

*Example of a MAP response:*

WARNING: A power down of ENET plane:1 shelf:00 may affect LIU components.

Please confirm ("YES", "Y", "NO", or "N"):

- 16** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to OFFLINE ENET Plane:1 Shelf:00 submitted.  
Request to OFFLINE ENET Plane:1 Shelf:00 passed.

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 17 |
| failed              | step 66 |

- 17** To locate the message switch (MS) chain head card that associates with the ENET plane, type

**>TRNSL plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to TRNSL ENET Plane:0 Shelf:00 submitted.  
Request to TRNSL ENET Plane:0 Shelf:00 passed.  
ENET Plane:0 Shelf:00 : MS 0 and 1 Card:05 Link:00 Port:000

## System cards in a SuperNode SE 16k ENET (continued)

**Note:** In the example, the number of the chain head card is 5. The link number is 0.

**18** Record the number of the chain head card and the link number.

**19** To access the MS;SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

```

 Message Switch Clock Shelf 0 Inter-MS Link 0 1
MS 0 . Slave . . .
MS 1 . M Free . . .

Shelf 0
Card 1 2 3 4 5 6 7 8 9 0 1 2 3
Chain
MS 0 - -
MS 1 - -

```

**20** To post the chain head card, type

**>CHAIN card\_no**

and press the Enter key.

*where*

**card\_no**

is the card number that you recorded in step 18

*Example of a MAP display:*

```

Chain 05 Range Link 0 1
MS 0 . 05-05 DS512 . .
MS 1 . 05-05 DS512 . .

```

**21** To manually busy the link on the chain on MS 0, type

**>BSY 0 LINK link\_no**

and press the Enter key.

*where*

**link\_no**

is the link number that you recorded in step 18

*Example of a MAP response:*

```

Request to MAN BUSY MS: 0 shelf: 0 chain:05 link 0 submitted
Request to MAN BUSY MS: 0 shelf: 0 chain:05 link 0 passed.

```

**If the BSY command**

**Do**

passed

step 22

## System cards in a SuperNode SE 16k ENET (continued)

- |           | If the BSY command                                                                                                                                                                                                                                                                 | Do      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | failed                                                                                                                                                                                                                                                                             | step 66 |
| <b>22</b> | To manually busy the link on the chain on MS 1, type<br><b>&gt;BSY 1 LINK link_no</b><br>and press the Enter key.<br><i>where</i><br><b>link_no</b><br>is the link number that you recorded in step 18                                                                             |         |
|           | passed                                                                                                                                                                                                                                                                             | step 23 |
|           | failed                                                                                                                                                                                                                                                                             | step 66 |
| <b>23</b> | To access the ENET SHELF level of the MAP display, type<br><b>&gt;NET;SHELF</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><i>Example of a MAP display:</i>                                                            |         |
|           | <pre> ENET      System  Matrix  Shelf 0 Plane 0 CSLink  Fault    F Plane 1 CSLink    .        F  SHELF 00  Power   LIU    ENET-Plane 0 ENET-Plane 1  LIU Power Slot      123456  789    11 1111111 22 2222222 333 333333           . .      .F   SSSSSSS .F  ....           </pre> |         |
| <b>24</b> | To manually busy all crosspoint cards on the shelf side, type<br><b>&gt;BSY plane_no ALL</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><i>Example of a MAP response:</i>                                              |         |

## System cards in a SuperNode SE 16k ENET (continued)

WARNING: This action will be performed on ALL XPT slots in ENET Plane:1 that are MBSY, INSV, OFFL, SBSY, or CBSY.

Please confirm ("YES", "Y", "NO", or "N"):

- 25 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
Request to MAN BSY ALL ENET Plane:1 Shelf:00 submitted.
Request to MAN BSY ALL ENET Plane:1 Shelf:00 completed.
```

- 26 To offline all crosspoint cards in the ENET shelf, type

**>OFFL plane\_no ALL**

and press the Enter key.

*where*

**plane\_no**

is the number of the ENET plane (0 or 1) containing the card you are replacing

*Example of a MAP response:*

```
Request to OFFLINE ENET Plane:0 Shelf:00 submitted.
Request to OFFLINE ENET Plane:0 Shelf:00 passed.
```

### *At the ENET shelf*

27



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

The next action depends on the type of card that you replace.

| If the card  | Do      |
|--------------|---------|
| is an NT9X13 | step 28 |
| is an NT9X40 | step 30 |

## System cards in a SuperNode SE 16k ENET (continued)

|    | If the card                                                                                                                                                                                                                                                                   | Do      |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | is an NT9X26 or NT9X36                                                                                                                                                                                                                                                        | step 33 |
| 28 | To unseat the NT9X36 (messaging clock) card on the shelf side, perform the procedure <i>Unseating cards in equipment shelves</i> . The procedure <i>Unseating cards in equipment shelves</i> appears in this NTP. Complete the procedure. Wait 20 s and return to this point. |         |
| 29 | To reseat the NT9X36 card, perform the procedure <i>Reseating cards in equipment shelves</i> in this NTP. Complete the procedure. Wait 20 s and return to this point.                                                                                                         |         |
|    | Go to step 33.                                                                                                                                                                                                                                                                |         |
| 30 |                                                                                                                                                                                                                                                                               |         |

### ATTENTION

Make sure that you identify connector zone numbers correctly. To identify zone numbers, refer to figure “NT9X40BA/BB connector zone numbers” for the NT9X40. Figures “Fiber connector detail” and “Fiber connector and receptable detail” are diagrams of fiber connector components for these cards. The figures are at the end of this procedure.

- Make sure that you are at the correct ENET node and interface card before you disconnect the fiber cables. To identify the ENET node, check the plane and shelf identification. To identify the interface card, check the slot.
- 31 Make sure that each cable has a label that contains the following information:
- ENET shelf number
  - plane number
  - slot number
  - link number
  - signal type

The signal type can be transmit or receive. If this information is not present, create a label and attach the label to the cable. This label provides information on how to connect the fiber cables to the card.

*Example of a label:*

|      |     |     |
|------|-----|-----|
| ENCO | 00  | 39  |
| 10R  | 04  | 17T |
| LTE  | 000 | 18  |
| 22R  | RX  |     |

*Label field descriptions*

## System cards in a SuperNode SE 16k ENET (continued)

---

|      |                                                                 |
|------|-----------------------------------------------------------------|
| ENCO | ENET plane (0 or 1)                                             |
| 00   | cabinet number                                                  |
| 39   | ENET shelf by the base mounting position number                 |
| 10R  | slot number and position (R for rear, or F for front)           |
| 04   | zone number                                                     |
| 17T  | link number and the signal type (T for transmit, R for receive) |
| LTE  | PM that the cable terminates on                                 |
| 000  | PM frame number                                                 |
| 18   | PM shelf by the base mounting position number                   |
| 22R  | slot number and position (R for rear, or F for front)           |
| RX   | signal type at the PM end ( RX for receive or TX for transmit)  |

32



### **DANGER**

#### **Avoid contamination of the fiber tip surface**

Make sure that you do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



### **DANGER**

#### **Fiber cable can become defective**

Make sure that you handle fiber cables carefully. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable.

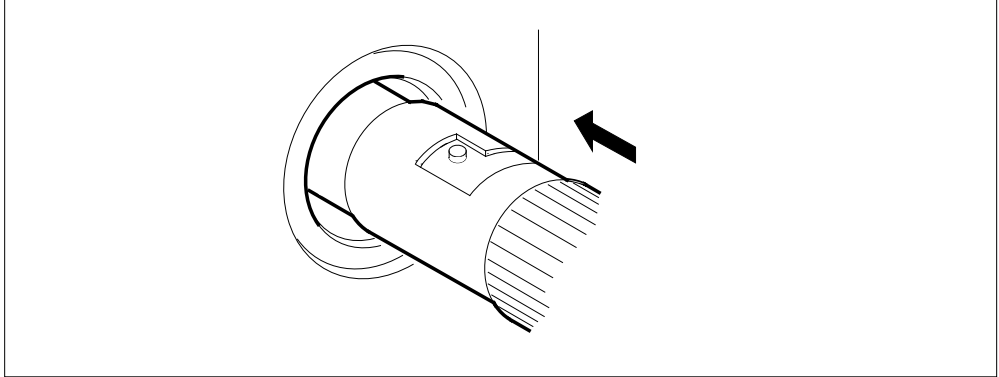
**Note:** When you disconnect the connectors, place dust caps on the ends of the connectors.

- a Grasp the sleeve with two fingers. Carefully push the sleeve toward the frame.

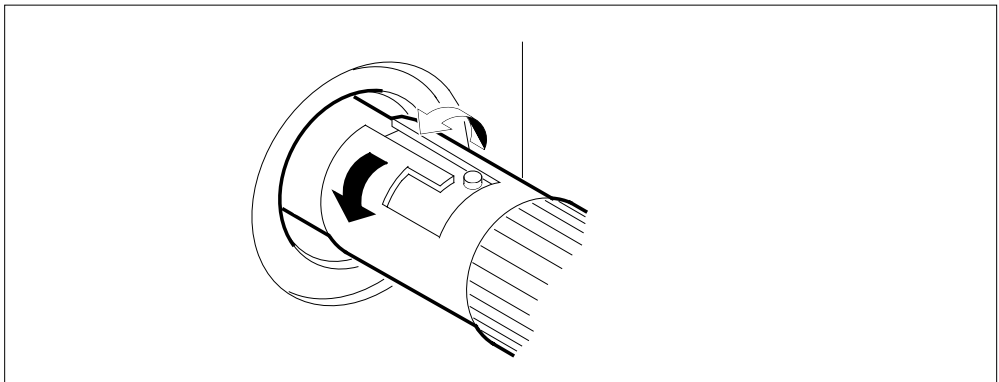


## System cards in a SuperNode SE 16k ENET (continued)

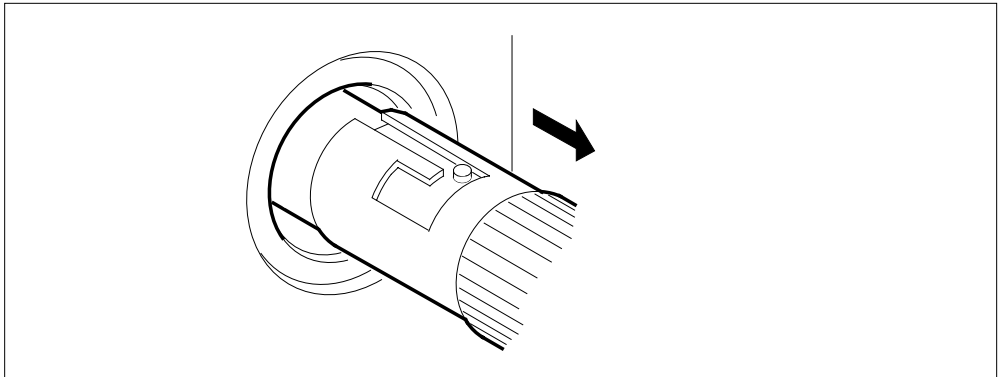
---



- b** Turn the connector counterclockwise until the connector pin is in the position shown in the following diagram.



- c** Carefully pull the connector away from the frame.



**Note:** Perform the procedure, *Cleaning fiber optic components and assemblies* in this NTP.

## System cards in a SuperNode SE 16k ENET (continued)

- 33 To replace the card, perform the procedure *Replacing a card* in this NTP. Complete the procedure and return to this point.

**Note:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.

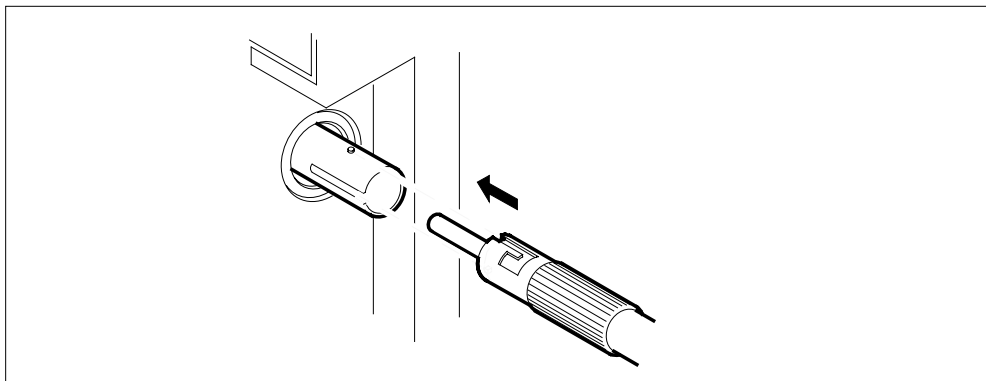
- 34 The next action depends on the type of card that you replace.

| If the card            | Do      |
|------------------------|---------|
| is an NT9X13           | step c  |
| is an NT9X40           | step 35 |
| is an NT9X26 or NT9X36 | step b  |

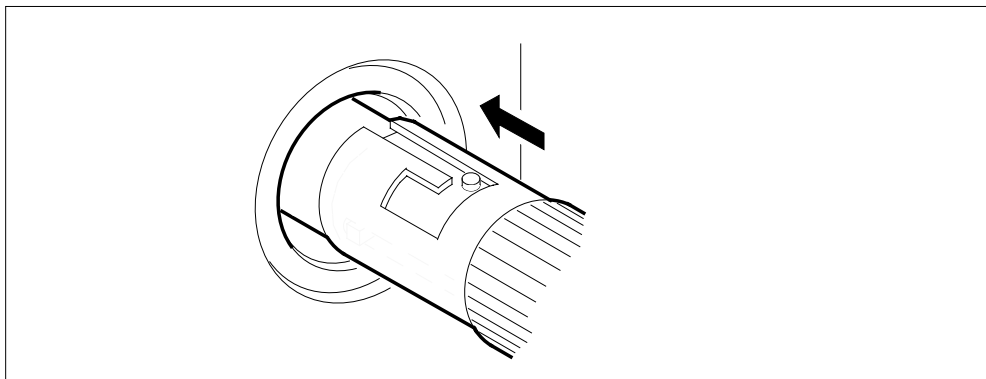
- 35 When you connect the connectors to the new card, remove the dust caps on the transmit and receive connectors.

Connect the transmit and receive connectors for each fiber cable.

- a Align the connector pin and slot with the receptacle slot and pin, in the sequence given, as shown in the following diagram.



- b Carefully slide the connector into the receptacle.

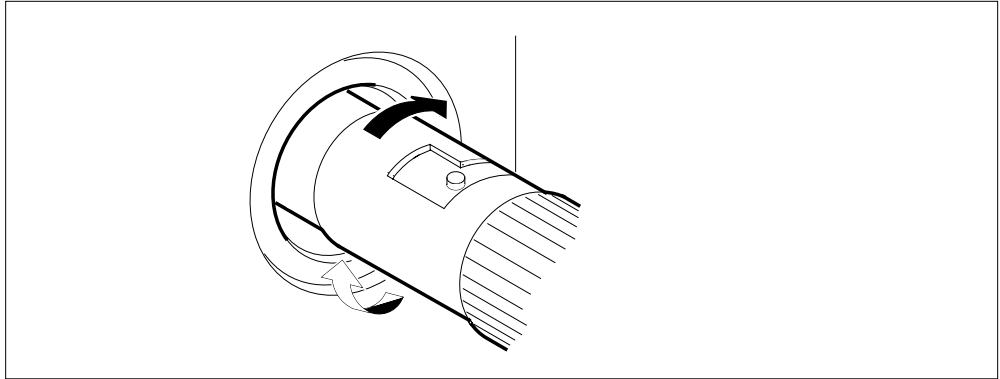


- c Turn the connector clockwise to lock the connector in place.

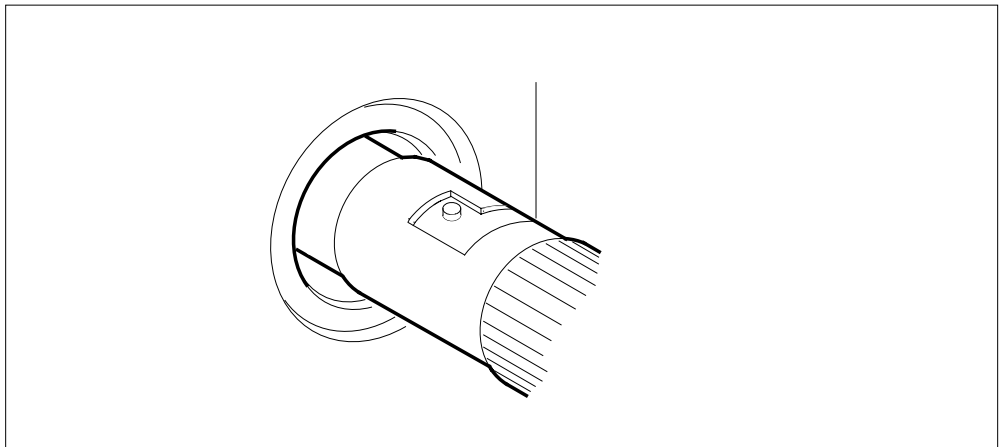
---

## System cards in a SuperNode SE 16k ENET (continued)

---



- d** Release the connector. The following figure displays the final connector position.



- 36** To unseat the NT9X13 (processor) card on the shelf side, perform the procedure *Unseating cards from equipment shelves*. The procedure *Unseating cards in equipment shelves* appears in this NTP. Complete the procedure. Wait 20 s and return to this point.
- 37** To reseat the NT9X13 card on the shelf side, perform the procedure *Reseating cards in equipment shelves*. The procedure *Reseating cards in equipment shelves* appears in this NTP. Complete the procedure and return to this point.

**Note:** Wait a minimum of 30 s before you continue this procedure.

### **At the MAP terminal**

- 38** To access the MS Chain card level of the MAP display, type  
**>MS;SHELF;CHAIN card\_no**  
and press the Enter key.  
*where*

## System cards in a SuperNode SE 16k ENET (continued)

---

**card\_no**

is the card number that you recorded in step 18

- 39** To return the link on the chain on MS 0 to service, type

**>RTS 0 LINK link\_no**

and press the Enter key.

*where*

**link\_no**

is the link number that you recorded in step 18

*Example of a MAP response:*

Request to RTS MS: 0 shelf: 0 chain:05 link 0 submitted.  
Request to RTS MS: 0 shelf: 0 chain:05 link 0 passed.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 40 |
| failed             | step 66 |

---

- 40** To return the link on the chain on MS 1 to service, type

**>RTS 1 LINK link\_no**

and press the Enter key.

*where*

**link\_no**

is the link number that you recorded in step 18

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 41 |
| failed             | step 66 |

---

- 41** To access the NET;SYSTEM level of the MAP display, type

**>NET;SYSTEM**

and press the Enter key.

- 42** To manually busy the ENET plane, type

**>BSY plane\_no 0**

and press the Enter key.

*where*

## System cards in a SuperNode SE 16k ENET (continued)

**plane\_no**  
is the ENET plane number (0 or 1)

|           | <b>If the response</b>                                                                                                                                                                               | <b>Do</b> |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | requests confirmation                                                                                                                                                                                | step 43   |
|           | indicates the BSY command passed                                                                                                                                                                     | step 44   |
| <b>43</b> | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.                                                                                                                           |           |
|           | <b>If the BSY command</b>                                                                                                                                                                            | <b>Do</b> |
|           | passed                                                                                                                                                                                               | step 44   |
|           | failed                                                                                                                                                                                               | step 66   |
| <b>44</b> | The next action depends on the location of the load file.                                                                                                                                            |           |
|           | <b>If the load file</b>                                                                                                                                                                              | <b>Do</b> |
|           | is as specified in tables PMLOADS and ENINV                                                                                                                                                          | step 45   |
|           | is different from the file specified in tables PMLOADS and ENINV                                                                                                                                     | step 46   |
| <b>45</b> | To load the ENET node, type<br><b>&gt;LOADEN plane_no 0</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><i>Example of a MAP response:</i> |           |
|           | <b>WARNING</b> Any software load in the ENET will be destroyed. Please confirm ("YES" or "NO"):                                                                                                      |           |
|           | Go to step 52.                                                                                                                                                                                       |           |
| <b>46</b> | To access the CI level of the MAP display, type<br><b>&gt;QUIT ALL</b><br>and press the Enter key.                                                                                                   |           |

## System cards in a SuperNode SE 16k ENET (continued)

- 47 To access the disk utility, type

**>DISKUT**

and press the Enter key.

*Example of a MAP response:*

Disk utility is now active.  
DISKUT:

- 48 To list the contents for the volume that contains the load file, type

**>LISTFL vol\_name**

and press the Enter key.

*where*

**vol\_name**

is the name of the volume that contains the ENET load file

*Example of a MAP response:*

File information for volume S00DVOL1:  
{NOTE: 1 BLOCK = 512 BYTES }

| LAST FILE<br>MODIFY CODE<br>DATE | O R I O<br>R E T P<br>G C O E<br>C N | FILE<br>SIZE<br>IN<br>BLOCKS | NUM OF<br>RECORDS<br>IN<br>FILE | MAX<br>REC<br>LEN | FILE NAME        |
|----------------------------------|--------------------------------------|------------------------------|---------------------------------|-------------------|------------------|
| 760128                           | 0 0 F                                | 277                          | 3219                            | 44                | EDRMAC07         |
| 941101                           | 0 I F Y                              | 9494                         | 4747                            | 1020              | RAPC03AW_1101_MS |
| 760104                           | 0 0 V                                | 651                          | 162                             | 2048              | MPC402BX         |
| 760104                           | 0 0 F                                | 63                           | 424                             | 76                | TDCMPA01         |
| 760104                           | 0 0 F                                | 37                           | 249                             | 76                | TTMNA01          |
| 941101                           | 0 I F Y                              | 202934                       | 101467                          | 1020              | RAPC03AW_1101_CM |
| 941025                           | 0 I F                                | 9494                         | 4747                            | 1020              | RBCS35CV_1025_MS |
| 941025                           | 0 I F                                | 242454                       | 121227                          | 1020              | RBCS35CV_1025_CM |
| 940426                           | 0 0 F                                | 784                          | 392                             | 1024              | MPCX33AB         |
| 930427                           | 0 0 F                                | 314                          | 2006                            | 80                | MTULI01          |

- 49 To quit the disk utility, type

**>QUIT**

and press the Enter key.

- 50 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

- 51 To load the ENET node, type

**>LOADEN plane\_no 0 filename**

and press the Enter key.

## System cards in a SuperNode SE 16k ENET (continued)

where

**plane\_no**  
is the ENET plane number (0 or 1)

**filename**  
is the name of the load file

*Example of a MAP response:*

WARNING Any software load in the ENET will be destroyed.  
Please confirm ("YES" or "NO"):

- 52 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to LOADEN ENET Plane:0 Shelf:00 submitted.  
Request to LOADEN ENET Plane:0 Shelf:00 passed.

- 53 To return the ENET plane to service, type

**>RTS plane\_no 0**

and press the Enter key.

where

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 submitted.  
Request to RTS ENET Plane:0 Shelf:00 passed.

There are no suspect cards.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 54 |
| failed             | step 66 |

- 54 To access the ENET SHELF level of the MAP, type

**>SHELF 0**

and press the Enter key.

- 55 To manually busy all crosspoint cards in the ENET shelf, type

**>BSY plane\_no ALL**

and press the Enter key.

where

## System cards in a SuperNode SE 16k ENET (continued)

**plane\_no**

is the number of the ENET plane (0 or 1) containing the card you are working on

|  | If the BSY command | Do      |
|--|--------------------|---------|
|  | passed             | step 56 |
|  | failed             | step 66 |

**56** To return all crosspoint cards on the shelf to service, type  
**>RTS plane\_no ALL**  
and press the Enter key.

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to RTS ENET Plane:1 Shelf:00 submitted.  
Request to RTS ENET Plane:1 Shelf:00 passed.

**57** To access the ENET SYSTEM level of the MAP display, type  
**>SYSTEM**  
and press the Enter key.

**58** To clear the deload condition on all crosspoint cards in the plane, type  
**>DELOAD plane\_no 0 CLEAR**  
and press the Enter key.

*where*

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

**59** The next action depends if you recorded a list of deloaded cards in step 8.

| If you                     | Do      |
|----------------------------|---------|
| recorded a card list       | step 60 |
| did not record a card list | step 63 |

**60** To access the SHELF level of the MAP display, type  
**>SHELF 0**  
and press the Enter key.



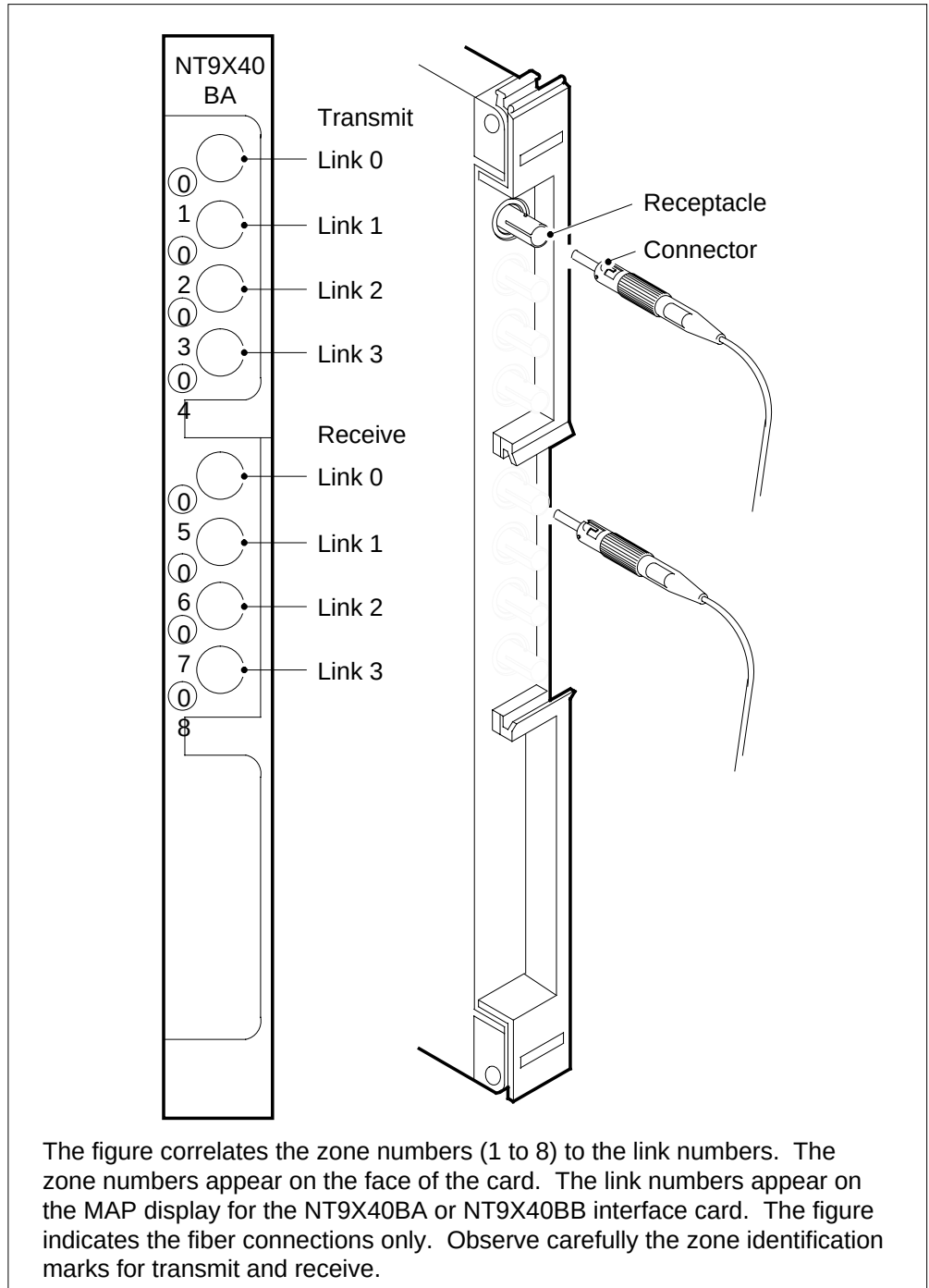
## System cards in a SuperNode SE 16k ENET (continued)

---

- 61** Set the first card on the list to the deloaded state , type  
**>DELOAD plane\_no slot\_no SET**  
and press the Enter key.  
*where*  
**plane\_no**  
is the ENET plane number (0 or 1)  
**slot\_no**  
is the number of the slot the card occupies (slots 12 to 19 on plane 0  
or slots 22 to 29 on plane 1)
- | <b>If all cards on the list</b> | <b>Do</b> |
|---------------------------------|-----------|
| are not set to a deloaded state | step 62   |
| are set to a deloaded state     | step 63   |
- 62** Repeat step 61 for the next card on the list.
- 63** The next action depends on the reason that you perform this procedure.
- | <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 64   |
| did not direct you to this procedure | step 68   |
- 64** Return to the maintenance procedure that directed you to this procedure and continue as directed.
- 65** This procedure instructs you to deload a node. Continue this procedure only under special conditions because the mate node has deloaded cards. Consult office personnel or the next level of support. Continue as directed.
- 66** For additional help, contact the next level of support.
- 67** To abort BSY command and continue with dump, type  
**>NO**  
and press the Enter key BSY has been aborted, ENET dump is continuing.
- 68** The procedure is complete.

## System cards in a SuperNode SE 16k ENET (continued)

### NT9X40BA/BB connector zone numbers

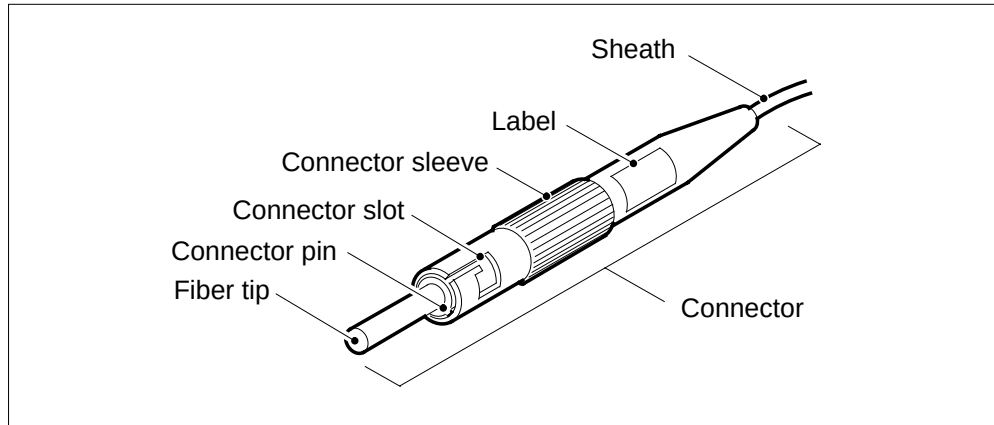


---

## System cards in a SuperNode SE 16k ENET (end)

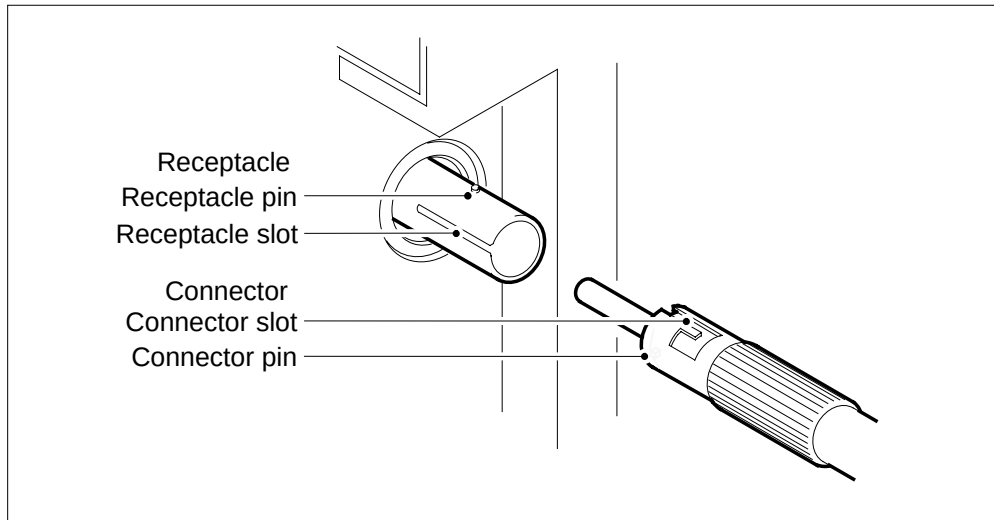
---

### Fiber connector detail



This figure shows the type of connector used to connect fibers to an NT9X40 or NT9X45 paddle board.

### Fiber connector and receptacle detail



This figure shows the different parts of the connector and receptacle.

## System cards in a SuperNode SE 32k ENET

---

### Application

Use this procedure to replace the following cards in a SuperNode SE 32k enhanced network shelf (ENET).

| PEC    | Suffix     | Card name                                    | Shelf or frame name |
|--------|------------|----------------------------------------------|---------------------|
| NT9X13 | FA, KA     | DMS SuperNode processor card                 | 32k ENET            |
| NT9X26 | AA, AB     | Reset terminal interface (RTIF) paddle board | 32k ENET            |
| NT9X30 | AA, AB     | +5V 86-A power converter card                | 32k ENET            |
| NT9X31 | AA, AB     | -5V 20-A power converter for DMS-100E card   | 32k ENET            |
| NT9X36 | BA         | ENET messaging clock card                    | 32k ENET            |
| NT9X40 | BA, BB, DA | ENET + quad fiber paddle board               | 32k ENET, slot 8    |

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

## System cards in a SuperNode SE 32k ENET (continued)

---

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Verifying load compatibility of SuperNode cards*
- *Cleaning fiber optic components and assemblies*

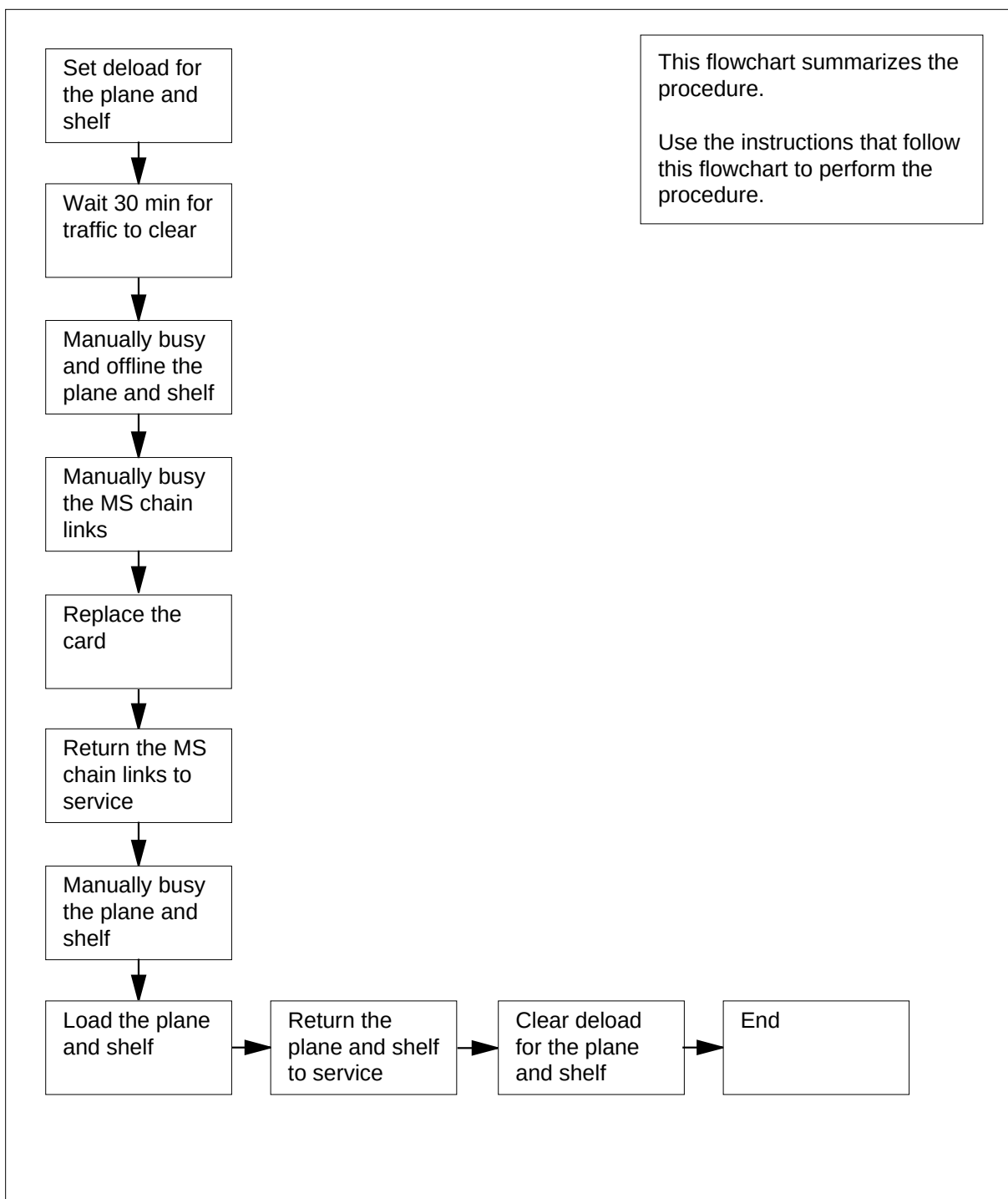
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## System cards in a SuperNode SE 32k ENET (continued)

### Summary of Replacing System cards in a SuperNode SE 32k ENET



## System cards in a SuperNode SE 32k ENET (continued)

### Replacing System cards in a SuperNode SE 32k ENET

#### *At your current location*

1



#### **CAUTION**

##### **System can drop calls**

This procedure removes an ENET shelf from service, which can cause the system to drop calls now in progress. Perform this procedure only if you need to return system and power converter cards to service. If you do not need to return the cards to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

- 2 To make sure that the replacement card is compatible with the software load, perform the procedure *Verifying load compatibility of SuperNode cards*. The procedure *Verifying load compatibility of SuperNode cards* appears in this document. Complete the procedure and return to this point.

#### *At the MAP terminal*

- 3 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

*Example of a MAP display:*

```
SYSTEM
Shelf Plane 0 Plane 1
 00 I CSLink 1 closed .
```

- 4 Check the state of the ENET plane that contains the card you replace. The state appears under the Plane headers on the SYSTEM level MAP display. In the example shown in step 3, plane 0 is in-service trouble (I) and plane 1 is in service.

| If the state of the plane | Do     |
|---------------------------|--------|
| is T (being tested)       | step 5 |
| is other than listed here | step 6 |

- 5 Wait until the system completes system-initiated testing. To evaluate the state of the plane again, go to step 4.

- 6 To determine if deloaded crosspoint cards are in the other plane, type

**>DELOAD plane\_no 0 QUERY**

## System cards in a SuperNode SE 32k ENET (continued)

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1) for the mate node

*Example of a MAP response:*

```
Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.
Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.
 1111111 11122222 22222333
 90123456 78901234 56789012
Plane:0 Shelf:00 ..Y.----- -----
```

**Note:** The letter Y under the slot number indicates a deloaded crosspoint card.

| If the plane                 | Do      |
|------------------------------|---------|
| has deloaded cards           | step 66 |
| does not have deloaded cards | step 7  |

- 7 To determine if deloaded crosspoint cards are in the plane, type

**>DELOAD plane\_no 0 QUERY**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

| If the plane                 | Do     |
|------------------------------|--------|
| has deloaded cards           | step 8 |
| does not have deloaded cards | step 9 |

- 8 Record the slot number for any deloaded crosspoint cards in the plane. Use this list to make sure that these cards are returned to the deloaded state when you complete this procedure.

- 9 To set all crosspoint cards for the plane that associates with the card that you will replace to a deloaded state, type

**>DELOAD plane\_no 0 SET**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*



## System cards in a SuperNode SE 32k ENET (continued)

Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to SET DELOAD ENET Plane:0 Shelf:00 passed.

- 10** Wait 30 min to allow network traffic on the plane to clear.
- 11** The next step depends on the state of the ENET plane that contains the card you replace.

| If the ENET plane         | Do      |
|---------------------------|---------|
| is 0 (offline)            | step 14 |
| is M (manual busy)        | step 13 |
| is other than listed here | step 12 |

- 12** To manually busy the ENET plane that contains the card you replace, type **>BSY plane\_no 0** and press the Enter key.

where

**plane\_no**  
is the ENET plane number (0 or 1)

Example of a MAP response:

Request to MAN BUSY ENET Plane:0 Shelf:00 submitted.  
Request to MAN BUSY ENET Plane:0 Shelf:00 passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 13 |
| failed             | step 57 |

- 13** To offline the ENET plane, type **>OFFL plane\_no 0** and press the Enter key.
- where
- plane\_no**  
is the ENET plane number (0 or 1)

Example of a MAP response:

## System cards in a SuperNode SE 32k ENET (continued)

Request to OFFL ENET Plane:0 Shelf:00 submitted.  
Request to OFFL ENET Plane:0 Shelf:00 passed.

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 14 |
| failed              | step 57 |

- 14** To locate the message switch (MS) chain head card that associates with the ENET plane, type

**>TRNSL plane\_no 0**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to TRNSL ENET Plane:0 Shelf:00 submitted.  
Request to TRNSL ENET Plane:0 Shelf:00 passed.  
ENET Plane:0 Shelf:00 : MS 0 and 1 Card:16 Link:00 Port:000

**Note:** In the example, the number of the chain head card on the MS is 16.  
The link number is 0.

- 15** Record the number of the chain head card and the link number.

- 16** To access the MS;SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

|         |                                                     |        |       |                                   |               |   |     |
|---------|-----------------------------------------------------|--------|-------|-----------------------------------|---------------|---|-----|
|         | Message Switch                                      | Clock  | Shelf | 0                                 | Inter-MS Link | 0 | 1   |
| MS 0    | M                                                   | Slave  | C     |                                   |               | - | -   |
| MS 1    | .                                                   | M Free | F     |                                   |               | - | -   |
| Shelf 0 |                                                     |        |       | 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 |               |   |     |
| Card    | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |        |       |                                   |               |   |     |
| Chain   |                                                     |        |       |                                   |               |   |     |
| MS 0    | .                                                   | .      | .     | .                                 | .             | . | F I |
| MS 1    | .                                                   | .      | .     | .                                 | .             | . | F I |

- 17** To access the Chain level of the MAP display, type

**>CHAIN card\_no**

and press the Enter key.

where

## System cards in a SuperNode SE 32k ENET (continued)

**card\_no**

is the card number that you recorded in step 15

*Example of a MAP display:*

```
Chain 05 Range Link 0 1
MS 0 . 16-17 DS512 . .
MS 1 . 16-17 DS512 . .
```

- 18** To manually busy the link on the chain on MS 0, type

**>BSY 0 LINK link\_no**

and press the Enter key.

*where*

**link\_no**

is the link number that you recorded in step 15

*Example of a MAP response:*

```
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0
submitted.
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0 passed.
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 19 |
| failed             | step 67 |

- 19** To manually busy the link on the chain on MS 1, type

**>BSY 1 LINK link\_no**

and press the Enter key.

*where*

**link\_no**

is the link number that you recorded in step 15

- 20** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
Request to MAN BUSY MS: 1 shelf: 0 chain:16 link 0
submitted.
Request to MAN BUSY MS: 1 shelf: 0 chain:16 link 1 passed.
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 21 |

## System cards in a SuperNode SE 32k ENET (continued)

|    | If the BSY command                                                                                                                                                                                                                                                                                                                                                                                                                                           | Do      |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | failed                                                                                                                                                                                                                                                                                                                                                                                                                                                       | step 67 |
| 21 | <p>To access the ENET SHELF level of the MAP display, type</p> <p><b>&gt;NET;SHELF 0</b></p> <p>and press the Enter key.</p> <p>where</p> <p><b>plane_no</b><br/>is the ENET plane number (0 or 1)</p> <p>Example of a MAP display:</p> <pre> SHELF 01 Slot      1111111 11122222 22222333 333333               123456 78 90123456 78901234 56789012 345678 Plane 0      0 0 00 CCCCCCCC ----- CCCCCCCC 0 0 Plane 1      . . .. ..... ----- ..... . . </pre> |         |
| 22 | <p>To busy all crosspoint cards on the shelf, type</p> <p><b>&gt;BSY plane_no ALL</b></p> <p>and press the Enter key.</p> <p>where</p> <p><b>plane_no</b><br/>is the ENET plane number (0 or 1)</p> <p>Example of a MAP response:</p> <pre> WARNING: This action will be performed on ALL XPT slots          in ENET Plane:1 that are MBSY, INSV, OFFL,          SBSY, or CBSY. Please confirm ("YES", "Y", "NO", or "N"): </pre>                            |         |
| 23 | <p>To confirm the command, type</p> <p><b>&gt;YES</b></p> <p>and press the Enter key.</p> <p>Example of a MAP response:</p> <pre> Request to MAN BSY ALL ENET Plane:1 Shelf:00 submitted. Request to MAN BSY ALL ENET Plane:1 Shelf:00 completed. </pre>                                                                                                                                                                                                     |         |
|    | If the BSY command                                                                                                                                                                                                                                                                                                                                                                                                                                           | Do      |
|    | passed                                                                                                                                                                                                                                                                                                                                                                                                                                                       | step 21 |
|    | failed                                                                                                                                                                                                                                                                                                                                                                                                                                                       | step 67 |

## System cards in a SuperNode SE 32k ENET (continued)

- 24 To offline all crosspoint cards on the shelf, type

**>OFFL plane\_no ALL**

and press the Enter key.

*Example of a MAP response:*

Request to OFFLINE ALL ENET Plane:1 Shelf:00 submitted.  
Request to OFFLINE ALL ENET Plane:1 Shelf:00 completed.

### **At the ENET shelf**

- 25



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

The next action depends on the ENET card that you replace.

| <b>If you</b>               | <b>Do</b>                                                                                                                                                                                                                                                                |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| replace an NT9X30 or NT9X31 | step 28                                                                                                                                                                                                                                                                  |
| replace an NT9X13           | step 26                                                                                                                                                                                                                                                                  |
| replace an NT9X40           | step 30                                                                                                                                                                                                                                                                  |
| replace an NT9X26 or NT9X36 | step b                                                                                                                                                                                                                                                                   |
| 26                          | To unseat the NT9X36 (messaging clock) card on the shelf, perform the procedure <i>Unseating cards in equipment shelves</i> . The procedure <i>Unseating cards in equipment shelves</i> appears in this NTP. Complete the procedure. Wait 20 s and return to this point. |
| 27                          | To reseat the NT9X36 card, perform the procedure <i>Reseating cards in equipment shelves</i> in this NTP. Complete the procedure. Wait 20 s and return to this point.<br>Go to step 33.                                                                                  |

## System cards in a SuperNode SE 32k ENET (continued)

- 28** Power down the NT9X31 card that associates with the ENET shelf. To power down the card, press down and release the power switch on the faceplate of the card.

**Note:** The CONVERTER OFF LED turns on when the converter powers down.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is lit                   | step 29 |
| is not lit               | step 67 |

- 29** Power down the NT9X30 card that associates with the ENET shelf. To power down the card, press down and release the power switch on the faceplate of the card.

**Note:** The CONVERTER OFF LED turns on when the converter powers down.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is lit                   | step 33 |
| is not lit               | step 67 |

**30**

### ATTENTION

Make sure that you identify connector zone numbers correctly. To identify zone numbers, refer to figure “NT9X40BA/BB connector zone number” for the NT9X40. Figures “Fiber connector detail” and “Fiber connector receptacle detail” are diagrams of fiber connector components for these cards. These figures are at the end of this chapter.

Make sure that you are at the correct ENET node and interface card, before you disconnect the fiber cables. To identify the ENET node, check the plane and shelf identification. To identify the interface card, check the slot.

- 31** Make sure that each cable has a label that contains the following information:

- ENET shelf number
- plane number
- slot number
- link number
- signal type

The signal type can be transmit or receive. If this information is not present, create a label and attach the label to the cable. This label provides information on how to connect the fiber cables to the card.

## System cards in a SuperNode SE 32k ENET (continued)

*Example of a label:*

|      |     |     |
|------|-----|-----|
| ENCO | 00  | 39  |
| 10R  | 04  | 17T |
| LTE  | 000 | 18  |
| 22R  | RX  |     |

*Label field descriptions*

|      |                                                                 |
|------|-----------------------------------------------------------------|
| ENCO | ENET plane (0 or 1)                                             |
| 00   | cabinet number                                                  |
| 39   | ENET shelf by the base mounting position number                 |
| 10R  | slot number and position (R for rear, or F for front)           |
| 04   | zone number                                                     |
| 17T  | link number and the signal type (T for transmit, R for receive) |
| LTE  | PM that the cable terminates on                                 |
| 000  | PM frame number                                                 |
| 18   | PM shelf by the base mounting position number                   |
| 22R  | slot number and position (R for rear, or F for front)           |
| RX   | signal type at the PM end (RX for receive or TX for transmit)   |

32



### **DANGER**

#### **Avoid contamination of the fiber tip surface**

Make sure that you do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



### **DANGER**

#### **Fiber cable can become damaged**

Make sure that you handle fiber cables carefully. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

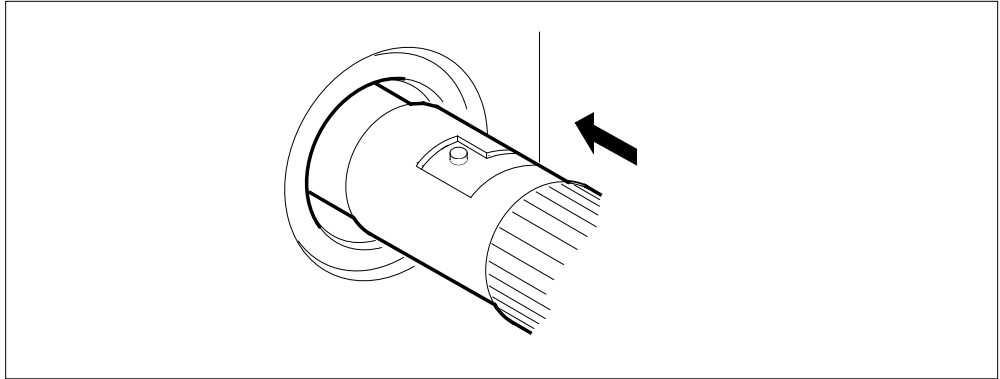
Disconnect the transmit and receive connectors for each fiber cable.

**Note:** When you disconnect the connectors, place dust caps on the ends of the connectors.

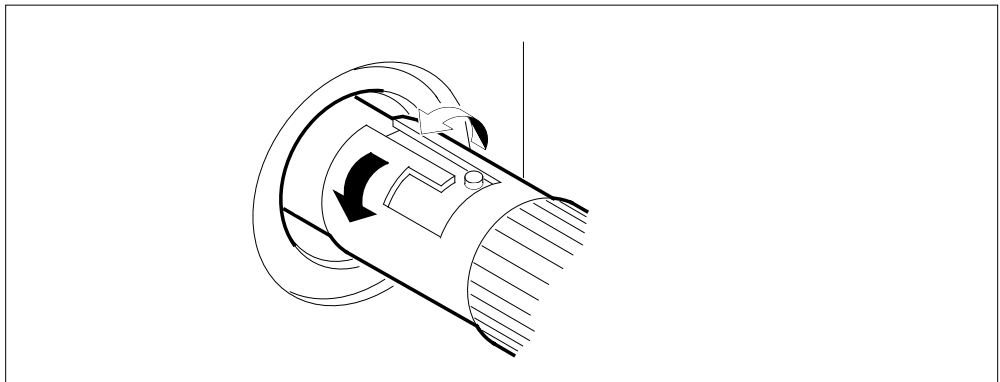
- a Grasp the sleeve with two fingers. Carefully push the sleeve toward the frame.

## System cards in a SuperNode SE 32k ENET (continued)

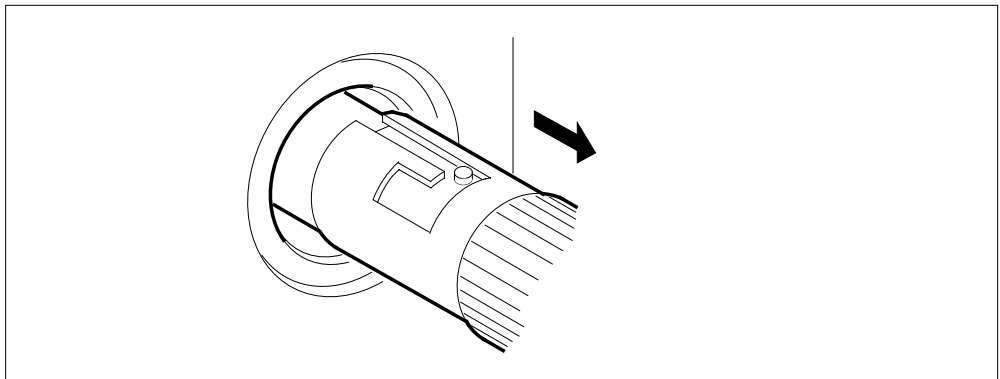
---



- b** Turn the connector counterclockwise until the connector pin is in the position shown in the following diagram.



- c** Carefully pull the connector away from the frame.



**Note:** Perform the procedure, *Cleaning fiber optic components and assemblies* in this NTP.

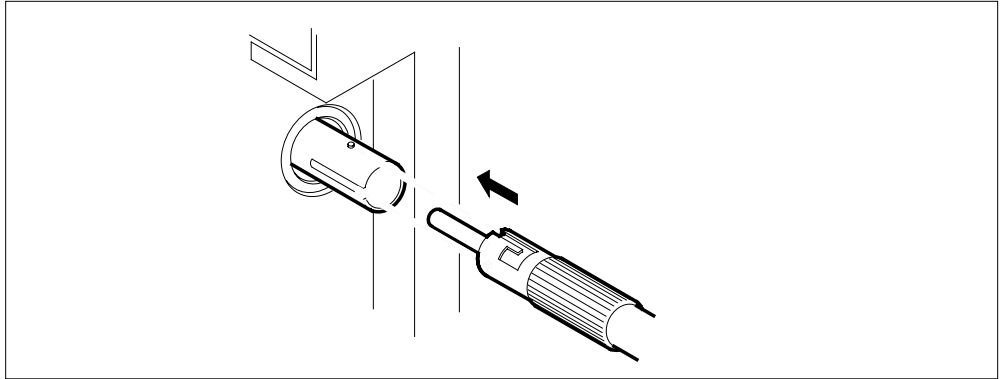


## System cards in a SuperNode SE 32k ENET (continued)

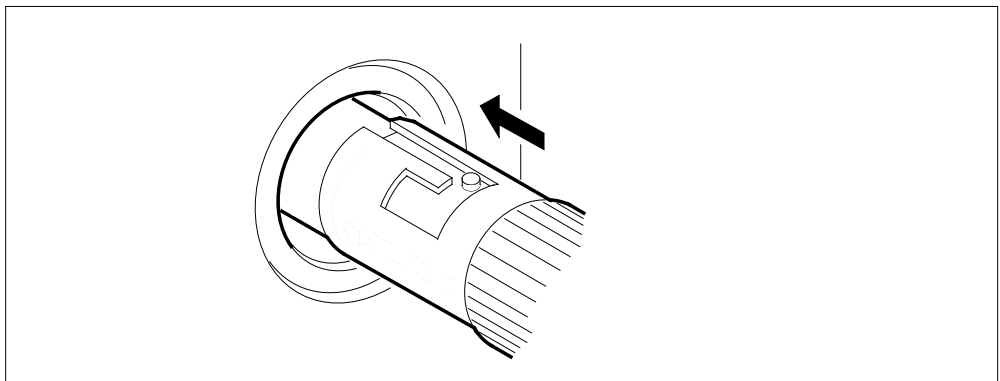
- 33** To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note 1:** If you replace the power converter card, make sure that the PWR switch on the replacement power converter is in the OFF position.
- Note 2:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.
- 34** The next action depends on the card that you replace.
- | If you                     | Do      |
|----------------------------|---------|
| replace a NT9X30 or NT9X31 | step 35 |
| replace a NT9X26 or NT9X36 | step 38 |
| replace a NT9X40           | step 37 |
| replace a NT9X13           | step 40 |
- 35** To power up the NT9X30 card, press up and release the power switch on the faceplate of the card.
- Note:** The CONVERTER OFF LED turns off when the converter powers up.
- | If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is not lit               | step 36 |
| is lit                   | step 67 |
- 36** To power up the NT9X31 card, press up and release the power switch on the faceplate of the card.
- Note:** The CONVERTER OFF LED turns off when the converter powers up.
- | If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is not lit               | step 40 |
| is lit                   | step 67 |
- 37** When you connect the connectors to the new card, remove the dust caps on the transmit and receive connectors.
- Connect the transmit and receive connectors for each fiber cable.
- a** Align the connector pin and slot with the receptacle slot and pin, in the sequence given, as shown in the following diagram.

## System cards in a SuperNode SE 32k ENET (continued)

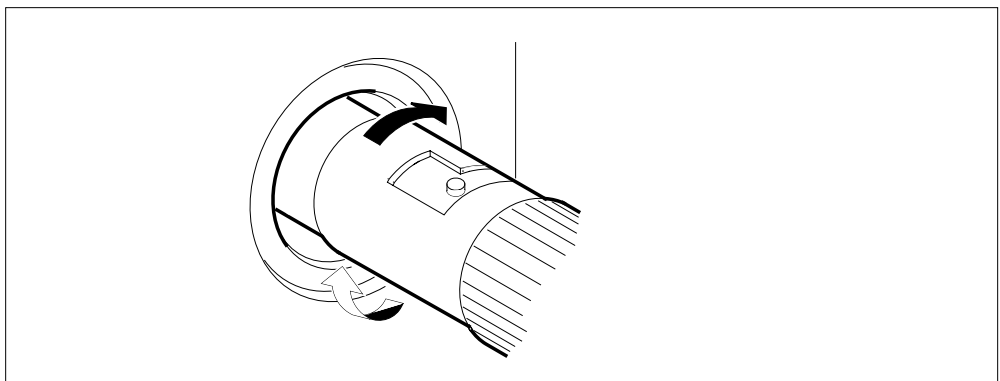
---



**b** Carefully slide the connector into the receptacle.

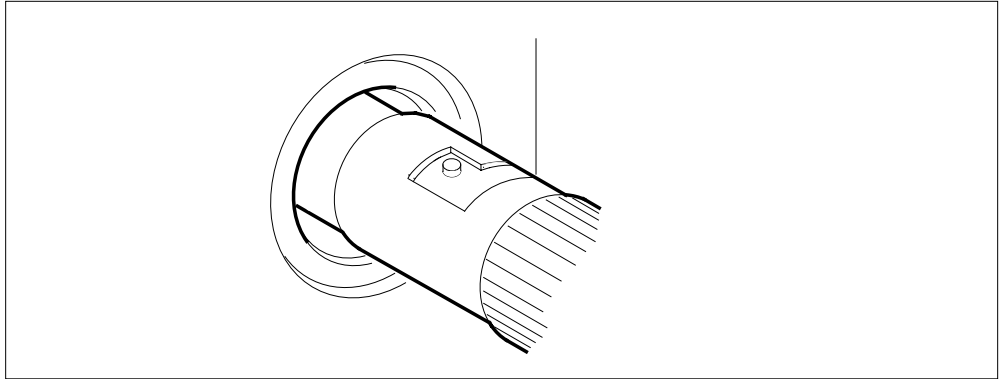


**c** Turn the connector clockwise to lock the connector in place.



**d** Release the connector. The following figure displays the final connector position.

## System cards in a SuperNode SE 32k ENET (continued)



- 38** To unseat the NT9X13 (processor) card on the shelf side, perform the procedure *Unseating cards in equipment shelves*. The procedure *Unseating cards in equipment shelves* appears in this NTP. Complete the procedure and return to this point.
- 39** To reseat the NT9X13 card on the shelf side, perform the procedure *Reseating cards in equipment shelves*. The procedure *Reseating cards in equipment shelves* appears in this NTP. Complete the procedure and return to this point.

### ***At the MAP terminal***

- 40** To access the Chain level of the MAP display, type  
**>MS;SHELF;CHAIN card\_no**  
 and press the Enter key.  
*where*  
**card\_no**  
 is the card number that you recorded in step 15
- 41** To return the link on the chain on MS 0 to service, type  
**>RTS 0 LINK link\_no**  
 and press the Enter key.  
*where*  
**link\_no**  
 is the link number that you recorded in step 15

*Example of a MAP response:*

Request to RTS MS: 0 shelf: 0 chain:16 link 0 submitted.  
 Request to RTS MS: 0 shelf: 0 chain:16 link 0 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 42 |

## System cards in a SuperNode SE 32k ENET (continued)

|           | If the RTS command                                                                                                                                                                                         | Do      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | failed                                                                                                                                                                                                     | step 67 |
| <b>42</b> | To return the link on the chain on MS 1 to service, type<br><b>&gt;RTS 1 LINK link_no</b><br>and press the Enter key.<br><i>where</i><br><b>link_no</b><br>is the link number that you recorded in step 15 |         |
|           | If the RTS command                                                                                                                                                                                         | Do      |
|           | passed                                                                                                                                                                                                     | step 43 |
|           | failed                                                                                                                                                                                                     | step 67 |
| <b>43</b> | To access the NET;SYSTEM level of the MAP display, type<br><b>&gt;NET;SYSTEM</b><br>and press the Enter key.                                                                                               |         |
| <b>44</b> | To manually busy the ENET plane, type<br><b>&gt;BSY plane_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)                                       |         |
|           | If the BSY command                                                                                                                                                                                         | Do      |
|           | passed                                                                                                                                                                                                     | step 45 |
|           | failed                                                                                                                                                                                                     | step 67 |
| <b>45</b> | The next action depends on the location of the load file.                                                                                                                                                  |         |
|           | If the load file                                                                                                                                                                                           | Do      |
|           | is the same as specified in tables PMLOADS and ENINV                                                                                                                                                       | step 46 |
|           | is different from the file specified in tables PMLOADS and ENINV                                                                                                                                           | step 47 |

## System cards in a SuperNode SE 32k ENET (continued)

---

- 46** To load the plane, type  
**>LOADEN plane\_no 0**  
and press the Enter key.  
*where*  
**plane\_no**  
is the ENET plane number (0 or 1)  
*Example of a MAP response:*
- WARNING Any software load in the ENET will be destroyed.  
Please confirm ("YES" or "NO"):
- Go to step 53.
- 47** To access the CI level of the MAP display, type  
**>QUIT ALL**  
and press the Enter key.
- 48** To access the disk utility, type  
**>DISKUT**  
and press the Enter key.  
*Example of a MAP response:*
- Disk utility is now active.  
DISKUT:
- 49** To list the contents for the volume that contains the loadfile, type  
**>LISTFILE vol\_name**  
and press the Enter key.  
*where*  
**vol\_name**  
is the name of the volume that contains the loadfile  
*Example of a MAP response:*

## System cards in a SuperNode SE 32k ENET (continued)

File information for volume S00DVOL1:  
{NOTE: 1 BLOCK = 512 BYTES }

| LAST<br>MODIFY<br>DATE | FILE<br>CODE | O<br>R<br>E<br>T<br>P<br>G<br>C<br>O<br>E<br>C<br>N | I<br>O<br>P<br>E<br>C<br>N | FILE<br>SIZE<br>IN<br>BLOCKS | NUM OF<br>RECORDS<br>IN<br>FILE | MAX<br>REC<br>LEN | FILE NAME        |
|------------------------|--------------|-----------------------------------------------------|----------------------------|------------------------------|---------------------------------|-------------------|------------------|
| 760128                 | 0 0 F        |                                                     |                            | 277                          | 3219                            | 44                | EDRMAC07         |
| 941101                 | 0 I F Y      |                                                     |                            | 9494                         | 4747                            | 1020              | RAPC03AW_1101_MS |
| 760104                 | 0 0 V        |                                                     |                            | 651                          | 162                             | 2048              | MPC402BX         |
| 760104                 | 0 0 F        |                                                     |                            | 63                           | 424                             | 76                | TDCMPA01         |
| 760104                 | 0 0 F        |                                                     |                            | 37                           | 249                             | 76                | TTMNA01          |
| 941101                 | 0 I F Y      |                                                     |                            | 202934                       | 101467                          | 1020              | RAPC03AW_1101_CM |
| 941025                 | 0 I F        |                                                     |                            | 9494                         | 4747                            | 1020              | RBCS35CV_1025_MS |
| 941025                 | 0 I F        |                                                     |                            | 242454                       | 121227                          | 1020              | RBCS35CV_1025_CM |
| 940426                 | 0 0 F        |                                                     |                            | 784                          | 392                             | 1024              | MPCX33AB         |
| 930427                 | 0 0 F        |                                                     |                            | 314                          | 2006                            | 80                | MTULI01          |

**50** To quit the disk utility, type

**>QUIT**

and press the Enter key.

**51** To return to the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

**52** To load the plane, type

**>LOADEN plane\_no 0 filename**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**filename**

is the name of the load file

*Example of a MAP response:*

WARNING Any software load in the ENET will be destroyed.  
Please confirm ("YES" or "NO"):

**53** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to LOADEN ENET Plane:0 Shelf:00 submitted.  
Request to LOADEN ENET Plane:0 Shelf:00 passed.

## System cards in a SuperNode SE 32k ENET (continued)

- 54 To return the ENET plane to service, type

**>RTS plane\_no**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 submitted.  
Request to RTS ENET Plane:0 Shelf:00 passed.

There are no suspect cards.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 55 |
| failed             | step 67 |

- 55 To access the ENET SHELF level of the MAP, type

**>SHELF 0**

and press the Enter key.

- 56 To busy all crosspoint cards on the shelf, type

**>BSY plane\_no ALL**

and press the Enter key.

**plane\_no**

is the ENET plane number (0 or 1)

- 57 To return all crosspoint cards on the shelf to service, type

**>RTS plane\_no ALL**

and press the Enter key.

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to RTS ALL ENET Plane:1 Shelf:00 submitted.  
Request to RTS ALL ENET Plane:1 Shelf:00 completed.

- 58 To access the ENET SYSTEM level of the MAP display, type

**>SYSTEM**

and press the Enter key.

- 59 To clear the deload condition on all crosspoint cards in the plane, type

**>DELOAD plane\_no 0 CLEAR**

## System cards in a SuperNode SE 32k ENET (continued)

---

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

- 60** The next action depends if you recorded a list of deloaded cards in step 8.

| If you                     | Do      |
|----------------------------|---------|
| recorded a card list       | step 61 |
| did not record a card list | step 64 |

- 61** To access the SHELF level of the MAP display, type

**>SHELF 0**

and press the Enter key.

- 62** To set the first card on the list to the deloaded state, type

**>DELOAD plane\_no slot\_no SET**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

**slot\_no**

is the slot number (8 to 32)

| If all the cards on the list | Do      |
|------------------------------|---------|
| are deloaded                 | step 63 |
| are not deloaded             | step 64 |

- 63** Repeat step 62 for the next card on the list.

- 64** The next action depends on the reason that you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 65 |
| did not direct you to this procedure | step 68 |

- 65** Return to the maintenance procedure that directed you to this procedure and continue as directed.



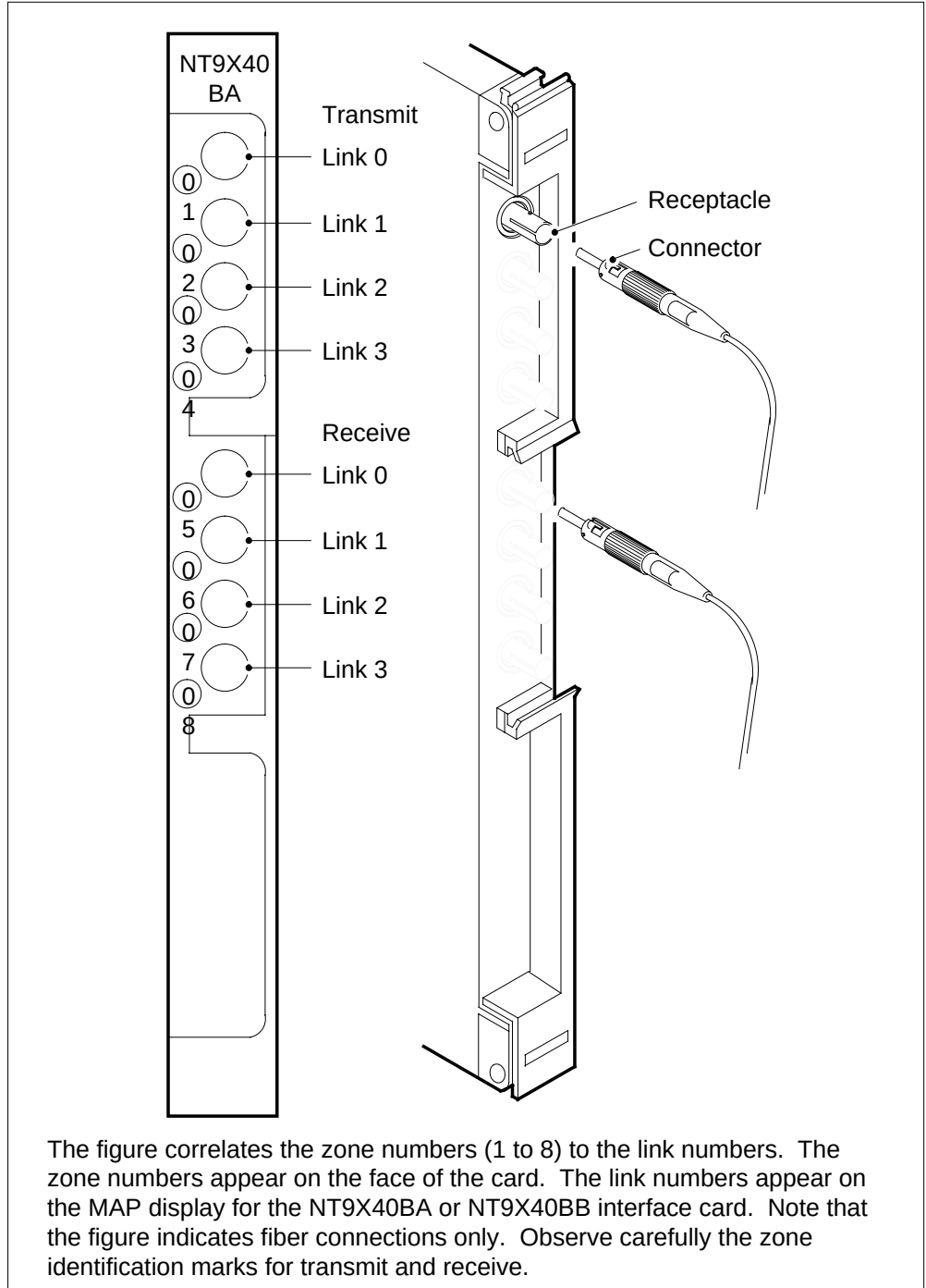
**System cards**  
**in a SuperNode SE 32k ENET** (continued)

---

- 66**     This procedure instructs you to deload and manually busy a node. Continue this procedure only under special conditions because the mate node has deloaded cards. Consult office personnel or the next level of support. Continue as directed.
- 67**     For additional help, contact the next level of support.
- 68**     The procedure is complete.

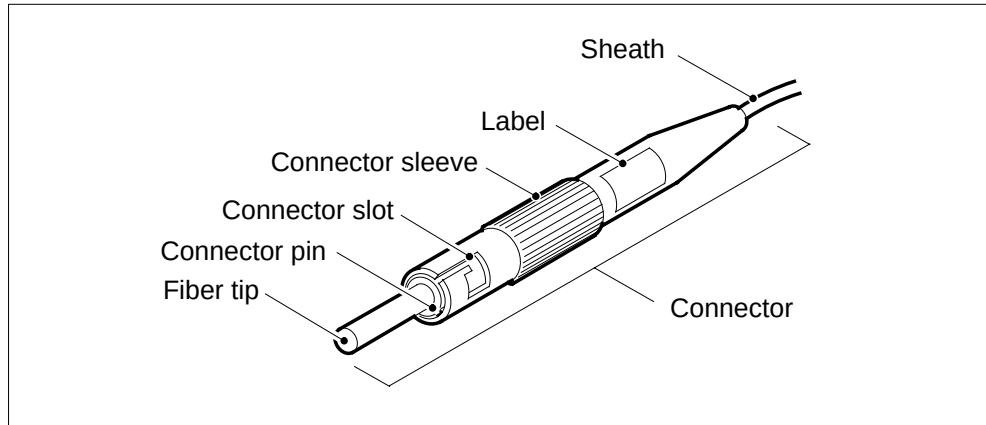
## System cards in a SuperNode SE 32k ENET (continued)

### NT9X40BA/BB connector zone numbers



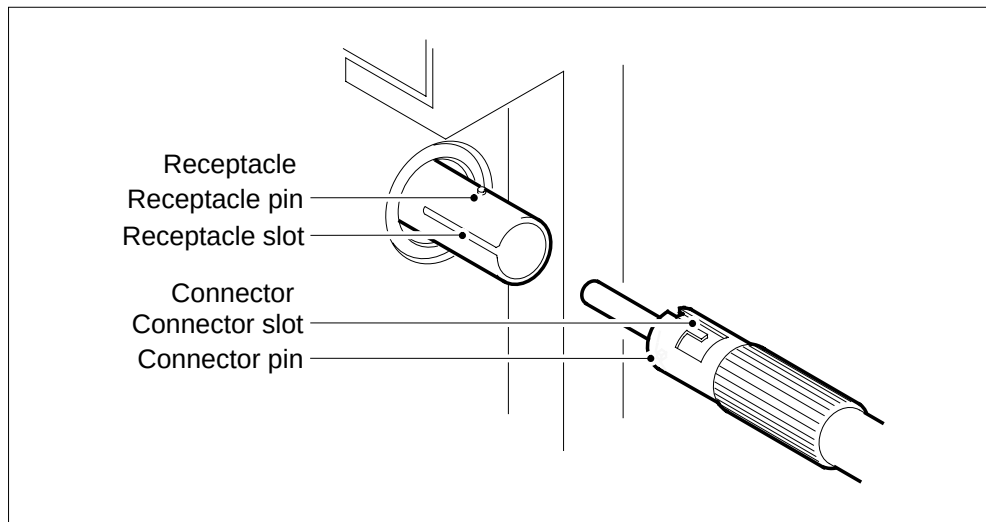
## System cards in a SuperNode SE 32k ENET (end)

### Fiber connector detail



The preceding figure displays the type of connector used to connect fibers to an NT9X40 or NT9X45 paddle board.

### Fiber connector and receptacle detail



This figure shows the different parts of the connector and receptacle.



---

# 7 File processor card replacement procedures

---

## Introduction

This chapter provides card replacement procedures for the file processor (FP). The first section in the chapter provides illustrations of FP shelf designs.

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) are in the chapter “Frame supervisory panel and maintenance supervisory panel card replacement procedures”.

Each procedure contains the following sections:

- Application
- Common procedures
- Action

## Application

This section identifies the FP card(s) the replacement procedure covers.

## Common procedures

This section lists common procedures in the FP card replacement procedure. A common procedure is a series of steps that you repeat within maintenance procedures. The procedure for the removal and replacement of a card is an example of a common procedure. Common procedures are in the common procedures chapter in this NTP.

Do not go to the common procedures unless the step-action procedure directs you.

## Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## **Recording card replacement activities**

When you replace a card, record the following information in office records:

- the serial number of the card you replaced
- the date you replaced the card
- the reason you replaced the card

---

## SuperNode Multicomputing Base shelf layouts

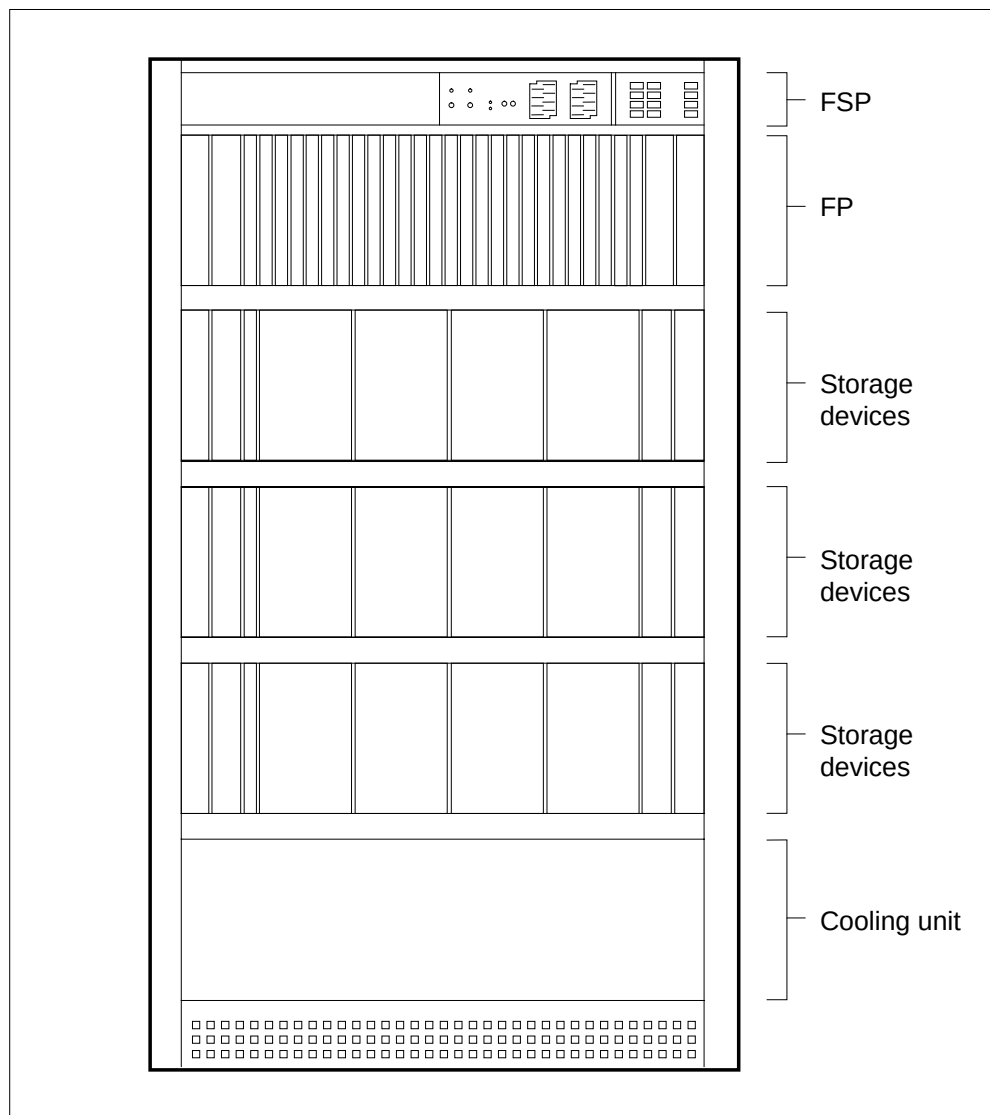
---

### Application

This procedure contains the following design diagrams:

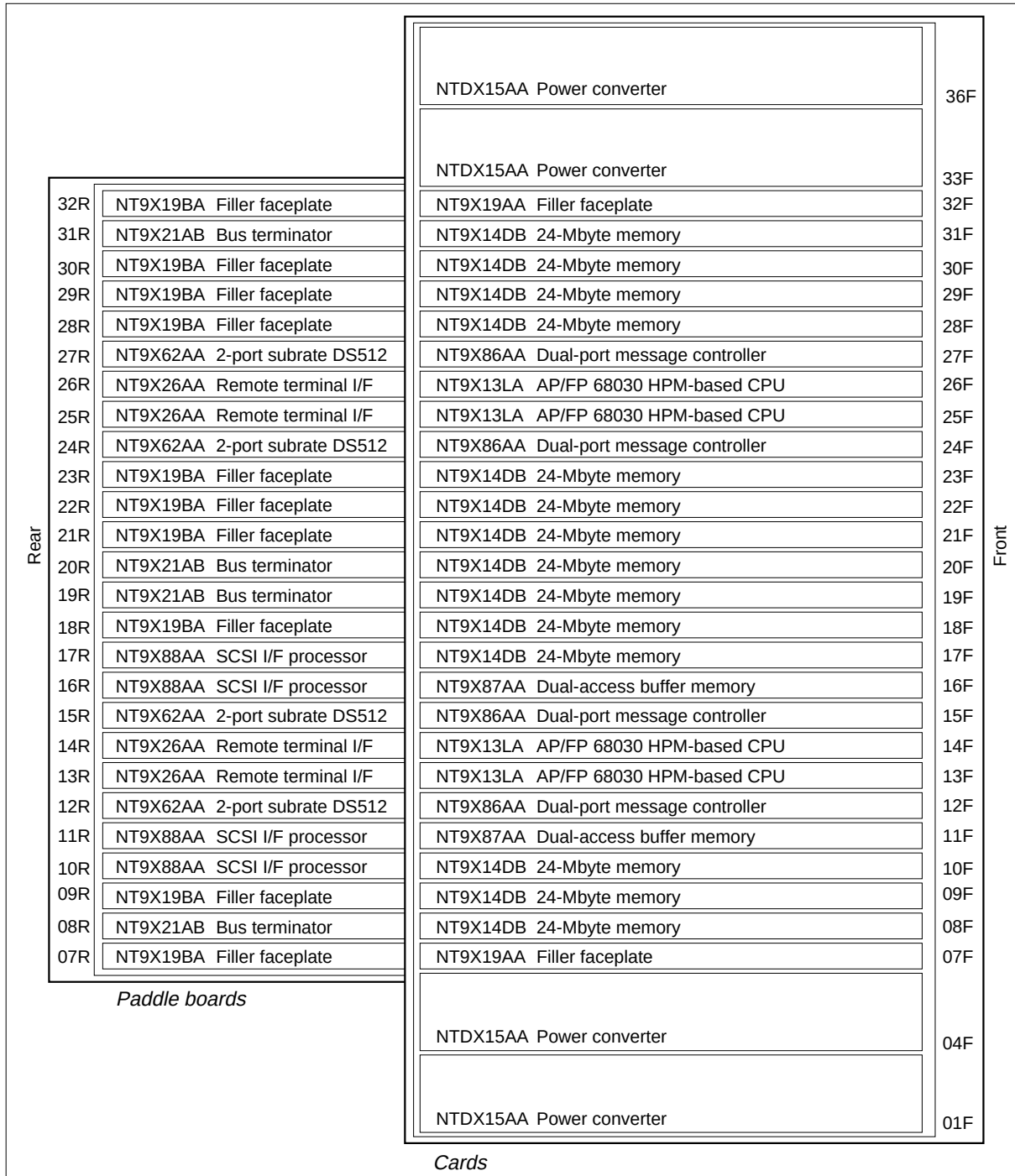
- application processor cabinet (APC)
- file processor (FP) shelf
- FP storage device shelf

**Figure 1** Application processor cabinet with FP



## SuperNode Multicomputing Base shelf layouts (continued)

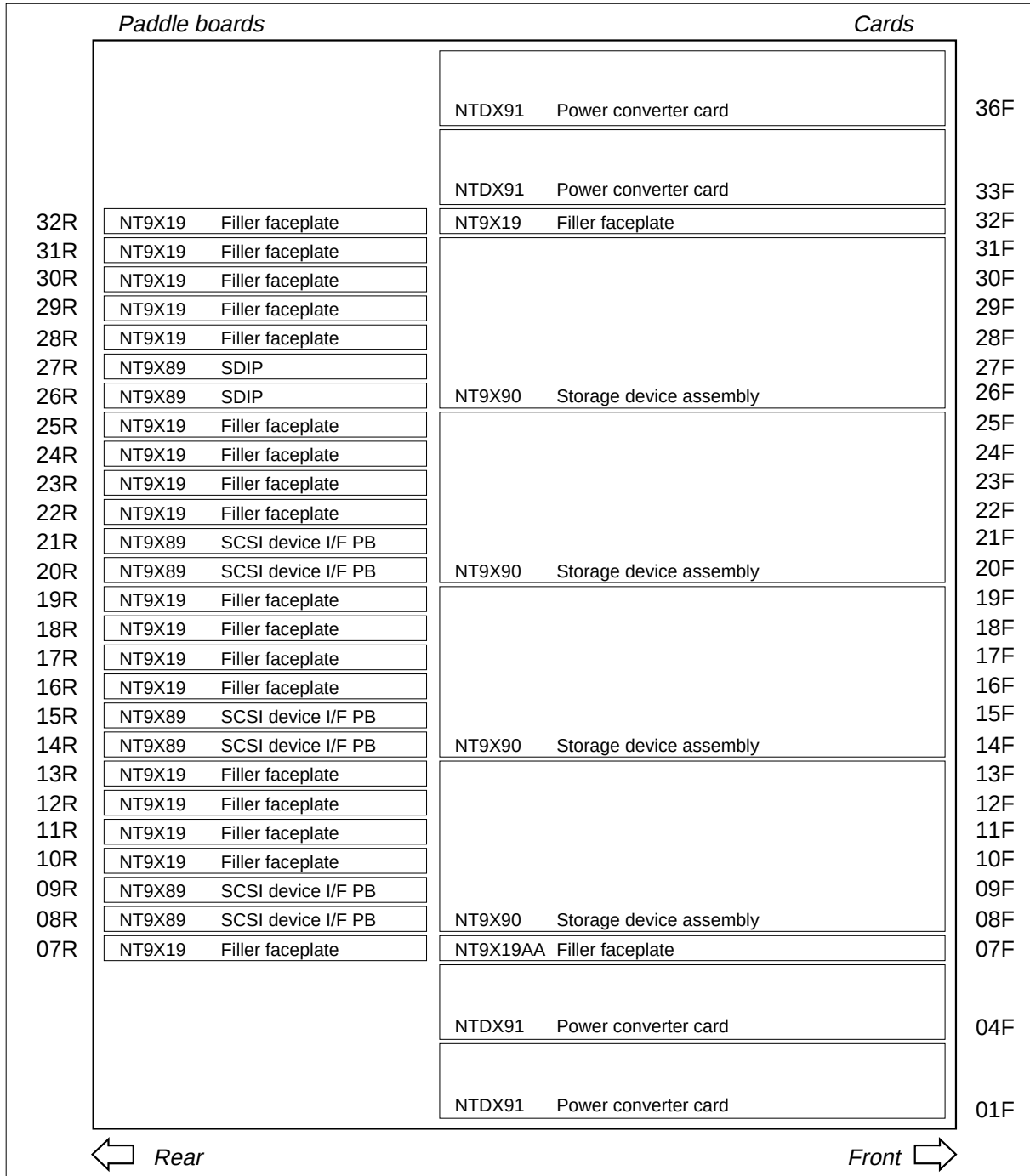
Figure 2 File processor shelf





## SuperNode Multicomputing Base shelf layouts (end)

**Figure 3**File processor storage device shelf



## NT9X89 in a storage device shelf in a file processor

---

### Application

Use this procedure to replace a NT9X89 in a storage device shelf for a SuperNode Multicomputing Base (SMB) file processor (FP). The following table lists the SMB FP.

| PEC    | Suffix | Card name                             | Shelf or frame name |
|--------|--------|---------------------------------------|---------------------|
| NT9X89 | AA, BA | SCSI device interface<br>paddle board | FP storage device   |

Refer to the "Index" if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*

Do not go to the common procedure unless the step-action procedure directs you.

