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

2 SuperNode SE computing module and system load 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 SE CM/SLM shelf layouts 2-3
   NT9X44 in a SuperNode SE CM/SLM 2-5
   NT9X46 in a SuperNode SE CM/SLM 2-27
   NT9X62 in a SuperNode SE CM/SLM 2-45
Power converter cards in a SuperNode SE CM/SLM 2-67
Replace system cards in a SuperNode SE CM/SLM 2-85

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

4  Enhanced link peripheral processor card replacement procedures 4-1
Introduction 4-1
Application 4-1
Common procedures 4-1
Action 4-1
Recording card replacement activities 4-2
ELPP shelf layouts 4-3
Common fill paddle boards in an ELPP LIS 4-9
HLIU cards in an ELPP LIS 4-17
HSLR cards in an ELPP LIS 4-27
MLIU cards in an LPP LIS 4-36
NT9X13 in an ELPP LIM unit 4-46
System and power cards in an ELPP LIM unit 4-58

5  SuperNode SE enhanced network card replacement procedures 5-1
Introduction 5-1
Application 5-1
Common procedures 5-1
Action 5-2
Recording card replacement activities 5-2
SuperNode SE ENET shelf designs 5-3
Crosspoint and interface cards in a SuperNode SE 16k ENET 5-7
Crosspoint and interface cards in a SuperNode SE 32k ENET 5-31
Power converter cards in a SuperNode SE 16k ENET 5-53
System cards in a SuperNode SE 16k ENET 5-77
System cards in a SuperNode SE 32k ENET 5-100

6  File processor card replacement procedures 6-1
Introduction 6-1
Application 6-1
Common procedures 6-1
### 7 Frame supervisory panel and modular supervisory panel card replacement procedures

**Introduction** 7-1
- Application 7-1
- Common procedures 7-1

**Action** 7-1
- Recording card replacement activities 7-2
- FSP cards in a 42-in. (106.7-cm) SuperNode cabinet 7-3
- NT0X36 in a cabinetized input/output equipment frame 7-8
- NT0X36 in a cabinetized trunk module equipment frame 7-29
- NT0X36 in an input/output equipment frame 7-53
- NT0X36 in an international cabinet auxiliary module 7-74
- NT0X91 in a CPCE frame 7-98
- NT0X91 in a digital carrier equipment frame 7-112
- NT0X91 in a line module equipment frame 7-123
- NT0X91 in an MS6E 7-133
- NT0X91 in an MS7E, ST7E, or ST6E 7-147
- NT0X91 in a network equipment frame 7-159
- NT0X91 in a trunk module equipment frame 7-172
- NT6X36 in LCE-type frames and CLCE 7-192
- NTRX41 in MSP in streamline B cabinets 7-197

### 8 Input/output device card replacement procedures

**Introduction** 8-1
- Application 8-1
- Common procedures 8-1

**Action** 8-1
- Recording card replacement activities 8-2
- IOD shelf layouts 8-3
- Disk drive and magnetic tape controller cards in an IOC 8-10
- NT1X67 in an IOC 8-21
- NT1X78 in an IOE DDU shelf 8-28
- NT1X89 in an IOC shelf 8-37
- NT2X70 in an IOC 8-44
- NTFX30 in an ISM 8-61
- NTFX31 in an ISM 8-77
- NTFX32AA in an ISM 8-92
- System cards in an IOC 8-97
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 SuperNode computing module 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, 1-2
- Recording card replacement activities Vol. 1, 1-2
- SuperNode CM shelf layouts Vol. 1, 1-3
- NT9X20 in a SuperNode CM Vol. 1, 1-5
- System cards in a SuperNode CM Vol. 1, 1-22

2 SuperNode SE computing module and system load 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 SE CM/SLM shelf layouts Vol. 1, 2-3
- NT9X44 in a SuperNode SE CM/SLM Vol. 1, 2-5
- NT9X46 in a SuperNode SE CM/SLM Vol. 1, 2-27
- NT9X62 in a SuperNode SE CM/SLM Vol. 1, 2-45
- Power converter cards in a SuperNode SE CM/SLM Vol. 1, 2-67
- Replace system cards in a SuperNode SE CM/SLM Vol. 1, 2-85
# 3 Digital carrier module card replacement procedures

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3-1</td>
</tr>
<tr>
<td>Application</td>
<td>3-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>3-1</td>
</tr>
<tr>
<td>Action</td>
<td>3-1</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>3-2</td>
</tr>
<tr>
<td>DCM shelf layouts</td>
<td>3-3</td>
</tr>
<tr>
<td>Control complex cards in a digital carrier module</td>
<td>3-8</td>
</tr>
<tr>
<td>NT2X35 in a digital carrier module</td>
<td>3-13</td>
</tr>
<tr>
<td>NT2X36 in a digital carrier module</td>
<td>3-27</td>
</tr>
<tr>
<td>NT3X65 in a digital echo suppressor</td>
<td>3-37</td>
</tr>
<tr>
<td>Power converter cards in a digital carrier module</td>
<td>3-47</td>
</tr>
</tbody>
</table>

# 4 Enhanced link peripheral processor card replacement procedures

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>4-1</td>
</tr>
<tr>
<td>Application</td>
<td>4-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>4-1</td>
</tr>
<tr>
<td>Action</td>
<td>4-1</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>4-2</td>
</tr>
<tr>
<td>ELPP shelf layouts</td>
<td>4-3</td>
</tr>
<tr>
<td>Common fill paddle boards in an ELPP LIS</td>
<td>4-9</td>
</tr>
<tr>
<td>HLIU cards in an ELPP LIS</td>
<td>4-17</td>
</tr>
<tr>
<td>HSLR cards in an ELPP LIS</td>
<td>4-27</td>
</tr>
<tr>
<td>MLIU cards in an LPP LIS</td>
<td>4-36</td>
</tr>
<tr>
<td>NT9X13 in an ELPP LIM unit</td>
<td>4-46</td>
</tr>
<tr>
<td>System and power cards in an ELPP LIM unit</td>
<td>4-58</td>
</tr>
</tbody>
</table>

# 5 SuperNode SE enhanced network card replacement procedures

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5-1</td>
</tr>
<tr>
<td>Application</td>
<td>5-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>5-1</td>
</tr>
<tr>
<td>Action</td>
<td>5-2</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>5-2</td>
</tr>
<tr>
<td>SuperNode SE ENET shelf designs</td>
<td>5-3</td>
</tr>
<tr>
<td>Crosspoint and interface cards in a SuperNode SE 16k ENET</td>
<td>5-7</td>
</tr>
<tr>
<td>Crosspoint and interface cards in a SuperNode SE 32k ENET</td>
<td>5-31</td>
</tr>
<tr>
<td>Power converter cards in a SuperNode SE 16k ENET</td>
<td>5-53</td>
</tr>
<tr>
<td>System cards in a SuperNode SE 16k ENET</td>
<td>5-77</td>
</tr>
<tr>
<td>System cards in a SuperNode SE 32k ENET</td>
<td>5-100</td>
</tr>
</tbody>
</table>

# 6 File processor card replacement procedures

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>6-1</td>
</tr>
<tr>
<td>Application</td>
<td>6-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>6-1</td>
</tr>
<tr>
<td>Action</td>
<td>6-1</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>6-2</td>
</tr>
</tbody>
</table>
7 Frame supervisory panel and modular supervisory panel card replacement procedures

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
FSP cards in a 42-in. (106.7-cm) SuperNode cabinet Vol. 1, 7-3
NT0X36 in a cabinetized input/output equipment frame Vol. 1, 7-8
NT0X36 in a cabinetized trunk module equipment frame Vol. 1, 7-29
NT0X36 in an input/output equipment frame Vol. 1, 7-53
NT0X36 in an international cabinet auxiliary module Vol. 1, 7-74
NT0X91 in a CPCE frame Vol. 1, 7-98
NT0X91 in a digital carrier equipment frame Vol. 1, 7-112
NT0X91 in a line module equipment frame Vol. 1, 7-123
NT0X91 in an MS6E Vol. 1, 7-133
NT0X91 in an MS7E, ST7E, or ST6E Vol. 1, 7-147
NT0X91 in a network equipment frame Vol. 1, 7-159
NT0X91 in a trunk module equipment frame Vol. 1, 7-172
NTFX36 in LCE-type frames and CLCE Vol. 1, 7-192
NTRX41 in MSP in streamline B cabinets Vol. 1, 7-197

8 Input/output device card replacement procedures

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
IOD shelf layouts Vol. 1, 8-3
Disk drive and magnetic tape controller cards in an IOC Vol. 1, 8-10
NT1X67 in an IOC Vol. 1, 8-21
NT1X78 in an IOE DDU shelf Vol. 1, 8-28
NT1X89 in an IOC shelf Vol. 1, 8-37
NT2X70 in an IOC Vol. 1, 8-44
NTFX30 in an ISM Vol. 1, 8-61
NTFX31 in an ISM Vol. 1, 8-77
NTFX32AA in an ISM Vol. 1, 8-92
System cards in an IOC Vol. 1, 8-97
# 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 SuperNode SE LIS or ENI 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
- **SuperNode SE link interface shelf layouts** Vol. 2, 3-3
- **Common fill cards in a SuperNode SE LIS or ENI shelf** Vol. 2, 3-6
- **EIU cards in a SuperNode SE LIS** Vol. 2, 3-13
- **FRIU cards in a SuperNode SE LIS** Vol. 2, 3-24
- **LIU7 cards in a SuperNode SE LIS or ENI shelf** Vol. 2, 3-38
- **NIU cards in a SuperNode SE LIS** Vol. 2, 3-49
- **NT9X30 in a SuperNode SE LIS** Vol. 2, 3-64
- **XLIU cards in a SuperNode SE LIS** Vol. 2, 3-91
4  Link peripheral processor 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
LPP shelf layouts   Vol. 2, 4-3
APU cards in an LPP LIS   Vol. 2, 4-9
Common fill paddle boards in an LPP LIS   Vol. 2, 4-36
EIU cards in an LPP LIS   Vol. 2, 4-47
FRIU cards in an LPP LIS   Vol. 2, 4-57
LIU7 cards in an LPP LIS   Vol. 2, 4-71
NIU processor and controller cards in an LPP LIS   Vol. 2, 4-82
NT9X13 in an LPP LIM unit   Vol. 2, 4-89
NT9X30 in an LPP LIS   Vol. 2, 4-100
NT9X74 in an LPP LIS   Vol. 2, 4-126
NTDX16 in an LPP LIS   Vol. 2, 4-140
NTEx28 in an NIU in an LPP LIS   Vol. 2, 4-145
System and power cards in an LPP LIM unit   Vol. 2, 4-155
VPU cards in an LPP LIS   Vol. 2, 4-168
XLIU cards in an LPP LIS   Vol. 2, 4-178

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
## Card Replacement Procedures

**Volume 3 of 7**

### 1 Remote line module card replacement procedures

<table>
<thead>
<tr>
<th>Volume</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>Introduction</td>
</tr>
<tr>
<td>3-1</td>
<td>Application</td>
</tr>
<tr>
<td>3-1</td>
<td>Common procedures</td>
</tr>
<tr>
<td>3-1</td>
<td>Action</td>
</tr>
<tr>
<td>3-1</td>
<td>Recording card replacement activities</td>
</tr>
<tr>
<td>3-1</td>
<td>RLM shelf layouts</td>
</tr>
<tr>
<td>3-1</td>
<td>Control complex cards in an RLM</td>
</tr>
<tr>
<td>3-1</td>
<td>Crosspoint and interface cards in an RLM</td>
</tr>
<tr>
<td>3-1</td>
<td>Power converter cards in an RLM</td>
</tr>
<tr>
<td>3-1</td>
<td>Processor and memory cards in an RLM</td>
</tr>
<tr>
<td>3-1</td>
<td>Signaling terminal cards in an RLM</td>
</tr>
</tbody>
</table>

---

297-9051-547 Standard 02.01 April 2000
2 Remote oscillator shelf card replacement procedures  Vol. 3, 2-1

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Vol. 3, 2-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Vol. 3, 2-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>Vol. 3, 2-1</td>
</tr>
<tr>
<td>Action</td>
<td>Vol. 3, 2-1</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>Vol. 3, 2-2</td>
</tr>
<tr>
<td>Remote oscillator shelf layouts</td>
<td>Vol. 3, 2-3</td>
</tr>
<tr>
<td>NT1X78 in a remote oscillator shelf</td>
<td>Vol. 3, 2-5</td>
</tr>
<tr>
<td>NT3X16 in a remote oscillator shelf</td>
<td>Vol. 3, 2-14</td>
</tr>
</tbody>
</table>