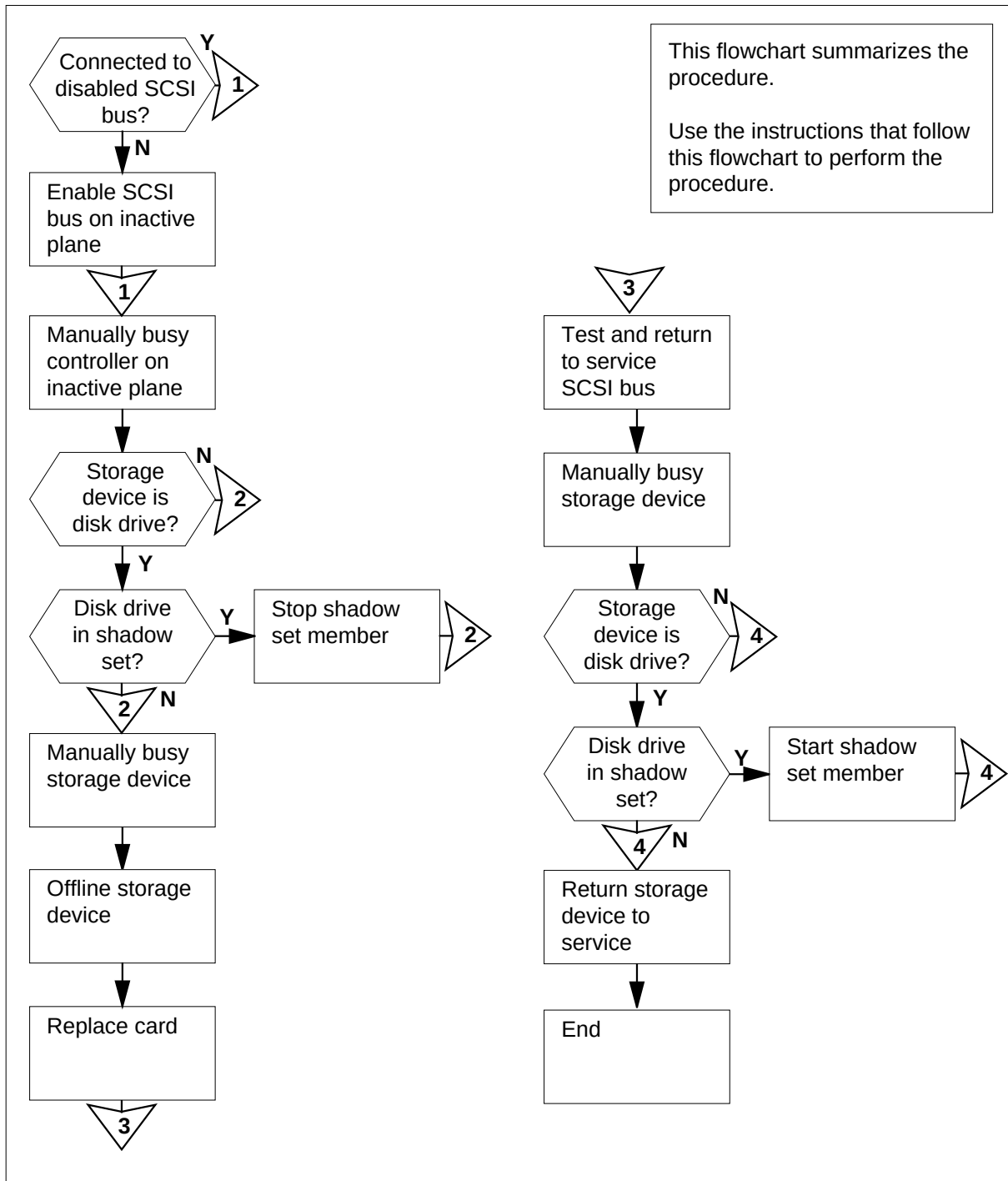
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT9X89

### in a storage device shelf in a file processor (continued)

#### Replacing a NT9X89 in a storage device shelf in a file processor



**NT9X89****in a storage device shelf in a file processor** (continued)**Replacing a NT9X89 in a storage device shelf in a file processor****At your Current Location**

- 1 Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. You must perform this procedure to make sure that the replacement card is compatible with the software load. Complete the procedure and return to this point.

**At the MAP terminal**

- 3 To post the FP that contains the card you replace, type

**>MAPCI;MTC;PM;POST FP fp\_no**

and press the Enter key.

where

**fp\_no**

is the number of the FP (0 to 99) that contains the card you will replace

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 14   | 0    | 5    | 11   |
| FP | 0    | 0    | 2    | 0    | 5    | 4    |

|        |           |        |         |
|--------|-----------|--------|---------|
| FP 20: | FP20_QPI0 | Plane  | Devices |
| ISTb   |           | NoSync | 1SysB   |

- 4 To access the Devices level of the MAP display, type

**>DEVICES**

and press the Enter key.

*Example of a MAP display:*

|        |           |        |             |
|--------|-----------|--------|-------------|
| FP 3:  | FP3_SR256 | Plane  | Devices     |
| ISTb   |           | NoSync | .           |
|        | CTRL0     | CTRL1  | DEVICE      |
| DABM   | .         | .      | 0 1 2 3 4 5 |
| SCSI 0 | .(EN)     | .(DIS) | - . - . - - |
| SCSI 1 | .(EN)     | .(DIS) | - . - . - - |

## NT9X89

### in a storage device shelf in a file processor (continued)

- 5 Determine if the NT9X89 card you replace connects to an enabled (EN) or disabled (DIS) SCSI bus.

| If the SCSI bus | Do     |
|-----------------|--------|
| is enabled      | step 6 |
| is disabled     | step 7 |

**Note:** The EN indicates the SCSI bus is enabled. The DIS indicates the SCSI bus is disabled. CTRL0 (controller 0) corresponds to plane 0 and CTRL1 corresponds to plane 1. The MAP display in step 4 indicates that both SCSI buses on plane 0 are enabled. The MAP display also indicates that both SCSI buses on plane 1 are disabled.

- 6 To switch enable the SCSI bus that associates with the NT9X89 card you replace, type

**>SWEN    scsi\_no**

and press the Enter key.

where

**scsi\_no**

is the number of the enabled SCSI bus (0 or 1)

*Example of a MAP response:*

FP 1 SwEn SCSI 0: Command request has been submitted.

FP 1 SwEn SCSI 0: Command passed.

| If the SWEN command | Do      |
|---------------------|---------|
| passed              | step 7  |
| failed              | step 33 |

- 7 To manually busy the disabled SCSI bus, type

**>BSY    SCSI    scsi\_no**

and press the Enter key.

where

**scsi\_no**

is the number of the disabled SCSI bus (0 or 1)

*Example of a MAP response:*

**NT9X89****in a storage device shelf in a file processor** (continued)

FP 1 Busy SCSI 0: Command request has been submitted.  
 FP 1 Busy SCSI 0: Command passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 8  |
| failed             | step 33 |

- 8** To query the SCSI components of the FP, type

**>QUERYFP SCSI scsi\_no**

and press the Enter key.

where

**scsi\_no**

is the number of the disabled SCSI bus (0 or 1)

Example of a MAP response:

| Card | Firmware | Ctrl | SCSI | Dev | Quad | Shelf | Slot | Status |
|------|----------|------|------|-----|------|-------|------|--------|
| SIP  | SXFW35CV | 0    | 0    | -   | 0    | 0     | 11   | InSv   |
| SDIP | 910822   | 0    | 0    | 0   | 0    | 3     | 8    | SysB   |
| SIP  | SXFW35CV | 1    | 0    | -   | 1    | 0     | 16   | InSv   |
| SDIP | 910822   | 1    | 0    | 0   | 0    | 3     | 9    | InSv   |

- 9** Record the following information for the NT9X89 card (SDIP) you replace:

- SCSI number
- device number
- quadrant location
- shelf number
- slot number

**Note:** The SCSI number appears under the SCSI header in the MAP response example in step 8. The device number appears under the Dev header. The quadrant number appears under the Quad header. The shelf number appears under the Shelf header. The slot number appears under the Slot header.

- 10** To query the device that associates with the NT9X89 card that you replace, type

**>QUERYFP DEV scsi\_no dev\_no**

and press the Enter key.

where

**scsi\_no**

is the SCSI number (0 or 1) you recorded in step 9

## NT9X89

### in a storage device shelf in a file processor (continued)

**dev\_no**

is the device number you recorded in step 9

*Example of a MAP response:*

| Dev  | Name | SCSI | Dev | Type | Quad | Shelf | Slot | Status |
|------|------|------|-----|------|------|-------|------|--------|
|      |      |      |     |      |      |       |      |        |
| DK00 |      | 0    | 0   | dk   | 0    | 3     | 8    | InSv   |

- 11** Record the following information for the storage device that associates with the NT9X89 card (SDIP) you replace:

- device name
- device type

**Note:** The device name appears under the Dev Name header of the MAP response that the system generated in step 10. The device type appears under the Type header.

| If the device type | Do      |
|--------------------|---------|
| is dk              | step 12 |
| is ct              | step 17 |

- 12** Determine if the disk drive is a member of a shadow set.

**Note:** Shadow sets are datafilled in table SHADOW.

| If the disk drive               | Do      |
|---------------------------------|---------|
| is a member of a shadow set     | step 13 |
| is not a member of a shadow set | step 17 |

- 13** Determine the name of the shadow set.

- 14** To access the shadow utility for the FP on which the disk drive resides, type

**>SHADOWUT FP fp\_no**

and press the Enter key

where

**fp\_no**

is the number of the FP (0 to 99) that contains the disk drive

*Example of a MAP response:*

```
FP22 is now node of reference
Disk shadowing utility is now active
SHADOWUT; FP22
```

## NT9X89

### in a storage device shelf in a file processor (continued)

---

- 15 To stop the shadow set member, type

**>STM ss\_name device\_name**

and press the Enter key.

*where*

**ss\_name**

is the name of the shadow set (SS00 or SS01)

**device\_name**

is the device name you recorded in step 11

*Example input:*

**>STM SS00 DK02**

*Example of a MAP response:*

```

**
*** WARNING: ***
*** If this is the last in-service member then File ***
*** Processing will no longer be available on the ***
*** shadow set: SS00 ***

```

Do you wish to proceed?

Please confirm ("Yes", "Y", "No", or "N"):

- 16 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Ok, Shadow Set Member stopped.  
Approximately 1 minute to complete.

Go to step 18.

- 17 To manually busy the storage device, type

**>BSY DEV scsi\_no dev\_no**

and press the Enter key.

*where*

**scsi\_no**

is the SCSI number you recorded in step 9

**dev\_no**

is the device number you recorded in step 9

*Example input:*

**>BSY DEV 0 1**



**NT9X89****in a storage device shelf in a file processor** (continued)

*Example of a MAP response:*

FP 1 Busy DEV 0 1:  
Command request has been submitted.  
FP 1 Busy DEV 0 1: Command passed.

| <b>If the BSY command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 18   |
| failed                    | step 33   |

- 18** To offline the device, type  
**>OFFL DEV scsi\_no dev\_no**  
 and press the Enter key.  
*where*  
     **scsi\_no**  
         is the SCSI number you recorded in step 9  
     **dev\_no**  
         is the device number you recorded in step 9

*Example input:*

**>OFFL DEV 0 1**

*Example of a MAP response:*

FP 1 Offline DEV 0 1: Command request has been submitted.  
 FP 1 Offline DEV 0 1: Command passed.

| <b>If the OFFL command</b> | <b>Do</b> |
|----------------------------|-----------|
| passed                     | step 19   |
| failed                     | step 33   |

**At the storage device shelf**

- 19** Locate the NT9X89 card that you must replace.  
**20** Determine the state of the LEDs on the card.

| <b>If</b>                | <b>Do</b> |
|--------------------------|-----------|
| no LEDs are lit          | step 21   |
| one or both LEDs are lit | step 33   |

## NT9X89

### in a storage device shelf in a file processor (continued)

- 21 Loosen the two screws that secure the connector to the back of the card.
- 22 To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- 23 Tighten the screws that secure the connector at the back of the card.

#### **At the MAP terminal**

- 24 To test the SCSI bus you busied in step 7, type

**>TST SCSI scsi\_no**

and press the Enter key.

where

**scsi\_no**

is the number of the disabled SCSI bus (0 or 1)

*Example of a MAP response:*

```
FP 1 Test DEV 0 1: Command request has been submitted.
FP 1 Test DEV 0 1: Command passed.
```

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 25 |
| failed             | step 33 |

- 25 To return the SCSI bus to service, type

**>RTS SCSI scsi\_no**

and press the Enter key.

where

**scsi\_no**

is the number of the disabled SCSI bus (0 or 1)

*Example of a MAP response:*

```
FP 1 RTS DEV 0 1: Command request has been submitted.
FP 1 RTS DEV 0 1: Command passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 33 |

- 26 To manually busy the storage device you offlined in step 18, type

**>BSY DEV scsi\_no dev\_no**

**NT9X89****in a storage device shelf in a file processor** (continued)

and press the Enter key.

where

**scsi\_no**

is the SCSI number you recorded in step 9

**dev\_no**

is the device number you recorded in step 9

Example input:

**>BSY DEV 0 1**

Example of a MAP response:

FP 1 Busy DEV 0 1: Command request has been submitted.  
FP 1 Busy DEV 0 1:  
Command passed.

|           | <b>If the BSY command</b>                                   | <b>Do</b>                                                   |
|-----------|-------------------------------------------------------------|-------------------------------------------------------------|
|           | passed                                                      | step 27                                                     |
|           | failed                                                      | step 33                                                     |
| <b>27</b> | Determine the type of storage device you busied in step 17. |                                                             |
|           | <b>If the device type</b>                                   | <b>Do</b>                                                   |
|           | is dk                                                       | step 28                                                     |
|           | is ct                                                       | step 32                                                     |
| <b>28</b> | Determine if the disk drive is a member of a shadow set.    |                                                             |
|           | <b>If the disk drive</b>                                    | <b>Do</b>                                                   |
|           | is a member of a shadow set                                 | step 29                                                     |
|           | is not a member of a shadow set                             | step 32                                                     |
| <b>29</b> | To start the shadow set member, type                        |                                                             |
|           | <b>&gt;SM ss_name device_name FORCE</b>                     |                                                             |
|           | and press the Enter key.                                    |                                                             |
|           | where                                                       |                                                             |
|           | <b>ss_name</b>                                              | is the name of the shadow set (SS00 or SS01)                |
|           | <b>device_name</b>                                          | is the name of the shadow set member you stopped in step 15 |

**NT9X89****in a storage device shelf in a file processor** (continued)

---

*Example input:*

**>SM SS00 DK02 FORCE**

*Example of a MAP response:*

The member will be started with the following parameter settings:

Node name : FP2  
Shadow set name: SS00  
Device name : DK02  
Transfer length: Optimal  
Interval : 0  
Synchronization: Default  
Force : NO

Do you want to continue?  
Please confirm ("YES", "Y", "NO", or "N"):

- 30** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

OK, Shadow Set Member start initiated.

---

| If the SM command | Do      |
|-------------------|---------|
| passed            | step 31 |
| failed            | step 33 |

---

- 31** To quit the shadow utility, type

**>QUIT**

and press the Enter key.

Go to step 34.

- 32** To return the device to service, type

**>RTS DEV scsi\_no dev\_no**

and press the Enter key.

*where*

**scsi\_no**  
is the SCSI number you recorded in step 9

**dev\_no**  
is the device number you recorded in step 9

---

**NT9X89**  
**in a storage device shelf in a file processor (end)**

---

*Example of a MAP response:*

FP 1 RTS DEV 0 1: Command request has been submitted.  
FP 1 RTS DEV 0 1: Command passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 34 |
| failed             | step 33 |

**33** For additional help, contact the next level of support.

**34** The procedure is complete.

## NT9X90 in a storage device shelf in a file processor

---

### Application

Use this procedure to replace an NT9X90 in a storage device shelf for a SuperNode Multicomputing Base (SMB) file processor (FP). The following table lists the SMB FP.

| PEC    | Suffix | Card name                                | Shelf or frame name |
|--------|--------|------------------------------------------|---------------------|
| NT9X90 | AA     | Storage device assembly (600-Mbyte disk) | FP storage device   |
| NT9X90 | AB     | Storage device assembly (2.1-Gbyte disk) | FP storage device   |
| NT9X90 | BA     | Storage device assembly (1.2-Gbyte DAT)  | FP storage device   |

Refer to the “Index” if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedure:

- *Verifying load compatibility of SuperNode cards*

Do not go to the common procedure unless the step-action procedure directs you.

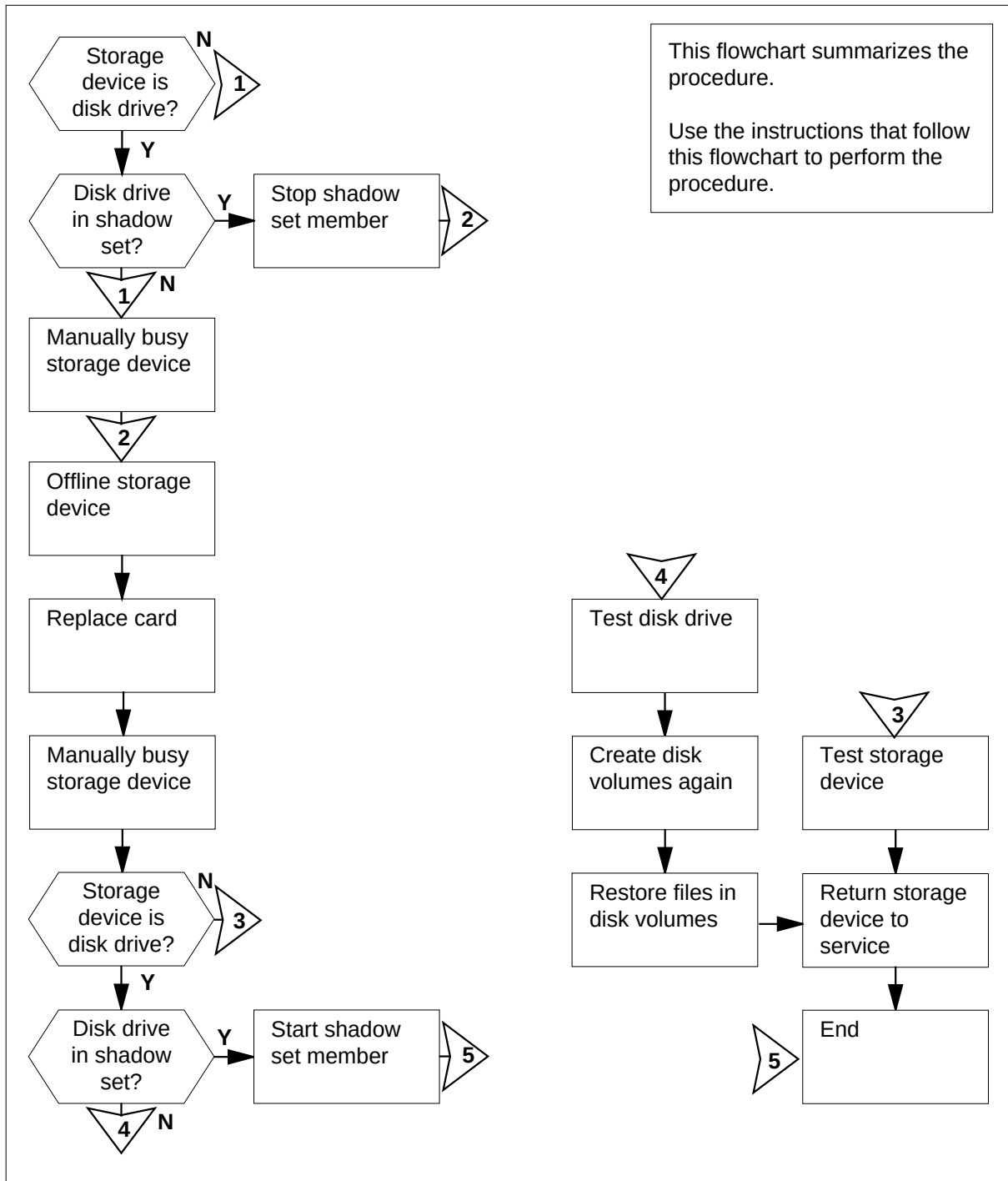
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT9X90

### in a storage device shelf in a file processor (continued)

#### Summary of Replacing a NT9X90 in a storage device shelf in a file processor



**NT9X90****in a storage device shelf in a file processor** (continued)**Replacing a NT9X90 in a storage device shelf in a file processor*****At your current location***

- 1 Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. You must perform this procedure to make sure that the replacement card is compatible with the software load. Complete the procedure and return to this point.

***At the MAP terminal***

- 3 To post the FP that contains the card you will replace, type

```
>MAPCI;MTC;PM;POST FP fp_no
```

and press the Enter key.

where

**fp\_no**

is the number of the FP (0 to 99) that contains the card you will replace

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 14   | 0    | 5    | 11   |
| FP | 0    | 0    | 2    | 0    | 5    | 4    |

|        |           |       |         |
|--------|-----------|-------|---------|
| FP 20: | FP20_QPI0 | Plane | Devices |
| NoSync | 1SysB     |       | ISTb    |

- 4 To access the Devices level of the MAP display, type

```
>DEVICES
```

and press the Enter key.

*Example of a MAP display:*

|        |           |        |             |
|--------|-----------|--------|-------------|
| FP 3:  | FP3_SR256 | Plane  | Devices     |
| ISTb   |           | NoSync | .           |
|        | CTRL0     | CTRL1  | DEVICE      |
| DABM   | .         | .      | 0 1 2 3 4 5 |
| SCSI 0 | .(EN)     | .(DIS) | - . - . -   |
| SCSI 1 | .(EN)     | .(DIS) | - . - . -   |

- 5 To query the device components for the FP, type

```
>QUERYFP DEV ALL ALL
```

and press the Enter key.



## NT9X90

### in a storage device shelf in a file processor (continued)

*Example of a MAP response:*

| Dev  | Name | SCSI | Dev | Type | Quad | Shelf | Slot | Status |
|------|------|------|-----|------|------|-------|------|--------|
| DK00 |      | 0    | 0   | dk   | 0    | 2     | 8    | InSv   |
| CT01 |      | 0    | 1   | ct   | 2    | 2     | 20   | InSv   |
| DK02 |      | 0    | 2   | dk   | 0    | 3     | 8    | InSv   |
| DK03 |      | 0    | 3   | dk   | 2    | 3     | 20   | InSv   |
| DK10 |      | 1    | 0   | dk   | 1    | 2     | 14   | SysB   |
| CT11 |      | 1    | 1   | ct   | 3    | 2     | 26   | InSv   |
| DK12 |      | 1    | 2   | dk   | 1    | 3     | 14   | InSv   |
| DK13 |      | 1    | 3   | dk   | 3    | 3     | 26   | InSv   |

- 6 In the MAP display the system generated in step 5, identify the device you will replace. Record the following information for the device:

- SCSI number
- device number
- device type
- quadrant location
- shelf number
- slot number

**Note:** The SCSI number appears under the SCSI header on the MAP display. The device number appears under the Dev header. The device type appears under the Type header. The quadrant location appears under the Quad header. The shelf number appears under the Shelf header. The slot number appears under the Slot header.

| If the device | Do      |
|---------------|---------|
| is dk         | step 7  |
| is ct         | step 16 |

- 7 The next action depends on why you perform this procedure.

| If                                                                                                            | Do      |
|---------------------------------------------------------------------------------------------------------------|---------|
| the procedure <i>Recovering disks in a shadow set after loss of both disks</i> directed you to this procedure | step 18 |
| other than listed here                                                                                        | step 8  |

**NT9X90****in a storage device shelf in a file processor** (continued)

- 8 Determine if the disk drive is a member of a shadow set.

**Note:** Datafill shadow sets in table SHADOW.

| If the disk drive               | Do      |
|---------------------------------|---------|
| is a member of a shadow set     | step 9  |
| is not a member of a shadow set | step 16 |

- 9 Determine the name of the shadow set.

**Note:** When you display and record the shadow set name, the SCP recovery procedure directs you to this procedure. The SCP recovery procedure is *Recovering disks in a shadow set after loss of one disk*.

- 10 To access the shadow utility for the FP that contains the disk drive, type

**>SHADOWUT FP fp\_no**

and press the Enter key.

where

**fp\_no**

is the number of the FP (0 to 99) that contains the disk drive

- 11 To display information on the shadow set, type

**>DIS ss\_name**

and press the Enter key.

where

**ss\_name**

is the name of the shadow set (SS00 or SS01)

*Example of a MAP response:*

Information about shadow set #0:

```
Node name: FP2
Shadow set name SS00
Set definition state: RUNNING
Set operational state: IN SERVICE
Synchronization status: SYNCHRONIZED
Multi-Writes: Serial
Capacity (blocks) 1244655
Transfer length Optimal
Interval: 0
```

=====  
Information about member disks:

| Name      | State | SyncState | Reads | Writes |
|-----------|-------|-----------|-------|--------|
| DK02      | INSV  | Yes       |       |        |
| Perm DK13 | INSV  | Yes       | 0     | 0      |

**NT9X90****in a storage device shelf in a file processor** (continued)

- 12** Record the shadow set member that has faults.
- Note:** In the MAP display example in step 11, the shadow set member that has faults is DK02.
- 13** To stop the shadow set member, type
- ```
>STM ss_name device_name
```
- and press the Enter key.
- where
- ss_name**
is the name of the shadow set (SS00 or SS01)
- device_name**
is DK (disk drive) followed by two digits
- Example input:*
- ```
>STM SS00 DK02
```
- Example of a MAP response:*
- ```
*****
****  WARNING:
***** If this is the last in-service member then File
***** Processing will no longer be available on the
***** shadow set: SS00
*****
Do you wish to proceed?
Please confirm ("Yes", "Y", "No", or "N"):
```
- 14** To confirm the command, type
- ```
>YES
```
- and press the Enter key.
- Example of a MAP response:*
- Ok, Shadow Set Member stopped.  
Approximately 1 minute to complete.
- 15** To quit the shadow utility, type
- ```
>QUIT
```
- and press the Enter key.
- Go to step 17.
- 16** To manually busy the device that has faults, type
- ```
>BSY DEV scsi_no dev_no
```
- and press the Enter key.
- where

**NT9X90****in a storage device shelf in a file processor** (continued)

---

**scsi\_no**

is the SCSI number you recorded in step 6

**dev\_no**

is the device number you recorded in step 6

*Example of a MAP response:*

```
FP 1 Busy DEV 0 1: Command request has been submitted.
FP 1 Busy DEV 0 1: Command passed.
```

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 17 |
| failed             | step 48 |

---

- 17** To offline the affected device, type  
**>OFFL DEV scsi\_no dev\_no**  
and press the Enter key.

*where***scsi\_no**

is the SCSI number you recorded in step 6

**dev\_no**

is the device number you recorded in step 6

*Example input:***>OFFL DEV 0 1***Example of a MAP response:*

```
FP 1 Offline DEV 0 1: Command request has been submitted.
FP 1 Offline DEV 0 1: Command passed.
```

---

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 18 |
| failed              | step 48 |

---

***At the storage device shelf***

- 18** Determine the state of both LEDs on the storage device.

---

| If              | Do      |
|-----------------|---------|
| no LEDs are lit | step 19 |

---

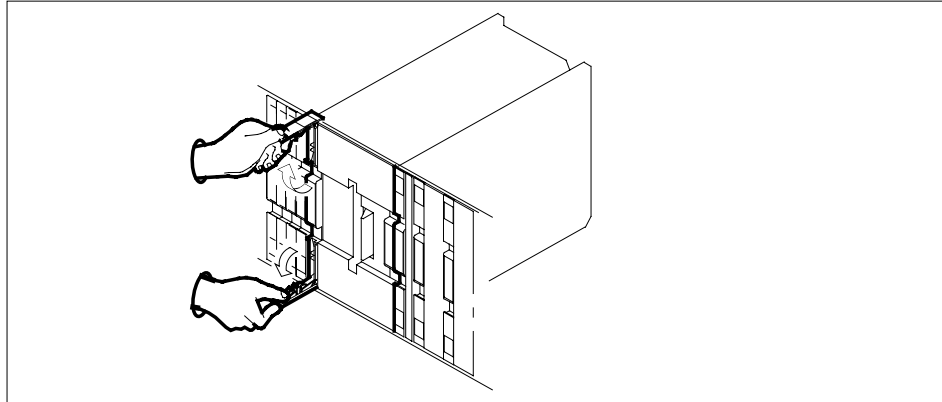
---

**NT9X90**  
**in a storage device shelf in a file processor (continued)**

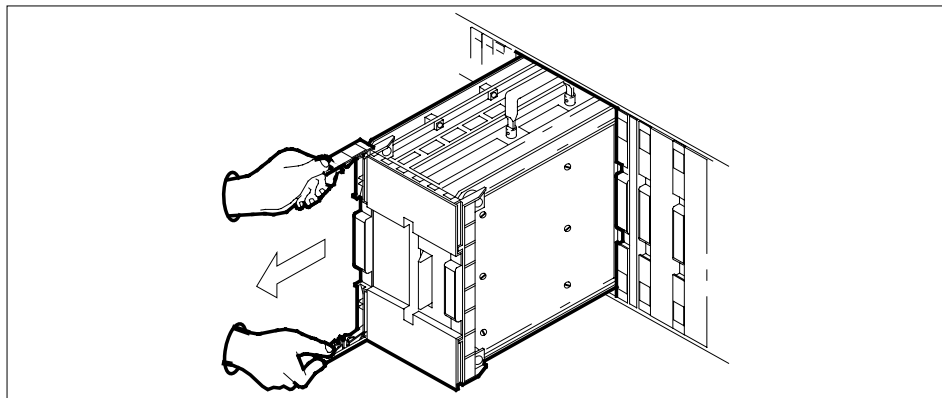
---

| If                       | Do      |
|--------------------------|---------|
| one or both LEDs are lit | step 48 |

- 19** Open the locking levers on the faceplate until the levers are horizontal.



- 20** Carefully pull the device toward you. Continue to pull until the locking latch at the back of the storage device stops the device from clearing the shelf.

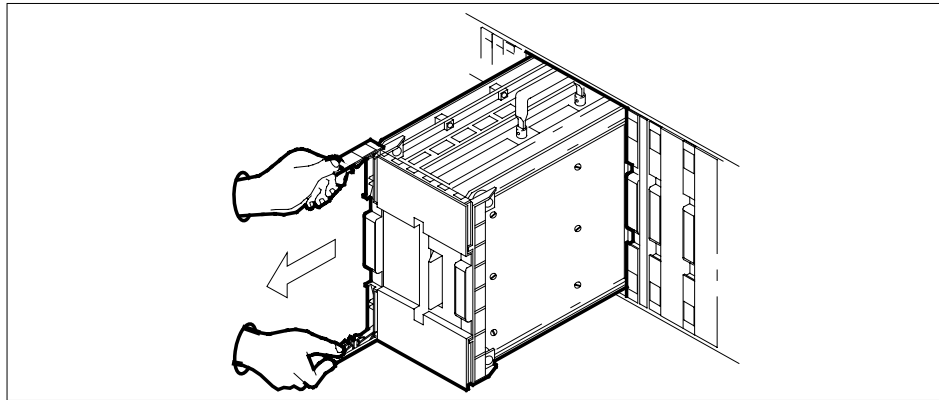


- 21** Close the locking levers.
- 22** Grasp the carrying handle for the storage device, and use your thumb to press the locking latch at the same time. Slide the storage device straight out from the shelf.

## NT9X90

### in a storage device shelf in a file processor (continued)

---



- 23 Place the storage device in an electrostatic discharge (ESD) protective container.
- 24 Lift the replacement device by the carrying handle.
- 25 Open the locking levers until the levers are horizontal.
- 26 Use your free hand to support and align the storage device with the slots in the shelf. Carefully slide the storage device into the shelf until the locking latch at the back of the device engages the shelf.
- 27 Use your fingers or thumbs to push on the upper and lower edges of the faceplate. Make sure the device sits completely in the shelf.
- 28 Close the locking levers.

#### ***At the MAP terminal***

- 29 To manually busy the device you offlined in step 17, type  
**>BSY DEV scsi\_no dev\_no**  
and press the Enter key.

*where*

**scsi\_no**  
is the SCSI number you recorded in step 6

**dev\_no**  
is the device number you recorded in step 6

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 30 |
| failed             | step 48 |

## NT9X90

### in a storage device shelf in a file processor (continued)

- 30** Determine the type of device you replaced.

| If the device type | Do      |
|--------------------|---------|
| is dk              | step 31 |
| is ct              | step 46 |

- 31** Determine if the disk drive is a member of a shadow set.

| If the disk drive               | Do      |
|---------------------------------|---------|
| is a member of a shadow set     | step 32 |
| is not a member of a shadow set | step 36 |

- 32** To access the shadow utility for the FP that contains the disk drive, type  
**>SHADOWUT FP fp\_no**  
 and press the Enter key.

*where*

**fp\_no**

is the number of the FP (0 to 99) that contains the disk drive

- 33** To start the shadow set member you stopped in step 13, type

**>SM ss\_name device\_name FORCE**

and press the Enter key.

*where*

**ss\_name**

is the name of the shadow set (SS00 or SS01)

**device\_name**

is DK (disk drive) followed by two digits

*Example input:*

**>SM SS00 DK02 FORCE**

*Example of a MAP response:*

**NT9X90****in a storage device shelf in a file processor** (continued)

---

The member will be started with the following parameter settings:

```
Node name : FP2
Shadow set name : SS00
Device name : DK02
Transfer length : Optimal
Interval : 0
Synchronization: Default
Force : NO
```

Do you want to continue?  
Please confirm ("Yes", "Y", "No", or "N"):

- 34** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

OK, Shadow Set Member start initiated.

---

| If the SM command | Do      |
|-------------------|---------|
| passed            | step 35 |
| failed            | step 48 |

---

- 35** To quit the shadow utility, type

**>QUIT**

and press the Enter key.

Go to step 49.

- 36** To test the storage device, type

**>TST DEV scsi\_no dev\_no**

and press the Enter key.

*where*

**scsi\_no**

is the SCSI number you recorded in step 6

**dev\_no**

is the device number you recorded in step 6

*Example of a MAP response:*



**NT9X90****in a storage device shelf in a file processor (continued)**

FP 1 Test DEV 0 1: Command request has been submitted.  
 FP 1 Test DEV 0 1: Command passed.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 37 |
| failed             | step 48 |

- 37** To access the disk administration utility, type

**>DISKADM disk\_name node\_name**

and press the Enter key.

*where*

**disk\_name**  
is the name of the disk

**node\_name**  
is the FP name

*Example input:*

**>DISKADM DK13 FP3**

*Example of a MAP response:*

Start up command sequence is in progress.  
 This may take a few minutes.  
 Administration of device DK13 on FP3 is now active.  
 DISKADM; FP3

- 38** To format the disk, type

**>FORMATDISK disk\_name**

and press the Enter key.

*where*

**disk\_name**  
is the name of the disk

*Example of a MAP response:*

## NT9X90

### in a storage device shelf in a file processor (continued)

---

\*\*\*\*\* WARNING \*\*\*\*\*

Formatting of DK13 will  
destroy the contents of the disk.  
The formatting will:  
    allocate 3 spare or alternate sectors per track,  
    allocate 16 spare or alternate tracks per disk,  
    use the G defect list,  
    assign DK13 as the name for the disk.  
    perform quick format,  
    exclude force option.  
Do you want to continue?  
Please confirm ("Yes", "Y", "No", or "N"):

- 39** To confirm the command, type

**>YES**

and press the Enter key.

- 40** From your office records, determine the number, size, and type of volumes the replacement disk requires.

- 41** To create a disk volume, type

**>CREATEVOL vol\_name vol\_size vol\_type**

and press the Enter key.

*where*

**vol\_name**

is the name of the disk volume

**vol\_size**

is the size of the volume in Mbytes

**vol\_type**

is the type of volume (STD or FTFS)

*Example input:*

**>CREATEVOL MLSUP 60 FTFS**

*Example of a MAP response:*

FTFS volume MLSUP will be created on DK13.

Volume size: 60 megabytes  
First FID table extent size: 32754 entries  
Volume Free Space Map size: 7936 segments

Do you want to continue?  
Please confirm ("Yes", "Y", "No", or "N"):

**NT9X90****in a storage device shelf in a file processor** (continued)

- 42** To confirm the command, type  
**>YES**  
 and press the Enter key.
- 43** Repeat steps 41 and 42 for each disk volume required.
- 44** Restore the backup files in the disk drive that has faults to the replacement disk drive volumes.
- 45** To quit the disk administration utility, type  
**>QUIT**  
 and press the Enter key.  
 Go to step 47.
- 46** To test the device, type  
**>TST DEV scsi\_no dev\_no**  
 and press the Enter key.  
*where*  
**scsi\_no**  
 is the SCSI number you recorded in step 6  
**dev\_no**  
 is the device number you recorded in step 6

*Example of a MAP response:*

```
FP 1 Test DEV 0 1: Command request has been submitted.
FP 1 Test DEV 0 1: Command passed.
```

| <b>If the TST command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 47   |
| failed                    | step 48   |

- 47** To return the device to service, type  
**>RTS DEV scsi\_no dev\_no**  
 and press the Enter key.  
*where*  
**scsi\_no**  
 is the SCSI number you recorded in step 6  
**dev\_no**  
 is the device number you recorded in step 6

*Example of a MAP response:*

## NT9X90

### in a storage device shelf in a file processor (end)

---

FP 1 RTS DEV 0 1: Command request has been submitted.  
FP 1 RTS DEV 0 1: Command passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 49 |
| failed             | step 48 |

**48** For additional help, contact the next level of support.

**49** The procedure is complete.

---

## NT9X91 in a storage device shelf in a file processor

---

### Application

Use this procedure to replace an NT9X91 in a storage device shelf for a SuperNode Multicomputing Base (SMB) file processor (FP). The following table lists the SMB FP.

| PEC    | Suffix | Card name                      | Shelf or frame name |
|--------|--------|--------------------------------|---------------------|
| NT9X91 | AA     | Storage device power converter | FP storage device   |
| NT9X91 | AB     | Power converter +5 V +12 V     | FP storage device   |

Refer to the "Index" if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*

Do not go to the common procedure unless the step-action procedure directs you to go.

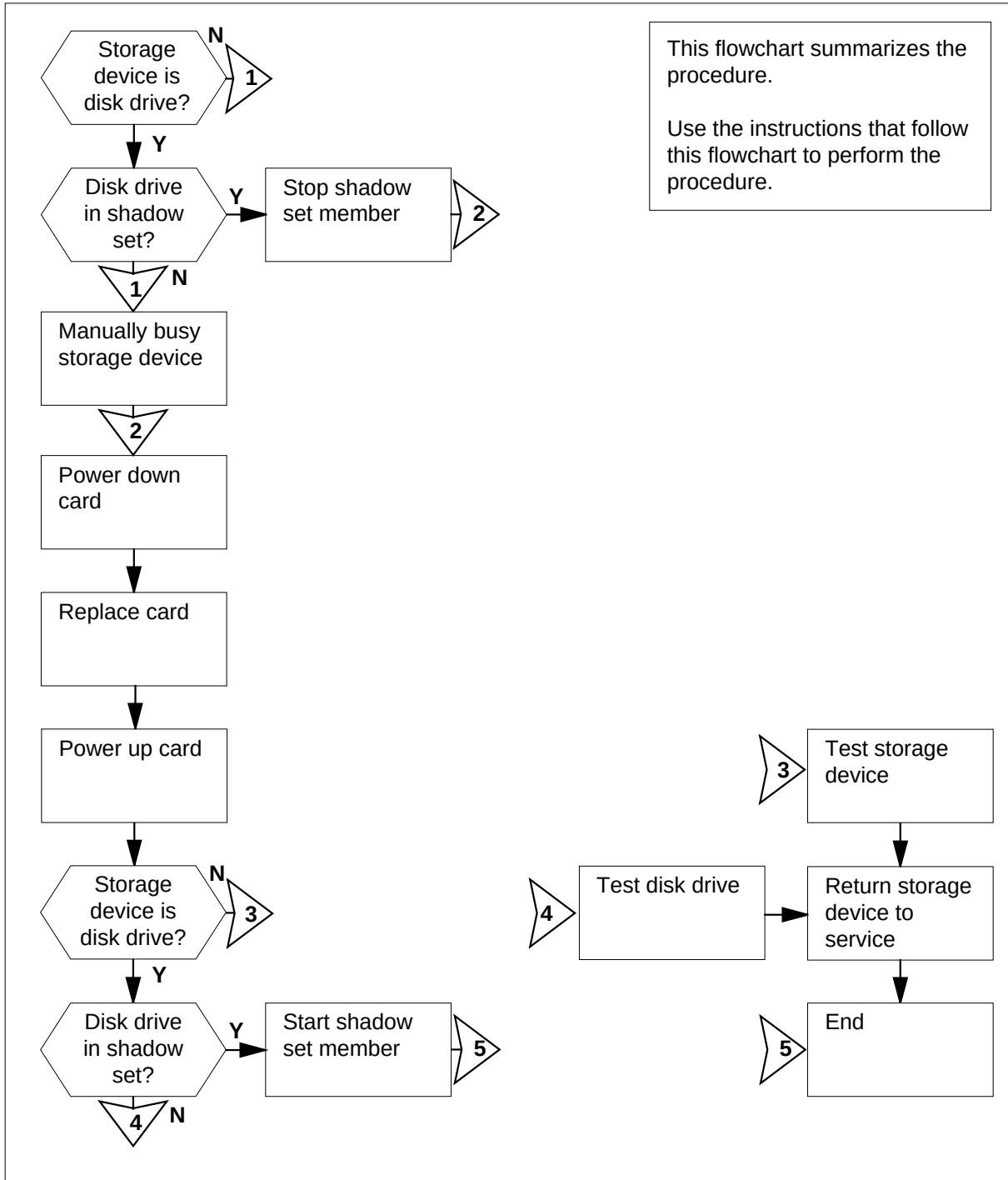
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT9X91

### in a storage device shelf in a file processor (continued)

#### Summary of Replacing a NT9X91 in a storage device shelf in a file processor



## NT9X91

### in a storage device shelf in a file processor (continued)

#### Replacing a NT9X91 in a storage device shelf in a file processor

##### *At your current location*

- 1 Obtain a replacement card. Make sure the replacement card and the card you replace have the same PEC and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. You must perform this procedure to make sure that the replacement card is compatible with the software load. Complete the procedure and return to this point.

##### *At the MAP terminal*

- 3 To post the FP that contains the card you will replace, type

**>MAPCI;MTC;PM;POST FP fp\_no**

and press the Enter key.

where

**fp\_no**

is the number of the FP (0 to 99) that contains the card you will replace

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 14   | 0    | 5    | 11   |
| FP | 0    | 0    | 2    | 0    | 5    | 4    |

|        |           |       |         |
|--------|-----------|-------|---------|
| FP 20: | FP20_QPI0 | Plane | Devices |
| NoSync | 1SysB     |       | ISTb    |

- 4 To access the Devices level of the MAP display, type

**>DEVICES**

and press the Enter key.

*Example of a MAP display:*

|        |           |        |             |
|--------|-----------|--------|-------------|
| FP 3:  | FP3_SR256 | Plane  | Devices     |
| ISTb   |           | NoSync | .           |
|        | CTRL0     | CTRL1  | DEVICE      |
| DABM   | .         | .      | 0 1 2 3 4 5 |
| SCSI 0 | .(EN)     | .(DIS) | - . - . - - |
| SCSI 1 | .(EN)     | .(DIS) | - . - . - - |

**NT9X91****in a storage device shelf in a file processor** (continued)*At the MAP terminal*

- 5 To post the device that the NT9X91 card powers, type

```
>POSTDEV scsi_bus_no device_no
```

and press the Enter key.

where

**scsi\_bus\_no**

is the number of the SCSI bus (0 or 1)

**device\_no**

is the number of the device (0 to 5)

*Example of a MAP display:*

|         |        |         |            |              |        |   |
|---------|--------|---------|------------|--------------|--------|---|
| DK12    | Type   | DISK    | SCSI bus   | 1            | Device | 2 |
| Shelf 2 | Status | InSv    | Shadow set | Use SHADOWUT |        |   |
| Quad 1  | Drive  | On Line | User       | SYSTEM       |        |   |

- 6 To query the device, type

```
>QRYDEV
```

and press the Enter key.

*Example of a MAP response:*

| Dev  | Name | SCSI | Dev | Type | Quad | Shelf | Slot | Status |
|------|------|------|-----|------|------|-------|------|--------|
| DK00 |      | 0    | 0   | dk   | 0    | 3     | 8    | InSv   |

- 7 From the MAP display the system generated in step 6, record the following information for the device:

- SCSI number
- device number
- device type
- quadrant location
- shelf number
- slot number

**Note:** The SCSI number appears under the SCSI header on the MAP display. The device number appears under the Dev header. The device type appears under the Type header. The quadrant location appears under the Quad header. The shelf number appears under the Shelf header. The slot number appears under the Slot header.

**If the device****Do**

is dk

step 8

is ct

step14



## NT9X91

### in a storage device shelf in a file processor (continued)

- 8 Determine if the associated disk drive is a member of a shadow set.

**Note:** Datafill shadow sets in table SHADOW.

| If the disk drive               | Do      |
|---------------------------------|---------|
| is a member of a shadow set     | step 9  |
| is not a member of a shadow set | step 14 |

- 9 To access the shadow utility for the FP on which the disk drive resides, type  
**>SHADOWUT FP fp\_no**  
 and press the Enter key.

where

**fp\_no**

is the number of the FP on which the disk drive resides

- 10 To display information on the shadow set, type

**>DIS ss\_name**

and press the Enter key.

where

**ss\_name**

is the name of the shadow set (SS00 or SS01)

*Example of a MAP response:*

```

Information about shadow set #0:
Node name: FP2
Shadow set name: SS00
Set definition state: RUNNING
Set operational state: IN SERVICE
Synchronization status: SYNCHRONIZED
Multi-Writes: Serial
Capacity (blocks): 1244655
Transfer length: Optimal
Interval: 0
=====
Information about member disks:

 Name State SyncState Reads Writes
 DK02 INSV Yes
Perm DK13 INSV Yes 0 0
Information about member disks:

```

| If                                       | Do      |
|------------------------------------------|---------|
| another shadow set member is in service  | step 11 |
| no other shadow set member is in service | step 26 |

## NT9X91 in a storage device shelf in a file processor (continued)

---

11



### **DANGER**

#### **Possible loss of service**

The removal of this device from service causes a loss of service for applications that use this file processor (FP) node.

To stop the shadow set member that the NT9X91 card powers, type

**>STM ss\_name device\_name**

and press the Enter key.

where

**ss\_name**

is the name of the shadow set (SS00 or SS01)

**device\_name**

is DK (disk drive) followed by two digits

*Example input:*

**>STM SS00 DK02**

*Example of a MAP response:*

```

**** WARNING: ***
*** If this is the last in-service member then File ***
*** Processing will no longer be available on the ***
*** shadow set: SS00 ***

Do you wish to proceed?
Please confirm ("Yes", "Y", "No", or "N"):
```

12 To confirm the response, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Ok, Shadow Set Member stopped.

Approximately 1 minute to complete.

13 To quit the shadow utility, type

**>QUIT**

and press the Enter key.

Go to step 15.

## NT9X91

### in a storage device shelf in a file processor (continued)

- 14** To manually busy the affected storage device, type

```
>BSY DEV scsi_no dev_no
```

and press the Enter key.

where

**scsi\_no**

is the SCSI number you recorded in step 7

**dev\_no**

is the device number you recorded in step 7

*Example of a MAP response:*

```
FP 1 Busy DEV 0 1: Command request has been submitted.
FP 1 Busy DEV 0 1: Command passed.
```

#### ***At the storage device shelf***

- 15**



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle cards. The wrist strap protects the cards against static electricity damage.

To power down the NT9X91, press down and release the switch on the faceplate of the NT9X91.

| <b>If the alarm light on the power converter</b> | <b>Do</b> |
|--------------------------------------------------|-----------|
| lights                                           | step 16   |
| does not light                                   | step 26   |

- 16** To replace the card, perform the procedure *Replacing a card* in this document.

- 17** To power up the power converter, lift and release the power switch on the faceplate.

| <b>If the alarm light on the power converter</b> | <b>Do</b> |
|--------------------------------------------------|-----------|
| turns off                                        | step 18   |
| remains on                                       | step 26   |

## NT9X91

### in a storage device shelf in a file processor (continued)

---

- 18** Determine the type of device you noted in step 7.

---

| If the device | Do      |
|---------------|---------|
| is dk         | step 19 |
| is ct         | step 24 |

---

- 19** Determine if the disk drive is a member of a shadow set.

---

| If the disk drive               | Do      |
|---------------------------------|---------|
| is a member of a shadow set     | step 20 |
| is not a member of a shadow set | step 24 |

---

**At the MAP terminal**

- 20** To access the shadow utility of the FP that contains the disk drive, type

**>SHADOWUT FP fp\_no**

and press the Enter key.

where

**fp\_no**

is the number of the FP (0 to 99) that contains the disk drive

- 21** To start the shadow set member, type

**>SM ss\_name device\_name**

and press the Enter key.

where

ss\_name is the name of the shadow set (SS00 or SS01)

**device\_name**

is DK (disk drive) followed by two digits

Example input:

**>SM SS00 DK02**

Example of a MAP response:

---

## NT9X91

### in a storage device shelf in a file processor (continued)

---

The member will be started with the following parametersettings:

```
Node name : FP2
Shadow set name: SS00
Device name : DK02
Transfer length: Optimal
Interval : 0
Synchronization: Default
Force : NO
```

Do you want to continue?  
Please confirm ("Yes", "Y", "No", or "N"):

- 22** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

OK, Shadow Set Member start initiated.

---

| If the device             | Do      |
|---------------------------|---------|
| returned to service       | step 23 |
| did not return to service | step 26 |

---

- 23** To quit the shadow utility, type

**>QUIT**

and press the Enter key.

Go to step 27.

- 24** To test the storage device, type

**>TST DEV scsi\_no dev\_no**

and press the Enter key.

*where*

**scsi\_no**

is the SCSI number you recorded in step 7

**dev\_no**

is the device number you recorded in step 7

*Example of a MAP response:*

## NT9X91

### in a storage device shelf in a file processor (end)

---

FP 1 Test DEV 0 1: Command request has been submitted.  
FP 1 Test DEV 0 1: Command passed.

---

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 25 |
| failed             | step 26 |

---

- 25** To return the storage device to service, type

**>RTS scsi\_no dev\_no**

and press the Enter key.

*where*

**scsi\_no**

is the SCSI number you recorded in step 7

**dev\_no**

is the device number you recorded in step 7

*Example of a MAP response:*

FP 1 RTS DEV 0 1: Command request has been submitted.  
FP 1 RTS DEV 0 1: Command passed.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 27 |
| failed             | step 26 |

---

- 26** For additional help, contact the next level of support.

- 27** The procedure is complete.

## System cards in a file processor

### Application

Use this procedure to replace the following cards in a SuperNode Multicomputing Base (SMB) file processor (FP).

| PEC    | Suffix | Card name                              | Shelf or frame name |
|--------|--------|----------------------------------------|---------------------|
| NT9X13 | LA     | AP/FP 68030 HPM-based CPU card         | FP                  |
| NT9X14 | DB     | 24-Mbyte memory card                   | FP                  |
| NT9X21 | AB     | Bus terminator paddle board            | FP                  |
| NT9X26 | AA, AB | Remote terminal interface paddle board | FP                  |
| NT9X62 | AA     | Two-port substrate DS512 paddle board  | FP                  |
| NT9X86 | AA, AB | Two-port message controller card       | FP                  |
| NT9X87 | AA     | Two-access buffer memory card          | FP                  |
| NT9X88 | AA     | SCSI interface processor paddle board  | FP                  |
| NTDX15 | AA     | Power converter $\pm 5$ V              | FP                  |
| NTDX15 | AB     | Global power converter $\pm 5$ V       | FP                  |

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the Index. The index contains a list of the cards, shelves, and frames documented in this card replacement book.

Refer to the "Index" if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

## **System cards in a file processor** (continued)

---

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### **Common procedures**

The procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*

Do not go to the common procedure unless the step-action procedure directs you.

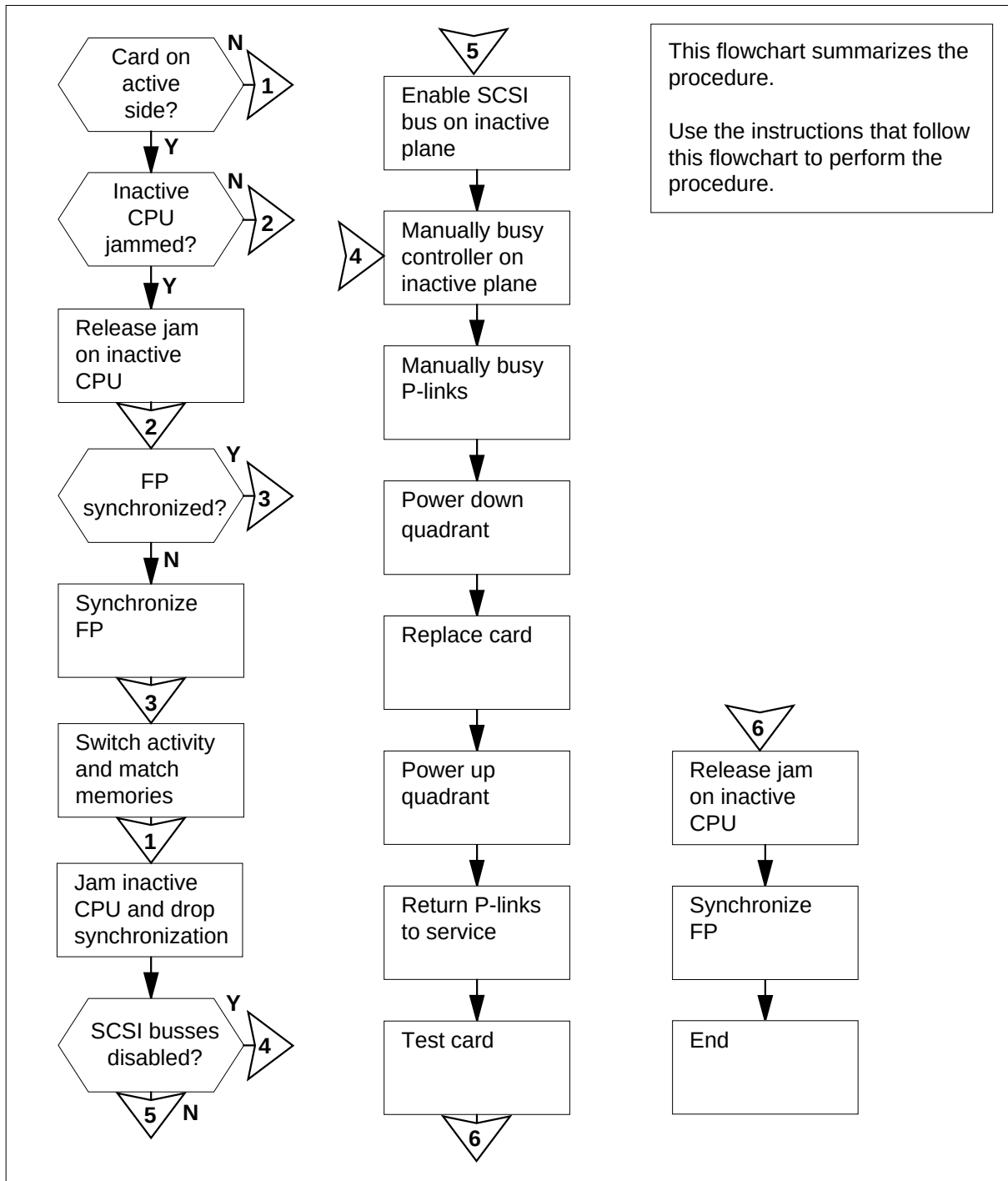
### **Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.



## System cards in a file processor (continued)

### Summary of Replacing System cards in a file processor



## System cards in a file processor (continued)

### Replacing System cards in a file processor

#### *At your current location*

- 1 Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. You must perform this procedure to make sure the replacement card is compatible with the software load. Complete the procedure and return to this point.

#### *At the MAP terminal*

- 3 To post the FP that contains the card you will replace, type  
**>MAPCI;MTC;PM;POST FP fp\_no**  
 and press the Enter key.

where

**fp\_no**

is the number of the FP (0 to 99) that contains the card you will replace

*Example of a MAP display:*

```
FP 20: FP20_QPI0 Plane Devices
InSv . .
```

- 4 To access the Plane level of the MAP display, type  
**>PLANE**  
 and press the Enter key.

*Example of a MAP display:*

```
Sync CPU Jam DRAM Port MsgCh PLink
No state act 0123 Card 0 1 0 1

Plane 0 . A
Plane 1 . I No -... F L L P P
```

- 5 Determine if the card you will replace is on the active or the inactive plane.  
**Note:** The letter A under the Act header indicates the plane is active. The letter I indicates the plane is inactive.

| If the card            | Do     |
|------------------------|--------|
| is on the active plane | step 6 |

## System cards in a file processor (continued)

|   | If the card                                                                                                                                                                                                                                                                                                                                                                   | Do      |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|   | is on the inactive plane                                                                                                                                                                                                                                                                                                                                                      | step 13 |
| 6 | Determine if the inactive CPU is jammed.<br><b>Note:</b> The word YES under the Jam header indicates that the CPU is jammed. The word NO indicates that the CPU is not jammed.                                                                                                                                                                                                |         |
|   | If the inactive CPU                                                                                                                                                                                                                                                                                                                                                           | Do      |
|   | is jammed                                                                                                                                                                                                                                                                                                                                                                     | step 7  |
|   | is not jammed                                                                                                                                                                                                                                                                                                                                                                 | step 8  |
| 7 | Determine why the inactive CPU is jammed before you proceed. When you have permission, release the jam on the inactive CPU. To release the jam, type<br><b>&gt;MATEJAM RELEASE</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>FP 3 Jam Mate: Request has been submitted.<br>FP 3 Jam Mate: Command Completed.<br>The inactive CPU is not jammed. |         |
| 8 | Determine if the FP is synchronized.<br><b>Note:</b> The word YES under the Sync header indicates that the FP synchronized. The word NO indicates that the FP did not synchronize.                                                                                                                                                                                            |         |
|   | If the FP                                                                                                                                                                                                                                                                                                                                                                     | Do      |
|   | is synchronized                                                                                                                                                                                                                                                                                                                                                               | step 10 |
|   | is not synchronized                                                                                                                                                                                                                                                                                                                                                           | step 9  |
| 9 | To synchronize the FP, type<br><b>&gt;SYNC</b><br>and press the Enter key.<br><i>Example of a MAP response:</i>                                                                                                                                                                                                                                                               |         |

## System cards in a file processor (continued)

---

FP 3 Synchronization: Request has been submitted.  
FP 3 Synchronization: Command completed.  
The PM is now running in sync

---

| If the SYNC command | Do      |
|---------------------|---------|
| passed              | step 10 |
| failed              | step 62 |

---

- 10** To switch activity, type  
**>SWACT**  
and press the Enter key.  
*Example of a MAP response:*

FP 3 Activity Switch: Request has been submitted.  
FP 3 Activity Switch: Command completed.  
CPU 1 is now running active.

---

| If the SWACT command | Do      |
|----------------------|---------|
| passed               | step 11 |
| failed               | step 62 |

---

- 11** To match the memories of the CPUs, type  
**>MATCH**  
and press the Enter key.  
*Example of a MAP response:*

FP 3 Memory Match: Request has been submitted.  
FP 3 Memory Match: Command Completed.  
Memory match was executed while the node was running in SYNC.  
Memory contents have been matched across the two planes

## System cards in a file processor (continued)

- 12** Determine if the system completed the following conditions as a result of the memory match:
- The memory match was successful.
  - The system did not generate any mismatch logs (AP317, AP318, FP354).
  - The FP remained synchronized, indicated by YES or NoOvr under the Sync header on the MAP display.

| If the system                   | Do      |
|---------------------------------|---------|
| completed the conditions        | step 13 |
| did not complete the conditions | step 62 |

- 13** To jam the inactive CPU, type

**>MATEJAM SET**

and press the Enter key.

*Example of a MAP response:*

```
FP 3 Jam Mate: Request has been submitted.
FP 3 Jam Mate Command completed.
The inactive CPU is jammed
```

- 14** To drop synchronization, type

**>DPSYNC**

and press the Enter key.

*Example of a MAP response:*

```
If you intend to jam the inactive CPU,
Please do so before dropping synchronization.
Please confirm ("YES" or "NO"):
```

- 15** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
FP 3 Drop synchronization: Request has been submitted.
FP 3 Drop synchronization: Command completed.
```

```
Now running in simplex mode with CPU 1 active.
```

| If the DPSYNC command | Do      |
|-----------------------|---------|
| passed                | step 16 |

## System cards in a file processor (continued)

|           | If the DPSYNC command                                                                                                                                                                                                                                                                                                                                                                                 | Do      |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                | step 62 |
| <b>16</b> | <p>To access the Devices level of the MAP display, type<br/> <b>&gt;DEVICES</b><br/> and press the Enter key.<br/> <i>Example of a MAP display:</i></p> <pre> FP 3:FP3_SR256PlaneDevices ISTbNoSync  .  CTRL0CTRL1  DEVICE DABM  .  .0 1 2 3 4 5 SCSI 0  .  .(EN)  .  .(DIS)-  .  .  .  .  . SCSI 1  .  .(EN)  .  .(DIS)-  .  .  .  .  . </pre>                                                       |         |
| <b>17</b> | <p>Determine if the system disabled both SCSI buses on the inactive plane.</p> <p><b>Note:</b> The CTRL0 (controller 0) corresponds to plane 0 and CTRL1 corresponds to plane 1. The EN indicates the SCSI bus is enabled. The DIS indicates the SCSI bus is disabled. In the MAP display example in step 16, both SCSI buses on plane 0 are enabled and both SCSI buses on plane 1 are disabled.</p> |         |
|           | If both SCSI buses on the inactive plane                                                                                                                                                                                                                                                                                                                                                              | Do      |
|           | are disabled                                                                                                                                                                                                                                                                                                                                                                                          | step 19 |
|           | are enabled                                                                                                                                                                                                                                                                                                                                                                                           | step 18 |
| <b>18</b> | <p>To switch enable the SCSI bus on the inactive plane, type<br/> <b>&gt;SWEN scsi_no</b><br/> and press the Enter key.<br/> <i>where</i></p> <p><b>scsi_no</b><br/> is the number of the enabled SCSI bus (0 or 1) on the inactive plane</p> <p><i>Example of a MAP response:</i></p> <pre> FP 1 SwEn SCSI 0: Command request has been submitted. FP 1 SwEn SCSI 0: Command passed. </pre>           |         |
|           | If the SWEN command                                                                                                                                                                                                                                                                                                                                                                                   | Do      |
|           | passed                                                                                                                                                                                                                                                                                                                                                                                                | step 19 |
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                | step 62 |

## System cards in a file processor (continued)

- 19** To manually busy the controller on the inactive plane, type

**>BSY CTRL ctrl\_no**

and press the Enter key.

where

**ctrl\_no**

is the number of the controller (0 or 1) on the inactive plane

*Example of a MAP response:*

```
FP 1 Busy CTRL 0: Command request has been submitted.
FP 1 Busy CTRL 0: Command passed.
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 20 |
| failed             | step 62 |

- 20** To access the Plane level of the MAP display, type

**>PLANE**

and press the Enter key.

*Example of a MAP display:*

```

Sync CPU Jam DRAM Port MsgCh PLink
No state act 0123 Card 0 1 0 1
 Plane 0 . A
 Plane 1 . I Yes -... : : : :

```

- 21** Determine if the inactive FP plane is 0 or 1.

**Note:** The letter A under the Act header indicates that the plane is active.  
The letter I indicates the plane is inactive.

| If the inactive plane | Do      |
|-----------------------|---------|
| is 0                  | step 22 |
| is 1                  | step 24 |

- 22** To manually busy the P-links between plane 0 and P-link 0, type

**>BSY PORT 0 PLINK 0**

and press the Enter key.

*Example of a MAP response:*

## System cards in a file processor (continued)

---

FP 3, Port 0 PLink 0, Busy PLink: Request has been submitted.  
FP 3, Port 0 PLink 0, Busy PLink: Command completed.  
completed.

The PLink is manually busy.

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 23 |
| failed             | step 62 |

---

- 23** To manually busy the P-links between plane 0 and P-link 1, type  
**>BSY PORT 0 PLINK 1**  
and press the Enter key.

*Example of a MAP response:*

FP 3, Port 0 PLink 1, Busy PLink: Request has been submitted.  
FP 3, Port 0 PLink 1, Busy PLink: Command completed.

The PLink is manually busy.

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 62 |

---

- 24** To manually busy the P-links between plane 1 and P-link 0, type  
**>BSY PORT 1 PLINK 0**  
and press the Enter key.

*Example of a MAP response:*

FP 3, Port 1 PLink 0, Busy PLink: Request has been submitted.  
FP 3, Port 1 PLink 0, Busy PLink: Command completed.

The PLink is manually busy.

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 25 |
| failed             | step 62 |

---



## System cards in a file processor (continued)

- 25 To manually busy the P-links between plane 1 and P-link 1, type

**>BSY PORT 1 PLINK 1**

and press the Enter key.

*Example of a MAP response:*

FP 3, Port 1 PLink 1, Busy PLink: Request has been submitted.  
FP 3, Port 1 PLink 1, Busy PLink: Command completed.

The PLink is manually busy.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 62 |

### At the FP shelf

26



#### WARNING

##### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Press down and release the power switch on the faceplate of the NTDX15 power converter. This procedure powers down the quadrant that corresponds to the card you replace.

| If the alarm light on the power converter | Do      |
|-------------------------------------------|---------|
| turns on                                  | step 27 |
| does not turn on                          | step 62 |

- 27 The next action depends on the type of card you replace.

| If the card               | Do      |
|---------------------------|---------|
| is an NT9X62              | step 28 |
| is other than listed here | step 34 |

## System cards in a file processor (continued)

---

28



### **DANGER**

#### **Possible equipment damage**

Make sure you do not contaminate the fiber tip surface. Do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



### **DANGER**

#### **Damage to fiber cable**

Make sure you handle fiber cables carefully. Do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

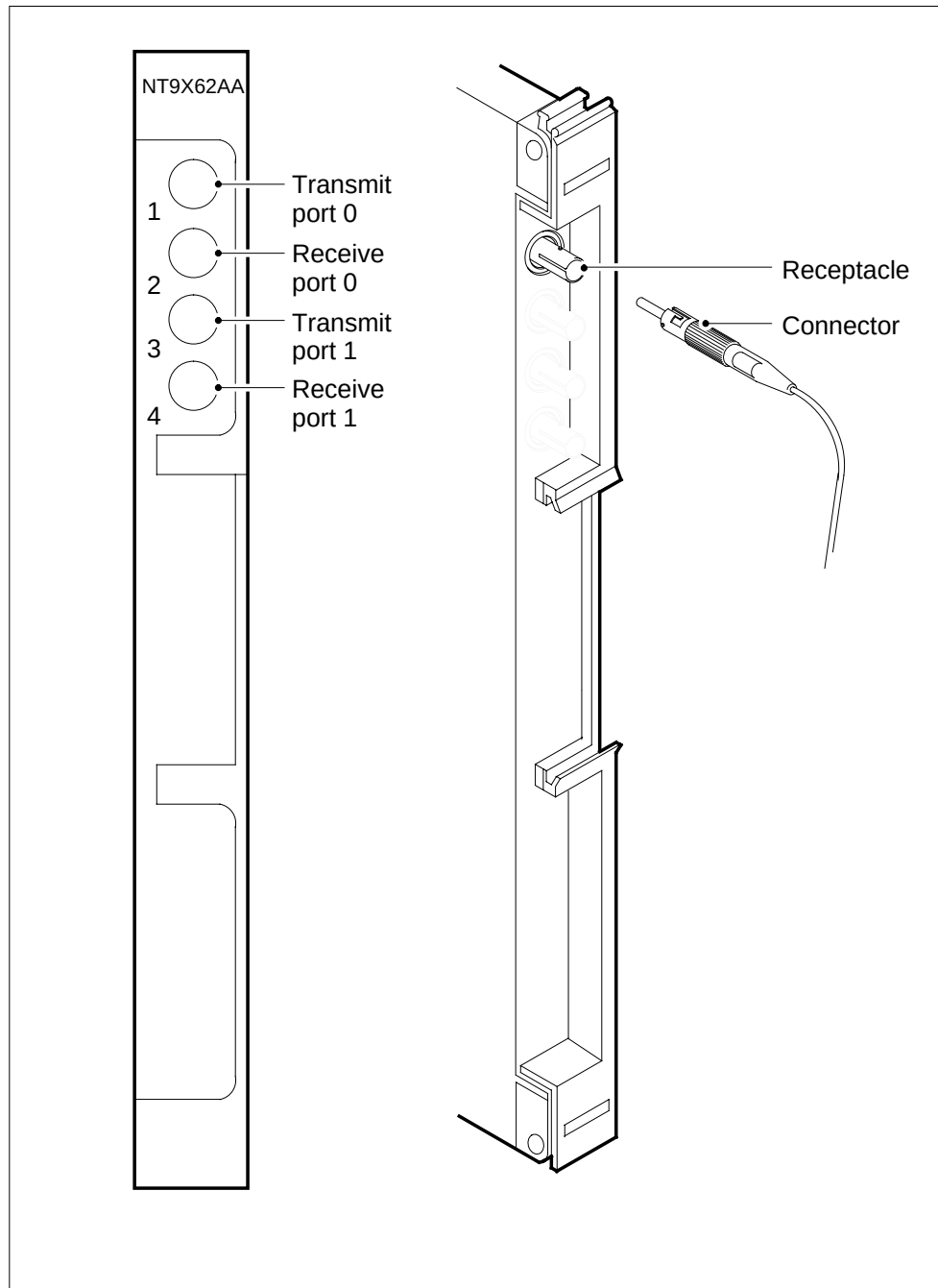
Locate the card you will remove.

- 29** Label each fiber link pair transmit for the top fiber of each port and receive for the bottom fiber of each port.

**Note:** The fiber cable connections appear on the next page.

- 30** Disconnect the fiber links from the card as follows:
- a** Loosen the fiber connections with the latch handles up.
  - b** Carefully push in and turn the fiber cable connector counter clockwise halfway until the connector slides out of the receptacle.
  - c** When you disconnect the connectors, place dust caps on the ends of the connectors.

## System cards in a file processor (continued)



- 31** To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

## System cards in a file processor (continued)

32

**DANGER****Damage to fiber cable**

Make sure you handle fiber cables carefully. Do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

Reconnect the fiber links as follows:

- a Tighten the fiber connections with the latch handles up.
- b Carefully guide the fiber connector into the receptacle notches.
- c Push in and turn the fiber connector clockwise halfway until the connection is finger tight. Put a maximum of 0.169 N m (1.5 lbf in) of pressure on the fiber connector.

33 Go to step 35.

34 To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

35 To power up the NTDX15 power converter you powered down in step 26, lift and release the power switch on the faceplate.

| If the alarm light on the power converter | Do      |
|-------------------------------------------|---------|
| turns off                                 | step 36 |
| remains on                                | step 62 |

**At the MAP terminal**

36 Determine if the inactive FP plane is 0 or 1.

| If the inactive plane | Do      |
|-----------------------|---------|
| is 0                  | step 37 |
| is 1                  | step 39 |

37 To return the P-links between plane 0 and P-link 0 to service, type

**>RTS PORT 0 PLINK 0**

and press the Enter key.

*Example of a MAP response:*

## System cards in a file processor (continued)

FP 3, Port 0 PLink 0, RTS PLink: Request has been submitted.  
 FP 3, Port 0 PLink 0, RTS PLink: Command completed.  
 The PLink is in-serviceTest Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 38 |
| failed             | step 62 |

- 38** To return the P-links between plane 0 and P-link 1 to service, type  
**>RTS PORT 0 PLINK 1**  
 and press the Enter key.  
*Example of a MAP response:*

FP 3, Port 0 PLink 1, RTS PLink: Request has been submitted.  
 FP 3, Port 0 PLink 1, RTS PLink: Command completed.  
 The PLink is in-service Test Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 41 |
| failed             | step 62 |

- 39** To return the P-links between plane 1 and P-link 0 to service, type  
**>RTS PORT 1 PLINK 0**  
 and press the Enter key.  
*Example of a MAP response:*

FP 3, Port 1 PLink 1, RTS PLink: Request has been submitted.  
 FP 3, Port 1 PLink 1, RTS PLink: Command completed.  
 The PLink is in-service Test Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 40 |
| failed             | step 62 |

## System cards in a file processor (continued)

- 40** To return the P-links between plane 1 and P-link 0 to service, type

**>RTS PORT 1 PLINK 1**

and press the Enter key.

*Example of a MAP response:*

FP 3, Port 1 PLink 0, RTS PLink: Request has been submitted.

FP 3, Port 1 PLink 0, RTS PLink: Command completed.

The PLink is in-service Test Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 41 |
| failed             | step 62 |

- 41** To access the Devices level of the MAP display, type

**>DEVICES**

and press the Enter key.

- 42** The next action depends on the type of card you replace.

| If the card               | Do      |
|---------------------------|---------|
| is an NT9X86              | step 43 |
| is other than listed here | step 47 |

- 43** To test the controller on the inactive plane, type

**>TST CTRL ctrl\_no**

and press the Enter key.

*where*

**ctrl\_no**

is the number of the controller (0 or 1) on the inactive plane

*Example of a MAP response:*

FP 3 Test CTRL 1: Command request has been submitted.

FP 3 Test CTRL 1: Command passed.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 44 |
| failed             | step 62 |

## System cards in a file processor (continued)

- 44** To return the controller on the inactive plane to service, type

**>RTS CTRL ctrl\_no**

and press the Enter key.

where

**ctrl\_no**

is the number of the controller (0 or 1) on the inactive plane

*Example of a MAP response:*

```
FP 3 Busy CTRL 1: Command request has been submitted.
FP 3 Busy CTRL 1: Command passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 45 |
| failed             | step 62 |

- 45** To access the Plane level of the MAP display, type

**>PLANE**

and press the Enter key.

- 46** To test the ports that correspond to the card that you replaced, type

**>TST PORT plane\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane (0 or 1)

*Example of a MAP response:*

```
FP 3 Port Test: Request has been submitted.
FP 3, Port 1, Port Test: Command completed.
Test Passed.
Port card 1 is OK.
```

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 60 |
| failed             | step 62 |

- 47** To return the controller on the inactive plane to service, type

**>RTS CTRL ctrl\_no**

and press the Enter key.

where

## System cards in a file processor (continued)

| <b>ctrl_no</b><br>is the number of the controller (0 or 1) on the inactive plane |                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>If the RTS command</b>                                                        | <b>Do</b>                                                                                                                                                                                                                                    |
| passed                                                                           | step 48                                                                                                                                                                                                                                      |
| failed                                                                           | step 62                                                                                                                                                                                                                                      |
| <b>48</b>                                                                        | The next action depends on the type of card you replace.                                                                                                                                                                                     |
| <b>If the card</b>                                                               | <b>Do</b>                                                                                                                                                                                                                                    |
| is a NT9X13, NT9X14, NT9X21, or NT9X26                                           | step 49                                                                                                                                                                                                                                      |
| is other than listed here                                                        | step 55                                                                                                                                                                                                                                      |
| <b>49</b>                                                                        | To access the Plane level of the MAP display, type<br><b>&gt;PLANE</b><br>and press the Enter key.                                                                                                                                           |
| <b>50</b>                                                                        | The next action depends on the type of card you replaced.                                                                                                                                                                                    |
| <b>If the card</b>                                                               | <b>Do</b>                                                                                                                                                                                                                                    |
| is a NT9X13                                                                      | step 51                                                                                                                                                                                                                                      |
| is a NT9X26                                                                      | step 53                                                                                                                                                                                                                                      |
| is a NT9X14 or NT9X21                                                            | step 54                                                                                                                                                                                                                                      |
| <b>51</b>                                                                        | To test the card, type<br><b>&gt;TST CPU HW</b><br><b>and press the Enter key.</b><br><i>Example of a MAP response:</i><br><br>CPU test of Static RAM will corrupt the load in the inactive CPU.<br>Please confirm ("YES", "Y" "NO", or "N") |
| <b>52</b>                                                                        | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.<br><i>Example of a MAP response:</i>                                                                                                                              |



## System cards in a file processor (continued)

FP 3 CPU Hardware Test: Request has been submitted.  
 FP 3 CPU Hardware Test: Command completed.  
 Inactive CPU hardware has passed all tests issued.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 60 |
| failed             | step 62 |

- 53** To test the card, type  
**>TST CPU HW RTIF**  
 and press the Enter key.

*Example of a MAP response:*

FP 1 CPU hardware test: Request has been submitted.  
 FP 1 CPU hardware test: Command completed.  
 Inactive CPU hardware has passed all tests issued

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 60 |
| failed             | step 62 |

- 54** To test the memory, type  
**>TST MEM**  
 and press the Enter key.

*Example of a MAP response:*

FP 1 Memory Test: Request has been submitted.  
 FP 1 Memory Test: Command completed.  
 Inactive memory test passed.  
 DRAM upgrade results:

DRAM Card 0: No DRAM upgrade was performed.  
 DRAM Card 1: No DRAM upgrade was performed.  
 DRAM Card 2: No DRAM upgrade was performed.  
 DRAM Card 3: No DRAM upgrade was performed.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 60 |

## System cards in a file processor (continued)

|    | If the TST command                                                                                                                                                                                                                                                                                                                                         | Do      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | failed                                                                                                                                                                                                                                                                                                                                                     | step 62 |
| 55 | The next action depends on the type of card you replace.                                                                                                                                                                                                                                                                                                   |         |
|    | If the card                                                                                                                                                                                                                                                                                                                                                | Do      |
|    | is a NT9X87 or NT9X88                                                                                                                                                                                                                                                                                                                                      | step 56 |
|    | is other than listed here                                                                                                                                                                                                                                                                                                                                  | step 59 |
| 56 | The next action depends on the type of card you replaced.                                                                                                                                                                                                                                                                                                  |         |
|    | If the card                                                                                                                                                                                                                                                                                                                                                | Do      |
|    | is a NT9X87                                                                                                                                                                                                                                                                                                                                                | step 57 |
|    | is a NT9X88                                                                                                                                                                                                                                                                                                                                                | step 58 |
| 57 | To test the card you replaced, type<br><b>&gt;TST DABM plane_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the number of the plane (0 or 1) associated with the card you replaced<br><br><i>Example of a MAP response:</i><br><br>FP 3 Test DABM 0: Command request has been submitted.<br>FP 3 Test DABM 0: Command passed. |         |
|    | If the TST command                                                                                                                                                                                                                                                                                                                                         | Do      |
|    | passed                                                                                                                                                                                                                                                                                                                                                     | step 59 |
|    | failed                                                                                                                                                                                                                                                                                                                                                     | step 62 |
| 58 | To test the card you replaced, type<br><b>&gt;TST SCSI scsi_no ctrl_no</b><br>and press the Enter key.<br><i>where</i><br><b>scsi_no</b><br>is the number of the SCSI bus (0 or 1) associated with the card you replaced                                                                                                                                   |         |

## System cards in a file processor (end)

**ctrl\_no**

is the number of the controller (0 or 1) on the inactive plane

*Example of a MAP response:*

```
FP 0 Test SCSI 0: Command request has been submitted.
FP 0 Test SCSI 0: Command passed.
```

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 59 |
| failed             | step 62 |

- 59** To access the Plane level of the MAP display, type

**>PLANE**

and press the Enter key.

- 60** To release the jam on the inactive plane, type

**>MATEJAM RELEASE**

and press the Enter key.

*Example of a MAP response:*

```
FP 3 Jam Mate: Request has been submitted.
FP 3 Jam Mate: Command completed,
The inactive CPU is not jammed.
```

- 61** To synchronize the FP, type

**>SYNC**

and press the Enter key.

*Example of a MAP response:*

```
FP 3 Synchronization: Request has been submitted.
FP 3 Synchronization: Command completed.
The PM is now running in SYNC.
```

| If the SYNC command | Do      |
|---------------------|---------|
| passed              | step 63 |
| failed              | step 62 |

- 62** For additional help, contact the next level of support.

- 63** The procedure is complete.



---

# 8 Frame supervisory panel and modular supervisory panel card replacement procedures

---

## Introduction

This chapter contains card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP).

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

This section identifies the FSP or MSP card(s) included in the replacement procedure.

### Common procedures

This section lists common procedures for the FSP or MSP card replacement procedure. A common procedure is a series of steps that repeat within maintenance procedures. The removal and replacement of a card is an example of a common procedure. Common procedures are in the common procedures chapter in this NTP.

Do not use common procedures unless the step-action procedure directs you to go.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

### **Recording card replacement activities**

When you replace a card, record the following information in the office records:

- the serial number of the card that you replaced
- the date that you replace the card
- the reason that you replaced the card

## FSP cards in a 42-in. (106.7-cm) SuperNode cabinet

---

### Application

Use this procedure to replace the following cards in the shelves or frames listed.

| PEC    | Suffix | Card name                | Shelf or frame name                                                                                                                                                                                                                                                                                                                         |
|--------|--------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NT0X91 | AA     | FSP drive and alarm card | application processor (AP) cabinet, computing module (CM) cabinet, dual plane combined core (DPCC) cabinet, enhanced multipurpose cabinet (EMC), SuperNode SE (SNSE) cabinet, 128k enhanced network (ENET) cabinet, 64k ENET cabinet, link peripheral processor (LPP) cabinet, message switch (MS) cabinet, SuperNode compact (SNC) cabinet |
| NT6X36 | AA, AF | ARLB FSP alarm card      | AP cabinet, CM cabinet, DPCC cabinet, EMC, SNSE cabinet, 128k ENET cabinet, 64k ENET cabinet, LPP cabinet, MS cabinet, SNC cabinet                                                                                                                                                                                                          |

**Note:** Automatic recovery from low battery (ARLB)

Refer to the “Index”, if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

There are no common procedures.

**FSP cards**  
**in a 42-in. (106.7-cm) SuperNode cabinet** (continued)

---

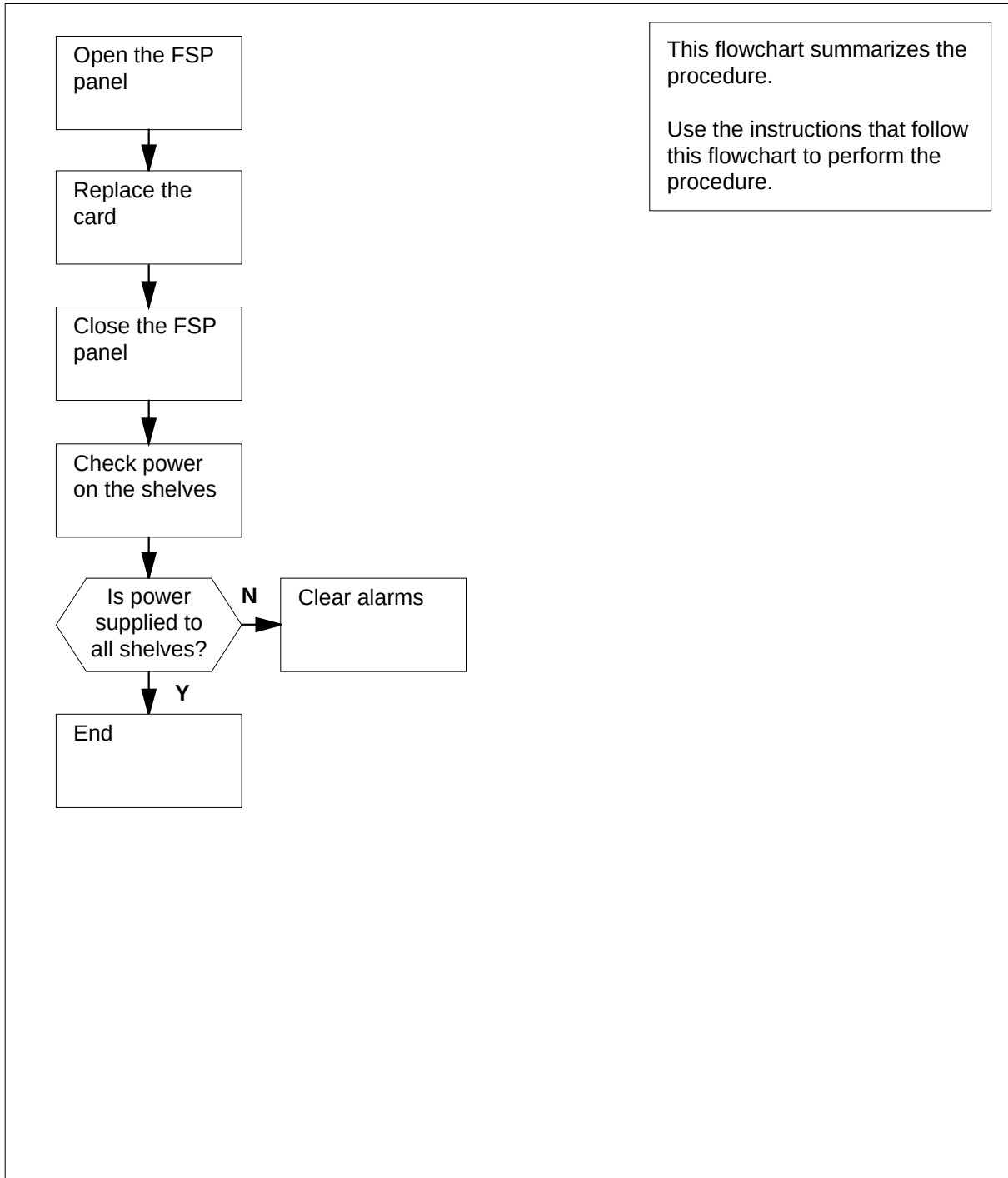
**Action**

This procedure contains a summary of the flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.



## FSP cards in a 42-in. (106.7-cm) SuperNode cabinet (continued)

### Summary of replacing FSP cards in a 42-in. (106.7-cm) SuperNode cabinet



## FSP cards in a 42-in. (106.7-cm) SuperNode cabinet (continued)

---

### Replacing FSP cards in a 42-in. (106.7-cm) SuperNode cabinet

#### *At the frame*

1



#### **DANGER**

##### **Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure that you remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.

Obtain a replacement card. Make sure that the replacement card and the card that you replace have the same PEC and PEC suffix.

2



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Unscrew the slotted nut on the left of the FSP.

3

Open the FSP.

4

Remove the card.

5

Insert the replacement alarm and control card.

6

Close the FSP.

7

Tighten the slotted nut on the FSP.

8

The next action depends on the reason that you perform this procedure.

---

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 9  |
| did not direct you to this procedure | step 10 |

---

9

Return to the maintenance procedure that directed you to this procedure and continue as directed.