3 Single shelf link peripheral processor card replacement procedures  Vol. 3, 3-1

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Vol. 3, 3-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Vol. 3, 3-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>Vol. 3, 3-1</td>
</tr>
<tr>
<td>Action</td>
<td>Vol. 3, 3-1</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>Vol. 3, 3-2</td>
</tr>
<tr>
<td>SSLPP shelf layouts</td>
<td>Vol. 3, 3-3</td>
</tr>
<tr>
<td>Common fill cards in an SSLPP</td>
<td>Vol. 3, 3-7</td>
</tr>
<tr>
<td>EIU cards in an SSLPP</td>
<td>Vol. 3, 3-17</td>
</tr>
<tr>
<td>FRIU cards in an SSLPP</td>
<td>Vol. 3, 3-29</td>
</tr>
<tr>
<td>LIU7 cards in an SSLPP</td>
<td>Vol. 3, 3-44</td>
</tr>
<tr>
<td>NIU cards in an SSLPP</td>
<td>Vol. 3, 3-57</td>
</tr>
<tr>
<td>Power converter cards in an SSLPP</td>
<td>Vol. 3, 3-74</td>
</tr>
<tr>
<td>XLIU cards in an SSLPP</td>
<td>Vol. 3, 3-106</td>
</tr>
</tbody>
</table>

4 SuperNode system load module card replacement procedures  Vol. 3, 4-1

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Vol. 3, 4-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Vol. 3, 4-1</td>
</tr>
<tr>
<td>Common procedures</td>
<td>Vol. 3, 4-1</td>
</tr>
<tr>
<td>Action</td>
<td>Vol. 3, 4-2</td>
</tr>
<tr>
<td>Recording card replacement activities</td>
<td>Vol. 3, 4-2</td>
</tr>
<tr>
<td>SuperNode SLM shelf layouts</td>
<td>Vol. 3, 4-3</td>
</tr>
<tr>
<td>NT9X44 in a SuperNode SLM</td>
<td>Vol. 3, 4-5</td>
</tr>
<tr>
<td>SPM NTLX60AA FIL with DSP RM DMS-Spectrum Peripheral Module</td>
<td>Vol. 3, 4-26</td>
</tr>
<tr>
<td>SPM NTLX60AA FIL with VSP RM DMS-Spectrum Peripheral Module</td>
<td>Vol. 3, 4-37</td>
</tr>
<tr>
<td>SPM NTLX61AA SIM card DMS-Spectrum Peripheral Module</td>
<td>Vol. 3, 4-47</td>
</tr>
</tbody>
</table>
SPM NTLX63AA CEM card DMS-Spectrum Peripheral Module Vol. 3, 4-55
SPM NTLX65BA DSP RM DMS-Spectrum Peripheral Module Vol. 3, 4-74
SPM NTLX66BA VSP RM DMS-Spectrum Peripheral Module Vol. 3, 4-87
SPM NTLX71AA OC3 card DMS-Spectrum Peripheral Module Vol. 3, 4-99
SPM NTLX72AA DLC RM Spectrum Peripheral Module Vol. 3, 4-120
SPM NTLX73AA ATM RM Spectrum Peripheral Module Vol. 3, 4-133
SPM NTLX82AA CEM card DMS-Spectrum Peripheral Module Vol. 3, 4-145
System cards in a SuperNode SLM Vol. 3, 4-165

5  Trunk module 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
TM shelf layouts Vol. 3, 5-3
Control complex cards in trunk and service modules Vol. 3, 5-27
Enhanced digital test unit or digital test unit cards in trunk and service modules Vol. 3, 5-37
Metallic test unit cards in trunk and service modules Vol. 3, 5-44
Power converter cards in trunk and service modules Vol. 3, 5-64
Single-card PMs in trunk and service modules Vol. 3, 5-79
Trunk, maintenance, and service cards in trunk and service modules Vol. 3, 5-88

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
Manually busying Series II PM and CPM C-side links Vol. 3, 6-42
NT2X70 in an XPM Vol. 3, 6-49
NT6X40 in an XPM Vol. 3, 6-71
NT6X48 in LGC, PLGC, LTC, PLTC Vol. 3, 6-84
NT6X48 in MSB7 Vol. 3, 6-94
NT6X60 in an SRU Vol. 3, 6-102
NT6X78 in an XPM Vol. 3, 6-106
NT7X03 in an XPM Vol. 3, 6-113
NTBX02 in an XPM Vol. 3, 6-122
P-side interface cards in an XPM Vol. 3, 6-131
Processor and memory cards in a GPP Vol. 3, 6-154
Processor and memory cards in an XPM Vol. 3, 6-161
Removing and replacing a card Vol. 3, 6-179
Returning a card for repair or replacement Vol. 3, 6-183
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, 7-9
Cleaning fiber-optic components and assemblies Vol. 3, 7-17
Correcting a load mismatch Vol. 3, 7-25
Deactivating CCS7 links Vol. 3, 7-40
Failure to switch clock mastership Vol. 3, 7-48
Loading a PM Vol. 3, 7-57
Manually busying LIM-to-MS DS30 links Vol. 3, 7-69
Memory extension in the SuperNode CM Vol. 3, 7-75
Memory extension in the SuperNode SE CM Vol. 3, 7-93
Moving an XSG to a spare XLIU Vol. 3, 7-111
Replacing a card Vol. 3, 7-119
Replacing a line card Vol. 3, 7-125
Reseating cards in equipment shelves Vol. 3, 7-132
Returning LIM-to-MS DS30 links to service Vol. 3, 7-137
Switching the clock source Vol. 3, 7-142
Unseating cards in equipment shelves Vol. 3, 7-149
Verifying load compatibility of SuperNode cards Vol. 3, 7-153

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
NT2X70 in an SMU Vol. 4, 1-533
NT2X90 in an IOPAC RMM Vol. 4, 1-540
NT2X90 in an OPAC RMM Vol. 4, 1-545
NT2X90 in an OPM RMM Vol. 4, 1-550
NT2X90 in an RLCM-EDC RMM Vol. 4, 1-558
NT2X90 in an RLCM RMM Vol. 4, 1-564
NT2X90 in an RSC RMM Vol. 4, 1-569
NT2X90 in an RSC-S (DS-1) Model A RMM Vol. 4, 1-576
NT2X90 in an RSC-S (DS-1) Model B RMM Vol. 4, 1-583
NT3X04 in an RSC RMM Vol. 4, 1-590
NT3X09 in an IOPAC RMM Vol. 4, 1-597
NT3X09 in an OPAC RMM Vol. 4, 1-603
NT3X09 in an OPM RMM Vol. 4, 1-608
NT3X09 in an RLCM-EDC RMM Vol. 4, 1-614
NT3X09 in an RLCM RMM Vol. 4, 1-619
NT3X09 in an RSC RMM Vol. 4, 1-624
NT3X09 in an RSC-S (DS-1) Model A RMM Vol. 4, 1-631
NT3X09 in an RSC-S (DS-1) Model B RMM Vol. 4, 1-641
NT3X09 in an RSC-S (PCM-30) Model B RMM Vol. 4, 1-651
NT3X82 in an RSC RMM Vol. 4, 1-660
NT3X83 in an RSC RMM Vol. 4, 1-667
NT4X97 in an IOPAC RMM Vol. 4, 1-675
NT4X97 in an RSC-S (PCM-30) Model A RMM Vol. 4, 1-680
NT4X97 in an RSC-S (PCM-30) Model B RMM Vol. 4, 1-687
NT4X98 in an IOPAC RMM Vol. 4, 1-694
NT4X98 in an RSC-S (PCM-30) Model B RMM Vol. 4, 1-701
NT6X17 in an IOPAC ILCM Vol. 4, 1-710
NT6X17 in an OPM Vol. 4, 1-714
NT6X17 in an RLCM Vol. 4, 1-718
NT6X17 in an RSC LCM Vol. 4, 1-722
NT6X17 in an RSC-S (DS-1) Model A LCME Vol. 4, 1-730
NT6X17 in an RSC-S (DS-1) Model B LCME Vol. 4, 1-738
NT6X17 in a STAR or RLD Vol. 4, 1-746
NT6X18 in an IOPAC ILCM Vol. 4, 1-750
NT6X18 in an OPAC LCM Vol. 4, 1-754
NT6X18 in an OPM Vol. 4, 1-758
NT6X18 in an RLCM Vol. 4, 1-762
NT6X18 in an RSC LCM Vol. 4, 1-766
NT6X18 in an RSC-S (DS-1) Model A LCME Vol. 4, 1-774
NT6X18 in an RSC-S (DS-1) Model B LCME Vol. 4, 1-782
NT6X18 in a STAR or RLD Vol. 4, 1-790
NT6X19 in an IOPAC ILCM Vol. 4, 1-794
NT6X19 in an OPM Vol. 4, 1-798
NT6X19 in an RLCM Vol. 4, 1-802
NT6X19 in an RSC LCM Vol. 4, 1-806
NT6X19 in an RSC-S (DS-1) Model A LCME Vol. 4, 1-814
NT6X19 in an RSC-S (DS-1) Model B LCME Vol. 4, 1-822
NT6X19 in a STAR or RLD Vol. 4, 1-830
NT6X20 in an IOPAC ILCM Vol. 4, 1-834
NT6X20 in an OPM Vol. 4, 1-838
NT6X20 in an RLCM Vol. 4, 1-842
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 a 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-E DC H I E  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-E DC  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 LCM  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-E DC  Vol. 5, 1-379
NT6X52 in an RSC LCM  Vol. 5, 1-384
NT6X52 in an RSC-S (DS-1) Model A LCM  Vol. 5, 1-392
NT6X52 in an RSC-S (DS-1) Model B LCM  Vol. 5, 1-401
NT6X52 in an RSC-S (PCM-30) Model A LCM-E  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-E DC  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-E DC  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
<table>
<thead>
<tr>
<th>Model/Configuration</th>
<th>Volume</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT6X54 in an RSC-S (DS-1) Model B LCM(E)</td>
<td>Vol. 5</td>
<td>1-549</td>
</tr>
<tr>
<td>NT6X54 in a STAR</td>
<td>Vol. 5</td>
<td>1-556</td>
</tr>
<tr>
<td>NT6X60 in an IOPAC HIE</td>
<td>Vol. 5</td>
<td>1-565</td>
</tr>
<tr>
<td>NT6X60 in an OPAC HIE</td>
<td>Vol. 5</td>
<td>1-572</td>
</tr>
<tr>
<td>NT6X60 in an OPM HIE</td>
<td>Vol. 5</td>
<td>1-579</td>
</tr>
<tr>
<td>NT6X60 in an RLCM HIE</td>
<td>Vol. 5</td>
<td>1-587</td>
</tr>
<tr>
<td>NT6X69 in an RSC-M</td>
<td>Vol. 5</td>
<td>1-595</td>
</tr>
<tr>
<td>NT6X69 in an RSC RCC/RCC2</td>
<td>Vol. 5</td>
<td>1-605</td>
</tr>
<tr>
<td>NT6X69 in an RSC-S (DS-1) Model A RCC2</td>
<td>Vol. 5</td>
<td>1-613</td>
</tr>
<tr>
<td>NT6X69 in an RSC-S (DS-1) Model B RCC2</td>
<td>Vol. 5</td>
<td>1-622</td>
</tr>
<tr>
<td>NT6X69 in an RSC-S (PCM-30) Model A RCO2</td>
<td>Vol. 5</td>
<td>1-630</td>
</tr>
<tr>
<td>NT6X69 in an RSC-S (PCM-30) Model B RCO2</td>
<td>Vol. 5</td>
<td>1-639</td>
</tr>
<tr>
<td>NT6X69 in an SMA</td>
<td>Vol. 5</td>
<td>1-648</td>
</tr>
<tr>
<td>NT6X69 in an SMA-MVI-20</td>
<td>Vol. 5</td>
<td>1-654</td>
</tr>
<tr>
<td>NT6X69 in an SMS</td>
<td>Vol. 5</td>
<td>1-661</td>
</tr>
<tr>
<td>NT6X69 in an SMS-R</td>
<td>Vol. 5</td>
<td>1-670</td>
</tr>
<tr>
<td>NT6X69 in an SMU</td>
<td>Vol. 5</td>
<td>1-678</td>
</tr>
<tr>
<td>NT6X71 in an IOPAC ILCM</td>
<td>Vol. 5</td>
<td>1-684</td>
</tr>
<tr>
<td>NT6X71 in an OPM</td>
<td>Vol. 5</td>
<td>1-688</td>
</tr>
<tr>
<td>NT6X71 in an RLCM</td>
<td>Vol. 5</td>
<td>1-692</td>
</tr>
<tr>
<td>NT6X71 in an RSC LCM</td>
<td>Vol. 5</td>
<td>1-696</td>
</tr>
<tr>
<td>NT6X71 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 5</td>
<td>1-705</td>
</tr>
<tr>
<td>NT6X71 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 5</td>
<td>1-713</td>
</tr>
<tr>
<td>NT6X71 in a STAR or RLD</td>
<td>Vol. 5</td>
<td>1-721</td>
</tr>
<tr>
<td>NT6X72 in an RSC</td>
<td>Vol. 5</td>
<td>1-725</td>
</tr>
<tr>
<td>NT6X73 in an IOPAC HIE</td>
<td>Vol. 5</td>
<td>1-734</td>
</tr>
<tr>
<td>NT6X73 in an OPAC HIE</td>
<td>Vol. 5</td>
<td>1-738</td>
</tr>
<tr>
<td>NT6X73 in an OPM HIE</td>
<td>Vol. 5</td>
<td>1-742</td>
</tr>
<tr>
<td>NT6X73 in an RLCM-EDC HIE</td>
<td>Vol. 5</td>
<td>1-746</td>
</tr>
<tr>
<td>NT6X73 in an RLCM HIE</td>
<td>Vol. 5</td>
<td>1-751</td>
</tr>
<tr>
<td>NT6X74 in an IOPAC RMM</td>
<td>Vol. 5</td>
<td>1-755</td>
</tr>
<tr>
<td>NT6X74 in an OPM RMM</td>
<td>Vol. 5</td>
<td>1-761</td>
</tr>
<tr>
<td>NT6X74 in an RLCM-EDC RMM</td>
<td>Vol. 5</td>
<td>1-768</td>
</tr>
<tr>
<td>NT6X74 in an RLCM RMM</td>
<td>Vol. 5</td>
<td>1-775</td>
</tr>
<tr>
<td>NT6X74 in an RSC RMM</td>
<td>Vol. 5</td>
<td>1-782</td>
</tr>
<tr>
<td>NT6X74 in an RSC-S (DS-1) Model A RMM</td>
<td>Vol. 5</td>
<td>1-790</td>
</tr>
<tr>
<td>NT6X74 in an RSC-S (DS-1) Model B RMM</td>
<td>Vol. 5</td>
<td>1-799</td>
</tr>
<tr>
<td>NT6X74 in an RSC-S (PCM-30) Model A RMM</td>
<td>Vol. 5</td>
<td>1-808</td>
</tr>
<tr>
<td>NT6X75 in an IOPAC HIE</td>
<td>Vol. 5</td>
<td>1-817</td>
</tr>
<tr>
<td>NT6X75 in an OPAC HIE</td>
<td>Vol. 5</td>
<td>1-824</td>
</tr>
<tr>
<td>NT6X75 in an OPM HIE</td>
<td>Vol. 5</td>
<td>1-831</td>
</tr>
<tr>
<td>NT6X75 in an RLCM HIE</td>
<td>Vol. 5</td>
<td>1-838</td>
</tr>
<tr>
<td>NT6X76 in an RSC LCME</td>
<td>Vol. 5</td>
<td>1-845</td>
</tr>
<tr>
<td>NT6X76 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 5</td>
<td>1-853</td>
</tr>
<tr>
<td>NT6X76 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 5</td>
<td>1-861</td>
</tr>
<tr>
<td>NT6X76 in a STAR or RLD</td>
<td>Vol. 5</td>
<td>1-869</td>
</tr>
<tr>
<td>NT6X78 in an RSC-M</td>
<td>Vol. 5</td>
<td>1-876</td>
</tr>
<tr>
<td>NT6X78 in an RSC RCC/RCC2</td>
<td>Vol. 5</td>
<td>1-883</td>
</tr>
<tr>
<td>NT6X78 in an RSC-S (DS-1) Model RCC2</td>
<td>Vol. 5</td>
<td>1-891</td>
</tr>
<tr>
<td>NT6X78 in an RSC-S (DS-1) Model B RCC2</td>
<td>Vol. 5</td>
<td>1-898</td>
</tr>
<tr>
<td>NT6X78 in an RSC-S (PCM-30) Model A RCO2</td>
<td>Vol. 5</td>
<td>1-905</td>
</tr>
</tbody>
</table>
### Card Replacement Procedures