## FSP cards in a 42-in. (106.7-cm) SuperNode cabinet (end)

- |                                                 |                                                                                                                                                                                                                                                                                                                                             |                                                 |           |        |         |            |         |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------|--------|---------|------------|---------|
| <b>10</b>                                       | Check the CONVERTER FAIL LEDs on each power converter for each shelf.                                                                                                                                                                                                                                                                       |                                                 |           |        |         |            |         |
|                                                 | <table border="0" style="width: 100%;"> <tr> <td style="border-bottom: 1px solid black; width: 50%;"><b>If the LED for any power con-<br/>verter</b></td> <td style="border-bottom: 1px solid black; width: 50%;"><b>Do</b></td> </tr> <tr> <td>is lit</td> <td>step 11</td> </tr> <tr> <td>is not lit</td> <td>step 12</td> </tr> </table> | <b>If the LED for any power con-<br/>verter</b> | <b>Do</b> | is lit | step 11 | is not lit | step 12 |
| <b>If the LED for any power con-<br/>verter</b> | <b>Do</b>                                                                                                                                                                                                                                                                                                                                   |                                                 |           |        |         |            |         |
| is lit                                          | step 11                                                                                                                                                                                                                                                                                                                                     |                                                 |           |        |         |            |         |
| is not lit                                      | step 12                                                                                                                                                                                                                                                                                                                                     |                                                 |           |        |         |            |         |
| <b>11</b>                                       | To clear alarms, go to <i>Alarm and Performance Monitoring Procedures</i> . Do not return to this procedure.                                                                                                                                                                                                                                |                                                 |           |        |         |            |         |
| <b>12</b>                                       | The procedure is complete.                                                                                                                                                                                                                                                                                                                  |                                                 |           |        |         |            |         |

## **NT0X36 in a cabinetized input/output equipment frame**

---

### **Application**

Use this procedure to replace a NT0X36 in a cabinetized input/output equipment (CIOE) frame, as listed in the following table.

| <b>PEC</b> | <b>Suffix</b> | <b>Card name</b>             | <b>Shelf or frame name</b> |
|------------|---------------|------------------------------|----------------------------|
| NT0X36     | AB            | Power control and alarm card | CIOE                       |

*Note:* To perform this procedure, shelf positions 05, 19, and 33 must have one of the following:

- input/output controller (IOC)
- disk drive unit (DDU)
- magnetic tape drive unit (MTD)

If the shelf positions in the CIOE frame in your office have other subsystems or applications, contact the next level of support.

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### **Common procedures**

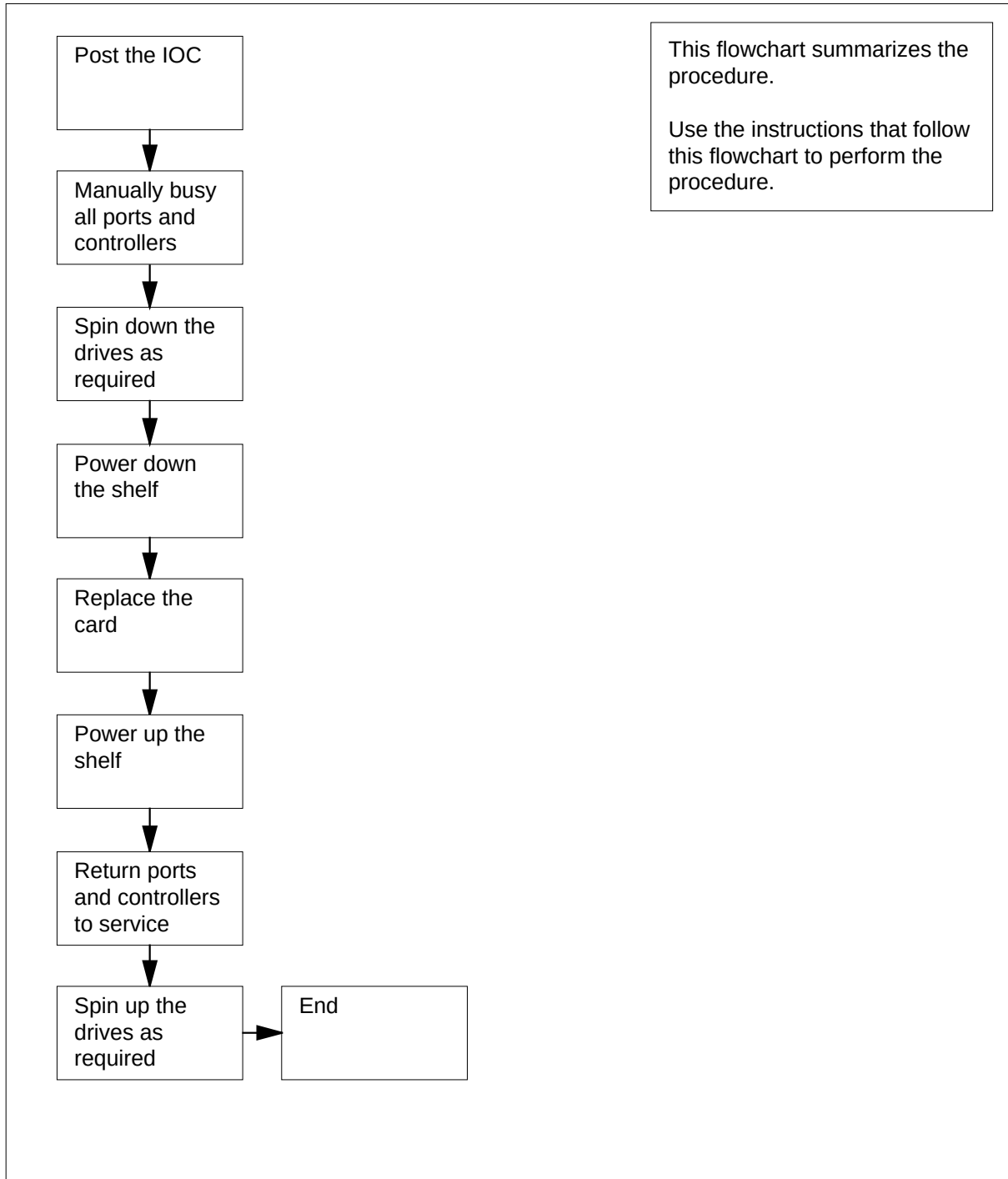
There are no common procedures.

### **Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT0X36 in a cabinetized input/output equipment frame (continued)

### Summary of replacing NT0X36 in a cabinetized input/output equipment frame



## NT0X36 in a cabinetized input/output equipment frame (continued)

---

### Replacing NT0X36 in a cabinetized input/output equipment frame

#### *At your current location*

1

#### **ATTENTION**

This procedure includes directions to manually busy all terminal controller cards for the IOC. Perform this procedure from a MAP terminal that does not connect to the IOC.



#### **CAUTION**

##### **Potential loss of service**

This procedure includes directions to manually busy an IOC and the IOC device controllers or a DDU. Perform this procedure only if you need to restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic.



#### **DANGER**

##### **Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure that you remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

#### *At the cabinet*

- 2 Unscrew the slotted nut on the left of the FSP.
- 3 Open the FSP.

## NT0X36

### in a cabinetized input/output equipment frame (continued)

4

**CAUTION****Potential loss of service**

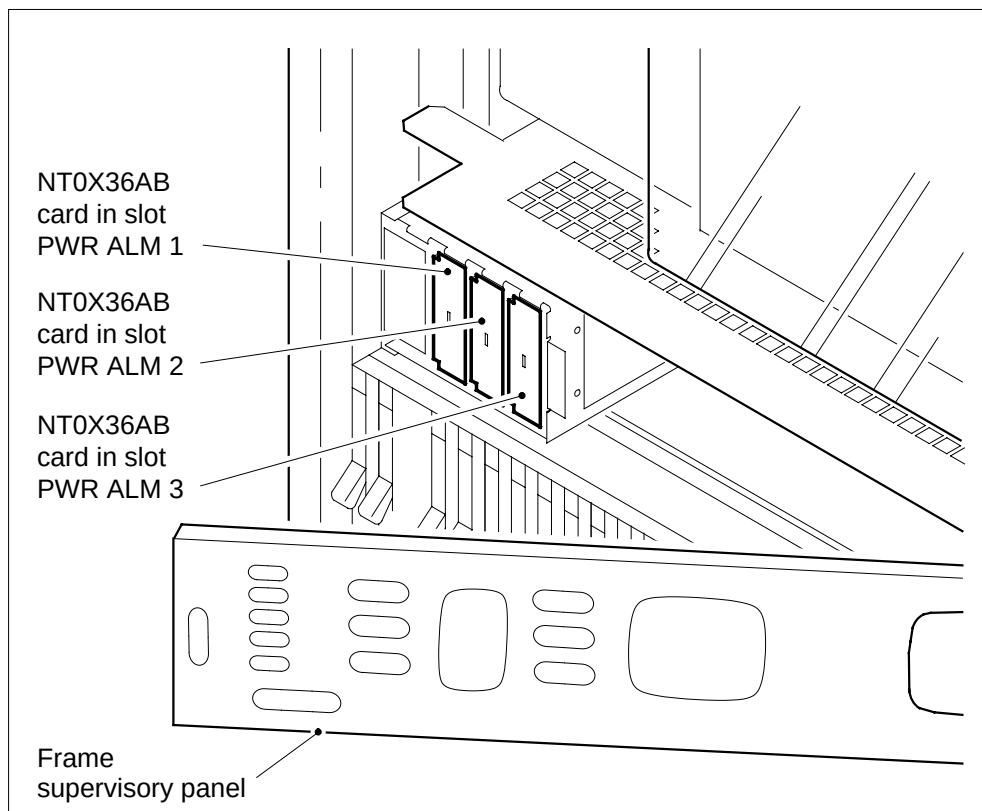
If the power distribution configuration in the following table does not match your office configuration, contact the next level of support. Contact the next level of support before you proceed.

Use the following table to identify the shelf positions, subsystems, subsystem numbers, shelf side, and FSP fuse numbers that associate with the card you replace.

| Power and alarm card slot | Shelf position | Sub-sy stem | Wiring option | Shelf side | FSP fuse number |
|---------------------------|----------------|-------------|---------------|------------|-----------------|
| PWR ALM 1                 | 33             | DPP         |               | A          | 01              |
|                           | 33             | MTD         | A             |            |                 |
|                           | 19             | IOC         | A             |            | 02              |
| PWR ALM 2                 | 05             | DDU 0       |               | A          | 03              |
|                           | 05             | ROS         |               | A          |                 |
|                           | 19             | IOC         | B             |            | 04              |
| PWR ALM 3                 | 33             | DPP         |               | B          | 05              |
|                           | 33             | MTD         | B             |            |                 |
|                           | 05             | DDU 1       |               | B          | 06              |
|                           | 05             | ROS         |               | B          |                 |

## NT0X36 in a cabinetized input/output equipment frame (continued)

---



- 5 Record the shelf positions, shelf side (if needed), and fuse numbers that associate with the card that you replace.
- 6 Record the subsystem names and subsystem numbers (if needed) that associate with the power and alarm card that you replace.  
**Note:** Each power and alarm card associate with two shelves (a maximum of two subsystems).

### **At the MAP terminal**

- 7 To access the IOD level of the MAP display, type  
**>MAPCI;MTC;IOD**  
and press the Enter key.
- 8 To post the affected input/output controller (IOC), type  
**>IOC ioc\_no**  
and press the Enter key.  
*where*  
**ioc\_no**  
is the number of the IOC (0 to 19)



## NT0X36

### in a cabinetized input/output equipment frame (continued)

- 9** Select a shelf position from the list that you recorded at step 5.

| If the shelf                    | Do      |
|---------------------------------|---------|
| contains DDUs                   | step 10 |
| contains an IOC                 | step 16 |
| contains other than listed here | step 92 |
| does not contain a unit         | step 46 |

- 10** To post the DDU controller for the affected DDU, type

**>CARD card\_no**

and press the Enter key.

where

**card\_no**  
is the card number (0 to 8)

Example of a MAP display:

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .--- .---
Card 0 TYPE MTD DDU CONS MPC CONS CONS MPC
 MTD
 TapeName
 Status Idle
 User

```

- 11** Determine the state of the DDU controller card.

| If the card                                            | Do      |
|--------------------------------------------------------|---------|
| is MBSY and the associated disk drive is not spun down | step 14 |
| is MBSY and the associated disk drive is spun down     | step 15 |
| is OFFL                                                | step 84 |

**NT0X36****in a cabinetized input/output equipment frame** (continued)

|       |                                                                                                                                                       | If the card               | Do      |      |      |     |            |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------|------|------|-----|------------|
|       |                                                                                                                                                       | is other than listed here | step 12 |      |      |     |            |
| 12    | To determine if files on the DDU are open, type<br><b>&gt;ALLOC</b><br>and press the Enter key.<br><i>Example of a MAP response:</i>                  |                           |         |      |      |     |            |
| VOLID | VOL_NAME                                                                                                                                              | SERIAL_NO                 | BLOCKS  | ADDR | TYPE | R/O | FILES_OPEN |
| 0     | IMAGE                                                                                                                                                 | 2800                      | 45000   | D000 | 0    | NO  | 0          |
| 1     | XPMLOADS                                                                                                                                              | 2801                      | 35000   | D000 | 0    | NO  | 0          |
| 2     | RTMLOADS                                                                                                                                              | 2802                      | 20000   | D000 | 0    | NO  | 0          |
| .     | .                                                                                                                                                     | .                         | .       | .    | .    | .   | .          |
| 7     | SMDR                                                                                                                                                  | 2807                      | 5000    | D000 | 0    | NO  | 0          |
| 8     | AMA1                                                                                                                                                  | 2808                      | 5000    | D000 | 0    | NO  | 0          |
| 9     | TST                                                                                                                                                   | 2809                      | 50      | D000 | 0    | NO  | 0          |
| 10    | AMA2                                                                                                                                                  | 280A                      | 500     | D000 | 0    | NO  | 0          |
|       |                                                                                                                                                       | If                        | Do      |      |      |     |            |
|       |                                                                                                                                                       | any files are open        | step 85 |      |      |     |            |
|       |                                                                                                                                                       | all files are closed      | step 13 |      |      |     |            |
| 13    | To manually busy the DDU controller, type<br><b>&gt;BSY</b><br>and press the Enter key.                                                               |                           |         |      |      |     |            |
| 14    | Spin down the disk drive, type<br><b>&gt;STOP</b><br>and press the Enter key.                                                                         |                           |         |      |      |     |            |
| 15    | Wait until the DDU spins down before you proceed to the next step. The status code spun_down appears under the Drive_State header on the MAP display. |                           |         |      |      |     |            |
| 16    | Determine the state of the IOC.                                                                                                                       |                           |         |      |      |     |            |
|       |                                                                                                                                                       | If the state of the IOC   | Do      |      |      |     |            |
|       |                                                                                                                                                       | is M                      | step 46 |      |      |     |            |
|       |                                                                                                                                                       | is other than listed here | step 17 |      |      |     |            |

## NT0X36

### in a cabinetized input/output equipment frame (continued)

- 17** The next action depends if terminal controller cards are on the shelf.

| If terminal controller cards | Do      |
|------------------------------|---------|
| are on the shelf             | step 18 |
| are not on the shelf         | step 24 |

- 18** To post the terminal controller card, type

**>CARD card\_no**

and press the Enter key.

where

**card\_no**

is the card number (0 to 8)

Example of a MAP display:

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123

 STAT .---- .---- .---- .---- .---- .---- .---- .----

Card TYPE MTD DDU CONS MPC CONS CONS MPC
Status 6 Ckt 0 1 2 3
Cons Id RD040 RD041 TEAM4 TEAM6
ConType VT100 VT100 VT100 VT100

```

- 19** Note the CONS ID and status for each port.

| If                                              | Do      |
|-------------------------------------------------|---------|
| all ports are ManBsy                            | step 23 |
| one or more ports are Offl                      | step 84 |
| one or more ports are . (dot)                   | step 20 |
| all ports are in any other out-of-service state | step 21 |

- 20** Inform operating company personnel that you will remove from service the CONS IDs that associate with the card you replace.

## NT0X36

### in a cabinetized input/output equipment frame (continued)

---

- 21 To manually busy a port on the card, type

**>BSY port\_no**

and press the Enter key.

*where*

**port\_no**

is the port number (0 to 3)

---

| If the BSY command | Do |
|--------------------|----|
|--------------------|----|

---

|        |         |
|--------|---------|
| passed | step 22 |
|--------|---------|

|        |         |
|--------|---------|
| failed | step 92 |
|--------|---------|

- 22 Repeat step 21 until all ports on the card are manual busy. Go to step 23.

- 23 Repeat steps 18 to 22 for each terminal controller card on the shelf. Go to step 24.

- 24 The next action depends if multiprotocol controller (MPC) cards are on the shelf.

---

| If MPC cards | Do |
|--------------|----|
|--------------|----|

---

|                  |         |
|------------------|---------|
| are on the shelf | step 25 |
|------------------|---------|

|                      |         |
|----------------------|---------|
| are not on the shelf | step 32 |
|----------------------|---------|

- 25 To post the MPC card, type

**>CARD card\_no**

and press the Enter key.

*where*

**card\_no**

is the card number (0 to 8)

*Example of a MAP display:*

## NT0X36

### in a cabinetized input/output equipment frame (continued)

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .--- .---

Card 3 TYPE MTD DDU CONS MPC CONS CONS MPC
 Unit
 User
 Status SYSTEM BOARD LINK0 LINK1 LINK2 LINK3
 Ready COMACT UNEQ N/A UNEQ ENABLD

```

- 26** Determine the state of the card.

| If the card state         | Do      |
|---------------------------|---------|
| is MANB                   | step 31 |
| is OFFL                   | step 84 |
| is other than listed here | step 27 |

**Note:** The card state listed appears under the BOARD header on the MAP display.

- 27** To display status information on current MPC conversations, type  
**>QCONV**  
 and press the Enter key.  
*Example of a MAP response:*

```

MPC L LCN STATUS CCC SEC PARDEV INP OPEN OWNER
--- - --- -
0 3 1 INACTIVE none none none FIL 0 none
0 3 2 INACTIVE none none none FIL 0 none

```

| If                              | Do      |
|---------------------------------|---------|
| one or more sessions are active | step 28 |
| all sessions are inactive       | step 29 |

## NT0X36

### in a cabinetized input/output equipment frame (continued)

---

- 28 Notify all users that an interruption of MPC service will occur. Wait until all sessions are inactive before you proceed.

- 29 To manually busy the card and the card links, type

**>BSY ALL FORCE**

and press the Enter key.

*Example of a MAP response:*

TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND

Please confirm ("YES", "Y", "NO", or "N"):

- 30 To confirm the command, type

**>YES**

and press the Enter key.

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 31 |
| failed             | step 92 |

---

- 31 Repeat steps 25 to 30 for each MPC card on the shelf. Go to step 32.

- 32 The next action depends if disk drive controller cards are on the shelf.

---

| If disk drive controller cards | Do      |
|--------------------------------|---------|
| are on the shelf               | step 33 |
| are not on the shelf           | step 38 |

---

- 33 To post the disk drive controller card, type

**>CARD card\_no**

and press the Enter key.

*where*

**card\_no**

is the card identification number (0 to 8)

*Example of a MAP display:*

## NT0X36

### in a cabinetized input/output equipment frame (continued)

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .---- .---- ---- ---- .---- .---- ----

Card 0 TYPE MTD DDU CONS MPC CONS CONS MPC
 MTD
 TapeName
 Status Idle
 User

```

- 34** Determine the state of the card.

| If the card               | Do      |
|---------------------------|---------|
| is MBSY                   | step 37 |
| is OFFL                   | step 84 |
| is other than listed here | step 35 |

- 35** To determine if open files are on the DDU, type  
**>ALLOC**  
 and press the Enter key.

*Example of a MAP response:*

| VOLID | VOL_NAME | SERIAL_NO | BLOCKS | ADDR | TYPE | R/O | FILES_OPEN |
|-------|----------|-----------|--------|------|------|-----|------------|
| 0     | IMAGE    | 2800      | 45000  | D000 | 0    | NO  | 0          |
| 1     | XPMLOADS | 2801      | 35000  | D000 | 0    | NO  | 0          |
| 2     | RTMLOADS | 2802      | 20000  | D000 | 0    | NO  | 0          |
| .     | .        | .         | .      | .    | .    | .   | .          |
| 7     | SMDR     | 2807      | 5000   | D000 | 0    | NO  | 0          |
| 8     | AMA1     | 2808      | 5000   | D000 | 0    | NO  | 0          |
| 9     | TST      | 2809      | 50     | D000 | 0    | NO  | 0          |
| 10    | AMA2     | 280A      | 500    | D000 | 0    | NO  | 0          |

| If                 | Do      |
|--------------------|---------|
| any files are open | step 85 |

**NT0X36****in a cabinetized input/output equipment frame** (continued)

|           | <b>If</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | all files are closed                                                                                                                                                                                                                                                                                                                                                                                                                                | step 36   |
| <b>36</b> | To manually busy the card, type<br><b>&gt;BSY</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br>bsyOK                                                                                                                                                                                                                                                                                                                         |           |
| <b>37</b> | Repeat steps 33 to 36 for each disk drive controller card on the shelf. Go to step 38.                                                                                                                                                                                                                                                                                                                                                              |           |
| <b>38</b> | The next action depends if magnetic tape drive controller cards are on the shelf.                                                                                                                                                                                                                                                                                                                                                                   |           |
|           | <b>If magnetic tape drive controller cards</b>                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Do</b> |
|           | are on the shelf                                                                                                                                                                                                                                                                                                                                                                                                                                    | step 39   |
|           | are not on the shelf                                                                                                                                                                                                                                                                                                                                                                                                                                | step 44   |
| <b>39</b> | To post the card, type<br><b>&gt;CARD card_no</b><br>and press the Enter key.<br><i>where</i><br><b>card_no</b><br>is the card number (0 to 8)<br><i>Example of a MAP display:</i>                                                                                                                                                                                                                                                                  |           |
|           | <pre> IOD IOC  0  1  2  3 STAT .  .  .  .  DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25: MLP :  .      DPPP:  .      DPPU:  .      SCAI:  .  IOC  CARD  0  1  2  3  4  5  6  7 0  PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123 ---- STAT  .---- .---- .---- .---- .---- .---- .---- .---- ---- TYPE  MTD  DDU  CONS  MPC  CONS          CONS  MPC Card 0  MTD          0       TapeName       Status      Idle       User </pre> |           |



## NT0X36

### in a cabinetized input/output equipment frame (continued)

- 40** Determine the state of the card.
- | If the card               | Do      |
|---------------------------|---------|
| is ManBsy                 | step 43 |
| is Offl                   | step 84 |
| is Idle                   | step 42 |
| is other than listed here | step 41 |
- 41** Notify all users that an interruption in service for the device will occur. Wait until all users finish with the device before you proceed to the next step.
- 42** To manually busy the card, type  
**>BSY**  
 and press the Enter key.  
*Example of a MAP response:*
- ```
bsy
OK
```
- 43** Repeat steps 39 and 42 for each magnetic tape drive controller card on the shelf. Go to step 44.
- 44** To return to the IOC level of the MAP display, type
>QUIT
 and press the Enter key.
- 45** To manually busy the affected IOC, type
>BSY IOC
 and press the Enter key.
- 46** The next action depends on if the other subsystem that associates with the power and alarm card you replace is out of service.
- | If the other subsystem | Do |
|--|---------|
| is out of service | step 48 |
| is not out of service | step 47 |
| that associates with the card you replace is not present | step 48 |
- 47** To remove the other subsystem that associates with the card you replace, go to step 9 and follow the procedure.

NT0X36

in a cabinetized input/output equipment frame (continued)

At the CIOE frame

48



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

For each power converter on the shelf, set the handle of the power converter POWER switch down to the OFF position.

- 49 Remove the FSP fuses that associate with the alarm and control card you replace.

Note: You recorded the fuse numbers in step 5.

50



WARNING

Loss of service

Make sure that the alarm and control card you remove is the alarm that controls the subsystems that you removed from service. Removal of the wrong card causes a loss of service.

Remove the card from the slot that you recorded in step 5.

- 51 Insert the replacement card.
52 Close the FSP.
53 Tighten the slotted nut on the FSP.
54 Insert the fuses that you removed in step 49.
55 The next action depends on the power converter on the shelf.

If the power converter	Do
is a NT2X70AA/AB/AC/AD	step 56
is a NT2X70AE	step 58
is a NT1X78	step 60

- 56 Power up the converter, as follows.
- a Pull up and set the handle of the POWER switch to the RESET position. Hold the switch until the CONVERTER FAIL LED turns off.
 - b Release the handle.

NT0X36

in a cabinetized input/output equipment frame (continued)

- 57 Go to step 61.
- 58 Power up the converter, as follows.
- a Pull up and set the handle of the POWER switch to the ON position.
 - b Press and hold the RESET button on the power converter until the CONVERTER FAIL LED turns off.
 - c Release the RESET button.
- 59 Go to step 61.
- 60 Reset the power converter:
- a Set the POWER switch on the converter to the ON position.
 - b Press and hold the RESET button on the power converter.
 - c When the CONVERTER FAIL lamp turns off, release the RESET button.
- 61 Verify that the power fail lamp is not lit. If the power lamps is not lit, the power converter is ON.

If the power fail lamp	Do
is not lit	step 63
is lit	step 92

At the MAP terminal

- 62 To return the IOC to service, type
>RTS IOC
 and press the Enter key.
- 63 Select a shelf position from the list that you recorded in step 5.
- | If the shelf | Do |
|--------------|---------|
| has DDUs | step 64 |
| has an IOC | step 66 |
- 64 To post the DDU controller that you posted at step 10, type
>CARD card_no
 and press the Enter key.
where
 card_no
 is the card number (0 to 8)
- 65 To return the DDU controller to service, type
>RTS

NT0X36**in a cabinetized input/output equipment frame** (continued)

and press the Enter key.

Note: The return to service process can require a maximum of 3 min. The RTS command spins up the disk drive.

	If the RTS command	Do
	passed (status is Ready and drive state is on-line)	step 62
	failed (status or drive state is other than listed here)	step 92
66	The next action depends if the controller cards are on the shelf.	
	If disk drive or magnetic tape drive controller cards	Do
	are on the shelf	step 67
	are not on the shelf	step 70
67	To post the card, type >CARD card_no and press the Enter key. where card_no is the card number (0 to 8)	
68	To return the card to service, type >RTS and press the Enter key.	
69	Repeat steps 67 and 68 for each disk drive or magnetic tape drive controller card on the shelf. Go to step 70.	
70	The next action depends on if MPC cards are on the shelf.	
	If MPC cards	Do
	are on the shelf	step 71
	are not on the shelf	step 77
71	To post the card, type >CARD card_no and press the Enter key. where card_no is the card number (0 to 8)	

NT0X36

in a cabinetized input/output equipment frame (continued)

- 72 To load the MPC, type

>DOWNLD

and press the Enter key.

Example of a MAP response:

DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED

If the DOWNLD command	Do
passed	step 73
failed	step 92

- 73 To return the MPC to service, type

>RTS ALL

and press the Enter key.

Example of a MAP response:

REQUEST PASSED FOR CARD.REQUEST PASSED FOR LINKS.

- 74 Wait 1 min and check the status of MPC components.

If the system status	Do
is Ready, the board status is COMACT, and the link status is ENABLD for each provisioned link	step 75
is other than listed here	step 92

- 75 Repeat steps 71 to 74 for each card on the shelf. Go to step 76.

- 76 Notify users that MPC service is available.

- 77 The next action depends if terminal controller cards are on the shelf.

If terminal controller cards	Do
are on the shelf	step 78
are not on the shelf	step 80

- 78 To post the card, type

>CARD card_no

and press the Enter key.

where

NT0X36

in a cabinetized input/output equipment frame (continued)

- card_no**
is the card number (0 to 8)
- 79** To return a port on the card to service, type
>RTS port_no
and press the Enter key.
where
port_no
is the port number (0 to 3)
- | If the RTS command | Do |
|--------------------|---------|
| passed | step 80 |
| failed | step 92 |
- 80** The next action depends if the other subsystem that associates with the card you replaced was returned to service.
- | If the other subsystem | Do |
|---|---------|
| was returned to service | step 82 |
| was not returned to service | step 81 |
| does not associate with the card you replaced | step 82 |
- 81** Go to step 63 and follow the procedure to return to service the other subsystem that associates with the the card you replaced.
- 82** The next action depends on the reason that you perform this procedure.
- | If a maintenance procedure | Do |
|--------------------------------------|---------|
| directed you to this procedure | step 83 |
| did not direct you to this procedure | step 93 |
- 83** Return to the maintenance procedure that directed you to this procedure and continue as directed.
- 84** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

NT0X36

in a cabinetized input/output equipment frame (continued)

85

**WARNING****Loss of data**

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

86 Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

>LOGUTIL;LISTDEVS

and press the Enter key.

87 Close files on volumes on the DDU of the IOC.

>STOPDEV <dev_name>

and press the Enter key.

where

dev_name

is the name of the device

>QUIT

and press the Enter key.

88 Repeat the ALLOC command to determine if files are closed, by typing

>ALLOC

and pressing the Enter key.

If the files	Do
are open	step 89
are closed	step 90

89 Confirm that you have done steps 85 to 88. If the files are still open, contact your next level of support.

NT0X36

in a cabinetized input/output equipment frame (end)

- 90** Manually busy the DDU, by typing
>BSY
and pressing the Enter key.

If the DDU	Do
is MBSY	step 91
is not MBSY	step 92

- 91** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.
- 92** For additional help, contact the next level of support.
- 93** The procedure is complete.

NT0X36

in a cabinetized trunk module equipment frame

Application

Use this procedure to replace an NT0X36 in a cabinetized trunk module equipment (CTME) frame, as listed in the following table.

PEC	Suffix	Card name	Shelf or frame name
NT0X36	AB	Power control and alarm card	CTME equipped with maintenance trunk module (MTM), office alarm unit (OAU), or trunk module (TM). Meridian or packaged switch cabinet equipped with service trunk module (STM).

Refer to the "Index", if you cannot identify the following features for the card that you want to replace;

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

Common procedures

This procedure refers to *Loading a PM*.

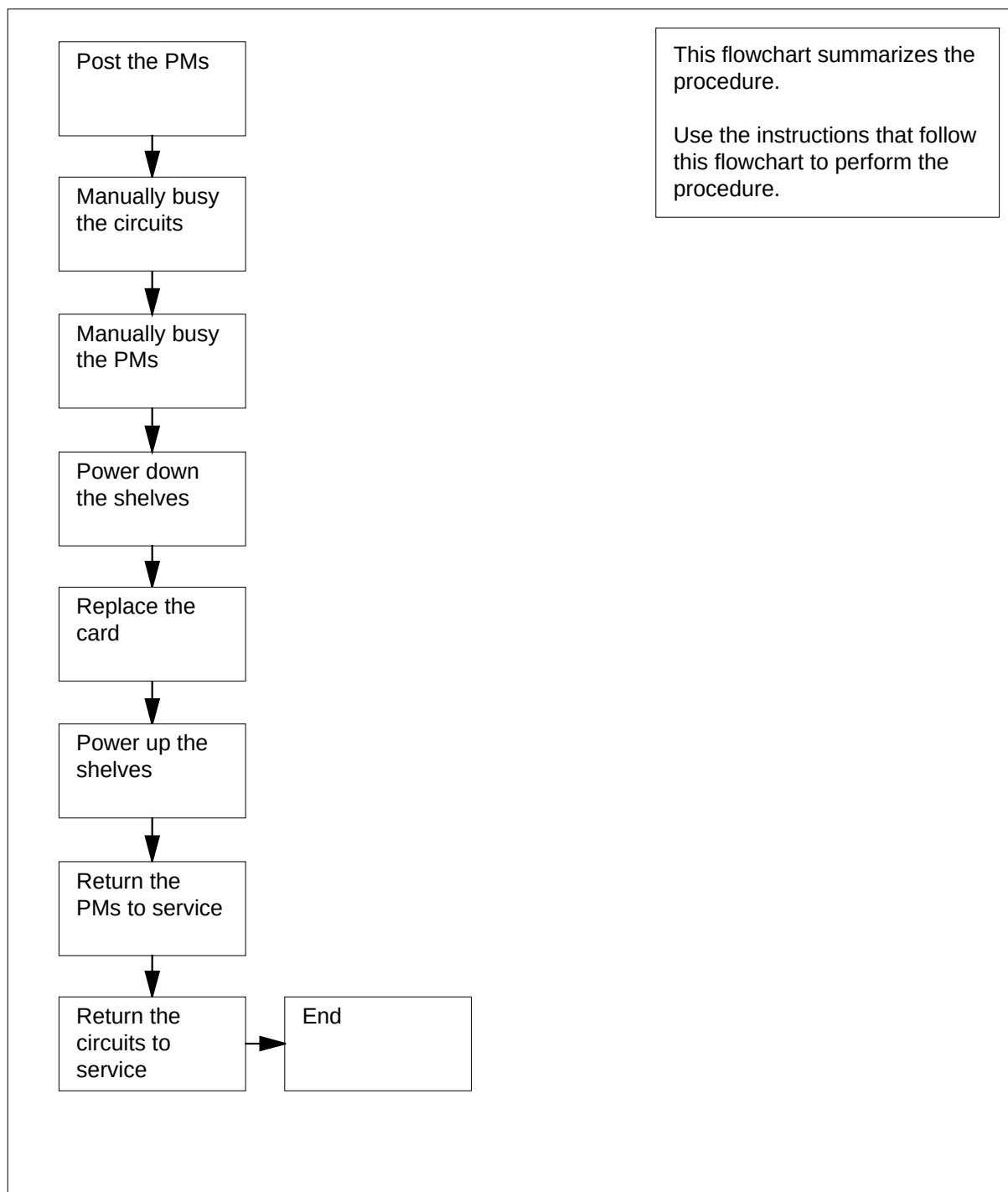
Do not go to the common procedure unless the step-action procedure directs you.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NT0X36 in a cabinetized trunk module equipment frame (continued)

Summary of replacing NT0X36 in a cabinetized trunk module equipment frame



NT0X36

in a cabinetized trunk module equipment frame (continued)

Replacing NT0X36 in a cabinetized trunk module equipment frame

At your current location

1



CAUTION

Loss of service

This procedure includes directions to remove an MTM, STM, or TM from service, which can cause service degradation. Perform this procedure only if you need to restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic. Do not perform this procedure if essential services use PM resources.



DANGER

Risk of electrocution

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure that you remove all jewelry before you replace a card in the FSP. Do not touch any terminal in the FSP.

Obtain a replacement card. Make sure that the replacement card and the card that you removed have the same PEC and PEC suffix.

At the cabinet

- 2 Unscrew the slotted nut on the left of the FSP.
- 3 Open the FSP.
- 4 To identify the shelf positions and FSP fuses that associate with the power and alarm card you will replace, use the following table and diagram.

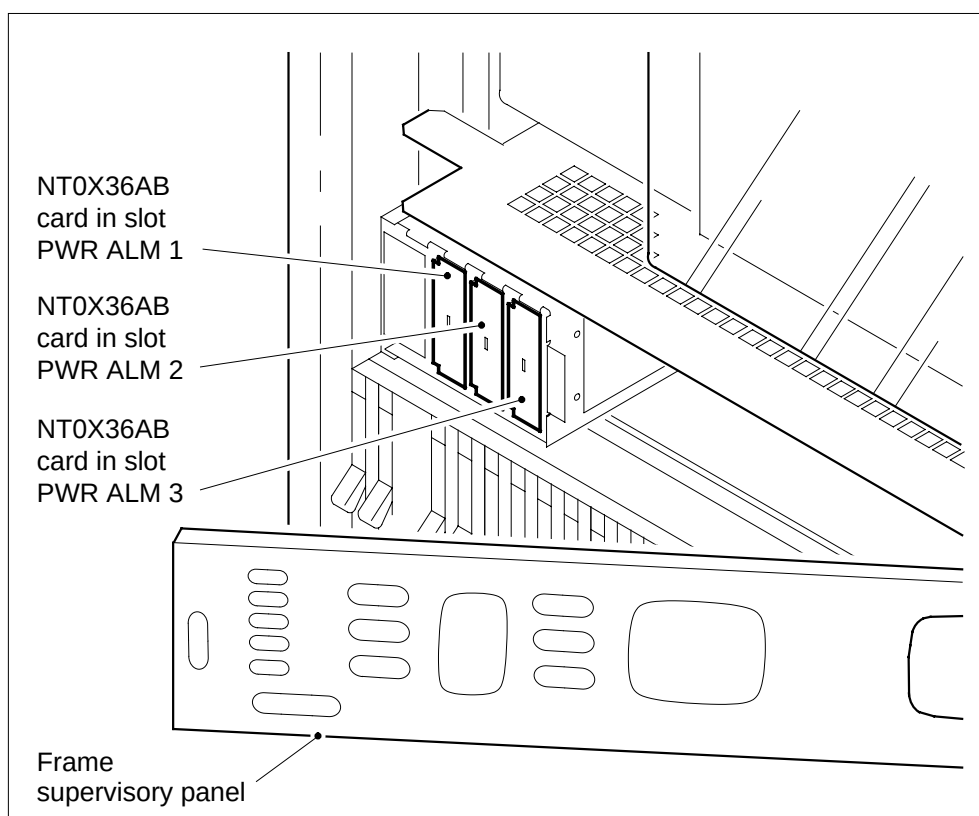
(Sheet 1 of 2)

Power and alarm card slot	FSP fuse number	Shelf position
PWR ALM 1	01	05
	02	33

NT0X36 in a cabinetized trunk module equipment frame (continued)

(Sheet 2 of 2)

Power and alarm card slot	FSP fuse number	Shelf position
PWR ALM 2	04	19
PWR ALM 3	05	47



5



CAUTION

Potential loss of service

If the power distribution in the following procedure does not match your office configuration, contact the next level of support before you proceed.

Record the fuse numbers and shelf positions that associate with the card you replace.

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 6 Select a shelf that associates with the FSP card you replace.

At the MAP terminal

- 7 To access the PM level of the MAP display, type

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1		6			102

- 8 The next step depends on the type of PM that is in the shelf.

If the PM	Do
is an OAU	step 9
is MTM, STM, or TM	step 13

- 9 To post the OAU, type

>POST OAU pm_no

and press the Enter key.

where

pm_no

is the number of the PM (0 to 9999)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	6	0	0	102
OAU	1	0	0	0	0	0

OAU 0 SysB

- 10 Determine the state of the OAU.

Note: The state of the OAU appears on the right of the PM number. In the example display in step 9, the OAU is system busy (SysB).

If the OAU	Do
is OffL	step 129
is ManB	step 40
is other than listed here	step 11

NT0X36**in a cabinetized trunk module equipment frame (continued)**

- 11** A maintenance flag (Mtce) can appear. A Mtce flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before you proceed to the next step.

- 12** To manually busy the PM, type

>BSY

and press the Enter key.

Example of a MAP display:

```

          SysB   ManB   OffL   CBsy   ISTb   InSv
PM       58      1       6      14     12     17
OAU      0       1       0       0      0      0

OAU      0      ManB
bsy
OAU 0 Bsy
OK.
```

Go to step 40.

- 13** From office records or operating company personnel, verify that essential services do not use the PM resources affected by this procedure.

Note: When you verify resources that are in use, include all PMs that associate with the shelf. For all STMs and TMs, include NT1X80 cards and NT1X81 cards (single-card PMs) on the shelf. Remove these single-card PMs from service to complete this procedure. If the shelf has an STM, check essential services on the STM that is on the other half of the shelf. To complete the procedure, remove both STMs from service.

If essential services	Do
use PM resources, and a minimum of one PM is in service	step 128
use PM resources and all PMs are out of service	step 14
do not use PM resources	step 14

- 14** To post the PM, type
>POST pm_type pm_no
and press the Enter key.

where

pm_type

is the type of PM (MTM, STM, TM)

pm_no

is the number of the PM (0 to 9999)

Example of a MAP display:

NT0X36

in a cabinetized trunk module equipment frame (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	6	0	0	102
MTM	1	0	0	0	0	9
MTM	0	SysB				

- 15** Determine the state of the PM.

Note: The PM state appears on the right of the PM number. In the example display in step 14, the PM state is system busy (SysB).

If the PM	Do
is Offl	step 129
is other than listed here	step 16

- 16** To access the TTP level of the MAP display, type

>MAPCI;MTC;TRKS;TTP

and press the Enter key.

Example of a MAP display:

POST	DELQ	BUSYQ	DIG
TTP 6-013			
CKT TYPE	PM NO.	COM LANG	STA S R DOT TE RESULT

- 17** To post the circuits for the PM, type

>POST P pm_type pm_no

and press the Enter key.

where

pm_type

is the type of PM (MTM, STM, TM)

pm_no

is the number of the PM (0 to 9999)

Example of a MAP display:

NT0X36**in a cabinetized trunk module equipment frame (continued)**

```

POST      17  DELQ          BUSYQ          DIG
TTP      6-013
CKT TYPE          PM NO.          COM LANG          STA S R  DOT TE  RESULT
CONF6      MTM      0  0  CF6P          0  IDL

```

```

post p MTM 0
LAST CKT = 17
SHORT CLLI IS: CF6P
OK, CKT POSTED

```

- 18** Determine if the state of any of the circuits is installation busy (INB). The INB on the right of the trunk name on the MAP display indicates installation busy.

Note: Repeat the command NEXT until you determine the state of each circuit.

If	Do
a minimum of one circuit is in the INB state	step 19
circuits are not in the INB state	step 24

- 19** Record the name and number of each circuit that is in the INB state.

- 20** To manually busy all posted circuits, type

>BSY ALL

and press the Enter key.

Example of a MAP display:

```

POST      18  DELQ          BUSYQ  A  6  DIG
TTP      6-027
CKT TYPE          PM NO.          COM LANG          STA S R  DOT TE  RESULT

```

BSYQ ALL IDLE

```

bsy all
OK, POST SET IS SET IN BSYQ

```

- 21** Wait until you manually busy all circuits before you proceed. When you manually busy circuits, you remove the circuits from the busy queue.

Note: The digit on the right of the BUSYQ header indicates the number of circuits that remain in use. As a circuit becomes available, you manually busy the circuit and the number in the queue decreases by one. A blank field indicates that all circuits are manual busy.

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 22 The next action depends if the affected shelf has the NT1X80 enhanced digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.

If the shelf	Do
contains the NT1X80 or the NT1X81	step 23
does not contain the NT1X80 or the NT1X81	step 27

- 23 To post the circuits for the single-card PM, type

>POST P pm_type pm_no

and press the Enter key.

where

pm_type

is the type of single-card PM (CTM, DTM)

pm_no

is the number of the PM (0 to 9999)

Note: The NT1X80 EDRAM card is a DTM on the MAP display. The NT1X81 conference card is a CTM. Both cards are single-card PMs.

- 24 To manually busy all posted circuits, type

>BSY ALL

and press the Enter key.

- 25 Wait until you manually busy all circuits before you proceed to the next step. When you manually busy circuits, you remove the circuits from the busy queue.

- 26 Repeat steps 23 to 25 for all NT1X80 and NT1X81 cards on the shelf.

- 27 To access the PM level of the MAP display, type

>PM

and press the Enter key.

- 28 To post the PM, type

>POST pm_type pm_no

and press the Enter key.

where

pm_type

is the type of PM (MTM, STM, TM)

pm_no

is the number of the PM (0 to 9999)

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 29 Determine the state of the PM.

If the PM	Do
is ManB	step 31
is other than listed here	step 30

- 30 To manually busy the PM, type
>BSY
 and press the Enter key.
Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	58	1	6	14	12	17
MTM	0	1	0	0	0	9

MTM 0 ManB
 bsy
 MTM 0 Bsy
 OK.

- 31 The next action depends if the shelf is either the NT1X80 EDRAM card or the NT1X81 conference card.

If the shelf	Do
contains the NT1X80 or the NT1X81	step 32
does not contain the NT1X80 or the NT1X81	step 36

- 32 To post the single-card PM, type
>POST pm_type pm_no
 and press the Enter key.
where

pm_type
 is the type of single-card PM (CTM, DTM)

pm_no
 is the number of the PM (0 to 9999)

- 33 Determine the state of the single-card PM.

If the PM	Do
is ManB	step 35
is other than listed here	step 34

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 34** To manually busy the single-card PM, type
>BSY
 and press the Enter key.
- 35** Repeat steps 32 to 34 for all NT1X80 and NT1X81 cards on the shelf.
- 36** The next action depends if the shelf contains an STM.

If the shelf	Do
contains an STM, and you manually busied only one STM	step 37
contains an STM, and you manually busied both STMs	step 38

37



WARNING

Loss of service

If you turn off an STM, the mate power converter in the other STM on the shelf trips. Make sure that you manually busy and turn off STMs on a shelf.

- Repeat steps 14 to 36 for the STM in the other half of the shelf.
- 38** The next action depends on how many shelves with PMs associate with the FSP that you replace.

If	Do
one shelf equipped with PMs associates with the card	step 40
two shelves equipped with PMs associate with the card, and you turned down functionality for only one shelf	step 39
two shelves equipped with PMs associate with the card, and you turned down functionality for both shelves	step 40

- 39** Repeat steps 6 to 38 for PMs in the other shelf that associates with the FSP card that you replace. Go to step 40.

NT0X36

in a cabinetized trunk module equipment frame (continued)

At the shelf

40



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Select a shelf to power down.

41 Pull down and set the handle of the POWER switch on the power converter to the OFF position.

42 The next action depends on the type of PM that is in the shelf.

If the shelf	Do
contains an STM (with or without DRAM)	step 43
contains an MTM (with or without DRAM)	step 44
contains a TM	step 45

43 For the mate power converter in the STM, pull down and set the handle of the POWER switch to the OFF position.

Go to step 45.

44 For the other power converter on the shelf, pull down and set the handle of the POWER switch to the OFF position.

45 The next action depends on how many shelves with PMs associate with the FSP card you replace.

If	Do
one shelf equipped with PMs associates with the card	step 47
two shelves equipped with PMs associate with the card, and you powered down only one shelf	step 46
two shelves equipped with PMs associate with the card, and you powered down both shelves	step 47

46 Repeat steps 41 to 45 for PMs in the other shelf that associates with the FSP card you replace. Go to step 47.

NT0X36

in a cabinetized trunk module equipment frame (continued)

At the FSP

- 47** Remove the alarm and control card.
- 48** Insert the replacement alarm and control card.
- 49** Close the FSP.
- 50** Tighten the slotted nut on the FSP.
- 51** Select a shelf to power up.

At the shelf

- 52** Power up the converter.
- a** Pull up and set the handle of the POWER switch to the ON position.
 - b** Press and hold the RESET button on the power converter until the CONVERTER FAIL LED turns off.
 - c** Release the RESET button.
- 53** The next action depends on the type of PM that is in the shelf, and if you powered up both power converters.

If the shelf	Do
contains an STM or an MTM (with or without DRAM) and you powered up both power converters	step 58
contains an STM (with or without DRAM)	step 54
contains an MTM (with or without DRAM)	step 55
contains a TM	step 58

- 54** For the mate power converter in the STM on the other half of the shelf, repeat steps 52 and 53. Go to step 56.
- 55** For the other power converter on the shelf, repeat steps 52 and 53. Go to step 56.
- 56** The next action depends on how many shelves associate with the FSP card you replace.

If	Do
one shelf equipped with PMs associates with the card	step 58
two shelves equipped with PMs associate with the card, and you powered up only one shelf	step 57
two shelves equipped with PMs associate with the card, and you powered up both shelves	step 58

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 57 Repeat steps 52 to 56 for PMs in the other shelf that associates with the FSP card you replace. Go to step 58.

At the MAP terminal

- 58 To access the PM level of the MAP display, type
>PM
and press the Enter key.

- 59 The next step depends on the type of PM in the shelf.

If the PM	Do
is an OAU	step 60
is an STM, TM, or MTM	step 64

- 60 To post the OAU, type
>POST OAU pm_no
and press the Enter key.
where
pm_no
is the number of the PM (0 to 9999)

- 61 To load the OAU, type
>LOADPM
and press the Enter key.
Example of a MAP response:

OAU 0 LoadPM Passed

If the LOADPM command	Do
passed	step 63
failed	step 62

- 62 To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 63 To return the PM to service, type
>RTS
and press the Enter key.
Example of a MAP response:

NT0X36

in a cabinetized trunk module equipment frame (continued)

OAU 0 Rts Passed

If the RTS command	Do
passed	step 124
failed	step 130

- 64** To post the PM, type
>POST pm_type pm_no
 and press the Enter key.
where
 pm_type
 is the type of PM (IMTM, STM, TM)
 pm_no
 is the number of the PM (0 to 9999)

- 65** To load the PM, type
>LOADPM
 and press the Enter key.
Example of a MAP response:

MTM 0 LoadPM Passed

If the LOADPM command	Do
passed	step 67
failed	step 66

- 66** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 67** To return the PM to service, type
>RTS
 and press the Enter key.
Example of a MAP response:

MTM 0 Rts Passed

If the RTS command	Do
passed, and the PM is InSv	step 76

NT0X36**in a cabinetized trunk module equipment frame** (continued)

	If the RTS command	Do
	passed, and the PM is ISTb with a system-generated card list	step 68
	failed	step 130
68	Record the messages on the MAP display for future reference.	
69	The next action depends on if the affected shelf contains the NT1X80 (EDRAM) card or the NT1X81 conference card.	
	If the shelf	Do
	contains the NT1X80 or the NT1X81	step 70
	does not contain the NT1X80 or the NT1X81	step 76
70	To post the single-card PM, type >POST pm_type pm_no and press the Enter key. <i>where</i> pm_type is the type of PM (CTM or DTM) pm_no is the number of the PM (0 to 9999)	
71	To load the single-card PM, type >LOADPM and press the Enter key. <i>Example of a MAP response:</i> DTM 0 LoadPM Passed	
	If the LOADPM command	Do
	passed	step 73
	failed	step 72
72	To load the single-card PM, perform the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.	
73	To return the PM to service, type >RTS and press the Enter key. <i>Example of a MAP response:</i>	

NT0X36

in a cabinetized trunk module equipment frame (continued)

MTM 0 Rts Passed

	If the RTS command	Do
	passed, and the PM is InSv	step 75
	passed, and the PM is ISTb with a system-generated card list	step 74
	failed	step 130
74	Record the messages on the MAP display for future reference.	
75	Repeat steps 70 to 74 for the other NT1X80 and NT1X81 cards on the shelf. Go to step 76.	
76	To access the TTP level of the MAP display, type >TRKS;TTP and press the Enter key.	
77	The next action depends if the shelf associated with the FSP card you replace contains a metallic test unit (MTU) or digital test unit (DTU). Note: The DTUs and MTUs are in pairs.	
	If the shelf	Do
	has MTUs	step 78
	has DTUs	step 93
	does not have MTUs or DTUs	step 108
78	To post the first circuit in the MTU, type >POST G MTU circuit_no and press the Enter key. <i>where</i> circuit_no is the number of the first MTU circuit	
79	To busy the circuit, type >BSY and press the Enter key.	
80	To seize the circuit, type >SEIZE and press the Enter key.	

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 81 To put the circuit on hold, type
>HOLD
and press the Enter key.
- 82 To post the second circuit in the MTU, type
>NEXT
and press the Enter key.
- 83 To busy the circuit, type
>BSY
and press the Enter key.
- 84 To seize the circuit, type
>SEIZE
and press the Enter key.
- 85 To put the circuit on hold, type
>HOLD
and press the Enter key.
- 86 To access the disk utility, type
>DISKUT
and press the Enter key.
- 87 To list the files in the volume that contains the MTU load, type
>LISTFL vol_name
and press the Enter key.
where
 vol_name
 is the name of the volume that contains the MTU load
- 88 Record the name of the MTU load file.
- 89 To quit the disk utility, type
>QUIT
and press the Enter key.
- 90 To load the MTU, type
>LOADFW CC load_name
and press the Enter key.
where

NT0X36

in a cabinetized trunk module equipment frame (continued)

load_name

is the load file name that you recorded in step 88

If the LOADFW command**Do**

passed

step 91

failed

step 130

91 To release the first MTU circuit, type

>RLS MTU circuit_no

and press the Enter key.

where

circuit_no

is the number of the first MTU circuit that you busied, seized, and put on hold

92 To release the second MTU circuit, type

>RLS MTU circuit_no

and press the Enter key.

where

circuit_no

is the number of the second MTU circuit that you busied, seized, and put on hold

Go to step 108.

93 To post the first circuit in the DTU, type

>POST G DTU circuit_no

and press the Enter key.

where

circuit_no

is the number of the first DTU circuit

94 To busy the circuit, type

>BSY

and press the Enter key.

95 To seize the circuit, type

>SEIZE

and press the Enter key.

96 To put the circuit on hold, type

>HOLD

and press the Enter key.

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 97 To post the second circuit in the DTU, type
>NEXT
 and press the Enter key.
- 98 To busy the circuit, type
>BSY
 and press the Enter key.
- 99 To seize the circuit, type
>SEIZE
 and press the Enter key.
- 100 To put the circuit on hold, type
>HOLD
 and press the Enter key.
- 101 To access the disk utility, type
>DISKUT
 and press the Enter key.
- 102 To list the files in the volume that contains the DTU load, type
>LISTFL vol_name
 and press the Enter key.
where
 vol_name
 is the name of the volume that contains the MTU load
- 103 Record the name of the DTU load file.
- 104 To quit the disk utility, type
>QUIT
 and press the Enter key.
- 105 To load the DTU, type
>LOADFW CC load_name
 and press the Enter key.
where
 load_name
 is the load file name that you recorded in step 103

If the LOADFW command	Do
passed	step 106
failed	step 130

NT0X36

in a cabinetized trunk module equipment frame (continued)

106 To release the first DTU circuit, type

>RLS RLS

107 To release the second DTU circuit, type

>RLS RLS

108 To post the circuits for the PM, type

>POST TM pm_type pm_no

and press the Enter key.

where

pm_type

is the type of PM (MTM, STM, TM)

pm_no

is the number of the PM (0 to 9999)

109 To return all the circuits to service, type

>RTS ALL

and press the Enter key.

Example of a MAP response:

RTS OK

110 The next action depends if you recorded INB circuits in step 19.

If you	Do
recorded INB circuits	step 111
did not record INB circuits	step 114

111 To post the first circuit on the list, type

>POST T circuit_name circuit_no

and press the Enter key.

where

circuit_name

is the circuit name that you recorded in step 19

circuit_no

is the circuit number that you recorded in step 19

112 To return the circuit to the INB state, type

>BSY INB

and press the Enter key.

113 Repeat steps 111 and 112 for each of the other circuits on the list that you recorded in step 19.

NT0X36

in a cabinetized trunk module equipment frame (continued)

- 114** The next action depends on the results of the PM that you returned to service in step 67.

If the RTS command	Do
passed	step 121
passed, but in-service tests failed, and the system generated a card list	step 115

- 115** To manually busy all posted circuits, type

>BSY ALL

and press the Enter key.

- 116** To return all circuits to service, type

>RTS ALL

and press the Enter key.

- 117** To access the PM level of the MAP display, type

>PM

and press the Enter key.

- 118** To post the PM, type

>POST pm_type pm_no

and press the Enter key.

where

pm_type

is the type of PM (CTM, DTM, MTM, STM, TM)

pm_no

is the number of the PM (0 to 9999)

- 119** To perform an in-service test on the PM, type

>TST

and press the Enter key.

Example of a MAP response:

NT0X36

in a cabinetized trunk module equipment frame (continued)

```

MTM      0      ISTb      TSTFAIL

InSvce Tests Initiated
MTM 0 Tst Failed
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 00 D06 TME 00 04 MTM : 000 04 2X59
HOST 00 D06 TME 00 04 MTM : 000 02 0X70
Following ISTb Exist :
Test Failed

```

	If the TST command	Do
	passed, and single-card PMs or an STM remain out of service	step 121
	passed, and you worked on all PMs on the shelf and all PMs have been returned to service	step 124
	passed, and you worked on all PMs on the shelf but one or more PMs have not been successfully returned to service	step 130
	failed, and single-card PMs or an STM are present that you did not work on to return to service	step 120
	failed, and you worked on all PMs on the shelf	step 130
120	Record the messages on the MAP display for future reference.	
121	To access the PM level of the MAP display, type >PM and press the Enter key.	
122	To post the PM, type >POST pm_type pm_no and press the Enter key. <i>where</i> pm_type is the type of PM (MTM, STM, TM) pm_no is the number of the PM (0 to 9999)	
123	Repeat steps 64 to 119 for other PMs on this shelf. Go to step 124.	

NT0X36**in a cabinetized trunk module equipment frame (end)**

- 124** The next action depends on how many shelves associate with the FSP card you replace.

If	Do
one shelf equipped with PMs associates with the card	step 126
two shelves equipped with PMs associate with the card, and you returned to service the PM on only one shelf	step 125
two shelves equipped with PMs associate with the card, and you returned to service the PM on both shelves	step 126

- 125** Repeat steps 59 to 124 for PMs in the other shelf that associates with the FSP card you replace. Go to step 126.

- 126** The next action depends on the reason that you perform this procedure.

If a maintenance procedure	Do
directed you to this procedure	step 127
did not direct you to this procedure	step 131

- 127** Return to the maintenance procedure that directed you to this procedure and continue as directed.

- 128** To determine how to handle essential services, consult the next level of support. Continue as directed by operating company personnel.

- 129** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

- 130** For additional help, contact the next level of support.

- 131** The procedure is complete.

NT0X36 in an input/output equipment frame

Application

Use this procedure to replace an NT0X36 in an input/output equipment (IOE) frame, as listed in the following table.

PEC	Suffix	Card name	Shelf or frame name
NT0X36	AB	Power control and alarm card	IOE frame

Note: Shelf positions 04, 18, and 32 must contain an input/output controller (IOC) or a disk drive unit (DDU). Shelf positions 55 and 61 must contain a magnetic tape drive unit. A maximum of two of the three shelf positions can be unequipped and covered with filler faceplates. If the shelf positions in the IOE frame in your office have other subsystems or applications, contact the next level of support.

Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" provides a list of the cards, shelves, and frames documented in this card replacement book.

Common procedures

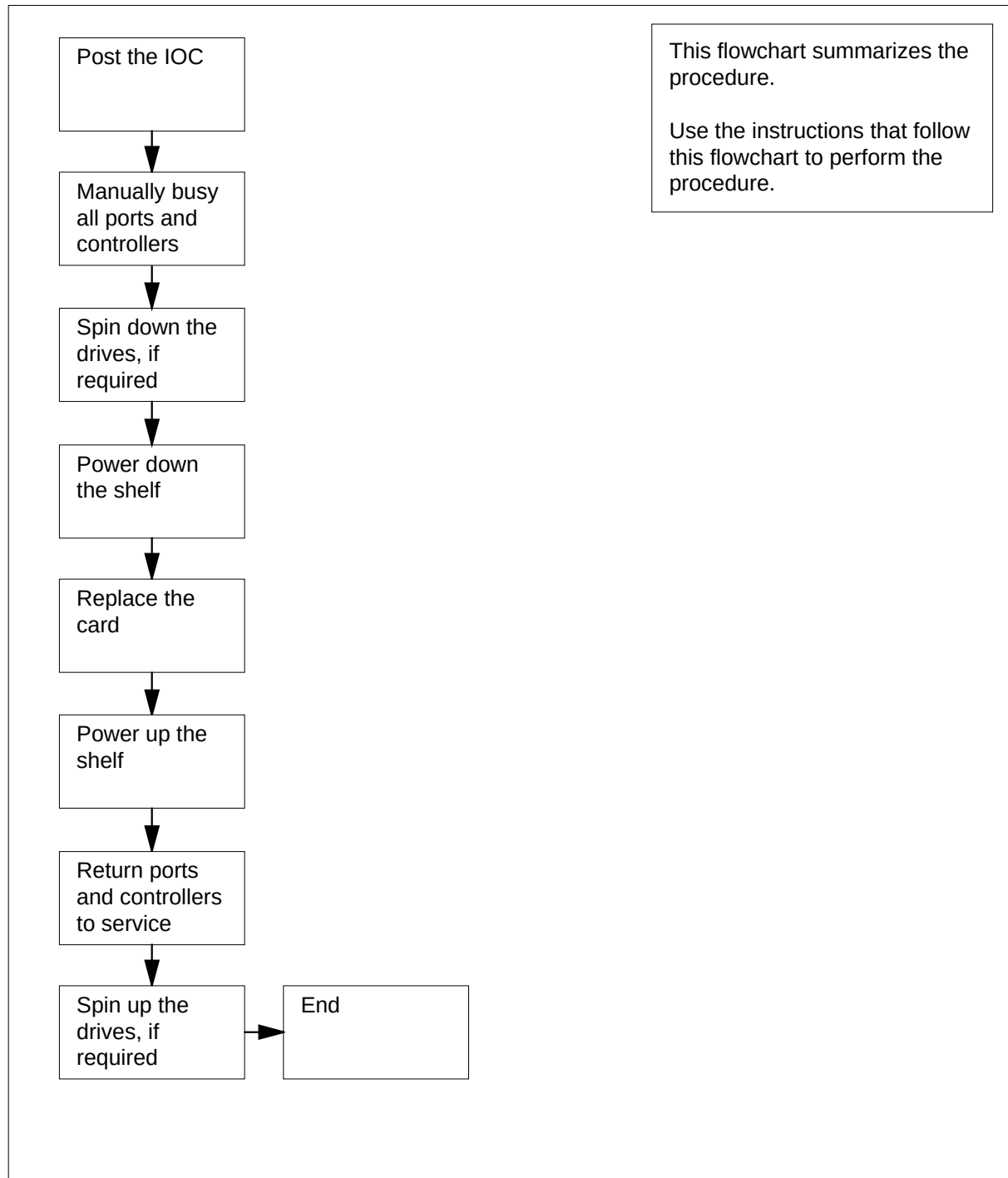
There are no common procedures.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NT0X36 in an input/output equipment frame (continued)

Summary of Replacing a NT0X36 in an input/output equipment frame



NT0X36 in an input/output equipment frame (continued)

Replacing NT0X36 in an input/output equipment frame

At your current location

1

ATTENTION

This includes directions to manually busy all terminal controller cards for the IOC. Perform this procedure from a MAP terminal. Make sure that the MAP terminal does not connect to the IOC in use.



CAUTION

Potential loss of service

This procedure includes directions to manually busy an IOC and IOC device controllers or a DDU. Perform this procedure only if you need to restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic.



DANGER

Risk of electrocution

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure that you remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

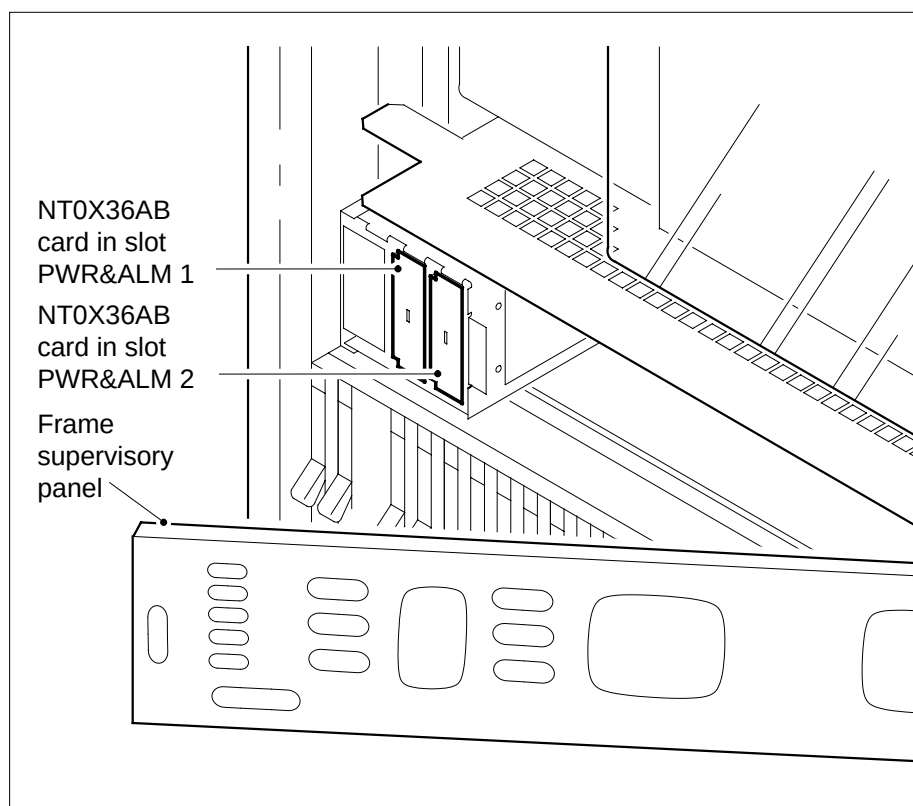
NT0X36 in an input/output equipment frame (continued)

At the frame

- 2 Use the following table to identify the PWR&ALM slot, shelf positions, and fuses that associate with the card you replace.

Note: The alarm, control cards, and fuses are behind the FSP.

Alarm and control card	Slot	Shelf position	Fuse
NT0X36AB	slot 1	04	03
NT0X36AB	slot 1	32	01
NT0X36AB	slot 2	18	02



- 3 Record the PWR&ALM slot, shelf positions, and fuses that associate with the card you replace.

NT0X36

in an input/output equipment frame (continued)

- 4 Examine the shelf positions that associate with the card you replace. Record the type of equipment shelves provided.

Note: If you replace the card in slot PWR & ALM 1, you can be required to manually busy functionality in a maximum of two shelves.

At the MAP terminal

- 5 To access the IOD level of the MAP display, type

>MAPCI;MTC;IOD

and press the Enter key.

- 6 To post the input/output controller (IOC), type

>IOC ioc_no

and press the Enter key.

where

ioc_no

is the number of the IOC (0 to 19)

- 7 Select a shelf position from the list that you recorded at step 3.

If the shelf	Do
contains one or two DDUs	step 8
contains an IOC	step 16
is empty	step 46
contains an item other than listed here	step 95

- 8 To post the DDU controller, type

>CARD card_no

and press the Enter key.

where

card_no

is the card identification number (0 to 8)

Example of a MAP display:

NT0X36**in an input/output equipment frame** (continued)

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25:
MLP :  .      DPPP:  .      DPPU:  .      SCAI:  .

IOC  CARD  0      1      2      3      4      5      6      7
0      PORT 0123  0123  0123  0123  0123  0123  0123  0123
0123
STAT  .---- .---- .---- .---- .---- .---- .---- .----
----
Card 0 TYPE MTD  DDU  CONS  MPC  CONS          CONS  MPC
      MTD
      TapeName
      Status   Idle
      User

```

- 9** Determine the state of the DDU controller card.

If the card	Do
is MBSY	step 13
is OFFL	step 87
is other than listed here	step 10

- 10** To determine if files are open on the DDU, type
>ALLOC
 and press the Enter key.

Example of a MAP response:

VOLID	VOL_NAME	SERIAL_NO	BLOCKS	ADDR	TYPE	R/O	FILES_OPEN
0	IMAGE	2800	45000	D000	0	NO	0
1	XPMLOADS	2801	35000	D000	0	NO	0
2	RTMLOADS	2802	20000	D000	0	NO	0
.	.	.	.	.	.	.	.
7	SMDR	2807	5000	D000	0	NO	0
8	AMA1	2808	5000	D000	0	NO	0
9	TST	2809	50	D000	0	NO	0
10	AMA2	280A	500	D000	0	NO	0

NT0X36

in an input/output equipment frame (continued)

	If files	Do
	are open	step 88
	are closed	step 11
11	To manually busy the controller, type >BSY and press the Enter key.	
12	To spin down the drive, type >STOP and press the Enter key.	
13	Wait until the DDU spins down before you proceed to the next step. The status code spun_down appears under the Drive_State header on the MAP display.	
14	The next action depends on the disk drive configuration in the IOC subsystem for your office. Note: If you do not know the file system configuration for your office, contact the next level of support.	
	If	Do
	other DDUs on the shelf are not present	step 46
	another DDU is on the shelf, and both DDUs spun down	step 46
	another DDU is on the shelf that is not the mate to the DDU that you spun down	step 15
	another DDU is on the shelf that is the mate to the DDU that you spun down	step 95
15	Repeat steps 8 to 14 for each disk drive on the shelf. Go to step 46.	
16	Determine the state of the IOC.	
	If the state of the IOC	Do
	is M	step 46
	is other than listed here	step 17

NT0X36

in an input/output equipment frame (continued)

- 17 The next action depends if terminal controller cards are on the shelf.

If terminal controller cards	Do
are on the shelf	step 18
are not on the shelf	step 24

- 18 To post the card, type
>CARD card_no
 and press the Enter key.
where
card_no
 is the card identification number (0 to 8)
Example of a MAP display:

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25:  .
MLP :  .      DPPP:  .      DPPU:  .      SCAI:  .

IOC  CARD  0  1  2  3  4  5  6  7  8
 0  PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123

      STAT .---- .---- .---- .---- .---- .---- .---- .----
----

      TYPE MTD  DDU  CONS  MPC  CONS  CONS  MPC
Card  6  Ckt  0      0      1      2      3
Status
Cons Id      RD040  RD041  TEAM4  TEAM6
ConType      VT100  VT100  VT100  VT100
  
```

- 19 Note the CONS ID and status for each port.

If	Do
all ports are ManBsy	step 23
a minimum of one port is Offl	step 87
a minimum of one port is . (dot)	step 20
all ports are in any other out-of-service state	step 21

- 20 Inform operating company personnel that you will remove from service the CONS IDs for the card you replace.

NT0X36
in an input/output equipment frame (continued)

- 21** To manually busy a port on the card, type
>BSY port_no
and press the Enter key.
where
port_no
is the port identification number (0 to 3)
- | If the BSY command | Do |
|--------------------|---------|
| passed | step 22 |
| failed | step 95 |
- 22** Repeat step 21 until you manually busy all ports on the card. Go to step 23.
- 23** Repeat steps 18 to 22 for each terminal controller card on the shelf. Go to step 24.
- 24** The next action depends on if multiprotocol controller (MPC) cards are on the shelf.
- | If MPC cards | Do |
|----------------------|---------|
| are on the shelf | step 25 |
| are not on the shelf | step 32 |
- 25** To post the card, type
>CARD card_no
and press the Enter key.
where
card_no
is the card identification number (0 to 8)
Example of a MAP display:

NT0X36 in an input/output equipment frame (continued)

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .  SLM : SLMbsy NOP :  .  NX25:  .
MLP :  .  DPPP:  .  DPPU:  .  SCAI:  .

IOC  CARD  0  1  2  3  4  5  6  7  8
0  PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
    STAT .--- .--- .... .--- .... .--- .--- .---
    TYPE MTD  DDU  CONS MPC  CONS  CONS  MPC

Card 3  Unit      0
        User      SYSTEM  BOARD LINK0 LINK1 LINK2 LINK3
        Status    Ready  COMACT UNEQ  N/A  UNEQ  ENBLD
  
```

- 26 Determine the state of the card.

If the card state	Do
is MANB	step 31
is OFFL	step 87
is other than listed here	step 27

Note: The card state appears under the BOARD header on the MAP display.95 95

- 27 To display status information on current MPC conversations, type

>QCONV

and press the Enter key.

Example of a MAP response:

```

MPC  L  LCN  STATUS  CCC  SEC  PARDEV  INP  OPEN  OWNER
---  -  ---  -
0  3  1  INACTIVE  none  none  none  FIL  0  none
0  3  2  INACTIVE  none  none  none  FIL  0  none
  
```

If	Do
a minimum of one session is ac- tive	step 28

NT0X36

in an input/output equipment frame (continued)

	If	Do
	all sessions are inactive	step 29
28	Notify all users that an interruption of the MPC service will occur. Wait until all sessions are inactive before you proceed.	
29	To manually busy the card and the card links, type >BSY ALL FORCE and press the Enter key. <i>Example of a MAP response:</i> TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND Please confirm ("YES", "Y", "NO", or "N"):	
30	To confirm the command, type >YES and press the Enter key.	
	If the BSY command	Do
	passed	step 31
	failed	step 95
31	Repeat steps 25 to 30 for each MPC card on the shelf. Go to step 32.	
32	The next action depends if disk drive controller cards are on the shelf.	
	If disk drive controller cards	Do
	are on the shelf	step 33
	are not on the shelf	step 17
33	To post the card, type >CARD card_no and press the Enter key. <i>where</i> card_no is the card identification number (0 to 8) <i>Example of a MAP display:</i>	

NT0X36**in an input/output equipment frame** (continued)

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25:  .
MLP :  .      DPPP:  .      DPPU:  .      SCAI:  .

IOC  CARD  0      1      2      3      4      5      6      7      8
0      PORT 0123  0123  0123  0123  0123  0123  0123  0123
0123
STAT  .----  .----  .----  .----  .----  .----  .----  .----
----
TYPE  MTD  DDU  CONS  MPC  CONS  CONS  CONS  MPC
Card 0  MTD  0
      TapeName
      Status  Idle
      User

```

- 34** Determine the state of the card.

If the card	Do
is MBSY	step 37
is OFFL	step 87
is other than listed here	step 35

- 35** To determine if files are open on the DDU, type

>ALLOC

and press the Enter key.

Example of a MAP response:

```

VALID  VOL_NAME  SERIAL_NO  BLOCKS  ADDR  TYPE  R/O
FILES_OPEN
0      IMAGE      2800      45000  D000  0      NO      0
1      XPMLOADS   2801      35000  D000  0      NO      0
2      RTMLOADS   2802      20000  D000  0      NO      0
.
.
.
7      SMDR       2807      5000   D000  0      NO      0
8      AMA1       2808      5000   D000  0      NO      0
9      TST        2809      50      D000  0      NO      0
10     AMA2       280A      500    D000  0      NO      0

```

NT0X36

in an input/output equipment frame (continued)

	If files	Do
	are open	step 88
	are closed	step 36
36	To manually busy the card, type >BSY and press the Enter key. <i>Example of a MAP response:</i> bsyOK	
37	Repeat steps 33 to 36 for each disk drive controller card on the shelf. Go to step 38.	
38	The next action depends on if magnetic tape drive controller cards are on the shelf.	
	If magnetic tape drive controller cards	Do
	are on the shelf	step 39
	are not on the shelf	step 44
39	To post the card, type >CARD card_no and press the Enter key. <i>where</i> card_no is the card identification number (0 to 8) <i>Example of a MAP display:</i>	

NT0X36

in an input/output equipment frame (continued)

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25:
MLP :  .      DPPP:  .      DPPU:  .      SCAI:  .