**Volume 6 of 7**

<table>
<thead>
<tr>
<th>Card Type</th>
<th>Model</th>
<th>Volume</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT6X78</td>
<td>RSC-S (PCM-30) Model B RCO2</td>
<td>5</td>
<td>1-912</td>
</tr>
<tr>
<td>NT6X78</td>
<td>SMA</td>
<td>5</td>
<td>1-919</td>
</tr>
<tr>
<td>NT6X78</td>
<td>SMA-MVI-20</td>
<td>5</td>
<td>1-925</td>
</tr>
<tr>
<td>NT6X78</td>
<td>SMA2</td>
<td>5</td>
<td>1-932</td>
</tr>
<tr>
<td>NT6X78</td>
<td>SMS</td>
<td>5</td>
<td>1-939</td>
</tr>
<tr>
<td>NT6X78</td>
<td>SMU</td>
<td>5</td>
<td>1-946</td>
</tr>
<tr>
<td>NT6X80</td>
<td>SMA</td>
<td>5</td>
<td>1-951</td>
</tr>
<tr>
<td>NT6X80</td>
<td>SMA-MVI-20</td>
<td>5</td>
<td>1-957</td>
</tr>
<tr>
<td>NT6X80</td>
<td>SMS</td>
<td>5</td>
<td>1-964</td>
</tr>
<tr>
<td>NT6X80</td>
<td>SMS-R</td>
<td>5</td>
<td>1-972</td>
</tr>
<tr>
<td>NT6X80</td>
<td>SMU</td>
<td>5</td>
<td>1-981</td>
</tr>
<tr>
<td>NT6X85</td>
<td>SMS</td>
<td>6</td>
<td>1-2</td>
</tr>
<tr>
<td>NT6X85</td>
<td>SMS-R</td>
<td>6</td>
<td>1-13</td>
</tr>
<tr>
<td>NT6X85</td>
<td>SMU</td>
<td>6</td>
<td>1-24</td>
</tr>
<tr>
<td>NT6X86</td>
<td>SMS</td>
<td>6</td>
<td>1-30</td>
</tr>
<tr>
<td>NT6X86</td>
<td>SMS-R</td>
<td>6</td>
<td>1-39</td>
</tr>
<tr>
<td>NT6X87</td>
<td>RSC LCME</td>
<td>6</td>
<td>1-48</td>
</tr>
<tr>
<td>NT6X87</td>
<td>RSC-S (DS-1) Model B LCME</td>
<td>6</td>
<td>1-56</td>
</tr>
<tr>
<td>NT6X92</td>
<td>RSC-M</td>
<td>6</td>
<td>1-64</td>
</tr>
<tr>
<td>NT6X92</td>
<td>RSC RCC/RCC2</td>
<td>6</td>
<td>1-71</td>
</tr>
<tr>
<td>NT6X92</td>
<td>RSC-S (DS-1) Model A RCC2</td>
<td>6</td>
<td>1-79</td>
</tr>
<tr>
<td>NT6X92</td>
<td>RSC-S (DS-1) Model B RCC2</td>
<td>6</td>
<td>1-87</td>
</tr>
<tr>
<td>NT6X92</td>
<td>RSC-S (PCM-30) Model A RCO2</td>
<td>6</td>
<td>1-95</td>
</tr>
<tr>
<td>NT6X92</td>
<td>RSC-S (PCM-30) Model B RCO2</td>
<td>6</td>
<td>1-104</td>
</tr>
<tr>
<td>NT6X92</td>
<td>SMA</td>
<td>6</td>
<td>1-112</td>
</tr>
<tr>
<td>NT6X92</td>
<td>SMA-MVI-20</td>
<td>6</td>
<td>1-118</td>
</tr>
<tr>
<td>NT6X92</td>
<td>SMA2</td>
<td>6</td>
<td>1-125</td>
</tr>
<tr>
<td>NT6X92</td>
<td>SMS</td>
<td>6</td>
<td>1-132</td>
</tr>
<tr>
<td>NT6X92</td>
<td>SMU</td>
<td>6</td>
<td>1-140</td>
</tr>
<tr>
<td>NT6X99</td>
<td>IOPAC ILCM</td>
<td>6</td>
<td>1-146</td>
</tr>
<tr>
<td>NT6X99</td>
<td>OPAC LCM</td>
<td>6</td>
<td>1-150</td>
</tr>
<tr>
<td>NT6X99</td>
<td>OPM</td>
<td>6</td>
<td>1-154</td>
</tr>
<tr>
<td>NT6X99</td>
<td>RLCM</td>
<td>6</td>
<td>1-158</td>
</tr>
<tr>
<td>NT6X99</td>
<td>RSC LCM</td>
<td>6</td>
<td>1-162</td>
</tr>
<tr>
<td>NT6X99</td>
<td>RSC-S (DS-1) Model A LCME</td>
<td>6</td>
<td>1-170</td>
</tr>
<tr>
<td>NT6X99</td>
<td>RSC-S (DS-1) Model B LCME</td>
<td>6</td>
<td>1-178</td>
</tr>
<tr>
<td>NT6X99</td>
<td>RSC-S (DS-1) Model B LCME</td>
<td>6</td>
<td>1-178</td>
</tr>
<tr>
<td>NT6X99</td>
<td>STAR or RLD</td>
<td>6</td>
<td>1-186</td>
</tr>
<tr>
<td>NT7X05</td>
<td>RSC RCC/RCC2</td>
<td>6</td>
<td>1-190</td>
</tr>
<tr>
<td>NT7X05</td>
<td>RSC-S (DS-1) Model A RCC2</td>
<td>6</td>
<td>1-198</td>
</tr>
<tr>
<td>NT7X05</td>
<td>RSC-S (DS-1) Model B RCC2</td>
<td>6</td>
<td>2-07</td>
</tr>
<tr>
<td>NT7X05</td>
<td>RSC-S (PCM-30) Model A RCO2</td>
<td>6</td>
<td>1-216</td>
</tr>
<tr>
<td>NT7X05</td>
<td>RSC-S (PCM-30) Model B RCO2</td>
<td>6</td>
<td>1-225</td>
</tr>
<tr>
<td>NT7X05</td>
<td>SMS</td>
<td>6</td>
<td>1-234</td>
</tr>
<tr>
<td>Description</td>
<td>Volume</td>
<td>Pages</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>NT7X05 in an SMS-R</td>
<td>Vol. 6</td>
<td>1-243</td>
<td></td>
</tr>
<tr>
<td>NT7X05 in an SMU</td>
<td>Vol. 6</td>
<td>1-252</td>
<td></td>
</tr>
<tr>
<td>NT8X02 in an OPAC BCU</td>
<td>Vol. 6</td>
<td>1-261</td>
<td></td>
</tr>
<tr>
<td>NT8X02 in an OPM BCU</td>
<td>Vol. 6</td>
<td>1-265</td>
<td></td>
</tr>
<tr>
<td>NT8X18 in an SMS-R</td>
<td>Vol. 6</td>
<td>1-270</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an RSC-S (DS-1) Model A RCC2</td>
<td>Vol. 6</td>
<td>1-281</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an RSC-S (DS-1) Model B RCC2</td>
<td>Vol. 6</td>
<td>1-292</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an RSC-S (PCM-30) Model A RCO2</td>
<td>Vol. 6</td>
<td>1-303</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an RSC-S (PCM-30) Model B RCO2</td>
<td>Vol. 6</td>
<td>1-315</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an SMA</td>
<td>Vol. 6</td>
<td>1-327</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an SMA-MVI-20</td>
<td>Vol. 6</td>
<td>1-337</td>
<td></td>
</tr>
<tr>
<td>NTAX74 in an SMA2</td>
<td>Vol. 6</td>
<td>1-347</td>
<td></td>
</tr>
<tr>
<td>NTAX78 in an SMA</td>
<td>Vol. 6</td>
<td>1-355</td>
<td></td>
</tr>
<tr>
<td>NTAX78 in an SMA-MVI-20</td>
<td>Vol. 6</td>
<td>1-362</td>
<td></td>
</tr>
<tr>
<td>NTAX78 in an SMU</td>
<td>Vol. 6</td>
<td>1-369</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an RSC RCC2</td>
<td>Vol. 6</td>
<td>1-374</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an RSC-S (DS-1) Model A RCC2</td>
<td>Vol. 6</td>
<td>1-381</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an RSC-S (DS-1) Model B RCC2</td>
<td>Vol. 6</td>
<td>1-390</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an RSC-S (PCM-30) Model A RCO2</td>
<td>Vol. 6</td>
<td>1-399</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an RSC-S (PCM-30) Model B RCO2</td>
<td>Vol. 6</td>
<td>1-408</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an SMA</td>
<td>Vol. 6</td>
<td>1-417</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an SMA-MVI-20</td>
<td>Vol. 6</td>
<td>1-423</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an SMA2</td>
<td>Vol. 6</td>
<td>1-430</td>
<td></td>
</tr>
<tr>
<td>NTBX01 in an SMU</td>
<td>Vol. 6</td>
<td>1-437</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an RSC RCC2</td>
<td>Vol. 6</td>
<td>1-443</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an RSC-S (DS-1) Model A RCC2</td>
<td>Vol. 6</td>
<td>1-456</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an RSC-S (DS-1) Model B RCC2</td>
<td>Vol. 6</td>
<td>1-469</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an RSC-S (PCM-30) Model A RCO2</td>
<td>Vol. 6</td>
<td>1-482</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an RSC-S (PCM-30) Model B RCO2</td>
<td>Vol. 6</td>
<td>1-495</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an SMA</td>
<td>Vol. 6</td>
<td>1-508</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an SMA-MVI-20</td>
<td>Vol. 6</td>
<td>1-515</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an SMA2</td>
<td>Vol. 6</td>
<td>1-523</td>
<td></td>
</tr>
<tr>
<td>NTBX02 in an SMU</td>
<td>Vol. 6</td>
<td>1-529</td>
<td></td>
</tr>
<tr>
<td>NTBX26 in an RSC LCME</td>
<td>Vol. 6</td>
<td>1-538</td>
<td></td>
</tr>
<tr>
<td>NTBX26 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 6</td>
<td>1-546</td>
<td></td>
</tr>
<tr>
<td>NTBX26 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 6</td>
<td>1-554</td>
<td></td>
</tr>
<tr>
<td>NTBX27 in an RSC LCME</td>
<td>Vol. 6</td>
<td>1-562</td>
<td></td>
</tr>
<tr>
<td>NTBX27 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 6</td>
<td>1-570</td>
<td></td>
</tr>
<tr>
<td>NTBX27 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 6</td>
<td>1-578</td>
<td></td>
</tr>
<tr>
<td>NTBX27 in a STAR or RLD</td>
<td>Vol. 6</td>
<td>1-586</td>
<td></td>
</tr>
<tr>
<td>NTBX34 in an RSC LCME</td>
<td>Vol. 6</td>
<td>1-593</td>
<td></td>
</tr>
<tr>
<td>NTBX34 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 6</td>
<td>1-601</td>
<td></td>
</tr>
<tr>
<td>NTBX34 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 6</td>
<td>1-611</td>
<td></td>
</tr>
<tr>
<td>NTBX34 in an RSC-S (PCM-30) Model A LCME</td>
<td>Vol. 6</td>
<td>1-621</td>
<td></td>
</tr>
<tr>
<td>NTBX35 in an RSC LCME</td>
<td>Vol. 6</td>
<td>1-630</td>
<td></td>
</tr>
<tr>
<td>NTBX35 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 6</td>
<td>1-638</td>
<td></td>
</tr>
<tr>
<td>NTBX35 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 6</td>
<td>1-648</td>
<td></td>
</tr>
<tr>
<td>NTBX35 in an RSC-S (PCM-30) Model A LCME</td>
<td>Vol. 6</td>
<td>1-658</td>
<td></td>
</tr>
<tr>
<td>NTBX36 in an RSC LCME</td>
<td>Vol. 6</td>
<td>1-667</td>
<td></td>
</tr>
<tr>
<td>NTBX36 in an RSC-S (DS-1) Model A LCME</td>
<td>Vol. 6</td>
<td>1-677</td>
<td></td>
</tr>
<tr>
<td>NTBX36 in an RSC-S (DS-1) Model B LCME</td>
<td>Vol. 6</td>
<td>1-687</td>
<td></td>
</tr>
</tbody>
</table>
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, 1-777
NTRX43 in an OPAC MSP  Vol. 7, 1-784
NTRX43 in an RSC-M/MSP  Vol. 7, 1-791
NTRX43 in an RSC MSP  Vol. 7, 1-799
NTRX43 in an RSC-S (DS-1) Model B MSP  Vol. 7, 1-807
NTRX43 in an SMA2 MSP  Vol. 7, 1-815
NTRX44 in an IOPAC MSP  Vol. 7, 1-823
NTRX44 in an OPAC MSP  Vol. 7, 1-835
NTRX44 in an RSC MSP  Vol. 7, 1-847
NTRX44 in an RSC-S (DS-1) Model B MSP  Vol. 7, 1-857
NTRX54 in an RSC-M/MSP  Vol. 7, 1-867
NTRX54 in an RSC MSP  Vol. 7, 1-874
NTRX54 in an RSC-S (DS-1) Model B MSP  Vol. 7, 1-881
NTRX54 in an SMA2 MSP  Vol. 7, 1-888
NTRX66 MSP  Vol. 7, 1-895
NTTR46 in an RLD  Vol. 7, 1-901
NTTR47 RLD  Vol. 7, 1-907
NTTR60 in a STAR  Vol. 7, 1-913
NTTR66 RLD  Vol. 7, 1-920
NTTR67 RLD  Vol. 7, 1-926
NTTR70 RLD  Vol. 7, 1-932
NTTR71 RLD  Vol. 7, 1-939
NTTR72 RLD  Vol. 7, 1-944
NTTR73 in a STAR  Vol. 7, 1-950
NTTR74 in a STAR  Vol. 7, 1-954
NTTR75 in a STAR  Vol. 7, 1-961
NTTR76 in a STAR  Vol. 7, 1-969
NTTR77 in a STAR  Vol. 7, 1-976
NTTR87 in a STAR  Vol. 7, 1-983
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, 297-9051-351
• Digital Recorded Announcement Machine DRAM and EDRAM Guide, 297-1001-527
• Product Documentation Directory, 297-8991-001
• Routine Maintenance Procedures
• Translations Guide, 297-9051-350

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 Nortel Networks 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 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

![Diagram of a dual-plane combined core cabinet with labels for FSP, MS 0, MS 1, CM 0, CM 1, SLM 0, SLM 1, and Cooling unit.]
### SuperNode CM shelf layouts (end)

#### SuperNode computing module

<table>
<thead>
<tr>
<th>Paddle boards</th>
<th>Cards</th>
<th>Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X21 CM-bus Terminator PB</td>
<td>NT9X30 +5V 86-A power converter card</td>
<td>36F</td>
</tr>
<tr>
<td>NT9X27 AA CM-bus Extender PB</td>
<td>NT9X30 –5V 20-A power converter card</td>
<td>33F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>31F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>30F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>29F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>28F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>27F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>26F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>25F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>24F</td>
</tr>
<tr>
<td>NT9X22 CM subsystem clock PB</td>
<td>NT9X14 Memory card</td>
<td>23F</td>
</tr>
<tr>
<td>NT9X20 DS512 PB</td>
<td>NT9X12 CPU port card</td>
<td>22F</td>
</tr>
<tr>
<td>NT9X20 DS512 PB</td>
<td>NT9X12 CPU port card</td>
<td>21F</td>
</tr>
<tr>
<td>NT9X26 RTIF PB</td>
<td>NT9X10/NT9X13 CPU card</td>
<td>20F</td>
</tr>
<tr>
<td>NT9X26 RTIF PB</td>
<td>NT9X10/NT9X13 CPU card</td>
<td>19F</td>
</tr>
<tr>
<td>NT9X20 DS512 PB</td>
<td>NT9X12 CPU port card</td>
<td>18F</td>
</tr>
<tr>
<td>NT9X20 DS512 PB</td>
<td>NT9X12 CPU port card</td>
<td>17F</td>
</tr>
<tr>
<td>NT9X22 CM subsystem clock PB</td>
<td>NT9X14 Memory card</td>
<td>16F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>15F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>14F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>13F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>12F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>11F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>10F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X14 Memory card</td>
<td>09F</td>
</tr>
<tr>
<td>NT9X27 AA CM-bus extender PB</td>
<td>NT9X14 Memory card</td>
<td>08F</td>
</tr>
<tr>
<td>NT9X21 CM-bus Terminator PB</td>
<td>NT9X14 Memory card</td>
<td>07F</td>
</tr>
<tr>
<td>NT9X30 +5V 86-A power converter card</td>
<td></td>
<td>04F</td>
</tr>
<tr>
<td>NT9X30 –5V 20-A power converter card</td>
<td></td>
<td>01F</td>
</tr>
</tbody>
</table>

*297-9051-547 Standard 02.01 April 2000*
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X20</td>
<td>AA</td>
<td>DS512 paddle board</td>
<td>CM</td>
</tr>
<tr>
<td>NT9X20</td>
<td>BB</td>
<td>DS512 interface CM-MS EN-MS paddle board</td>
<td>CM</td>
</tr>
</tbody>
</table>

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

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

1. Card on active side? Y Switch activity
   N

2. Jam inactive CPU and drop synchronization

3. CM runs on inactive CPU clock? Y Switch clock source
   N

4. Manually busy associated MC

5. Power down inactive CPU

6. Replace card

7. Power up inactive CPU

8. Return MC to service

9. Test inactive CPU

10. Release jam and synchronize CM

End
**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:**

<table>
<thead>
<tr>
<th>CM</th>
<th>Sync</th>
<th>Act</th>
<th>CPU0</th>
<th>CPU1</th>
<th>Jam</th>
<th>Memory</th>
<th>CMMnt</th>
<th>MC</th>
<th>PMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no</td>
<td>cpu</td>
<td>1</td>
<td>.</td>
<td>yes</td>
<td>.</td>
<td>mbsy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the card associates with the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>associates with the inactive CPU</td>
<td>step 5</td>
</tr>
<tr>
<td>associates with the active CPU</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the inactive CPU is not jammed</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not jammed</td>
<td>step 6</td>
</tr>
<tr>
<td>is jammed</td>
<td>step 8</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is synchronized</td>
<td>step 9</td>
</tr>
<tr>
<td>is not synchronized</td>
<td>step 13</td>
</tr>
</tbody>
</table>

9

To drop synchronization, type
>

DPSYNC
and press the Enter key.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>About to drop sync with CPU n active.</td>
<td>step 10</td>
</tr>
<tr>
<td>The inactive CPU is JAMMED.</td>
<td></td>
</tr>
<tr>
<td>Do you want to continue?</td>
<td></td>
</tr>
<tr>
<td>Please confirm (&quot;YES&quot;, &quot;Y&quot;, &quot;NO&quot;, or &quot;N&quot;):</td>
<td></td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 42</td>
</tr>
</tbody>
</table>

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 5-min for A1 to begin to flash.

<table>
<thead>
<tr>
<th>If A1</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>flashes</td>
<td>step 13</td>
</tr>
<tr>
<td>does not flash</td>
<td>step 42</td>
</tr>
</tbody>
</table>

12 Perform the procedure *Activity switch with memory match* 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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>runs on the clock of the inactive CPU</td>
<td>step 14</td>
</tr>
<tr>
<td>runs on the clock of the active CPU</td>
<td>step 15</td>
</tr>
</tbody>
</table>

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    .
```
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.

<table>
<thead>
<tr>
<th>If the state of the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is mbsy</td>
<td>step 18</td>
</tr>
<tr>
<td>is not mbsy</td>
<td>step 17</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>If the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 18</td>
</tr>
<tr>
<td>did not busy</td>
<td>step 42</td>
</tr>
</tbody>
</table>
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.
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.
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.
SuperNode computing module card replacement procedures

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.
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.

---

**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.).
30 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.

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)

<table>
<thead>
<tr>
<th>Shelf</th>
<th>Slot</th>
<th>Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>12</td>
<td>NT9X14DB...</td>
</tr>
<tr>
<td>00</td>
<td>13</td>
<td>NT9X14DB...</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>powered up</td>
<td>step 33</td>
</tr>
<tr>
<td>did not power up</td>
<td>step 42</td>
</tr>
</tbody>
</table>

**At the MAP terminal**

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of an MC Tbl alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCFIt alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCTbl alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure as a result of a NoTOD alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure as a result of an SBsyMC alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure as a result of an MBsyMC alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure as a result of a CBsyMC alarm</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 34</td>
</tr>
</tbody>
</table>
To access the MC level of the MAP display, type 
>MC
and press the Enter key.

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 36</td>
</tr>
<tr>
<td>failed</td>
<td>step 42</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of a CM alarm clearing procedure</td>
<td>step 37</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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

To test the inactive CPU, type 
>CM; 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"):

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

Example of a MAP response:

Maintenance action submitted.
Test passed.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 40</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 42</td>
</tr>
</tbody>
</table>

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:
Maintenance action submitted.
Synchronization successful.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the SYNC command was successful</td>
<td>step 43</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 42</td>
</tr>
</tbody>
</table>

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)

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

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

Card on active side?

N

Jam inactive CPU and drop synchronization

CM running on inactive CPU clock?

Y

Switch clock source

N

Manually busy associated MC

Power down inactive CPU

Replace card

Power up inactive CPU

SSC or memory card replaced?

Y

Test card

N

Series 70 or above

Y

Return MC to service

N

Record card changes

End
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.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>associates with the inactive CPU</td>
<td>step 5</td>
</tr>
<tr>
<td>associates with the active CPU</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not jammed</td>
<td>step 6</td>
</tr>
<tr>
<td>is jammed</td>
<td>step 8</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is synchronized</td>
<td>step 9</td>
</tr>
<tr>
<td>is not synchronized</td>
<td>step 13</td>
</tr>
</tbody>
</table>

9 To drop synchronization, type

>DPSYNC

and press the Enter key.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>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”):</td>
<td>step 10</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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.
SuperNode computing module card replacement procedures

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.

<table>
<thead>
<tr>
<th>If A1</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>flashes</td>
<td>step 13</td>
</tr>
<tr>
<td>does not flash</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>runs on the clock of the inactive CPU</td>
<td>step 14</td>
</tr>
<tr>
<td>runs on the clock of the active CPU</td>
<td>step 15</td>
</tr>
</tbody>
</table>
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

\[ \text{\textgreater MC} \]

and press the Enter key.

*Example of a MAP display:*

<table>
<thead>
<tr>
<th>MC 0</th>
<th>MC 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>mbsy</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the state of the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is mbsy</td>
<td>step 18</td>
</tr>
<tr>
<td>is not mbsy</td>
<td>step 17</td>
</tr>
</tbody>
</table>

**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

\[ \text{\textgreater BSY mc\_number} \]

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.

<table>
<thead>
<tr>
<th>If the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 18</td>
</tr>
</tbody>
</table>
System cards in a SuperNode CM (continued)

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

<table>
<thead>
<tr>
<th>If the card being replaced</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X22</td>
<td>step 19</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 21</td>
</tr>
</tbody>
</table>

19 To access the Clock level of the MAP display, type

> CLOCK

and press the Enter key.

Example of a MAP display:

```
TOD
   MC0   MC1
Link 0 .       .
Link 1 .       .
ssc   f       .
```

20 To determine the location of the NT9X22 card, type

> LOCATE 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:

```
Site Flr  RPos  Bay_id Shf Description Slot EqPEC
HOST 00  A00  CMDC:00 18  SSC:00:0:0 16  9X22CA BACK
```
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 1F through 3F. For CPU 1, the power converter is in slots 33F through 35F.

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

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

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 4F through 6F. For CPU 1, the power converter is in slots 36F through 38F.
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 cannot synchronize the CPUs.

Wait for the switch to complete firmware tests.

Example of an RTIF response:

<table>
<thead>
<tr>
<th>Shelf</th>
<th>Slot</th>
<th>Card Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>12</td>
<td>NT9X14DB...</td>
</tr>
<tr>
<td>00</td>
<td>13</td>
<td>NT9X14DB...</td>
</tr>
</tbody>
</table>

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
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", "NC", 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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 32</td>
</tr>
<tr>
<td>failed</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the self test</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 32</td>
</tr>
<tr>
<td>failed</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of an MC Tbl alarm</td>
<td>step 46</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCFlt alarm</td>
<td>step 46</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCTbl alarm</td>
<td>step 46</td>
</tr>
<tr>
<td>perform this procedure as a result of a NoTOD alarm</td>
<td>step 46</td>
</tr>
<tr>
<td>perform this procedure as a result of an SBsyMC alarm</td>
<td>step 46</td>
</tr>
<tr>
<td>perform this procedure as a result of an MBsyMC alarm</td>
<td>step 46</td>
</tr>
<tr>
<td>perform this procedure as a result of a CBsyMC alarm</td>
<td>step 46</td>
</tr>
</tbody>
</table>
SuperNode computing module card replacement procedures

System cards in a SuperNode CM (continued)

The next action depends on the series of your SuperNode CM hardware.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure for any reason different from those listed here</td>
<td>step 33</td>
</tr>
</tbody>
</table>

33

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:

![Example of a MAP response](image)

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.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card replacement has been recorded.</td>
<td>step 36</td>
</tr>
<tr>
<td>Aborted. Card replacement has NOT been recorded.</td>
<td>step 35</td>
</tr>
</tbody>
</table>
System cards in a SuperNode CM (continued)

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is different from those listed here</td>
<td>step 44</td>
</tr>
</tbody>
</table>

**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

\[ >\text{MC} \]

and press the Enter key.

37 To return the manual busy MC to service, type

\[ >\text{RTS mc\_number} \]

and press the Enter key.

*where*

\[ \text{mc\_number} \]

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

*Example of a MAP response:*

Maintenance action submitted.
MC RTS OK.

38 The next action depends on the reason for performing this procedure.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a CM alarm clearing procedure</td>
<td>step 42</td>
</tr>
<tr>
<td>anything else</td>
<td>step 39</td>
</tr>
</tbody>
</table>

39 Test the inactive CPU by typing

\[ >\text{CM; TST} \]

and pressing 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”):
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"):
   
41 Confirm the command by typing
   >YES
   and pressing the Enter key.
   
   Example of a MAP response:
   
   Maintenance action submitted.
   Test passed.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 42</td>
</tr>
<tr>
<td>anything else</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the SYNC command was successful</td>
<td>step 45</td>
</tr>
<tr>
<td>anything else</td>
<td>step 44</td>
</tr>
</tbody>
</table>

44 For additional help, contact the next level of support.
45 The next action depends on the reason for performance of this procedure.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a CM alarm clearing procedure</td>
<td>step 46</td>
</tr>
<tr>
<td>anything else</td>
<td>step 47</td>
</tr>
</tbody>
</table>

46 Return to the alarm clearing procedure that sent you to this procedure and continue as directed.
47 You have completed the procedure.
2 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
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

<table>
<thead>
<tr>
<th>Rear</th>
<th>Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>32R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>31R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>30R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>29R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>28R</td>
<td>NT9X46 Parallel port I/F PB</td>
</tr>
<tr>
<td>27R</td>
<td>NT9X21 Bus terminator PB</td>
</tr>
<tr>
<td>26R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>25R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>24R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>23R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>22R</td>
<td>NT9X46 Parallel port I/F PB</td>
</tr>
<tr>
<td>21R</td>
<td>NT9X62 Subrate DS512 PB</td>
</tr>
<tr>
<td>20R</td>
<td>NT9X26 RTIF</td>
</tr>
<tr>
<td>19R</td>
<td>NT9X26 RTIF</td>
</tr>
<tr>
<td>18R</td>
<td>NT9X62 Dual-link SR512 I/F PB</td>
</tr>
<tr>
<td>17R</td>
<td>NT9X46 Parallel CM port I/F PB</td>
</tr>
<tr>
<td>16R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>15R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>14R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>13R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>12R</td>
<td>NT9X21 Bus terminator PB</td>
</tr>
<tr>
<td>11R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>10R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>09R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>08R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>07R</td>
<td>NT9X46 Parallel port I/F PB</td>
</tr>
</tbody>
</table>

| 36F  | NT9X91 Power converter card |
| 33F  | NTDX15 Power converter card |
| 28F  | NT9X44 System load module assembly |
| 27F  | NT9X14 Memory card |
| 26F  | NT9X14 Memory card |
| 25F  | NT9X14 Memory card |
| 24F  | NT9X14 Memory card |
| 23F  | NT9X14 Memory card |
| 22F  | NT9X12 CPU port card |
| 21F  | NT9X86 Dual-port message controller card |
| 20F  | NT9X13 CPU card |
| 19F  | NT9X13 CPU card |
| 18F  | NT9X86 Dual-port message controller card |
| 17F  | NT9X12 Single-port message card |
| 16F  | NT9X14 Memory card |
| 15F  | NT9X14 Memory card |
| 14F  | NT9X14 Memory card |
| 13F  | NT9X14 Memory card |
| 12F  | NT9X14 Memory card |

### NT9X44 System load module assembly

- NT9X44 System load module assembly

### NTDX15 Power converter card

- NTDX15 Power converter card

### NT9X91 Power converter card

- NT9X91 Power converter card
Application

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

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X44</td>
<td>AC</td>
<td>System load module IA</td>
<td>CM/SLM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>assembly</td>
<td></td>
</tr>
<tr>
<td>NT9X44</td>
<td>AD</td>
<td>System load module III</td>
<td>CM/SLM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>assembly</td>
<td></td>
</tr>
</tbody>
</table>

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

This flowchart summarizes the procedure.

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

Card on active side?

Jam inactive CPU and drop synchronization

CM runs on inactive clock of CPU?

Primary autoload device on inact side?

Busy SLM

Offline SLM

Busy associated PMC port

Power down SLM side

Switch activity

Switch clock source

Change primary autoload device

Replace card

Turn on SLM side

Return PMC port to service

Test SLM

Return SLM to service

Release jam and synchronize CM

End
Replacing a NT9X44 in a SuperNode SE CM/SLM

At your current location

1. 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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>have a backup SLM tape</td>
<td>step 3</td>
</tr>
<tr>
<td>do not have a backup SLM tape</td>
<td>step 84</td>
</tr>
</tbody>
</table>

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 >MAP;MTC;CM

   Example of a MAP display:

<table>
<thead>
<tr>
<th>CM</th>
<th>Sync</th>
<th>Act</th>
<th>CPU0</th>
<th>CPU1</th>
<th>Jam</th>
<th>Memory</th>
<th>CMnt</th>
<th>MC</th>
<th>PMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no</td>
<td>cpu1</td>
<td>.</td>
<td>.</td>
<td>yes</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM plane contains the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>step 5</td>
</tr>
</tbody>
</table>
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

SuperNode SE computing module and system load module card replacement procedures

NT9X44

in a SuperNode SE CM/SLM (continued)

<table>
<thead>
<tr>
<th>If the CM plane contains the active CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>step 12</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the inactive CPU is not jammed</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>not jammed</td>
<td>step 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If the inactive CPU is jammed</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>jammed</td>
<td>step 8</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>synchronized</td>
<td>step 9</td>
</tr>
<tr>
<td>not synchronized</td>
<td>step 13</td>
</tr>
</tbody>
</table>

9 To drop synchronization, type

>`DPSYNC`

and press the Enter key.

<table>
<thead>
<tr>
<th>If the response is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>About to drop sync with CPU n active.</td>
<td>step 10</td>
</tr>
<tr>
<td>The inactive CPU is JAMMED.</td>
<td></td>
</tr>
<tr>
<td>Do you want to continue?</td>
<td></td>
</tr>
<tr>
<td>Please confirm (&quot;YES&quot;, &quot;Y&quot;, &quot;NO&quot;, or &quot;N&quot;):</td>
<td></td>
</tr>
<tr>
<td>other than listed here</td>
<td>step 84</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If A1</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>flashes</td>
<td>step 13</td>
</tr>
<tr>
<td>does not flash</td>
<td>step 84</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM runs on the clock of the</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>inactive CPU</td>
<td>step 14</td>
</tr>
<tr>
<td>active CPU</td>
<td>step 15</td>
</tr>
</tbody>
</table>

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:*
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.

<table>
<thead>
<tr>
<th>CM</th>
<th>Sync</th>
<th>Act</th>
<th>CPU0</th>
<th>CPU1</th>
<th>Jam</th>
<th>Memory</th>
<th>CMMnt</th>
<th>MC</th>
<th>PMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no</td>
<td>cpu 0</td>
<td>.</td>
<td>.</td>
<td>yes</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

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.

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

```shell
> AUTOLD SLM slm_number device_type
```

and press the Enter key.

**Example of a MAP response:**

New autoload route has been set.
To access the DIRP level of the MAP display, type

```plaintext
>IOD;DIRP
```

and press the Enter key.

To determine if there are any active files for each subsystem on the SLM to be made busy, type

```plaintext
>query ssys
```

and press the Enter key.

where

```plaintext
ssys
```

is the active subsystem (AMA, OM, or JF)

To close any active files for each subsystem on the SLM to be made busy, type

```plaintext
>close ssys [active]
```

and press the Enter key.

where

```plaintext
ssys
```

is the active subsystem (AMA, OM, or JF)

Demount the volume by typing

```plaintext
>DMNT ssys vol_name [paralel]
```

and pressing the Enter key.

where

```plaintext
ssys
```

is the subsystem (AMA, OM, or JF)

```plaintext
vol_name
```

is the name of the volume to be demounted

```plaintext
[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"):
```

Confirm the demount by typing

```plaintext
>YES
```

and pressing the Enter key.

Example of a MAP response:
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 . . . .


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.

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.
To offline the SLM, type

```plaintext
>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.
```

To access the PMC level of the MAP display, type

```plaintext
>CM; PMC
```

and press the Enter key.

*Example of a MAP display:*

```
PMC 0
 .
PORT0:  .
PORT1:  .
```

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

```plaintext
>BSY 0 PORT port_number
```

and press the Enter key.

*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.
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.
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.

<table>
<thead>
<tr>
<th>If the SLM has a</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connor tape drive</td>
<td>step 41</td>
</tr>
<tr>
<td>Tandberg tape drive</td>
<td>step 43</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 46</td>
</tr>
<tr>
<td>failed</td>
<td>step 84</td>
</tr>
</tbody>
</table>

46 To access the MAP level for the SLM 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) that you replaced

47

To manually busy the SLM, type

>BSY

and press the Enter key.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 48</td>
</tr>
<tr>
<td>failed</td>
<td>step 84</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the response indicates</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the TST command passed</td>
<td>step 53</td>
</tr>
<tr>
<td>the TST command failed, and the system generated a card list</td>
<td>step 51</td>
</tr>
</tbody>
</table>
Record the location, description, slot number, PEC and the PEC suffix, of the cards on the list.

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**

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**

To synchronize the CM, type

```
> CM; SYNC
```

and press the Enter key.

*Example of a MAP response:*

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

<table>
<thead>
<tr>
<th>If the response indicates</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>other than listed here</td>
<td>step 84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If the response indicates</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the SYNC command was successful</td>
<td>step 55</td>
</tr>
<tr>
<td>other than listed here</td>
<td>step 84</td>
</tr>
</tbody>
</table>

To access the disk administration utility, type