IOC  CARD  0      1      2      3      4      5      6      7
0      PORT 0123  0123  0123  0123  0123  0123  0123  0123
0123
STAT  .----  .----  .----  .----  .----  .----  .----  .----
----
Card 0  TYPE  MTD  DDU  CONS  MPC  CONS  CONS  MPC
      MTD
      TapeName
      Status  Idle
      User
  
```

- 40** Determine the state of the card.

If the card	Do
is ManBSy	step 43
is Offl	step 87
is Idle	step 42
is other than listed here	step 41

- 41** Notify all users that interruption of service for the device will occur. Wait until all users finish with the device before you proceed to the next step.

- 42** To manually busy the card, type

>BSY

and press the Enter key.

Example of a MAP response:

```

bsy
OK
  
```

- 43** Repeat steps 39 and 42 for each magnetic tape drive controller card on the shelf. Go to step 31.

- 44** To return to the IOC level of the MAP display, type

>QUIT

and press the Enter key.

- 45** To manually busy the IOC, type

>BSY IOC

NT0X36

in an input/output equipment frame (continued)

and press the Enter key.

- 46** The next action depends on the FSP card you replace.

If you	Do
replace the card in slot PWR&ALM 1	step 47
replace the card in slot PWR&ALM 2	step 48

- 47** Repeat step 7 for the second shelf position that you recorded at step 3. Go to step 48.

At the frame

- 48**



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

For each power converter on the shelf, pull down and set the handle of the power converter POWER switch to the OFF position.

- 49** Remove the fuses that associate with the alarm and control card, as recorded in step 3.

- 50** Unscrew the slotted nut on the left of the FSP.

Note: Friction clips fasten some FSP front panels. Hold the panel at each end. To remove the panel, pull the panel toward you.

- 51** Open the FSP.

- 52**



WARNING

Loss of service

Make sure that the alarm and control card that you remove controls the shelf that you turned down. Removal of the wrong card causes a loss of service.

Remove the card from the slot that you recorded in step 3.

- 53** Insert the replacement card.

NT0X36

in an input/output equipment frame (continued)

- 54** Close the FSP.
- Note:** For FSP front panels fastened with friction clips, align the pins on the back of the panel with the holes on the FSP. Press the panel in tightly.
- 55** Tighten the slotted nut on the FSP.
- 56** Insert the fuses that you removed in step 49.
- 57** The next action depends on the power converter on the shelf.
- | If the power converter | Do |
|------------------------------|---------|
| is an NT2X70AA/AB/AC/AD card | step 58 |
| is an NT2X70AE card | step 59 |
| is an NT1X78 card | step 60 |
- 58** Power up the converter.
- Pull up and set the handle of the POWER switch to the RESET position. Hold the handle until the CONVERTER FAIL LED turns off.
 - Release the handle.
 - Go to step 61.
- 59** Power up the converter, as follows.
- Pull up and set the handle of the POWER switch to the ON position.
 - Press and hold the RESET button on the power converter until the CONVERTER FAIL LED turns off.
 - Release the RESET button.
 - Go to step 61.
- 60** Reset the power converter:
- Pull up and set the POWER switch on the converter to the ON position.
 - Press and hold the RESET button on the power converter.
 - When the CONVERTER FAIL lamp turns off, release the RESET button.
- 61** Verify that the power LED is lit. A lit power LED indicates that the power converter is ON.
- | If the power LED | Do |
|--|---------|
| is lit, and is the only power converter on the shelf (IOC shelf or a single-DDU shelf) | step 63 |
| is lit, and another power converter is on the shelf (two-DDU shelf) | step 62 |
| is not lit | step 95 |

NT0X36

in an input/output equipment frame (continued)

- 62 Repeat step 57 for the other power converter on the shelf.

At the MAP terminal

- 63 Select a shelf position from the list that you recorded at step 3.

If the shelf	Do
has one or two DDUs	step 64
has an IOC	step 68

- 64 To post the DDU controller, type
>CARD card_no
 and press the Enter key.
where
 card_no
 is the card identification number (0 to 8)

- 65 To return the DDU controller to service, type

>RTS

and press the Enter key.

Note: The return to service process can require a maximum of 3 min. The RTS command also spins up the disk drive.

If the RTS command	Do
passed (status is Ready and drive state is on - line)	step 66
failed (status or drive state is other than listed here)	step 95

- 66 The next action depends on the disk drive configuration in the IOC subsystem for your office.

If	Do
other DDUs are not on the shelf	step 84
another DDU is on the shelf and both are in service	step 84
another DDU is on the shelf that you did not return to service	step 67

- 67 Repeat steps 64 to 66 for each disk drive on the shelf. Go to step 83.

- 68 To return the IOC to service, type

>RTS IOC

and press the Enter key.

NT0X36**in an input/output equipment frame** (continued)

- 69** The next action depends if the controller cards are on the shelf.
- | If disk drive or magnetic tape drive or magnetic tape drive controller cards | Do |
|---|-----------|
| are on the shelf | step 70 |
| are not on the shelf | step 73 |
- 70** To post the card, type
>CARD card_no
and press the Enter key.
where
 card_no
 is the card identification number (0 to 8)
- 71** To return the card to service, type
>RTS
and press the Enter key.
- 72** Repeat steps 70 and 71 for each disk drive or magnetic tape drive controller card on the shelf. Go to step 73.
- 73** The next action depends if MPC cards are on the shelf.
- | If MPC cards | Do |
|----------------------|-----------|
| are on the shelf | step 74 |
| are not on the shelf | step 80 |
- 74** To post the card, type
>CARD card_no
and press the Enter key.
where
 card_no
 is the card identification number (0 to 8)
- 75** To load the MPC, type
>DOWNLD
and press the Enter key.
Example of a MAP response:

NT0X36

in an input/output equipment frame (continued)

DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.

	If the DOWNLD command	Do
	passed	step 76
	failed	step 95
76	To return the MPC to service, type >RTS ALL and press the Enter key. <i>Example of a MAP response:</i> REQUEST PASSED FOR CARD.REQUEST PASSED FOR LINKS.	
77	Wait 1 min to determine the status of MPC components.	
	If the system status	Do
	is Ready, the board status is COMACT, and the link status is ENABLD for each link	step 78
	is other than listed here	step 95
78	Repeat steps 74 to 77 for each card on the shelf. Go to step 79.	
79	Notify users that MPC service is available.	
80	The next action depends if terminal controller cards are on the shelf.	
	If terminal controller cards	Do
	are on the shelf	step 81
	are not on the shelf	step 83
81	To post the card, type >CARD card_no and press the Enter key. <i>where</i> card_no is the card identification number (0 to 8)	
82	To return a port on the card to service, type >RTS port_no and press the Enter key.	

NT0X36

in an input/output equipment frame (continued)

where

port_no
is the port identification number (0 to 3)

	If the RTS command	Do
	passed	step 83
	failed	step 95
83	The next action depends on the FSP card that you replace.	
	If you	Do
	replace the card in slot PWR&ALM 1	step 84
	replace the card in slot PWR&ALM 2	step 85
84	Repeat step 63 for the second shelf position that you recorded in step 3. Go to step 85.	
85	The next action depends on the reason that you perform this procedure.	
	If a maintenance procedure	Do
	directed you to this procedure	step 86
	did not direct you to this procedure	step 96
86	Return to the maintenance procedure that directed you to this procedure and continue as directed.	
87	To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.	
88		



WARNING

Loss of data

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

NT0X36

in an input/output equipment frame (end)

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 89** Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

>LOGUTIL ; LISDEVS

and press the Enter key.

- 90** Close files on volumes on the DDU of the IOC.

>STOPDEV dev_name

and press the Enter key.

where

dev_name

is the name of the device

>QUIT

and press the Enter key.

- 91** Repeat the ALLOC command to determine if files are closed, by typing

>ALLOC

and pressing the Enter key.

If the files	Do
are open	step 92
are closed	step 93

- 92** Confirm that you have done steps 88 to 91. If the files are still open, contact your next level of support.

- 93** Manually busy the DDU, by typing

>BSY

and pressing the Enter key.

If the DDU	Do
is MBSY	step 94
is not MBSY	step 95

- 94** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 95** For additional help, contact the next level of support.

- 96** The procedure is complete.

NT0X36 in an international cabinet auxiliary module

Application

Use this procedure to replace an NT0X36 in an international cabinet auxiliary module (ICAM), as listed in the following table.

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the “Index” for a list of the cards, shelves, and frames documented in this card replacement book.

PEC	Suffix	Card name	Shelf or frame name
NT0X36	AB	Power control and alarm card	CAM equipped with office alarm unit (OAU), international packaged trunk module (IPTM) or international maintenance trunk module (IMTM).

Common procedures

Loading a PM is referenced in this procedure.

Do not go to the common procedure unless directed to do so in the step-action procedure.

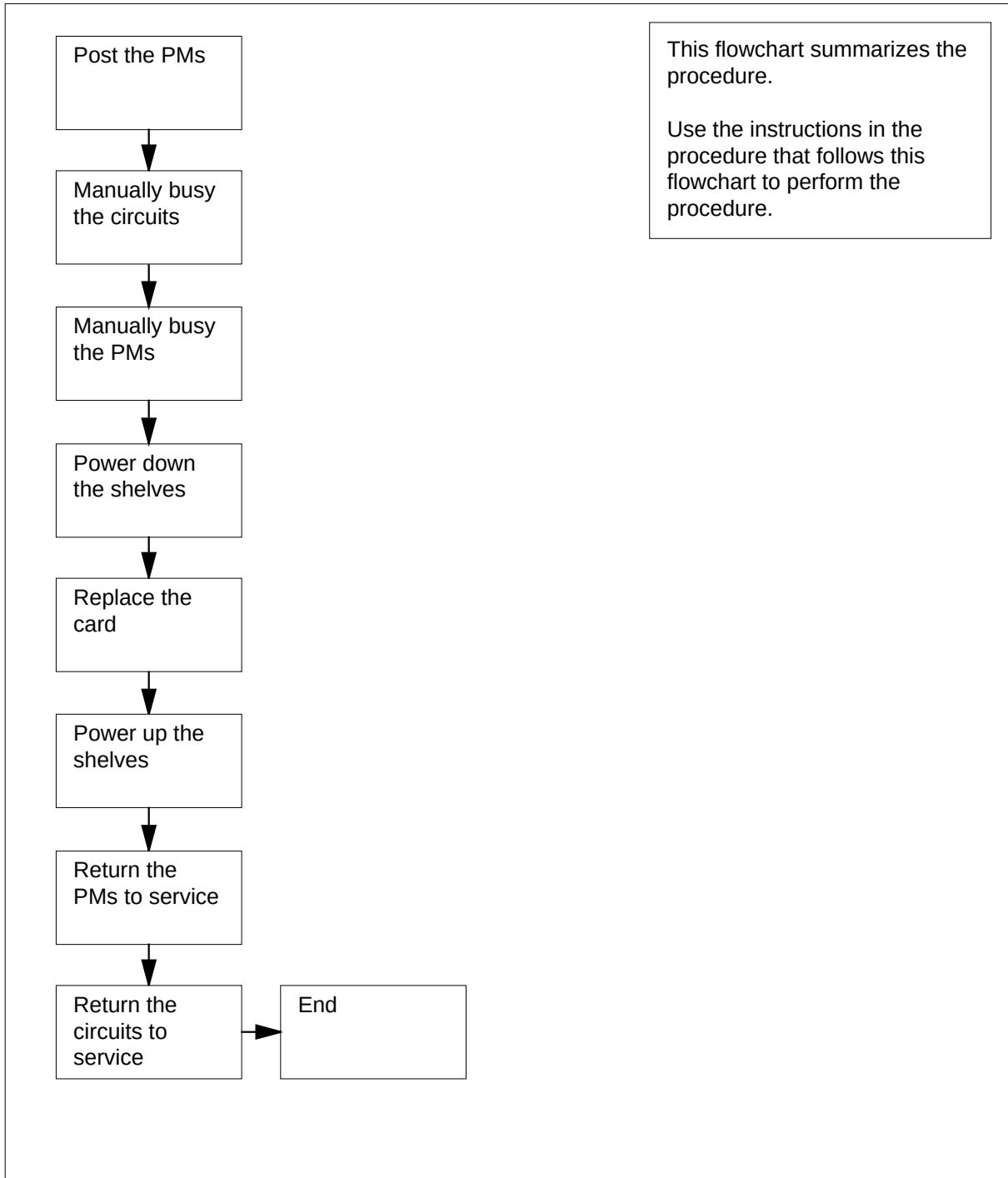
Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

NT0X36

in an international cabinet auxiliary module (continued)

Summary of Replacing an NT0X36 in an international cabinet auxiliary module



NT0X36

in an international cabinet auxiliary module (continued)

Replacing an NT0X36 in an international cabinet auxiliary module

At your current location

1



DANGER

Risk of electrocution

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Remove all jewelry before replacing a card in the FSP. Do not touch any terminal in the FSP.



CAUTION

Loss of service

This procedure includes directions to remove an IMTM, or an IPTM from service, which can cause service degradation. Perform this procedure only if necessary to restore out-of-service components. Otherwise, carry out this procedure during periods of low traffic. Do not perform this procedure if essential services are using PM resources.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

At the cabinet

- 2 Unscrew the slotted nut on the left-hand side of the FSP.
- 3 Open the FSP.
- 4 Use the following table and illustration to identify the shelf positions and FSP fuses associated with the power and alarm card you are replacing.

(Sheet 1 of 2)

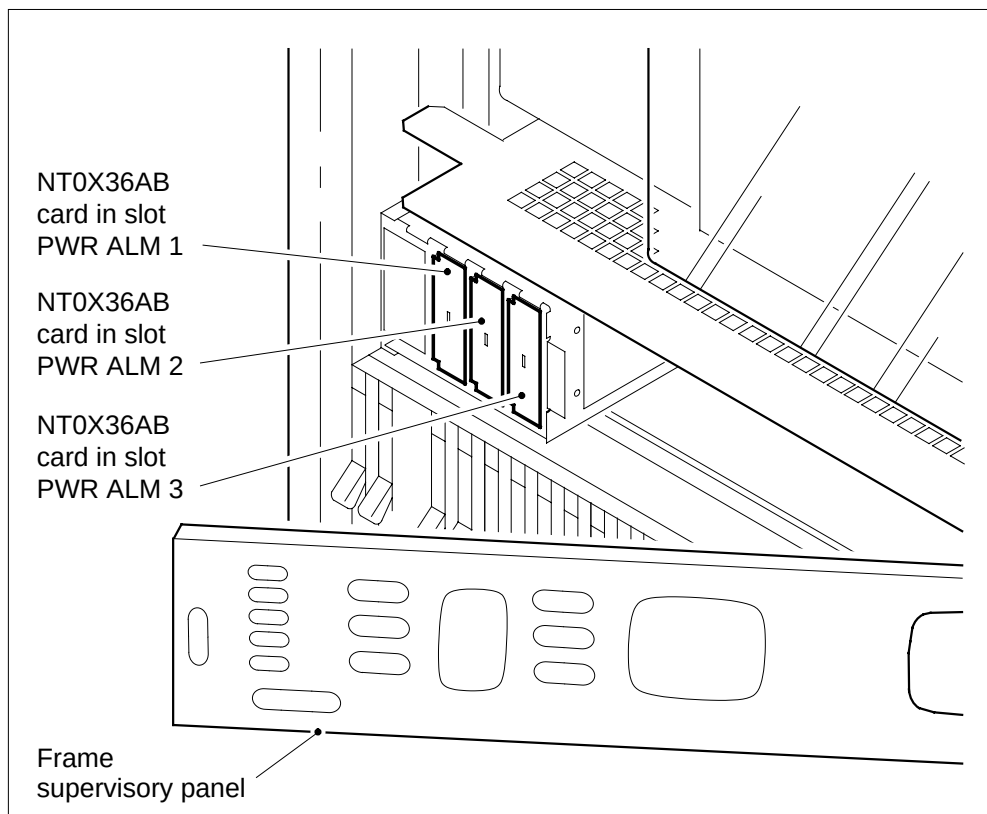
Power and alarm card slot	FSP fuse number	Shelf position
PWR ALM 1	01	05
	02	33

NT0X36

in an international cabinet auxiliary module (continued)

(Sheet 2 of 2)

Power and alarm card slot	FSP fuse number	Shelf position
PWR ALM 2	04	19
PWR ALM 3	05	47



5



CAUTION

Potential loss of service

If the power distribution in the procedure below does not match the configuration in your office, contact the next level of support before proceeding.

Record the fuse numbers and shelf positions associated with the card you are replacing.

NT0X36

in an international cabinet auxiliary module (continued)

- 6 Select a shelf associated with the FSP card you are replacing.

At the MAP terminal

- 7 Access the PM level of the MAP display by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP display:

PM	SysB 1	ManB	OffL 6	CBsy	ISTb	InSv 102

- 8 The next step depends on the type of PM that is provisioned in the shelf.

If the PM is an	Do
OAU	step 9
IMTM, or IPTM	step 13

- 9 Post the OAU by typing

>POST OAU pm_no

and pressing the Enter key.

where

pm_no

is the number of the PM (0 to 9999)

Example of a MAP display:

PM	SysB 1	ManB 0	OffL 6	CBsy 0	ISTb 0	InSv 102
OAU	1	0	0	0	0	0

OAU	0	SysB

- 10 Determine the state of the OAU.

Note: The state of the OAU is shown to the right of the PM number. In the example display in step 9, the OAU is system busy (SysB).

If the OAU is	Do
OffL	step 129

NT0X36

in an international cabinet auxiliary module (continued)

	If the OAU is	Do																																				
	ManB	step 40																																				
	anything else	step 11																																				
11	A maintenance flag (Mtce) may appear, indicating that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before proceeding to the next step.																																					
12	Manually busy the PM by typing >BSY and pressing the Enter key. <i>Example of a MAP display:</i>																																					
	<table><tr><td></td><td></td><td>SysB</td><td>ManB</td><td>OffL</td><td>CBsy</td><td>ISTb</td><td>InSv</td></tr><tr><td>PM</td><td></td><td>58</td><td>1</td><td>6</td><td>14</td><td>12</td><td>17</td></tr><tr><td>OAU</td><td></td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> <table><tr><td>OAU</td><td>0</td><td>ManB</td></tr><tr><td>bsy</td><td></td><td></td></tr><tr><td>OAU 0 Bsy</td><td></td><td></td></tr><tr><td>OK.</td><td></td><td></td></tr></table>				SysB	ManB	OffL	CBsy	ISTb	InSv	PM		58	1	6	14	12	17	OAU		0	1	0	0	0	0	OAU	0	ManB	bsy			OAU 0 Bsy			OK.		
		SysB	ManB	OffL	CBsy	ISTb	InSv																															
PM		58	1	6	14	12	17																															
OAU		0	1	0	0	0	0																															
OAU	0	ManB																																				
bsy																																						
OAU 0 Bsy																																						
OK.																																						
	Go to step 40.																																					
13	From office records or office personnel, verify that essential services are not using the PM resources that will be affected by this procedure. Note: When verifying resources used, include all PMs that are associated with the shelf you are working on. For all service and trunk modules, include NT1X80 cards and NT1X81 cards (single-card PMs) provisioned on the shelf; these single-card PMs must be removed from service to complete this procedure. If the shelf is equipped with an STM, also check for essential services on the STM provisioned on the other half of the shelf; both STMs must be removed from service to complete this procedure.																																					
	If essential services	Do																																				
	are using PM resources and one or more PMs are in service	step 128																																				
	are using PM resources and all PMs are out of service	step 14																																				
	are not using PM resources	step 14																																				
14	Post the PM by typing >POST pm_type pm_no and pressing the Enter key. <i>where</i>																																					

NT0X36**in an international cabinet auxiliary module** (continued)**pm_type**

is the type of PM (IMTM, IPTM)

pm_no

is the number of the PM (0 to 9999)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	6	0	0	102
IMTM	1	0	0	0	0	9

IMTM	0	SysB

- 15** Determine the state of the PM.

Note: The PM state is shown to the right of the PM number. In the example display in step 14, the PM state is system busy (SysB).

If the PM is	Do
OffL	step 129
anything else	step 16

- 16** Access the TTP level of the MAP display by typing
>MAPCI;MTC;TRKS;TTP
 and pressing the Enter key.

Example of a MAP display:

POST	DELQ	BUSYQ	DIG
TTP 6-013			
CKT TYPE	PM NO.	COM LANG	STA S R DOT TE RESULT

- 17** Post the circuits for the PM by typing

>POST P pm_type pm_no

and pressing the Enter key.

*where***pm_type**

is the type of PM (IMTM, IPTM)

pm_no

is the number of the PM (0 to 9999)

Example of a MAP display:

NT0X36

in an international cabinet auxiliary module (continued)

```

POST      17  DELQ          BUSYQ          DIG
TTP      6-013
CKT TYPE      PM NO.          COM LANG      STA S R  DOT TE  RESULT
CONF6    IMTM      0  0    CF6P          0  IDL

```

```

post p IMTM 0
LAST CKT = 17
SHORT CLLI IS: CF6P
OK,CKT POSTED

```

- 18** Determine if the state of any of the circuits is installation busy (INB), indicated by INB to the right of the trunk name on the MAP display.

Note: The state of each circuit can be determined by repeating the command NEXT until the state of each circuit has been determined.

If	Do
one or more circuits is in the INB state	step 19
no circuits are in the INB state	step 24

- 19** Record the name and number of each of the circuits in the INB state.

- 20** Manually busy all posted circuits by typing

>BSY ALL

and pressing the Enter key.

Example of a MAP display:

```

POST      18  DELQ          BUSYQ  A  6  DIG
TTP      6-027
CKT TYPE      PM NO.          COM LANG      STA S R  DOT TE  RESULT

```

BSYQ ALL IDLE

```

bsy all
OK,POST SET IS SET IN BSYQ

```

- 21** Wait until all circuits have been manually busied (removed from the busy queue) before proceeding to the next step.

Note: The digit to the right of the BUSYQ header indicates the number of circuits still in use. As a circuit becomes available, it is manually busied and the number in the queue is decremented by one. When the field is blank, this indicates that all circuits have been manually busied.

NT0X36

in an international cabinet auxiliary module (continued)

- 22 The next action depends on whether the affected shelf is provisioned with either the NT1X80 enhanced digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.
- | If the shelf is | Do |
|--|---------|
| provisioned with either the NT1X80 or the NT1X81 | step 23 |
| not provisioned with either the NT1X80 or the NT1X81 | step 27 |
- 23 Post the circuits for the single-card PM by typing
>POST P pm_type pm_no
 and pressing the Enter key.
where
pm_type
 is the type of single-card PM (CTM, DTM)
pm_no
 is the number of the PM (0 to 9999)
Note: The NT1X80 EDRAM card is referred to as a DTM on the MAP display, and the NT1X81 conference card is referred to as a CTM. Both cards are known as single-card PMs.
- 24 Manually busy all posted circuits by typing
>BSY ALL
 and pressing the Enter key.
- 25 Wait until all circuits have been manually busied (removed from the busy queue) before proceeding to the next step.
- 26 Repeat steps 23 to 25 for all NT1X80 and NT1X81 cards provisioned on the shelf.
- 27 Access the PM level of the MAP display by typing
>PM
 and pressing the Enter key.
- 28 Post the PM by typing
>POST pm_type pm_no
 and pressing the Enter key.
where
pm_type
 is the type of PM (IMTM, IPTM)
pm_no
 is the number of the PM (0 to 9999)

NT0X36

in an international cabinet auxiliary module (continued)

- 29 Determine the state of the PM.

If the PM is	Do
ManB	step 31
anything else	step 30

- 30 Manually busy the PM by typing

>BSY

and pressing the Enter key.

Example of a MAP display:

		SysB	ManB	OffL	CBsy	ISTb	InSv
PM		58	1	6	14	12	17
IMTM		0	1	0	0	0	9
IMTM	0	ManB					
bsy							
IMTM	0	Bsy					
OK.							

- 31 The next action depends on whether the shelf is provisioned with either the NT1X80 enhanced digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.

If the shelf is	Do
provisioned with either the NT1X80 or the NT1X81	step 32
not provisioned with either the NT1X80 or the NT1X81	step 36

- 32 Post the single-card PM by typing

>POST pm_type pm_no

and pressing the Enter key.

where

pm_type

is the type of single-card PM (CTM, DTM)

pm_no

is the number of the PM (0 to 9999)

- 33 Determine the state of the single-card PM.

If the PM is	Do
ManB	step 35

NT0X36**in an international cabinet auxiliary module** (continued)

	If the PM is	Do
	anything else	step 34
34	Manually busy the single-card PM by typing > BSY and pressing the Enter key.	
35	Repeat steps 32 to 34 for all NT1X80 and NT1X81 cards provisioned on the shelf.	
36	The next action depends on whether the shelf is provisioned as an IPTM.	
	If the shelf is provisioned as	Do
	an IPTM, and you have manually busied only one IPTM	step 37
	an IPTM, and you have manually busied both IPTMs	step 38
37		

**CAUTION****Loss of service**

Powering down an IPTM will trip the mate power converter in the other IPTM provisioned on the shelf. Therefore, it is best to manually busy and power down both IPTMs on a shelf.

- Repeat steps 14 to 36 for the IPTM in the other half of the shelf.
- 38** The next action depends on how many shelves equipped with PMs are associated with the FSP card you are replacing.

If	Do
one shelf equipped with PMs is associated with the card	step 40
two shelves equipped with PMs are associated with the card, and you have turned down functionality for only one shelf	step 39
two shelves equipped with PMs are associated with the card, and you have turned down functionality for both shelves	step 40

NT0X36

in an international cabinet auxiliary module (continued)

- 39** Repeat steps 6 to 38 for PMs in the other shelf associated with the FSP card you are replacing, then go to step 40.

At the shelf

40



DANGER

Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Select a shelf to power down.

- 41** Pull and set the handle of the POWER switch on the power converter downward to the OFF position.
- 42** The next action depends on the type of PM that is provisioned in the shelf.

If the shelf is provisioned as	Do
an IPTM	step 43
an IMTM	step 44

- 43** For the mate power converter in the IPTM on the other half of the shelf, pull and set the handle of the POWER switch downward to the OFF position.
Go to step 45.
- 44** For the other power converter on the shelf, pull and set the handle of the POWER switch downward to the OFF position.
- 45** The next action depends on how many shelves equipped with PMs are associated with the FSP card you are replacing.

If	Do
one shelf equipped with PMs is associated with the card	step 47
two shelves equipped with PMs are associated with the card, and you have powered down only one shelf	step 46
two shelves equipped with PMs are associated with the card, and you have powered down both shelves	step 47

- 46** Repeat steps 41 to 45 for PMs in the other shelf associated with the FSP card you are replacing, then go to step 47.

NT0X36**in an international cabinet auxiliary module** (continued)***At the FSP***

- 47** Remove the alarm and control card.
- 48** Insert the replacement alarm and control card.
- 49** Close the FSP.
- 50** Tighten the slotted nut on the FSP.
- 51** Select a shelf to power up.

At the shelf

- 52** Power up the converter.
 - a** Pull and set the handle of the POWER switch upward to the ON position.
 - b** Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
 - c** Release the RESET button.
- 53** The next action depends on the type of PM that is provisioned in the shelf, and whether you have powered up both power converters.

If the shelf	Do
is provisioned as an IPTM or an IMTM and you have already powered up both power converters	step 58
is provisioned as an IPTM	step 54
is provisioned as an IMTM	step 55

- 54** For the mate power converter in the IPTM on the other half of the shelf, repeat steps 52 and 53, then go to step 56.
- 55** For the other power converter on the shelf, repeat steps 52 and 53, then go to step 56.
- 56** The next action depends on how many shelves are associated with the FSP card you are replacing.

If	Do
one shelf equipped with PMs is associated with the card	step 58
two shelves equipped with PMs are associated with the card, and you have powered up only one shelf	step 57
two shelves equipped with PMs are associated with the card, and you have powered up both shelves	step 58

- 57** Repeat steps 52 to 56 for PMs in the other shelf associated with the FSP card you are replacing, then go to step 58.

NT0X36**in an international cabinet auxiliary module** (continued)**At the MAP terminal**

- 58** Access the PM level of the MAP display by typing

>PM

and pressing the Enter key.

- 59** The next step depends on the type of PM that is provisioned in the shelf.

If the PM is	Do
an OAU	step 60
an IPTM, or IMTM	step 64

- 60** Post the OAU by typing

>POST OAU pm_no

and pressing the Enter key.

where

pm_no

is the number of the PM (0 to 9999)

- 61** Load the OAU by typing

>LOADPM

and pressing the Enter key.

Example of a MAP response:

OAU 0 LoadPM Passed

If the LOADPM command	Do
passed	step 63
failed	step 62

- 62** Load the PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

- 63** Return the PM to service by typing

>RTS

and pressing the Enter key.

Example of a MAP response:

OAU 0 Rts Passed

If the RTS command	Do
passed	step 124

NT0X36**in an international cabinet auxiliary module** (continued)

	If the RTS command	Do
	failed	step 130
64	Post the PM by typing >POST pm_type pm_no and pressing the Enter key. <i>where</i> pm_type is the type of PM (IMTM, IPTM) pm_no is the number of the PM (0 to 9999)	
65	Load the PM by typing >LOADPM and pressing the Enter key. <i>Example of a MAP response:</i> MTM 0 LoadPM Passed	
	If the LOADPM command	Do
	passed	step 67
	failed	step 66
66	Load the PM using the procedure <i>Loading a PM</i> in this document. When you have completed the procedure, return to this point.	
67	Return the PM to service by typing >RTS and pressing the Enter key. <i>Example of a MAP response:</i> MTM 0 Rts Passed	
	If the RTS command	Do
	passed, and the PM is InSv	step 76
	passed, and the PM is ISTb with a card list generated	step 68
	failed	step 130

NT0X36

in an international cabinet auxiliary module (continued)

- 68** Record the messages on the MAP display for future reference.
- 69** The next action depends on whether the affected shelf is provisioned with either the NT1X80 (EDRAM) card or the NT1X81 conference card.
- | If the shelf is | Do |
|--|---------|
| provisioned with either the NT1X80 or the NT1X81 | step 70 |
| not provisioned with either the NT1X80 or the NT1X81 | step 76 |
- 70** Post the single-card PM by typing
>POST pm_type pm_no
 and pressing the Enter key.
where
 pm_type
 is the type of PM (CTM or DTM)
 pm_no
 is the number of the PM (0 to 9999)
- 71** Load the single-card PM by typing
>LOADPM
 and pressing the Enter key.
Example of a MAP response:
- ```
DTM 0 LoadPM Passed
```
- | If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 73 |
| failed                | step 72 |
- 72** Load the single-card PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.
- 73** Return the PM to service by typing  
**>RTS**  
 and pressing the Enter key.  
*Example of a MAP response:*

## NT0X36

### in an international cabinet auxiliary module (continued)

*MTM 0 Rts Passed*

|           | <b>If the RTS command</b>                                                                                                                                                                                                           | <b>Do</b> |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed, and the PM is InSv                                                                                                                                                                                                          | step 75   |
|           | passed, and the PM is ISTb with a card list generated                                                                                                                                                                               | step 74   |
|           | failed                                                                                                                                                                                                                              | step 130  |
| <b>74</b> | Record the messages on the MAP display for future reference.                                                                                                                                                                        |           |
| <b>75</b> | Repeat steps 70 to 74 for the other NT1X80 and NT1X81 cards provisioned on the shelf, then go to step 76.                                                                                                                           |           |
| <b>76</b> | Access the TTP level of the MAP display by typing<br><b>&gt;TRKS;TTP</b><br>and pressing the Enter key.                                                                                                                             |           |
| <b>77</b> | The next action depends on whether the shelf associated with the FSP card you replaced is provisioned with metallic test units (MTU) or digital test units (DTU).<br><br><b>Note:</b> DTU and MTU are usually provisioned in pairs. |           |
|           | <b>If the shelf is</b>                                                                                                                                                                                                              | <b>Do</b> |
|           | equipped with MTU                                                                                                                                                                                                                   | step 78   |
|           | equipped with DTU                                                                                                                                                                                                                   | step 93   |
|           | not equipped with MTU or DTU                                                                                                                                                                                                        | step 108  |
| <b>78</b> | Post the first circuit in the MTU by typing<br><b>&gt;POST G MTU circuit_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>circuit_no</b><br>is the number of the first MTU circuit                                       |           |
| <b>79</b> | Busy the circuit by typing<br><b>&gt;BSY</b><br>and pressing the Enter key.                                                                                                                                                         |           |
| <b>80</b> | Seize the circuit by typing<br><b>&gt;SEIZE</b><br>and pressing the Enter key.                                                                                                                                                      |           |

## NT0X36

### in an international cabinet auxiliary module (continued)

- 81 Put the circuit on hold by typing  
**>HOLD**  
 and pressing the Enter key.
- 82 Post the second circuit in the MTU by typing  
**>NEXT**  
 and pressing the Enter key.
- 83 Busy the circuit by typing  
**>BSY**  
 and pressing the Enter key.
- 84 Seize the circuit by typing  
**>SEIZE**  
 and pressing the Enter key.
- 85 Put the circuit on hold by typing  
**>HOLD**  
 and pressing the Enter key.
- 86 Access the disk utility by typing  
**>DISKUT**  
 and pressing the Enter key.
- 87 List the files in the volume containing the MTU load by typing  
**>LISTFL vol\_name**  
 and pressing the Enter key.  
*where*  
     **vol\_name**  
         is the name of the volume containing the MTU load
- 88 Record the name of the MTU load file.
- 89 Quit the disk utility by typing  
**>QUIT**  
 and pressing the Enter key.
- 90 Load the MTU by typing  
**>LOADFW CC load\_name**  
 and pressing the Enter key.  
*where*

**NT0X36****in an international cabinet auxiliary module** (continued)

---

**load\_name**

is the load file name recorded in step 88

---

**If the LOADFW command****Do**

---

passed

step 91

failed

step 130

---

- 91** Release the first MTU circuit by typing

**>RLS MTU circuit\_no**

and pressing the Enter key.

*where***circuit\_no**

is the number of the first MTU circuit you busied, seized, and put on hold

- 92** Release the second MTU circuit to by typing

**>RLS MTU circuit\_no**

and pressing the Enter key.

*where***circuit\_no**

is the number of the second MTU circuit you busied, seized, and put on hold

Go to step 108.

- 93** Post the first circuit in the DTU by typing

**>POST G DTU circuit\_no**

and pressing the Enter key.

*where***circuit\_no**

is the number of the first DTU circuit

- 94** Busy the circuit by typing

**>BSY**

and pressing the Enter key.

- 95** Seize the circuit by typing

**>SEIZE**

and pressing the Enter key.

- 96** Put the circuit on hold by typing

**>HOLD**

and pressing the Enter key.



**NT0X36****in an international cabinet auxiliary module** (continued)

- 97** Post the second circuit in the DTU by typing  
**>NEXT**  
 and pressing the Enter key.
- 98** Busy the circuit by typing  
**>BSY**  
 and pressing the Enter key.
- 99** Seize the circuit by typing  
**>SEIZE**  
 and pressing the Enter key.
- 100** Put the circuit on hold by typing  
**>HOLD**  
 and pressing the Enter key.
- 101** Access the disk utility by typing  
**>DISKUT**  
 and pressing the Enter key.
- 102** List the files in the volume containing the DTU load by typing  
**>LISTFL vol\_name**  
 and pressing the Enter key.  
*where*  
     **vol\_name**  
     is the name of the volume containing the MTU load
- 103** Record the name of the DTU load file.
- 104** Quit the disk utility by typing  
**>QUIT**  
 and pressing the Enter key.
- 105** Load the DTU by typing  
**>LOADFW CC load\_name**  
 and pressing the Enter key.  
*where*  
     **load\_name**  
     is the load file name recorded in step 103

| If the LOADFW command | Do       |
|-----------------------|----------|
| passed                | step 106 |
| failed                | step 130 |

## NT0X36

### in an international cabinet auxiliary module (continued)

---

- 106** Release the first DTU circuit by typing

**>RLS RLS**

- 107** Release the second DTU circuit to by typing

**>RLS RLS**

- 108** Post the circuits for the PM by typing

**>POST TM pm\_type pm\_no**

and pressing the Enter key.

*where*

**pm\_type**

is the type of PM (IMTM, IPTM)

**pm\_no**

is the number of the PM (0 to 9999)

- 109** Return all the circuits to service by typing

**>RTS ALL**

and pressing the Enter key.

*Example of a MAP response:*

RTS OK

- 110** The next action depends on whether INB circuits were recorded in step 19.

---

| If                           | Do       |
|------------------------------|----------|
| INB circuits were recorded   | step 111 |
| no INB circuits wre recorded | step 114 |

---

- 111** Post the first circuit on the list by typing

**>POST T circuit\_name circuit\_no**

and pressing the Enter key.

*where*

**circuit\_name**

is the circuit name recorded in step 19

**circuit\_no**

is the circuit number recorded in step 19

- 112** Return the circuit to the INB state by typing

**>BSY INB**

and pressing the Enter key.

- 113** Repeat steps 111 and 112 for each of the other circuits on the list recorded in step 19.

## NT0X36

### in an international cabinet auxiliary module (continued)

**114** The next action depends on the results of the PM return to service in step 67.

| If the RTS command                                                | Do       |
|-------------------------------------------------------------------|----------|
| passed unconditionally                                            | step 121 |
| passed, but in-service tests failed and a card list was generated | step 115 |

**115** Manually busy all posted circuits by typing

**>BSY ALL**

and pressing the Enter key.

**116** Return all circuits to service by typing

**>RTS ALL**

and pressing the Enter key.

**117** Access the PM level of the MAP display by typing

**>PM**

and pressing the Enter key.

**118** Post the PM by typing

**>POST pm\_type pm\_no**

and pressing the Enter key.

where

**pm\_type**

is the type of PM (CTM, DTM, IMTM, IPTM)

**pm\_no**

is the number of the PM (0 to 9999)

**119** Perform an in-service test on the PM by typing

**>TST**

and pressing the Enter key.

*Example of a MAP response:*

## NT0X36

### in an international cabinet auxiliary module (continued)

```

MTM 0 ISTb TSTFAIL

InSvcce Tests Initiated
IMTM 0 Tst Failed
 Site Flr RPos Bay_id Shf Description Slot EqPEC
 HOST 00 D06 TME 00 04 MTM : 000 04 2X59
 HOST 00 D06 TME 00 04 MTM : 000 02 0X70
Following ISTb Exist :
Test Failed

```

|            | If the TST command                                                                                                                                                                                               | Do       |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|            | passed, and there are single-card PMs or an IPTM still out of service                                                                                                                                            | step 121 |
|            | passed, and you have worked on all PMs provisioned on the shelf and all PMs have been returned to service                                                                                                        | step 124 |
|            | passed, and you have worked on all PMs provisioned on the shelf but one or more PMs have not been successfully returned to service                                                                               | step 130 |
|            | failed, and there are single-card PMs or an IPTM that you have not worked on to return to service                                                                                                                | step 120 |
|            | failed, and you have worked on all PMs provisioned on the shelf                                                                                                                                                  | step 130 |
| <b>120</b> | Record the messages on the MAP display for future reference.                                                                                                                                                     |          |
| <b>121</b> | Access the PM level of the MAP display by typing<br><b>&gt;PM</b><br>and pressing the Enter key.                                                                                                                 |          |
| <b>122</b> | Post the PM by typing<br><b>&gt;POST pm_type pm_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>pm_type</b><br>is the type of PM (IMTM, IPTM)<br><b>pm_no</b><br>is the number of the PM (0 to 9999) |          |
| <b>123</b> | Repeat steps 64 to 119 for other PMs provisioned on this shelf, then go to step 124.                                                                                                                             |          |

## NT0X36

### in an international cabinet auxiliary module (end)

- 124** The next action depends on how many shelves are associated with the FSP card you are replacing.

| If                                                                                                                    | Do       |
|-----------------------------------------------------------------------------------------------------------------------|----------|
| one shelf equipped with PMs is associated with the card                                                               | step 126 |
| two shelves equipped with PMs are associated with the card, and you have returned to service the PM on only one shelf | step 125 |
| two shelves equipped with PMs are associated with the card, and you have returned to service the PM on both shelves   | step 126 |

- 125** Repeat steps 59 to 124 for PMs in the other shelf associated with the FSP card you are replacing, then go to step 126.

- 126** The next action depends on your reason for performing this procedure.

| If you were                                                 | Do       |
|-------------------------------------------------------------|----------|
| directed to this procedure from a maintenance procedure     | step 127 |
| not directed to this procedure from a maintenance procedure | step 131 |

- 127** Return to the maintenance procedure that sent you to this procedure and continue as directed.
- 128** Consult the personnel responsible for the next level of support to determine how essential services can be handled. Continue as directed by office personnel.
- 129** Consult office personnel to determine why the component is off line. Continue as directed by office personnel.
- 130** For further assistance, contact the personnel responsible for the next level of support.
- 131** You have completed this procedure.

## NT0X91 in a CPCE frame

---

### Application

Use this procedure to replace the NT0X91 in the common-peripheral controller equipment (CPCE) frame, as listed in the following table.

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card to replace, refer to the Index. The Index provides a list of the cards, shelves, and frames documented in this card replacement book.

| PEC    | Suffix | Card name                             | Shelf or frame name                                                                                                                                                                                                                                                                                                                                                             |
|--------|--------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NT0X91 | AA     | FSP drive and alarm circuit pack      | CPCE equipped with digital trunk controller (DTC), international DTC (IDTC), international line group controller (ILGC), international line trunk controller (ILTC), ISDN DTC (DTCI), ISDN line group controller (LGCI), ISDN line trunk controller (LTCI), line group controller (LGC), line trunk controller (LTC), PCM30 DTC (PDTC), PCM30 LGC (PLGC), PCM30 LTC (PLTC), SMS |
| NT0X91 | AE     | FSP drive and protection circuit pack | CPCE equipped with DTC, DTCI IDTC, ILGC, ILTC, LGC, LGCI, LTC, LTCI, PDTC, PLGC, PLTC, SMS                                                                                                                                                                                                                                                                                      |

### Common procedures

This procedure refers to the following common procedures:

- *Loading a PM*
- *Manually busying Series II PM and CPM C-side links*

**NT0X91**  
**in a CPCE frame** (continued)

---

- *Reseating cards in equipment shelves*
- *Unseating cards in equipment shelves*

Do not go to the common procedure unless the step-action procedure directs you to go.

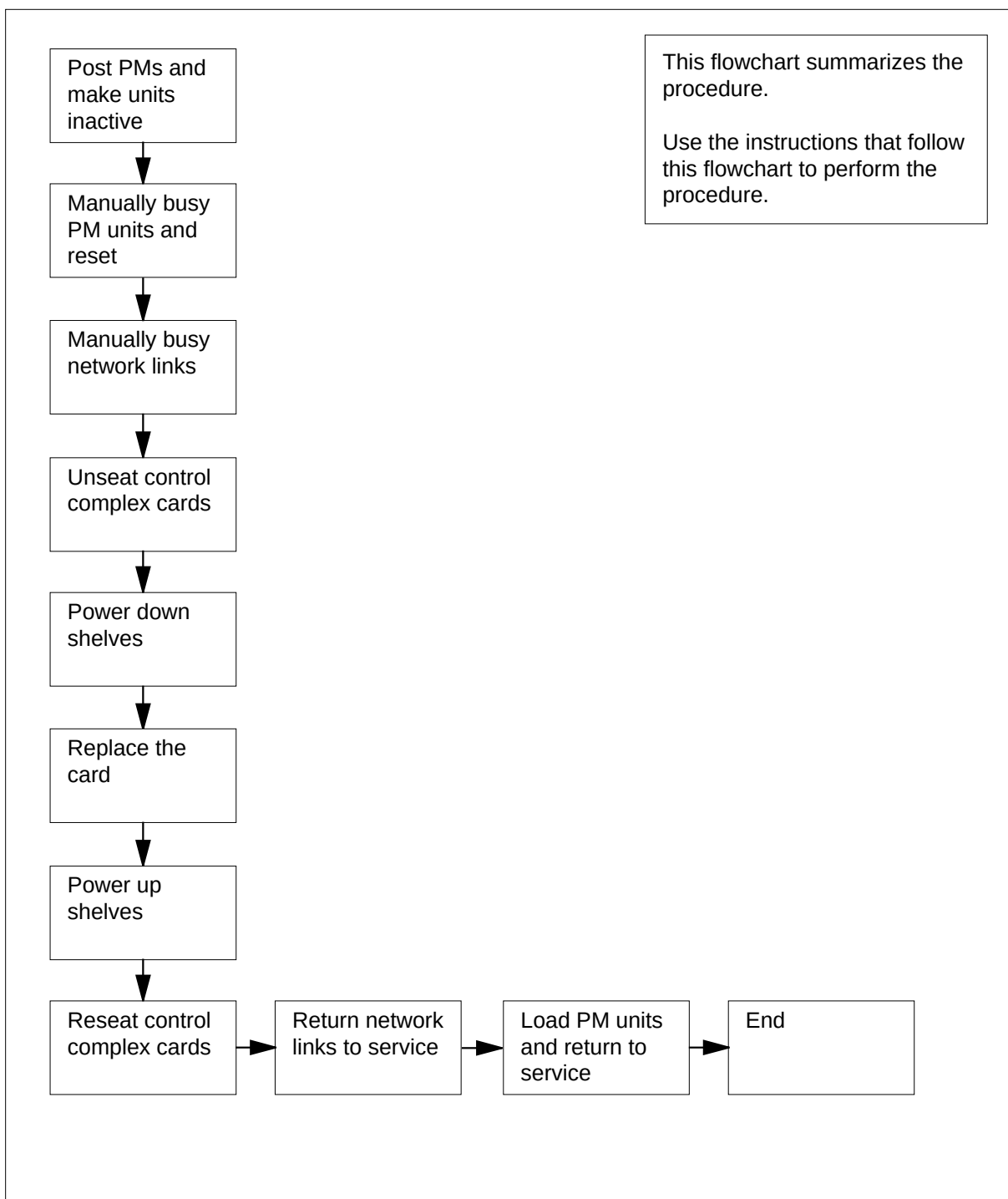
**Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT0X91 in a CPCE frame (continued)

---

### Summary of replacing a NT0X91 in a CPCE frame





## NT0X91 in a CPCE frame (continued)

### Replacing a NT0X91 in a CPCE frame

#### *At your current location*

1



#### **DANGER**

##### **Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.



#### **WARNING**

##### **Loss of service**

This procedure manually busies one or more peripheral module (PM) units, which can cause service degradation. Perform this procedure only if you need to restore out-of-service components. If this procedure is not needed for a return to service, perform this procedure only during periods of low traffic.

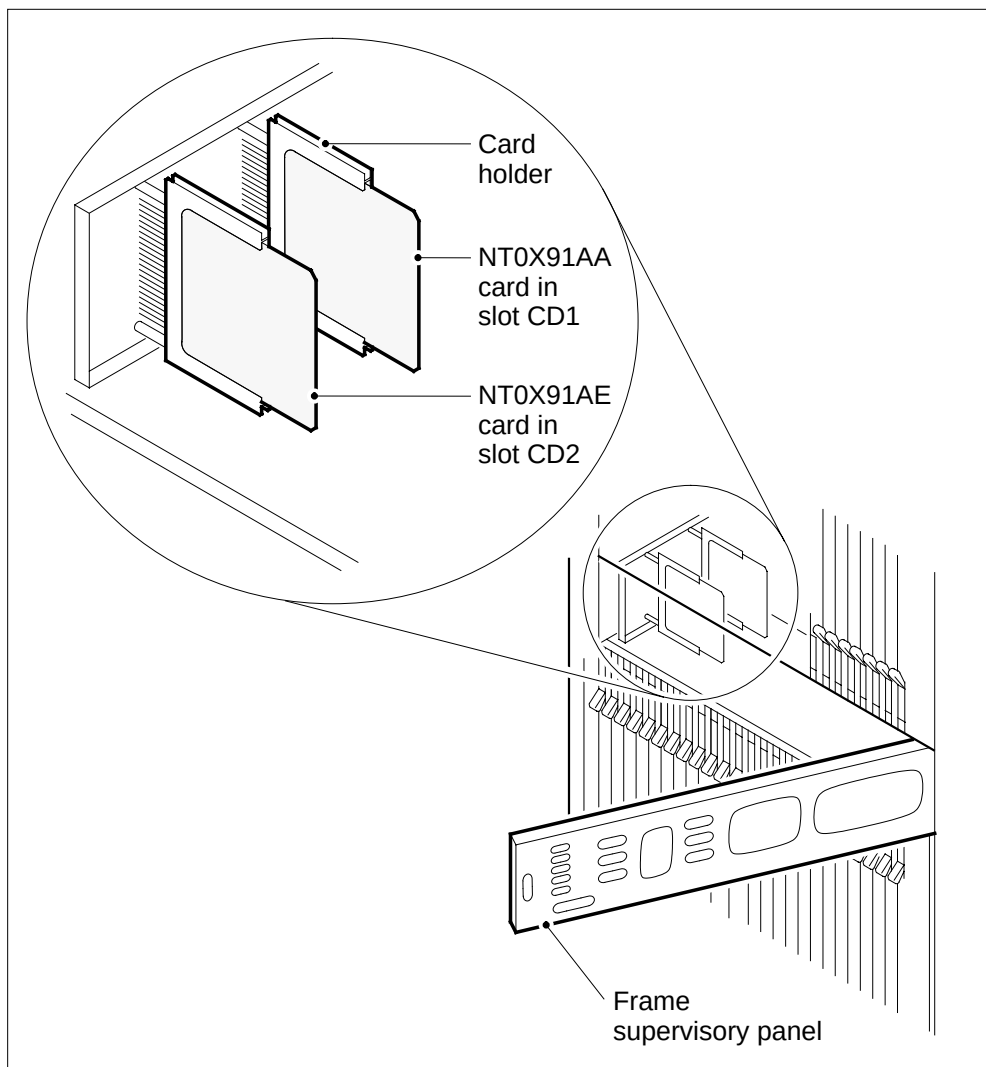
Obtain a replacement card. Make sure that the replacement card has the same PEC, including suffix, as the card being removed.

#### *At the frame*

- 2 Record the frame supervisory panel (FSP) slot, frame circuit breakers (CB), shelves, PM location and units, and power converter slots associated with the NT0X91 card you are replacing. Use the following table to obtain this information.

| Card     | FSP Slot | CB  | Shelf and PM information    | PC slot |
|----------|----------|-----|-----------------------------|---------|
| NT0X91AA | CD1      | CB5 | shelf 18 (lower PM, unit 0) | 25      |
| NT0X91AA | CD1      | CB4 | shelf 51 (upper PM, unit 0) | 25      |
| NT0X91AE | CD2      | CB2 | shelf 32 (lower PM, unit 1) | 25      |
| NT0X91AE | CD2      | CB1 | shelf 65 (upper PM, unit 1) | 25      |

## NT0X91 in a CPCE frame (continued)



- 3 Record the type of PMs associated with the NT0X91 that you will replace.

### ***At the MAP terminal***

- 4 To access the PM level of the MAP display, type  
**>MAPCI;MTC;PM**  
and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
| PM | SysB | ManB | OffL | CBsy | ISTb | InSv |
|    | 0    | 0    | 0    | 0    | 3    | 39   |

## NT0X91 in a CPCE frame (continued)

- 5 To post one of the PMs associated with the NT0X91 you replace, type

**>POST pm\_type pm\_no**

and press the Enter key.

where

**pm\_type**

is the PM type recorded in step 3

**pm\_no**

is the PM number recorded in step 2

*Example of a MAP display:*

| PM  | SysB | ManB | OffL | CBSy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| DTC | 0    | 0    | 0    | 0    | 3    | 39   |
| DTC | 0    | 0    | 0    | 0    | 0    | 4    |

DTC 0 InSv Links\_OOS: CSide 0 , PSide 0  
 Unit0: Act InSv  
 Unit1: Inact InSv

- 6 Determine the state of the PM unit associated with the card you replace.

| If the state of the PM unit                | Do      |
|--------------------------------------------|---------|
| is ISTb, InSv, SysB, or CBSy, and active   | step 7  |
| is ISTb, InSv, SysB, or CBSy, and inactive | step 10 |
| is ManB                                    | step 12 |
| is OffL                                    | step 51 |

- 7 Determine the state of the mate PM unit.

| If the state of the mate PM unit | Do      |
|----------------------------------|---------|
| is ISTb or InSv                  | step 8  |
| is other than listed here        | step 52 |

- 8 To switch activity, type

**>SWACT**

and press the Enter key.

*Example of a MAP response:*

## NT0X91

### in a CPCE frame (continued)

DTC 0      A Warm SwAct will be performed after  
data sync of active terminals.  
Please confirm ("YES", "Y", "NO", or "N"):

| If                           | Do      |
|------------------------------|---------|
| you must confirm the command | step 9  |
| the system rejects the SWACT | step 52 |

- 9 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Unit0:    Inact SysB   Mtce  
Unit1:    Act    ISTb

DTC 0      SwAct Passed

| If the MAP response       | Do      |
|---------------------------|---------|
| is SWACT passed           | step 10 |
| is other than listed here | step 52 |

- 10 A maintenance flag (Mtce) can appear. This flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before you proceed to the next step.

- 11 To manually busy the unit, type

**>BSY UNIT unit\_no**

and press the Enter key.

*where*

**unit\_no**

is the PM unit number (0 or 1) recorded in step 2

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 12 |
| failed             | step 53 |

- 12 To reset the inactive PM unit, type

**>PMRESET UNIT unit\_no NORUN**

and press the Enter key.

**NT0X91**  
**in a CPCE frame** (continued)

where

**unit\_no**  
is the PM unit number (0 or 1)

Example of a MAP response:

DTC 0 Unit 0 PMReset Passed

- 13** To manually busy all C-side links associated with the PM unit in use, use the procedure *Manually busy Series II PM and CPMC-side links* in this document. Complete the procedure and return to this point.
- 14** Repeat steps 5 to 13 for the other PM unit associated with the NT0X91 you are replacing.

**At the shelf**

**15**



**WARNING**

**Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

If there are NT6X48 DS30A interface cards in slots 6 and 7, unseat them.

| If you                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Do      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| are working on any XPM with the NTMX77 unified processor (XPM plus)                                                                                                                                                                                                                                                                                                                                                                                                               | step 18 |
| are working on any 2-processor XPM (NT6X45-based)                                                                                                                                                                                                                                                                                                                                                                                                                                 | step 16 |
| are working on an international 3-processor XPM (NT6X45-based)                                                                                                                                                                                                                                                                                                                                                                                                                    | step 17 |
| <p><b>16</b> Unseat control complex cards (2-processor XPMs). For each sub-step below, use the procedure <i>Unseating cards in equipment shelves</i> in this document.</p> <p><b>a</b> According to the configuration of your unit, unseat either the NT6X43 message interface card or the NT6X69 message protocol card in slot 18.</p> <p><b>b</b> Unseat the NT6X45 signaling processor card in slot 12.</p> <p><b>c</b> Unseat the NT6X45 master processor card in slot 8.</p> |         |

## NT0X91 in a CPCE frame (continued)

- d Go to step 18.
- 17 Unseat control complex cards (international 3-processor XPMs). For each sub-step below, use the procedure *Unseating cards in equipment shelves* in this document.
  - a According to the configuration of your unit, unseat either the NT6X43 message interface card or the NT6X69 message protocol card in slot 10.
  - b Unseat the NT6X45 signaling processor card in slot 12.
  - c Unseat the NT6X45 PCM30 signaling processor card in slot 18.
  - d Unseat the NT6X45 master processor card in slot 14.
- 18 Pull and set the power converter POWER switch handle downward to the OFF position.
- 19 Repeat steps 15 to 18 for the second PM unit associated with NT0X91 you are replacing.
- 20 Verify that the CBs for the power converters associated with the NT0X91 you are replacing are in the OFF position.
- 21 Unscrew the slotted nut on the left-hand side of the FSP.
- 22 Open the FSP.
- 23



### WARNING

#### Loss of service

Make sure that the alarm and control card you remove controls the PM units that you manual busied. Removal of the wrong card causes a loss of service.

- Remove the NT0X91 card from the CD slot in the FSP.
- 24 Place the removed card in an electrostatic discharge (ESD) protective container.
- 25 Make sure that the replacement card has the same PEC, including suffix, as the removed card.
- 26 Insert the replacement card.
- 27 Close the FSP.
- 28 Tighten the slotted nut on the FSP.
- 29 The next action depends on the power converter version and the type of supervisory panel.

#### If the power converter

#### Do

is an NT2X70AE card and the FSP or MSP has circuit breakers

step 30

**NT0X91**  
**in a CPCE frame** (continued)

|           | <b>If the power converter</b>                                                                                          | <b>Do</b> |
|-----------|------------------------------------------------------------------------------------------------------------------------|-----------|
|           | is an NT2X70AE card and the FSP or MSP does not have circuit breakers                                                  | step 31   |
|           | is not an NT2X70AE card and the FSP or MSP has circuit breakers                                                        | step 32   |
|           | is not an NT2X70AE card and the FSP or MSP does not have circuit breakers                                              | step 33   |
| <b>30</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the RESET position and hold.                                       |           |
|           | <b>b</b> Set the handle of the converter circuit breaker on the FSP or MSP up until it clicks into place.              |           |
|           | <b>c</b> Release the POWER switch handle.<br>Go to step 34.                                                            |           |
| <b>31</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the RESET position and hold until the CONVERTER FAIL LED goes off. |           |
|           | <b>b</b> Release the handle.<br>Go to step 34.                                                                         |           |
| <b>32</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the ON position.                                                   |           |
|           | <b>b</b> Press and hold the RESET button on the power converter.                                                       |           |
|           | <b>c</b> Set the handle of the converter circuit breaker on the FSP or MSP up until it clicks into place.              |           |
|           | <b>d</b> Release the RESET button.<br>Go to step 34.                                                                   |           |
| <b>33</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the ON position.                                                   |           |
|           | <b>b</b> Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.                 |           |
|           | <b>c</b> Release the RESET button.                                                                                     |           |

## NT0X91 in a CPCE frame (continued)

- 34** The next action depends on the processor configuration of the PM you are working on.
- | If you                                                              | Do      |
|---------------------------------------------------------------------|---------|
| are working on any XPM with the NTMX77 unified processor (XPM plus) | step 37 |
| are working on any 2-processor XPM (NT6X45-based)                   | step 35 |
| are working on an international 3-processor XPM (NT6X45-based)      | step 36 |
- 35** Reseat control complex cards (2-processor XPMs). For each sub-step below, use the procedure *Reseating cards in equipment shelves* in this document.
- a** Reseat the NT6X45 master processor card in slot 8.
  - b** Reseat the NT6X45 signaling processor card in slot 12.
  - c** According to the configuration of your unit, reseat either the NT6X43 message interface card or the NT6X69 message protocol card in slot 18.  
Go to step 37.
- 36** Reseat control complex cards (3-processor international XPMs). For each sub-step below, use the procedure *Reseating cards in equipment shelves* in this document.
- a** Reseat the NT6X45 master processor card in slot 14.
  - b** Reseat the NT6X45 PCM30 signaling processor card in slot 18.
  - c** Reseat the NT6X45 signaling processor card in slot 12.
  - d** According to the configuration, reseat either the NT6X43 message interface card or the NT6X69 message protocol card in slot 10.
- 37** If there are NT6X48 DS30A interface cards in slots 6 and 7, reseat them.
- 38** Repeat steps 29 to 37 for the other PM unit associated with the replaced NT0X91. Power up the power converter and reseat the control complex cards for both shelves and continue this procedure.

### At the MAP terminal

- 39** The next action depends on the type of network in the office.

| If you              | Do      |
|---------------------|---------|
| are working on JNET | step 40 |
| are working on ENET | step 42 |



## NT0X91 in a CPCE frame (continued)

- 40** To return to service one of the network links associated with the PM unit in use, type

**>RTS plane\_no link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane (0 or 1) for the link

**link\_no**

is the link number (0 to 63)

| If the link                                                   | Do      |
|---------------------------------------------------------------|---------|
| returned to service and more manual-busy links are present    | step 41 |
| returned to service and no more manual-busy links are present | step 43 |
| did not return to service                                     | step 53 |

- 41** Repeat step 40 for all C-side links to the shelf in use.

- 42** To return the network link to service, type

**>RTS plane\_no LINK link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the plane (0 or 1) for the link

**link\_no**

is the link number (0 to 3)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 submitted.  
Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 passed.

| If the link               | Do      |
|---------------------------|---------|
| returned to service       | step 43 |
| did not return to service | step 53 |

- 43** Repeat steps 39 to 42 for the other PM unit associated with the NT0X91 you are replacing. Return all network links to service for both PM units and continue this procedure.

- 44** To post one of the PMs in use, type

**>PM;POST pm\_type pm\_no**

**NT0X91**  
**in a CPCE frame** (continued)

---

and press the Enter key.

where

**pm\_type**

is the PM type (for example DTC, ILGC, LTCI, PDTC, etc.)

**pm\_no**

is the PM number (0 to 255)

- 45** To load the inactive unit, type

**>LOADPM UNIT unit\_no**

and press the Enter key.

where

**unit\_no**

is the PM unit number (0 or 1)

---

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 47 |
| failed                | step 46 |

---

- 46** To load the PM unit, use the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 47** To return the inactive unit to service, type

**>RTS UNIT unit\_no**

and press the Enter key.

where

**unit\_no**

is the PM unit number (0 or 1)

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 48 |
| failed             | step 53 |

---

- 48** Repeat steps 44 to 47 for the PM unit in the other shelf associated with the NT0X91 you are replacing. Return both PM units to service. Go to step 49.

- 49** The next action depends on your reason for performing this procedure.

---

| If                                                           | Do      |
|--------------------------------------------------------------|---------|
| a maintenance procedure directed you to this procedure       | step 50 |
| a maintenance procedure did not direct you to this procedure | step 54 |

---

**NT0X91**  
**in a CPCE frame (end)**

---

- 50      Return to the maintenance procedure that sent you to this procedure and continue as directed.
- 51      Consult office personnel to determine why the component is offline. Continue as directed by office personnel.
- 52      For additional help with switch of activity, contact the next level of support.  
          **Note:** If the system recommends using the SWACT command with the FORCE option, consult office personnel. Consult office personnel to determine if you have permission to use the FORCE option.
- 53      For additional help, contact the next level of support.
- 54      The procedure is complete.

## NT0X91 in a digital carrier equipment frame

---

### Application

Use this procedure to replace a NT0X91 in a digital carrier equipment (DCE) frame.

| PEC    | Suffix | Card name                 | Shelf or frame name                                                          |
|--------|--------|---------------------------|------------------------------------------------------------------------------|
| NT0X91 | AA, AB | Drive and alarm card      | DCE equipped with digital carrier module (DCM), digital echo supressor (DES) |
| NT0X91 | AD     | Drive and protection card | DCE equipped with DCM, DES                                                   |

Basic>Refer to the "Index", if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The "Index" contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to *Loading a PM*.

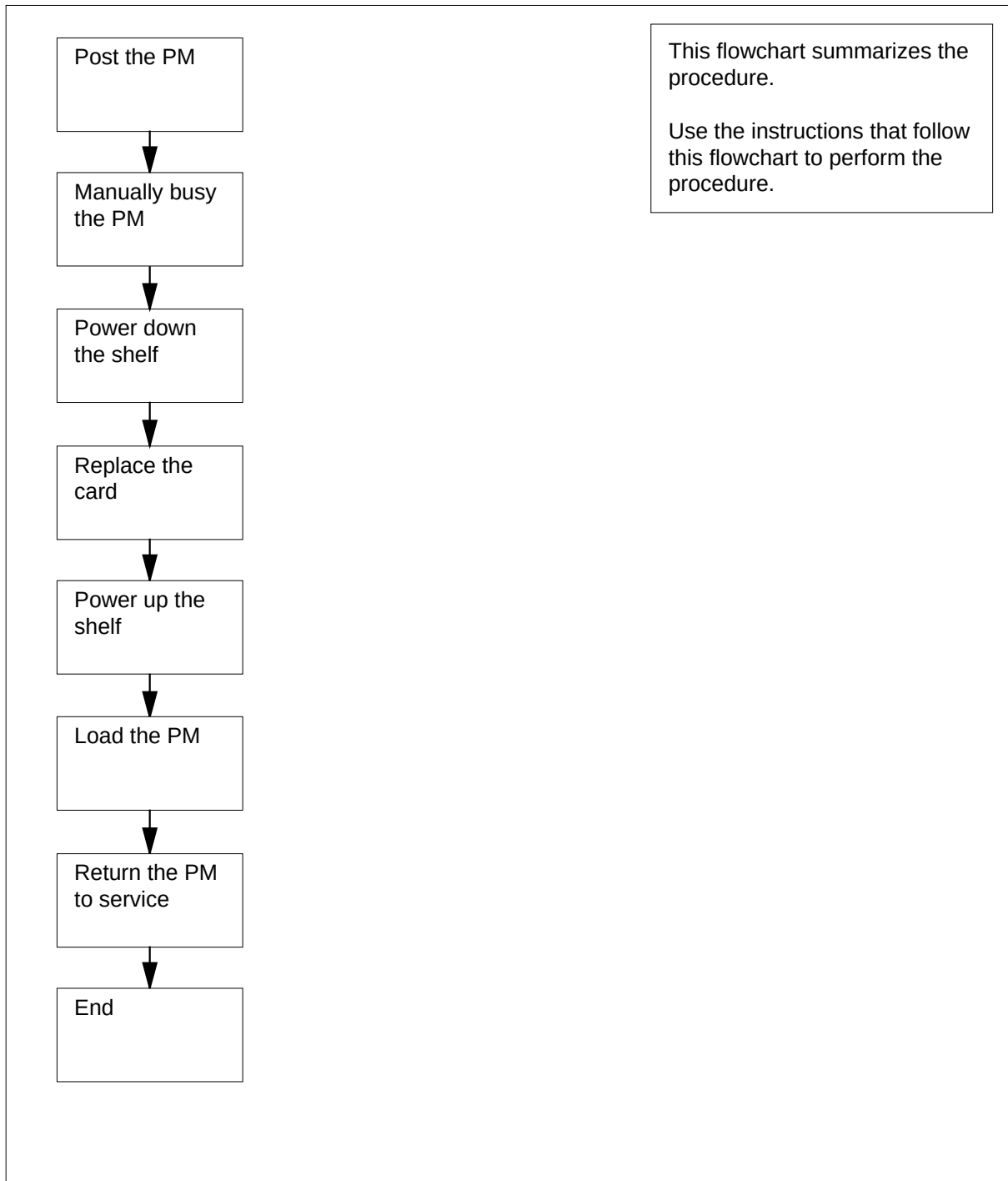
Do not go to the common procedure unless the step-action procedure directs you.

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT0X91 in a digital carrier equipment frame (continued)

### Summary of replacing a NT0X91 in a digital carrier equipment frame



## NT0X91 in a digital carrier equipment frame (continued)

---

### Replacing a NT0X91 in a digital carrier equipment frame

#### *At the frame*

1



#### **DANGER**

##### **Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure that you remove all jewelry before you replace a card in the FSP. Do not touch any terminal in the FSP.



#### **CAUTION**

##### **Loss of service**

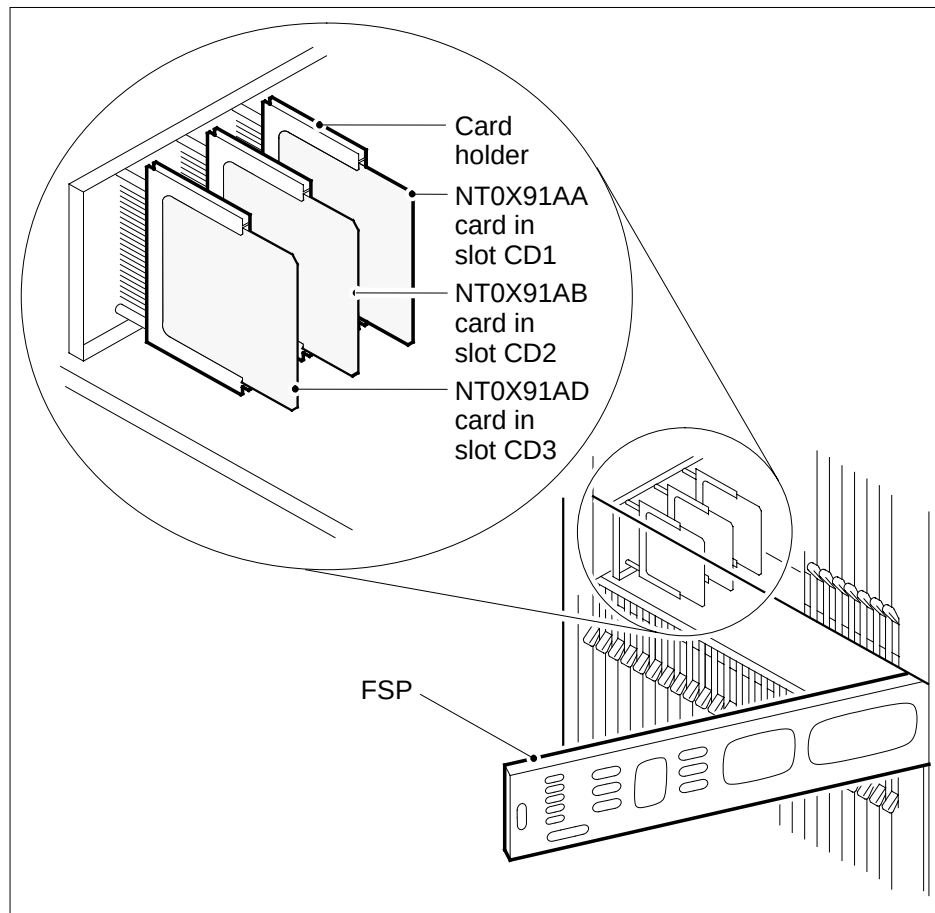
This procedure includes directions to manually busy a DCM or DES. If you manually busy a DCM or DES, a service power failure can occur. Perform this procedure only if you need to restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic. .

Obtain a replacement card. Make sure that the replacement card and the card that you replace have the same PEC and PEC suffix.

2

Use the table following the figure to identify the slot that contains the alarm and control card that you replace:

## NT0X91 in a digital carrier equipment frame (continued)



| If Alarm and control card | Do Slot |
|---------------------------|---------|
| is NT0X91AA               | CD1     |
| is NT0X91AB               | CD2     |
| is NT0X91AD               | CD3     |

## NT0X91 in a digital carrier equipment frame (continued)

- 3 Record information on FSP fuses, FSP circuit breakers (CB), and network shelf positions that associate with the card you replace. Use the following table to obtain this information.

| FSP card                                               | FSP card position | FSP circuit breakers | Shelf position |
|--------------------------------------------------------|-------------------|----------------------|----------------|
| NT0X91AA                                               | CD1               | CB5                  | 04             |
| NT0X91AB                                               | CD2               | CB3                  | 32             |
|                                                        |                   | CB1                  | 65             |
| NT0X91AD                                               | CD3               | CB4                  | 18             |
|                                                        |                   | CB2                  | 51             |
| <b>Note:</b> A minimum of one shelf can be unequipped. |                   |                      |                |

- 4 Select a shelf that associates with the FSP card that you replace.

### At the MAP terminal

- 5 To access the PM level of the MAP display, type  
**>MAPCI;MTC;PM ndInstance>**  
 and press the Enter key.

*Example of a MAP display:*

```

PM SysB ManB OffL CBsy ISTb InSv
 6 1 0 0 23 24

```

- 6 To post the PM that associates with the card you replace, type  
**>POST pm\_type pm\_no**  
 and press the Enter key.

*where*

**pm\_type**  
 is the type of PM (DCM, DES)

**pm\_no**  
 ption>

is the PM number (0 to 511)

*Example of a MAP display:*



## NT0X91

### in a digital carrier equipment frame (continued)

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 6    | 1    | 0    | 0    | 23   | 24   |
| DCM | 1    | 0    | 0    | 0    | 1    | 4    |

|     |   |      |
|-----|---|------|
| DCM | 0 | InSv |
|-----|---|------|

- 7 Determine the state of the PM.

**Note:** The PM state appears on the right of the PM number. In the example display in step 6, the PM state is in service (InSv).

| If the state of the PM unit  | Do      |
|------------------------------|---------|
| is ISTb, InSv, SysB, or CBsy | step 8  |
| is ManB                      | step 12 |
| is OffL                      | step 41 |

- 8 A maintenance flag (Mtce) can appear. A Mtce indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before you proceed to the next step.

- 9 To manually busy the PM, type

**>BSY e>**

and press the Enter key.

*Example of a MAP response:*  
OK.DCM 0 Bsy

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 10 |
| failed             | step 43 |

- 10 The next action depends on how many shelves equipped with PMs associate with the FSP card that you replace.

| If                                                                                                          | DoDo    |
|-------------------------------------------------------------------------------------------------------------|---------|
| one shelf equipped with PMs associate with the card                                                         | step 12 |
| two shelves equipped with PMs associate with the card, and you turned down functionality for only one shelf | step 11 |

**NT0X91****in a digital carrier equipment frame** (continued)

|           | <b>If</b>                                                                                                    | <b>DoDo</b> |
|-----------|--------------------------------------------------------------------------------------------------------------|-------------|
|           | two shelves equipped with PMs associate with the card, and you turned down functionality for both shelves    | step 12     |
| <b>11</b> | Repeat steps 6 to10 for PMs in the other shelf that associates with the FSP card you replace. Go to step .12 |             |

**At the frame****12****WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Select a shelf to power down.

- 13** Pull down and set the handle of the POWER switch on the power converter to the OFF position.
- 14** The next action depends on the power configuration of the shelf.

| <b>If the shelf</b>            | <b>Do</b> |
|--------------------------------|-----------|
| contains a single NT2X70       | step 16   |
| contains a NT2X06 and a NT2X07 | step 15   |

- 15** For the mate power converter, pull down and set the handle of the POWER switch to the OFF position.
- 16** The next action depends on how many shelves equipped with PMs associate with the FSP card that you replace.

| <b>If</b>                                                                                  | <b>Do</b> |
|--------------------------------------------------------------------------------------------|-----------|
| one shelf equipped with PMs associate with the card                                        | step 18   |
| two shelves equipped with PMs associate with the card, and you powered down only one shelf | step 17   |
| two shelves equipped with PMs associate with the card, and you powered down both shelves   | step 18   |

## NT0X91

### in a digital carrier equipment frame (continued)

- 17 Repeat steps 13 to 16 for the PM in the other shelf that associates with the FSP card you replace. Go to step .18
- 18 Unscrew the slotted nut on the left of the FSP.
- 19 Open the FSP.
- 20 Remove the card.
- 21 Insert the replacement alarm and control card.
- 22 Close the FSP.
- 23 Tighten the slotted nut on the FSP.
- 24 The next action depends on the power converter version and the type of supervisory panel.

| If you                                                                            | Do      |
|-----------------------------------------------------------------------------------|---------|
| replace an NT2X70AE card and the FSP or MSP has circuit breakers                  | step 25 |
| replace an NT2X70AE card and the FSP or MSP does not have circuit breakers        | step 26 |
| do not replace an NT2X70AE card and the FSP or MSP has circuit breakers           | step 27 |
| do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers | step 28 |

- 25 Power up the converter, as follows:
  - a Pull up and set the handle of the POWER switch to the RESET position and hold.
  - b Set the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.
  - c Release the handle of the POWER switch.
  - d Go to step 29
- 26 Power up the converter, as follows:
  - a Pull up and set the handle of the POWER switch to the RESET position and hold until the CONVERTER FAIL LED turns off.
  - b Release the handle of the POWER switch.
  - c Go to step 29.
- 27 Power up the converter, as follows:
  - a Pull up and set the handle of the POWER switch to the ON position.
  - b Press and hold the RESET button on the power converter.
  - c Set the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.

**NT0X91****in a digital carrier equipment frame** (continued)

- d Release the RESET button.
  - e Go to step 29.
- 28** Power up the converter, as follows:
- a Pull up and set the handle of the POWER switch to the ON position.
  - b Press and hold the RESET button on the power converter until the CONVERTER FAIL LED turns off.
  - c Release the RESET button.
- 29** The next action depends on the number of power converters on the shelf.
- | If                                                                                   | Do      |
|--------------------------------------------------------------------------------------|---------|
| one power converter is on the shelf                                                  | step 31 |
| two power converters are on the shelf, and you powered up both of the converters     | step 31 |
| two power converters are on the shelf, and you powered up only one of the converters | step 30 |
- 30** Repeat steps 24 to 29 for the other power converter on the shelf.
- 31** The next action depends on how many shelves associate with the FSP card that you replace.
- | If                                                                                       | Do      |
|------------------------------------------------------------------------------------------|---------|
| one shelf equipped with PMs associates with the card                                     | step 33 |
| two shelves equipped with PMs associate with the card, and you powered up only one shelf | step 32 |
| two shelves equipped with PMs associate with the card, and you powered up both shelves   | step 33 |
- 32** Repeat steps 24 to 31 for PMs in the other shelf that associates with the FSP card you replace. Go to step 33.
- 33** At the MAP terminalTo post the PM, type
- ```
>POST pm_type pm_no
```
- and press the Enter key.
- where
- pm_type**
is the type of PM (DCM, DES)
- pm_no**
is the PM number (0 to 511)

NT0X91

in a digital carrier equipment frame (continued)

34	To load the PM, type >LOADPM ance> and press the Enter key.		Do
	failed		step 35
	passed		step 36
- 35** Perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.
- 36** To return the PM to service, type
>RTS e>
and press the Enter key.
- | | |
|--|-----------|
| | Do |
| passed | step 37 |
| passed, but the PM is ISTb as a result of a command protocol violation | step 42 |
| failed | step 43 |
- 37** The next action depends on how many shelves associate with the FSP card that you replace.
- | | |
|--|-----------|
| | Do |
| one shelf equipped with PMs associates with the card | step 39 |
| two shelves equipped with PMs associate with the card, and you powered down only one shelf | step 38 |
| two shelves equipped with PMs associate with the card, and you powered down both shelves | step 39 |
- 38** Repeat steps 33 to 37 for PMs in the other shelf that associates with the FSP card you replace. Go to step 39.
- 39** The next action depends on the reason that you perform this procedure.
- | | |
|--------------------------------|-----------|
| | Do |
| directed you to this procedure | step 40 |

NT0X91
in a digital carrier equipment frame (end)

	If a maintenance procedure	Do
	did not direct you to this maintenance procedure	step 24
40	Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.	
41	To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.	
42	A minor problem is present. The PM can process traffic. For additional help, contact the next level of support.	
43	For additional help, contact the next level of support.	
44	The procedure is complete.	

NT0X91 in a line module equipment frame

Application

Use this procedure to replace a NT0X91 in a line module equipment (LME) frame, as listed in the following table.

PEC	Suffix	Card name	Shelf or frame name
NT0X91	AA	FSP drive and alarm card	FSP (NT0X29) in a LME
NT0X91	AD	FSP drive and protector card	FSP (NT0X29) in a LME

Refer to the “Index”, if you cannot identify the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

Common procedures

This procedure refers to *Loading a PM*.

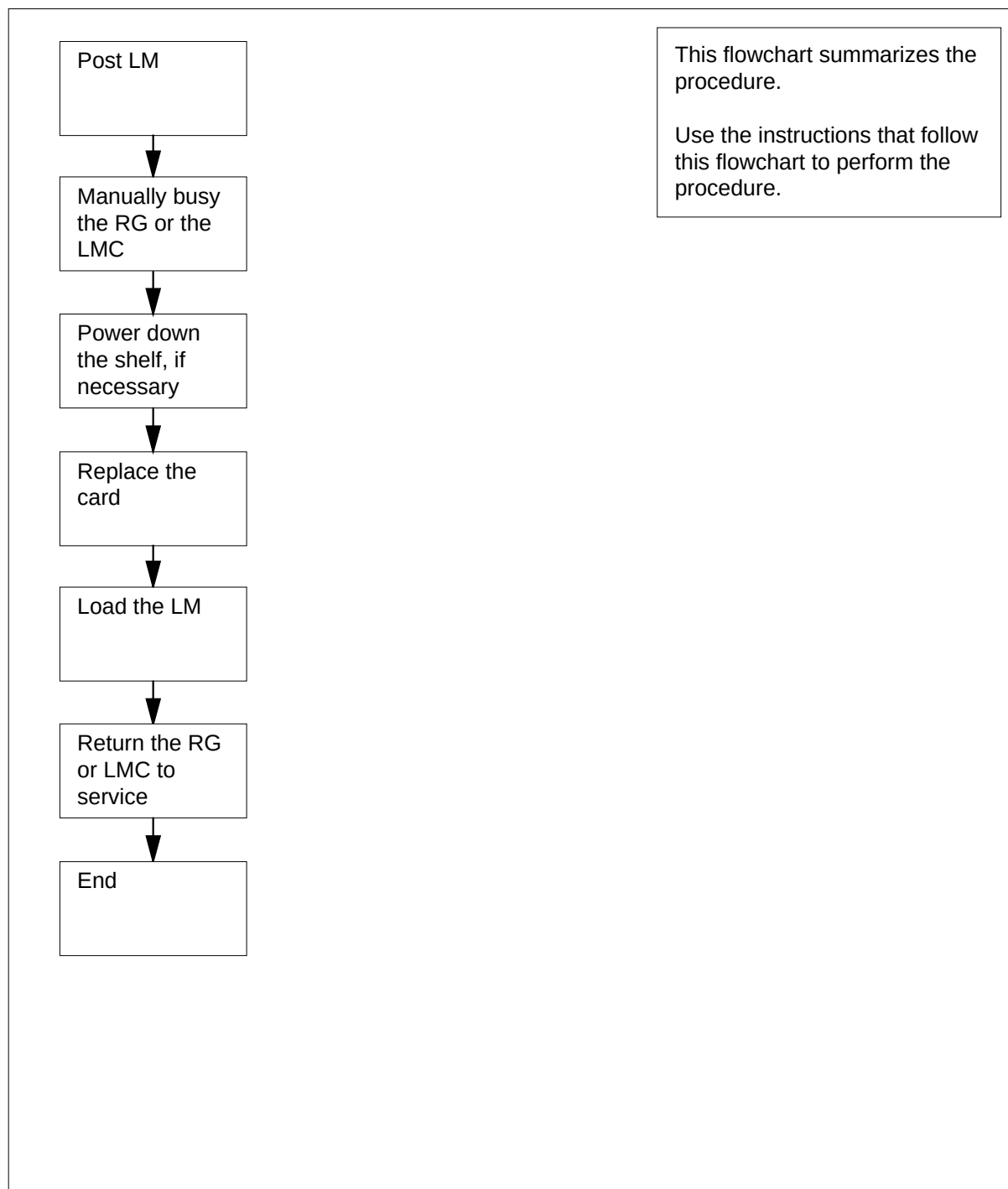
Do not go to the common procedure unless the step-action procedure directs you.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NT0X91 in a line module equipment frame (continued)

Summary of replacing a NT0X91 in a line module equipment frame



NT0X91

in a line module equipment frame (continued)

Replacing a NT0X91 in a line module equipment frame

At your current location

1



CAUTION

Potential loss of service

This procedure includes directions to manually busy a line module controller (LMC). If you manually busy an LMC, service degradation can occur. Perform this procedure only if you need to restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic.



DANGER

Risk of electrocution

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure that you remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.

Obtain a replacement card. Make sure that the replacement card and the card that you replace have the same PEC and PEC suffix.

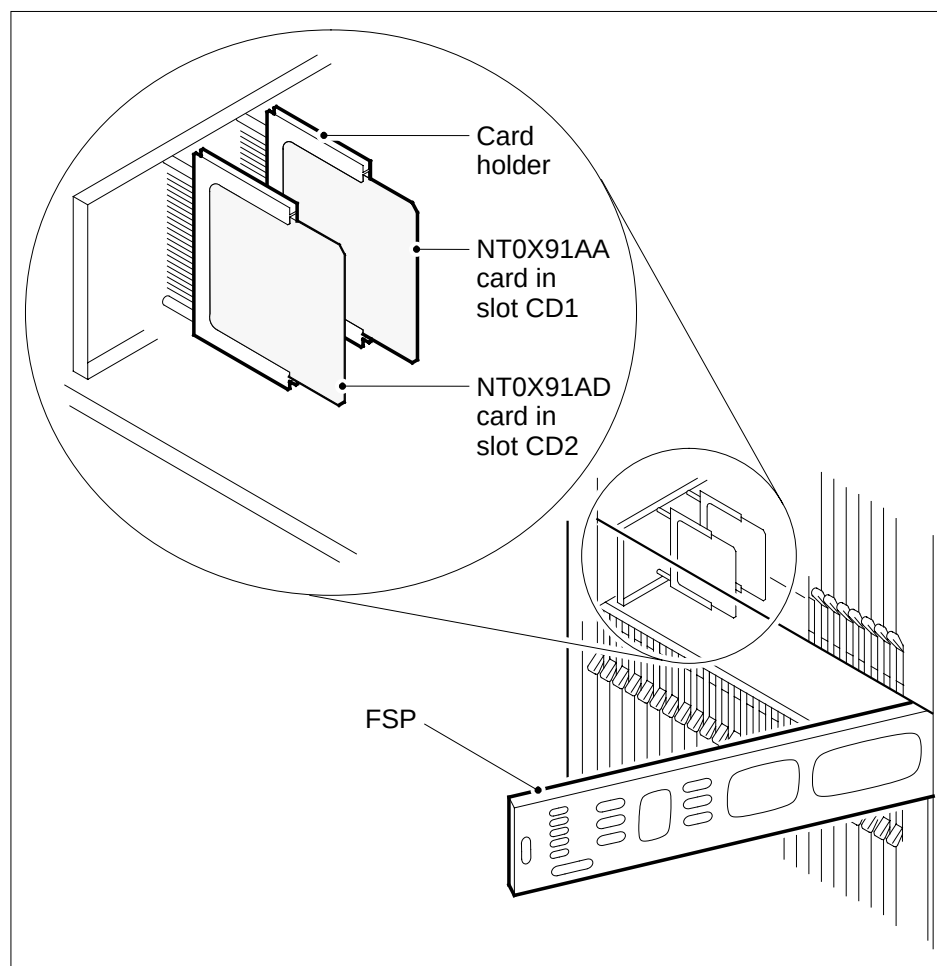
At the frame

2

Use the following table to identify the slot that contains the alarm and control card that you replace.

Card	Slot	Card position
NT0X91AA	slot CD1	rear
NT0X91AD	slot CD2	front

NT0X91 in a line module equipment frame (continued)



- 3 Use the following table to identify the converters and circuit breakers that associate with the alarm and control card you replace.

Card	Power converter	FSP circuit breaker
NT0X91AD	NT2X05 (RG 0) in slot 1	CB1
NT0X91AA	NT2X05 (RG 1) in slot 5	CB2
NT0X91AD	NT2X70 in slot 22	CB3

Note: Circuit breakers are on the FSP.

NT0X91

in a line module equipment frame (continued)

At the MAP terminal

4 To access the PM level of the MAP display, type
>MAPCI;MTC;PM
 and press the Enter key.

5 To post the line module (LM) that contains the alarm and control card you want to replace, type
>POST LM bay_no pair_no
 and press the Enter key.

where

bay_no
 is the number of the LM bay (0 to 511)

pair_no
 is the number of the LM in the bay (0 or 1)

6 The next action depends on the card that you replace.

If you	Do
replace the NT0X91AA	step 7
replace the NT0X91AD	step 11

7 Determine the state of the ringing generators (RG).

If	Do
either RG is Standby	step 34
RG 1 (slot 05) is InSv or ISTb and RG 0 (slot 01) is InSv or ISTb	step 8
RG 1 (slot 05) is InSv or ISTb and RG 0 (slot 01) is ManB or SysB	step 34
RG 1 (slot 05) is ManB	step 10
RG 1 (slot 05) is SysB	step 8

8 To manually busy the ringing generator interface (RGI) for RG 1, type
>BSY RGI 1
 and press the Enter key.

Example of a MAP response:

WARNING:CALLS IN RINGING STATE USING THIS RGI WILL BE LOSTDO
 YOU WANT TO CONTINUE ?Please confirm ("YES", "Y", "NO", or "N"):

NT0X91

in a line module equipment frame (continued)

- 9 To confirm the command, type
>YES
 and press the Enter key.
Example of a MAP response:
 OK

At the frame

10



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Pull down and set the handle of the POWER switch on RG 1 (slot 5) to the OFF position.

Go to step 18.

- 11 Determine the state of the LM.

If the state of the LM	Do
is InSv or ISTb	step 12
is SysB or CBSy	step 15
is ManB	step 16
is Offl	step 35

- 12 To post the mate LM, type
>POST LM site frame_no unit_no
 and press the Enter key.
where
site
 is the PM location (alphanumeric)
frame_no
 is the frame number (0 to 511)
unit_no
 is the PM unit number (0 or 1)

NT0X91

in a line module equipment frame (continued)

13 Determine the state of the mate LM and the state of the RGs of the mate LM.

If	Do
the state of the mate LM is InSv or ISTb and both RGs are InSv	step 14
the states of the mate LM and RGs are other than listed here	step 36

14 To post the LM on which you want to replace a card, type

>POST LM site frame_no unit_no

and press the Enter key.

where

site
is the PM location (alphanumeric)

frame_no
is the frame number (0 to 511)

unit_no
is the PM unit number (0 or 1)

15 To manually busy the LM, type

>BSY

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	3	1	0	0	0	71
LM	0	1	0	0	0	1

LM HOST 01 0 ManB
RGen : 0 Standby 1 InSv
bsy
OK

NT0X91 in a line module equipment frame (continued)

At the frame

16



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Pull down and set the handle of the power converter POWER switch to the OFF position.

17 Pull down and set the handle of the POWER switch on RG 0 (slot 1) to the OFF position.

18 Unscrew the slotted nut on the left of the FSP.

19 Open the FSP.

20



WARNING

Loss of service

Make sure that the alarm and control card that you remove controls the power converter. The alarm and control card also can control the RG that you powered down. Removal of the wrong card causes a loss of service.

Remove the NT0X91 card from the slot that you identified in step 2.

21 Insert the replacement card.

22 Close the FSP.

23 Tighten the slotted nut on the FSP.

24 The next action depends on the card that you replace.

If you	Do
replace the NT0X91AA	step 25
replace the NT0X91AD	step 27

25 Power up RG 1.

a Pull up and set the handle of the POWER switch to the ON position.

b Press and hold the RESET button on the RG.

NT0X91

in a line module equipment frame (continued)

- c Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
- d Release the RESET button.

At the MAP terminal

- 26** To return the RGI to service, type

>RTS RGI rgi_no

and press the Enter key.

where

rgi_no

is the number (0 or 1) of the RGI

Example of a MAP response:

OK.

Go to step 32.

- 27** Power up the converter, as follows.

- a Pull up and set the handle of the POWER switch to the ON position.
- b Press and hold the RESET button on the power converter.
- c Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
- d Release the RESET button.

- 28** Power up RG 0.

- a Pull up and set the handle of the POWER switch to the ON position.
- b Press and hold the RESET button on the RG.
- c Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
- d Release the RESET button.

- 29** To load the LM, type

>LOADPM

and press the Enter key.

Example of a MAP response:

LM HOST 01 0 LoadPM PASSED

- 30** To load the PM unit, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 31** To return the LM to service, type

>RTS

and press the Enter key.

NT0X91

in a line module equipment frame (end)

Example of a MAP response:

```
rts
OK.
InSvc Tests Initiated
OK.
```

- 32** The next action depends on the reason that you perform this procedure.

If a maintenance procedure	Do
directed you to this maintenance procedure	step 33
did not direct you to this procedure	step 38

- 33** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.
- 34** If you manually busy the RG, you disable all RGs in the LM bay. To determine how to proceed, consult the next level of support. Continue as directed by the next level of support.
- 35** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 36** If you manually busy the LMC, you lose calls in progress. To determine how to proceed, consult the next level of support. Continue as directed by the next level of support.
- 37** For additional help, contact the next level of support.
- 38** The procedure is complete.

**NT0X91
in an MS6E**

Application

Use this procedure to replace an NT0X91 in a CCS6 message switch equipment (MS6E) frame, as listed in the following table.

If you cannot identify the product engineering code (PEC), suffix, or shelf or frame for the card to replace, refer to the Index. The Index provides a list of the cards, shelves, and frames documented in this card replacement book.

PEC	Suffix	Card name	Shelf or frame name
NT0X91	AA	FSP drive and alarm circuit pack	MS6E
NT0X91	AE	FSP drive and protection circuit pack	MS6E

Common procedures

This procedure refers to the following:

- *Manually busying Series II PM C-side links*
- *Loading a PM*

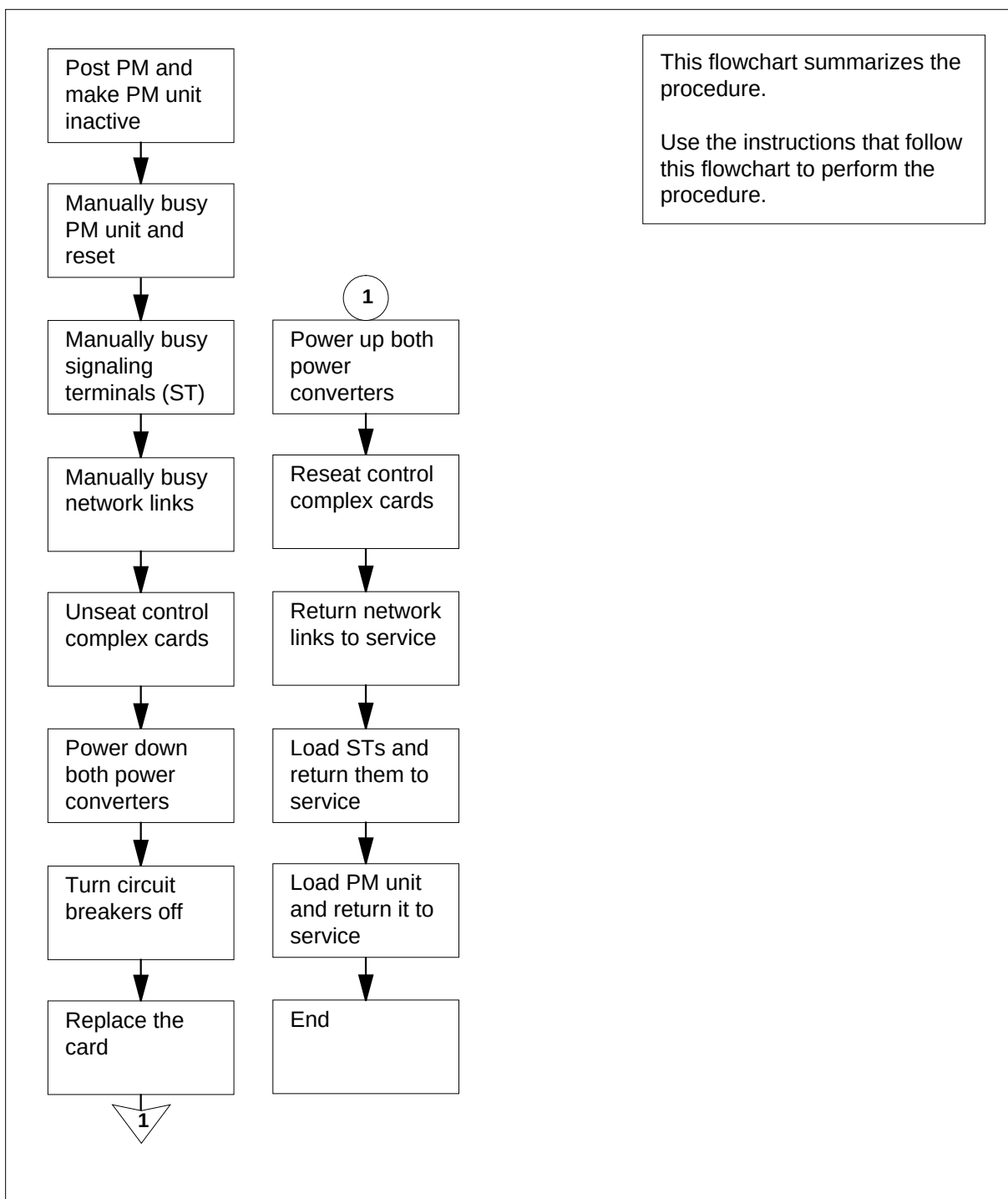
Do not go to the common procedure unless the step-action procedure directs you.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NT0X91 in an MS6E (continued)

Summary of replacing a NT0X91 in an MS6E



NT0X91
in an MS6E (continued)

NT0X91 in an MS6E

At your current location

1



DANGER

Risk of electrocution

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.



DANGER

Loss of service

This procedure manually busies one or more peripheral module (PM) units, which can cause service degradation. Perform this procedure only if you need to restore out-of-service components. If this procedure is not needed for a return to service, perform this procedure during periods of low traffic only.



DANGER

Loss of service

This procedure manually busies one or more signaling terminals (ST), which can cause service degradation. Perform this procedure only if you need to restore out-of-service components. If this procedure is not required for a return to service, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card has the same PEC, including suffix, as the card being removed.

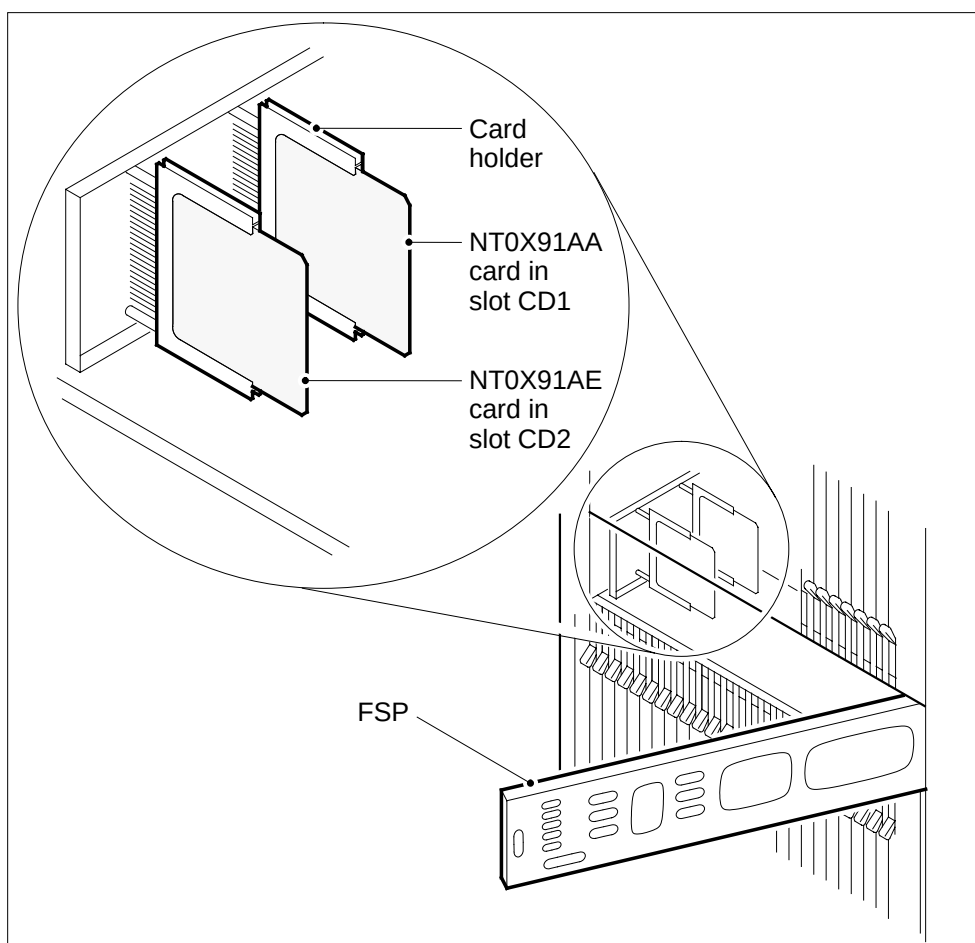
2

Record the FSP slot, frame circuit breakers (CB), shelves, signaling terminal controllers (STC), MSB6 unit number, and power converter slot associated

NT0X91 in an MS6E (continued)

with the NT0X91 card you will replace. Use the following table and diagram to obtain this information.

Card	FSP Slot	CB	Shelf and PM information	PC slot
NT0X91AA	CD1	CB5	shelf 51, MSB6 unit 0 (right side)	25
NT0X91AA	CD1	CB4	shelf 51, STCM 0 (left side)	01
NT0X91AE	CD2	CB2	shelf 65, MSB6 unit 1 (right side)	25
NT0X91AE	CD2	CB1	shelf 65, STCM 1 (left side)	01



NT0X91 in an MS6E (continued)

At the MAP terminal

- 3 To access the PM level of the MAP display, type

>MAPCI ; MTC ; PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBSy	ISTb	InSv
PM	12	0	2	0	13	24

- 4 To post the MSB, type

>POST MSB6 pm_no

and press the Enter key.

where

pm_no

is the PM number (0 to 999)

Example of a MAP display:

	SysB	ManB	OffL	CBSy	ISTb
PM	12	0	2	0	13
MSB6	0	0	0	0	0

MSB6 0 InSv Links_00S: CSide 0 , PSide 0
Unit0: Inact InSv
Unit1: Act InSv

- 5 Determine the state and activity of the PM unit associated with the card you are replacing.

If the state of the PM unit	Do
is ISTb, InSv, SysB, or CBSy, and active	step 6
is ISTb, InSv, SysB, or CBSy, and inactive	step 9
is ManB	step 11
is OffL	step 55

- 6 Determine the state of the mate PM unit.

If the state of the mate PM unit	Do
is ISTb or InSv	step 7
is other than listed here	step 57

NT0X91
in an MS6E (continued)

- 7 To switch activity, type

>SWACT

and press the Enter key.

Example of a MAP response:

```
MSB6 0      A Warm SwAct will be performed after
              data sync of active terminals.
Please confirm ("YES", "Y", "NO", or "N"):
```

If	Do
you must confirm the command	step 8
the system rejects the SWACT	step 56

- 8 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

```
Unit0:  Inact SysB Mtce
Unit1:  Act   ISTb

MSB6 0      SwAct Passed
```

If the MAP response	Do
is SWACT passed	step 9
is other than listed here	step 56

- 9 A maintenance flag (Mtce) can appear. This flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before you proceed to the next step.

- 10 To manually busy the inactive unit, type

>BSY UNIT unit_no

and press the Enter key.

where

unit_no
is the PM unit number (0 or 1)

Example of a MAP response:

NT0X91 in an MS6E (continued)

```
MSB6 0 ISTb Links_00S: CSide 0 , PSide 0
Unit0: Inact ManB
Unit1: Act InSv
bsy unit 0
MSB6 0 Unit 0 Bsy Passed
```

If the BSY command	Do
passed	step 11
failed	step 57

- 11** To reset the PM unit, type
>PMRESET UNIT unit_no NORUN
 and press the Enter key.
where
 unit_no
 is the PM unit number (0 or 1)
Example of a MAP response:
- 12** To access the STC level of the MAP display, type
>STC
 and press the Enter key.
- 13** To post the STC that you recorded in step 2, type
>POST STCM stcm_no
 and press the Enter key.
where
 stcm_no
 is the STCM number (0 to 9)
- 14** To manually busy the signaling terminals (ST), type
>BSY ALL
 and press the Enter key.
Example of a MAP response:

```
STC 301
STC 302
STC 303
STC 304
This will busy the above STC(S)
Please confirm ("YES", "Y", "NO", or "N"):
```

NT0X91 in an MS6E (continued)

- 15 To confirm the command, type
>YES
and press the Enter key.
- 16 To return to the PM level of the MAP display, type
>QUIT
and press the Enter key.
- 17 To manually busy C-side links associated with the shelf in use, use the procedure *Manually busy Series II PM C-side links*. The procedure *Manually busy Series II PM C-side links* appears in this document. Complete the procedure and return to this point.

At the frame

18



WARNING

Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

- Unseat cards in the control complex.
- a Unseat the NT6X43 message interface card in slot 20.
 - b Unseat the NT6X45 signaling processor card in slot 19.
 - c Unseat the NT6X45 master processor card from slot 15.
- 19 To power down the power converter in slot 01, pull and set the POWER switch handle down to the OFF position.
 - 20 To power down the power converter in slot 25, pull and set the POWER switch handle down to the OFF position.
 - 21 Turn off the CBs for the shelf associated with the NT0X91 card you are replacing
 - 22 Unscrew the slotted nut on the left-hand side of the FSP.
 - 23 Open the FSP.

NT0X91 in an MS6E (continued)

24



WARNING

Loss of service

Make sure that the alarm and control card you remove controls the shelves with the STs that you set to manually busy. Removal of the wrong card causes loss of service.

Remove the NT0X91 card from the CD slot in the FSP.

- 25 Place the removed card in an electrostatic discharge (ESD) protective container.
- 26 Make sure that the replacement card has the same PEC, including suffix, as the removed card.
- 27 Insert the replacement card.
- 28 Close the FSP.
- 29 Tighten the slotted nut on the FSP.
- 30 The next action depends on the power converter version and the type of supervisory panel.

If the power converter	Do
is an NT2X70AE card and the FSP has circuit breakers	step 31
is an NT2X70AE card and the FSP does not have circuit breakers	step 32
is not an NT2X70AE card and the FSP has circuit breakers	step 33
is not an NT2X70AE card and the FSP does not have circuit breakers	step 34

- 31 Power up the converter.

- a Pull the set the POWER switch handle up to the RESET position and hold.
 - b Set the converter circuit breaker handle on the FSP up until it clicks into place.
 - c Release the POWER switch handle.
- Go to step 35.

- 32 Power up the converter.

NT0X91

in an MS6E (continued)

- a Pull and set the POWER switch handle up to the RESET position and hold until the CONVERTER FAIL LED goes off.
 - b Release the handle.
Go to step 35.
- 33 Power up the converter.
 - a Pull and set the POWER switch handle up to the ON position.
 - b Press and hold the RESET button on the power converter.
 - c Set the converter circuit breaker handle on the FSP up until it clicks into place.
 - d Release the RESET button.
Go to step 35.
- 34 Power up the converter.
 - a Pull and set the POWER switch handle up to the ON position.
 - b Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
 - c Release the RESET button.
- 35 Repeat steps 30 to 34 for the other power converter. Turn on both power converters and go to step 36.
- 36 Reseat cards in the control complex.
 - a Reseat the NT6X45 master processor card in slot 15.
 - b Reseat the NT6X45 signaling processor card in slot 19.
 - c Reseat the NT6X43 message interface card in slot 20.

At the MAP terminal

- 37 The next action depends on the type of network in the office.

If you	Do
are working on JNET	step 38
are working on ENET	step 40

- 38 To return to service one of the network links associated with the PM unit in use, type
- ```
>RTS plane_no link_no
```
- and press the Enter key.
- where
- plane\_no**  
is the number of the plane (0 or 1) for the link

## NT0X91 in an MS6E (continued)

**link\_no**  
is the link number (0 to 63)

| If the link                                                   | Do      |
|---------------------------------------------------------------|---------|
| returned to service and more manual-busy links are present    | step 39 |
| returned to service and no more manual-busy links are present | step 41 |
| did not return to service                                     | step 57 |

**39** Repeat step 38 for all C-side links for the PM unit in use. When you correctly return all C-side links to service, go to step 41.

**40** To return the link to service, type

**>RTS plane\_no LINK link\_no**

and press the Enter key.

where

**plane\_no**  
is the number of the plane (0 or 1) for the link

**link\_no**  
is the link number (0 to 63)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 sybmitted.  
Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 passed.

| If the link               | Do      |
|---------------------------|---------|
| returned to service       | step 41 |
| did not return to service | step 57 |

**41** To return to the STC level of the MAP display, type

**>PM;STC**

and press the Enter key.

**42** To post the STCM, type

**>POST STCM stcm\_no**

and press the Enter key.

where

**stcm\_no**  
is the STCM number (0 to 9)

## NT0X91

### in an MS6E (continued)

- 43** To load the STs, type  
**>LOADPM ALL**  
 and press the Enter key.

*Example #1 of a MAP response:*

```
STC 301 load Passed : <loadname>
STC 302 load Passed : <loadname>
STC 303 load Passed : <loadname>
STC 304 load Passed : <loadname>
```

*Example #2 of a MAP response:*

```
STC load '<loadname>' not in MSB6 0
```

| If the LOADPM command                                          | Do      |
|----------------------------------------------------------------|---------|
| passed                                                         | step 49 |
| failed, with the message STC Load <loadname> not in <msb_unit> | step 44 |
| failed, with messages other than listed here                   | step 46 |

**Note:** As shown above in *Example of a MAP response #2*, loadname is the name of the ST load; msb\_unit is the MSB6 and the unit number.

- 44** To return to the PM level of the MAP display, type  
**>QUIT**  
 and press the Enter key.

- 45** To add the load to the MSB6, type  
**>STCLOAD UNIT unit\_no ADD loadname**  
 and press the Enter key.

where

**unit\_no**  
 is the PM unit number (0 or 1)

**loadname**  
 is the STC load name

| If the STCLOAD command | Do      |
|------------------------|---------|
| failed                 | step 46 |
| passed                 | step 49 |

## NT0X91 in an MS6E (continued)

- 46** To load the PM unit, use the procedure *How to load a PM* in this document. Complete the procedure and return to this point.
- 47** To return to the STC level of the MAP display, type  
**>STC**  
 and press the Enter key.
- 48** To post the STCM, type  
**>POST stcm\_no**  
 and press the Enter key.  
*where*  
**stcm\_no**  
 is the STCM number (0 to 9)
- Go to step 43.
- 49** To return the STs to service, type  
**>RTS ALL**  
 and press the Enter key.

*Example of a MAP response:*

```
STC 301 Out-of-service test initiated
STC 301 Tst Passed
STC 301 Rts Passed
STC 302 Out-of-service test initiated
STC 302 Tst Passed
STC 302 Rts Passed
STC 303 Out-of-service test initiated
STC 303 Tst Passed
STC 303 Rts Passed
STC 304 Out-of-service test initiated
STC 304 T Passed
STC 304 Rts Passed
```

| If the RTS command | Do      |
|--------------------|---------|
| passed for all STs | step 50 |
| failed for any ST  | step 57 |

- 50** The next action depends on your reason for performing this procedure.

| If                                                           | Do      |
|--------------------------------------------------------------|---------|
| a maintenance procedure directed you to this procedure       | step 51 |
| a maintenance procedure did not direct you to this procedure | step 52 |

**NT0X91**  
**in an MS6E (end)**

---

**51** Return to the maintenance procedure that sent you to this procedure and continue as directed.

**52** To load the inactive unit, type  
**>LOADPM UNIT unit\_no**  
and press the Enter key.

*where*

**unit\_no**  
is the PM unit number (0 or 1)

---

| <b>If the LOADPM command</b> | <b>Do</b> |
|------------------------------|-----------|
| failed                       | step 53   |
| passed                       | step 54   |

---

**53** To load the PM unit, use the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

**54** To return the inactive unit to service, type  
**>RTS UNIT unit\_no**  
and press the Enter key.

*where*

**unit\_no**  
is the PM unit number (0 or 1)

---

| <b>If the RTS command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 57   |
| failed                    | step 58   |

---

**55** Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

**56** For additional help with switch of activity, contact the next level of support.  
**Note:** If the system recommends use of the SWACT command with the FORCE option, consult office personnel. Consult office personnel to determine if you have permission to use the option.

**57** For additional help, contact the next level of support.

**58** The procedure is complete.

## NT0X91 in an MS7E, ST7E, or ST6E

---

### Application

Use this procedure to replace a NT0X91 in the shelves or frames listed in the following table.

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card to replace, refer to the Index. The Index provides a list of the cards, shelves, and frames documented in this card replacement book.

| PEC    | Suffix | Card name                             | Shelf or frame name                                                                      |
|--------|--------|---------------------------------------|------------------------------------------------------------------------------------------|
| NT0X91 | AA     | FSP drive and alarm circuit card      | signaling terminal 6 equipment (ST6E) frame, signaling terminal 7 equipment (ST7E) frame |
| NT0X91 | AE     | FSP drive and protection circuit card | CCS7 message buffer equipment (MS7E) frame, ST6E, ST7E                                   |

**Note:** This procedure is not used to change the NT0X91AA FSP drive and alarm circuit card in the MS7E frame. If card replacement is necessary for this card in the MS7E, contact your next level of support.

### Common procedures

This procedure refers to *Loading a PM*.

Do not go to the common procedure unless the step-action procedure directs you to go.

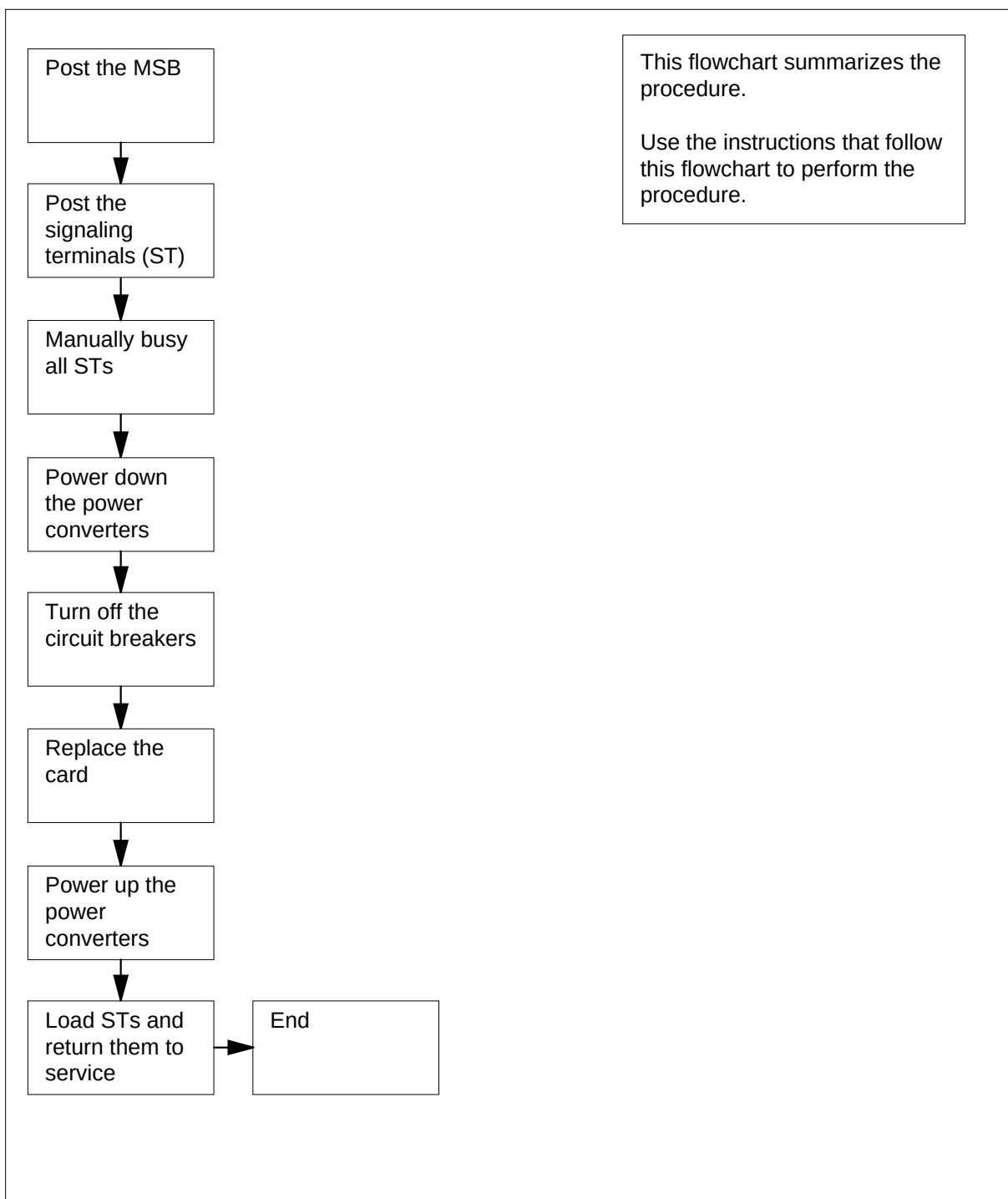
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT0X91 in an MS7E, ST7E, or ST6E (continued)

---

### Summary of replacing a NT0X91 in an MS7E, ST7E or ST6E





**NT0X91**  
**in an MS7E, ST7E, or ST6E** (continued)

**Replacing a NT0X91 in an MS7E, ST7E, or ST6E**

*At your current location*

**1**



**DANGER**

**Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.



**WARNING**

**Loss of service**

This procedure manually busies one or more signaling terminals (ST), which can cause service degradation. Perform this procedure during low traffic periods only.

The next action depends on the version of the NT0X91 you are replacing.

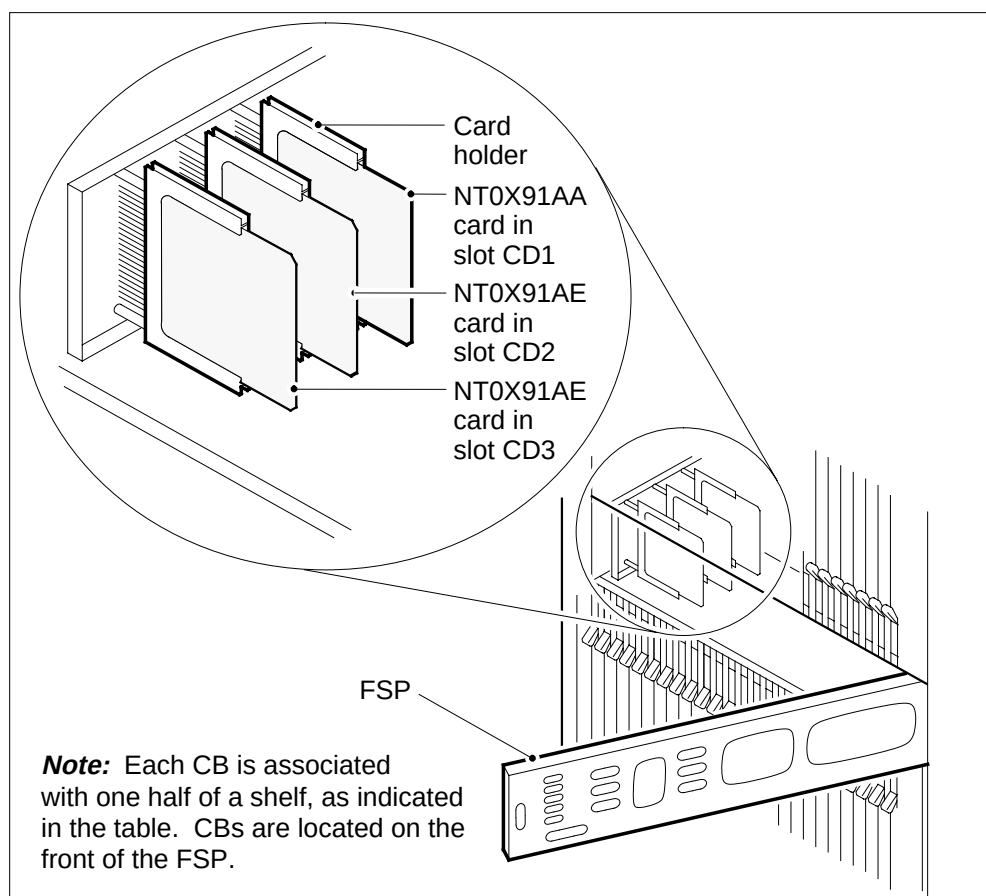
| <b>If the card you are replacing</b>        | <b>Do</b> |
|---------------------------------------------|-----------|
| is a NT0X91AA in an MS7E                    | step 41   |
| is a NT0X91AE in an MS7E                    | step 2    |
| is a NT0X91AA or NT0X91AE in a ST7E or ST6E | step 5    |

- 2** Obtain a replacement card. Make sure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
- 3** For the MS7E, record the FSP slot, frame circuit breakers (CB), shelves, CCS7 signaling terminal groups (ST7G), and power converter slots associated with the NT0X91 card you are replacing. Use the following table to obtain this information.
- Note:** The signaling terminal controller (STC) is called a signaling terminal controller module (STCM) for a CCS6 message switch and buffer (MSB6). The signaling terminal controller (STC) is called a CCS7 signaling terminal group (ST7G) for a CCS7 message switch and buffer

## NT0X91 in an MS7E, ST7E, or ST6E (continued)

(MSB7). In this procedure, the name STC refers to both ST7Gs and signaling-terminal controller modules (STCM).

| Card     | FSP Slot | CB  | Shelf and PM information      | PC slot |
|----------|----------|-----|-------------------------------|---------|
| NT0X91AE | CD2      | CB4 | shelf 51, ST7G 3 (right side) | 01      |
| NT0X91AE | CD2      | CB3 | shelf 18, ST7G 0 (right side) | 01      |
| NT0X91AE | CD3      | CB5 | shelf 32, ST7G 1 (left side)  | 01      |
| NT0X91AE | CD3      | CB1 | shelf 51, ST7G 2 (left side)  | 25      |



4 Go to step 7.

## NT0X91 in an MS7E, ST7E, or ST6E (continued)

- 5 Obtain a replacement card. Make sure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
- 6 For the ST6E and ST7E, record the FSP slot, frame circuit breakers (CB), shelves, signaling terminal controllers (STC), and power converter slots associated with the NT0X91 card you are replacing. Use the following table to obtain this information (see also the figure in step 3).

**Note:** The signaling terminal controller (STC) is called a signaling terminal controller module (STCM) for a CCS6 message switch and buffer (MSB6). The signaling terminal controller (STC) is called a CCS7 signaling terminal group (ST7G) for a CCS7 message switch and buffer (MSB7). In this procedure, the name STC refers to both ST7Gs and signaling terminal controller modules (STCM).

| Card     | FSP Slot | CB  | Shelf and PM information     | PC slot |
|----------|----------|-----|------------------------------|---------|
| NT0X91AA | CD1      | CB3 | shelf 18, STC 5 (right side) | 01      |
| NT0X91AA | CD1      | CB6 | shelf 18, STC 4 (left side)  | 25      |
| NT0X91AE | CD2      | CB2 | shelf 32, STC 7 (right side) | 01      |
| NT0X91AE | CD2      | CB1 | shelf 51, STC 9 (right side) | 01      |
| NT0X91AE | CD3      | CB5 | shelf 32, STC 6 (left side)  | 25      |
| NT0X91AE | CD3      | CB4 | shelf 51, STC 8 (left side)  | 25      |

### At the MAP terminal

- 7 To access the PM level of the MAP display, type

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM |      | 0    | 5    | 6    | 0    | 2    |

- 8 To post the MSB, type  
**>POST pm\_type pm\_no**  
and press the Enter key.

*where*

**pm\_type**  
is the PM type (MSB6, MSB7)

**NT0X91****in an MS7E, ST7E, or ST6E** (continued)**pm\_no**

is the PM number (0 to 999)

*Example of a MAP display:*

|      |  |      |      |      |      |      |      |
|------|--|------|------|------|------|------|------|
|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   |  | 0    | 5    | 6    | 0    | 2    | 41   |
| MSB7 |  | 0    | 0    | 1    | 0    | 0    | 1    |

MSB7 0 InSv Links\_00S: CSide 0 , PSide 0  
Unit0: Inact InSv  
Unit1: Act InSv

**9** To access the STC level of the MAP display, type**>STC**

and press the Enter key.

*Example of a MAP display:*

|      |  |      |      |      |      |      |      |
|------|--|------|------|------|------|------|------|
|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   |  | 0    | 5    | 6    | 0    | 2    | 41   |
| MSB7 |  | 0    | 0    | 1    | 0    | 0    | 1    |

MSB7 0 InSv Links\_00S: CSide 0 , PSide 0  
Unit0: Inact InSv  
Unit1: Act InSv

STC 0 0 0 0 0

STC STCM Ctrl

**10** To post one of the STCs that you recorded in previous steps, type**>POST stc\_type stcm\_no**

and press the Enter key.

*where***stc\_type**

is the STC type (STCM, ST7G)

**stcm\_no**

is the STC number (0 to 9)

*Example of a MAP display:*

**NT0X91**  
**in an MS7E, ST7E, or ST6E (continued)**

|      |  |  |      |      |      |      |      |      |
|------|--|--|------|------|------|------|------|------|
|      |  |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   |  |  | 0    | 5    | 6    | 0    | 2    | 41   |
| MSB7 |  |  | 0    | 0    | 1    | 0    | 0    | 1    |

MSB7 0 InSv Links\_00S: CSide 0 , PSide 0  
Unit0: Inact InSv  
Unit1: Act InSv

|     |  |  |   |   |   |   |   |  |
|-----|--|--|---|---|---|---|---|--|
| STC |  |  | 0 | 0 | 0 | 0 | 0 |  |
|-----|--|--|---|---|---|---|---|--|

STC 100 STCM 0 Ctrl 0 Bd InSv

**11** To manually busy the signaling terminals (ST), type  
**>BSY ALL**  
and press the Enter key.  
*Example of a MAP response:*

STC 301  
STC 302  
STC 303  
STC 304  
This will busy the above STC(S)  
Please confirm ("YES", "Y", "NO", or "N"):

**12** To confirm the command, type  
**>YES**  
and press the Enter key.

| If you                           | Do      |
|----------------------------------|---------|
| set STs in both STCMs to busy    | step 14 |
| set STs in only one STCM to busy | step 13 |

**13** Repeat steps 10 to 12 for the other STC.

## NT0X91 in an MS7E, ST7E, or ST6E (continued)

*At the frame*

14



### WARNING

#### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To power down the power converter for the first STC, pull and set the POWER switch handle down to the OFF position.

15 Repeat step 14 for the power converter for the second STC associated with the card you are replacing.

16 Turn off the CBs for the power converters associated with the card you are replacing.

17 Unscrew the slotted nut on the left-hand side of the FSP.

18 Open the FSP.

19



### WARNING

#### Loss of service

Make sure that the alarm and control card you remove controls the shelves with the STs that you set to manually busy. Removal of the wrong card causes a loss of service.

Remove the NT0X91 card from the CD slot in the FSP.

20 Place the removed card in an electrostatic discharge (ESD) protective container.

21 Make sure that the replacement card has the same PEC, including suffix, as the removed card.

22 Insert the replacement card.

23 Close the FSP.

24 Tighten the slotted nut on the FSP.

25 The next action depends on the power converter version and the type of supervisory panel.

**If the power converter**

**Do**

is an NT2X70AE card and the FSP has circuit breakers      step 26

## NT0X91

### in an MS7E, ST7E, or ST6E (continued)

|           | <b>If the power converter</b>                                                                                          | <b>Do</b> |
|-----------|------------------------------------------------------------------------------------------------------------------------|-----------|
|           | is an NT2X70AE card and the FSP does not have circuit breakers                                                         | step 27   |
|           | is not an NT2X70AE card and the FSP has circuit breakers                                                               | step 28   |
|           | is not an NT2X70AE card and the FSP does not have circuit breakers                                                     | step 29   |
| <b>26</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the RESET position and hold.                                       |           |
|           | <b>b</b> Pull and set the converter circuit breaker handle on the FSP up until it clicks into place.                   |           |
|           | <b>c</b> Release the POWER switch handle.<br>Go to step 30.                                                            |           |
| <b>27</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the RESET position and hold until the CONVERTER FAIL LED goes off. |           |
|           | <b>b</b> Release the handle.<br>Go to step 30.                                                                         |           |
| <b>28</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the ON position.                                                   |           |
|           | <b>b</b> Press and hold the RESET button on the power converter.                                                       |           |
|           | <b>c</b> Pull and set the converter circuit breaker handle on the FSP up until it clicks into place.                   |           |
|           | <b>d</b> Release the RESET button.<br>Go to step 30.                                                                   |           |
| <b>29</b> | Power up the converter.                                                                                                |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the ON position.                                                   |           |
|           | <b>b</b> Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.                 |           |
|           | <b>c</b> Release the RESET button.                                                                                     |           |

## NT0X91

### in an MS7E, ST7E, or ST6E (continued)

---

#### *At the MAP terminal*

- 30** To load the STs, type  
**>LOADPM ALL**  
and press the Enter key.

*where*

**unit\_no**  
is the PM unit number (0 or 1)

*Example #1 of a MAP response:*

```
STC 301 load Passed : M7CQA01
STC 302 load Passed : M7CQA01
STC 303 load Passed : M7CQA01
STC 304 load Passed : M7CQA01
```

*Example #2 of a MAP response:*

STC load 'M7QA01' not in MSB7 0

---

| If the LOADPM command                                      | Do      |
|------------------------------------------------------------|---------|
| passed                                                     | step 36 |
| failed, with the message STC Load loadname not in msb_unit | step 31 |
| failed, with a message other than listed here              | step 33 |

---

**Note:** As shown above in *Example #2 of a MAP response*;, Loadname is the name of the ST load; msb\_unit is the MSB (MSB6, MSB7) and the unit number.

- 31** To return to the PM level of the MAP display, type  
**>QUIT**  
and press the Enter key.

- 32** To add the load to the MSB, type  
**>STCLOAD PM ADD loadname**  
and press the Enter key.  
*where*



## NT0X91

### in an MS7E, ST7E, or ST6E (continued)

**loadname**  
is the STC load name

|           | <b>If the STCLOAD command</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Do</b> |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | step 33   |
|           | passed                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | step 34   |
| <b>33</b> | To load the PM unit, use the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.                                                                                                                                                                                                                                                                                                                                                 |           |
| <b>34</b> | To access the STC level of the MAP display, type<br><b>&gt;STC</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                                                                                                |           |
| <b>35</b> | To post the STC, type<br><b>&gt;POST stcm_no</b><br>and press the Enter key.<br><i>where</i><br><b>stcm_no</b><br>is the STCM number (0 to 9)<br>Go to step 30.                                                                                                                                                                                                                                                                                                               |           |
| <b>36</b> | To return the STs to service, type<br><b>&gt;RTS ALL</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br>STC 301 Out-of-service test initiated<br>STC 301 Tst Passed<br>STC 301 Rts Passed<br>STC 302 Out-of-service test initiated<br>STC 302 Tst Passed<br>STC 302 Rts Passed<br>STC 303 Out-of-service test initiated<br>STC 303 Tst Passed<br>STC 303 Rts Passed<br>STC 304 Out-of-service test initiated<br>STC 304 TsT Passed<br>STC 304 Rts Passed |           |
|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Do</b> |
|           | passed for all STs, and you have not worked on the other STC                                                                                                                                                                                                                                                                                                                                                                                                                  | step 37   |

**NT0X91****in an MS7E, ST7E, or ST6E (end)**

|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                              | <b>Do</b> |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed for all STs, and you have worked on the other STC                                                                                                                                                                                                                                                                               | step 39   |
|           | failed for any ST                                                                                                                                                                                                                                                                                                                      | step 42   |
| <b>37</b> | To post the other STC, type<br><b>&gt;POST stcm_no</b><br>and press the Enter key.<br><i>where</i><br><b>stcm_no</b><br>is the STC number (0 to 9)                                                                                                                                                                                     |           |
| <b>38</b> | Repeat steps 30 to 36 for the other STC. When you have loaded and returned to service all STs, go to step 39.                                                                                                                                                                                                                          |           |
| <b>39</b> | The next action depends on your reason for performing this procedure.                                                                                                                                                                                                                                                                  |           |
|           | <b>If</b>                                                                                                                                                                                                                                                                                                                              | <b>Do</b> |
|           | a maintenance procedure directed you to this procedure                                                                                                                                                                                                                                                                                 | step 40   |
|           | a maintenance procedure did not direct you to this procedure                                                                                                                                                                                                                                                                           | step 43   |
| <b>40</b> | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                                                                                                                                                                                                                          |           |
| <b>41</b> | For additional help with changing the NT0X91AA in the MS7E, contact the next level of support.<br><br><b>Note:</b> To change the NT0X91AA, you must install a test strap to maintain power on the in-service PM unit. Use of a test strap in this event is advanced maintenance and qualified personnel must perform the installation. |           |
| <b>42</b> | For additional help, contact the next level of support.                                                                                                                                                                                                                                                                                |           |
| <b>43</b> | The procedure is complete.                                                                                                                                                                                                                                                                                                             |           |

## NT0X91 in a network equipment frame

---

### Application

Use this procedure to replace an NT0X91 in the shelves or frames listed in the following table.

| PEC    | Suffix | Card name                 | Shelf or frame name                                                                                         |
|--------|--------|---------------------------|-------------------------------------------------------------------------------------------------------------|
| NT0X91 | AA     | Drive and alarm card      | NT0X48 single-bay network (NET), NT5X13 combined single-bay network (NETC), NT8X11 dual shelf network (DSN) |
| NT0X91 | AE     | Drive and protection card | NET, NETC, DSN                                                                                              |

If you cannot identify the product engineering code (PEC), PEC suffix, or shelf or frame for the card to replace, refer to the Index. The Index provides a list of the cards, shelves, and frames in this card replacement book.

### Common procedures

There are no common procedures.

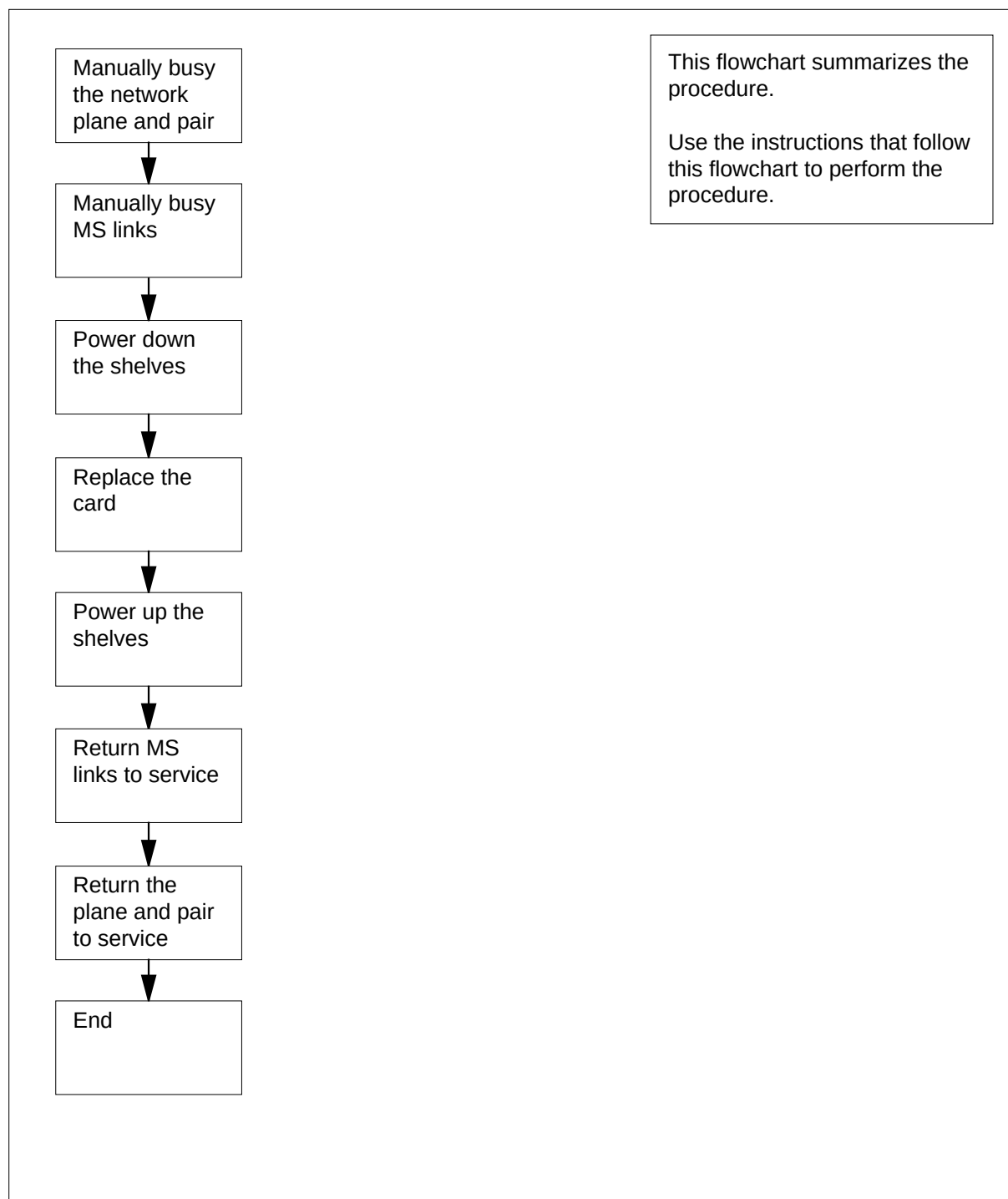
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT0X91 in a network equipment frame (continued)

---

### Summary of replacing a NT0X91 in a network equipment frame



**NT0X91**

**in a network equipment frame** (continued)

**Replacing a NT0X91 in a network equipment frame**

***At the frame***

**1**



**DANGER**  
**Risk of electrocution**  
Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Remove all jewelry before you replace a card in the FSP. Make sure you do not touch any terminal inside the FSP.



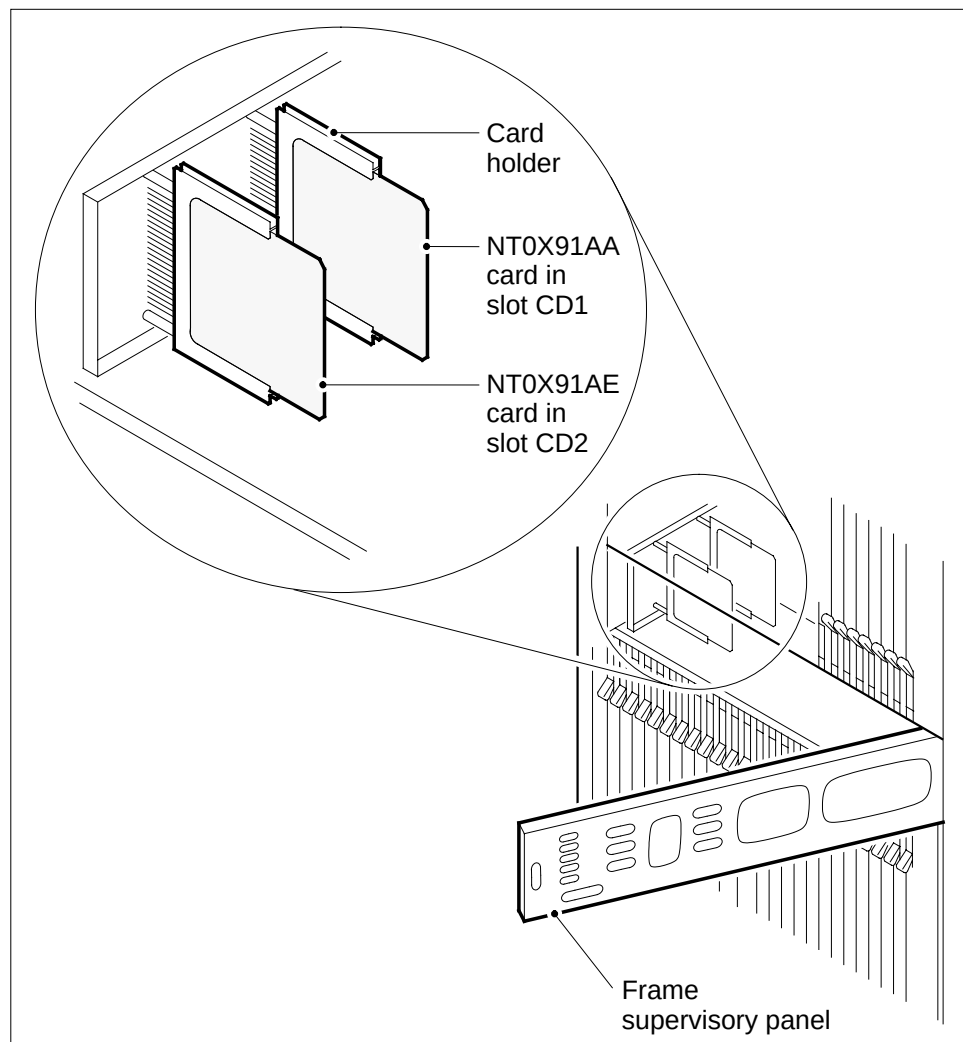
**WARNING**  
**Loss of service**  
Before you perform this procedure, notify all far-end offices with common channel signaling of a possible temporary alarm. The out-of-service test used in this procedure can cause a temporary alarm in far-end offices.



**WARNING**  
**Loss of service**  
This procedure includes directions to manually busy one plane of a network pair, resulting in loss of network redundancy. Perform this procedure to restore out-of-service components as required. Unless it is urgent, carry out this procedure during periods of low traffic.

- Obtain a replacement card. Make sure the replacement card and the card you replace have the same PEC and PEC suffix.
- 2** Use the following table to identify the slot that contains the alarm and control card that you replace:

## NT0X91 in a network equipment frame (continued)



| If Alarm and control card | Do Slot |
|---------------------------|---------|
| is NT0X91AA               | CD1     |
| is NT0X91AE               | CD2     |

## NT0X91

### in a network equipment frame (continued)

- 3** Record information on FSP fuses, FSP circuit breakers (CB), and network shelf positions associated with the card you replace. Use the following table to obtain this information.

(Sheet 1 of 2)

| Network frame | FSP card | FSP card position | FSP fuses or CBs | Shelf position | Shelf function |
|---------------|----------|-------------------|------------------|----------------|----------------|
| NET (fuses)   | NT0X91AA | CD1               | F04              | 18             | I/F            |
|               |          |                   | F02              | 51             | I/F            |
|               | NT0X91AE | CD2               | F03              | 32             | XPT            |
|               |          |                   | F01              | 65             | XPT            |
| NET (CBs)     | NT0X91AA | CD1               | CB4              | 18             | I/F            |
|               |          |                   | CB2              | 51             | I/F            |
|               | NT0X91AE | CD2               | CB3              | 32             | XPT            |
|               |          |                   | CB1              | 65             | XPT            |
| NETC          | NT0X91AA | CD1               | CB2              | 51             | XPT            |
|               |          |                   | CB1              | 65             | I/F            |
|               | NT0X91AE | CD2               | CB5              | 18             | I/F            |
|               |          |                   | CB4              | 32             | XPT            |
| DSN           | NT0X91AA | CD1               | CB1              | 65             | NM             |
|               |          |                   | CB2              | 51             | NM             |

**Note 1:** NET = NT0X48; NETC = NT5X13; DSN = NT8X11

**Note 2:** Some NT0X48 frames can have FSPs with fuses only.

**Note 3:** All NET shelves associate with a specific pair for a specified plane. NETC shelves 51 and 65 comprise the pair for plane 0, and shelves 18 and 32 comprise the pair for plane 1. DSN shelves 51 and 65 are each a pair associated with plane 0, and shelves 18 and 32 are each a pair that associate with plane 1.

**Note 4:** I/F = interface, XPT = crosspoint; NM = network module (combined I/F and XPT)

## NT0X91

### in a network equipment frame (continued)

(Sheet 2 of 2)

| Network frame                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FSP card | FSP card position | FSP fuses or CBs | Shelf position | Shelf function |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|------------------|----------------|----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NT0X91AE | CD2               | CB5              | 32             | NM             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                   | CB4              | 18             | NM             |
| <p><b>Note 1:</b> NET = NT0X48; NETC = NT5X13; DSN = NT8X11</p> <p><b>Note 2:</b> Some NT0X48 frames can have FSPs with fuses only.</p> <p><b>Note 3:</b> All NET shelves associate with a specific pair for a specified plane. NETC shelves 51 and 65 comprise the pair for plane 0, and shelves 18 and 32 comprise the pair for plane 1. DSN shelves 51 and 65 are each a pair associated with plane 0, and shelves 18 and 32 are each a pair that associate with plane 1.</p> <p><b>Note 4:</b> I/F = interface, XPT = crosspoint; NM = network module (combined I/F and XPT)</p> |          |                   |                  |                |                |

**At the MAP terminal**

- 4 To access the NET level of the MAP display, type

**>MAPCI;MTC;NET**

and press the Enter key.

*Example of a MAP display:*

```

Net 11111 11111 22222 22222 33
Plane 01234 56789 01234 56789 01234 56789 01
 0 S...
 1
JNET:
```

- 5 The next action depends on your knowledge about the network plane and pair associated with the card you replace.

**If you****Do**

know the network plane and pair associated with the card to replace

step 10

do not know the network plane and pair associated with the card to replace

step 6

- 6 Select a network plane and pair.

- 7 To display the frame and shelf location, type

**>LOC plane\_no pair\_no**



## NT0X91

### in a network equipment frame (continued)

and press the Enter key.

where

**plane\_no**

is the network plane number (0 to 1)

**pair\_no**

is the network plane pair number (0 to 31)

*Example of a MAP response:*

| Site | Flr | RPos | Bay_id  | Shf | Description | Slot | EqPEC |
|------|-----|------|---------|-----|-------------|------|-------|
| HOST | 01  | B09  | NET0 00 |     | NM 0-00     |      | 5X13  |

**Note:** The frame location appears under the Flr and RPos headers on the MAP display. For the NT8X11 DSN, the shelf location appears under the Shf header. The network plane and pair appear under the Bay\_id header.

- 8** Correlate the location displayed with the known frame location of FSP card you will replace.

| If the network module                           | Do      |
|-------------------------------------------------|---------|
| corresponds to the FSP card you replace         | step 10 |
| does not correspond to the FSP card you replace | step 9  |

- 9** Repeat step 6 for another network plane and pair. Identify a network plane and pair associated with the card you replace. Go to step 10.

- 10** To manually busy the plane and network module associated with the alarm and control card to replace, type

**>BSY plane\_no pair\_no**

and press the Enter key.

where

**plane\_no**

is the network plane number (0 to 1)

**pair\_no**

is the network plane pair number (0 to 31)

*Example of a MAP response:*

```
bsy 0 0
OK
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 11 |

# NT0X91

## in a network equipment frame (continued)

|    | If the BSY command                                                                                                                                                                                                                                                                                                                                                           | Do      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | needs confirmation                                                                                                                                                                                                                                                                                                                                                           | step 39 |
|    | failed                                                                                                                                                                                                                                                                                                                                                                       | step 40 |
| 11 | Wait 30 min to make sure that calls in progress finish.<br><b>Note:</b> If you replace a card that failed, you do not need the waiting period. Calls do not process on that network plane and pair.                                                                                                                                                                          |         |
| 12 | To obtain information on the link to the message switch (MS), type<br><b>&gt;TRNSL plane_no pair_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the number of the network plane (0 to 1)<br><b>pair_no</b><br>is the number of the network plane pair (0 to 31)<br><i>Example of a MAP response:</i><br><br>NM 0-0 = MS 0 and 1, Card 22 Port 1 |         |
| 13 | Record the slot position and the port number of the MS port card that connects to the network plane and pair. In the example MAP response in step 12, the slot position is 22 and the port number is 1.                                                                                                                                                                      |         |
| 14 | To access the MS;SHELF level of the MAP display, type<br><b>&gt;MS;SHELF</b><br>and press the Enter key.<br><i>Example of a MAP display:</i>                                                                                                                                                                                                                                 |         |
|    | <pre> Message Switch      Clock      Shelf  0      Inter-MS Link 0 1 MS 0                M Free      F MS 1                S Slave      C  Shelf 0 Card 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 2 2 2 2 2 2 2 Chain MS 0      . . I . . - - - - - - - - - - . . . . . F . MS 1      C C C C C - - - - - - - - - - C C C C C C C C C </pre>                               |         |
| 15 | To post the card in the slot that you recorded in step 13, type<br><b>&gt;CARD slot_no</b><br>and press the Enter key.<br><i>where</i>                                                                                                                                                                                                                                       |         |

## NT0X91

### in a network equipment frame (continued)

**slot\_no**

is the number of the card slot that you recorded in step 13

*Example of a MAP display:*

```

 Message Switch Clock Shelf 0 Inter-MS Link 0 1
MS 0 . M Free F
MS 1 S Slave C
Shelf 0 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2
Card 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Chain
MS 0 . . I . . - - - - - - - - - F .
MS 1 - - - - - - - - -

Card 22 Protocol Port 0____3
MS 0 . DS30 4 . P . . .
MS 1 . DS30 4 . P . . .

```

- 16** To manually busy the port on MS 0 that connects to the network plane and pair, type

**>BSY 0 PORT port\_no**

and press the Enter key.

*where*

**port\_no**

is the port number that you recorded in step 13

*Example of a MAP response:*

```

Request to MAN BUSY MS: 0 shelf: 0 card:22 port: 1 submitted.
Request to MAN BUSY MS: 0 shelf: 0 card:22 port: 1 passed.

```

- 17** To manually busy the port on MS1 that connects to the network plane and pair, type

**>BSY 1 PORT port\_no**

and press the Enter key.

*where*

**port\_no**

is the port number that you recorded in step 13

## NT0X91 in a network equipment frame (continued)

---

### *At the frame*

18



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Power down the shelves associated with the FSP card you replace.

- a Choose a shelf.
- b Pull down and set the handle of the POWER switch on the power converter to the OFF position.
- c Repeat steps 18a.a and 18b.b for each power converter on the shelf.
- d Repeat steps 18a.a to 18c.c for each shelf associated with the FSP card that you replace.

19 Unscrew the slotted nut on the left of the FSP.

20 Open the FSP.

21



#### **WARNING**

##### **Loss of service**

Make sure that the alarm and control card that you remove controls the network modules that you manually busied. Removal of the wrong card causes a loss of service.

Remove the NT0X91 card from the correct slot.

22 Insert the replacement card.

23 Close the FSP.

24 Tighten the slotted nut on the FSP.

25 The next action depends on the type of power converter in the affected shelves and the type of supervisory panel.

---

| If the shelf                     | Do      |
|----------------------------------|---------|
| has an NT2X70AE card and the FSP | step 26 |
| has circuit breakers             |         |

---

## NT0X91

### in a network equipment frame (continued)

|           | <b>If the shelf</b>                                                                                                   | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------|-----------|
|           | has an NT2X70AE card and the FSP does not have circuit breakers                                                       | step 27   |
|           | does not have an NT2X70AE card and the FSP has circuit breakers                                                       | step 28   |
|           | does not have an NT2X70AE card and the FSP does not have circuit breakers                                             | step 29   |
| <b>26</b> | Power up the converter as follows:                                                                                    |           |
|           | <b>a</b> Pull up and set the handle of the POWER switch to the RESET position and hold.                               |           |
|           | <b>b</b> Pull up and set the handle of the converter circuit breaker on the FSP until the handle clicks into place.   |           |
|           | <b>c</b> Release the handle of the POWER switch.<br>Go to step 30.                                                    |           |
| <b>27</b> | Power up the converter as follows:                                                                                    |           |
|           | <b>a</b> Pull up and set the handle of the POWER switch to the RESET position until the CONVERTER FAIL LED turns off. |           |
|           | <b>b</b> Release the handle.<br>Go to step 30.                                                                        |           |
| <b>28</b> | Power up the converter as follows:                                                                                    |           |
|           | <b>a</b> Pull up and set the handle of the POWER switch to the ON position.                                           |           |
|           | <b>b</b> Press and hold the RESET button on the power converter.                                                      |           |
|           | <b>c</b> Pull up and set the handle of the converter circuit breaker on the FSP until the handle clicks into place.   |           |
|           | <b>d</b> Release the RESET button.<br>Go to step 30.                                                                  |           |
| <b>29</b> | Power up the converter as follows:                                                                                    |           |
|           | <b>a</b> Pull up and set the handle of the POWER switch to the ON position.                                           |           |
|           | <b>b</b> Press and hold the RESET button on the power converter until the CONVERTER FAIL LED turns off.               |           |
|           | <b>c</b> Release the RESET button.                                                                                    |           |
| <b>30</b> | The next action depends on the power converter configuration for the shelf.                                           |           |
|           | <b>If the shelf</b>                                                                                                   | <b>Do</b> |
|           | has one power converter                                                                                               | step 32   |

## NT0X91

### in a network equipment frame (continued)

|                            | If the shelf                                                                                                                                                                                                                                                                                                                                                                                           | Do      |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                            | has two power converters, and you powered up both converters                                                                                                                                                                                                                                                                                                                                           | step 32 |
|                            | has two power converters, you powered up only one converter, and the mate converter is an NT2X06 or an NT2X07                                                                                                                                                                                                                                                                                          | step 31 |
| 31                         | Repeat step 25 for the second power converter on the shelf. Go to step 32.                                                                                                                                                                                                                                                                                                                             |         |
| 32                         | Repeat steps 25 to 31 for the other shelf associated with the FSP card you replace. Go to step 33.                                                                                                                                                                                                                                                                                                     |         |
| <b>At the MAP terminal</b> |                                                                                                                                                                                                                                                                                                                                                                                                        |         |
| 33                         | To return to service the port on MS0 that connects to the network plane and pair, type<br><b>&gt;RTS 0 PORT port_no</b><br>and press the Enter key.<br><i>where</i><br><b>port_no</b><br>is the port number that you recorded in step 13<br><i>Example of a MAP response:</i><br><br>Request to RTS MS: 0 shelf: 0 card:22 port: 1 submitted.<br>Request to RTS MS: 0 shelf: 0 card:22 port: 1 passed. |         |
| 34                         | To return to service the port on MS1 that connects to the network plane and pair in use, type<br><b>&gt;RTS 1 PORT port_no</b><br>and press the Enter key.<br><i>where</i><br><b>port_no</b><br>is the port number that you recorded in step 13                                                                                                                                                        |         |
| 35                         | To access the NET level of the MAP display, type<br><b>&gt;NET</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                         |         |
| 36                         | To return the network module to service, type<br><b>&gt;RTS plane_no pair_no</b><br>and press the Enter key.<br><i>where</i>                                                                                                                                                                                                                                                                           |         |

## NT0X91

### in a network equipment frame (end)

---

**plane\_no**

is the number of the network plane (0 to 1)

**pair\_no**

is the number of the network plane pair (0 to 31)

*Example of a MAP response:*

```

rts 0 0
Request submitted. Reply expected within 3 mins.
Test Passed
OK

```

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 37 |
| failed             | step 40 |

---

- 37** The next action depends on the reason that you perform this procedure.

---

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 38 |
| did not direct you to this procedure | step 41 |

---

- 38** Return to the maintenance procedure that directed you to this procedure and continue as directed.

- 39** To determine if you can manually busy the network plane and pair, contact operating company personnel or the next level of support. Continue as directed.

- 40** For additional help, contact the next level of support.

- 41** The procedure is complete.

## NT0X91 in a trunk module equipment frame

---

### Application

Use this procedure to replace an NT0X91 in a trunk module equipment (TME) frame, as listed in the following table.

| PEC    | Suffix | Card name                 | Shelf or frame name                                                                                                                                          |
|--------|--------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NT0X91 | AA, AB | Drive and alarm card      | TME equipped with integrated service module (ISM), maintenance trunk module (MTM), office alarm unit (OAU), service trunk module (STM), or trunk module (TM) |
| NT0X91 | AD     | Drive and protection card | TME equipped with ISM, MTM, OAU, STM, or TM                                                                                                                  |

If you cannot identify the product engineering code (PEC), PEC suffix, or shelf or frame for the card to replace, refer to the Index. The Index provides a list of cards, shelves, and frames in this card replacement book.

**Note:** This procedure does not cover card replacement for DCE frames equipped with digital carrier modules (DCM). A separate procedure covers FSP card replacement for digital carrier equipment (DCE) frames.

### Common procedures

This procedure refers to *Loading a PM*.

Do not go to the common procedure unless the step-action procedure directs you.

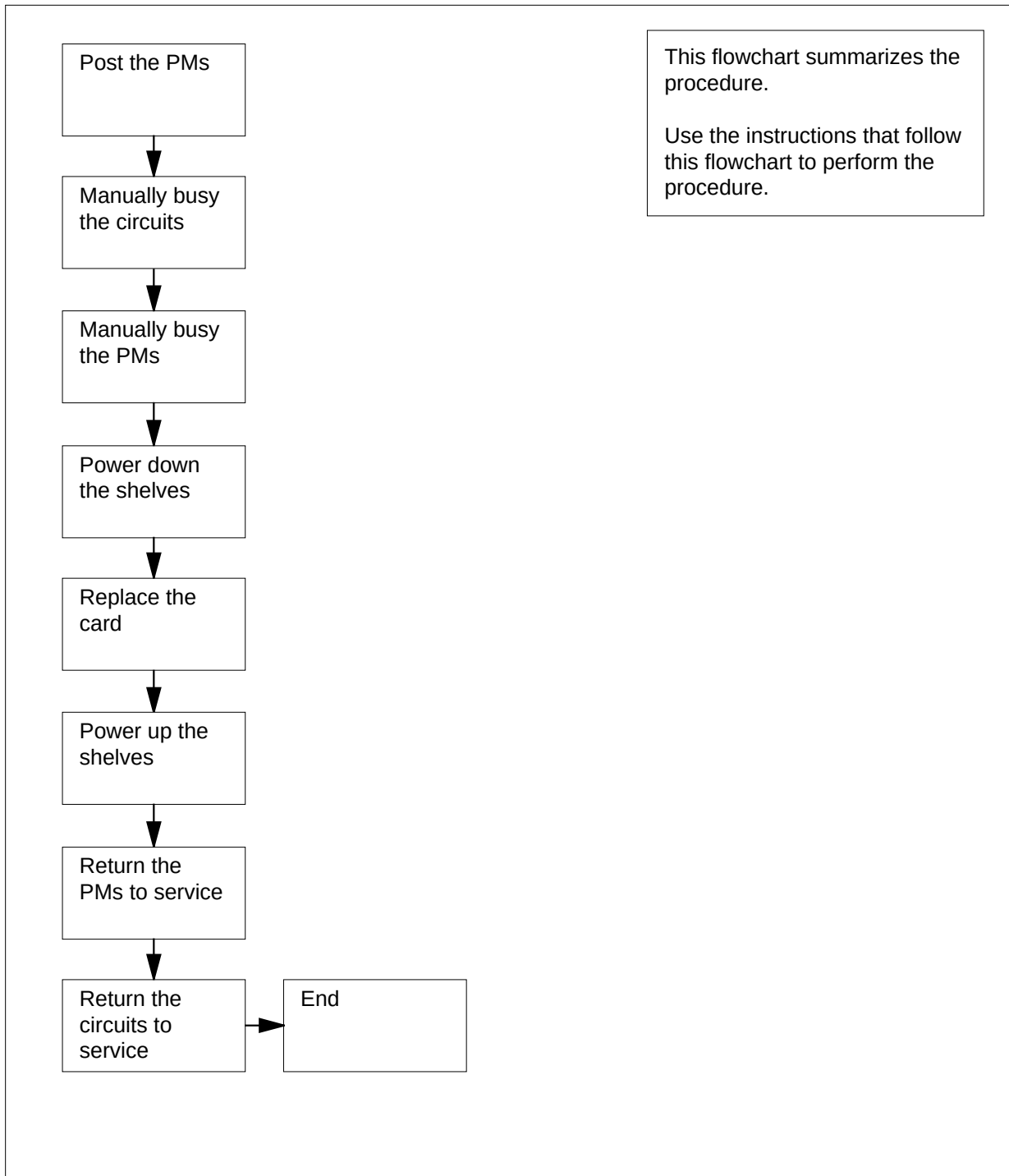
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.



## NT0X91 in a trunk module equipment frame (continued)

### Summary of replacing a NT0X91 in a trunk module equipment frame



## NT0X91 in a trunk module equipment frame (continued)

---

### Replacing a NT0X91 in a trunk module equipment frame

#### *At the frame*

1



#### **DANGER**

##### **Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure you remove all jewelry before you replace a card in the FSP. Do not touch any terminal in the FSP.



#### **WARNING**

##### **Loss of service**

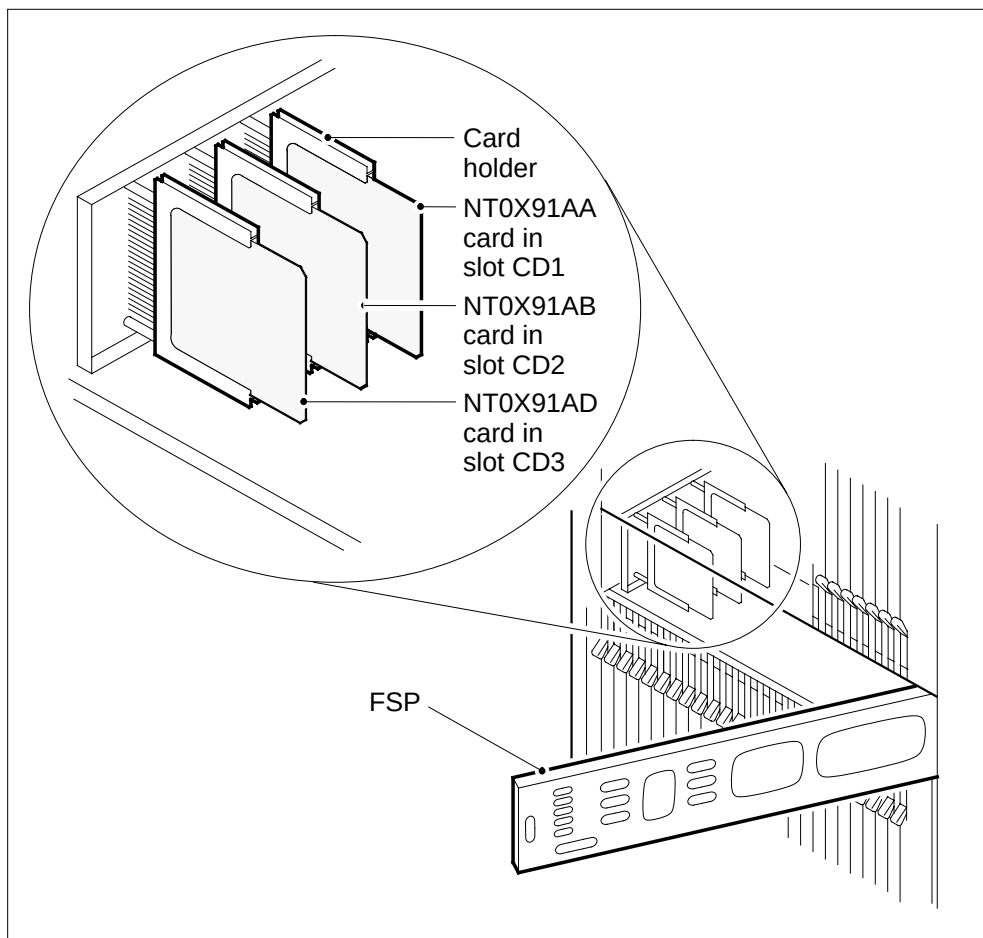
This procedure removes an ISM, MTM, STM, or TM from service, which can cause service degradation. Perform this procedure only if you must restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic. Do not perform this procedure if essential services use PM resources.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

2

Use the following table to identify the slot that contains the alarm and control card to replace:

## NT0X91 in a trunk module equipment frame (continued)



| If Alarm and control card | Do Slot |
|---------------------------|---------|
| NT0X91AA                  | CD1     |
| NT0X91AB                  | CD2     |
| NT0X91AD                  | CD3     |

## NT0X91

### in a trunk module equipment frame (continued)

- 3 Record information on FSP fuses, FSP circuit breakers (CB), and network shelf positions associated with the card you replace. Use the following table to obtain this information.

| FSP card                                                                                                                                                                                                                                                                                                              | FSP card position | FSP circuit breakers | Shelf position |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|----------------|
| NT0X91AA                                                                                                                                                                                                                                                                                                              | CD1               | CB5                  | 04             |
| NT0X91AB                                                                                                                                                                                                                                                                                                              | CD2               | CB3                  | 32             |
|                                                                                                                                                                                                                                                                                                                       |                   | CB1                  | 65             |
| NT0X91AD                                                                                                                                                                                                                                                                                                              | CD3               | CB4                  | 18             |
|                                                                                                                                                                                                                                                                                                                       |                   | CB2                  | 51             |
| <p><b>Note 1:</b> A minimum of one shelf can be unequipped.</p> <p><b>Note 2:</b> If the TME is equipped with the OAU, shelf positions 51 and 65 are used for the magnetic tape drive. Only shelf positions 04, 18, and 32 can be equipped with PMs. In this event, only one shelf associates with each FSP card.</p> |                   |                      |                |

- 4 Select a shelf associated with the FSP card you replace.

#### At the MAP terminal

- 5 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |           |      |           |      |      |             |
|----|-----------|------|-----------|------|------|-------------|
| PM | SysB<br>1 | ManB | OffL<br>6 | CBsy | ISTb | InSv<br>102 |
|----|-----------|------|-----------|------|------|-------------|

- 6 The next step depends on the type of PM that is in the shelf.

#### If the PM

#### Do

is an OAU

step 7

is an ISM, MTM, STM, or TM

step 11

- 7 To post the OAU, type

**>POST OAU pm\_no**

and press the Enter key.

*where*

## NT0X91

### in a trunk module equipment frame (continued)

**pm\_no**

is the number of the PM (0 to 9999)

*Example of a MAP display:*

|      | SysB | ManB | OffL | CBsy | ISTb | InSv |
|------|------|------|------|------|------|------|
| PM   | 1    | 0    | 6    | 0    | 0    | 102  |
| 0AU  | 1    | 0    | 0    | 0    | 0    |      |
| 00AU | 0    | SysB |      |      |      |      |

- 8** Determine the state of the PM.

**Note:** The PM state appears on the right of the PM number. In the example display in step 7, the PM state is system busy (SysB).

| If the PM                 | Do      |
|---------------------------|---------|
| is OffL                   | step 89 |
| is ManB                   | step 36 |
| is other than listed here | step 9  |

- 9** A maintenance flag (Mtce) can appear. This flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status line before you proceed to the next step.

- 10** To manually busy the PM, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

|           | SysB | ManB | OffL | CBsy | ISTb |
|-----------|------|------|------|------|------|
| PM        | 58   | 1    | 6    | 14   | 12   |
| 0AU       | 0    | 1    | 0    | 0    | 0    |
| 00AU      | 0    | ManB |      |      |      |
| bsy       |      |      |      |      |      |
| 0AU 0 Bsy |      |      |      |      |      |
| OK.       |      |      |      |      |      |

Go to step 36.

- 11** Verify from office records or operating company personnel that necessary services do not use the PM resources that this procedure affects.

**Note:** When you verify resources, include all PMs associated with the shelf. For all service and trunk modules, include NT1X80 cards and NT1X81 cards (single-card PMs) on the shelf. You must remove these single-card PMs from service to complete this procedure. If the shelf has an STM, check for necessary services on the STM on the other half of the

**NT0X91****in a trunk module equipment frame** (continued)

shelf. You must remove both STMs from service to complete this procedure.

| If necessary services                                  | Do      |
|--------------------------------------------------------|---------|
| use PM resources and a minimum of one PM is in service | step 88 |
| use PM resources and all PMs are out of service        | step 12 |
| do not use PM resources                                | step 12 |

- 12** To post the PM, type  
**>POST pm\_type pm\_no**  
 and press the Enter key.

where

**pm\_type**  
 is the type of PM (ISM, MTM, STM, TM)

**pm\_no**  
 is the number of the PM (0 to 9999)

Example of a MAP display:

|     |   |      |      |      |      |      |      |
|-----|---|------|------|------|------|------|------|
|     |   | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  |   | 1    | 0    | 6    | 0    | 0    | 102  |
| MTM |   | 1    | 0    | 0    | 0    | 0    | 9    |
| MTM | 0 | SysB |      |      |      |      |      |

- 13** Determine the state of the PM.

**Note:** The PM state appears on the right of the PM number. In the example display in step 12, the PM state is system busy (SysB).

| If the PM                 | Do      |
|---------------------------|---------|
| is OffL                   | step 89 |
| is other than listed here | step 14 |

- 14** To access the TTP level of the MAP display, type  
**>MAPCI;MTC;TRKS;TTP**  
 and press the Enter key.

Example of a MAP display:

|           |        |          |                       |
|-----------|--------|----------|-----------------------|
| POST      | DELQ   | BUSYQ    | DIG                   |
| TTP 6-013 |        |          |                       |
| CKT TYPE  | PM NO. | COM LANG | STA S R DOT TE RESULT |

## NT0X91

### in a trunk module equipment frame (continued)

- 15** To post the circuits for the PM, type

**>POST P pm\_type pm\_no**

and press the Enter key.

where

**pm\_type**

is the type of PM (ISM, MTM, STM, TM)

**pm\_no**

is the number of the PM (0 to 9999)

*Example of a MAP display:*

```

POST 17 DELQ BUSYQ DIG
TTP 6-013
CKT TYPE PM NO. COM LANG STA S R DOT TE RESULT
CONF6 MTM 0 0 CF6P 0 IDL

post p MTM 0
LAST CKT = 17
SHORT CLLI IS: CF6P
OK,CKT POSTED

```

- 16** To manually busy all posted circuits, type

**>BSY ALL**

and press the Enter key.

*Example of a MAP display:*

```

POST 18 DELQ BUSYQ A 6 DIG
TTP 6-027
CKT TYPE PM NO. COM LANG STA S R DOT TE RESULT

BSYQ ALL IDLE

bsy all
OK,POST SET IS SET IN BSYQ

```

- 17** Wait until all circuits are manually busy (removed from the busy queue) before you proceed to the next step.

**Note:** The digit on the right of the BUSYQ header indicates the number of circuits in use. As a circuit becomes available, the circuit is manually busy and the number in the queue decreases by one. A blank field indicates that all circuits are manually busy.

- 18** Determine if the shelf has the NT1X80 enhanced-digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.

**If the shelf**

**Do**

has the NT1X80 or the NT1X81      step 19

**NT0X91****in a trunk module equipment frame** (continued)

|           | <b>If the shelf</b>                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Do</b> |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | does not have the NT1X80 or the NT1X81                                                                                                                                                                                                                                                                                                                                                                                         | step 23   |
| <b>19</b> | To post the circuits for the single-card PM, type<br><b>&gt;POST P pm_type pm_no</b><br>and press the Enter key.<br><i>where</i><br><b>pm_type</b><br>is the type of single card PM (CTM, DTM)<br><b>pm_no</b><br>is the number of the PM (0 to 9999)<br><b>Note:</b> The MAP display refers to the NT1X80 EDRAM card as a DTM. The MAP display refers to the NT1X81 conference card as a CTM. Both cards are single-card PMs. |           |
| <b>20</b> | To manually busy all posted circuits, type<br><b>&gt;BSY ALL</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                                                   |           |
| <b>21</b> | Wait until all circuits are manually busy (removed from the busy queue) before you proceed to the next step.                                                                                                                                                                                                                                                                                                                   |           |
| <b>22</b> | Repeat steps 19 to 21 for all NT1X80 and NT1X81 cards on the shelf.                                                                                                                                                                                                                                                                                                                                                            |           |
| <b>23</b> | To access the PM level of the MAP display, type<br><b>&gt;PM</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                                                   |           |
| <b>24</b> | To post the PM, type<br><b>&gt;POST pm_type pm_no</b><br>and press the Enter key.<br><i>where</i><br><b>pm_type</b><br>is the type of PM (ISM, MTM, STM, TM)<br><b>pm_no</b><br>is the number of the PM (0 to 9999)                                                                                                                                                                                                            |           |
| <b>25</b> | Determine the state of the PM.                                                                                                                                                                                                                                                                                                                                                                                                 |           |
|           | <b>If the PM</b>                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Do</b> |
|           | is ManB                                                                                                                                                                                                                                                                                                                                                                                                                        | step 27   |
|           | is other than listed here                                                                                                                                                                                                                                                                                                                                                                                                      | step 26   |



**NT0X91**

**in a trunk module equipment frame** (continued)

- 26** To manually busy the PM, type  
**>BSY**  
and press the Enter key.  
*Example of a MAP display:*

|     |  |      |      |      |      |      |      |
|-----|--|------|------|------|------|------|------|
|     |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
|     |  | 58   | 1    | 6    | 14   | 12   | 17   |
| PM  |  | 0    | 1    | 0    | 0    | 0    | 9    |
| MTM |  |      |      |      |      |      |      |

MTM 0 ManB  
bsy  
MTM 0 Bsy  
OK.

- 27** Determine if the shelf has the NT1X80 enhanced-digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.

| If the shelf                           | Do      |
|----------------------------------------|---------|
| has the NT1X80 or the NT1X81           | step 28 |
| does not have the NT1X80 or the NT1X81 | step 32 |

- 28** To post the single-card PM, type  
**>POST pm\_type pm\_no**  
and press the Enter key.  
*where*  
**pm\_type**  
is the type of single card PM (CTM, DTM)  
**pm\_no**  
is the number of the PM (0 to 9999)

- 29** Determine the state of the PM.

| If the PM                 | Do      |
|---------------------------|---------|
| is ManB                   | step 35 |
| is other than listed here | step 30 |

- 30** To manually busy the PM, type  
**>BSY**  
and press the Enter key.
- 31** Repeat steps 28 to 30 for all NT1X80 and NT1X81 cards on the shelf.

**NT0X91****in a trunk module equipment frame** (continued)

- 32** Determine if the shelf has a STM.

**If the shelf****Do**

has a STM, and only one STM is manually busy      step 33

has a STM, and both STMs are manually busy      step 34

has a STM      step 34

- 33**

**WARNING****Loss of service**

When you power down a STM, the mate power converter in the other STM on the shelf trips. It is recommended to manually busy and turn off both STMs on a shelf.

Repeat steps 12 to 32 for the STM in the other half of the shelf.

- 34** The next action depends on how many shelves equipped with PMs associate with the FSP card you replace.

**If****Do**

one shelf equipped with PMs associates with the card      step 36

two shelves equipped with PMs associate with the card, and you turned down functionality for only one shelf      step 35

two shelves equipped with PMs associate with the card, and you turned down functionality for both shelves      step 36

- 35** Repeat steps 4 to 34 for PMs in the other shelf associated with the FSP card you replace. Go to step 36.

**NT0X91**

**in a trunk module equipment frame** (continued)

*At the shelf*

36



**WARNING**

**Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding point is on a modular supervisory panel (MSP) or a frame supervisory panel (FSP). The wrist-strap protects the cards against static electricity damage.

Select a shelf to turn off.

**37** Pull and set the POWER switch handle on the power converter down to the OFF position.

**38** The next action depends on the type of PM in the shelf.

| If the shelf                      | Do      |
|-----------------------------------|---------|
| has an STM (with or without DRAM) | step 39 |
| has an MTM (with or without DRAM) | step 40 |
| has an ISM (with or without DRAM) | step 41 |
| is equipped as a TM               | step 41 |

**39** For the mate power converter in the STM on the other half of the shelf, set the POWER switch to the OFF position.

Go to step 41.

**40** For the other power converter on the shelf, pull and set the POWER switch handle to the OFF position.

**41** The next action depends on how many shelves equipped with PMs associate with the FSP card you replace.

| If                                                   | Do      |
|------------------------------------------------------|---------|
| one shelf equipped with PMs associates with the card | step 43 |

**NT0X91****in a trunk module equipment frame** (continued)

|           | <b>If</b>                                                                                                 | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------|-----------|
|           | two shelves equipped with PMs<br>associate with the card, and you<br>powered down only one shelf          | step 46   |
|           | two shelves equipped with PMs<br>associate with the card, and you<br>powered down both shelves            | step 43   |
| <b>42</b> | Repeat steps 37 to 41 for PMs in the other shelf associated with the FSP card you replace. Go to step 43. |           |
| <b>43</b> | Unscrew the slotted nut on the left-hand side of the FSP.                                                 |           |
| <b>44</b> | Open the FSP.                                                                                             |           |
| <b>45</b> | Remove the card.                                                                                          |           |
| <b>46</b> | Insert the replacement alarm and control card.                                                            |           |
| <b>47</b> | Close the FSP.                                                                                            |           |
| <b>48</b> | Tighten the slotted nut on the FSP.                                                                       |           |
| <b>49</b> | Select a shelf to power up.                                                                               |           |
| <b>50</b> | The next action depends on the type of power converter and the type of supervisory panel.                 |           |
|           | <b>If you</b>                                                                                             | <b>Do</b> |
|           | replace an NT2X70AE card and<br>the FSP or MSP has circuit<br>breakers                                    | step 51   |
|           | replace an NT2X70AE card and<br>the FSP or MSP does not have<br>circuit breakers                          | step 52   |
|           | are not replacing an NT2X70AE<br>card and the FSP or MSP has<br>circuit breakers                          | step 53   |
|           | do not replace an NT2X70AE<br>card and the FSP or MSP does<br>not have circuit breakers                   | step 54   |
| <b>51</b> | Power up the converter.                                                                                   |           |
|           | <b>a</b> Pull and set the POWER switch handle up to the RESET position and hold.                          |           |

## NT0X91

### in a trunk module equipment frame (continued)

- b** Pull and set the converter circuit breaker handle on the FSP or MSP up until the handle clicks into place.
  - c** Release the POWER switch handle.  
Go to step 55.
- 52** Power up the converter.
  - a** Pull and set the POWER switch handle up to the RESET position and hold until the CONVERTER FAIL LED goes off.
  - b** Release the handle.  
Go to step 55.
- 53** Power up the converter.
  - a** Pull and set the POWER switch handle up to the ON position.
  - b** Press and hold the RESET button on the power converter.
  - c** Pull the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.
  - d** Release the RESET button.  
Go to step 55.
- 54** Power up the converter.
  - a** Pull and set the POWER switch handle up to the ON position.
  - b** Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
  - c** Release the RESET button.
- 55** Determine the type of PM in the shelf, and if you powered up both power converters.

| If the shelf                                                                                 | Do      |
|----------------------------------------------------------------------------------------------|---------|
| has an STM or an MTM (with or without DRAM) and you already powered up both power converters | step 60 |
| has an STM (with or without DRAM)                                                            | step 56 |
| has an MTM (with or without DRAM)                                                            | step 57 |
| has an ISM (with or without DRAM)                                                            | step 60 |
| is equipped as a TM                                                                          | step 60 |

## NT0X91

### in a trunk module equipment frame (continued)

---

- 56 For the mate power converter in the STM on the other half of the shelf, repeat steps 50 to 55. Go to step 58.
- 57 For the other power converter on the shelf, repeat steps 50 to 55. Go to step 58.
- 58 The next action depends on how many shelves associate with the FSP card you replace.

---

| If                                                                                       | Do      |
|------------------------------------------------------------------------------------------|---------|
| one shelf equipped with PMs associates with the card                                     | step 60 |
| two shelves equipped with PMs associate with the card, and you powered up only one shelf | step 59 |
| two shelves equipped with PMs associate with the card, and you powered up both shelves   | step 60 |

---

- 59 Repeat steps 50 to 58 for PMs in the other shelf associated with the FSP card you replace. Go to step 60.

#### *At the MAP terminal*

- 60 To access the PM level of the MAP display, type  
**>PM**  
and press the Enter key.
- 61 The next step depends on the type of PM that is in the shelf.

---

| If the PM                  | Do      |
|----------------------------|---------|
| is an OAU                  | step 62 |
| is an ISM, MTM, STM, or TM | step 66 |

---

- 62 To post the OAU, type  
**>POST OAU pm\_no**  
and press the Enter key.  
*where*  
**pm\_no**  
is the number of the PM (0 to 9999)
- 63 To load the OAU, type  
**>LOADPM**  
and press the Enter key.

## NT0X91

### in a trunk module equipment frame (continued)

*Example of a MAP response:*

OAU 0 LoadPM Passed

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 65 |
| failed                | step 64 |

**64** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

**65** To return the PM to service, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

OAU 0 Rts Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 84 |
| failed             | step 91 |

**66** To post the PM, type

**>POST pm\_type pm\_no**

and press the Enter key.

where

**pm\_type**

is the type of PM (ISM, MTM, STM, TM)

**pm\_no**

is the number of the PM (0 to 9999)

**67** To load the PM, type

**>LOADPM**

and press the Enter key.

*Example of a MAP response:*

MTM 0 LoadPM Passed

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 69 |

**NT0X91****in a trunk module equipment frame** (continued)

|           | <b>If the LOADPM command</b>                                                                                                                                                                                                            | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                                                                                  | step 68   |
| <b>68</b> | To load the PM, perform the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.                                                                                                            |           |
| <b>69</b> | To return the PM to service, type<br><b>&gt;RTS</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>MTM 0 Rts Passed                                                                                            |           |
|           | <b>If the RTS command</b>                                                                                                                                                                                                               | <b>Do</b> |
|           | passed, and the PM is InSv                                                                                                                                                                                                              | step 71   |
|           | passed, and the PM is ISTb with a card list generated                                                                                                                                                                                   | step 70   |
|           | failed                                                                                                                                                                                                                                  | step 91   |
| <b>70</b> | Record the messages on the MAP display for future reference.                                                                                                                                                                            |           |
| <b>71</b> | To access the TTP level of the MAP display, type<br><b>&gt;TRKS;TTP</b><br>and press the Enter key.                                                                                                                                     |           |
| <b>72</b> | To post the circuits for the PM, type<br><b>&gt;POST TM pm_type pm_no</b><br>and press the Enter key.<br><i>where</i><br><b>pm_type</b><br>is the type of PM (ISM, MTM, STM, TM)<br><b>pm_no</b><br>is the number of the PM (0 to 9999) |           |
| <b>73</b> | To return all circuits to service, type<br><b>&gt;RTS ALL</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>RTS OK                                                                                            |           |



## NT0X91

### in a trunk module equipment frame (continued)

- 74 The next action depends on the results of the PM RTS in step 69.

| If the RTS command                                                       | Do      |
|--------------------------------------------------------------------------|---------|
| passed without problems                                                  | step 81 |
| passed, but in-service tests failed and the system generated a card list | step 75 |

- 75 To manually busy all posted circuits, type  
**>BSY ALL**  
 and press the Enter key.

- 76 To return all circuits to service, type  
**>RTS ALL**  
 and press the Enter key.

- 77 To access the PM level of the MAP display, type  
**>PM**  
 and press the Enter key.

- 78 To post the PM, type  
**>POST pm\_type pm\_no**  
 and press the Enter key.  
*where*  
**pm\_type**  
 is the type of PM (CTM, DTM, ISM, MTM, STM, TM)  
**pm\_no**  
 is the number of the PM (0 to 9999)

- 79 To perform an in-service test on the PM, type  
**>TST**  
 and press the Enter key.

*Example of a MAP response:*

## NT0X91

### in a trunk module equipment frame (continued)

```

MTM 0 ISTb TSTFAIL

InSvcce Tests Initiated
MTM 0 Tst Failed
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 00 D06 TME 00 04 MTM : 000 04 2X59
HOST 00 D06 TME 00 04 MTM : 000 02 0X70
Following ISTb Exist :
Test Failed

```

|    | If the TST command                                                                                                                                                                                                  | Do      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | passed, and single-card PMs or an STM are out of service                                                                                                                                                            | step 81 |
|    | passed, and you worked on all PMs on the shelf and you returned all PMs to service                                                                                                                                  | step 84 |
|    | passed, and you worked on all PMs on the shelf, not all PMs returned to service                                                                                                                                     | step 91 |
|    | failed, and single-card PMs or an STM that you did not work on that you must return to service                                                                                                                      | step 80 |
|    | failed, and you worked on all PMs on the shelf                                                                                                                                                                      | step 91 |
| 80 | Record the messages on the MAP display for future reference.                                                                                                                                                        |         |
| 81 | To access the PM level of the MAP display, type<br><b>&gt;PM</b><br>and press the Enter key.                                                                                                                        |         |
| 82 | To post the PM, type<br><b>&gt;POST pm_type pm_no</b><br>and press the Enter key.<br><i>where</i><br><b>pm_type</b><br>is the type of PM (ISM, MTM, STM, TM)<br><b>pm_no</b><br>is the number of the PM (0 to 9999) |         |
| 83 | Repeat steps 66 to 79 for all PMs on this shelf. Go to step 84.                                                                                                                                                     |         |

## NT0X91

### in a trunk module equipment frame (end)

- |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--|-----------|--|------------------------------------------------------|---------|--|-------------------------------------------------------------------------------------------------------------|---------|--|-----------------------------------------------------------------------------------------------------------|---------|
| <b>84</b>                         | Determine how many shelves associate with the FSP card you replace.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>If</b></td> <td style="width: 55%;"></td> <td style="width: 40%; text-align: right;"><b>Do</b></td> </tr> <tr> <td></td> <td>one shelf equipped with PMs associates with the card</td> <td style="text-align: right;">step 86</td> </tr> <tr> <td></td> <td>two shelves equipped with PMs associate with the card, and you returned to service the PM on only one shelf</td> <td style="text-align: right;">step 85</td> </tr> <tr> <td></td> <td>two shelves equipped with PMs associate with the card, and you returned to service the PM on both shelves</td> <td style="text-align: right;">step 86</td> </tr> </table> | <b>If</b>                         |  | <b>Do</b> |  | one shelf equipped with PMs associates with the card | step 86 |  | two shelves equipped with PMs associate with the card, and you returned to service the PM on only one shelf | step 85 |  | two shelves equipped with PMs associate with the card, and you returned to service the PM on both shelves | step 86 |
| <b>If</b>                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Do</b>                         |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | one shelf equipped with PMs associates with the card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | step 86                           |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | two shelves equipped with PMs associate with the card, and you returned to service the PM on only one shelf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | step 85                           |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | two shelves equipped with PMs associate with the card, and you returned to service the PM on both shelves                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | step 86                           |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>85</b>                         | Repeat steps 61 to 84 for PMs in the other shelf associated with the FSP card you replace. Go to step 86.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>86</b>                         | Determine if the maintenance procedure directed you to this procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>If a maintenance procedure</b></td> <td style="width: 55%;"></td> <td style="width: 40%; text-align: right;"><b>Do</b></td> </tr> <tr> <td></td> <td>directed you to this procedure</td> <td style="text-align: right;">step 87</td> </tr> <tr> <td></td> <td>did not direct you to this procedure</td> <td style="text-align: right;">step 92</td> </tr> </table>                                                                                                                                                                                                                                                          | <b>If a maintenance procedure</b> |  | <b>Do</b> |  | directed you to this procedure                       | step 87 |  | did not direct you to this procedure                                                                        | step 92 |  |                                                                                                           |         |
| <b>If a maintenance procedure</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Do</b>                         |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | directed you to this procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | step 87                           |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
|                                   | did not direct you to this procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | step 92                           |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>87</b>                         | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>88</b>                         | Contact the next level of support to determine how to handle necessary services. Continue as directed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>89</b>                         | Contact operating company personnel to determine why the component is offline. Continue as directed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>90</b>                         | Report the results of the maintenance activity to the next level of support.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>91</b>                         | For additional help, contact the next level of support.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |
| <b>92</b>                         | The procedure is complete.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                   |  |           |  |                                                      |         |  |                                                                                                             |         |  |                                                                                                           |         |

## **NT6X36 in LCE-type frames and CLCE**

---

### **Application**

Use this procedure to replace the following cards in the shelves or frames listed.

| <b>PEC</b> | <b>Suffix</b> | <b>Card name</b> | <b>Shelf or frame name</b>                                    |
|------------|---------------|------------------|---------------------------------------------------------------|
| NT6X36     | AA, AB        | FSP alarm card   | line concentrating equipment (LCE) frame                      |
| NT6X36     | AA, EA        | FSP alarm card   | enhanced line concentrating equipment (LCEI) frame            |
| NT6x36     | AA, AB        | FSP alarm card   | cabinetized line concentrating equipment (CLCE), PEC NTRX30AA |

Refer to the “Index” if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

### **Common procedures**

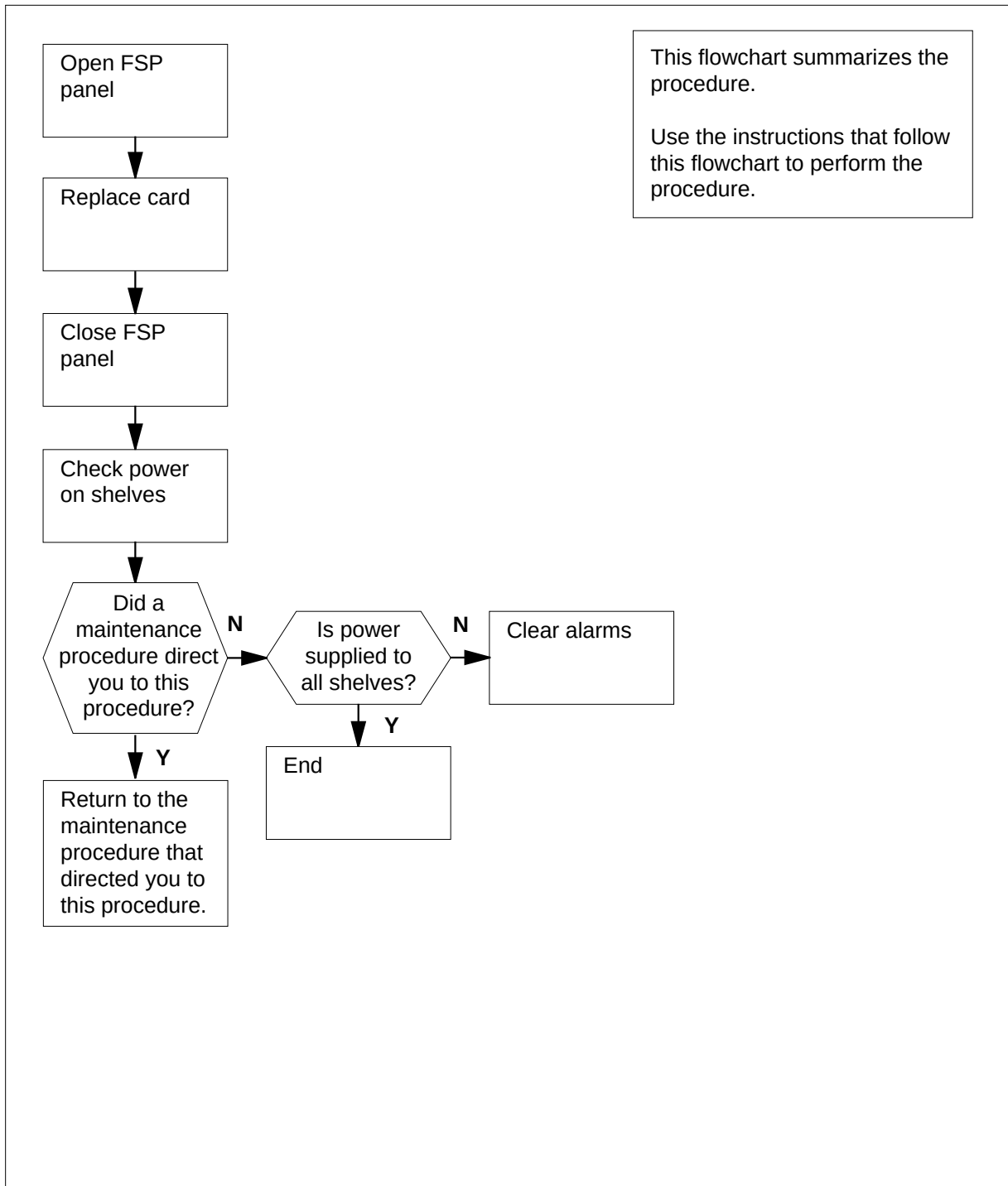
There are no common procedures.