```
> DISKADM disk_name
```

and press the Enter key.

*where*

```
disk_name
```

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

*Example of a MAP response:*

```
Maintenance action submitted.
Disk administration utility accessed.
```

other than listed here step 84
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:*

```
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.
Obtain the backup tape for the SLM that you replaced.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 65</td>
</tr>
<tr>
<td>failed</td>
<td>step 84</td>
</tr>
</tbody>
</table>

65 Obtain the backup tape for the SLM that you replaced.

<table>
<thead>
<tr>
<th>If the SLM has a</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connor tape drive</td>
<td>step 66</td>
</tr>
<tr>
<td>Tandberg tape drive</td>
<td>step 68</td>
</tr>
</tbody>
</table>

**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)

\[
\text{tape\_device\_name}
\]

is the name of the tape device that contains the backup SLM 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

\[\text{>LISTFL tape\_device\_name}\]

and press the Enter key.

where

\[\text{tape\_device\_name}\]

is the name of the tape device containing the back-up SLM tape (S00T for SLM 0 or S01T for SLM 1)

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

<table>
<thead>
<tr>
<th>If the disk volume name is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the same on the backup tape and the SLM disk</td>
<td>step 74</td>
</tr>
<tr>
<td>not the same on the backup tape and the SLM disk</td>
<td>step 76</td>
</tr>
</tbody>
</table>

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

\[\text{>RESTORE STDVOL disk\_volume\_name tape\_device\_name tape\_file\_name}\]

and press the Enter key.

where

\[\text{disk\_volume\_name}\]

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

\[\text{tape\_device\_name}\]

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

\[\text{tape\_file\_name}\]

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

Example input

\[\text{>RESTORE STDVOL ROOTDIR.S00DPMLOADS S00T S00DPMLOADS}\]

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

\[\text{>RESTORE STDVOL disk\_volume\_name tape\_device\_name tape\_file\_name}\]

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 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.

<table>
<thead>
<tr>
<th>If an ITOC alarm is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>present</td>
<td>step 81</td>
</tr>
<tr>
<td>not present</td>
<td>step 82</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you perform this procedure as a result of</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>another maintenance procedure</td>
<td>step 83</td>
</tr>
</tbody>
</table>
### NT9X44 in a SuperNode SE CM/SLM (end)

<table>
<thead>
<tr>
<th>If you perform this procedure as a result of</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>other than listed here</td>
<td>step 85</td>
</tr>
</tbody>
</table>

83 Return to the maintenance procedure that directed you to this procedure and continue as directed.
84 For additional help, contact the next level of support.
85 The procedure is complete.
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X46</td>
<td>AA</td>
<td>Parallel port interface</td>
<td>CM/SLM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>paddle board</td>
<td></td>
</tr>
</tbody>
</table>

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

This flowchart summarizes the procedure.

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

1. Jam inactive CPU and drop synchronization
   - CM on clock of inactive CPU?
     - Yes: Switch activity
     - No: Primary autoload device on inact side?
       - Yes: Change primary autoload device
       - No: Busy SLM

2. Busy SLM
   - Busy associated PMC port
     - Offline SLM

3. Busy PMMC port
   - Card in CM subsystem?
     - Yes: Busy associated MC
     - No: Power down SLM side

4. Power down SLM side
   - Power down CM side

5. Replace card
   - Power up CM/SLM side
   - Return MC and PMC port to service
   - Test SLM
   - Return SLM to service
   - Release jam and synchronize CM
   - End
Replacing an NT9X46 in a SuperNode SE CM/SLM

At your current location

1 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:

<table>
<thead>
<tr>
<th>CM</th>
<th>Sync</th>
<th>Act</th>
<th>CPU0</th>
<th>CPU1</th>
<th>Jam</th>
<th>Memory</th>
<th>CMMnt</th>
<th>MC</th>
<th>PMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no</td>
<td>cpu1</td>
<td>.</td>
<td>.</td>
<td>yes</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not jammed</td>
<td>step 8</td>
</tr>
<tr>
<td>is jammed</td>
<td>step 6</td>
</tr>
</tbody>
</table>

At the CM reset terminal for the inactive CPU

6

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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is synchronized</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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

If the CM

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not synchronized</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>flashes</td>
</tr>
<tr>
<td>does not flash</td>
</tr>
</tbody>
</table>

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.

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 runs on the inactive clock of the CPU

Do

step 14

If the CM runs on the active clock of the CPU

Do

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)

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.

<table>
<thead>
<tr>
<th>If the primary autoload device</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is on the side of the switch with the active CPU</td>
<td>step 18</td>
</tr>
<tr>
<td>is on the side of the switch with the inactive CPU</td>
<td>step 17</td>
</tr>
</tbody>
</table>

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.
where

\texttt{slm\_number}

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

Example of a MAP display:

\begin{verbatim}
IOD
IOC 0 1 2 3
STAT . . . .


SLM 0 1
Stat . .

SLM 0 device TAPE DISK
    status . .
    drive idle on line
    user SYSTEM
\end{verbatim}

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

\texttt{>BSY}

and press the Enter key.

Example of a MAP response:

\begin{verbatim}
SLM 0 busy passed.
\end{verbatim}

Example of a MAP display:

\begin{verbatim}
SLM 0 1
Stat M .
\end{verbatim}

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

\texttt{>CM; PMC}

and press the Enter key.

Example of a MAP display:
To manually busy the port that corresponds to the inactive CPU, type

\texttt{>BSY 0 PORT \texttt{port\_number}}

and press the Enter key.

\textit{where}

\texttt{port\_number}

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

\textit{Example input}

\texttt{>BSY 0 PORT 0}

\textit{Example of a MAP response:}

Maintenance action submitted.
Passed.

To spin down the SLM disk, type

\texttt{>SPIN DOWN}

and press the Enter key.

\textit{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.

\textit{Example of a MAP response:}

Disk of SLM 0 is not ready.

To offline the SLM, type

\texttt{>OFFL}

and press the Enter key.

\textit{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.
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

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.

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

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.
**mc_number**

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

*Example of a MAP response:*

Maintenance action submitted.
MC busied OK.

<table>
<thead>
<tr>
<th>If the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 28</td>
</tr>
<tr>
<td>did not busy</td>
<td>step 61</td>
</tr>
</tbody>
</table>

**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 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.

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:
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

Wait for the switch to complete firmware tests.

Example of an RTIF response:

<table>
<thead>
<tr>
<th>Testing Memory:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelf</td>
<td>Slot</td>
</tr>
<tr>
<td>00</td>
<td>15</td>
</tr>
<tr>
<td>00</td>
<td>16</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>powered up</td>
<td>step 39</td>
</tr>
<tr>
<td>did not turn on</td>
<td>step 61</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 41</td>
</tr>
<tr>
<td>failed</td>
<td>step 61</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 47</td>
</tr>
<tr>
<td>failed, and the system</td>
<td>step 45</td>
</tr>
<tr>
<td>generated a card list</td>
<td></td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 61</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 48</td>
</tr>
<tr>
<td>failed</td>
<td>step 61</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is part of the CM subsystem (card is in slot 17R or 22R)</td>
<td>step 49</td>
</tr>
</tbody>
</table>
Your next step depends on the reason that you perform this procedure.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of a MC Tbl alarm</td>
<td>step 53</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCFlt alarm</td>
<td>step 53</td>
</tr>
<tr>
<td>perform this procedure as a result of a NoTOD alarm</td>
<td>step 53</td>
</tr>
<tr>
<td>perform this procedure as a result of a SBsyMC alarm</td>
<td>step 53</td>
</tr>
<tr>
<td>perform this procedure as a result of a MBsyMC alarm</td>
<td>step 53</td>
</tr>
<tr>
<td>perform this procedure as a result of a CBsyMC alarm</td>
<td>step 53</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 50</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 52</td>
</tr>
</tbody>
</table>
The next action depends on the reason that you performed this procedure.

If you perform this procedure as a result of a CM alarm clearing procedure, step 53

If you perform this procedure for any reason other than listed here, step 54

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

To access the CM level of the MAP display, type

>CM

and press the Enter key.

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"):

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 passed, step 57
### NT9X46 in a SuperNode SE CM/SLM (end)

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is other than listed here</td>
<td>step 61</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the SYNC command was successful</td>
<td>step 59</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 61</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of another maintenance procedure</td>
<td>step 60</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.
Application

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

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X62</td>
<td>AA</td>
<td>Two-port subrate DS512 paddle board</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X62</td>
<td>BA</td>
<td>Four-port subrate DS512 paddle board</td>
<td>CM/SLM</td>
</tr>
</tbody>
</table>

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

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

Card on active side?
- Y: Switch activity
- N: Jam inactive CPU and drop synchronization

CM runs on an inactive CPU clock?
- Y: Switch clock source
- N: Primary autoload device on inact side?
  - Y: Change primary autoload device
  - N: Busy SLM

Busy associated PMC port
- Busy SLM
- Power down CM side
  - Replace card
  - Power up CM side
    - Return MC and PMC port to service
    - End

Offline SLM
- Busy associated MC
- Release jam and synchronize CM
- Return SLM to service
- End
Replacing NT9X62 in a SuperNode SE CM/SLM

At your current location

1 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:

<table>
<thead>
<tr>
<th>CM</th>
<th>Sync</th>
<th>Act</th>
<th>CPU0</th>
<th>CPU1</th>
<th>Jam</th>
<th>Memory</th>
<th>CM</th>
<th>MC</th>
<th>PMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no</td>
<td>cpu 1</td>
<td>.</td>
<td>.</td>
<td>yes</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

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 associates with the inactive CPU
   Do step 5

   If the SLM assembly associates with the active CPU
   Do 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 not jammed
   Do step 6
NT9X62
in a SuperNode SE CM/SLM (continued)

If the inactive CPU is jammed Do
step 8

At the CM reset terminal for the inactive CPU
6

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
and press the Enter key.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is About to drop sync with CPU active.</td>
<td>step 10</td>
</tr>
<tr>
<td>The inactive CPU is JAMMED.</td>
<td></td>
</tr>
<tr>
<td>Do you want to continue?</td>
<td></td>
</tr>
<tr>
<td>Please confirm (&quot;YES&quot;, &quot;Y&quot;, &quot;NO&quot;, or &quot;N&quot;)</td>
<td></td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If A1</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>flashes</td>
<td>step 13</td>
</tr>
<tr>
<td>does not flash</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

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 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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>runs on the inactive clock of the CPU</td>
<td>step 14</td>
</tr>
<tr>
<td>runs on the active clock of the CPU</td>
<td>step 15</td>
</tr>
</tbody>
</table>

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:
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 side of 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.
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 . . . .


SLM 0 1
Stat . .

SLM device TAPE DISK
0 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:
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.
```

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.
```

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.

<table>
<thead>
<tr>
<th>If the state of the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is mbsy</td>
<td>step 26</td>
</tr>
<tr>
<td>is not mbsy</td>
<td>step 25</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 26</td>
</tr>
<tr>
<td>did not busy</td>
<td>step 62</td>
</tr>
</tbody>
</table>
At the CM/SLM shelf

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.

Locate the card on the shelf.

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.

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

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.

---

**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.).
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.
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.
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.

**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.).

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.
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 .......
```

**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
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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>powered up</td>
<td>step 41</td>
</tr>
<tr>
<td>did not power up</td>
<td>step 62</td>
</tr>
</tbody>
</table>

**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
```

*where*

```
port_number
```

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

**Example of a MAP response:**

Maintenance action submitted.
Passed.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 43</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

```
>IOD; SLM slm_number
```

*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.
Example of a MAP response:

SLM 0 busy passed.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 45</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 49</td>
</tr>
<tr>
<td>failed, and the system generated a card list</td>
<td>step 47</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 50</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of a MC Tbl alarm</td>
<td>step 54</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCFlt alarm</td>
<td>step 54</td>
</tr>
<tr>
<td>perform this procedure as a result of a NoTOD alarm</td>
<td>step 54</td>
</tr>
<tr>
<td>perform this procedure as a result of a SBsyMC alarm</td>
<td>step 54</td>
</tr>
<tr>
<td>perform this procedure as a result of a MBsyMC alarm</td>
<td>step 54</td>
</tr>
<tr>
<td>perform this procedure as a result of a CBsyMC alarm</td>
<td>step 54</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 51</td>
</tr>
</tbody>
</table>

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

If you perform the procedure as a result of a CM alarm clearing procedure

- step 54

If you perform the procedure for any reason other than listed here

- step 55

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

>CM

and press the Enter key.

55

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:*
Maintenance action submitted.
Test passed.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 58</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the SYNC command was successful</td>
<td>step 60</td>
</tr>
<tr>
<td>indicates the command was other than listed here</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of another maintenance procedure</td>
<td>step 61</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 63</td>
</tr>
</tbody>
</table>
Return to the maintenance procedure that directed you to this procedure and continue as directed. 

For additional help, contact the next level of support.

The procedure is complete.
SuperNode SE computing module and system load module card replacement procedures

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).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X91</td>
<td>AA</td>
<td>Storage device power converter</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NTDX15</td>
<td>AA, AB</td>
<td>Global power converter ±5V</td>
<td>CM/SLM</td>
</tr>
</tbody>
</table>

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

This flowchart summarizes the procedure.

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

1. Card on active side?
   - Y: Switch activity
   - N: Jam inactive CPU and drop synchronization

2. CM runs on inactive clock of CPU?
   - Y: Switch clock source
   - N: Primary autoload device on inact side?
     - Y: Change primary autoload device
     - N: Busy SLM

3. Busy SLM
   - Y: Busy associated PMC port
     - Y: Offine SLM
     - N: Card in CM subsystem?
       - Y: Busy associated MC
         - Y: Power down SLM side
         - N: Power down CM side
       - N: Power down CM side
   - N: Power up CM/SLM side

4. Replace card
   - Y: Return MC and PMC port to service
   - N: Test SLM
     - Y: Return SLM to service
     - N: Release jam and synchronize CM

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

**At your current location**

1. 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:*

   ```plaintext
   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

   **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.
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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not jammed</td>
<td>step 8</td>
</tr>
<tr>
<td>is jammed</td>
<td>step 6</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is synchronized</td>
<td>step 9</td>
</tr>
</tbody>
</table>
## Power converter cards in a SuperNode SE CM/SLM (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>To drop synchronization, type <code>&gt;DPSYNC</code> and press the Enter key.</td>
</tr>
<tr>
<td></td>
<td>If the response is about to drop sync with CPU n active, the inactive CPU is JAMMED. Do you want to continue? If other than listed here, go to step 58.</td>
</tr>
<tr>
<td>10</td>
<td>To confirm the command, type <code>&gt;YES</code> and press the Enter key. Example of a MAP response:</td>
</tr>
<tr>
<td></td>
<td>Maintenance action submitted. Running in simplex mode with active CPU n.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Wait until A1 flashes on the reset terminal for the inactive CPU. <strong>Note:</strong> Allow approximately 5 min for A1 to start to flash.</td>
</tr>
<tr>
<td></td>
<td>If A1 flashes, go to step 13. If A1 does not flash, go to step 58.</td>
</tr>
<tr>
<td>12</td>
<td>Perform the procedure <em>Activity switch with memory match</em> in this document. Complete the procedure and return to this point.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the CM runs on the inactive clock of the CPU</th>
<th>Do</th>
</tr>
</thead>
</table>

14 step 14

15 step 15

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.

To access the CMMNT level of the MAP display, type

>CMMNT

and press the Enter key.

Example of a MAP display:
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.

<table>
<thead>
<tr>
<th>If the primary autoload device</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is on the same side of the switch as the active CPU</td>
<td>step 18</td>
</tr>
<tr>
<td>is on the same side of the switch as the inactive CPU</td>
<td>step 17</td>
</tr>
</tbody>
</table>

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

\[ >\text{AUTOLD} \ \text{SLM} \ \text{slm\_number} \ \text{device\_type} \]

and press the Enter key.

where

- \text{slm\_number} is the number of the active CPU (0 or 1)
- \text{device\_type} is the type of SLM device (DISK or TAPE)

Example of a MAP response:

New autoload route has been set.

To access the SLM that corresponds to the inactive CPU, type

\[ >\text{IOD}\;\text{SLM} \ \text{slm\_number} \]

and press the Enter key.
Power converter cards
in a SuperNode SE CM/SLM (continued)

where

\texttt{slm\_number}

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

\textit{Example of a MAP display:}

\begin{verbatim}
IOD
IOC  0  1  2  3
STAT . . . .


SLM  0  1
Stat . .

SLM 0  device  TAPE  DISK
     status   .   .
     drive    idle  on line
     user     SYSTEM
\end{verbatim}

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

\textbf{19} To manually busy the SLM, type
\texttt{ >BSY}
and press the Enter key.

\textit{Example of a MAP response:}

\begin{verbatim}
SLM 0 busy passed.
\end{verbatim}

\textit{Example of a MAP display:}

\begin{verbatim}
SLM  0  1
Stat M .
\end{verbatim}

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

\textbf{20} To access the PMC level of the MAP display, type
\texttt{ >CM; PMC}
and press the Enter key.

\textit{Example of a MAP display:}
Power converter cards
in a SuperNode SE CM/SLM (continued)

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

\texttt{>BSY \ 0 \ PORT \ port\_number}

and press the Enter key.

\textit{where}

\texttt{port\_number}

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

\textit{Example input}

\texttt{>BSY \ 0 \ PORT \ 0}

\textit{Example of a MAP response:}

\begin{verbatim}
Maintenance action submitted.
Passed.
\end{verbatim}

To offline the SLM, type

\texttt{>OFFL}

and press the Enter key.

\textbf{Note:} Wait for the light on the faceplate of the SLM to turn off before you continue this procedure.

\textit{Example of a MAP response:}

\begin{verbatim}
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.
\end{verbatim}

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

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is part of the CM subsystem</td>
<td>step 24 (NT9X91)</td>
</tr>
<tr>
<td>is part of the SLM subsystem</td>
<td>step 31 (NTDX15)</td>
</tr>
</tbody>
</table>

To access the message controller (MC) level of the MAP display, type

\texttt{>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.

<table>
<thead>
<tr>
<th>If the state of the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is mbsy</td>
<td>step 27</td>
</tr>
<tr>
<td>is not mbsy</td>
<td>step 26</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 27</td>
</tr>
<tr>
<td>did not busy</td>
<td>step 58</td>
</tr>
</tbody>
</table>
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:
<table>
<thead>
<tr>
<th>Shelf</th>
<th>Slot</th>
<th>PEC Module Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>15</td>
<td>NT9X14EA .........</td>
</tr>
<tr>
<td>00</td>
<td>16</td>
<td>NT9X14EA .........</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>powered up</td>
<td>step 36</td>
</tr>
<tr>
<td>did not power up</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 38</td>
</tr>
<tr>
<td>failed</td>
<td>step 58</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 40</td>
</tr>
<tr>
<td>failed</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 44</td>
</tr>
<tr>
<td>failed, and the system generated a card list</td>
<td>step 42</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 58</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Passed</th>
<th>Step 45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed</td>
<td>Step 58</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 49</td>
</tr>
<tr>
<td>failed</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of a CM alarm clearing procedure</td>
<td>step 50</td>
</tr>
<tr>
<td>performed this procedure for any reason other than listed here</td>
<td>step 51</td>
</tr>
</tbody>
</table>

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”):

To confirm the command, type

> YES

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.
Test passed.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 54</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 58</td>
</tr>
</tbody>
</table>

At the CM reset terminal for the inactive CPU

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

To synchronize the CM, type

> SYNC

and press the Enter key.

*Example of a MAP response:*

Maintenance action submitted.
Synchronization successful.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the SYNC command was successful</td>
<td>step 56</td>
</tr>
</tbody>
</table>
Power converter cards
in a SuperNode SE CM/SLM (end)

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is other than listed here</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure for another maintenance proce-</td>
<td>step 57</td>
</tr>
<tr>
<td>dure</td>
<td></td>
</tr>
<tr>
<td>perform this procedure for any reason other than list-</td>
<td>step 59</td>
</tr>
<tr>
<td>ed here</td>
<td></td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card Name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X10</td>
<td>AA</td>
<td>33-MHz 88100 BRISC CPU card</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X10</td>
<td>BA, CA</td>
<td>60-MHz 88100 BRISC CPU card</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X12</td>
<td>AA, AB, AC, AD</td>
<td>CPU port card</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X13</td>
<td>MA, MB</td>
<td>Supernode SE core processor card</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X14</td>
<td>DB</td>
<td>24-Mbyte memory card</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X14</td>
<td>EA</td>
<td>96-Mbyte memory card</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X21</td>
<td>AA</td>
<td>CM-bus terminator paddle board</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X21</td>
<td>AB</td>
<td>Bus terminator paddle board</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X26</td>
<td>AB, CA</td>
<td>Remote terminal interface paddle (RTIF) board</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X26</td>
<td>DA, DB, DC, EA, FA</td>
<td>BRISC RTIF paddle board</td>
<td>CM/SLM</td>
</tr>
<tr>
<td>NT9X86</td>
<td>AA/AB</td>
<td>Dual-port message controller card</td>
<td>CM/SLM</td>
</tr>
</tbody>
</table>

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

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

1. Card on active side? If yes, Switch activity. If no, go to step 2.
2. CM runs on inactive clock of CPU? If yes, Switch clock source. If no, go to step 3.
3. Primary autoload device on inact side? If yes, Change primary autoload device. If no, go to step 4.
4. Busy SLM or Busy associated PMC port? If yes, go to step 5. If no, Offline SLM or Busy associated MC? If yes, go to step 5. If no, go to step 4.
5. Test SLM. If Busy SLM, return SLM to service. If Offline SLM, release jam and synchronize CM. If Busy associated MC, restore image volumes. If End, return MC and PMC port to service.
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
    >MAP; 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)

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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is synchronized</td>
<td>step 9</td>
</tr>
<tr>
<td>is not synchronized</td>
<td>step 13</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is About to drop sync with CPU 1 active. The inactive CPU is JAMMED. Do you want to continue? Please confirm (“YES”, “Y”, “NO”, or “N”):</td>
<td>step 10</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If A1</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>flashes</td>
<td>step 13</td>
</tr>
<tr>
<td>does not flash</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>runs on the clock of the inactive CPU</td>
<td>step 14</td>
</tr>
<tr>
<td>runs on the clock of the active CPU</td>
<td>step 15</td>
</tr>
</tbody>
</table>
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:*

<table>
<thead>
<tr>
<th>CM</th>
<th>Sync</th>
<th>Act</th>
<th>CPU0</th>
<th>CPU1</th>
<th>Jam</th>
<th>Memory</th>
<th>CMMnt</th>
<th>MC</th>
<th>PMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no</td>
<td>cpu</td>
<td>0</td>
<td>.</td>
<td>.</td>
<td>yes</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

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 of the Primary header. In the example in step 15, the primary autoload device is the disk of SLM 0.

<table>
<thead>
<tr>
<th>If the primary autoload device is on the same side of the switch as the active CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 18</td>
<td></td>
</tr>
<tr>
<td>is on the same side of the switch as the inactive CPU</td>
<td>step 17</td>
</tr>
<tr>
<td>step 17</td>
<td></td>
</tr>
</tbody>
</table>

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)
Replace system cards in a SuperNode SE CM/SLM (continued)

Example of a MAP response:

New autoload route has been set.

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

$$> \text{IOD;SLM slm\_number}$$

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 . . . .


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.

<table>
<thead>
<tr>
<th>If the SLM Stat header</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has dots</td>
<td>step 19</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 70</td>
</tr>
</tbody>
</table>

19 To manually busy the SLM, type

$$> \text{BSY}$$

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.

<table>
<thead>
<tr>
<th>If the SLM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 22</td>
</tr>
<tr>
<td>did not busy</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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

```plaintext
>CM; PMC
```

and press the Enter key.

*Example of a MAP display:*

```
PMC 0
.
PORT0: .
PORT1: .
```

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

```plaintext
>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*

```plaintext
>BSY 0 PORT 0
```