### **Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT6X36 in LCE-type frames and CLCE (continued)

### Summary of replacing a NT6X36 in LCE-type frames and CLCE



## NT6X36 in LCE-type frames and CLCE (continued)

### Replacing a NT6X36 in LCE-type frames and CLCE

*At your current location*

1



#### **DANGER**

##### **Risk of electrocution**

Some of the terminals inside the frame supervisory panel (FSP) have an electrical potential of -48 V dc. Make sure you remove all jewelry before you replace a card in the FSP. Do not touch any terminal inside the FSP.

Obtain a replacement card. Make sure the replacement card and the card you replace have the same PEC and PEC suffix.

*At the frame*

2



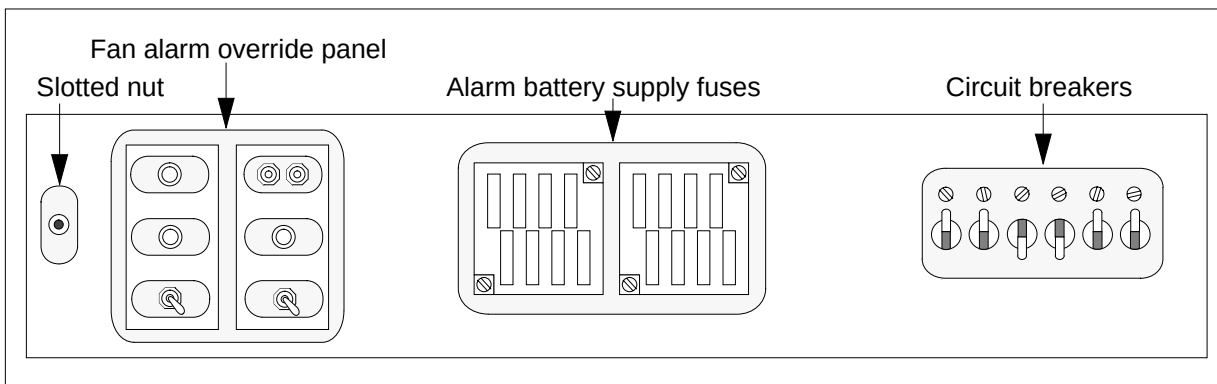
#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding is on a modular supervisory panel (MSP) or a frame supervisory panel (FSP). The wrist-strap protects the cards against static electricity damage.

Unscrew the slotted nut on the left of the FSP.

### Frame supervisory panel

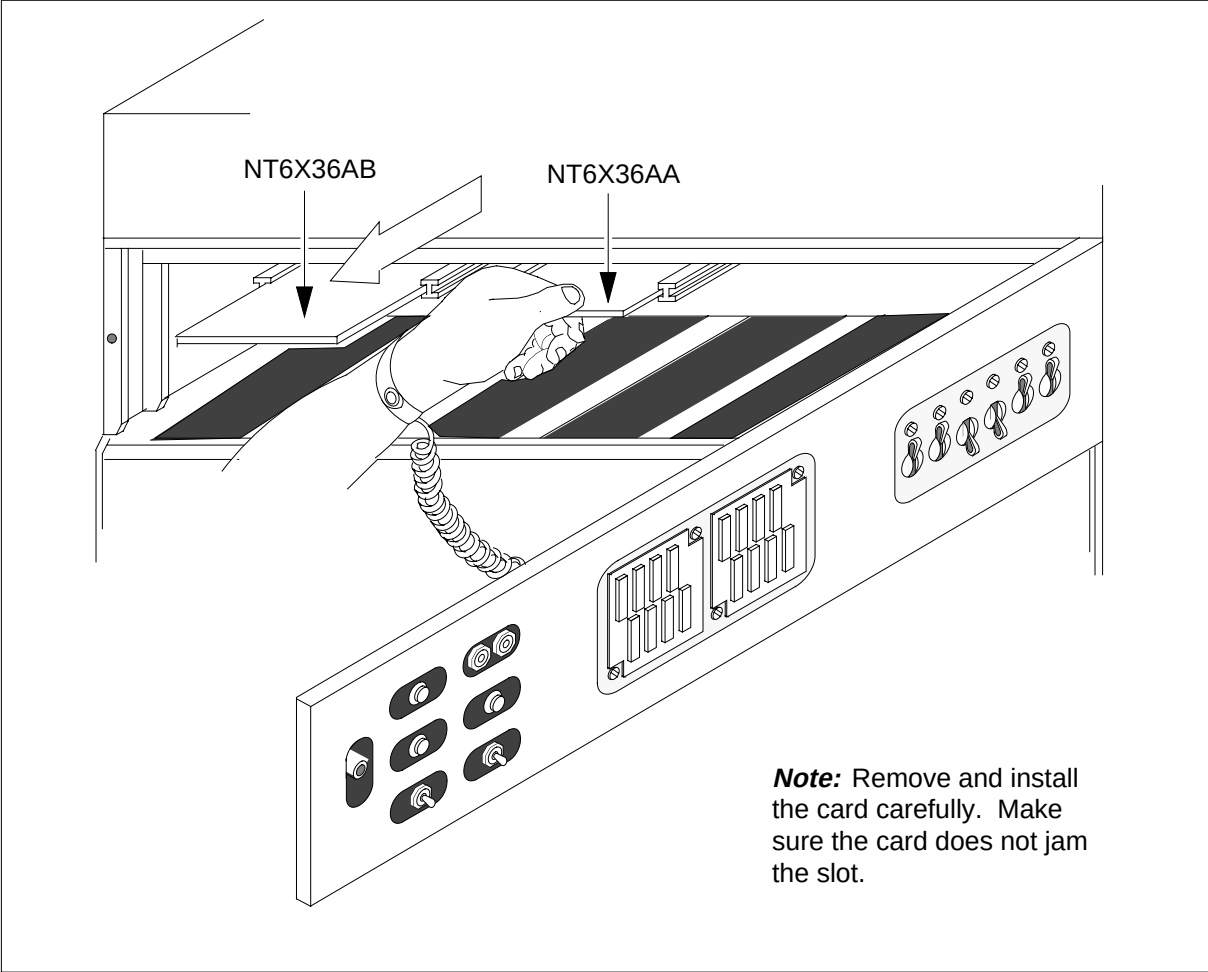


3 Open the FSP.

4 Remove the card.

**NT6X36**  
**in LCE-type frames and CLCE (continued)**

**Frame supervisory panel alarm and control cards**



- 5 Insert the replacement alarm and control card.
- 6 Close the FSP.
- 7 Tighten the slotted nut on the FSP.
- 8 The next action depends on why you perform this procedure.

| If                                                           | Do      |
|--------------------------------------------------------------|---------|
| a maintenance procedure directed you to this procedure       | step 9  |
| a maintenance procedure did not direct you to this procedure | step 10 |

- 9 Return to the maintenance procedure that directed you to this procedure and continue as directed.

## NT6X36 in LCE-type frames and CLCE (end)

---

- |                                             |                                                                                                            |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------|
| 10                                          | Check the CONVERTER FAIL LEDs on each power converter for each shelf.                                      |
|                                             | <b>Do</b>                                                                                                  |
| the LED is lit for any power converter      | step 11                                                                                                    |
| the LED is not lit for each power converter | step 12                                                                                                    |
| 11                                          | To clear alarms, go to <i>Alarm clearing and performance monitoring</i> . Do not return to this procedure. |
| 12                                          | The procedure is complete.                                                                                 |



## NTRX41 in MSP in streamline B cabinets

### Application

Use this procedure to replace the following cards in a modular supervisory panel (MSP). The following table lists the cards.

| PEC    | Suffix | Card name    | Shelf or frame name                                   |
|--------|--------|--------------|-------------------------------------------------------|
| NTRX41 | AA     | Alarm module | Cabinetized two-shelf network (CDSN)                  |
| NTRX41 | AA     | Alarm module | Cabinetized input-output equipment (CIOE)             |
| NTRX41 | AA     | Alarm module | Cabinetized international peripheral equipment (CIPE) |
| NTRX41 | AA     | Alarm module | Cabinetized miscellaneous equipment (CMIS)            |
| NTRX41 | AA     | Alarm module | Cabinetized trunk module equipment (CTME)             |
| NTRX41 | AA     | Alarm module | Cabinetized digital trunk controller offshore (CDTO)  |
| NTRX41 | AA     | Alarm module | Cabinetized line group controller offshore (CLGO)     |
| NTRX41 | AA     | Alarm module | Cabinetized message switch 7 (CMS7)                   |

Refer to the “Index” if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement NTP.

**NTRX41**  
**in MSP in streamline B cabinets** (continued)

---

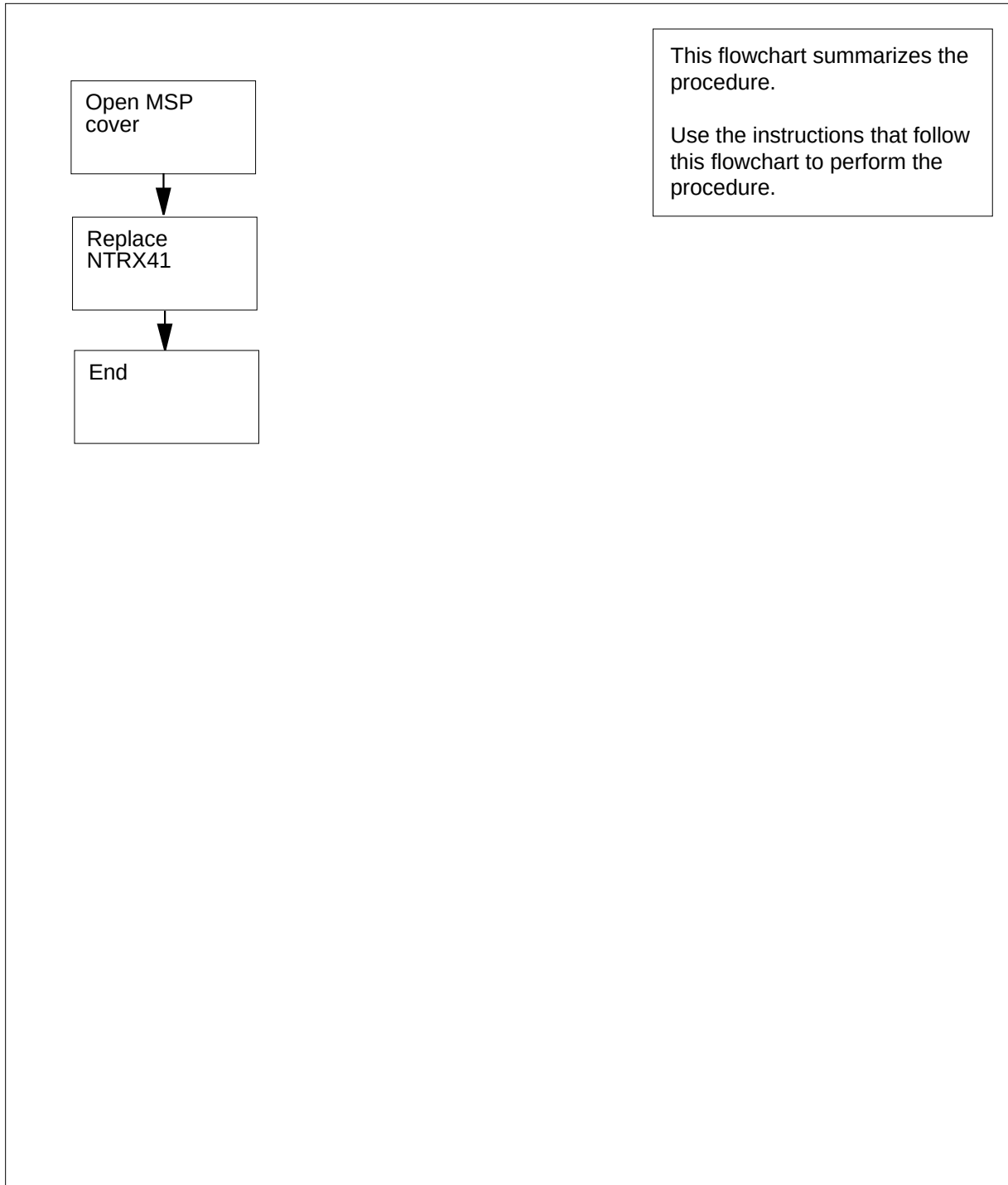
**Common procedures**

There are no common procedures.

## **NTRX41** **in MSP in streamline B cabinets** (continued)

---

### **Summary of replacing a NTRX41 in MSP in streamline B cabinets**



## NTRX41 in MSP in streamline B cabinets (continued)

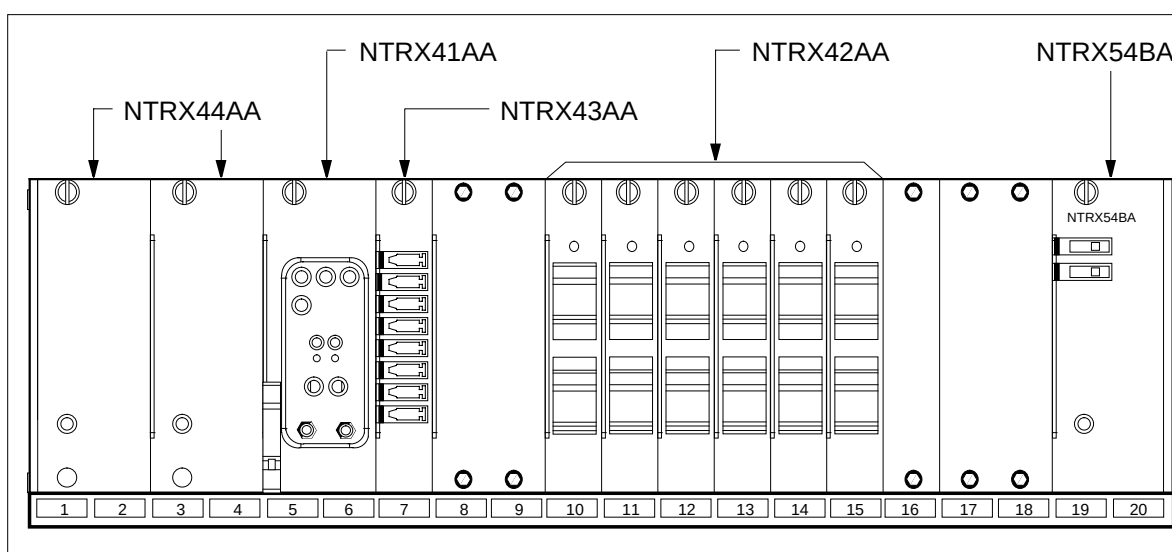
### Replacing a NTRX41 in MSP in streamline B cabinets

#### *At your current location*

- 1 Obtain a replacement module. Make sure that the replacement module and the module you remove have the same PEC and PEC suffix.

#### *At the front of the MSP*

- 2 To open the front cover of the MSP, pull out at the finger holes provided. Swing the cover down to the open position.



3



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) to handle modules. The wrist strap protects the modules against static electricity damage.



#### **DANGER**

##### **Risk of injury from high energy levels, equipment damage**

When you remove or insert a module, do not apply direct pressure to module components. Make sure you do not force a module into a slot.

Put on a wrist strap.

## NTRX41 in MSP in streamline B cabinets (continued)

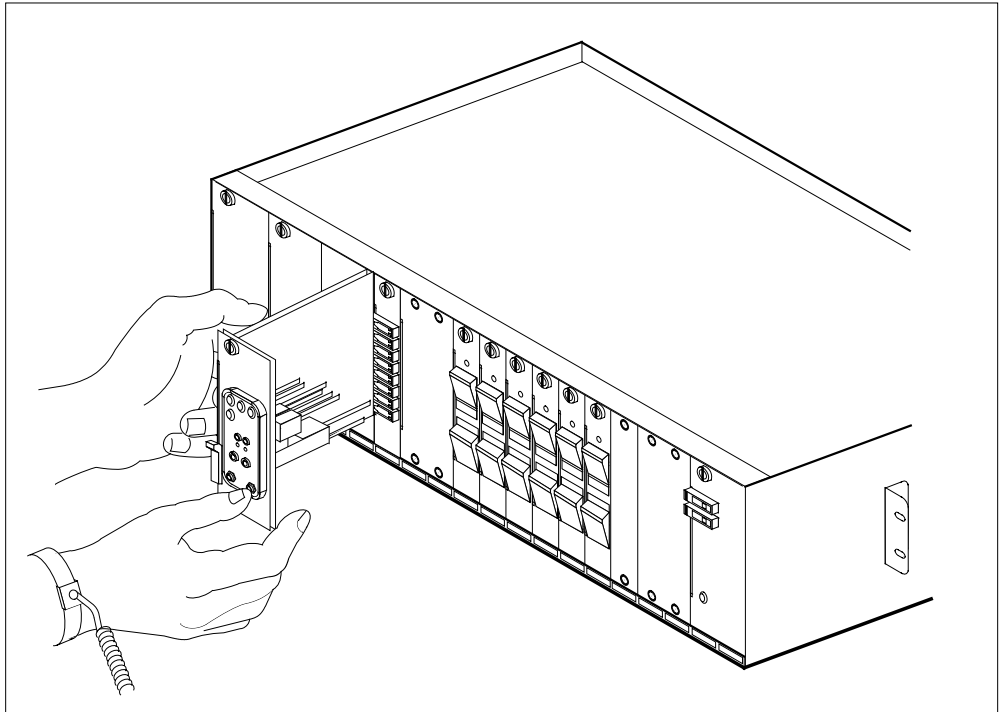
---

### *At the front of the MSP*

- 4 Remove the NTRX41 (alarm module) as follows:

- a Locate the module.

**Note:** The NTRX41 is in slots 5 and 6.



- b Disengage (loosen) the captive screw at the top of the module.
- c Pull down (open) the locking lever on the lower left corner of the module.
- d Carefully pull the module toward you until the module clears the shelf.
- 5 Make sure the replacement module and the module you removed have the same PEC and PEC suffix.
- 6 Insert the replacement module as follows:
- a Open the locking lever on the replacement module.
- b Align the module with the slots in the shelf and carefully slide the module into the shelf.
- c Use your fingers or thumbs to push on the upper and lower edges of the faceplate. Make sure the module sits completely in the shelf.
- d Close the locking lever.

**NTRX41**  
**in MSP in streamline B cabinets (end)**

---

e Tighten the captive screw at the top of the module.

---

| <b>If the MSP alarm LED</b> | <b>Do</b> |
|-----------------------------|-----------|
|-----------------------------|-----------|

---

|             |        |
|-------------|--------|
| remains off | step 8 |
|-------------|--------|

|          |        |
|----------|--------|
| turns on | step 7 |
|----------|--------|

---

**7** For additional help, contact the next level of support.

**8** The procedure is complete.

---

## 9 Input/output device card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the input/output device (IOD). The first section in the chapter provides illustrations that show shelf layouts.

Card replacement procedures for the frame supervisory panel (FSP) and modular supervisory panel (MSP) are in the chapter "Frame supervisory panel and maintenance supervisory panel card replacement procedures".

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

This section identifies the IOD card(s) that the replacement procedure covers.

### Common procedures

This section lists common procedures for the IOD card replacement procedure. A common procedure is a series of steps you repeat within maintenance procedures. The procedure for the removal and replacement of a card is a common procedure. Common procedures are in the common procedures chapter in this NTP.

Do not go to the common procedures unless the step-action procedure directs you to go.

### Action

This procedure contains a summary flow chart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## **Recording card replacement activities**

When you replace a card, record the following information in office records:

- the serial number of the card you replaced
- the date you replaced the card
- the reason you replaced the card



## IOD shelf layouts

---

### Application

This module contains a frame layout diagram for the input/output equipment (IOE) frame. The module contains a cabinetized layout diagram for the integrated services cabinet (CISM). The module contains shelf layouts for the following:

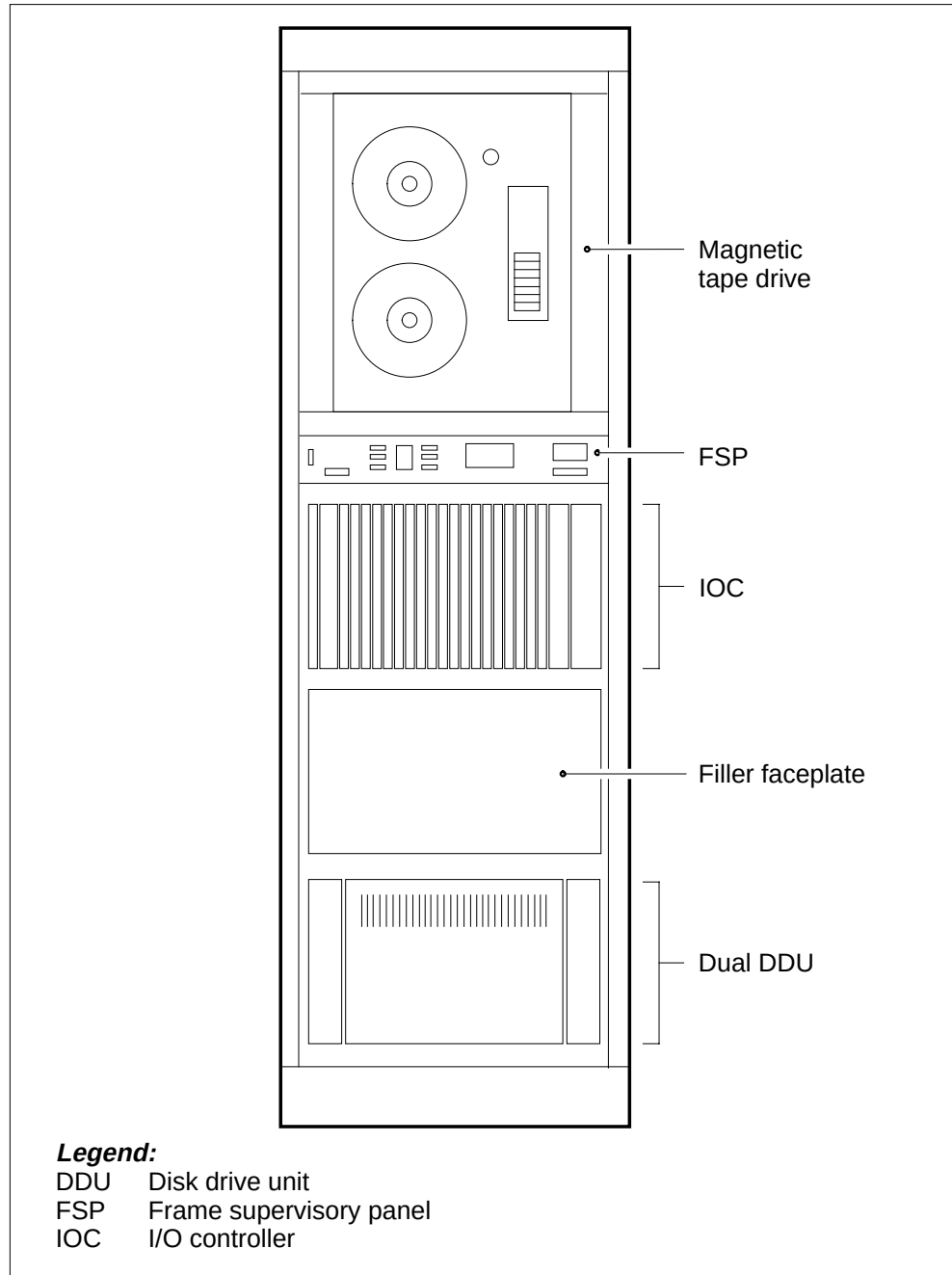
- input/output controller (IOC) shelf
- single disk drive unit (DDU) shelf
- two DDU shelf
- input/output module (IOM) housed in a integrated services module (ISM) shelf

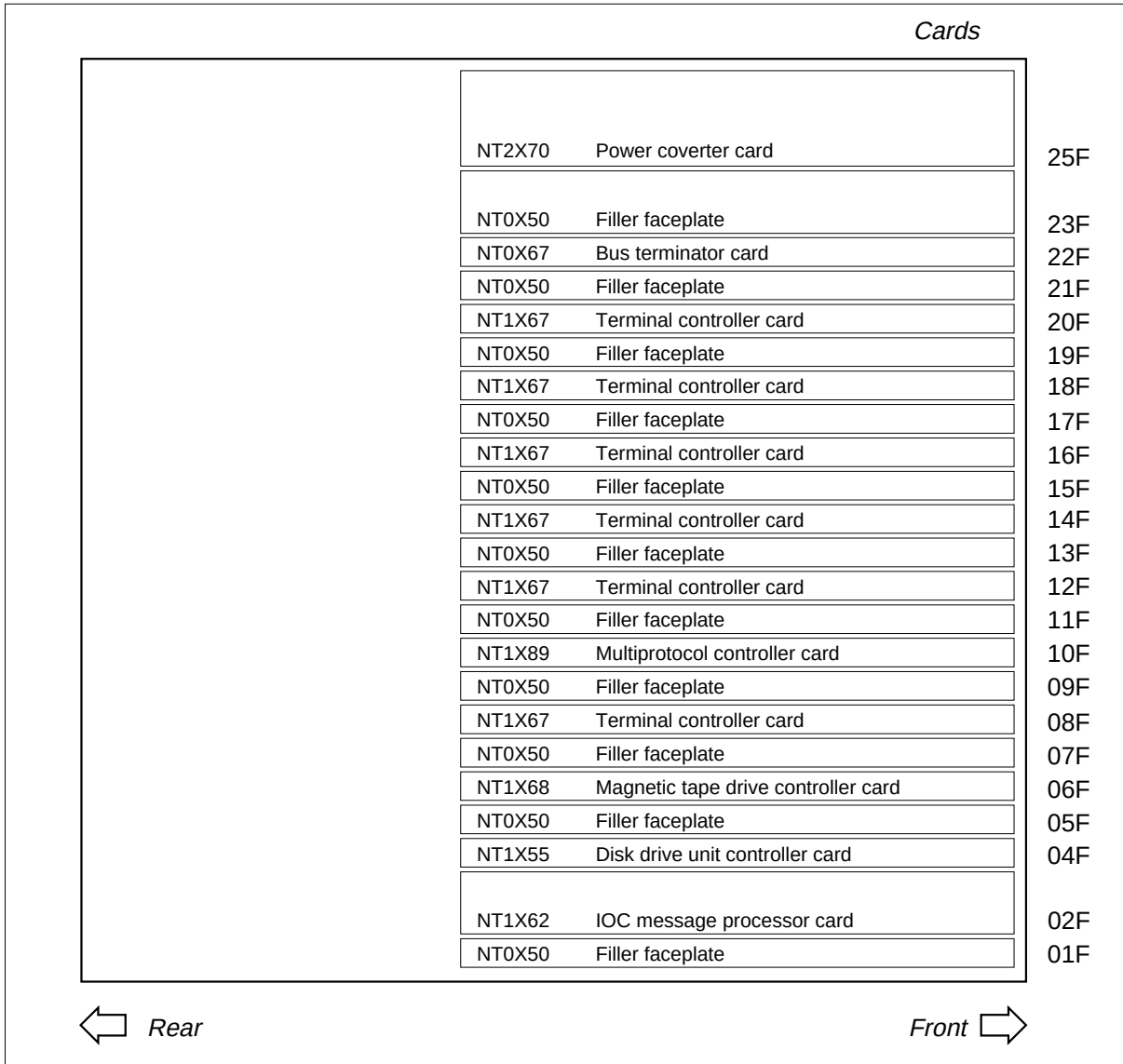
**Note:** The frame and shelf layouts on the following pages are standard. Differences in the shelves in your office can be present.

## IOD shelf layouts (continued)

---

**Figure Input/output equipment frame**



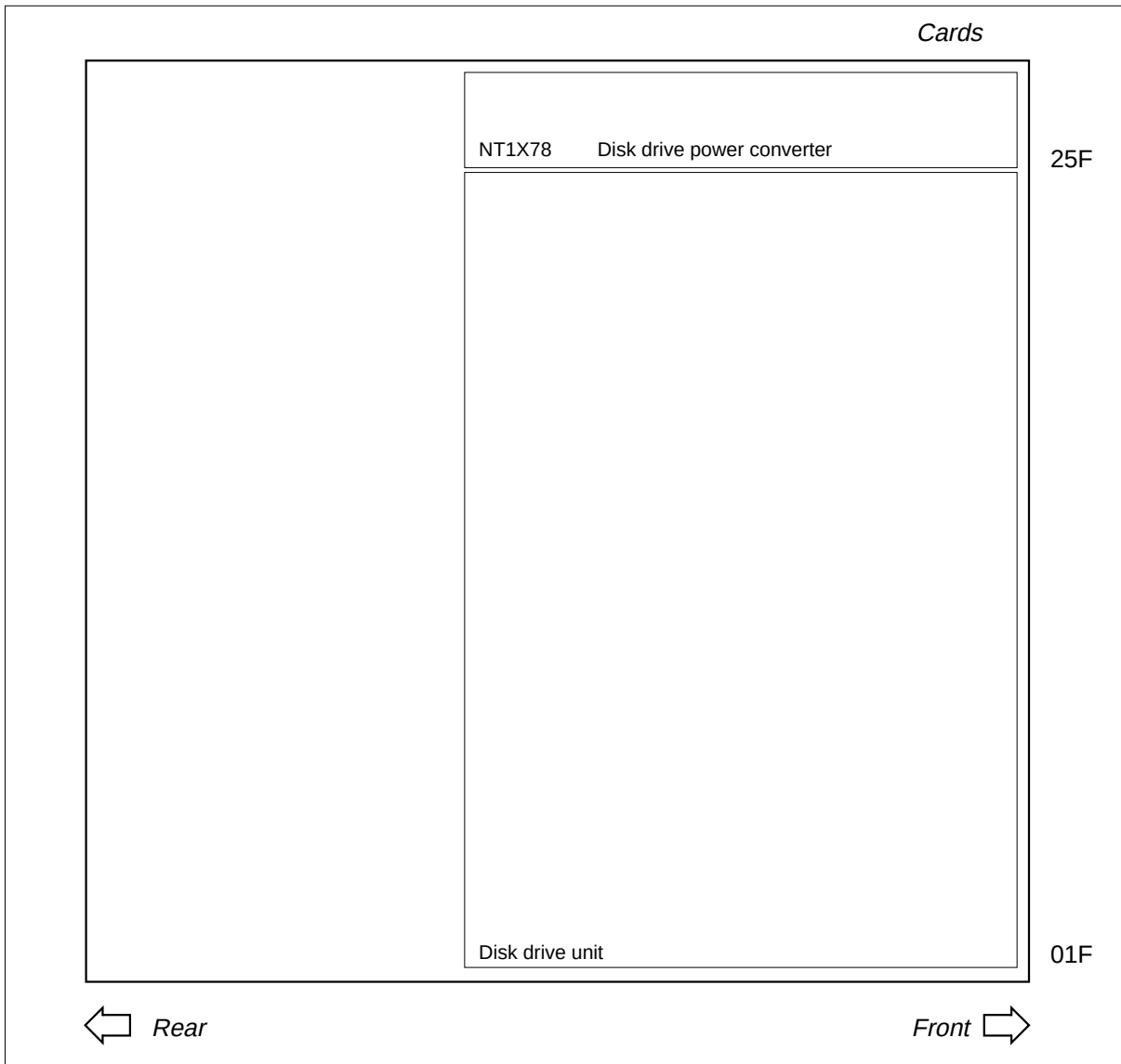
**IOD shelf layouts** (continued)**Figure Input/output controller shelf**

**Note:** The NT1X67 terminal controller card can function as a Datalink controller card, DATAPAC controller card, or SMDI controller card.

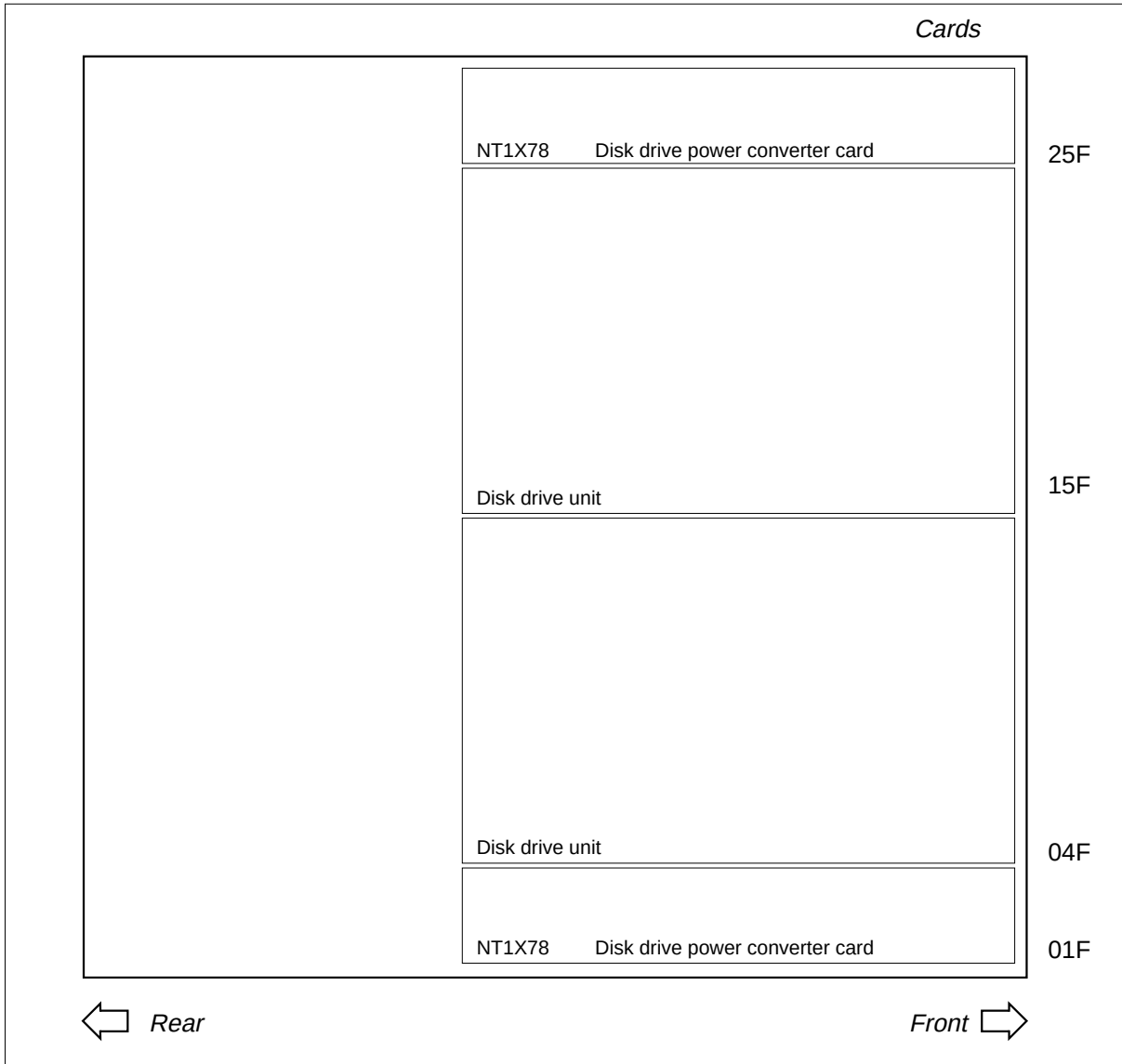
## IOD shelf layouts (continued)

---

Figure Single disk drive unit shelf



**Note:** A faceplate covers the DDU. The drive is an 8 in. (20.3 cm) model 8211D-19 drive, a 5.25 in. (13.3 cm) model Seagate ST4883E or model Maxtor XT4380E drive.

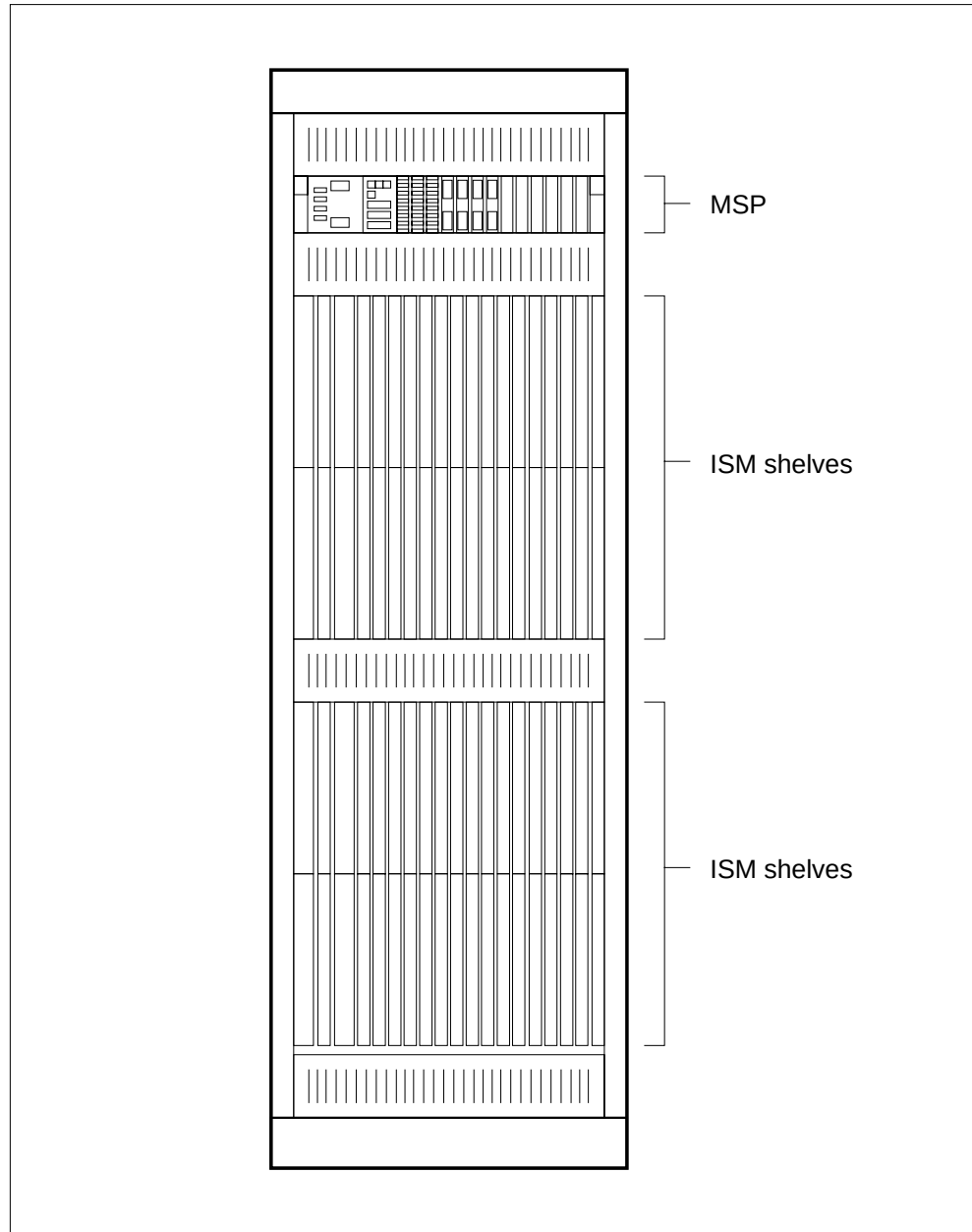
**IOD shelf layouts** (continued)**Figure Two disk drive unit shelf**

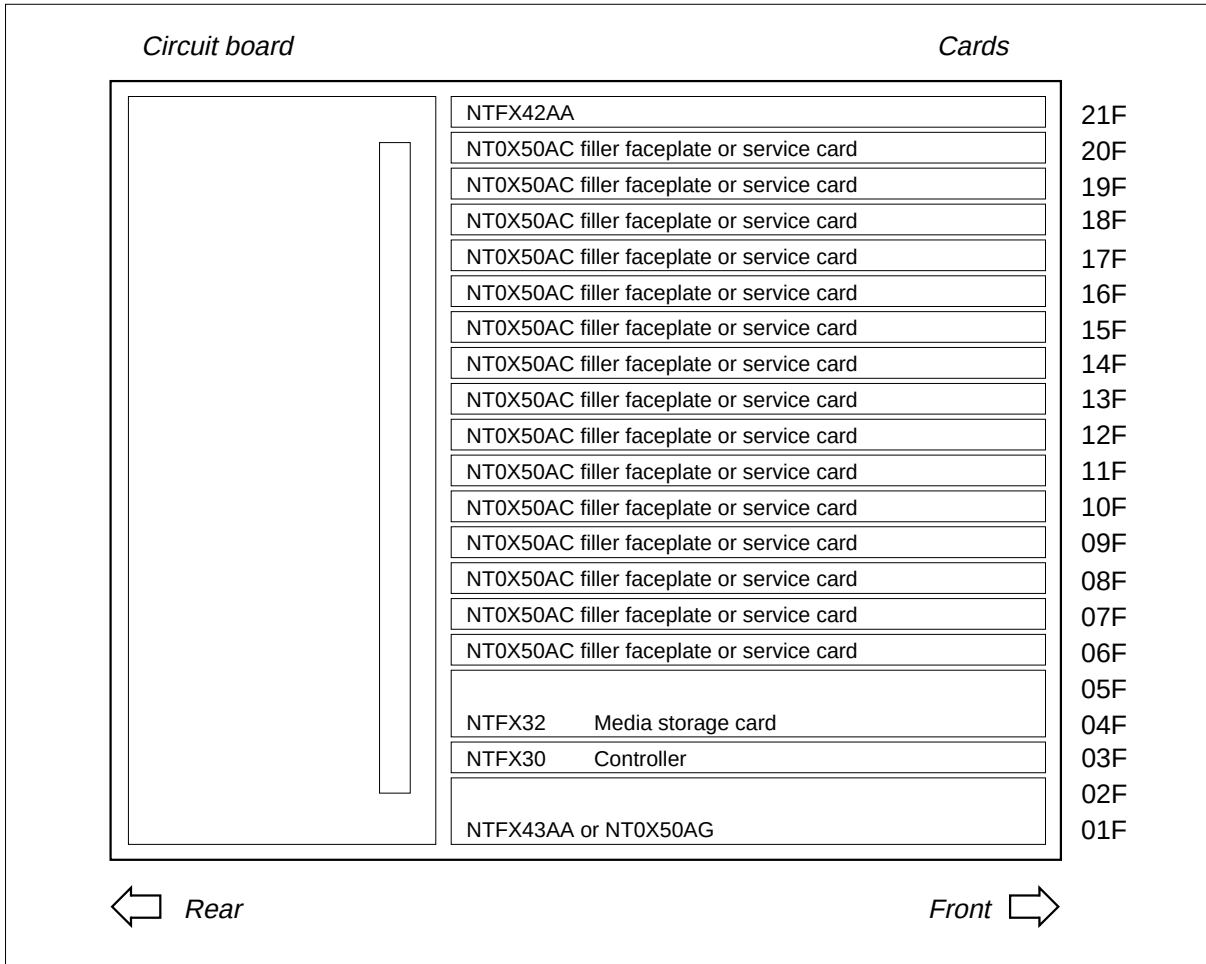
**Note:** A faceplate covers the DDUs. The drives are 8 in. (20.3 cm) model 8211D-19 drive, 5.25 in. (13.3 cm) model Seagate ST4883E or model Maxtor XT4380E drive.

## IOD shelf layouts (continued)

---

**Figure Integrated services cabinet (CISM)**



**IOD shelf layouts (end)****Figure Integrated services module shelf**

## Disk drive and magnetic tape controller cards in an IOC

---

### Application

Use this procedure to replace the following cards in an input/output controller (IOC).

| PEC    | Suffix                 | Card name                    | Shelf or frame name |
|--------|------------------------|------------------------------|---------------------|
| NT1X55 | AA, AB, BA, CA, DA     | Disk drive controller card   | IOC                 |
| NT1X55 | FA                     | SCSI disk drive unit         | IOC                 |
| NT1X68 | AA, AB, AC, BB, BC, BD | Magnetic tape interface card | IOC                 |

Refer to the “Index” if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The “Index” contains a list of the cards, shelves, and frames documented in this card replacement book.

*Note:* If the IOC shelf contains a minimum of one NT1X55FA disk drive unit (DDU), the shelf must not contain the following power converter cards:

- NT2X70AA
- NT2X70AB
- NT2X70AC

If the IOC contains these cards, a loss of service on the DDU's can occur and a loss of data results. Contact the operating company personnel responsible for the next level of support.

### Common procedures

Refer to *Replacing a card* in this document.



## **Disk drive and magnetic tape controller cards in an IOC (continued)**

---

Do not go to the common procedure unless the step-action procedure directs you to go.

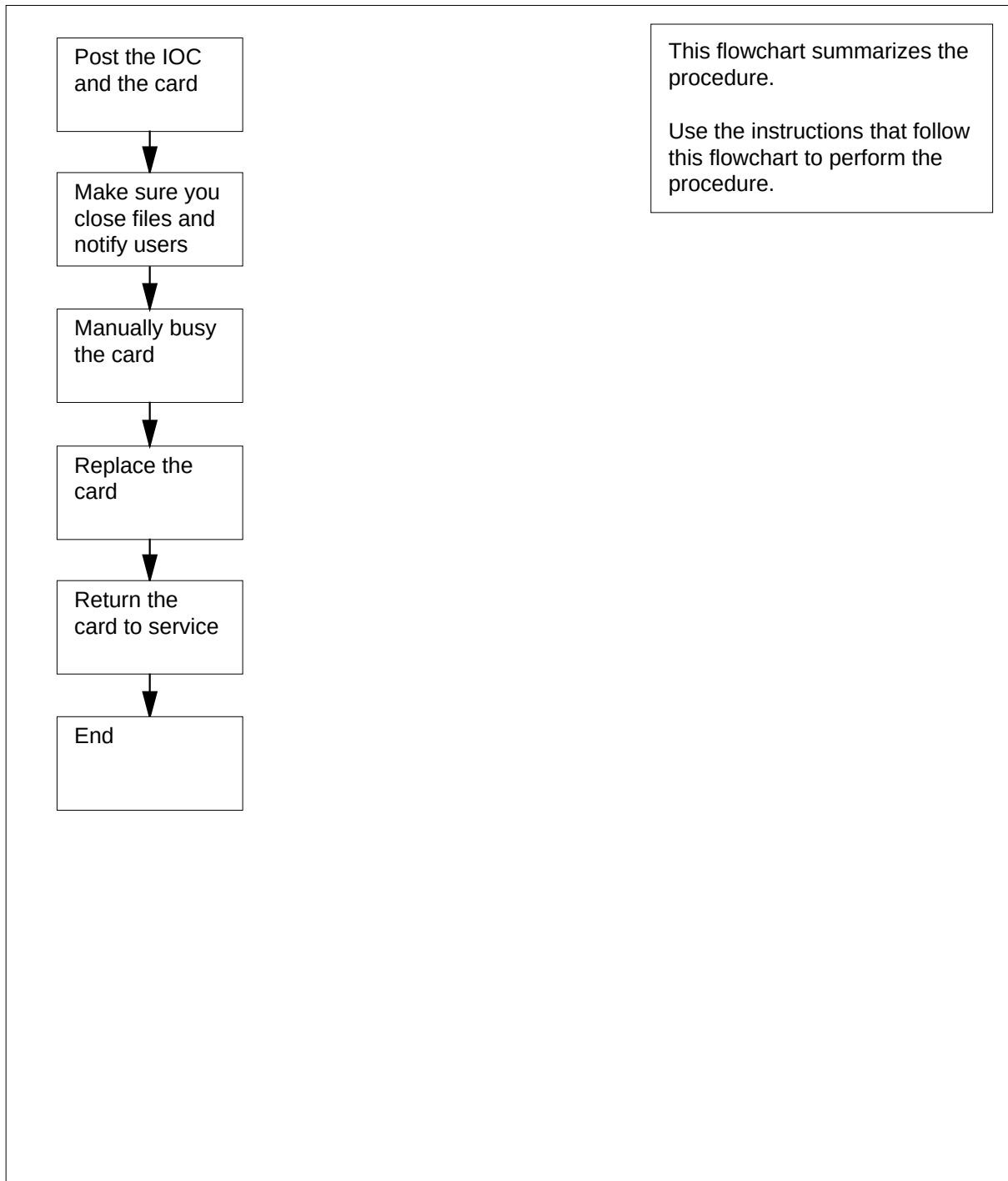
### **Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## Disk drive and magnetic tape controller cards in an IOC (continued)

---

### Summary of replacing Disk drive and magnetic tape controller cards in an IOC



## Disk drive and magnetic tape controller cards in an IOC (continued)

### Replacing Disk drive and magnetic tape controller cards in an IOC

#### At the MAP terminal

1



#### WARNING

##### Loss of billing data

This procedure instructs you to remove disk and tape drive device controllers from service. The active automatic message accounting (AMA) file can be on the IOC that contains the card you will replace. Make sure you close all files before you manually busy the controller.

Get a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the IOD level of the MAP display, type

**>MAPCI;MTC;IOD**

and press the Enter key.

3

To post the IOC that associates with the card you are replacing, type

**>IOC ioc\_no**

and press the Enter key.

where

**ioc\_no**

is the IOC identification number (0 to 19)

Example of a MAP response:

```

IOD
IOC 0 1 2 3
STAT
DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 01230123 0123 0123 0123 0123
STAT .--- .--- .--- .--- .--- .--- .--- .---
TYPE MTD DDU CONS MPC CONS CONS CONS MPC

```

4

To post the card, type

**>CARD card\_no**

and press the Enter key.

where

Disk drive and magnetic tape controller cards  
in an IOC (continued)

card\_no  
is the card identification number (0 to 8)

Example of a MAP response:

```
IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0120123 0123 0123 0123 0123
STAT .--- .--- .--- .--- .--- .--- .--- .--- .---
TYPE MTD DDU CONS MPC CONS CONS CONS MPC

Card 0 MTD 0
 TapeName
 Status Idle
 User
```

5 The next action depends on the card you replace.

| If the card you replace | Do      |
|-------------------------|---------|
| is NT1X55               | step 6  |
| is NT1X68               | step 10 |

6 Determine the state of the NT1X55 controller card.

| If the card               | Do      |
|---------------------------|---------|
| is ManB                   | step 9  |
| is Offl                   | step 39 |
| is other than listed here | step 7  |

7 To determine if files are open on the DDU, type

>ALLOC  
and press the Enter key.  
Example of a MAP response:

## Disk drive and magnetic tape controller cards in an IOC (continued)

| VOLID | VOL_NAME | SERIAL_NO | BLOCKS | ADDR | TYPE | R/O | FILES_OPEN |
|-------|----------|-----------|--------|------|------|-----|------------|
| 0     | IMAGE    | 2800      | 45000  | D000 | 0    | NO  | 0          |
| 1     | XPMLoads | 2801      | 35000  | D000 | 0    | NO  | 0          |
| 2     | RTMLoads | 2802      | 20000  | D000 | 0    | NO  | 0          |
| .     | .        | .         | .      | .    | .    | .   | .          |
| 7     | SMDR     | 2807      | 5000   | D000 | 0    | NO  | 0          |
| 8     | AMA1     | 2808      | 5000   | D000 | 0    | NO  | 0          |
| 9     | TST      | 2809      | 50     | D000 | 0    | NO  | 0          |
| 10    | AMA2     | 280A      | 5000   | D000 | 0    | NO  | 0          |

**Note:** If you replace an NT1X55FA, record the name and number of each disk volume.

|           | If files                                                                                                                                                     | Do      |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | are open                                                                                                                                                     | step 31 |
|           | are not open                                                                                                                                                 | step 8  |
| <b>8</b>  | To manually busy the controller, type<br><b>&gt;BSY</b><br>and press the Enter key.                                                                          |         |
| <b>9</b>  | To offline the NT1X55 card, type<br><b>&gt;OFFL</b><br>and press the Enter key.<br>Go to step 13.                                                            |         |
| <b>10</b> | Determine the state of the NT1X68 controller card.                                                                                                           |         |
|           | If the card                                                                                                                                                  | Do      |
|           | is ManB                                                                                                                                                      | step 13 |
|           | is Offl                                                                                                                                                      | step 39 |
|           | is other than listed here                                                                                                                                    | step 11 |
| <b>11</b> | Notify all users that the system will interrupt service for the device. Wait until all users cease to access the device before you proceed to the next step. |         |
| <b>12</b> | To manually busy the controller, type<br><b>&gt;BSY</b><br>and press the Enter key.                                                                          |         |

## Disk drive and magnetic tape controller cards in an IOC (continued)

---

### *At the shelf*

13



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding point is on a frame supervisory panel (FSP) or a modular supervisory panel (MSP). The wrist strap protects the cards against static electricity damage.

To replace the card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note 1:** Make sure the handle of the PWR switch on the replacement power converter is in the OFF position.

**Note 2:** Determine if the card you will replace has switches. Make sure the switches for the replacement card and the card you will replace have the same settings.

14 The next action depends on the type of card you replace.

| If the card you replace   | Do      |
|---------------------------|---------|
| is NT1X55FA               | step 15 |
| is other than listed here | step 26 |

### *At the MAP terminal*

15 To start the disk drive motor, type

**>START**

and press the Enter key.

*MAP response:*

Disk Start Successful

16 To test the disk drive, type

**>TST**

and press the Enter key.

*Example of a MAP display:*

## Disk drive and magnetic tape controller cards in an IOC (continued)

|        |        |        |             |
|--------|--------|--------|-------------|
| Card 8 | Unit   | 0      |             |
|        | User   | SYSTEM | Drive_State |
|        | Status | BSY    | spinning    |

**If the TST command****Do**

passed

step 17

failed

step 40

- 17** To perform the volume allocation tests, perform the procedure *Allocating test volumes on 8-in., 5.25-in., or 2.5-in. DDUs in Routine Maintenance Procedures*. Complete the procedure and return to this point.
- 18** To perform interference and file transfer tests, perform the procedure *Performing DDU interference and file transfer tests*. This document is in *Routine Maintenance Procedures*. Complete the procedure and return to this point.
- 19** To access the CI level of the MAP display, type  
**>QUIT ALL**  
and press the Enter key.
- 20** To access the allocation utility, type  
**>ALLOC ddu\_no**  
and press the Enter key.  
*where*  
**ddu\_no**  
is the DDU number (0 to 9)
- 21** To confirm the command, type  
**>YES**  
and press the Enter key.
- 22** To add a volume to the disk, type  
**>ADD vol\_name vol\_size**  
and press the Enter key.  
**Note:** You recorded the names and sizes of the required disk volumes in step 7.  
*where*  
**vol\_name**  
is the volume name you recorded in step 7  
**vol\_size**  
is the volume size you recorded in step 7
- 23** Repeat step 22 for each of the disk volumes that remain.

---

## Disk drive and magnetic tape controller cards in an IOC (continued)

---

- 24** To enforce the allocation of the volumes, type  
**>UPDATE**  
and press the Enter key.  
*Example of a MAP response:*
- WARNING: A break HX of this process may cause  
severe corruption on the disk that may  
require it to be reformatted.  
Writing label of Volume IMAGE  
Successful  
Starting Initialization of Volume IMAGE  
A break HX of this process may cause severe corruption  
on this volume that may require reinitialization of all  
non initialized volumes.  
Number of Bad Blocks = 0  
Successful  
Update Done
- 25** To quit the allocation utility, type  
**>QUIT**  
and press the Enter key.
- 26** To manually busy the card, type  
**>BSY**  
and press the Enter key.
- 27** To test the card, type  
**>TST**  
and press the Enter key.
- 28** To return the card to service, type  
**>RTS**  
and press the Enter key.
- Note:** If an NT1X55 is in use, the RTS command requires 75 s to complete.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 29 |
| failed             | step 40 |

---



## Disk drive and magnetic tape controller cards in an IOC (continued)

- 29 The next action depends on why you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 30 |
| did not direct you to this procedure | step 41 |

- 30 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

31



### WARNING

#### Loss of data

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 32 Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

**>LOGUTIL;LISTDEVS**

and press the Enter key.

- 33 Close files on volumes on the DDU of the IOC by typing

**>STOPDEV dev\_name**

and pressing the Enter key.

where

**dev\_name**

is the name of the device

- 34 To quit the allocation utility, type

**>QUIT**

and press the Enter key.

## Disk drive and magnetic tape controller cards in an IOC (end)

---

- 35** Repeat the ALLOC command to determine if the files are closed by typing **>ALLOC** and pressing the Enter key.
- | If the files | Do      |
|--------------|---------|
| are open     | step 36 |
| are closed   | step 37 |
- 36** Confirm that you have done steps 31 to 35. If the files are still open, contact your next level of support.
- 37** Manually busy the DDU, by typing **>BSY** and pressing the Enter key.
- | If the DDU  | Do      |
|-------------|---------|
| is ManB     | step 9  |
| is not ManB | step 40 |
- 38** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.
- 39** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 40** For additional help, contact the next level of support.
- 41** The procedure is complete.

---

**NT1X67  
in an IOC**

---

**Application**

Use this procedure to replace an NT1X67 in an input/output controller (IOC).

| PEC    | Suffix                   | Card name                  | Shelf or frame name |
|--------|--------------------------|----------------------------|---------------------|
| NT1X67 | AA, AB,<br>BC, BD,<br>CB | Terminal controller card   | IOC                 |
| NT1X67 | BA, DA                   | Datalink controller card   | IOC                 |
| NT1X67 | BB, DB                   | DATAPAC controller<br>card | IOC                 |
| NT1X67 | FA                       | SMDI controller card       | IOC                 |

Refer to the Index if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- provisioned shelf
- provisioned frame

The Index contains a list of the cards, shelves, and frames documented in this card replacement book.

**Common procedures**

This procedure refers to *Replacing a card*.

Do not go to the common procedure unless the step-action procedure directs you to go.

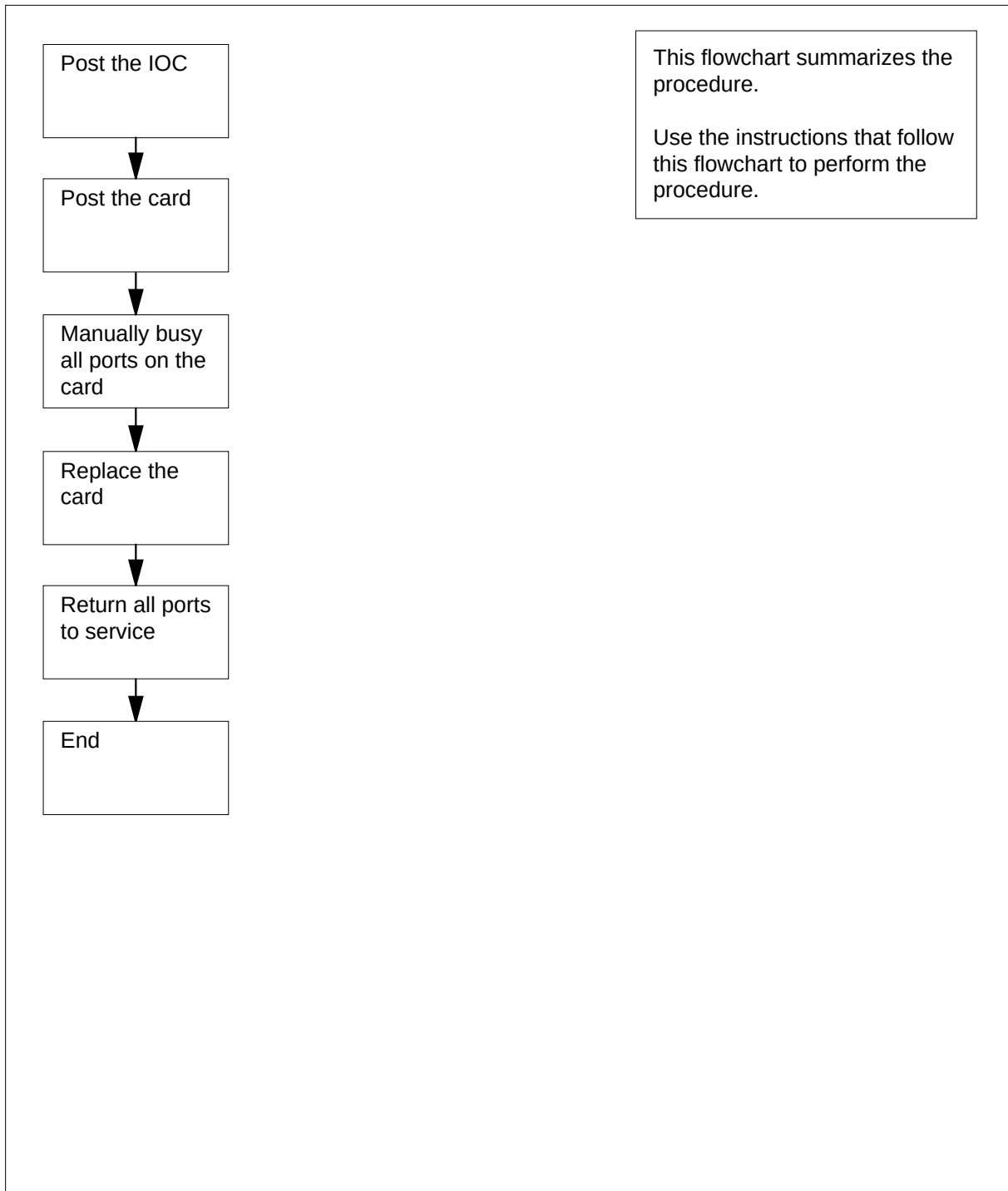
**Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT1X67 in an IOC (continued)

---

### Summary of replacing a NT1X67 in an IOC



## NT1X67 in an IOC (continued)

### Replacing a NT1X67 in an IOC

#### At the shelf

1



#### WARNING

##### Loss of billing and other data

Do not proceed if NT2X70AA, NT2X70AB, or NT2X70AC power converter cards power the IOC shelf. The following cards may not function reliably in an IOC powered by NT2X70AA, NT2X70AB, or NT2X70AC cards: NT1X55FA, NT1X89, or NT1X67BC/BD that run applications at 9600 baud (on one port or all four ports combined). Contact the personnel responsible for the next level of support.



#### WARNING

##### Loss of service

If you remove IOC P-side ports from service, you can affect MAP access for other operating company personnel. Perform this procedure during periods of low maintenance activity.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

- 2 Determine which power converter card is on the shelf that contains the card you want to replace.

| If the power converter card is     | Do      |
|------------------------------------|---------|
| an NT2X70AA, NT2X70AB, or NT2X70AC | step 19 |
| an NT2X70AD or NT2X70AE            | step 3  |

#### At the MAP terminal

- 3 To access the IOD level of the MAP display, type  
**>MAPCI;MTC;IOD**  
 and press the Enter key.  
*Example of a MAP display:*

## NT1X67

### in an IOC (continued)

---

```

IOD
IOC 0 1 2 3
STAT

```

- 4 To post the IOC that associates with the card you will replace, type

**>IOC ioc\_no**

and press the Enter key.

where

**ioc\_no**

is the IOC identification number (0 to 19)

*Example of a MAP display:*

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123

STAT .--- .--- .--- .--- .--- .--- .--- .--- .---
TYPE MTD DDU CONS MPC CONS ---- CONS MPC ----

```

- 5 To post the card, type

**>CARD card\_no**

and press the Enter key.

where

**card\_no**

is the card identification number (0 to 8)

*Example of a MAP display:*

## NT1X67 in an IOC (continued)

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .---
 TYPE MTD DDU CONS MPC CONS MPC
Card 6 Ckt 0 1 2 3
Status
Cons Id RD040 RD041 TEAM4 TEAM6
ConType VT100 VT100 VT100 VT100

```

- 6** Note the CONS ID and status for each port.

**Note:** If you use a minimum of one of these IDs to access the MAP maintenance levels, logout. Use an ID on a different card or a different IOC.

| If                                              | Do      |
|-------------------------------------------------|---------|
| all ports are ManBsy                            | step 12 |
| a minimum of one port is Offl                   | step 20 |
| a minimum of one port is . (dot)                | step 7  |
| all ports are in any other out-of-service state | step 8  |

- 7** Notify all operating company personnel that you will remove from service the CONS IDs that associate with the card you replace.

- 8** To manually busy a port on the card, type

**>BSY port\_no**

and press the Enter key.

where

**port\_no**

is the port identification number (0 to 3)

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 9  |
| failed             | step 21 |

- 9** Repeat step 8 until you manually busy all ports on the card. Go to step 10.

## NT1X67 in an IOC (continued)

- 10** To offline a port on the card, type

**>OFFL port\_no**

and press the Enter key.

where

**port\_no**

is the port identification number (0 to 3)

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 11 |
| failed              | step 21 |

- 11** Repeat step 10 until you offline all ports on the card. Go to step 12.

**At the shelf**

**12**



### WARNING

#### Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding point is on a frame supervisory panel (FSP) or a modular supervisory panel (MSP). The wrist trap protects the cards against static electricity damage.

To replace the card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** Determine if the card you replace has switches. Make sure the switches on the replacement card and the card you replace have the same settings.

**At the MAP terminal**

- 13** To manually busy a port on the card, type

**>BSY port\_no**

and press the Enter key.

where

**port\_no**

is the port identification number (0 to 3)

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 14 |



## NT1X67 in an IOC (end)

|           | <b>If the BSY command</b>                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                                          | step 21   |
| <b>14</b> | Repeat step 13 until you manually busy all ports on the card. Go to step 15.                                                                                                                                                                                                                                                                                                                                                    |           |
| <b>15</b> | To return a port to service, type<br><b>&gt;RTS port_no</b><br>and press the Enter key.<br><i>where</i><br><b>port_no</b><br>is the port identification number (0 to 3)                                                                                                                                                                                                                                                         |           |
|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                                                                                                          | step 16   |
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                                          | step 21   |
| <b>16</b> | Repeat step 15 until you return all ports to service. Go to step 17.                                                                                                                                                                                                                                                                                                                                                            |           |
| <b>17</b> | The next action depends on why you perform this procedure.                                                                                                                                                                                                                                                                                                                                                                      |           |
|           | <b>If a maintenance procedure</b>                                                                                                                                                                                                                                                                                                                                                                                               | <b>Do</b> |
|           | directed you to this procedure                                                                                                                                                                                                                                                                                                                                                                                                  | step 18   |
|           | did not direct you to this procedure                                                                                                                                                                                                                                                                                                                                                                                            | step 22   |
| <b>18</b> | Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.                                                                                                                                                                                                                                                                                                     |           |
| <b>19</b> | Do not proceed if NT2X70AA, NT2X70AB, or NT2X70AC power converter cards power the IOC shelf. The following cards may not function reliably in an IOC powered by NT2X70AA, NT2X70AB, or NT2X70AC power converter cards: <ul style="list-style-type: none"> <li>• NT1X55FA</li> <li>• NT1X67BC or NT1X67BD the run applications at 9600 baud (on one port or all four ports combined)</li> <li>• NT1X89</li> </ul> Go to step 21. |           |
| <b>20</b> | To determine why the port is offline, consult operating company personnel. Continue as directed by operating company personnel.                                                                                                                                                                                                                                                                                                 |           |
| <b>21</b> | For additional help, contact the operating company personnel responsible for the next level of support.                                                                                                                                                                                                                                                                                                                         |           |
| <b>22</b> | The procedure is complete.                                                                                                                                                                                                                                                                                                                                                                                                      |           |

## NT1X78 in an IOE DDU shelf

---

### Application

Use this procedure to replace an NT1X78 in the shelves or frames listed in the following table.

| PEC    | Suffix | Card name                                        | Shelf or frame name                                                                                        |
|--------|--------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| NT1X78 | AA     | Power converter card (+5V, -5V, -12V, +24V)      | single-disk drive unit (DDU) shelf in an input/output equipment (IOE) frame; two-DDU shelf in an IOE frame |
| NT1X78 | KA     | -60V power converter card (+5V, -5V, -12V, +24V) | single-DDU shelf in an IOE frame; two-DDU shelf in an IOE frame                                            |

Refer to the Index if you cannot identify the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped shelf
- equipped frame

The Index contains a list of the cars, shelves, and frames documented in this card replacement book.

Refer to figure Figure , "DDU shelf" on page -36 on page 8-26 for a diagram of the NT1X78 in a single-DDU shelf.

### Common procedures

This procedure refers to *Replacing a card*.

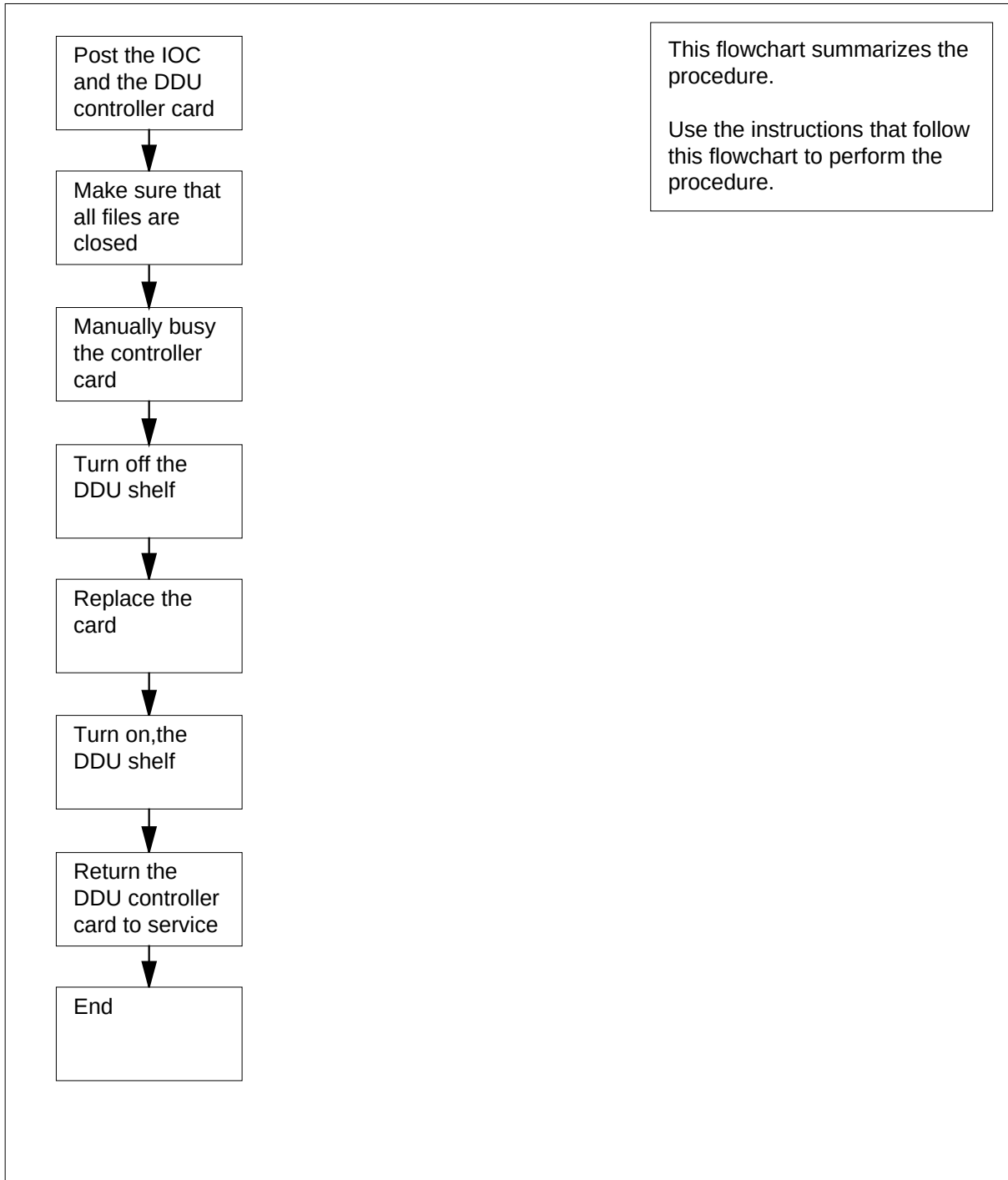
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

The following flowchart is a summary of the procedure. To replace the card, use the instructions that follow the flowchart.

## NT1X78 in an IOE DDU shelf (continued)

### Summary of Replacing a NT1X78 in an IOE DDU shelf



## NT1X78 in an IOE DDU shelf (continued)

### Replacing a NT1X78 in an IOE DDU shelf

#### At the MAP terminal

1



#### WARNING

##### Loss of billing data

This procedure instructs you to power down a disk drive unit. The active automatic message accounting (AMA) file can be on the IOC that contains the card you replace. Make sure that you close all files before you power down the disk drive unit.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the IOD level of the MAP display, type

**>MAPCI;MTC;IOD**

and press the Enter key.

3

To post the IOC that associates with the card you will replace, type

**>IOC ioc\_no**

and press the Enter key.

where

**ioc\_no**

is the IOC identification number (0 to 19)

Example of a MAP response:

```
IOD
IOC 0 1 2 3
STAT
```

```
DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .
```

```
IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .---
 TYPE MTD DDU CONS MPC CONS CONS CONS MPC
```

4

To post the DDU controller card, type

**>CARD card\_no**

and press the Enter key.

## NT1X78 in an IOE DDU shelf (continued)

where

**card\_no**

is the card identification number (0 to 8)

Example of a MAP response:

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25:
MLP : . DPPP: . DPPU: . SCAL: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .---
 TYPE MTD DDU CONS MPC CONS CONS MPC
Card 0 MTD 0
 TapeName
 Status Idle
 User

```

- 5 Determine the state of the DDU controller card.

| If the card               | Do      |
|---------------------------|---------|
| is MBSY                   | step 9  |
| is OFFL                   | step 24 |
| is other than listed here | step 6  |

- 6 To determine if files are open on the DDU, type

**>ALLOC**

and press the Enter key.

Example of a MAP response:

```

VOLID VOL_NAME SERIAL_NO BLOCKS ADDR TYPE R/O FILES_C
0 IMAGE 2800 45000 D000 0 NO 0
1 XPMLOADS 280 35000 D000 0 NO 0
2 RTMLOADS 2802 20000 D000 0 NO 0
.
.
.
7 SMDR 2807 5000 D000 0 NO 0
8 AMA1 2808 5000 D000 0 NO 0
9 TST 2809 50 D000 0 NO 0
10 AMA2 280A 500 D000 0 NO 0

```

**NT1X78**  
**in an IOE DDU shelf** (continued)

---

|          | <b>If files</b>                                                                                                                                       | <b>Do</b> |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|          | are open                                                                                                                                              | step 17   |
|          | are not open                                                                                                                                          | step 7    |
| <b>7</b> | To manually busy the controller, type<br><b>&gt;BSY</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>bsyOK                 |           |
| <b>8</b> | To spin down the DDU, type<br><b>&gt;STOP</b><br>and press the Enter key.<br><i>Example of a MAP display:</i><br><br>Disk stop successful             |           |
| <b>9</b> | Wait until the DDU spins down before you proceed to the next step. The status code spun_down appears under the Drive_State header on the MAP display. |           |

## NT1X78

### in an IOE DDU shelf (continued)

**At the shelf****10****DANGER****Risk of personal injury**

If you touch the parts that rotate on the underside of the DDU, you can be injured.

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding point is on a frame supervisory panel (FSP) or a modular supervisory panel (MSP). The wrist strap protects the cards against static electricity damage.

Set the POWER switch on the power converter to the OFF position.

- 11** To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** Determine if the card you will replace has switches. Make sure the switches on the replacement card and the card you will replace have the same settings.

- 12** Reset the power converter as follows:
- a** Set the POWER switch on the converter to the ON position.
  - b** Press and hold the RESET button on the power converter.
  - c** When the CONVERTER FAIL lamp turns off, release the RESET button.
- 13** Make sure the power LED is lit. The power LED indicates that the power converter is on.

**If the power LED****Do**

is lit

step 14

is not lit

step 25

## NT1X78 in an IOE DDU shelf (continued)

### *At the MAP terminal*

- 14** To return the DDU controller to service, type

**>RTS**

and press the Enter key.

**Note:** The RTS command can take 3 min to complete. The RTS command also spins up the disk drive.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 15 |
| failed             | step 25 |

- 15** The next action depends on why you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 16 |
| did not direct you to this procedure | step 26 |

- 16** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

**17**



#### **CAUTION**

##### **Loss of data**

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 18** Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

**>LOGUTIL ; LISTDEVS**



## NT1X78

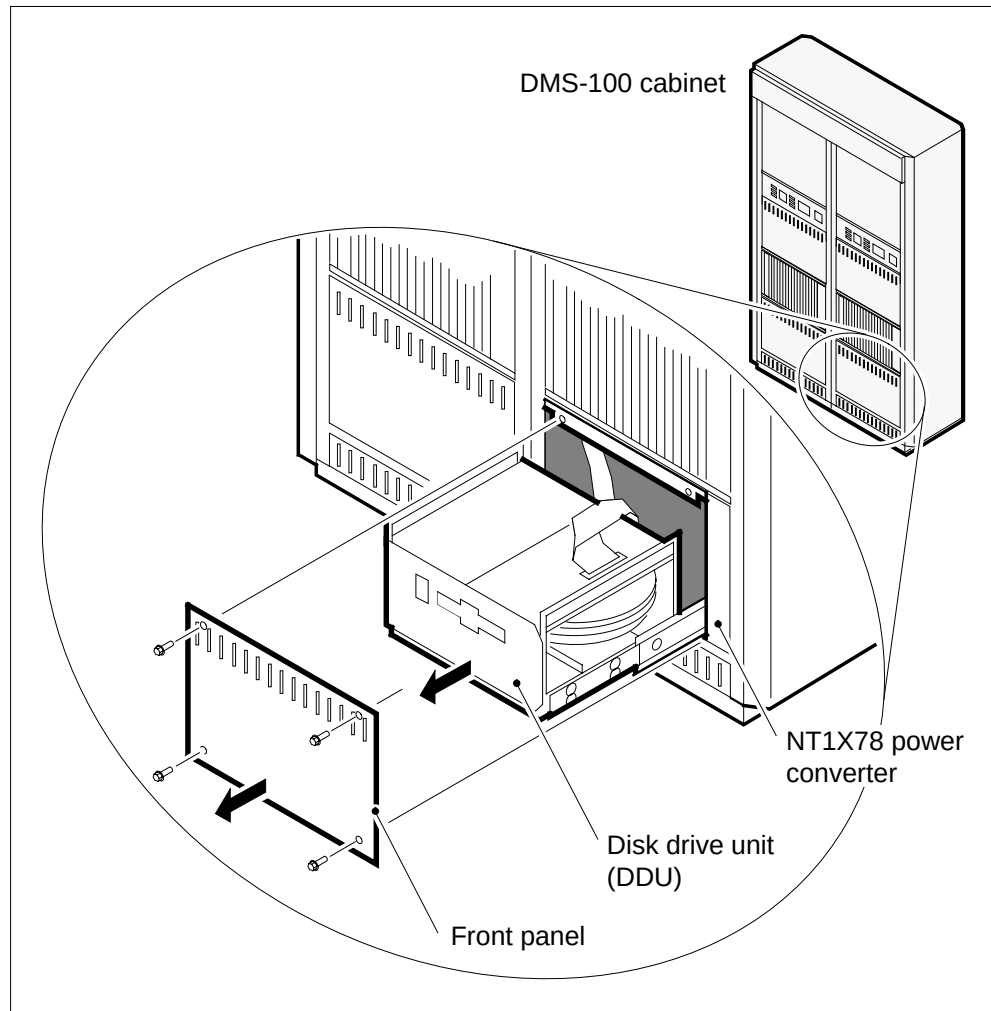
### in an IOE DDU shelf (continued)

- and press the Enter key.
- 19** Close files on volumes on the DDU of the IOC.  
**>STOPDEV dev\_name**  
 and press the Enter key.  
*where*  
     **dev\_name**  
     is the name of the device  
**>QUIT**  
 and press the Enter key.
- 20** Repeat the ALLOC command to determine if files are closed, by typing  
**>ALLOC**  
 and pressing the Enter key.
- | If the files | Do      |
|--------------|---------|
| are open     | step 21 |
| are closed   | step 22 |
- 21** Confirm that you have done steps 17 to 20. If the files are still open, contact your next level of support.
- 22** Manually busy the DDU, by typing  
**>BSY**  
 and pressing the Enter key.
- | If the DDU  | Do      |
|-------------|---------|
| is MBSY     | step 23 |
| is not MBSY | step 25 |
- 23** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.
- 24** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 25** For additional help, contact the next level of support.
- 26** The procedure is complete.

## NT1X78 in an IOE DDU shelf (end)

---

### DDU shelf



## NT1X89 in an IOC shelf

---

### Application

Use this procedure to replace an NT1X89 in an input/output controller (IOC), as listed in the following table.

| PEC    | Suffix | Card name                              | Shelf or frame name |
|--------|--------|----------------------------------------|---------------------|
| NT1X89 | AA, AB | Multiprotocol controller card          | IOC                 |
| NT1X89 | BB     | Enhanced multiprotocol controller card | IOC                 |

Refer to the Index if you cannot identify one of the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped shelf
- equipped frame

The Index contains a list of the cards, shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to *Replacing a card*.

Do not go to the common procedure unless the step-action procedure directs you to go.

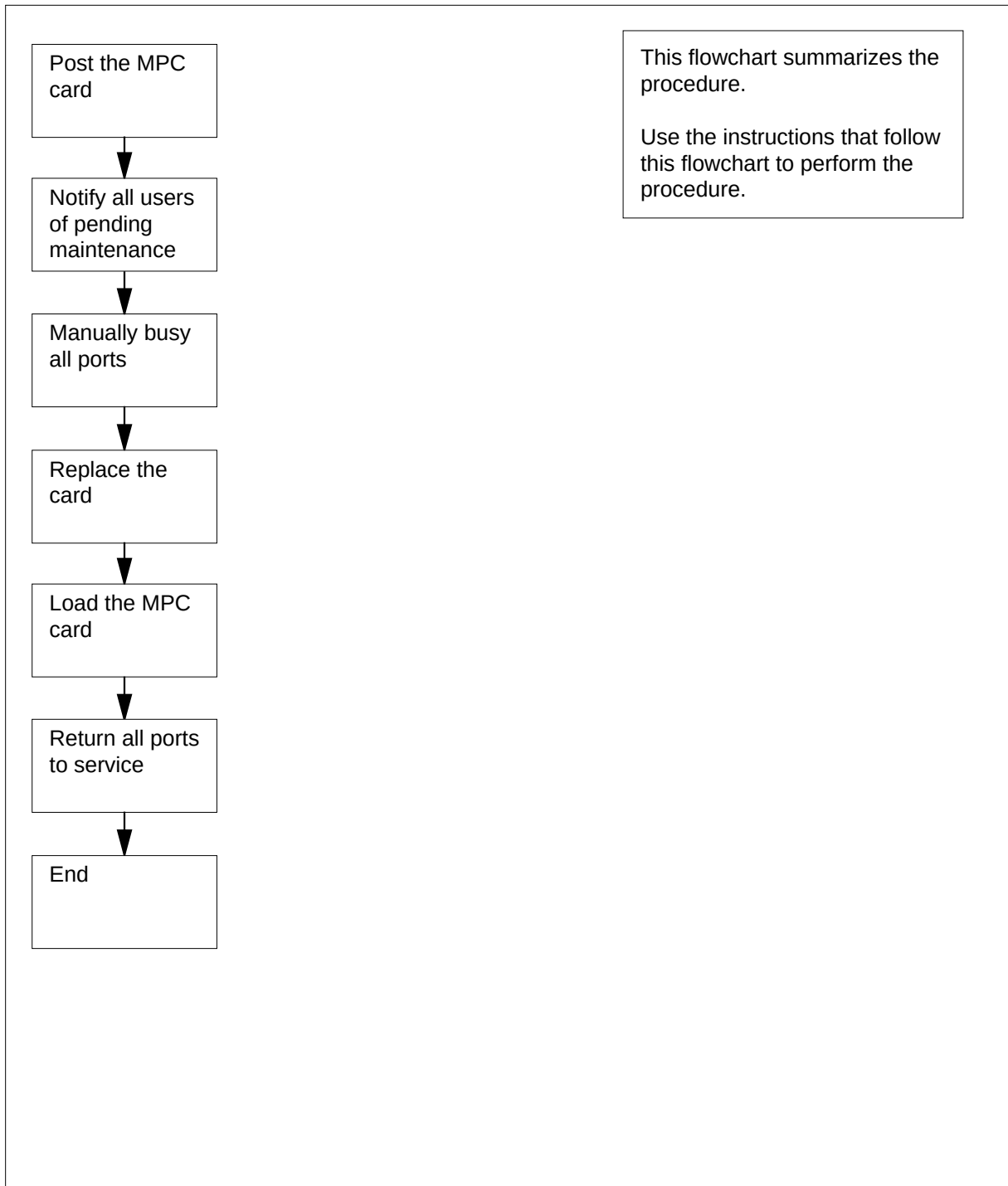
### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT1X89 in an IOC shelf (continued)

---

### Summary of replacing a NT1X89 in an IOC shelf



## NT1X89 in an IOC shelf (continued)

### Replacing a NT1X89 in an IOC shelf

#### At the MAP terminal

1



#### WARNING

##### Loss of billing and other data

Do not proceed if NT2X70AA, NT2X70AB, or NT2X70AC power converter cards power the IOC shelf. The following cards may not function reliably in an IOC powered by NT2X70AA, NT2X70AB, or NT2X70AC cards: NT1X55FA, NT1X89, or NT1X67BC/BD that run applications at 9600 baud (on one port or all four ports combined). Contact the personnel responsible for the next level of support.



#### WARNING

##### Loss of service

Perform this procedure during periods of low traffic. If you remove a multiprotocol controller (MPC) card from service you can affect Data Packet Network (DPN) service and the service of any other MPC cards on the same IOC shelf.

Obtain a replacement card. Make sure the replacement card and the you remove have the same PEC and PEC suffix.

2

Determine which power converter card is on the shelf that contains the card you want to replace.

| If the power converter card           | Do      |
|---------------------------------------|---------|
| is an NT2X70AA, NT2X70AB, or NT2X70AC | step 18 |
| is an NT2X70AD or NT2X70AE            | step 3  |

3

To access the IOD level of the MAP display, type  
**>MAPCI;MTC;IOD**  
 and press the Enter key.  
*Example of a MAP display:*

## NT1X89

### in an IOC shelf (continued)

```
IOD
IOC 0 1 2 3
STAT
```

- 4 To post the IOC associated with the card you will replace, type

**>IOC ioc\_no**

and press the Enter key.

*where*

**ioc\_no**

is the IOC identification number (0 to 19)

*Example of a MAP display:*

```
IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- --- ---- .--- .--- ----
 TYPE MTD DDU CONS MPC CONS CONS MPC
```

- 5 To post the card, type

**>CARD card\_no**

and press the Enter key.

*where*

**card\_no**

is the card identification number (0 to 8)

*Example of a MAP display:*

```
IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- --- ---- .--- .--- ----
 TYPE MTD DDU CONS MPC CONS CONS MPC

Card 3 Unit 0
 User SYSTEM
 Status Ready
 BOARD COMACT
 LINK0 UNEQ
 LINK1 N/A
 LINK2 UNEQ
 LINK3 ENABLD
```

## NT1X89 in an IOC shelf (continued)

- 6 Determine the state of the card.

| If the card state is   | Do      |
|------------------------|---------|
| MANB                   | step 11 |
| OFFL                   | step 19 |
| other than listed here | step 7  |

**Note:** The card state appears under the BOARD header on the MAP display.

- 7 To display status information on current MPC conversations, type

**>QCONV**

and press the Enter key.

*Example of a MAP response:*

| MPC | L | LCN | STATUS   | CCC  | SEC  | PARDEV | INP | OPEN | OWNER |
|-----|---|-----|----------|------|------|--------|-----|------|-------|
| 0   | 3 | 1   | INACTIVE | none | none | none   | FIL | 0    | none  |
| 0   | 3 | 2   | INACTIVE | none | none | none   | FIL | 0    | none  |

| If                                 | Do     |
|------------------------------------|--------|
| a minimum of one session is active | step 8 |
| all sessions are inactive          | step 9 |

- 8 Notify all users of the MPC card you will replace that an interruption of service will occur. Also notify all users of the other MPC cards on the same IOC shelf that an interruption of service may occur.

Wait until all sessions are inactive before you proceed. If you need to verify MPC activity, repeat step 6.

- 9 To manually busy the card and the links of the card, type

**>BSY ALL FORCE**

and press the Enter key.

*Example of a MAP response:*

TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND  
Please confirm ("YES", "Y", "NO", or "N"):

- 10 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

## NT1X89

### in an IOC shelf (continued)

---

REQUEST PASSED FOR LINKS.  
REQUEST PASSED FOR CARD.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 11 |
| failed             | step 20 |

#### *At the shelf*

11



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding point is on a frame supervisory panel (FSP) or a modular supervisory panel (MSP). The wrist strap protects the cards against static electricity damage.

To replace the card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** Determine if the card you replace has switches. Make sure the switches on the replacement card and the card you replace have the same settings.

12 The next action depends on why you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 13 |
| did not direct you to this procedure | step 14 |

13 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

#### *At the MAP terminal*

14 To load the MPC, type  
**>DOWNLD**  
and press the Enter key.  
*Example of a MAP response:*



## NT1X89 in an IOC shelf (end)

DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.

|           | <b>If the DOWNLD command</b>                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                                                                                                                                                                                                                                                          | step 15   |
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                                          | step 20   |
| <b>15</b> | To return the MP to service, type<br><b>&gt;RTS ALL</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>REQUEST PASSED FOR CARD.<br>REQUEST PASSED FOR LINKS.                                                                                                                                                                                                                                           |           |
| <b>16</b> | Wait 1 min to determine the status of MPC components.                                                                                                                                                                                                                                                                                                                                                                           |           |
|           | <b>If</b>                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Do</b> |
|           | the system status is <b>Ready</b> , the board status is <b>COMACT</b> , and the link status is <b>ENABLD</b> for each provisioned link                                                                                                                                                                                                                                                                                          | step 17   |
|           | the status of MPC components is other than listed here                                                                                                                                                                                                                                                                                                                                                                          | step 20   |
| <b>17</b> | Notify users that the MPC is in service.                                                                                                                                                                                                                                                                                                                                                                                        |           |
| <b>18</b> | Do not proceed if NT2X70AA, NT2X70AB, or NT2X70AC power converter cards power the IOC shelf. The following cards may not function reliably in an IOC powered by NT2X70AA, NT2X70AB, or NT2X70AC power converter cards: <ul style="list-style-type: none"> <li>• NT1X55FA</li> <li>• NT1X67BC or NT1X67BD the run applications at 9600 baud (on one port or all four ports combined)</li> <li>• NT1X89</li> </ul> Go to step 20. |           |
| <b>19</b> | To determine why the MPC is offline, contact operating company personnel. Continue as directed by operating company personnel.                                                                                                                                                                                                                                                                                                  |           |
| <b>20</b> | For additional help, contact the next level of support.                                                                                                                                                                                                                                                                                                                                                                         |           |
| <b>21</b> | The procedure is complete.                                                                                                                                                                                                                                                                                                                                                                                                      |           |

## NT2X70 in an IOC

---

### Application

Use this procedure to replace an NT2X70 in an input/output controller (IOC).

| PEC    | Suffix        | Card name                     | Shelf or frame name |
|--------|---------------|-------------------------------|---------------------|
| NT2X70 | AD, AE,<br>AF | Power converter card          | IOC                 |
| NT2X70 | EA            | -48 V power converter<br>card | IOC                 |

If NT2X70AA, NT2X70AB, or NT2X70AC power converter cards power the IOC shelf, contact the personnel responsible for the next level of support. The following cards may not function reliably in an IOC powered by NT2X70AA, NT2X70AB, or NT2X70AC cards:

- NT1X55FA
- NT1X67BC or NT1X67BD that run applications at 9600 baud (on one port or all four ports combined)
- NT1X89

Refer to the Index if you cannot identify one of the following features for the card you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped shelf
- equipped frame

The Index contains a list of cards,shelves, and frames documented in this card replacement book.

### Common procedures

This procedure refers to *Replacing a card*.

Do not go to the common procedure unless the step-action procedure directs you to go.

**NT2X70**  
**in an IOC** (continued)

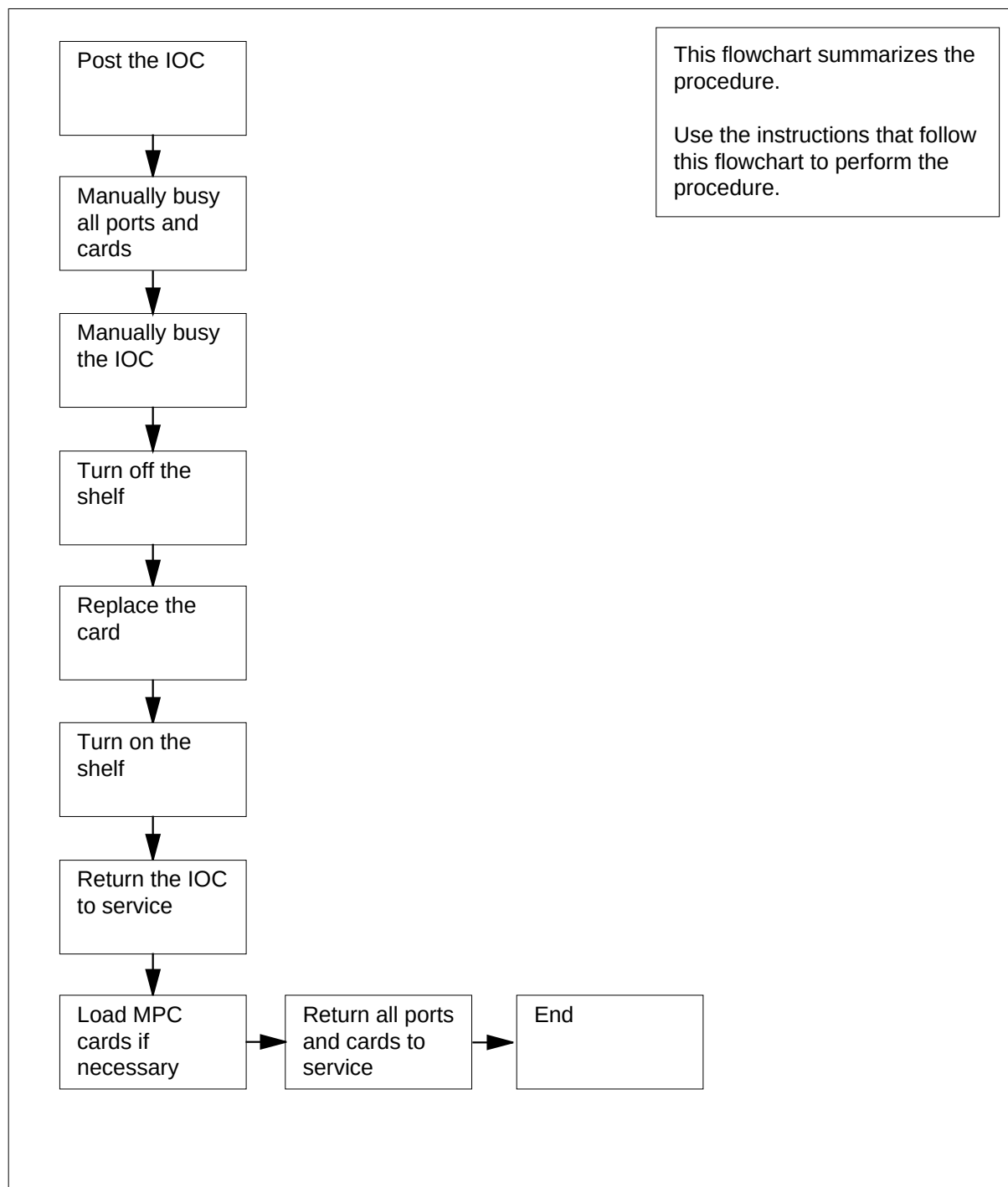
---

**Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NT2X70 in an IOC (continued)

### Summary of replacing a NT2X70 in an IOC



## NT2X70 in an IOC (continued)

### Replacing a NT2X70 in an IOC

#### At the MAP terminal

1

#### ATTENTION

This procedure directs you to manually busy all terminal controller cards for the IOC. Perform this procedure from a MAP terminal that does not connect to the IOC.



#### WARNING

##### Loss of service

This procedure directs you to remove an IOC and the device controllers from service. Perform this procedure only if you need to recover out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.



#### WARNING

##### Loss of billing and other data

If NT2X70AA, NT2X70AB, or NT2X70AC power converter cards power the IOC shelf, contact the personnel responsible for the next level of support. The following cards may not function reliably in an IOC powered by NT2X70AA, NT2X70AB, or NT2X70AC cards: NT1X55FA, NT1X89, or NT1X67BC/BD that run applications at 9600 baud (on one port or all four ports combined).

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the IOD level of the MAP display, type

**>MAPCI;MTC;IOD**

and press the Enter key.

3

To post the IOC that associates with the card you will replace, type

**>IOC ioc\_no**

and press the Enter key.

*where*

NT2X70  
in an IOC (continued)

**ioc\_no**  
is the IOC identification number (0 to 19)

Example of a MAP display:

|       |      |      |       |      |       |      |       |      |       |      |
|-------|------|------|-------|------|-------|------|-------|------|-------|------|
| IOC   | 0    | 1    | 2     | 3    |       |      |       |      |       |      |
| STAT  | .    | .    | .     | .    |       |      |       |      |       |      |
| DIRP: | NO   | AMA  | XFER: | .    | SLM : | .    | NOP : | .    | NX25: | .    |
| MLP : | .    |      | DPPP: | .    | DPPU: | .    | SCAI: | .    |       |      |
| IOC   | CARD | 0    | 1     | 2    | 3     | 4    | 5     | 6    | 7     | 8    |
| 0     | PORT | 0123 | 0123  | 0123 | 0123  | 0123 | 0123  | 0123 | 0123  | 0123 |
|       | STAT | P--- | P---  | .... | ---   | .... | ---   | .... | ---   | .... |
|       | TYPE | MTD  | DDU   | CONS | MPC   | CONS | CONS  | CONS | MPC   | CONS |

- 4 The next action depends on if terminal controller cards are on the shelf.

| If terminal controller cards | Do      |
|------------------------------|---------|
| are on the shelf             | step 5  |
| are not on the shelf         | step 11 |

- 5 To post the card, type  
>**CARD card\_no**  
and press the Enter key.  
where  
**card\_no**  
is the card identification number (0 to 8)

Example of a MAP response:

## NT2X70 in an IOC (continued)

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .---- .---- .---- .---- .---- .---- .---- .---- .----
 TYPE MTD DDU CONS MPC CONS CONS MPC
Card 6 Ckt 0 1 2 3
Status
Cons Id RD040 RD041 TEAM4 TEAM6
ConType VT100 VT100 VT100 VT100

```

- 6 Note the CONS ID and status for each port.

| If                                              | Do      |
|-------------------------------------------------|---------|
| all ports are ManBsy                            | step 10 |
| a minimum of one port is Offl                   | step 60 |
| a minimum of one port is . (dot)                | step 7  |
| all ports are in any other out-of-service state | step 8  |

- 7 Notify all operating company personnel that you will remove from service the CONS IDs that associate with the card you replace. Wait until all operating company personnel cease activity for these CONS IDs.

- 8 To manually busy a port on the card, type

**>BSY port\_no**

and press the Enter key.

where

**port\_no**

is the port identification number (0 to 3)

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 9  |
| failed             | step 68 |

- 9 Repeat step 8 until all ports on the card are manually busy. Go to step 10.

## NT2X70 in an IOC (continued)

- 10** Repeat steps 5 to 9 for each terminal controller card on the shelf. Go to step 11.
- 11** The next action depends on if multiprotocol controller cards (MPC) are on the shelf.

| If MPC cards         | Do      |
|----------------------|---------|
| are on the shelf     | step 12 |
| are not on the shelf | step 19 |

- 12** To post the card, type  
**>CARD card\_no**  
 and press the Enter key.  
*where*  
**card\_no**  
 is the card identification number (0 to 8)  
*Example of a MAP response:*

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
 0 PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .--- .---

Card 3 TYPE MTD DDU CONS MPC CONS CONS MPC
 Unit 0
 User SYSTEM BOARD LINK0 LINK1 LINK2 LINK3
 Status Ready COMACT UNEQ N/A UNEQ ENABLD

```

- 13** Determine the state of the card.

| If the card state         | Do      |
|---------------------------|---------|
| is MANB                   | step 18 |
| is OFFL                   | step 60 |
| is other than listed here | step 14 |

**Note:** The card state appears under the BOARD header on the MAP display.



## NT2X70 in an IOC (continued)

- 14** To display status information on current MPC conversations, type  
**>QCONV**  
 and press the Enter key.

*Example of a MAP response:*

| MPC | L | LCN | STATUS   | CCC  | SEC  | PARDEV | INP | OPEN | OWNER |
|-----|---|-----|----------|------|------|--------|-----|------|-------|
| 0   | 3 | 1   | INACTIVE | none | none | none   | FIL | 0    | none  |
| 0   | 3 | 2   | INACTIVE | none | none | none   | FIL | 0    | none  |

**If**

**Do**

a minimum of one session is active      step 15

all sessions are inactive      step 16

- 15** Notify all users that an interruption of MPC service will occur. Wait until all sessions are inactive before you proceed. Repeat step 14 if you need to verify MPC session activity.

- 16** To manually busy the card and links, type  
**>BSY ALL FORCE**  
 and press the Enter key.

*Example of a MAP response:*

TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND  
 Please confirm ("YES", "Y", "NO", or "N"):

- 17** To confirm the command, type  
**>YES**  
 and press the Enter key.

*Example of a MAP response:*

REQUEST PASSED FOR LINKS.REQUEST PASSED FOR CARD.

**If the BSY command**

**Do**

passed      step18

failed      step 68

- 18** Repeat steps 12 to 17 for each MPC card on the shelf. Go to step 19.

## NT2X70 in an IOC (continued)

- 19** The next action depends on if disk drive or magnetic tape controller cards are on the shelf.

| If disk drive controller cards | Do      |
|--------------------------------|---------|
| are on the shelf               | step 20 |
| are not on the shelf           | step 25 |

- 20** To post the card, type  
**>CARD card\_no**  
 and press the Enter key.  
*where*  
**card\_no**  
 is the card identification number (0 to 8)  
*Example of a MAP response:*

```

IOD
IOC 0 1 2 3
STAT

DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .
MLP : . DPPP: . DPPU: . SCAI: .

IOC CARD 0 1 2 3 4 5 6 7 8
0 PORT 0123 0123 0123 0123 0123 0123 0123 0123
 STAT .--- .--- .--- .--- .--- .--- .--- .---
 TYPE MTD DDU CONS MPC CONS CONS MPC
Card 0 MTD 0
 TapeName
 Status Idle
 User

```

- 21** Determine the state of the card.

| If the card               | Do      |
|---------------------------|---------|
| is MBSY                   | step 24 |
| is OFFL                   | step 60 |
| is other than listed here | step 22 |

- 22** To determine if files are open on the DDU, type  
**>ALLOC**  
 and press the Enter key.  
*Example of a MAP response:*

## NT2X70 in an IOC (continued)

| VOLID | VOL_NAME | SERIAL_NO | BLOCKS | ADDR | TYPE | R/O | FILES_OPEN |
|-------|----------|-----------|--------|------|------|-----|------------|
| 0     | IMAGE    | 2800      | 45000  | D000 | 0    | NO  | 0          |
| 1     | XPMLOADS | 2801      | 35000  | D000 | 0    | NO  | 0          |
| 2     | RTMLOADS | 2802      | 20000  | D000 | 0    | NO  | 0          |
| .     | .        | .         | .      | .    | .    | .   | .          |
| 7     | SMDR     | 2807      | 5000   | D000 | 0    | NO  | 0          |
| 8     | AMA1     | 2808      | 5000   | D000 | 0    | NO  | 0          |
| 9     | TST      | 2809      | 50     | D000 | 0    | NO  | 0          |
| 10    | AMA2     | 280A      | 500    | D000 | 0    | NO  | 0          |

**If files****Do**

are open

step 61

are not open

step 23

**23** To manually busy the controller, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

```
bsy
OK
```

**24** Perform steps 20 to 23 for each disk drive controller card on the shelf. Go to step 25.

**25** The next action depends on if magnetic tape drive controller cards are on the shelf.

**If magnetic tape controller cards****Do**

are on the shelf

step 26

are not on the shelf

step 31

**26** To post the card, type

**>CARD card\_no**

and press the Enter key.

*where***card\_no**

is the card identification number (0 to 8)

*Example of a MAP response:*

## NT2X70

### in an IOC (continued)

| IOD                                                                                                                                                                                                                                             |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|-------------------------|----|-----------|---------|---------|---------|---------|---------|---------------------------|---------|
| IOC                                                                                                                                                                                                                                             | 0                                                                                                                                                                | 1    | 2    | 3    |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| STAT                                                                                                                                                                                                                                            | .                                                                                                                                                                | .    | .    | .    |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| DIRP: AMA B XFER: . SLM : SLMbsy NOP : . NX25: .                                                                                                                                                                                                |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| MLP : . DPPP: . DPPU: . SCAI: .                                                                                                                                                                                                                 |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| IOC                                                                                                                                                                                                                                             | CARD                                                                                                                                                             | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |                         |    |           |         |         |         |         |         |                           |         |
| 0                                                                                                                                                                                                                                               | PORT                                                                                                                                                             | 0123 | 0123 | 0123 | 0123 | 0123 | 0123 | 0123 | 0123 | 0123 |                         |    |           |         |         |         |         |         |                           |         |
| STAT .---- .---- .---- .---- .---- .---- .---- .---- .---- .----                                                                                                                                                                                |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| Card 0 TYPE MTD DDU CONS MPC CONS CONS MPC                                                                                                                                                                                                      |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| MTD 0                                                                                                                                                                                                                                           |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| TapeName                                                                                                                                                                                                                                        |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| Status Idle                                                                                                                                                                                                                                     |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| User                                                                                                                                                                                                                                            |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| 27                                                                                                                                                                                                                                              | Determine the state of the card.                                                                                                                                 |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| <table><tr><th>If the card</th><th>Do</th></tr><tr><td>is ManBsy</td><td>step 30</td></tr><tr><td>is Offl</td><td>step 60</td></tr><tr><td>is Idle</td><td>step 29</td></tr><tr><td>is other than listed here</td><td>step 28</td></tr></table> |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      | If the card             | Do | is ManBsy | step 30 | is Offl | step 60 | is Idle | step 29 | is other than listed here | step 28 |
| If the card                                                                                                                                                                                                                                     | Do                                                                                                                                                               |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| is ManBsy                                                                                                                                                                                                                                       | step 30                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| is Offl                                                                                                                                                                                                                                         | step 60                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| is Idle                                                                                                                                                                                                                                         | step 29                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| is other than listed here                                                                                                                                                                                                                       | step 28                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| 28                                                                                                                                                                                                                                              | Notify all users that an interruption of service for the device will occur. Wait until all users cease to access the device before you proceed to the next step. |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| 29                                                                                                                                                                                                                                              | To manually busy the card, type<br><b>&gt;BSY</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br>bsyOK                                      |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| 30                                                                                                                                                                                                                                              | Repeat steps 26 to 29 for each magnetic tape drive controller card on the shelf. Go to step 31.                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| 31                                                                                                                                                                                                                                              | To return to the IOC level of the map display, type<br><b>&gt;QUIT</b><br>and press the Enter key.                                                               |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| 32                                                                                                                                                                                                                                              | Determine the state of the IOC.                                                                                                                                  |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| <table><tr><th>If the state of the IOC</th><th>Do</th></tr><tr><td>is M</td><td>step 34</td></tr></table>                                                                                                                                       |                                                                                                                                                                  |      |      |      |      |      |      |      |      |      | If the state of the IOC | Do | is M      | step 34 |         |         |         |         |                           |         |
| If the state of the IOC                                                                                                                                                                                                                         | Do                                                                                                                                                               |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |
| is M                                                                                                                                                                                                                                            | step 34                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                         |    |           |         |         |         |         |         |                           |         |

## NT2X70 in an IOC (continued)

|    | If the state of the IOC                                                          | Do      |
|----|----------------------------------------------------------------------------------|---------|
|    | is other than listed here                                                        | step 33 |
| 33 | To manually busy the IOC, type<br><b>&gt;BSY IOC</b><br>and press the Enter key. |         |

### At the shelf

34

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point to handle circuit cards. The wrist-strap grounding point is on a frame supervisory panel (FSP) or a modular supervisory panel (MSP). The wrist strap protects the cards against static electricity damage.

Pull down and set the handle of the power converter POWER switch to the OFF position.

- 35 To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note 1:** Make sure the handle of the PWR switch on the replacement power converter is in the OFF position.
- Note 2:** Determine if the card you replace has switches. Make sure the switches on the replacement card and the card you replace have the same settings.
- 36 The next action depends on the power converter version and the type of supervisory panel.

| If you                                                                            | Do      |
|-----------------------------------------------------------------------------------|---------|
| replace an NT2X70AE card and the FSP or MSP has circuit breakers                  | step 33 |
| replace an NT2X70AE card and the FSP or MSP does not have circuit breakers        | step 38 |
| do not replace an NT2X70AE card and the FSP or MSP has circuit breakers           | step 39 |
| do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers | step 40 |

**NT2X70**  
**in an IOC (continued)**

---

- 37** Power up the converter as follows:
- a** Pull up and set the handle of the POWER switch to the RESET position and hold.
  - b** Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
  - c** Release the handle.
  - d** Go to step 41.
- 38** Power up the converter as follows:
- a** Pull up and set the handle of the POWER switch to the RESET position and hold until the CONVERTER FAIL LED turns off.
  - b** Release the handle.
  - c** Go to step 41.
- 39** Power up the converter as follows:
- a** Pull up and set the handle of the POWER switch to the ON position.
  - b** Press and hold the RESET button on the power converter.
  - c** Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
  - d** Release the RESET button.
  - e** Go to step 41.
- 40** Power up the converter as follows:
- a** Pull up and set the handle of the POWER switch to the ON position.
  - b** Press the RESET button on the power converter until the CONVERTER FAIL LED turns off.
  - c** Release the RESET button.
- 41** The next action depends on the reason you perform this procedure.

---

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 42   |
| did not direct you to this procedure | step 43   |

---

- 42** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

***At the MAP terminal***

- 43** To return the IOC to service, type  
**>RTS IOC**  
and press the Enter key.

---

**NT2X70**  
**in an IOC (continued)**

---

- 44** The next action depends on if disk drive or magnetic tape controller cards are on the shelf.

---

| <b>If disk drive or magnetic tape controller cards</b> | <b>Do</b> |
|--------------------------------------------------------|-----------|
| are on the shelf                                       | step 45   |
| are not on the shelf                                   | step 48   |

---

- 45** To post the card, type  
**>CARD card\_no**  
and press the Enter key.  
*where*  
**card\_no**  
is the card identification number (0 to 8)

- 46** To return the controller to service, type  
**>RTS**  
and press the Enter key.

- 47** Repeat steps 45 and 46 for each disk drive or magnetic tape controller card on the shelf. Go to step 48.

- 48** The next action depends on if MPC cards are on the shelf.

---

| <b>If MPC cards</b>  | <b>Do</b> |
|----------------------|-----------|
| are on the shelf     | step 49   |
| are not on the shelf | step 55   |

---

- 49** To post the card, type  
**>CARD card\_no**  
and press the Enter key.  
*where*  
**card\_no**  
is the card identification number (0 to 8)

- 50** To load the MPC, type  
**>DOWNLD**  
and press the Enter key.  
*Example of a MAP response:*

## NT2X70 in an IOC (continued)

DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.

| If the DOWNLD command | Do      |
|-----------------------|---------|
| passed                | step 51 |
| failed                | step 68 |

- 51** To return the MPC to service, type

**>RTS ALL**

and press the Enter key.

*Example of a MAP response:*

REQUEST PASSED FOR CARD.REQUEST PASSED FOR LINKS.

- 52** Wait 1 min to determine the status of MPC components.

| If                                                                                                                          | Do      |
|-----------------------------------------------------------------------------------------------------------------------------|---------|
| the system status is <b>Ready</b> , the board status is <b>C0-MACT</b> , and the link status is <b>ENABLD</b> for each link | step 53 |
| the status of the MPC components are other than listed here                                                                 | step 68 |

- 53** Notify all users that the MPC is in service.

- 54** Repeat steps 49 to 53 for each MPC card on the shelf. Go to step 55.

- 55** The next action depends on if terminal controller cards are on the shelf.

| If terminal controller cards | Do      |
|------------------------------|---------|
| are on the shelf             | step 56 |
| are not on the shelf         | step 68 |

- 56** To post the card, type

**>CARD card\_no**

and press the Enter key.

*where*

**card\_no**

is the card identification number (0 to 8)

- 57** To return a port on the card to service, type

**>RTS port\_no**



## NT2X70 in an IOC (continued)

and press the Enter key.

where

**port\_no**  
is the port identification number (0 to 3)

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 58 |
| failed             | step 68 |

- 58** Repeat step 57 until all ports on the card are manually busy. Go to step 59.
- 59** Repeat steps 56 to 58 for each terminal controller card on the shelf. Go to step 68.
- 60** To determine why the component is offline, contact operating company personnel. Continue as directed by operating company personnel.
- 61**



### WARNING

#### Loss of data

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 62** Stop files recording to and from the Logutil. Type the following command at the Logutil command level:
- >LOGUTIL ; LISTDEVS**
- and press the Enter key.
- 63** Close files on volumes on the DDU of the IOC.
- >STOPDEV dev\_name**
- and press the Enter key.
- where

**NT2X70**  
**in an IOC (end)**

---

**dev\_name**  
is the name of the device

**>QUI**

and press the Enter key.

- 64** Repeat the ALLOC command to determine if files are closed, by typing

**>ALLOC**

and pressing the Enter key.

---

| <b>If the files</b> | <b>Do</b> |
|---------------------|-----------|
|---------------------|-----------|

---

|          |         |
|----------|---------|
| are open | step 65 |
|----------|---------|

|            |         |
|------------|---------|
| are closed | step 66 |
|------------|---------|

---

- 65** Confirm that you have done steps 61 to 64. If the files are still open, contact your next level of support.

- 66** Manually busy the DDU, by typing

**>BSY**

and pressing the Enter key.

---

| <b>If the DDU</b> | <b>Do</b> |
|-------------------|-----------|
|-------------------|-----------|

---

|         |         |
|---------|---------|
| is MBSY | step 67 |
|---------|---------|

|             |         |
|-------------|---------|
| is not MBSY | step 68 |
|-------------|---------|

---

- 67** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 68** For additional help, contact the next level of support.

- 69** The procedure is complete.

**NTFX30  
in an ISM**

---

**Application**

Use this procedure to replace an NTFX30 IOM controller card in an integrated services module (ISM) shelf.

| PEC    | Suffix | Card name       | Shelf or frame name |
|--------|--------|-----------------|---------------------|
| NTFX30 | AA     | Controller card | ISM                 |

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped frame
- equipped shelf

The Index contains a list of the cards, shelves, and frames that this card replacement book documents.

**Common procedures**

This procedure refers to the common procedure *Replacing a card*.

Do not go to the common procedure unless the step-action procedure directs you to go.

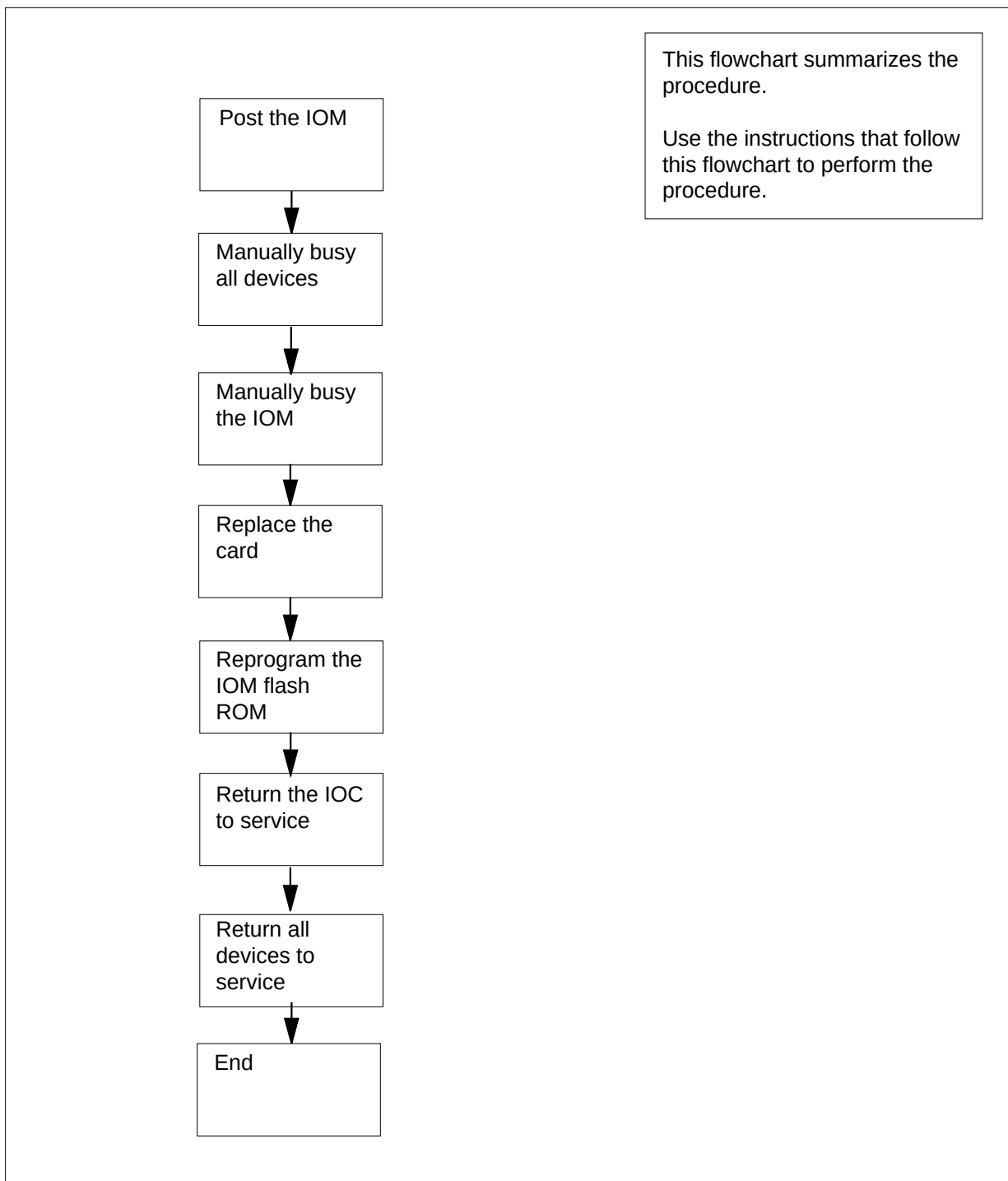
**Action**

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

## NTFX30 in an ISM (continued)

---

### Summary of replacing a NTFX30 in an ISM



## NTFX30 in an ISM (continued)

### Replacing a NTFX30 in an ISM

#### ATTENTION

This procedure directs you to manually busy the controller card for the IOM. Perform this procedure from a MAP terminal that does not connect to the IOM.



#### WARNING

##### Loss of service

This procedure instructs you to remove the controller card for the IOM. Perform this procedure only if you need to recover out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

#### *At the MAP terminal*

- 1 Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

#### *At the MAP terminal*

- 2 To access the IOD level of the MAP display, type

**>MAPCI;MTC;IOD**

and press the Enter key.

*Example of a MAP display:*

IOD

IOC 0 1 2 3

STAT . . . S

DIRP: SMDR B XFER: . SLM : . NPO: . NX25: .  
MLP : . DPPP: . DPPU: . SCAI :

- 3 To post the IOM controller system configured, type

**>IOC ioc\_no**

and press the Enter key.

*where*

**ioc\_no**

is the IOM identification number

*Example of an IOM MAP display:*

## NTFX30 in an ISM (continued)

```
IOD
IOC 0 1 2 3
STAT . . . S
```

```
DIRP: SMDR B XFER: . SLM : . NPO: . NX25: .
MLP : . DPPP: . DPPU: . SCAI :
```

```
IOC PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
(IOM) STAT . . . - . . - - - . - - - - - - - -
0 TYPE C C C C M M S S
 0 0 0 0 T P C C
 N N N N D C S S
```

- 4 The next action depends on if terminal controller ports are on the shelf.

| If terminal controller ports | Do      |
|------------------------------|---------|
| are on the shelf             | step 5  |
| are not on the shelf         | step 10 |

- 5 Note the consoles (CONS) ID and status for each port.

| If                                              | Do      |
|-------------------------------------------------|---------|
| all ports are ManBsy                            | step 10 |
| a minimum of one port is Offl                   | step 55 |
| a minimum of one port is . (dot)                | step 6  |
| all ports are in any other out-of-service state | step 8  |

- 6 Notify all operating company personnel that you will remove from service the CONS IDs that associate with the card you manually busy. Wait until all operating company personnel terminate the activity of these CONS IDs.

- 7 To post the port that associates with the CONS you replace, type

```
>PORT port_no
```

and press the Enter key.

where

**port\_no**  
is the port identification number

*Example of an IOM MAP display:*

## NTFX30 in an ISM (continued)

```

Port 0 Status Disc
 Cons Id 1CONS
 ConType VT100

```

- 8** To manually busy the device, type  
**>BSY**

and press the Enter key.

*Example of MAP response:*

```

bsy
OK

```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 9  |
| failed             | step 63 |

- 9** Repeat step 8 until all CONS ports are manually busy.

- 10** The next action depends on if multiprotocol ports (MPC) are on the controller card.

| If MPC ports                   | Do      |
|--------------------------------|---------|
| are on the controller card     | step 11 |
| are not on the controller card | step 18 |

- 11** To post a port that associates with the MPC, type  
**>PORT port\_no**  
and press the Enter key.

*where*

**port\_no**  
is the port identification number

*Example of an IOM MAP display:*

```

Port 9 Unit 1
 User SYSTEM PROTOCOL LINK
 Status Ready X2584 COMACT ENABLED

```

- 12** Determine the state of the port.

| If the port state | Do      |
|-------------------|---------|
| is ManB           | step 17 |

## NTFX30 in an ISM (continued)

|     | If the port state                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Do      |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|------|------|--------|-----|------|-------|--|-----|---|-----|--------|-----|-----|--------|-----|------|-------|-----|---|-----|-------|-----|-----|-------|-----|-----|-------|---|---|---|----------|------|------|------|-----|---|------|---|---|---|----------|------|------|------|-----|---|------|
|     | is OFFL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | step 55 |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | is other than listed here                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | step 13 |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| 13  | To display status information on current MPC conversations, type<br><b>&gt;QCONV</b><br>and press the Enter key.<br><i>Example of a MAP response:</i>                                                                                                                                                                                                                                                                                                                                                                                                            |         |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | <table><tr><th>MPC</th><th>L</th><th>LCN</th><th>STATUS</th><th>CCC</th><th>SEC</th><th>PARDEV</th><th>INP</th><th>OPEN</th><th>OWNER</th></tr><tr><td>---</td><td>-</td><td>---</td><td>-----</td><td>---</td><td>---</td><td>-----</td><td>---</td><td>---</td><td>-----</td></tr><tr><td>0</td><td>3</td><td>1</td><td>INACTIVE</td><td>none</td><td>none</td><td>none</td><td>FIL</td><td>0</td><td>none</td></tr><tr><td>0</td><td>3</td><td>2</td><td>INACTIVE</td><td>none</td><td>none</td><td>none</td><td>FIL</td><td>0</td><td>none</td></tr></table> |         |          |      |      |        |     |      |       |  | MPC | L | LCN | STATUS | CCC | SEC | PARDEV | INP | OPEN | OWNER | --- | - | --- | ----- | --- | --- | ----- | --- | --- | ----- | 0 | 3 | 1 | INACTIVE | none | none | none | FIL | 0 | none | 0 | 3 | 2 | INACTIVE | none | none | none | FIL | 0 | none |
| MPC | L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LCN     | STATUS   | CCC  | SEC  | PARDEV | INP | OPEN | OWNER |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| --- | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ---     | -----    | ---  | ---  | -----  | --- | ---  | ----- |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| 0   | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1       | INACTIVE | none | none | none   | FIL | 0    | none  |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| 0   | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2       | INACTIVE | none | none | none   | FIL | 0    | none  |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | If                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Do      |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | a minimum of one session is active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | step 14 |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | all sessions are inactive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | step 15 |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| 14  | Notify all users that an interruption of MPC service will occur. Wait until all sessions are inactive before you proceed. To verify MPC session activity, repeat step 13.                                                                                                                                                                                                                                                                                                                                                                                        |         |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| 15  | To manually busy the port and the port links, type<br><b>&gt;BSY FORCE</b><br>and press the Enter key.<br><i>Example of MAP response:</i>                                                                                                                                                                                                                                                                                                                                                                                                                        |         |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND<br>Please confirm ("YES", "Y", "NO", or "N")                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
| 16  | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.<br><i>Example of MAP response:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | REQUEST PASSED FOR UNIT<br>REQUEST PASSED FOR LINK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | If the BSY command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Do      |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |
|     | passed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | step 17 |          |      |      |        |     |      |       |  |     |   |     |        |     |     |        |     |      |       |     |   |     |       |     |     |       |     |     |       |   |   |   |          |      |      |      |     |   |      |   |   |   |          |      |      |      |     |   |      |



## NTFX30 in an ISM (continued)

|           | <b>If the BSY command</b>                                                                                                                                                                                                                 | <b>Do</b> |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                                                                                    | step 63   |
| <b>17</b> | Repeat steps 11 to 16 for each MPC port on the IOM.                                                                                                                                                                                       |           |
| <b>18</b> | The next action depends on if disk drive ports are on the controller card.                                                                                                                                                                |           |
|           | <b>If disk drive ports</b>                                                                                                                                                                                                                | <b>Do</b> |
|           | are on the shelf                                                                                                                                                                                                                          | step 19   |
|           | are not on the shelf                                                                                                                                                                                                                      | step 24   |
| <b>19</b> | To post a port that associates with the disk drive unit (DDU), type<br><b>&gt;PORT port_no</b><br>and press the Enter key.<br><i>where</i><br><b>port_no</b><br>is the port identification number<br><i>Example of a IOM MAP display:</i> |           |
|           | Port 16    Unit            0<br>(SCSI)    User            system            Drive_State<br>Status        Ready            On_line                                                                                                         |           |
| <b>20</b> | Determine the state of the port.                                                                                                                                                                                                          |           |
|           | <b>If the port</b>                                                                                                                                                                                                                        | <b>Do</b> |
|           | is ManB                                                                                                                                                                                                                                   | step 24   |
|           | is OFFL                                                                                                                                                                                                                                   | step 55   |
|           | is other than listed here                                                                                                                                                                                                                 | step 21   |
| <b>21</b> | To determine if open files are on the DDU, type<br><b>&gt;ALLOC</b><br>and press the Enter key.<br><i>Example of a MAP display:</i>                                                                                                       |           |

## NTFX30 in an ISM (continued)

| VOLID | VOL_NAME | SERIAL_NO | BLOCKS | ADDR | TYPE | R/O | FILES_OPEN |
|-------|----------|-----------|--------|------|------|-----|------------|
| 0     | IMAGE    | 2800      | 45000  | D000 | 0    | NO  | 0          |
| 1     | XPMLoads | 2801      | 35000  | D000 | 0    | NO  | 0          |
| 2     | RTMLoads | 2802      | 20000  | D000 | 0    | NO  | 0          |
| .     | .        | .         | .      | .    | .    | .   | .          |
| 7     | SMDR     | 2807      | 5000   | D000 | 0    | NO  | 0          |
| 8     | AMA1     | 2808      | 5000   | D000 | 0    | NO  | 0          |
| 9     | TST      | 2809      | 50     | D000 | 0    | NO  | 0          |
| 10    | AMA2     | 280A      | 500    | D000 | 0    | NO  | 0          |

**If open files****Do**

are on the DDU

step 56

are not on the DDU

step 22

- 22** To manually busy the device on the controller card, type

**>BSY**

and press the Enter key.

*Example of MAP response:*

bsy

OK

- 23** If a second DDU is on the controller card, repeat steps 19 to 22.

- 24** The next action depends on if magnetic tape drive (MTD) or digital audio tape (DAT) ports are on the controller card.

**If MTD or DAT ports****Do**

are on the controller card

step 25

are not on the controller card

step 30

- 25** To post a port that associates with the MTD or DAT, type

**>PORT port\_no**

and press the Enter key.

*where***port\_no**

is the port identification number

*Example of a IOM MAP display:*

## NTFX30 in an ISM (continued)

| Port | 5                                                                                                                                                                | MTD<br>TapeName<br>Status      | Ready     | DevType<br>User |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------|-----------------|
| 26   | Determine the state of the port.                                                                                                                                 |                                |           |                 |
|      |                                                                                                                                                                  | <b>If the port state</b>       | <b>Do</b> |                 |
|      |                                                                                                                                                                  | is ManB                        | step 30   |                 |
|      |                                                                                                                                                                  | is OFFL                        | step 55   |                 |
|      |                                                                                                                                                                  | is Idle                        | step 28   |                 |
|      |                                                                                                                                                                  | is other than listed here      | step 27   |                 |
| 27   | Notify all users that an interruption of service for the device will occur. Wait until all users cease to access the device before you proceed to the next step. |                                |           |                 |
| 28   | To manually busy the port, type<br><b>&gt;BSY</b><br>and press the Enter key.<br><i>Example of MAP response:</i><br><br>bsy<br>OK                                |                                |           |                 |
| 29   | Repeat steps 25 to 28 for each magnetic tape drive or digital audio port on the controller card.                                                                 |                                |           |                 |
| 30   | To return to the IOC level of the MAP display, type<br><b>&gt;QUIT</b><br>and press the Enter key.                                                               |                                |           |                 |
| 31   | Determine the state of the IOM.                                                                                                                                  |                                |           |                 |
|      |                                                                                                                                                                  | <b>If the state of the IOM</b> | <b>Do</b> |                 |
|      |                                                                                                                                                                  | is M                           | step 33   |                 |
|      |                                                                                                                                                                  | is other than listed here      | step 32   |                 |
| 32   | To manually busy the IOM controller card, type<br><b>&gt;BSY IOC</b><br>and press the Enter key.<br><i>Example of MAP response:</i>                              |                                |           |                 |

## NTFX30 in an ISM (continued)

---

bsy  
OK

### *At the ISM shelf*

33



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of the modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the controller card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

34

Wait for internal diagnostic tests on the card to complete.

**Note 1:** After you insert the new NTFX30 card, the LED is off for approximately 30 seconds. The color of the LED changes to red and then to green if the internal diagnostic tests pass. The internal diagnostic tests take less than 2 minutes.

**Note 2:** You view the LED through a small plastic window on the card faceplate.

35

To list the IOM load file, type

**>DISKUT;LF VOLUME**

and press the Enter key.

36

To access the TOOLSUP control, type

**>TOOLSUP**

and press the Enter key.

37

To access the UPGIOM tool, type

**>ACCESS ON UPGIOM**

and press the Enter key.

**Note:** The command response asks for a password. To obtain the password, call Northern Telecom. Use the password to enter.

## NTFX30 in an ISM (continued)

38

**DANGER****How to download IOM load file**

This command downloads the complete IOM load file as specified in the parameter. The command provides reprogramming options for the flash.

To reprogram the IOM flash ROM on the new controller card, type

**>UPGIOM file\_name RPGM**

and press the Enter key.

where

**file\_name**  
is the IOM load file

**Note:** RPGM is the optional parameter that indicates if the system specifies the reprogramming option

*Example input*

**>UPGIOM IOMRAA01 RPGM**

*Example of MAP response:*

WARNING: This command will reprogram the onboard IOM Flash memory. Proceed with caution.

Reprogramming 100%  
Reprogram IOC 14 successful

| If the reprogram | Do      |
|------------------|---------|
| passes           | step 41 |
| fails            | step 39 |

## NTFX30 in an ISM (continued)

---

### *At the ISM shelf*

39



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of the MSP to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the failed controller card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.

40



#### **DANGER**

##### **How to download IOM load file**

This command downloads the complete IOM load file as specified in the parameter. The command also provides reprogramming options for the flash.

To reprogram the IOM flash ROM on the new controller card, type

**>UPGIOM file\_name RPGM**

and press the Enter key.

where

**file\_name**

is the IOM load file

**Note:** RPGM is the optional parameter that indicates if the system specifies the reprogramming option

*Example input*

**>UPGIOM IOMRAA01 RPGM**

*Example of MAP response:*

## NTFX30 in an ISM (continued)

WARNING: This command will reprogram the onboard IOM Flash memory. Proceed with caution.

Reprogramming 100%  
Reprogram IOC 14 successful

|                            | If the reprogram                                                                                                             | Do      |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|---------|
|                            | passes                                                                                                                       | step 41 |
|                            | fails                                                                                                                        | step 63 |
| 41                         | To quit the TOOLSUP utility, type<br><b>&gt;QUIT</b><br>and press the Enter key.                                             |         |
| 42                         | The next action depends on the reason that you perform this procedure.                                                       |         |
|                            | If a maintenance procedure                                                                                                   | Do      |
|                            | directed you to this procedure                                                                                               | step 43 |
|                            | did not direct you to this procedure                                                                                         | step 44 |
| 43                         | Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.. |         |
| <b>At the MAP terminal</b> |                                                                                                                              |         |
| 44                         | To return the IOM to service, type<br><b>&gt;RTS IOC</b><br>and press the Enter key.                                         |         |
| 45                         | The next action depends on if consoles, disk drives, magnetic tape drives or DAT tape ports are present.                     |         |
|                            | If console, disk drive, magnetic drive or DAT ports                                                                          | Do      |
|                            | are present                                                                                                                  | step 46 |
|                            | are not present                                                                                                              | step 49 |
| 46                         | To post the device port, type<br><b>&gt;PORT port_no</b><br>and press the Enter key.<br><i>where</i>                         |         |

---

**NTFX30**  
**in an ISM** (continued)

---

- port\_no**  
is the port identification number (0 to 17)
- 47** To return the port to service, type  
**>RTS**  
and press the Enter key.
- | If RTS command | Do      |
|----------------|---------|
| passes         | step 48 |
| fails          | step 63 |
- 48** Repeat steps 46 and 47 for each disk drive, magnetic tape drive or DAT tape port.
- 49** The next action depends on if MPC ports are present.
- | If MPC ports    | Do      |
|-----------------|---------|
| are present     | step 50 |
| are not present | step 64 |
- 50** To post the MPC port, type  
**>PORT port\_no**  
and press the Enter key.  
*where*  
**port\_no**  
is the port identification number (0 to 17)
- 51** To return the MPC port to service, type  
**>RTS**  
and press the Enter key.  
*Example of MAP response:*
- ```
REQUEST PASSED FOR UNIT  
REQUEST PASSED FOR LINKS
```
If RTS command	Do
passes	step 52
fails	step 63

NTFX30 in an ISM (continued)

- 52 Check the status of MPC components

If	Do
the system status is Ready, the port status is COMACT, and the link status is ENABLED for each link.	step 50
status of MPC components is other than listed here	step 63

- 53 Repeat steps 50 to 52 for each port on the shelf.

- 54 Notify users that MPC service is available.

- 55 To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

- 56



WARNING

Loss of data

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 57 Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

>LOGUTIL ; LISTDEVS

and press the Enter key.

- 58 Close files on volumes on the DDU of the IOC.

>STODEV dev_name

and press the Enter key.

where

dev_name

is the name of the device

>QUIT

NTFX30
in an ISM (end)

- and press the Enter key.
- 59** Repeat the ALLOC command to determine if files are closed, by typing
>ALLOC
and pressing the Enter key.
- | If the files | Do |
|---------------------|-----------|
| are open | step 60 |
| are closed | step 61 |
- 60** Confirm that you have done steps 56 to 59. If the files are still open, contact your next level of support.
- 61** Manually busy the DDU, by typing
>BSY
and pressing the Enter key.
- | If the DDU | Do |
|-------------------|-----------|
| is MBSY | step 62 |
| is not MBSY | step 63 |
- 62** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.
- 63** For additional help, contact the next level of support.
- 64** The procedure is complete.

**NTFX31
in an ISM**

Application

Use this procedure to replace an NTFX31 paddle board assembly in an input/output module (IOM) in an integrated services module (ISM) shelf.

PEC	Suffix	Card name	Shelf or frame name
NTFX31	AA	Paddle board assembly	ISM

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped frame
- equipped shelf

The Index contains a list of the cards, shelves, and frames that this card replacement book documents.

Common procedures

This procedure refers to the common procedure *Replacing a card*.

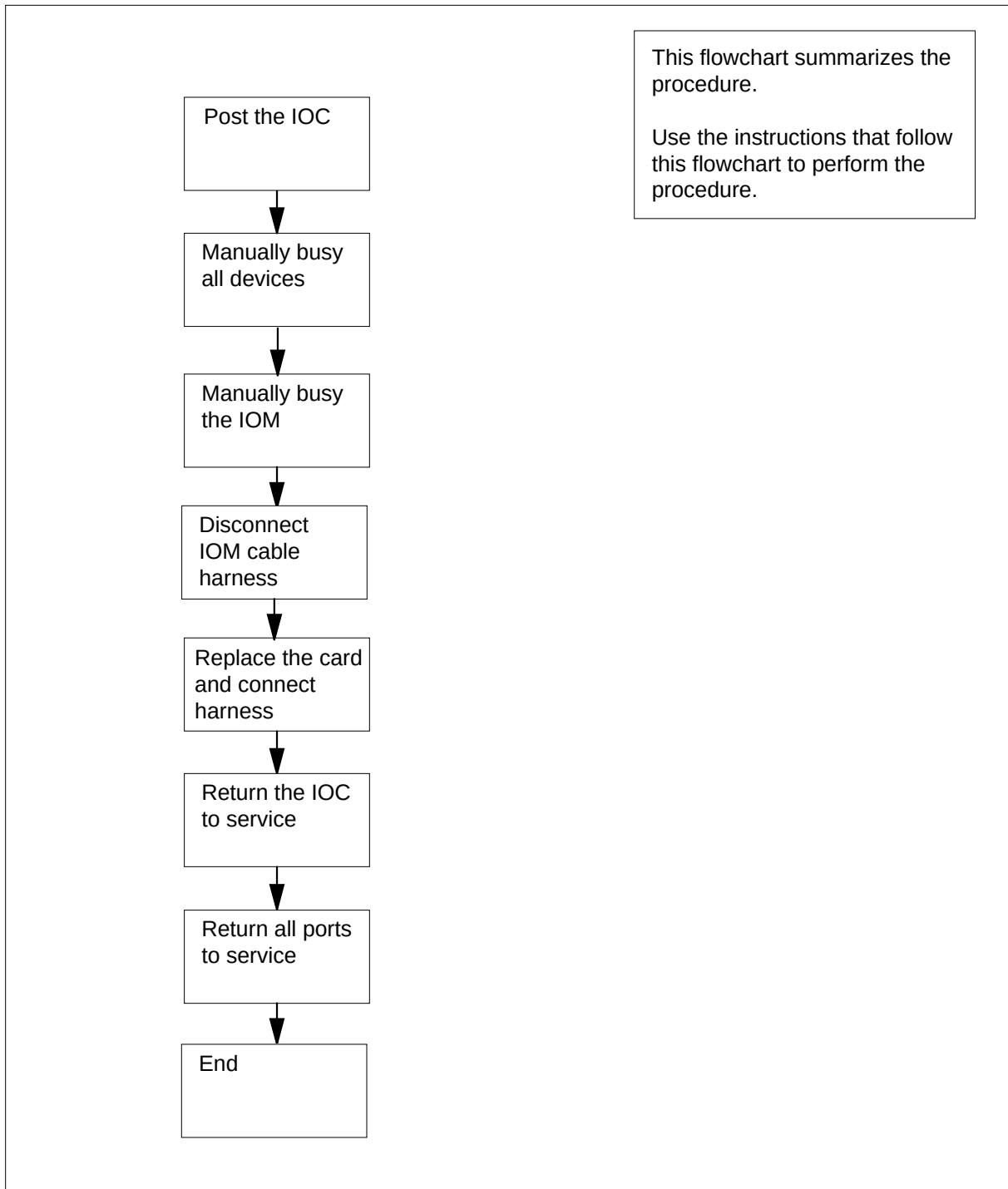
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NTFX31 in an ISM (continued)

Summary of replacing a NTFX31 in an ISM



NTFX31 in an ISM (continued)

NTFX31 in an ISM

ATTENTION

This procedure directs you to manually busy the controller card for the IOM. Perform this procedure from a MAP terminal that does not connect to the IOM.



WARNING

Loss of service

This procedure instructs you to remove the paddle board for the IOM. Perform this procedure only if you need to recover out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

At the MAP terminal

- 1 Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

At the MAP terminal

- 2 To access the IOD level of the MAP display, type

>MAPCI;MTC;IOD

and press the Enter key.

Example of a MAP display:

IOD

IOC 0 1 2 3

STAT . . . S

DIRP: SMDR B XFER: . SLM : . NPO: . NX25: .
MLP : . DPPP: . DPPU: . SCAI :

- 3 To post the configured IOM controller, type

>IOC ioc_no

and press the Enter key.

where

ioc_no

is the IOM identification number

Example of an IOM MAP display:

NTFX31 in an ISM (continued)

```
IOD
IOC  0  1  2  3
STAT .  .  .  S
```

```
DIRP: SMDR B XFER:  .  SLM :  .  NPO:  .  NX25:  .
MLP :  .  DPPP:  .  DPPU:  .  SCAI :
```

```
IOC  PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
(IOM) STAT . . . - . . - - - . - - - - - - - -
0      TYPE C C C  C M      M      S  S
          0 0 0  0 T      P      C  C
          N N N  N D      C      S  S
```

- 4 The next action depends on if terminal controller ports are on the shelf.

If terminal controller ports	Do
are on the shelf	step 5
are not on the shelf	step 10

- 5 Note the consoles (CONS) ID and status for each port.

If	Do
all ports are ManBsy	step 9
a minimum of one port is Offl	step 65
a minimum of one port is (.) dot	step 6
all ports are in any other out-of- service state	step 8

- 6 Notify all operating company personnel that you will remove from service the CONS IDs that associate with the controller card that you manually busy. Wait until all operating company personnel terminate activity for these CONS IDs.

- 7 To post the port that associates with the CONS that you replace, type

>PORT port_no

and press the Enter key.

where

port_no
is the port identification number

Example of an IOM MAP display:

NTFX31 in an ISM (continued)

```

Port 2      Status      Disc
      Cons Id    1CONS
      ConType    VT100

```

- 8** To manually busy the device, type
>BSY

and press the Enter key.

Example of MAP response:

```

bsy
OK

```

If the BSY command	Do
passed	step 9
failed	step 66

- 9** Repeat step 7 and 8 until all CONS ports are manually busy.

- 10** The next action depends on if multiprotocol ports (MPC) are on the controller card.

If MPC ports	Do
are on the controller card	step 11
are not on the controller card	step 18

- 11** To post a port that associates with the MPC, type
>PORT port_no
and press the Enter key.

where

port_no
is the port identification number

Example of an IOM MAP display:

```

Port 9      Unit      1
      User   SYSTEM   PROTOCOL   LINK
      Status Ready    X2584      COMACT  ENABLED

```

- 12** Determine the state of the port.

If the port	Do
is ManB	step18

NTFX31 in an ISM (continued)

	If the port	Do																																															
	is OFFL	step 65																																															
	is other than listed here	step13																																															
13	To display status information on current MPC conversations, type >QCONV and press the Enter key. <i>Example of a MAP response:</i>																																																
	<table><tr><th>MPC</th><th>L</th><th>LCN</th><th>STATUS</th><th>CCC</th><th>SEC</th><th>PARDEV</th><th>INP</th><th>OPEN</th><th>OWNER</th></tr><tr><td>---</td><td>-</td><td>---</td><td>-----</td><td>---</td><td>---</td><td>-----</td><td>---</td><td>---</td><td>-----</td></tr><tr><td>0</td><td>3</td><td>1</td><td>INACTIVE</td><td>none</td><td>none</td><td>none</td><td>FIL</td><td>0</td><td>none</td></tr><tr><td>0</td><td>3</td><td>2</td><td>INACTIVE</td><td>none</td><td>none</td><td>none</td><td>FIL</td><td>0</td><td>none</td></tr></table>									MPC	L	LCN	STATUS	CCC	SEC	PARDEV	INP	OPEN	OWNER	---	-	---	-----	---	---	-----	---	---	-----	0	3	1	INACTIVE	none	none	none	FIL	0	none	0	3	2	INACTIVE	none	none	none	FIL	0	none
MPC	L	LCN	STATUS	CCC	SEC	PARDEV	INP	OPEN	OWNER																																								
---	-	---	-----	---	---	-----	---	---	-----																																								
0	3	1	INACTIVE	none	none	none	FIL	0	none																																								
0	3	2	INACTIVE	none	none	none	FIL	0	none																																								
	If	Do																																															
	a minimum of one session is active	step14																																															
	all sessions are inactive	step15																																															
14	Notify all users that an interruption of MPC service will occur. Wait until all sessions are inactive before you proceed. To verify MPC session activity, repeat step 13.																																																
15	To manually busy the port and port links, type >BSY FORCE and press the Enter key. <i>Example of a MAP response:</i>																																																
	TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND Please confirm ("YES", "Y", "NO", or "N")																																																
16	To confirm the command, type >YES and press the Enter key. <i>Example of MAP response:</i>																																																
	REQUEST PASSED FOR UNIT REQUEST PASSED FOR LINK																																																
	If the BSY command	Do																																															
	passed	step 17																																															

NTFX31 in an ISM (continued)

		If the BSY command	Do												
		failed	step 66												
17	Repeat steps 11 to 16 for each MPC port on the IOM.														
18	The next action depends on if disk drive unit (DDU) ports are on the controller card.														
		If DDU ports	Do												
		are on the shelf	step 19												
		are not on the shelf	step 24												
19	To post a port that associates with the DDU, type >PORT port_no and press the Enter key. <i>where</i> port_no is the port identification number <i>Example of an IOM MAP display:</i>														
	<table> <tr> <td>Port 16</td><td>Unit</td><td>0</td><td></td></tr> <tr> <td>(SCSI)</td><td>User</td><td>system</td><td>Drive_State</td></tr> <tr> <td></td><td>Status</td><td>Ready</td><td>On_line</td></tr> </table>			Port 16	Unit	0		(SCSI)	User	system	Drive_State		Status	Ready	On_line
Port 16	Unit	0													
(SCSI)	User	system	Drive_State												
	Status	Ready	On_line												
20	Determine the state of the port.														
		If the port	Do												
		is ManB	step 24												
		is OFFL	step 65												
		is other than listed here	step 21												
21	To determine if open files are on the DDU, type >ALLOC and press the Enter key. <i>Example of a MAP display:</i>														

NTFX31

in an ISM (continued)

VOLID	VOL_NAME	SERIAL_NO	BLOCKS	ADDR	TYPE	R/O	FILES_OPEN
0	IMAGE	2800	45000	D000	0	NO	0
1	XPMLOADS	2801	35000	D000	0	NO	0
2	RTMLOADS	2802	20000	D000	0	NO	0
.	.	.	.	.	.	.	.
7	SMDR	2807	5000	D000	0	NO	0
8	AMA1	2808	5000	D000	0	NO	0
9	TST	2809	50	D000	0	NO	0
10	AMA2	280A	500	D000	0	NO	0

If open files**Do**

are on the DDU

step 57

are not on the DDU

step 22

- 22** To manually busy the device on the controller card, type

>BSY

and press the Enter key.

Example of MAP response:

bsy

OK

- 23** Repeat steps 19 to 22 if a second DDU is on the controller card.

- 24** The next action depends on if magnetic tape drive (MTD) or digital audio tape (DAT) ports are on the controller card.

If MTD or DAT ports**Do**

are on the controller card

step 25

are not on the controller card

step 30

- 25** To post a port that associates with the MTD or DAT, type

>PORT port_no

and press the Enter key.

*where***port_no**

is the port identification number

Example of an IOM MAP display:

NTFX31 in an ISM (continued)

Port 5	MTD TapeName Status	Idle	DevType User
26	Determine the state of the port.		
If the port		Do	
is ManBsy		step 29	
is OFFL		step 65	
is Idle		step 28	
is other than listed here		step 27	
27	Notify all users that an interruption of service for the device will occur. Wait until all users cease to access the device before you proceed to the next step.		
28	To manually busy the device, type >BSY and press the Enter key. <i>Example of MAP response:</i> bsy OK		
29	Repeat steps 25 to 28 for each MTD device or DAT on the IOM.		
30	To return to the IOC level of the MAP display, type >QUIT and press the Enter key.		
31	Determine the state of the IOM.		
If the state of the IOM		Do	
is M		step 33	
is other than listed here		step 32	
32	To manually busy the IOM controller card, type >BSY IOC and press the Enter key. <i>Example of MAP response:</i> bsy OK		

NTFX31 in an ISM (continued)

At the front of the ISM shelf

33



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of the modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Unseat the IOM controller card NTFX30 in slot 3 or 4 of the ISM shelf.

- 34 If the media storage card NTFX32 is equipped, unseat the card. The card is in slots 4 and 5.

At the rear of the ISM shelf

35



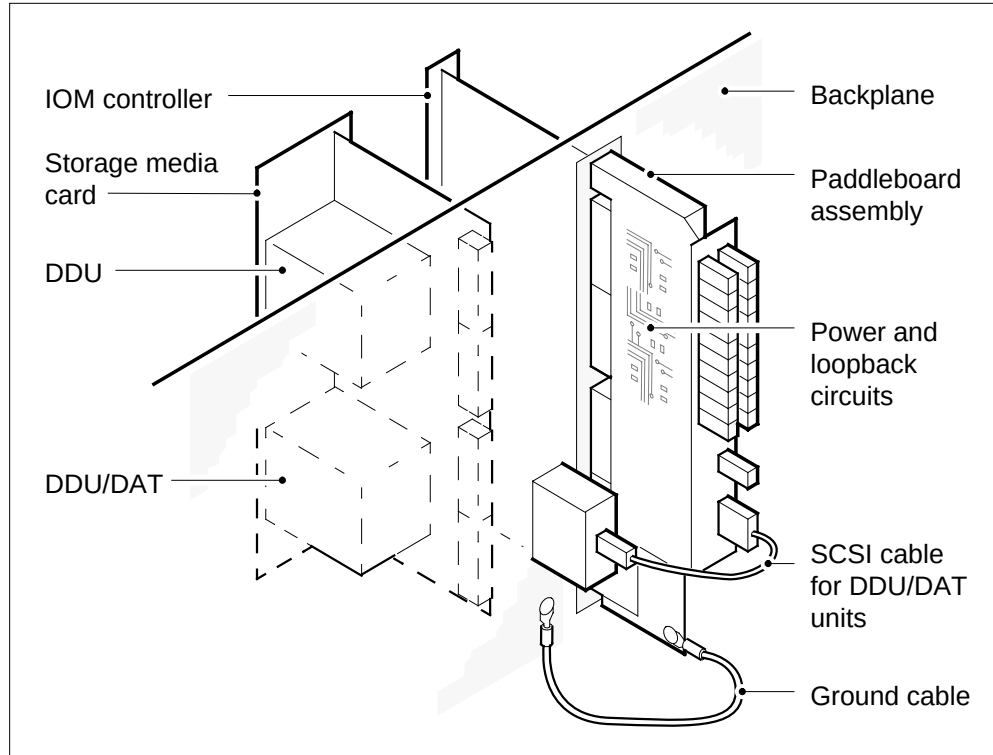
WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of MSP to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Locate the paddle board assembly in slot 03 or 04 on the backplane. Note the numbers and positions of the connectors on the harness from the paddle board. Detach the connectors on the harness from the paddle board.

Disconnect the cable harness that connects the paddle board to the DDU/DAT connector on the backplane.

NTFX31
in an ISM (continued)

- 36** Locate the paddle board ground cable. Disconnect at the backplane end of the cable. Refer to the diagram in step 35.
- 37** To replace the paddle board assembly in slots 03 or 04, remove the bolts that secure the paddle board bracket to the backplane. Secure the paddle board assembly in position with screws and washers. Refer to the diagram in step 35.
- 38** Connect the paddle board ground cable. Refer to the diagram in step 35.
- 39** Connect the connectors on the cable harness to the receptacles on the paddleboard assembly and the DDU/DAT connector on the backplane. Make sure that the names on the cable connectors match the names on the paddle board.
- 40** Connect the cable harness to the DDU/DAT connector on the backplane.

NTFX31 in an ISM (continued)

At the front of the ISM shelf

41



WARNING

Static electricity damage

Wear a wrist strap that connects to the wrist-strap grounding point of the MSP to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Reseat the NTFX32 card that you unseated in step 34.

Note 1: After you reseat the NTFX32 card, both LEDs on the faceplate must be on.

Note 2: You view the LED through a plastic window (light pipe) on the card faceplate.

42 Reseat the NTFX30 card that you unseated in step 33.

43 Wait for internal diagnostic tests on the NTFX30 card to complete.

Note 1: After you reseat the NTFX30 card, the LED is off for approximately 30 seconds. The color of the LED changes to red and then to green if the internal diagnostic tests pass. The internal diagnostic tests take less than 2 minutes.

Note 2: You view the LED through a small plastic window on the card faceplate.

44 The next action depends on the reason that you perform the procedure.

If a maintenance procedure	Do
directed you to this procedure	step 45
did not direct you to this procedure	step 46

45 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

At the MAP terminal

46 To return the IOM to service, type

>RTS IOC

and press the Enter key.

47 The next action depends on if consoles, disk drives, MTDs, or DAT tape ports are present.

If consoles, disk drives, MTDs, or DAT ports	Do
are present	step 48

NTFX31 in an ISM (continued)

	<table> <tr> <th>If consoles, disk drives, MTDs, or DAT ports</th><th>Do</th></tr> <tr> <td>are not present</td><td>step 51</td></tr> </table>	If consoles, disk drives, MTDs, or DAT ports	Do	are not present	step 51		
If consoles, disk drives, MTDs, or DAT ports	Do						
are not present	step 51						
48	To post the device port, type >PORT port_no and press the Enter key. <i>where</i> port_no is the port identification number (0 to 17)						
49	To return the port to service, type >RTS and press the Enter key. <table> <tr> <th>If the RTS command</th><th>Do</th></tr> <tr> <td>passes</td><td>step 50</td></tr> <tr> <td>fails</td><td>step 66</td></tr> </table>	If the RTS command	Do	passes	step 50	fails	step 66
If the RTS command	Do						
passes	step 50						
fails	step 66						
50	Repeat steps 48 and 49 for each disk drive, MTD, or DAT tape port.						
51	The next action depends on if MPC ports are present.						
	<table> <tr> <th>If MPC ports</th><th>Do</th></tr> <tr> <td>are present</td><td>step 52</td></tr> <tr> <td>are not present</td><td>step 67</td></tr> </table>	If MPC ports	Do	are present	step 52	are not present	step 67
If MPC ports	Do						
are present	step 52						
are not present	step 67						
52	To post the MPC port, type >PORT port_no and press the Enter key. <i>where</i> port_no is the port identification number (0 to 17)						
53	To return the MPC port to service, type >RTS ALL and press the Enter key. <i>Example of a MAP response:</i> REQUEST PASSED FOR PORT REQUEST PASSED FOR LINKS						

NTFX31 in an ISM (continued)

- 54 Check the status of MPC components.

If

Do

the system status is Ready, the port status is COMACT, and the link status the system status is ENABLED for each link.

step 55

the status of MPC components is other than listed here

step 66

- 55 Repeat steps 52 to 54 for each port on the shelf.

- 56 Notify users that MPC service is available.

57



WARNING

Loss of data

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

- 58 Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

>LOGUTIL;LISTDEVS

and press the Enter key.

- 59 Close files on volumes on the DDU of the IOC.

>STOPDEV dev_name

and press the Enter key.

where

dev_name

is the name of the device

NTFX31 in an ISM (end)

- 60** To quit the disk utility, type
>QUIT
and press the Enter key.
- 61** Repeat the ALLOC command to determine if files are closed, by typing
>ALLOC
and pressing the Enter key.
- | If the files | Do |
|--------------|---------|
| are open | step 62 |
| are closed | step 63 |
- 62** Confirm that you have done steps 57 to 61. If the files are still open, contact your next level of support.
- 63** Manually busy the DDU, by typing
>BSY
and pressing the Enter key.
- | If the DDU is | Do |
|---------------|---------|
| MBSY | step 64 |
| not MBSY | step 66 |
- 64** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.
- 65** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 66** For additional help, contact the next level of support.
- 67** The procedure is complete.

NTFX32AA in an ISM

Application

Use this procedure to replace an NTFX32AA storage media card in the shelves or frames identified in the following table.

PEC	Suffixes	Card name	Shelf/frame name
NTFX32	AA	Storage media card	ISM

To replace an NTFX32BA (3.5-in. disk drive unit) and an NTFX32CA (digital audio tape unit) see *Trouble Locating and Clearing Procedures*.

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped frame
- equipped shelf

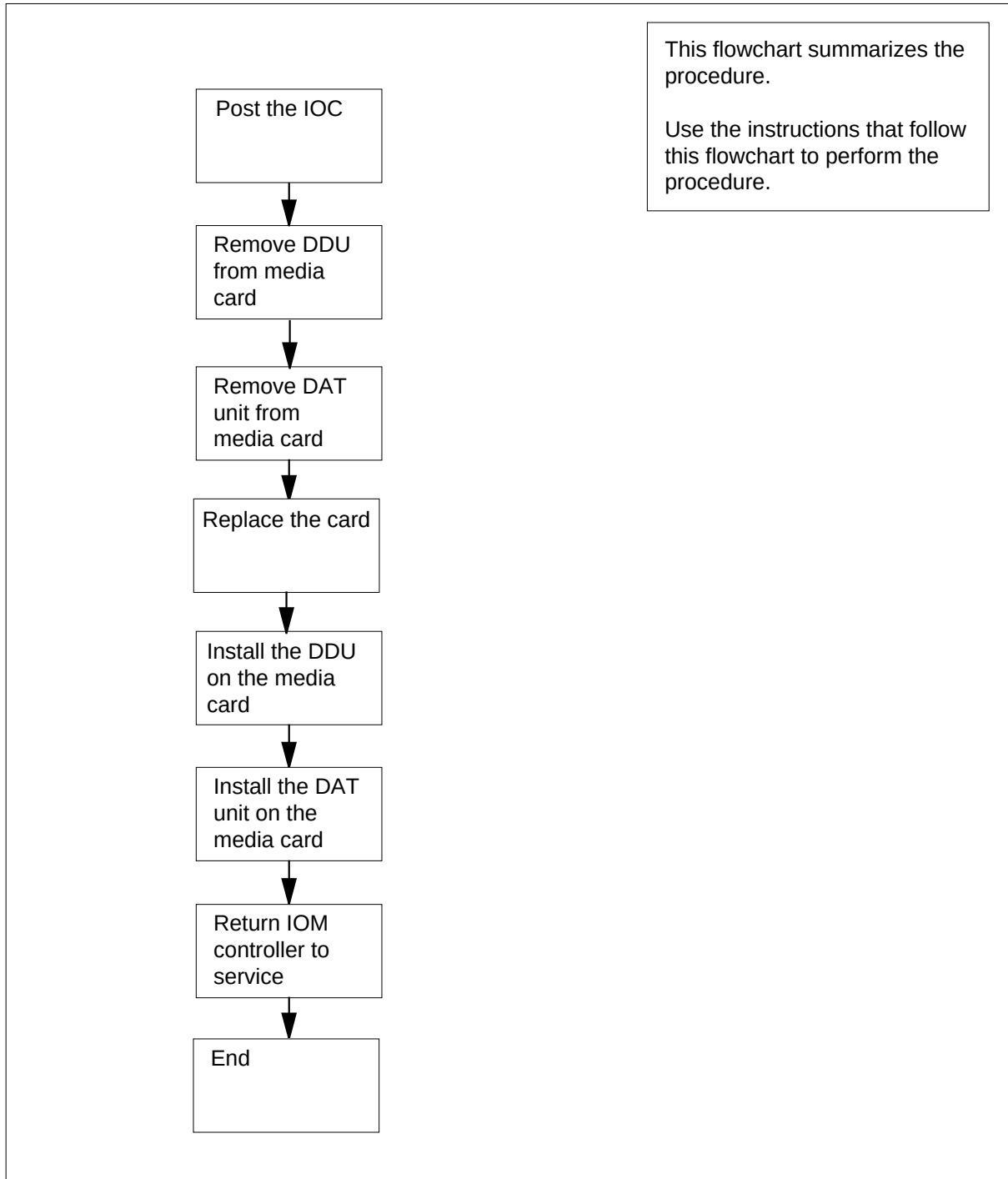
The Index contains a list of the cards, shelves, and frames that this card replacement NTP documents.

Common procedures

This procedure refers to the common procedure *Replacing a card*.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

NTFX32AA
in an ISM (continued)**Summary of replacing an NTFX32AA in an ISM**

NTFX32AA in an ISM (continued)

NTFX32AA in an ISM

At the MAP terminal

- 1 Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.
- 2 To access the IOD level of the MAP display, type

>MAPCI;MTC;IOD

and press the Enter key.

Example of a MAP display:

IOD

IOC 0 1 2 3

STAT . . . S

DIRP: SMDR B XFER: . SLM : . NPO: . NX25: .

MLP : . DPPP: . DPPU: . SCAI :

- 3 To post the IOM controller system configured, type

>IOC ioc_no

and press the Enter key.

where

ioc_no

is the IOM identification number

Example of an IOM MAP display:

IOD

IOC 0 1 2 3

STAT . . . S

DIRP: SMDR B XFER: . SLM : . NPO: . NX25: .

MLP : . DPPP: . DPPU: . SCAI :

IOC	PORT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
(IOM)	STAT	.	.	.	-	.	.	-	-	-	.	-	-	-	-	-	-	-	-
0	TYPE	C	C	C		C	M				M							S	S
		0	0	0		0	T				P							C	C
		N	N	N		N	D				C							S	S

NTFX32AA in an ISM (continued)

- 4 The next action depends on if a 3.5-in. disk drive unit (DDU) NTFX32 BA or a digital audio tape (DAT) unit NTFX32CA is on the media storage card.

If the media storage card	Do
contains a 3.5-in. DDU	step 5
contains a DAT unit	step 6

At the ISM shelf

- 5 To remove the 3.5-in. DDU, perform the correct procedure in *Trouble Locating and Clearing Procedures*. Complete the section of the procedure to remove the disk drive and return to this point.
- 6 To remove the DAT unit, perform the correct procedure in *Trouble Locating and Clearing Procedures*. Complete the section of the procedure to remove the tape unit and return to this point.
- 7 To replace the media storage card, perform the procedure *How to replace a card*. Complete the procedure and return to this point.

If the media storage card	Do
contains a 3.5-in. DDU	step 8
contains a DAT unit	step 9

- 8 To install the 3.5-in. DDU unit that you removed in step 6, perform the correct procedure in *Trouble Locating and Clearing Procedures*. Complete the section of the procedure to remove the disk drive and return to this point.
- 9 To install the DAT unit that you removed in step 6, perform the correct procedure in *Trouble Locating and Clearing Procedures*. Complete the section of the procedure to remove the tape unit and return to this point.
- 10 The next action depends on the reason that you perform this procedure.

If a maintenance procedure	Do
directed you to this procedure	step 11
did not direct you to this procedure	step 12

- 11 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

At the MAP terminal

- 12 To return the IOM to service, type
>RTS
 and press the Enter key.
- 13 For additional help, contact the next level of support.

NTFX32AA
in an ISM (end)

- 14** The procedure is complete.

System cards in an IOC

Application

Use this procedure to replace the following cards in an input/output controller (IOC).

PEC	Suffix	Card name	Shelf or frame name
NT0X67	AA	IOC terminator card	IOC
NT1X62	AA	Input/output controller card	IOC
NT1X62	AB	IOC message controller card	IOC
NT1X62	CA, CB	IOC message processor card	IOC

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace:

- product engineering code (PEC)
- PEC suffix
- equipped frame
- equipped shelf

The Index contains a list of the cards, shelves, and frames that this card replacement book documents.

Common procedures

This procedure refers to the common procedure *Replacing a card*.

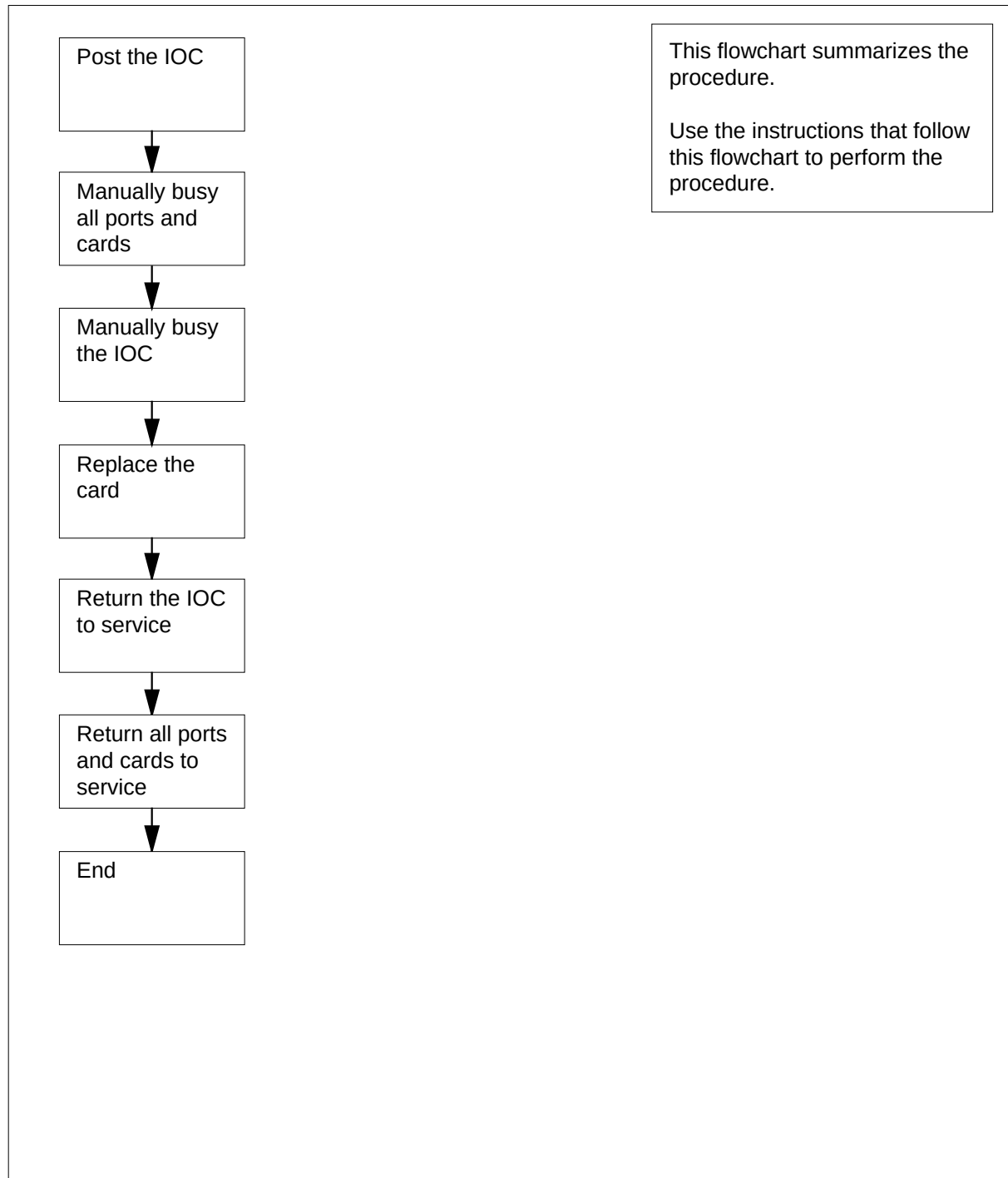
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

System cards in an IOC (continued)

Summary of replacing System cards in an IOC



System cards in an IOC (continued)

System cards in an IOC

At the MAP terminal

1

ATTENTION

This procedure directs you to manually busy all terminal controller cards for the IOC. Perform this procedure from a MAP terminal that does not connect to the IOC.



WARNING

Loss of service

This procedure instructs you to remove an IOC and the device controllers of an IOC from service. Perform this procedure only if you need to recover out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

2

To access the IOD level of the MAP display, type

>MAPCI;MTC;IOD

and press the Enter key.

Example of a MAP display:

```
IOC  0  1  2  3
STAT .  .  .  .
```

3

To post the IOC that associates with the card you replace, type

>IOC ioc_no

and press the Enter key.

where

ioc_no

is the IOC identification number (0 to 19)

Example of a MAP display:

System cards
in an IOC (continued)

```
IOC  0  1  2  3
STAT .  .  .  .

DIRP: P00L07 XFER:  .  SLM  .  NOP :  .  NX25:  .
MLP :  .  DPPP:  .  DPPU:  .  SCAI:  .

IOC CARD 0      1      2      3      4      5      6      7      8
0  PORT 0123  0123  0123  01230123  0123  0123  0123  0123
STAT  ----  ----  ----  ----  ----  ----  ----  ----
TYPE      DDU  CONS  MPC  CONS  MPC  CONS  MPC  CONS
```

4 The next action depends on if terminal controller cards are on the shelf.

If terminal controller cards	Do
are on the shelf	step 5
are not on the shelf	step 11

5 To post the card, type
>**CARD card_no**
and press the Enter key.
where
 card_no
 is the card identification number (0 to 8)
Example of a MAP display:

```
IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .  SLM : SLMbsy NOP :  .  NX25:  .
MLP :  .  DPPP:  .  DPPU:  .  SCAI:  .

IOC  CARD  0      1      2      3      4      5      6      7      8
0  PORT 0123  0123  0123  01230123  0123  0123  0123  0123
STAT  ----  ----  ----  ----  ----  ----  ----  ----
TYPE  MTD  DDU  CONS  MPC  CONS  CONS  CONS  MPC
Card  6  Ckt  0      1      2      3
Status
Cons Id      RD040  RD041  TEAM4  TEAM6
ConType      VT100  VT100  VT100  VT100
```

6 Note the CONS ID and the status for each port.

If	Do
all ports are ManBsy	step 10

System cards in an IOC (continued)

	If	Do
	a minimum of one port is Offl	step 61
	a minimum of one port is . (dot)	step 7
	all ports are in any other out-of-service state	step 8
7	Notify all operating company personnel that you will remove from service all CONS IDs that associate with the card you manually busy. Wait until all operating company personnel terminate the activity of these CONS IDs.	
8	To manually busy a port on the card, type >BSY port_no and press the Enter key. <i>where</i> port_no is the port identification number (0 to 3)	
	If the BSY command	Do
	passed	step 9
	failed	step 62
9	Repeat step 8 until you manually busy all ports on the card. Go to step 10.	
10	Repeat steps 5 to 9 for each terminal controller card on the shelf. Go to step 11.	
11	The next action depends on if multiprotocol controller (MPC) cards are on the shelf.	
	If MPC cards	Do
	are on the shelf	step 12
	are not on the shelf	step 19
12	To post the card, type >CARD card_no and press the Enter key. <i>where</i> card_no is the card identification number (0 to 8) <i>Example of a MAP display:</i>	

System cards in an IOC (continued)

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .          SLM : SLMbsy NOP :  .          NX25:  .
MLP :  .    DPPP:  .          DPPU:  .    SCAI:  .

IOC  CARD      0      1      2      3      4      5      6      7      8
0    PORT  0123  0123  0123  01230123  0123  0123  0123  0123
    STAT  .---- .---- .---- .---- .---- .---- .---- .----
    TYPE  MTD   DDU   CONS  MPC   CONS          CONS  MPC
Card 3 Unit      0
    User      SYSTEM  BOARD  LINK0  LINK1  LINK2  LINK3
    Status    Ready  COMACT UNEQ  N/A   UNEQ  ENABLD

```

- 13** Determine the state of the card.

If the card state	Do
is MANB	step 18
is OFFL	step 61
is other than listed here	step 14

Note: The card state appears under the BOARD header on the MAP display.

- 14** To display status information on current MPC conversations, type

>QCONV

and press the Enter key.

Example of a MAP response:

```

MPC  L  LCN  STATUS  CCC  SEC  PARDEV  INP  OPEN  OWNER
----
  0  3    1 INACTIVE  none  none  none   FIL    0  none
  0  3    2 INACTIVE  none  none  none   FIL    0  none

```

If	Do
a minimum of one session is active	step 15
all sessions are inactive	step 16

- 15** Notify all users that an interruption of MPC service will occur. Wait until all sessions are inactive before you proceed. To verify MPC session activity, repeat step 14.

System cards in an IOC (continued)

- 16** To manually busy the card and card links, type

>BSY ALL FORCE

and press the Enter key.

Example of a MAP response:

TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND
Please confirm ("YES", "Y", "NO", or "N"):

- 17** To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

REQUEST PASSED FOR LINKS.
REQUEST PASSED FOR CARD.

If the BSY command	Do
passed	step 18
failed	step 62

- 18** Repeat steps 12 to 17 for each MPC card on the shelf. Go to step 19.

- 19** The next action depends on if disk drive controller cards are on the shelf.

If disk drive controller cards	Do
are on the shelf	step 20
are not on the shelf	step 25

- 20** To post the card, type

>CARD card_no

and press the Enter key.

where

card_no

is the card identification number (0 to 8)

Example of a MAP display:

System cards in an IOC (continued)

```

IOD
IOC  0  1  2  3
STAT .  .  .  .

```

```

DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25:
MLP :      .      DPPP:  .      DPPU:  .      SCAI:  .

```

```

IOC      CARD      0      1      2      3 4      5      6      7      8
0      PORT  0123  0123  0123  010323  0123  0123  0123  0123
STAT     .---- .---- .---- .---- .---- .---- .---- .----
TYPE  MTD      DDU CONS  MPC      CONS      CONS      MPC

```

Card 0 MTD 0
TapeName
Status Idle
User

- 21** Determine the state of the card.

If the card	Do
is MBSY	step 24
is OFFL	step 61
is other than listed here	step 22

- 22** To determine if files are open on the DDU, type

>ALLOC

and press the Enter key.

Example of a MAP response:

VOLID	VOL_NAME	SERIAL_NO	BLOCKS	ADDR	TYPE	R/O	FILES_OPEN
0	IMAGE	2800	45000	D000	0	NO	0
1	XPMLOADS	2801	35000	D000	0	NO	0
2	RTMLOADS	2802	20000	D000	0	NO	0
.							
..							
.							
7	SMDR	2807	5000	D000	0	NO	0
8	AMA1	2808	5000	D000	0	NO	0
9	TST	2809	50	D000	0	NO	0
10	AMA2	280A	5000	D000	0	NO	0

If files	Do
are open	step 54
are closed	step 23

System cards in an IOC (continued)

- 23** To manually busy the controller, type

>BSY

and press the Enter key.

Example of a MAP response:

```
bsy
OK
```

- 24** Repeat steps 20 to 23 for each disk drive controller card on the shelf. Go to step 25.

- 25** The next action depends on if magnetic tape drive (MTD) controller cards are on the shelf.

If MTD controller cards	Do
are on the shelf	step 26
are not on the shelf	step 31

- 26** To post the card, type

>CARD card_no

and press the Enter key.

where

card_no

is the card identification number (0 to 8)

Example of a MAP display:

```
IOD
IOC  0  1  2  3
STAT .  .  .  .

DIRP: AMA  B XFER:  .      SLM : SLMbsy NOP :  .      NX25:  .
MLP :  .      DPPP:  .      DPPU:  .      SCAI:  .

IOC   CARD    0    1    2    3    4    5    6    7    8
0   PORT  0123  0123  0123  0123  0123  0123  0123  0123  0123
STAT  .---  .---  .---  .---  .---  .---  .---  .---  .---
TYPE  MTD   DDU   CONS  MPC   CONS      CONS  MPC

Card 0   MTD           0
      TapeName
      Status   Idle
      User
```

System cards in an IOC (continued)

- 27** Determine the state of the card.
- | If the card | Do |
|---------------------------|---------|
| is ManBsy | step 30 |
| is Offl | step 61 |
| is Idle | step 29 |
| is other than listed here | step 28 |
- 28** Notify all users an interruption of service for the device will occur. Wait until all users cease to access the device before you proceed to the next step.
- 29** To manually busy the card, type
>BSY
and press the Enter key.
Example of a MAP response:
- ```
bsy
OK
```
- 30** Repeat steps 26 and 29 for each MTD controller card on the shelf. Go to step 31.
- 31** To return to the IOC level of the MAP display, type  
**>QUIT**  
and press the Enter key.
- 32** Determine the state of the IOC.
- | If the state of the IOC   | Do      |
|---------------------------|---------|
| is M                      | step 34 |
| is other than listed here | step 33 |
- 33** To manually busy the IOC, type  
**>BSY IOC**  
and press the Enter key.



## System cards in an IOC (continued)

### At the shelf

34

**WARNING****Static electricity damage**

Wear a wrist strap that connects to the wrist-strap grounding point of the frame supervisory panel (FSP) or the modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

35 The next action depends on the reason you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 36 |
| did not direct you to this procedure | step 37 |

36 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

### At the MAP terminal

37 To return the IOC to service, type

**>RTS IOC**

and press the Enter key.

38 The next action depends on if disk drive or MTD controller cards are on the shelf.

| If disk drive or MTD controller cards | Do      |
|---------------------------------------|---------|
| are on the shelf                      | step 39 |
| are not on the shelf                  | step 42 |

39 To post the card, type

**>CARD card\_no**

and press the Enter key.

*where*

## System cards in an IOC (continued)

---

- card\_no**  
is the card identification number (0 to 8)
- 40** To return the controller to service, type  
**>RTS**  
and press the Enter key.
- 41** Repeat steps 39 and 40 for each disk drive or MTD controller card on the shelf. Go to step 42.
- 42** The next action depends on if MPC cards are on the shelf.
- | If MPC cards         | Do      |
|----------------------|---------|
| are on the shelf     | step 43 |
| are not on the shelf | step 49 |
- 43** To post the card, type  
**>CARD card\_no**  
and press the Enter key.  
*where*  
**card\_no**  
is the card identification number (0 to 8)
- 44** To load the MPC, type  
**>DOWNLD**  
and press the Enter key.  
*Example of a MAP response:*  
  
DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.
- | If the DOWNLD command | Do      |
|-----------------------|---------|
| passed                | step 45 |
| failed                | step 62 |
- 45** To return the MPC to service, type  
**>RTS ALL**  
and press the Enter key.  
*Example of a MAP response:*  
  
REQUEST PASSED FOR CARD.REQUEST PASSED FOR LINKS.

## System cards in an IOC (continued)

- 
- 46** Wait 1 min to check the status of MPC components.
- | If                                                                                                                          | Do      |
|-----------------------------------------------------------------------------------------------------------------------------|---------|
| the system status is <b>Ready</b> , the board status is <b>CO-MACT</b> , and the link status is <b>ENABLD</b> for each link | step 47 |
| these statuses are other than listed here                                                                                   | step 62 |
- 
- 47** Repeat steps 43 to 46 for each card on the shelf. Go to step 48.
- 48** Notify users that MPC service is available.
- 49** The next action depends on if terminal controller cards are on the shelf.
- | If terminal controller cards | Do      |
|------------------------------|---------|
| are on the shelf             | step 50 |
| are not on the shelf         | step 63 |
- 
- 50** To post the card, type  
**>CARD card\_no**  
 and press the Enter key.  
*where*  
     **card\_no**  
     is the card identification number (0 to 8)
- 51** To return a port on the card to service, type  
**>RTS port\_no**  
 and press the Enter key.  
*where*  
     **port\_no**  
     is the port identification number (0 to 3)
- | If the RTS command | Do      |
|--------------------|---------|
| passed             | step 52 |
| failed             | step 62 |
- 
- 52** Repeat step 51 until you return to service all ports on the terminal controller card. Go to step 53.
- 53** Repeat steps 50 to 52 for each terminal controller card on the shelf. Go to step 63.
-

## System cards in an IOC (continued)

54

**WARNING****Loss of data**

If files are open do not busy the controller. If you busy the controller while files are open, billing data will be lost. For additional help, contact the next level of support.

If device independent recording package (DIRP) volumes are open, the following events occur:

- the DDU drops SysB
- billing data is lost
- open Logutil files are lost or corrupted

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.

**55** Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

**>LOGUTIL;LISTDEVS**

and press the Enter key.

**56** Close files on volumes on the DDU of the IOC.

**>STOPDEV dev\_name**

and press the Enter key.

where

**dev\_name**

is the name of the device

**>QUIT**

and press the Enter key.

**57** Repeat the ALLOC command to determine if files are closed, by typing

**>ALLOC**

and pressing the Enter key.

| If the files | Do      |
|--------------|---------|
| are open     | step 58 |
| are closed   | step 59 |

**58** Confirm that you have done steps 54 to 57. If the files are still open, contact your next level of support.

---

**System cards  
in an IOC (end)**

---

- 59** Manually busy the DDU, by typing  
**>BSY**  
and pressing the Enter key.

---

**If the DDU****Do**

---

is MBSY

step 60

is not MBSY

step 62

---

- 60** When cards are replaced and the DDU is in service, open the files. Use the procedure "Allocating Recording Volumes in the DIRP Utility" in *Routine Maintenance Procedures*.
- 61** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 62** For additional help, contact the next level of support.
- 63** The procedure is complete.



# Index

## C

### Card

- replacing Vol. 3, 7-150
- card replacement common procedures
  - Activating CCS7 links Vol. 3, 7-2
  - Activity switch with memory match Vol. 3, 7-11
  - Correcting a load mismatch Vol. 3, 7-27
  - Deactivating CCS7 links Vol. 3, 7-42
  - Failure to switch clock mastership Vol. 3, 7-50
  - Loading a PM Vol. 3, 7-59
  - Manually busying LIM-to-MS DS30 links Vol. 2, 5-26, Vol. 3, 7-71
  - Manually busying Series II PM C-side links Vol. 3, 7-77, Vol. 3, 7-90
  - Manually busying SMA C-side links Vol. 3, 7-84
  - Moving an XSG to a spare XLIU Vol. 3, 7-132
  - Replacing a card Vol. 3, 7-144
  - Replacing a line card Vol. 3, 7-156
  - Reseating cards in equipment shelves Vol. 3, 7-163
  - Returning LIM-to-MS DS30 links to service Vol. 2, 5-33, Vol. 3, 7-172
  - Switching the clock source Vol. 3, 7-177
  - Unseating cards in equipment shelves Vol. 3, 7-184
  - Verifying load compatibility of SuperNode cards Vol. 3, 7-188
- card replacement procedures
  - NT2X70 Vol. 4, 1-490, Vol. 4, 1-498
  - NT6X17 Vol. 4, 1-739
  - NT6X18 Vol. 4, 1-783
  - NT6X19 Vol. 4, 1-823
  - NT6X20 Vol. 4, 1-863
  - NT6X21 Vol. 4, 1-920
  - NT6X40 Vol. 5, 1-2, Vol. 5, 1-14, Vol. 5, 1-26
  - NT6X41 Vol. 5, 1-64, Vol. 5, 1-71
  - NT6X42 Vol. 5, 1-101, Vol. 5, 1-107
  - NT6X44 Vol. 5, 1-138
  - NT6X50 Vol. 5, 1-259, Vol. 5, 1-275
  - NT6X53 Vol. 5, 1-487
  - NT6X54 Vol. 5, 1-556
  - NT6X69 Vol. 5, 1-648, Vol. 5, 1-654
  - NT6X71 Vol. 5, 1-721
  - NT6X76 Vol. 5, 1-869
  - NT6X78 Vol. 5, 1-919, Vol. 5, 1-925, Vol. 5, 1-932
  - NT6X80 Vol. 5, 1-951, Vol. 5, 1-957
  - NT6X92 Vol. 6, 1-112, Vol. 6, 1-118, Vol. 6, 1-125
  - NT6X99 Vol. 6, 1-186
  - NTAX74 Vol. 6, 1-303, Vol. 6, 1-315, Vol. 6, 1-327, Vol. 6, 1-337, Vol. 6, 1-347
  - NTAX78 Vol. 6, 1-355, Vol. 6, 1-362
  - NTBX01 Vol. 6, 1-417, Vol. 6, 1-423, Vol. 6, 1-430
  - NTBX02 Vol. 6, 1-508, Vol. 6, 1-515, Vol. 6, 1-523
  - NTBX27 Vol. 6, 1-586
  - NTMX71 Vol. 6, 1-916, Vol. 6, 1-924
  - NTMX72 Vol. 6, 1-1002
  - NTMX73 Vol. 7, 1-54
  - NTMX75 Vol. 7, 1-162
  - NTMX76 Vol. 7, 1-214
  - NTMX79 Vol. 7, 1-390
  - NTMX81 Vol. 7, 1-435, Vol. 7, 1-451
  - NTRX41 Vol. 7, 1-655
    - in CDSN (cabinetized dual shelf network) Vol. 1, 8-197

- in CDTO (cabinetized digital trunk controller offshore) Vol. 1, 8-197
- in CIOE (cabinetized input/output equipment) Vol. 1, 8-197
- in CIPE (cabinetized international peripheral equipment) Vol. 1, 8-197
- in CLGO (cabinetized line group controller offshore) Vol. 1, 8-197
- in CMIS (cabinetized miscellaneous equipment) Vol. 1, 8-197
- in CMS7 (cabinetized message switch 7) Vol. 1, 8-197
- in CTME (cabinetized trunk module equipment) Vol. 1, 8-197
- NTRX42 Vol. 7, 1-766
- NTRX43 Vol. 7, 1-816
- NTRX54 Vol. 7, 1-889
- NTTR46 Vol. 7, 1-902
- NTTR47 Vol. 7, 1-908
- NTTR60 Vol. 7, 1-914
- NTTR66 Vol. 7, 1-921
- NTTR67 Vol. 7, 1-927
- NTTR70 Vol. 7, 1-934
- NTTR71 Vol. 7, 1-941
- NTTR72 Vol. 7, 1-946
- NTTR73 Vol. 7, 1-952
- NTTR74 Vol. 7, 1-956
- NTTR75 Vol. 7, 1-962
- NTTR76 Vol. 7, 1-970
- NTTR77 Vol. 7, 1-979
- NTTR87 Vol. 7, 1-986
- card replacement procedures
  - in a/an Vol. 3, 4-37, Vol. 3, 6-97, Vol. 6, 1-216, Vol. 6, 1-225, Vol. 6, 1-529, Vol. 6, 1-868, Vol. 6, 1-878, Vol. 6, 1-888
- EDRAM Vol. 3, 4-79
- NT0X10 Vol. 4, 1-2, Vol. 4, 1-6, Vol. 4, 1-14, Vol. 4, 1-18, Vol. 4, 1-25, Vol. 4, 1-31, Vol. 4, 1-37, Vol. 4, 1-43
  - in an RMM Vol. 4, 1-10
  - in MTM, STM Vol. 3, 4-88
  - in OAU Vol. 2, 9-7
- NT0X36
  - in an international cabinet auxiliary module Vol. 1, 8-74
  - in CIOE with DDU, DPP, IOC, MTD, or ROS Vol. 1, 8-8
  - in IOE frame Vol. 1, 8-53
- NT0X67
  - in IOC Vol. 1, 9-97
- NT0X70
  - in MTM, TM Vol. 3, 4-27
  - in OAU Vol. 2, 9-7
- NT0X91 Vol. 4, 1-61
  - in CPCE provisioned for DTC, DTCL, IDTC, PDTCL Vol. 1, 8-98
  - in CPCE provisioned for ILGC, LGC, LGCL, PLGC Vol. 1, 8-98
  - in CPCE provisioned for ILTC, LTC, LTCL, PLTC Vol. 1, 8-98
  - in CTME with ISM, MTM, OAU, STM, or TM Vol. 1, 8-29
  - in DCE Vol. 1, 8-112
  - in LME Vol. 1, 8-123
  - in MS6E Vol. 1, 8-133
  - in MS7E Vol. 1, 8-147
  - in NT0X48 single-bay network Vol. 1, 8-159
  - in NT5X13 combined single-bay network Vol. 1, 8-159
  - in NT8X11 dual shelf network Vol. 1, 8-159
  - in ST6E, ST7E Vol. 1, 8-147
  - in TME with ISM, MTM, OAU, STM, and TM Vol. 1, 8-172
- NT0X91AA Vol. 4, 1-49, Vol. 4, 1-90
- NT0X91AE Vol. 4, 1-49, Vol. 4, 1-96, Vol. 4, 1-105
- NT1X00
  - in ISM, MTM, STM Vol. 3, 4-88
- NT1X31
  - in MTM, STM Vol. 3, 4-88
- NT1X54
  - in ISM, TM Vol. 3, 4-88
- NT1X55
  - in IOC Vol. 1, 9-10
- NT1X62
  - in IOC Vol. 1, 9-97
- NT1X67
  - in IOC Vol. 1, 9-21
- NT1X68
  - in IOC Vol. 1, 9-10
- NT1X75
  - in MTM with DRAM, STM with DRAM Vol. 3, 4-27
- NT1X76
  - in DRAM Vol. 3, 4-88
  - in MTM, STM Vol. 3, 4-88



- NT1X77
  - in DRAM Vol. 3, 4-88
  - in MTM, STM Vol. 3, 4-88
- NT1X78
  - in dual DDU shelf Vol. 1, 9-28
  - in single DDU shelf Vol. 1, 9-28
  - in SuperNode ROS Vol. 3, 1-5
  - in SuperNode SE ROS Vol. 3, 1-5
- NT1X79
  - in DRAM Vol. 3, 4-88
  - in MTM, STM Vol. 3, 4-88
- NT1X80
  - in ISM, MTM, STM Vol. 3, 4-79
- NT1X81
  - in ISM, MTM, STM Vol. 3, 4-79
- NT1X89
  - in IOC Vol. 1, 9-37
- NT1X90
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X01
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X02
  - in LM line drawer Vol. 2, 2-16
- NT2X03
  - in LM line drawer Vol. 2, 2-16
- NT2X05
  - in LM controller Vol. 2, 2-30
  - in remote line controller Vol. 2, 10-22
  - in RLM Vol. 2, 10-22
- NT2X06 Vol. 4, 1-114, Vol. 4, 1-121,  
Vol. 4, 1-129, Vol. 4, 1-136, Vol. 4, 1-144,  
Vol. 4, 1-153, Vol. 4, 1-162
  - in DCM, DES Vol. 1, 4-47
  - in MTM, TM Vol. 3, 4-64
  - in NT0X48 single-bay network Vol. 2, 8-40
  - in OAU Vol. 2, 9-14
- NT2X07
  - in DCM, DES Vol. 1, 4-47
  - in NT0X48 single-bay network Vol. 2, 8-40
- NT2X09 Vol. 4, 1-171, Vol. 4, 1-178,  
Vol. 4, 1-186, Vol. 4, 1-194, Vol. 4, 1-202,  
Vol. 4, 1-211, Vol. 4, 1-220
  - in DRAM Vol. 3, 4-64
  - in EDRAM Vol. 3, 4-64
  - in MTM, TM Vol. 3, 4-64
  - in OAU Vol. 2, 9-14
- NT2X10 Vol. 4, 1-229, Vol. 4, 1-233,  
Vol. 4, 1-237, Vol. 4, 1-244, Vol. 4, 1-251,  
Vol. 4, 1-258
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X11 Vol. 4, 1-265, Vol. 4, 1-270,  
Vol. 4, 1-278, Vol. 4, 1-282, Vol. 4, 1-289,  
Vol. 4, 1-298, Vol. 4, 1-307
  - in an RMM Vol. 4, 1-274
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X16
  - in LM line drawer Vol. 2, 2-16
- NT2X20
  - in LM line drawer Vol. 2, 2-24, Vol. 2, 10-16
- NT2X21
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X22
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X23
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X24
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X25
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X26
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X27
  - in LM controller Vol. 2, 2-9
  - in remote line controller Vol. 2, 10-9
  - in RLM Vol. 2, 10-9
- NT2X32
  - in DCM, DES Vol. 1, 4-8
- NT2X33
  - in DCM, DES Vol. 1, 4-8
  - in LM controller Vol. 2, 2-9
- NT2X34
  - in DCM, DES Vol. 1, 4-8
  - in LM controller Vol. 2, 2-9
- NT2X35
  - in DCM Vol. 1, 4-13

- NT2X36
  - in DCM Vol. 1, 4-27
  - in LM controller Vol. 2, 2-9
- NT2X37
  - in DCM, DES Vol. 1, 4-8
- NT2X38
  - in DCM, DES Vol. 1, 4-8
- NT2X41
  - in OAU Vol. 2, 9-7
- NT2X42
  - in OAU Vol. 2, 9-7
- NT2X43
  - in ISM, MTM, STM Vol. 3, 4-88
  - in OAU Vol. 2, 9-7
- NT2X45
  - in MTM, TM Vol. 3, 4-27
  - in OAU Vol. 2, 9-7
- NT2X47
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X48 Vol. 4, 1-316, Vol. 4, 1-321, Vol. 4, 1-326
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X50
  - in MTM, STM Vol. 3, 4-88
- NT2X53
  - in MTM, TM Vol. 3, 4-27
  - in OAU Vol. 2, 9-7
- NT2X55 Vol. 4, 1-331
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X56
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X57 Vol. 4, 1-338, Vol. 4, 1-342, Vol. 4, 1-350, Vol. 4, 1-355, Vol. 4, 1-362, Vol. 4, 1-369, Vol. 4, 1-376
  - in an RMM Vol. 4, 1-346
  - in ISM, MTM, STM Vol. 3, 4-88
  - in OAU Vol. 2, 9-7
- NT2X59 Vol. 4, 1-383, Vol. 4, 1-387, Vol. 4, 1-401, Vol. 4, 1-406, Vol. 4, 1-413, Vol. 4, 1-420, Vol. 4, 1-427
  - in an RMM Vol. 4, 1-394
  - in MTM, TM Vol. 3, 4-27
  - in OAU Vol. 2, 9-7
- NT2X65
  - in ISM, MTM, STM, TM Vol. 3, 4-88
- NT2X66
  - in ISM, MTM, STM, TM Vol. 3, 4-88
- NT2X70 Vol. 4, 1-434, Vol. 4, 1-441, Vol. 4, 1-464, Vol. 4, 1-478, Vol. 4, 1-506, Vol. 4, 1-517, Vol. 4, 1-526
  - in 6STA or MSB6 Vol. 2, 7-20
  - in an HIE Vol. 4, 1-455
  - in DCM, DES Vol. 1, 4-47
  - in DRAM Vol. 3, 4-64
  - in DTC, DTCL, IDTC, PDTC Vol. 3, 6-42
  - in EDRAM Vol. 3, 4-64
  - in ILGC, LGC, LGCI, PLGC Vol. 3, 6-42
  - in ILTC, LTC, LTCL, PLTC Vol. 3, 6-42
  - in IOC Vol. 1, 9-44
  - in LM controller Vol. 2, 2-36
  - in NT5X13 combined single-bay network Vol. 2, 8-40
  - in NT8X11 dual shelf network Vol. 2, 8-40
  - in remote line module Vol. 2, 10-28
  - in RLM Vol. 2, 10-28
  - in ST7G of MSB7 Vol. 2, 7-35
  - in STA7 or MSB7 Vol. 2, 7-20
  - in STCM of MSB6 Vol. 2, 7-35
  - in STM Vol. 3, 4-64
- NT2X71
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X72
  - in ISM, TM Vol. 3, 4-88
- NT2X75
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X77
  - in ISM, MTM, STM Vol. 3, 4-88
- NT2X78
  - in TM Vol. 3, 4-88
- NT2X80
  - in MTM, STM Vol. 3, 4-88
- NT2X81
  - in TM Vol. 3, 4-88
- NT2X82
  - in ISM, TM Vol. 3, 4-88
- NT2X83
  - in TM Vol. 3, 4-88
- NT2X84
  - in ISM, TM Vol. 3, 4-88
- NT2X85
  - in ISM, TM Vol. 3, 4-88
- NT2X86
  - in ISM, TM Vol. 3, 4-88
- NT2X88
  - in TM Vol. 3, 4-88

- 
- NT2X90 Vol. 4, 1-533, Vol. 4, 1-538,  
Vol. 4, 1-543, Vol. 4, 1-557, Vol. 4, 1-562,  
Vol. 4, 1-569, Vol. 4, 1-576
    - in an RMM Vol. 4, 1-551
    - in ISM, TM Vol. 3, 4-88
  - NT2X92
    - in TM Vol. 3, 4-88
  - NT2X95
    - in TM Vol. 3, 4-88
  - NT2X96
    - in ISM, MTM, STM Vol. 3, 4-88
  - NT2X98
    - in ISM, TM Vol. 3, 4-88
  - NT3X02
    - in ISM, MTM, STM Vol. 3, 4-88
  - NT3X03
    - in ISM, MTM, STM Vol. 3, 4-88
  - NT3X04 Vol. 4, 1-583
    - in ISM, TM Vol. 3, 4-88
  - NT3X05
    - in MTM, STM Vol. 3, 4-88
  - NT3X06
    - in ISM, TM Vol. 3, 4-88
  - NT3X07
    - in ISM, TM Vol. 3, 4-88
  - NT3X08
    - in ISM, MTM, STM Vol. 3, 4-88
  - NT3X09 Vol. 4, 1-590, Vol. 4, 1-596,  
Vol. 4, 1-601, Vol. 4, 1-612, Vol. 4, 1-617,  
Vol. 4, 1-624, Vol. 4, 1-634, Vol. 4, 1-644
    - in an RMM Vol. 4, 1-607
    - in ISM, MTM, STM Vol. 3, 4-88
  - NT3X16
    - in SuperNode ROS Vol. 3, 1-14
    - in SuperNode SE ROS Vol. 3, 1-14
  - NT3X17
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X18
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X19
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X20
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X21
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X22
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X23
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X24
    - in NT0X48 single-bay network Vol. 2, 8-72
  - NT3X47
    - in remote line controller Vol. 2, 10-9
    - in RLM Vol. 2, 10-9
  - NT3X48
    - in remote line controller Vol. 2, 10-9
    - in RLM Vol. 2, 10-9
  - NT3X49
    - in remote line controller Vol. 2, 10-9
    - in RLM Vol. 2, 10-9
  - NT3X65
    - in DCM Vol. 1, 4-37
  - NT3X67
    - in MTM, STM Vol. 3, 4-88
  - NT3X68
    - in MTM, STM Vol. 3, 4-88
  - NT3X70
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
  - NT3X71
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
  - NT3X72
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
  - NT3X73
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
  - NT3X74
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
    - in NT8X11 dual-shelf network Vol. 2, 8-72
  - NT3X75
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
    - in NT8X11 dual-shelf network Vol. 2, 8-72
  - NT3X76
    - in NT5X13 combined single-bay network  
Vol. 2, 8-72
    - in NT8X11 dual-shelf network Vol. 2, 8-72
  - NT3X82 Vol. 4, 1-653
    - in OAU Vol. 2, 9-7
  - NT3X83 Vol. 4, 1-660
    - in OAU Vol. 2, 9-7
  - NT3X84
    - in OAU Vol. 2, 9-7
  - NT3X85
    - in OAU Vol. 2, 9-7
-

- NT3X86
  - in NT5X13 combined single-bay network Vol. 2, 8-72
- NT3X91
  - in ISM, TM Vol. 3, 4-88
- NT4X23
  - in ISM, MTM, STM Vol. 3, 4-88
- NT4X65
  - in MTM, STM, TM Vol. 3, 4-27
  - in OAU Vol. 2, 9-7
- NT4X97 Vol. 4, 1-668, Vol. 4, 1-673, Vol. 4, 1-680
  - in ISM, MTM, STM Vol. 3, 4-44
- NT4X98 Vol. 4, 1-687, Vol. 4, 1-694
  - in ISM, MTM, STM Vol. 3, 4-44
- NT5X03
  - in ISM, TM Vol. 3, 4-88
- NT5X04
  - in ISM, TM Vol. 3, 4-88
- NT5X06
  - in TM Vol. 3, 4-88
- NT5X25
  - in ISM, TM Vol. 3, 4-88
- NT5X29
  - in ISM, MTM, STM Vol. 3, 4-88
- NT5X30
  - in ISM, MTM, STM, TM Vol. 3, 4-88
- NT6X1205
  - in DTC, IDTC, PDTC Vol. 3, 6-19
  - in ILGC, LGC, PLGC Vol. 3, 6-19
  - in ILTC, LTC, PLTC Vol. 3, 6-19
- NT6X17 Vol. 4, 1-703, Vol. 4, 1-707, Vol. 4, 1-711, Vol. 4, 1-715, Vol. 4, 1-723, Vol. 4, 1-731
  - in ILCM, LCM, LCME Vol. 2, 1-39
  - in LM line drawer Vol. 2, 2-24, Vol. 2, 10-16
- NT6X18 Vol. 4, 1-743, Vol. 4, 1-747, Vol. 4, 1-751, Vol. 4, 1-755, Vol. 4, 1-759, Vol. 4, 1-767, Vol. 4, 1-775
  - in LCM, LCME Vol. 2, 1-39
  - in LM line drawer Vol. 2, 2-24, Vol. 2, 10-16
- NT6X19 Vol. 4, 1-787, Vol. 4, 1-791, Vol. 4, 1-795, Vol. 4, 1-799, Vol. 4, 1-807, Vol. 4, 1-815
  - in LCM, LCME Vol. 2, 1-39
- NT6X20 Vol. 4, 1-827, Vol. 4, 1-831, Vol. 4, 1-835, Vol. 4, 1-839, Vol. 4, 1-847, Vol. 4, 1-855
  - in LCM Vol. 2, 1-73
- NT6X21 Vol. 4, 1-867, Vol. 4, 1-871, Vol. 4, 1-875, Vol. 4, 1-883, Vol. 4, 1-893, Vol. 4, 1-902, Vol. 4, 1-911
  - in an LCM Vol. 4, 1-879
  - in LCM, LCME Vol. 2, 1-39
- NT6X23
  - in LCM Vol. 2, 1-73
- NT6X27 Vol. 4, 1-924, Vol. 4, 1-931, Vol. 4, 1-938
  - in IDTC, ILGC, ILTC Vol. 3, 6-124
  - in PDTC, PLGC, PLTC Vol. 3, 6-124
- NT6X28
  - in IDTC, ILGC, ILTC Vol. 3, 6-31
  - in IPDTC, PLGC, LTCO, PLTC Vol. 3, 6-31
- NT6X30 Vol. 4, 1-945, Vol. 4, 1-960, Vol. 4, 1-974, Vol. 4, 1-988, Vol. 4, 1-1002
  - in LCE, LCEI Vol. 2, 1-47
- NT6X33
  - in ILCM, LCM, LCME Vol. 2, 1-39
- NT6X36 Vol. 4, 1-1021, Vol. 4, 1-1031, Vol. 4, 1-1036
  - in an FSP Vol. 4, 1-1016, Vol. 4, 1-1026
  - in LCE frame Vol. 1, 8-192
  - in LCEI frame Vol. 1, 8-192
- NT6X40 Vol. 5, 1-38, Vol. 5, 1-51
  - in 6STA of MSB6 Vol. 2, 7-48
  - in DTC, DTCL, IDTC, DTCL, PDTC Vol. 3, 6-59
  - in ILGC, LGC, LGCL, LGCL, PLGC Vol. 3, 6-59
  - in ILTC, LTC, LTCL, LTCL, PLTC Vol. 3, 6-59
  - in STA7 of MSB7 Vol. 2, 7-48
- NT6X41 Vol. 5, 1-78, Vol. 5, 1-87, Vol. 5, 1-95
  - in DTC, DTCL, IDTC, DTCL, PDTC Vol. 3, 6-31
  - in ILGC, LGC, LGCL, LGCL, PLGC Vol. 3, 6-31
  - in ILTC, LTC, LTCL, LTCL, PLTC Vol. 3, 6-31
- NT6X42 Vol. 5, 1-114, Vol. 5, 1-122
  - in DTC, DTCL, IDTC, DTCL, PDTC Vol. 3, 6-31
  - in ILGC, LGC, LGCL, LGCL, PLGC Vol. 3, 6-31
  - in ILTC, LTC, LTCL, LTCL, PLTC Vol. 3, 6-31
- NT6X43
  - in DTC, LGC, LTC Vol. 3, 6-31

- 
- NT6X44 Vol. 5, 1-130, Vol. 5, 1-144,  
 Vol. 5, 1-158  
     in DTC, DTCL, IDTC, DTCO, PDTC  
     Vol. 3, 6-31  
     in ILGC, LGC, LGCI, LGCO, PLGC  
     Vol. 3, 6-31  
     in ILTC, LTC, LTCL, LTCO, PLTC  
     Vol. 3, 6-31  
 NT6X45 Vol. 5, 1-166, Vol. 5, 1-172,  
 Vol. 5, 1-178, Vol. 5, 1-184  
     in 6STA of MSB6 Vol. 2, 7-62  
     in STA7 of MSB7 Vol. 2, 7-62  
 NT6X46  
     in 6STA of MSB6 Vol. 2, 7-62  
     in STA7 of MSB7 Vol. 2, 7-62  
 NT6X47 Vol. 5, 1-190, Vol. 5, 1-196,  
 Vol. 5, 1-202  
     in 6STA of MSB6 Vol. 2, 7-62  
     in STA7 of MSB7 Vol. 2, 7-62  
 NT6X48 Vol. 3, 6-72, Vol. 3, 6-82, Vol. 5, 1-208  
 NT6X50 Vol. 5, 1-216, Vol. 5, 1-223,  
 Vol. 5, 1-237, Vol. 5, 1-244  
     in an HIE Vol. 5, 1-230  
     in DTC, DTCL, IDTC, DTCO, DTCOI  
     Vol. 3, 6-124  
     in ILGC LGC, LGCI, LGCO Vol. 3, 6-124  
     in ILTC, LTC, LTCL, LTCO Vol. 3, 6-124  
 NT6X51 Vol. 5, 1-291, Vol. 5, 1-298,  
 Vol. 5, 1-305, Vol. 5, 1-312, Vol. 5, 1-324,  
 Vol. 5, 1-332, Vol. 5, 1-339, Vol. 5, 1-347  
     in an LCM Vol. 5, 1-319  
     in LCM, ILCM Vol. 2, 1-31  
 NT6X52 Vol. 5, 1-355, Vol. 5, 1-361,  
 Vol. 5, 1-367, Vol. 5, 1-373, Vol. 5, 1-384,  
 Vol. 5, 1-392, Vol. 5, 1-401, Vol. 5, 1-410  
     in an LCM Vol. 5, 1-379  
     in LCM, ILCM Vol. 2, 1-31  
 NT6X53 Vol. 5, 1-418, Vol. 5, 1-425,  
 Vol. 5, 1-432, Vol. 5, 1-444, Vol. 5, 1-460,  
 Vol. 5, 1-469, Vol. 5, 1-478  
     in an LCM Vol. 5, 1-453  
     in LCM, LCME Vol. 2, 1-79  
 NT6X54 Vol. 5, 1-493, Vol. 5, 1-500,  
 Vol. 5, 1-509, Vol. 5, 1-518, Vol. 5, 1-533,  
 Vol. 5, 1-542, Vol. 5, 1-549  
     in an LCM Vol. 5, 1-527  
     in ILCM, LCM Vol. 2, 1-13  
 NT6X55  
     in DTC, IDTC, DTCO, PDTC Vol. 3, 6-124  
     in ILGC, LGC, LGCO, PLGC Vol. 3, 6-124  
     in ILTC, LTC, LTCO, PLTC Vol. 3, 6-124  
 NT6X60 Vol. 5, 1-565, Vol. 5, 1-572,  
 Vol. 5, 1-579, Vol. 5, 1-587  
 NT6X62  
     in DTC, IDTC, DTCO, PDTC Vol. 3, 6-31  
     in ILGC, LGCO, PLGC Vol. 3, 6-31  
 NT6X65  
     in STCM of MSB6 Vol. 2, 7-70  
 NT6X66  
     in ST7G of MSB7 Vol. 2, 7-70  
 NT6X68  
     in MSB6 Vol. 2, 7-55  
     in MSB7 Vol. 2, 7-55  
 NT6X69 Vol. 5, 1-595, Vol. 5, 1-605,  
 Vol. 5, 1-613, Vol. 5, 1-622, Vol. 5, 1-630,  
 Vol. 5, 1-639, Vol. 5, 1-670, Vol. 5, 1-678  
     in DTC, DTCL, IDTC, DTCO, PDTC  
     Vol. 3, 6-31  
     in ILGC, LGC, LGCI, LGCO, PLGC  
     Vol. 3, 6-31  
     in ILTC, LTC, LTCL, LTCO, PLTC  
     Vol. 3, 6-31  
 NT6X70  
     in LGC, LGCI Vol. 3, 6-31  
     in LTC, LTCL Vol. 3, 6-31  
 NT6X71 Vol. 5, 1-684, Vol. 5, 1-688,  
 Vol. 5, 1-692, Vol. 5, 1-696, Vol. 5, 1-705,  
 Vol. 5, 1-713  
     in LCM, LCME Vol. 2, 1-39  
 NT6X72 Vol. 5, 1-725  
 NT6X73 Vol. 5, 1-734, Vol. 5, 1-738,  
 Vol. 5, 1-742, Vol. 5, 1-751  
     in an HIE Vol. 5, 1-746  
 NT6X74 Vol. 5, 1-755, Vol. 5, 1-761,  
 Vol. 5, 1-775, Vol. 5, 1-782, Vol. 5, 1-790,  
 Vol. 5, 1-799, Vol. 5, 1-808  
     in an RMM Vol. 5, 1-768  
 NT6X75 Vol. 5, 1-817, Vol. 5, 1-824,  
 Vol. 5, 1-831, Vol. 5, 1-838  
 NT6X76 Vol. 5, 1-845, Vol. 5, 1-853,  
 Vol. 5, 1-861  
     in LCM, LCME Vol. 2, 1-39  
 NT6X78 Vol. 5, 1-876, Vol. 5, 1-883,  
 Vol. 5, 1-891, Vol. 5, 1-898, Vol. 5, 1-905,  
 Vol. 5, 1-912, Vol. 5, 1-946  
     in ILGC Vol. 3, 6-90  
     in ILTC Vol. 3, 6-90  
     in LGC Vol. 3, 6-90
-

- in LGCO Vol. 3, 6-90
- in LGOI Vol. 3, 6-90
- in LTC Vol. 3, 6-90
- in LTCO Vol. 3, 6-90
- in LTCOI Vol. 3, 6-90
- in PLGC Vol. 3, 6-90
- in PLTC Vol. 3, 6-90
- NT6X79
  - in DTC, DTCO, PDTC Vol. 3, 6-31
  - in LGC, LGCI Vol. 3, 6-31
  - in LTC, LTCI Vol. 3, 6-31
- NT6X80 Vol. 5, 1-964, Vol. 5, 1-972, Vol. 5, 1-981
- NT6X85 Vol. 6, 1-2, Vol. 6, 1-13, Vol. 6, 1-24
- NT6X86 Vol. 6, 1-30, Vol. 6, 1-39
- NT6X87 Vol. 6, 1-48, Vol. 6, 1-56
- NT6X92 Vol. 6, 1-64, Vol. 6, 1-71, Vol. 6, 1-79, Vol. 6, 1-87, Vol. 6, 1-95, Vol. 6, 1-104, Vol. 6, 1-140, Vol. 6, 1-243
  - in DTC, DTCL, IDTC, DTCO, PDTC Vol. 3, 6-31
  - in ILGC, LGC, LGCI, LGCO, PLGC Vol. 3, 6-31
  - in ILTC, LTC, LTCI, LGCO, PLTC Vol. 3, 6-31
- NT6X93
  - in ILCM, LCM Vol. 2, 1-39
- NT6X94
  - in ILCM Vol. 2, 1-39
- NT6X95
  - in LCME Vol. 2, 1-73
- NT6X98
  - in ILCM, LCM, LCME Vol. 2, 1-39
- NT6X99 Vol. 6, 1-146, Vol. 6, 1-150, Vol. 6, 1-154, Vol. 6, 1-158, Vol. 6, 1-162, Vol. 6, 1-170, Vol. 6, 1-178
  - in LCM, LCME Vol. 2, 1-39
- NT7X05 Vol. 6, 1-190, Vol. 6, 1-198, Vol. 6, 1-207, Vol. 6, 1-234, Vol. 6, 1-252
  - in LGC, LGCI, LTC, LTCI, DTC, DTCL Vol. 3, 6-31
- NT8X02 Vol. 6, 1-261, Vol. 6, 1-265
- NT8X12
  - in NT8X11 dual-shelf network Vol. 2, 8-72
- NT8X13
  - in NT8X11 dual-shelf network Vol. 2, 8-72
- NT8X14
  - in NT8X11 dual-shelf network Vol. 2, 8-72
- NT8X18 Vol. 6, 1-270
- NT8X99
  - in LCM Vol. 2, 1-79
- NT9X10
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode SE CM/SLM Vol. 1, 3-85
- NT9X12
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode SE CM/SLM Vol. 1, 3-85
  - in SuperNode SLM Vol. 3, 3-137
- NT9X13
  - in an ELPP LIM unit Vol. 1, 5-36
  - in ENET 128k Vol. 2, 8-49
  - in ENET 64k Vol. 2, 8-49
  - in file processor Vol. 1, 7-43
  - in LIM unit of LPP Vol. 2, 3-89
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE 16k ENET Vol. 1, 6-77
  - in SuperNode SE CM/SLM Vol. 1, 3-85
  - in SuperNode SE ENI shelf Vol. 1, 6-77
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X14
  - in APU in LPP LIS Vol. 2, 3-9
  - in file processor Vol. 1, 7-43
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE CM/SLM Vol. 1, 3-85
- NT9X15
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X17
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X20
  - in SuperNode CM Vol. 1, 2-5, Vol. 3, 3-37, Vol. 3, 3-78
  - in SuperNode MS Vol. 2, 5-5
- NT9X21
  - in file processor Vol. 1, 7-43
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode SE CM/SLM Vol. 1, 3-85
  - in SuperNode SLM Vol. 3, 3-137
- NT9X22
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode SLM Vol. 3, 3-137

- NT9X23
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode MS Vol. 2, 5-5
  - in SuperNode SE MS Vol. 2, 6-5
- NT9X25
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X26
  - in ENET 128k Vol. 2, 8-49
  - in ENET 64k Vol. 2, 8-49
  - in file processor Vol. 1, 7-43
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE 16k ENET Vol. 1, 6-77
  - in SuperNode SE CM/SLM Vol. 1, 3-85
  - in SuperNode SE ENI shelf Vol. 1, 6-77
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X27
  - in superNode CM Vol. 1, 2-22
  - in SuperNode SLM Vol. 3, 3-137
- NT9X30
  - in ENET 128k Vol. 2, 8-49
  - in ENET 64k Vol. 2, 8-49
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in LPP LIS Vol. 2, 3-100
  - in SSLPP Vol. 3, 2-74
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE 16k ENET Vol. 1, 6-53
  - in SuperNode SE ENI shelf Vol. 1, 6-53
  - in SuperNode SE LIS Vol. 2, 4-64
  - in SuperNode SE MS Vol. 2, 6-25
  - in SuperNode SLM Vol. 3, 3-137
- NT9X31
  - in ENET 128k Vol. 2, 8-49
  - in ENET 64k Vol. 2, 8-49
  - in LIM unit of ELPP Vol. 1, 5-48
  - in SSLPP Vol. 3, 2-74
  - in SuperNode CM Vol. 1, 2-22
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE 16k ENET Vol. 1, 6-53
  - in SuperNode SE ENI shelf Vol. 1, 6-53
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X32
  - in SuperNode MS Vol. 2, 5-39
- NT9X35
  - in ENET 128k Vol. 2, 8-15
  - in ENET 64k Vol. 2, 8-15
  - in SuperNode SE 16k ENET Vol. 1, 6-7
  - in SuperNode SE 32k ENET Vol. 1, 6-31
  - in SuperNode SE ENI shelf Vol. 1, 6-7
- NT9X36
  - in ENET 128K Vol. 2, 8-49
  - in ENET 64k Vol. 2, 8-49
  - in SuperNode SE 16k ENET Vol. 1, 6-77
  - in SuperNode SE ENI shelf Vol. 1, 6-77
- NT9X40
  - in ENET 128k Vol. 2, 8-15
  - in ENET 64k Vol. 2, 8-15
  - in SuperNode SE 16k ENET Vol. 1, 6-7, Vol. 1, 6-77
  - in SuperNode SE 32k ENET Vol. 1, 6-31
  - in SuperNode SE ENI shelf Vol. 1, 6-7, Vol. 1, 6-77
- NT9X41
  - in ENET 128k Vol. 2, 8-15
  - in ENET 64k Vol. 2, 8-15
  - in SuperNode SE 16k ENET Vol. 1, 6-7
  - in SuperNode SE 32k ENET Vol. 1, 6-31
  - in SuperNode SE ENI shelf Vol. 1, 6-7
- NT9X44
  - in SuperNode SE CM/SLM Vol. 1, 3-5
  - in SuperNode SLM Vol. 3, 3-5
- NT9X45
  - in ENET 128k Vol. 2, 8-15
  - in ENET 64k Vol. 2, 8-15
  - in SuperNode SE 16k ENET Vol. 1, 6-7
  - in SuperNode SE 32k ENET Vol. 1, 6-31
  - in SuperNode SE ENI shelf Vol. 1, 6-7
- NT9X46
  - in SuperNode SE CM/SLM Vol. 1, 3-27
  - in SuperNode SLM Vol. 3, 3-137
- NT9X47
  - in SuperNode SLM Vol. 3, 3-137
- NT9X49
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X52
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X53
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155

- in SuperNode MS Vol. 2, 5-39
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X54
  - in SuperNode MS Vol. 2, 5-5
  - in SuperNode SE MS Vol. 2, 6-5
- NT9X62
  - in file processor Vol. 1, 7-43
  - in LIM unit of ELPP Vol. 1, 5-48
  - in SuperNode MS Vol. 2, 5-5
  - in SuperNode SE CM/SLM Vol. 1, 3-45
  - in SuperNode SE MS Vol. 2, 6-5
- NT9X69
  - in SuperNode MS Vol. 2, 5-5
  - in SuperNode SE MS Vol. 2, 6-5
- NT9X73
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in SuperNode SE MS Vol. 2, 6-25
- NT9X74
  - in ELPP LIS Vol. 1, 5-9
  - in LPP LIS Vol. 2, 3-126
  - in SuperNode SE ENI shelf Vol. 2, 4-6
  - in SuperNode SE LIS Vol. 2, 4-6
- NT9X76
  - in EIU in LPP LIS Vol. 2, 3-47
  - in EIU in SSLPP Vol. 3, 2-17
  - in EIU in SuperNode SE LIS Vol. 2, 4-13
  - in LIU7 in LPP LIS Vol. 2, 3-57
  - in LIU7 in SSLPP Vol. 3, 2-44
  - in LIU7 in SuperNode SE ENI shelf Vol. 2, 4-38
  - in LIU7 in SuperNode SE LIS Vol. 2, 4-38
- NT9X77
  - in LIU7 in LPP LIS Vol. 2, 3-57
  - in LIU7 in SSLPP Vol. 3, 2-44
  - in LIU7 in SuperNode SE ENI shelf Vol. 2, 4-38
  - in LIU7 in SuperNode SE LIS Vol. 2, 4-38
- NT9X78
  - in LIU7 in LPP LIS Vol. 2, 3-57
  - in LIU7 in SSLPP Vol. 3, 2-44
  - in LIU7 in SuperNode SE ENI shelf Vol. 2, 4-38
  - in LIU7 in SuperNode SE LIS Vol. 2, 4-38
- NT9X79
  - in ELPP LIS Vol. 1, 5-9
  - in LIM unit of ELPP Vol. 1, 5-48
  - in LIM unit of LPP Vol. 2, 3-155
  - in LPP LIS Vol. 2, 3-36
  - in SuperNode SE ENI shelf Vol. 2, 4-6
  - in SuperNode SE LIS Vol. 2, 4-6
  - in SuperNode SE MS Vol. 2, 6-5
- NT9X84
  - in EIU in LPP LIS Vol. 2, 3-47
- NT9X85
  - in EIU in LPP LIS Vol. 2, 3-47
  - in EIU in SSLPP Vol. 3, 2-17
  - in EIU in SuperNode SE LIS Vol. 2, 4-13
- NT9X86
  - in file processor Vol. 1, 7-43
  - in SuperNode SE CM/SLM Vol. 1, 3-85
- NT9X87
  - in file processor Vol. 1, 7-43
- NT9X88
  - in file processor Vol. 1, 7-43
- NT9X89
  - in file processor Vol. 1, 7-6
- NT9X90
  - in file processor Vol. 1, 7-18
- NT9X91
  - in file processor Vol. 1, 7-33
  - in SuperNode SE CM/SLM Vol. 1, 3-67
- NT9X96
  - in SSLPP Vol. 3, 2-7
- NT9X98
  - in SSLPP Vol. 3, 2-7
- NTAX74 Vol. 6, 1-281, Vol. 6, 1-292
  - in DTCL, PDTC Vol. 3, 6-147
- NTAX78 Vol. 6, 1-369
  - in DTCL Vol. 3, 6-31
- NTBX01 Vol. 6, 1-381, Vol. 6, 1-390, Vol. 6, 1-399, Vol. 6, 1-408, Vol. 6, 1-437
  - in DTCL, LGCI, LTCI Vol. 3, 6-147
  - in DTCL, LTCI, LGCI, PDTC, PLTC, PLGC Vol. 3, 6-147
- NTBX02 Vol. 6, 1-443, Vol. 6, 1-456, Vol. 6, 1-469, Vol. 6, 1-482, Vol. 6, 1-495
  - LGCI, PLGC Vol. 3, 6-115
  - LTCI, PLTC Vol. 3, 6-115
- NTBX25
  - in LCME Vol. 2, 1-39
- NTBX26 Vol. 6, 1-538, Vol. 6, 1-546, Vol. 6, 1-554
  - in LCME Vol. 2, 1-39
- NTBX27 Vol. 6, 1-562, Vol. 6, 1-570, Vol. 6, 1-578
  - in LCME Vol. 2, 1-39
- NTBX34 Vol. 6, 1-593, Vol. 6, 1-601, Vol. 6, 1-611, Vol. 6, 1-621



- 
- in LCME Vol. 2, 1-31
  - NTBX35 Vol. 6, 1-630, Vol. 6, 1-638,  
Vol. 6, 1-648, Vol. 6, 1-658
  - in LCME Vol. 2, 1-31
  - NTBX36 Vol. 6, 1-667, Vol. 6, 1-677,  
Vol. 6, 1-687
  - in LCME Vol. 2, 1-13
  - NTBX71
  - in LCME Vol. 2, 1-62
  - NTBX72 Vol. 6, 1-697, Vol. 6, 1-706,  
Vol. 6, 1-715, Vol. 6, 1-724
  - in LCME Vol. 2, 1-79
  - NTCX50
  - in PDTC Vol. 3, 6-19
  - NTDX15
  - in file processor Vol. 1, 7-43
  - in SuperNode SE CM/SLM Vol. 1, 3-67
  - NTDX16
  - in LPP LIS Vol. 2, 3-140
  - NTEX17 Vol. 6, 1-733, Vol. 6, 1-743,  
Vol. 6, 1-753, Vol. 6, 1-763, Vol. 6, 1-773
  - in LCM Vol. 2, 1-39
  - NTEX20
  - in ELPP LIS Vol. 1, 5-9
  - in LPP LIS Vol. 2, 3-36
  - in SSLPP Vol. 3, 2-7
  - in SuperNode SE ENI shelf Vol. 2, 4-6
  - in SuperNode SE LIS Vol. 2, 4-6
  - NTEX22
  - in APU in LPP LIS Vol. 2, 3-9
  - in EIU in SSLPP Vol. 3, 2-17
  - in EIU in SuperNode SE LIS Vol. 2, 4-13
  - in FRIU in LPP LIS Vol. 2, 3-68
  - in FRIU in SSLPP Vol. 3, 2-29
  - in FRIU SuperNode SE LIS Vol. 2, 4-24
  - in HLIU in an ELPP LIS Vol. 1, 5-17
  - in HSLR in an ELPP LIS Vol. 1, 5-27
  - in LIU7 in LPP LIS Vol. 2, 3-57
  - in LIU7 in SSLPP Vol. 3, 2-44
  - in LIU7 in SuperNode SE ENI shelf  
Vol. 2, 4-38
  - in LIU7 in SuperNode SE LIS Vol. 2, 4-38
  - in NIU in LPP LIS Vol. 2, 3-82
  - in NIU in SSLPP Vol. 3, 2-57
  - in NIU in SuperNode SE LIS Vol. 2, 4-49
  - in VPU in LPP LIS Vol. 2, 3-168
  - in XLIU in LPP LIS Vol. 2, 3-177
  - in XLIU in SSLPP Vol. 3, 2-105
  - in XLIU in SuperNode SE LIS Vol. 2, 4-91
  - NTEX25
  - in NIU in LPP LIS Vol. 2, 3-82
  - in NIU in SSLPP Vol. 3, 2-57
  - in NIU in SuperNode SE LIS Vol. 2, 4-49
  - NTEX26
  - in LIU7 in LPP LIS Vol. 2, 3-57
  - in LIU7 in SSLPP Vol. 3, 2-44
  - in LIU7 in SuperNode SE ENI shelf  
Vol. 2, 4-38
  - in LIU7 in SuperNode SE LIS Vol. 2, 4-38
  - NTEX28
  - in NIU in LPP LIS Vol. 2, 3-145
  - in NIU in SSLPP Vol. 3, 2-57
  - in NIU in SuperNode SE LIS Vol. 2, 4-49
  - NTEX30
  - in FRIU in LPP LIS Vol. 2, 3-68
  - in FRIU in SSLPP Vol. 3, 2-29
  - in FRIU in SuperNode SE LIS Vol. 2, 4-24
  - NTEX31
  - in FRIU in LPP LIS Vol. 2, 3-68
  - in FRIU in SSLPP Vol. 3, 2-29
  - in FRIU in SuperNode SE LIS Vol. 2, 4-24
  - NTEX54 Vol. 6, 1-783, Vol. 6, 1-800,  
Vol. 6, 1-817, Vol. 6, 1-834, Vol. 6, 1-851
  - in LCM Vol. 2, 1-13
  - NTEX76
  - in HLIU in an ELPP LIS Vol. 1, 5-17
  - NTEX78
  - in HLIU in an ELPP LIS Vol. 1, 5-17
  - NTFX09
  - in XLIU in LPP LIS Vol. 2, 3-177
  - in XLIU in SSLPP Vol. 3, 2-105
  - in XLIU in SuperNode SE LIS Vol. 2, 4-91
  - NTFX10
  - in XLIU in LPP LIS Vol. 2, 3-177
  - in XLIU in SSLPP Vol. 3, 2-105
  - in XLIU in SuperNode SE LIS Vol. 2, 4-91
  - NTFX32AA
  - in an ISM Vol. 1, 9-92
  - NTFX42
  - in ISM Vol. 3, 4-27
  - NTFX43
  - in ISM Vol. 3, 4-64
  - NTMX45 Vol. 6, 1-898
  - NTMX71 Vol. 6, 1-908, Vol. 6, 1-932,  
Vol. 6, 1-940
  - in DTC, DTCL, IDTC, PDTC Vol. 3, 6-19
  - in ILGC, LGC, LGCI, PLGC Vol. 3, 6-19
  - in ILTC, LTC, LTCL, PLTC Vol. 3, 6-19
-

NTMX72 Vol. 6, 1-949, Vol. 6, 1-957,  
Vol. 6, 1-966, Vol. 6, 1-975, Vol. 6, 1-984,  
Vol. 6, 1-993  
NTMX73 Vol. 7, 1-2, Vol. 7, 1-9, Vol. 7, 1-17,  
Vol. 7, 1-26, Vol. 7, 1-36, Vol. 7, 1-45  
NTMX74 Vol. 7, 1-60, Vol. 7, 1-69,  
Vol. 7, 1-77, Vol. 7, 1-86, Vol. 7, 1-95,  
Vol. 7, 1-104  
NTMX75 Vol. 7, 1-113, Vol. 7, 1-120,  
Vol. 7, 1-128, Vol. 7, 1-136, Vol. 7, 1-144,  
Vol. 7, 1-153  
NTMX76 Vol. 7, 1-168, Vol. 7, 1-175,  
Vol. 7, 1-182, Vol. 7, 1-188, Vol. 7, 1-195,  
Vol. 7, 1-205  
    in DTC, DTCI, IDTC, DTCO, PDTC  
    Vol. 3, 6-31  
    in ILGC, LGC, LGCI, LGCO, PLGC  
    Vol. 3, 6-31  
    in ILTC, LTC, LTCI, LTCO, PLTC  
    Vol. 3, 6-31  
NTMX77 Vol. 7, 1-221, Vol. 7, 1-234,  
Vol. 7, 1-241, Vol. 7, 1-254, Vol. 7, 1-267,  
Vol. 7, 1-280, Vol. 7, 1-293, Vol. 7, 1-306,  
Vol. 7, 1-318  
    in DTC, DTCI, IDTC, DTCO, PDTC  
    Vol. 3, 6-147  
    in ILGC, LGC, LGCI, LGCO, PLGC  
    Vol. 3, 6-147  
    in ILTC, LTC, LTCI, LTCO, PLTC  
    Vol. 3, 6-147  
NTMX79 Vol. 7, 1-333, Vol. 7, 1-343,  
Vol. 7, 1-349, Vol. 7, 1-359, Vol. 7, 1-370,  
Vol. 7, 1-380  
NTMX81 Vol. 7, 1-397, Vol. 7, 1-409,  
Vol. 7, 1-421, Vol. 7, 1-592  
NTMX82 Vol. 7, 1-465, Vol. 7, 1-476,  
Vol. 7, 1-486, Vol. 7, 1-496  
NTMX87 Vol. 7, 1-508, Vol. 7, 1-528,  
Vol. 7, 1-548, Vol. 7, 1-571  
NTMX97  
    in VPU in LPP LIS Vol. 2, 3-168  
NTMX99  
    in VPU in LPP LIS Vol. 2, 3-168  
NTRX41 Vol. 7, 1-630, Vol. 7, 1-635,  
Vol. 7, 1-640, Vol. 7, 1-650  
NTRX42 Vol. 7, 1-660, Vol. 7, 1-677,  
Vol. 7, 1-695, Vol. 7, 1-726, Vol. 7, 1-746

NTRX43 Vol. 7, 1-778, Vol. 7, 1-785,  
Vol. 7, 1-792, Vol. 7, 1-808  
NTRX44 Vol. 7, 1-824, Vol. 7, 1-836,  
Vol. 7, 1-858  
NTRX54 Vol. 7, 1-868, Vol. 7, 1-882  
NTRX66 Vol. 7, 1-896  
NTSX06  
    in LTC, LTC, DTC, LGCI, and LTCI  
    Vol. 3, 6-147  
card replacement procedures  
    NTBX01 Vol. 6, 1-374  
cards  
    inserting Vol. 3, 7-140  
    removing Vol. 3, 7-140

## M

### Maintenance

    returning cards Vol. 3, 7-168

### Media access control address

    DBIC provisioning Vol. 6, 1-785,  
    Vol. 6, 1-797, Vol. 6, 1-802, Vol. 6, 1-814,  
    Vol. 6, 1-819, Vol. 6, 1-831, Vol. 6, 1-836,  
    Vol. 6, 1-848, Vol. 6, 1-853, Vol. 6, 1-865

## N

### NT0X10

    card replacement procedures Vol. 4, 1-2,  
    Vol. 4, 1-6, Vol. 4, 1-14, Vol. 4, 1-18, Vol. 4, 1-25,  
    Vol. 4, 1-31, Vol. 4, 1-37, Vol. 4, 1-43

### NT0X91

    card replacement procedures Vol. 4, 1-61

### NT0X91AA

    card replacement procedures Vol. 4, 1-49,  
    Vol. 4, 1-90

### NT0X91AE

    card replacement procedures Vol. 4, 1-49,  
    Vol. 4, 1-96, Vol. 4, 1-105

### NT2X06

    card replacement procedures Vol. 4, 1-114,  
    Vol. 4, 1-121, Vol. 4, 1-129, Vol. 4, 1-136,  
    Vol. 4, 1-144, Vol. 4, 1-153, Vol. 4, 1-162

### NT2X09

    card replacement procedures Vol. 4, 1-171,  
    Vol. 4, 1-178, Vol. 4, 1-186, Vol. 4, 1-194,  
    Vol. 4, 1-202, Vol. 4, 1-211, Vol. 4, 1-220

- NT2X10  
card replacement procedures Vol. 4, 1-229,  
Vol. 4, 1-233, Vol. 4, 1-237, Vol. 4, 1-244,  
Vol. 4, 1-251, Vol. 4, 1-258
- NT2X11  
card replacement procedures Vol. 4, 1-265,  
Vol. 4, 1-270, Vol. 4, 1-278, Vol. 4, 1-282,  
Vol. 4, 1-289, Vol. 4, 1-298, Vol. 4, 1-307
- NT2X48  
card replacement procedures Vol. 4, 1-316,  
Vol. 4, 1-321, Vol. 4, 1-326
- NT2X55  
card replacement procedures Vol. 4, 1-331
- NT2X57  
card replacement procedures Vol. 4, 1-338,  
Vol. 4, 1-342, Vol. 4, 1-350, Vol. 4, 1-355,  
Vol. 4, 1-362, Vol. 4, 1-369, Vol. 4, 1-376
- NT2X59  
card replacement procedures Vol. 4, 1-383,  
Vol. 4, 1-387, Vol. 4, 1-401, Vol. 4, 1-406,  
Vol. 4, 1-413, Vol. 4, 1-420, Vol. 4, 1-427
- NT2X70  
card replacement procedures Vol. 4, 1-434,  
Vol. 4, 1-441, Vol. 4, 1-464, Vol. 4, 1-478,  
Vol. 4, 1-490, Vol. 4, 1-498, Vol. 4, 1-506,  
Vol. 4, 1-517, Vol. 4, 1-526
- NT2X90  
card replacement procedures Vol. 4, 1-533,  
Vol. 4, 1-538, Vol. 4, 1-543, Vol. 4, 1-557,  
Vol. 4, 1-562, Vol. 4, 1-569, Vol. 4, 1-576
- NT3X04  
card replacement procedures Vol. 4, 1-583
- NT3X09  
card replacement procedures Vol. 4, 1-590,  
Vol. 4, 1-596, Vol. 4, 1-601, Vol. 4, 1-612,  
Vol. 4, 1-617, Vol. 4, 1-624, Vol. 4, 1-634,  
Vol. 4, 1-644
- NT3X82  
card replacement procedures Vol. 4, 1-653
- NT3X83  
card replacement procedures Vol. 4, 1-660
- NT4X97  
card replacement procedures Vol. 4, 1-668,  
Vol. 4, 1-673, Vol. 4, 1-680
- NT4X98  
card replacement procedures Vol. 4, 1-687,  
Vol. 4, 1-694
- NT6X17  
card replacement procedures Vol. 4, 1-703,  
Vol. 4, 1-707, Vol. 4, 1-711, Vol. 4, 1-715,  
Vol. 4, 1-723, Vol. 4, 1-731, Vol. 4, 1-739
- NT6X18  
card replacement procedures Vol. 4, 1-743,  
Vol. 4, 1-747, Vol. 4, 1-751, Vol. 4, 1-755,  
Vol. 4, 1-759, Vol. 4, 1-767, Vol. 4, 1-775,  
Vol. 4, 1-783
- NT6X19  
card replacement procedures Vol. 4, 1-787,  
Vol. 4, 1-791, Vol. 4, 1-795, Vol. 4, 1-799,  
Vol. 4, 1-807, Vol. 4, 1-815, Vol. 4, 1-823
- NT6X20  
card replacement procedures Vol. 4, 1-827,  
Vol. 4, 1-831, Vol. 4, 1-835, Vol. 4, 1-839,  
Vol. 4, 1-847, Vol. 4, 1-855, Vol. 4, 1-863
- NT6X21  
card replacement procedures Vol. 4, 1-867,  
Vol. 4, 1-871, Vol. 4, 1-875, Vol. 4, 1-883,  
Vol. 4, 1-893, Vol. 4, 1-902, Vol. 4, 1-911,  
Vol. 4, 1-920
- NT6X27  
card replacement procedures Vol. 4, 1-924,  
Vol. 4, 1-931, Vol. 4, 1-938
- NT6X30  
card replacement procedures Vol. 4, 1-945,  
Vol. 4, 1-960, Vol. 4, 1-974, Vol. 4, 1-988,  
Vol. 4, 1-1002
- NT6X36  
card replacement procedures Vol. 4, 1-1021,  
Vol. 4, 1-1031, Vol. 4, 1-1036
- NT6X40  
card replacement procedures Vol. 5, 1-2,  
Vol. 5, 1-14, Vol. 5, 1-26
- NT6X41  
card replacement procedures Vol. 5, 1-64,  
Vol. 5, 1-71, Vol. 5, 1-78, Vol. 5, 1-87, Vol. 5, 1-95
- NT6X42  
card replacement procedures Vol. 5, 1-101,  
Vol. 5, 1-107, Vol. 5, 1-114, Vol. 5, 1-122
- NT6X44  
card replacement procedures Vol. 5, 1-130,  
Vol. 5, 1-138, Vol. 5, 1-144, Vol. 5, 1-158
- NT6X45  
card replacement procedures Vol. 5, 1-166,  
Vol. 5, 1-172, Vol. 5, 1-178, Vol. 5, 1-184

- NT6X47  
card replacement procedures Vol. 5, 1-190,  
Vol. 5, 1-196, Vol. 5, 1-202
- NT6X48  
card replacement procedures Vol. 3, 6-72,  
Vol. 3, 6-82, Vol. 5, 1-208
- NT6X50  
card replacement procedures Vol. 5, 1-216,  
Vol. 5, 1-223, Vol. 5, 1-237, Vol. 5, 1-244,  
Vol. 5, 1-259, Vol. 5, 1-275
- NT6X51  
card replacement procedures Vol. 5, 1-291,  
Vol. 5, 1-298, Vol. 5, 1-305, Vol. 5, 1-312,  
Vol. 5, 1-324, Vol. 5, 1-332, Vol. 5, 1-339,  
Vol. 5, 1-347
- NT6X52  
card replacement procedures Vol. 5, 1-355,  
Vol. 5, 1-361, Vol. 5, 1-367, Vol. 5, 1-373,  
Vol. 5, 1-384, Vol. 5, 1-392, Vol. 5, 1-401,  
Vol. 5, 1-410
- NT6X53  
card replacement procedures Vol. 5, 1-418,  
Vol. 5, 1-425, Vol. 5, 1-432, Vol. 5, 1-444,  
Vol. 5, 1-460, Vol. 5, 1-469, Vol. 5, 1-478,  
Vol. 5, 1-487
- NT6X54  
card replacement procedures Vol. 5, 1-493,  
Vol. 5, 1-500, Vol. 5, 1-509, Vol. 5, 1-518,  
Vol. 5, 1-533, Vol. 5, 1-542, Vol. 5, 1-549,  
Vol. 5, 1-556
- NT6X60  
card replacement procedures Vol. 5, 1-565,  
Vol. 5, 1-572, Vol. 5, 1-579, Vol. 5, 1-587
- NT6X69  
card replacement procedures Vol. 5, 1-605,  
Vol. 5, 1-613, Vol. 5, 1-622, Vol. 5, 1-630,  
Vol. 5, 1-639, Vol. 5, 1-648, Vol. 5, 1-654,  
Vol. 5, 1-670, Vol. 5, 1-678
- NT6X71  
card replacement procedures Vol. 5, 1-684,  
Vol. 5, 1-688, Vol. 5, 1-692, Vol. 5, 1-696,  
Vol. 5, 1-705, Vol. 5, 1-713, Vol. 5, 1-721
- NT6X72  
card replacement procedures Vol. 5, 1-725
- NT6X73  
card replacement procedures Vol. 5, 1-734,  
Vol. 5, 1-738, Vol. 5, 1-742, Vol. 5, 1-751
- NT6X74  
card replacement procedures Vol. 5, 1-755,  
Vol. 5, 1-761, Vol. 5, 1-775, Vol. 5, 1-782,  
Vol. 5, 1-790, Vol. 5, 1-799, Vol. 5, 1-808
- NT6X75  
card replacement procedures Vol. 5, 1-817,  
Vol. 5, 1-824, Vol. 5, 1-831, Vol. 5, 1-838
- NT6X76  
card replacement procedures Vol. 5, 1-845,  
Vol. 5, 1-853, Vol. 5, 1-861, Vol. 5, 1-869
- NT6X78  
card replacement procedures Vol. 5, 1-876,  
Vol. 5, 1-883, Vol. 5, 1-891, Vol. 5, 1-898,  
Vol. 5, 1-905, Vol. 5, 1-912, Vol. 5, 1-919,  
Vol. 5, 1-925, Vol. 5, 1-932, Vol. 5, 1-946
- NT6X80  
card replacement procedures Vol. 5, 1-951,  
Vol. 5, 1-957, Vol. 5, 1-964, Vol. 5, 1-972,  
Vol. 5, 1-981
- NT6X85  
card replacement procedures Vol. 6, 1-2,  
Vol. 6, 1-13, Vol. 6, 1-24
- NT6X86  
card replacement procedures Vol. 6, 1-30,  
Vol. 6, 1-39
- NT6X87  
card replacement procedures Vol. 6, 1-48,  
Vol. 6, 1-56
- NT6X92  
card replacement procedures Vol. 6, 1-64,  
Vol. 6, 1-71, Vol. 6, 1-79, Vol. 6, 1-87,  
Vol. 6, 1-95, Vol. 6, 1-104, Vol. 6, 1-112,  
Vol. 6, 1-118, Vol. 6, 1-125, Vol. 6, 1-140,  
Vol. 6, 1-243
- NT6X99  
card replacement procedures Vol. 6, 1-146,  
Vol. 6, 1-150, Vol. 6, 1-154, Vol. 6, 1-158,  
Vol. 6, 1-162, Vol. 6, 1-170, Vol. 6, 1-178,  
Vol. 6, 1-186
- NT7X05  
card replacement procedures Vol. 6, 1-190,  
Vol. 6, 1-198, Vol. 6, 1-207, Vol. 6, 1-234,  
Vol. 6, 1-252
- NT8X02  
card replacement procedures Vol. 6, 1-261,  
Vol. 6, 1-265

- 
- NT8X18  
card replacement procedures Vol. 6, 1-270
- NTAX74  
card replacement procedures Vol. 6, 1-281,  
Vol. 6, 1-292, Vol. 6, 1-303, Vol. 6, 1-315,  
Vol. 6, 1-327, Vol. 6, 1-337, Vol. 6, 1-347
- NTAX78  
card replacement procedures Vol. 6, 1-355,  
Vol. 6, 1-362, Vol. 6, 1-369
- NTBX01  
card replacement procedures Vol. 6, 1-374,  
Vol. 6, 1-381, Vol. 6, 1-390, Vol. 6, 1-399,  
Vol. 6, 1-408, Vol. 6, 1-417, Vol. 6, 1-423,  
Vol. 6, 1-430, Vol. 6, 1-437
- NTBX02  
card replacement procedures Vol. 6, 1-443,  
Vol. 6, 1-456, Vol. 6, 1-469, Vol. 6, 1-482,  
Vol. 6, 1-495, Vol. 6, 1-508, Vol. 6, 1-515,  
Vol. 6, 1-523
- NTBX26  
card replacement procedures Vol. 6, 1-538,  
Vol. 6, 1-546, Vol. 6, 1-554
- NTBX27  
card replacement procedures Vol. 6, 1-562,  
Vol. 6, 1-570, Vol. 6, 1-578, Vol. 6, 1-586
- NTBX34  
card replacement procedures Vol. 6, 1-593,  
Vol. 6, 1-601, Vol. 6, 1-611, Vol. 6, 1-621
- NTBX35  
card replacement procedures Vol. 6, 1-630,  
Vol. 6, 1-638, Vol. 6, 1-648, Vol. 6, 1-658
- NTBX36  
card replacement procedures Vol. 6, 1-667,  
Vol. 6, 1-677, Vol. 6, 1-687
- NTBX72  
card replacement procedures Vol. 6, 1-697,  
Vol. 6, 1-706, Vol. 6, 1-715, Vol. 6, 1-724
- NTEX17  
card replacement procedures Vol. 6, 1-733,  
Vol. 6, 1-743, Vol. 6, 1-753, Vol. 6, 1-763,  
Vol. 6, 1-773
- NTEX54  
card replacement procedures Vol. 6, 1-783,  
Vol. 6, 1-800, Vol. 6, 1-817, Vol. 6, 1-834,  
Vol. 6, 1-851
- NTMX45  
card replacement procedures Vol. 6, 1-898
- NTMX71  
card replacement procedures Vol. 6, 1-908,  
Vol. 6, 1-916, Vol. 6, 1-924, Vol. 6, 1-932,  
Vol. 6, 1-940
- NTMX71, Back plane cards in an XPM  
Vol. 3, 6-19
- NTMX72  
card replacement procedures Vol. 6, 1-949,  
Vol. 6, 1-957, Vol. 6, 1-966, Vol. 6, 1-975,  
Vol. 6, 1-984, Vol. 6, 1-993, Vol. 6, 1-1002
- NTMX73  
card replacement procedures Vol. 7, 1-9,  
Vol. 7, 1-17, Vol. 7, 1-26, Vol. 7, 1-36,  
Vol. 7, 1-45, Vol. 7, 1-54  
card replacement procedures Vol. 7, 1-2
- NTMX74  
card replacement procedures Vol. 7, 1-60,  
Vol. 7, 1-69, Vol. 7, 1-77, Vol. 7, 1-86,  
Vol. 7, 1-95, Vol. 7, 1-104
- NTMX75  
card replacement procedures Vol. 7, 1-113,  
Vol. 7, 1-120, Vol. 7, 1-128, Vol. 7, 1-136,  
Vol. 7, 1-144, Vol. 7, 1-153, Vol. 7, 1-162
- NTMX76  
card replacement procedures Vol. 7, 1-168,  
Vol. 7, 1-175, Vol. 7, 1-182, Vol. 7, 1-188,  
Vol. 7, 1-195, Vol. 7, 1-205, Vol. 7, 1-214
- NTMX77  
card replacement procedures Vol. 7, 1-221,  
Vol. 7, 1-234, Vol. 7, 1-241, Vol. 7, 1-254,  
Vol. 7, 1-267, Vol. 7, 1-280, Vol. 7, 1-293,  
Vol. 7, 1-306, Vol. 7, 1-318
- NTMX79  
card replacement procedures Vol. 7, 1-333,  
Vol. 7, 1-343, Vol. 7, 1-349, Vol. 7, 1-359,  
Vol. 7, 1-370, Vol. 7, 1-380, Vol. 7, 1-390
- NTMX81  
card replacement procedures Vol. 7, 1-397,  
Vol. 7, 1-409, Vol. 7, 1-421, Vol. 7, 1-435,  
Vol. 7, 1-451, Vol. 7, 1-592
- NTMX82  
card replacement procedures Vol. 7, 1-465,  
Vol. 7, 1-476, Vol. 7, 1-486, Vol. 7, 1-496
- NTMX87  
card replacement procedures Vol. 7, 1-508,  
Vol. 7, 1-528, Vol. 7, 1-548, Vol. 7, 1-571
-

NTRX41  
  card replacement procedures Vol. 7, 1-630,  
  Vol. 7, 1-635, Vol. 7, 1-640, Vol. 7, 1-650,  
  Vol. 7, 1-655

NTRX42  
  card replacement procedures Vol. 7, 1-660,  
  Vol. 7, 1-677, Vol. 7, 1-695, Vol. 7, 1-726,  
  Vol. 7, 1-746, Vol. 7, 1-766

NTRX43  
  card replacement procedures Vol. 7, 1-778,  
  Vol. 7, 1-785, Vol. 7, 1-792, Vol. 7, 1-808,  
  Vol. 7, 1-816

NTRX44  
  card replacement procedures Vol. 7, 1-824,  
  Vol. 7, 1-836, Vol. 7, 1-858

NTRX54  
  card replacement procedures Vol. 7, 1-868,  
  Vol. 7, 1-882, Vol. 7, 1-889

NTRX66  
  card replacement procedures Vol. 7, 1-896

NTTR46  
  card replacement procedures Vol. 7, 1-902

NTTR47  
  card replacement procedures Vol. 7, 1-908

NTTR60  
  card replacement procedures Vol. 7, 1-914

NTTR66  
  card replacement procedures Vol. 7, 1-921

NTTR67  
  card replacement procedures Vol. 7, 1-927

NTTR70  
  card replacement procedures Vol. 7, 1-934

NTTR71  
  card replacement procedures Vol. 7, 1-941

NTTR72  
  card replacement procedures Vol. 7, 1-946

NTTR73  
  card replacement procedures Vol. 7, 1-952

NTTR74  
  card replacement procedures Vol. 7, 1-956

NTTR75  
  card replacement procedures Vol. 7, 1-962

NTTR76  
  card replacement procedures Vol. 7, 1-970

NTTR77  
  card replacement procedures Vol. 7, 1-979

NTTR87  
  card replacement procedures Vol. 7, 1-986

## R

returning cards Vol. 3, 7-168

## S

shelf layouts

  application processor cabinet

    APC cabinet layout Vol. 1, 7-3

    file processor shelf Vol. 1, 7-4

    storage device shelf Vol. 1, 7-5

  common peripheral controller equipment  
  frame

    CPCE frame layout Vol. 3, 6-4

    DTC with 2 NT6X45's Vol. 3, 6-8

    international XPMs with 2 NT6X45's  
    Vol. 3, 6-14

    international XPMs with 3 NT6X45's  
    Vol. 3, 6-15

    international XPMs with NTMX77  
    Vol. 3, 6-13

    ISDN XPMs with 2 NT6X45's Vol. 3, 6-12

    ISDN XPMs with NTMX77 Vol. 3, 6-11

    LGC with 2 NT6X45's Vol. 3, 6-9

    LGC with NTMX77 Vol. 3, 6-6

    LTC with 2 NT6X45's Vol. 3, 6-10

    LTC with NTMX77 Vol. 3, 6-7

    PCM30 XPMs with 2 NT6X45's Vol. 3, 6-18

    PCM30 XPMs with NTMX77 Vol. 3, 6-16,  
    Vol. 3, 6-17

  dual plane combined core cabinet

    DPCC cabinet layout Vol. 2, 5-3, Vol. 3, 3-3

    SuperNode message switch shelf Vol. 2, 5-4

    SuperNode system load module shelf  
    Vol. 3, 3-4

  enhanced link peripheral processor

    ELPP cabinet layout Vol. 1, 5-4

    link interface module showing LMS units  
    Vol. 1, 5-6

    link interface shelf common fill Vol. 1, 5-7

    link interface shelf for DLIUs Vol. 1, 5-8

    triple F-bus configuration in ELPP cabinet  
    Vol. 1, 5-5

  enhanced multipurpose cabinet

    EMC cabinet layout Vol. 3, 2-4

    single shelf link peripheral processor, 2-slot  
    ASUs Vol. 3, 2-6

- single shelf link peripheral processor, ASU common fill Vol. 3, 2-5
- fiber link peripheral processor (SuperNode)
  - link interface module showing LMS units Vol. 2, 3-6
- host ISDN XPMs Vol. 3, 6-3
- host XPMs Vol. 3, 6-3
- input/output equipment frame
  - dual disk drive unit shelf Vol. 1, 9-7, Vol. 1, 9-8, Vol. 1, 9-9
  - input/output controller shelf Vol. 1, 9-5
  - IOE frame layout Vol. 1, 9-4, Vol. 3, 1-3
  - remote oscillator shelf Vol. 3, 1-4
  - single disk drive unit shelf Vol. 1, 9-6
- ISDN XPMs (host) Vol. 3, 6-3
- line concentrating equipment frame
  - enhanced line concentrating module Vol. 2, 1-9
  - ISDN LCE frame layout Vol. 2, 1-5
  - ISDN line concentrating equipment frame Vol. 2, 1-3, Vol. 3, 5-3
  - LCE frame layout Vol. 2, 1-4, Vol. 3, 5-3
  - LCM line drawer Vol. 2, 1-7
  - LCME line drawer Vol. 2, 1-10
  - LCMI line drawer (international) Vol. 2, 1-8
  - line concentrating module Vol. 2, 1-6, Vol. 3, 5-4
- line module equipment frame
  - line drawer layout (metal) Vol. 2, 2-8, Vol. 2, 10-8
  - line drawer layout (plastic) Vol. 2, 2-7, Vol. 2, 10-7
  - line drawer shelf Vol. 2, 2-6, Vol. 2, 10-6
  - line module controller Vol. 2, 2-5, Vol. 2, 10-5
  - LME frame layout Vol. 2, 10-4
- link peripheral processor (SuperNode)
  - application processor unit Vol. 2, 3-8
  - CCS7 link interface unit (2-slot, channelized) Vol. 2, 3-8
  - CCS7 link interface unit (2-slot, non-channelized) Vol. 2, 3-8
  - Ethernet interface unit (2-slot) Vol. 2, 3-8
  - frame relay interface unit Vol. 2, 3-8
  - link interface module showing LMS units Vol. 2, 3-5
  - link interface shelf common fill, 2-slot ASUs Vol. 2, 3-7
  - link interface shelf for 2-slot ASUs Vol. 2, 3-8
  - LPP cabinet layout Vol. 2, 3-4
  - network interface unit Vol. 2, 3-8
  - voice processor unit Vol. 2, 3-8
  - X.25 link interface unit Vol. 2, 3-8
- message switch and buffer equipment frame
  - CCS6 signaling terminal array Vol. 2, 7-8
  - CCS6 signaling terminal controller array Vol. 2, 7-9
  - CCS7 signaling terminal array Vol. 2, 7-11
  - CCS7 signaling terminal group Vol. 2, 7-10
  - MS6E frame layout Vol. 2, 7-4
  - MS7E frame layout Vol. 2, 7-6
  - ST6E frame layout Vol. 2, 7-5
  - ST7E frame layout Vol. 2, 7-7
- network equipment frames
  - ENET 128K frame layout Vol. 2, 8-8
  - ENET 64K frame layout Vol. 2, 8-7
  - ENET shelf Vol. 2, 8-14
  - NT0X48 NET crosspoint shelf Vol. 2, 8-10
  - NT0X48 NET frame layout Vol. 2, 8-4
  - NT0X48 NET interface shelf Vol. 2, 8-9
  - NT5X13 NETC crosspoint shelf Vol. 2, 8-12
  - NT5X13 NETC frame layout Vol. 2, 8-5
  - NT5X13 NETC interface shelf Vol. 2, 8-11
  - NT8X11 DSN frame layout Vol. 2, 8-6
  - NX8X11 DSN shelf Vol. 2, 8-13
- office alarm unit Vol. 2, 9-3
- single core cabinet
  - enhanced network and interface shelf Vol. 1, 6-5, Vol. 1, 6-6
  - SCC cabinet layout Vol. 1, 3-3, Vol. 1, 6-3, Vol. 2, 4-3, Vol. 2, 6-3
  - SuperNode SE computing module/system load module Vol. 1, 3-4
  - SuperNode SE link interface shelf, 2-slot ASUs Vol. 2, 4-5
  - SuperNode SE link interface shelf, ASU common fill Vol. 2, 4-4
  - SuperNode SE message switch shelf Vol. 2, 6-4
  - SuperNode SE 16K ENET Vol. 1, 6-5
  - SuperNode SE 16k ENET Vol. 1, 6-3

- SuperNode SE 32k Vol. 1, 6-4
- trunk module equipment frame
  - digital recorded announcement machine with NT0X70 processor Vol. 3, 4-9
  - digital recorded announcement machine with NT4X65 processor Vol. 3, 4-10
  - integrated service module with NTFX42 processor Vol. 3, 4-12
  - integrated service module with single-card PMs Vol. 3, 4-13
  - maintenance trunk module with NT0X70 processor Vol. 3, 4-7
  - maintenance trunk module with NT4X65 processor Vol. 3, 4-8
  - office alarm unit with NT0X70 processor Vol. 2, 9-5
  - office alarm unit with NT4X65 processor Vol. 2, 9-6
  - service trunk module Vol. 3, 4-11
  - TME frame layout Vol. 2, 9-4, Vol. 3, 4-4
  - trunk module with NT0X70 processor Vol. 3, 4-5
  - trunk module with NT4X65 processor Vol. 3, 4-6
- XPMs (host) Vol. 3, 6-3
- Star Remote System
  - Star Module
    - C-side links mapping
      - illustrated Vol. 7, 1-459, Vol. 7, 1-993





DMS-100 Family  
**North American DMS-100**  
Card Replacement Procedures  
Volume 1 of 7

Product Documentation - Dept. 3423  
Nortel Networks  
P.O. Box 13010  
RTP, NC 27709-3010  
Telephone: 1-877-662-5669  
email: [cits@nortelnetworks.com](mailto:cits@nortelnetworks.com)

Copyright © 1996-2001 Nortel Networks,  
All Rights Reserved

**NORTEL NETWORKS CONFIDENTIAL:** The information contained herein is the property of Nortel Networks and is strictly confidential. Except as expressly authorized in writing by Nortel Networks, the holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information, in whole or in part, from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information, but with no less than reasonable care. Except as expressly authorized in writing by Nortel Networks, the holder is granted no rights to use the information contained herein.

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant. Changes or modification to the DMS-100 without the express consent of Nortel Networks may void its warranty and void the user's authority to operate the equipment.

Nortel Networks, the Nortel Networks logo, the Globemark, How the World Shares Ideas, Unified Networks, DMS, DMS-100, Helmsman, MAP, Meridian, Nortel, Northern Telecom, NT, and Supernode are trademarks of Nortel Networks.

Publication number: 297-8001-547  
Product release: LEC0015 and up  
Document release: Standard 14.02  
Date: May 2001  
Printed in the United States of America