*Example of a MAP response:*

```
Maintenance action submitted.
Passed.
```

22 To offline the SLM, type

```plaintext
>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:*
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.

<table>
<thead>
<tr>
<th>If the SLM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>offline</td>
<td>step 23</td>
</tr>
<tr>
<td>did not offline</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the state of the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is mbsy</td>
<td>step 26</td>
</tr>
<tr>
<td>is not mbsy</td>
<td>step 25</td>
</tr>
</tbody>
</table>

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 active 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.

<table>
<thead>
<tr>
<th>If the MC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>busied</td>
<td>step 26</td>
</tr>
<tr>
<td>did not busy</td>
<td>step 70</td>
</tr>
</tbody>
</table>

*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.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>powered up</td>
<td>step 31</td>
</tr>
<tr>
<td>did not turn on</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 33</td>
</tr>
<tr>
<td>failed</td>
<td>step 70</td>
</tr>
</tbody>
</table>

33 To access the SLM that associates with the card that you replaced, type

>`IOD;SLM  slm_number`

and press the Enter key.

*Example of a MAP response:*

34 To return the SLM to service, type

>`RTS`

and press the Enter key.

*Example of a MAP response:*

If the RTS command Do

| passed              | step 35             |
| failed              | step 70             |

35 The next action depends on the type of card that you replaced.

<table>
<thead>
<tr>
<th>If the card that you replaced</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X14</td>
<td>step 36</td>
</tr>
<tr>
<td>is an NT9X26</td>
<td>step 38</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 39</td>
</tr>
</tbody>
</table>

36 To access the Memory level of the MAP display, type

>`CM; MEMORY`

and press the Enter key.

*Example of a MAP display:*

`EOF`
Replace system cards
in a SuperNode SE CM/SLM (continued)

To test the card that you replaced, type

\texttt{>TST CARD card\_number}

and press the Enter key.

\textit{where}

\begin{itemize}
  \item \texttt{card\_number} is the number of the memory card that you replaced (0 to 5)
\end{itemize}

\textit{Example of a MAP response:}

Maintenance action submitted.
Memory test OK.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 39</td>
</tr>
<tr>
<td>failed</td>
<td>step 70</td>
</tr>
</tbody>
</table>

\textit{At the CM reset terminal (RTIF) for the inactive CPU}

To determine the result of the last self test, type

\texttt{>\SELF\ TEST}

and press the Enter key.

\textit{Example of a MAP response:}

\textbf{SELF TEST RESULTS: ROM OK RAM OK 9X26 OK}

<table>
<thead>
<tr>
<th>If the self test</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 39</td>
</tr>
<tr>
<td>failed</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of a MC Tbl alarm</td>
<td>step 43</td>
</tr>
<tr>
<td>perform this procedure as a result of a PMCFlt alarm</td>
<td>step 43</td>
</tr>
</tbody>
</table>
Replace system cards in a SuperNode SE CM/SLM (continued)

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of a PMCTbl alarm</td>
<td>step 43</td>
</tr>
<tr>
<td>perform this procedure as a result of a NoTOD alarm</td>
<td>step 43</td>
</tr>
<tr>
<td>perform this procedure as a result of a SBsyMC alarm</td>
<td>step 43</td>
</tr>
<tr>
<td>perform this procedure as a result of a MBsyMC alarm</td>
<td>step 43</td>
</tr>
<tr>
<td>perform this procedure as a result of a CBsyMC alarm</td>
<td>step 43</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 40</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 42</td>
</tr>
<tr>
<td>failed</td>
<td>step 70</td>
</tr>
</tbody>
</table>
**Replace system cards in a SuperNode SE CM/SLM**

(continued)

42 The next step depends on the type of switch and the software load.

<table>
<thead>
<tr>
<th>If the switch</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a SuperNode SE Series 20 or 60 with software release BASE06</td>
<td>step 43</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 45</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is Card replacement has been recorded.</td>
<td>step 45</td>
</tr>
<tr>
<td>is Aborted. Card replacement has NOT been recorded.</td>
<td>step 44</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 70</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the fault</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is memory fault correctable mismatches</td>
<td>step 46</td>
</tr>
<tr>
<td>is mismatches other than memory fault correctable</td>
<td>step 46</td>
</tr>
<tr>
<td>is REx test failures: manual or auto</td>
<td>step 50</td>
</tr>
<tr>
<td>is manual test failures</td>
<td>step 50</td>
</tr>
<tr>
<td>is other failures</td>
<td>step 50</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If software</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is BCS33 or earlier</td>
<td>step 50</td>
</tr>
<tr>
<td>is BCS34 or later</td>
<td>step 48</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the fault</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a memory fault correctable mismatches</td>
<td>step 52</td>
</tr>
</tbody>
</table>
Replace system cards in a SuperNode SE CM/SLM (continued)

<table>
<thead>
<tr>
<th>If the fault</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is mismatches other than memory fault correctable</td>
<td>step 54</td>
</tr>
<tr>
<td>is REX failures: manual or auto</td>
<td>step 56</td>
</tr>
<tr>
<td>is manual test failures</td>
<td>step 58</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 60</td>
</tr>
</tbody>
</table>

52 Complete one return label (form 24-115) for each card that returns. 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

53 Enter the following in the failure description section of the label:
- reason for failure (failure caused by a 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)
- for software release Base 06, include associated MFC logs
- 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.

54 Complete one return label (form 24-115) for each card returns. 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
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, #bnt12345mm, #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)

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.

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

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>perform this procedure as a result of the CM alarm clearing procedure</td>
<td>step 64</td>
</tr>
<tr>
<td>perform this procedure for any reason other than listed here</td>
<td>step 65</td>
</tr>
</tbody>
</table>

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

To access the CM level of the MAP display, type

>CM

and press the Enter key.

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"):  

To confirm the command, type

>YES

and press the Enter key.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 68</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 70</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the SYNC command was successful</td>
<td>step 71 is other than listed here</td>
</tr>
</tbody>
</table>

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

71. The procedure is complete.
3 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
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)

**Legend:**
- DCM: Digital carrier module
- FSP: Frame supervisory panel
## DCM, with two power converters

<table>
<thead>
<tr>
<th>Cards</th>
<th>21F</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X06</td>
<td>Power converter card</td>
</tr>
<tr>
<td>NT2X07</td>
<td>Power converter card</td>
</tr>
<tr>
<td>NT0X50</td>
<td>Filler faceplate</td>
</tr>
<tr>
<td>NT0X50</td>
<td>Filler faceplate</td>
</tr>
<tr>
<td>NT0X50</td>
<td>Filler faceplate</td>
</tr>
<tr>
<td>NT2X32</td>
<td>DCM processor card</td>
</tr>
<tr>
<td>NT2X33</td>
<td>Control card</td>
</tr>
<tr>
<td>NT2X34</td>
<td>PP message processor card</td>
</tr>
<tr>
<td>NT0X50</td>
<td>Filler faceplate</td>
</tr>
<tr>
<td>NT2X36</td>
<td>Network interface card</td>
</tr>
<tr>
<td>NT2X37</td>
<td>DCM tone card</td>
</tr>
<tr>
<td>NT2X38</td>
<td>DCM signaling card</td>
</tr>
<tr>
<td>NT2X35</td>
<td>DCM interface card</td>
</tr>
<tr>
<td>NT2X35</td>
<td>DCM interface card</td>
</tr>
<tr>
<td>NT2X35</td>
<td>DCM interface card</td>
</tr>
<tr>
<td>NT2X35</td>
<td>DCM interface card</td>
</tr>
<tr>
<td>NT2X35</td>
<td>DCM interface card</td>
</tr>
<tr>
<td>NT0X50</td>
<td>Filler faceplate</td>
</tr>
<tr>
<td></td>
<td>07F</td>
</tr>
<tr>
<td></td>
<td>06F</td>
</tr>
<tr>
<td></td>
<td>05F</td>
</tr>
<tr>
<td></td>
<td>04F</td>
</tr>
<tr>
<td></td>
<td>03F</td>
</tr>
<tr>
<td></td>
<td>01F</td>
</tr>
</tbody>
</table>
### DCM shelf layouts (continued)

DCM, with one power converter

<table>
<thead>
<tr>
<th>Cards</th>
<th>Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X70 Power converter card</td>
<td>20F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>18F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>17F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>16F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>15F</td>
</tr>
<tr>
<td>NT2X32 DCM processor card</td>
<td>14F</td>
</tr>
<tr>
<td>NT2X33 Control card</td>
<td>13F</td>
</tr>
<tr>
<td>NT2X24 PP message processor card</td>
<td>12F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>11F</td>
</tr>
<tr>
<td>NT2X36 Network interface card</td>
<td>10F</td>
</tr>
<tr>
<td>NT2X37 DCM tone card</td>
<td>09F</td>
</tr>
<tr>
<td>NT2X38 DCM signaling card</td>
<td>08F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>07F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>06F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>05F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>04F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>03F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>02F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>01F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td></td>
</tr>
</tbody>
</table>
Digital echo suppressor (DES)

<table>
<thead>
<tr>
<th>Cards</th>
<th>Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X70 Power converter card</td>
<td>20F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>18F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>17F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>16F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>15F</td>
</tr>
<tr>
<td>NT2X32 DCM processor card</td>
<td>14F</td>
</tr>
<tr>
<td>NT2X33 Control card</td>
<td>13F</td>
</tr>
<tr>
<td>NT2X24 PP message processor card</td>
<td>12F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>11F</td>
</tr>
<tr>
<td>NT2X36 Network interface card</td>
<td>10F</td>
</tr>
<tr>
<td>NT2X37 DCM tone card</td>
<td>09F</td>
</tr>
<tr>
<td>NT2X38 DCM signaling card</td>
<td>08F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>07F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>06F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>05F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>04F</td>
</tr>
<tr>
<td>NT2X35 DCM interface card</td>
<td>03F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>02F</td>
</tr>
<tr>
<td>NT0X50 Filler faceplate</td>
<td>01F</td>
</tr>
</tbody>
</table>

Rear
## Control complex cards in a digital carrier module

### Application

Use this procedure to replace the following cards in the shelves or frames listed.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X32</td>
<td>AA</td>
<td>Master processor card</td>
<td>Digital carrier module (DCM), Digital echo supressor (DES)</td>
</tr>
<tr>
<td>NT2X33</td>
<td></td>
<td>Control card</td>
<td>DCM, DES</td>
</tr>
<tr>
<td>NT2X34</td>
<td></td>
<td>Message supervision card</td>
<td>DCM, DES</td>
</tr>
<tr>
<td>NT2X37</td>
<td></td>
<td>Tone card</td>
<td>DCM, DES</td>
</tr>
<tr>
<td>NT2X38</td>
<td></td>
<td>Signaling timing card</td>
<td>DCM, DES</td>
</tr>
</tbody>
</table>

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

- Post the PM
- Manually busy the PM
- Replace the card
- Load the PM
- Return the PM to service
- End

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
Replacing Control complex cards in a digital carrier module

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 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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

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.

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>DCM</td>
<td>0</td>
<td>InSv</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the state of the PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb, InsV, SysB, or CBsy</td>
<td>step 5</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 7</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 13</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 7</td>
</tr>
<tr>
<td>failed</td>
<td>step 15</td>
</tr>
</tbody>
</table>

   **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.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 9</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 10</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 11</td>
</tr>
<tr>
<td>passed</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 16</td>
</tr>
<tr>
<td>passed, but the PM is ISTb as a result of a command protocol violation</td>
<td>step 14</td>
</tr>
<tr>
<td>failed</td>
<td>step 15</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X35</td>
<td>AA</td>
<td>DCM interface card</td>
<td>DCM</td>
</tr>
</tbody>
</table>

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.
Summary of replacing an NT2X35 in a digital carrier module

This flowchart summarizes the procedure.

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

1. Busy circuits on link associated with card
   - Busy link associated with card
   - Replace card

2. Manually busy carrier associated with card
   - Manually busy LM or RLM
   - Replace card

3. Timing carrier?
   - Return trunking carrier to service
   - Switch timing carrier
   - Manually busy carrier associated with card

4. MS Clock alarm?
   - Synchronize office
   - Standby link in service?
   - Carrier is active link?
   - Links to LM or RLM?
   - Load LM or RLM

End
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.

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:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

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:*

**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.
NT2X35
in a digital carrier module (continued)

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 number.
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.

<table>
<thead>
<tr>
<th>If the link</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an LM or remote line module</td>
<td>step 6</td>
</tr>
<tr>
<td>(RLM)</td>
<td></td>
</tr>
<tr>
<td>is a carrier of class - timing</td>
<td>step 8</td>
</tr>
<tr>
<td>is a carrier of class - trunk</td>
<td>step 21</td>
</tr>
</tbody>
</table>

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:*

```
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:
```

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)

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  2  6
     TIMING  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  2  6
   TIMING  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
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.

<table>
<thead>
<tr>
<th>If the carrier</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>supports the active link, and the standby link is</td>
<td>step 11</td>
</tr>
<tr>
<td>in service (INSV or ISTB)</td>
<td></td>
</tr>
<tr>
<td>supports the active link, and the standby link is</td>
<td>step 41</td>
</tr>
<tr>
<td>not in service</td>
<td></td>
</tr>
<tr>
<td>supports the standby link (one or both links are</td>
<td>step 19</td>
</tr>
<tr>
<td>standby)</td>
<td></td>
</tr>
</tbody>
</table>

11 To access the CLOCK level of the MAP display, type

>`MS; CLOCK`

and press the Enter key.

*Example of a MAP display:*

<table>
<thead>
<tr>
<th>Message Switch</th>
<th>Clock</th>
<th>Shelf 0</th>
<th>Inter-MS Link 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 0</td>
<td></td>
<td>Master</td>
<td></td>
</tr>
<tr>
<td>MS 1</td>
<td></td>
<td>Slave</td>
<td></td>
</tr>
</tbody>
</table>

| Shelf 0        | 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 |
| Card 1         | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |
| Chain          |                                 |
| MS 0           | . . . . . . . - - - - - - - - - - |
| MS 1           | . . . . . . . - - - - - - - - - - |

<table>
<thead>
<tr>
<th>Card 02 Alm Stat %Adj Src</th>
<th>Car Stat Sp PM CCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 0 . Syn +11.3 Lk0</td>
<td>Lk0 Lck 0 DTC 000 00</td>
</tr>
<tr>
<td>MS 1 . Syn -11.9 Ms0</td>
<td>Lk1 Smp 0 DTC 001 00</td>
</tr>
</tbody>
</table>

Links Slipping: 6 out of 200

MS:

CLOCK:

12 Determine if a CLOCK alarm under the MS alarm banner is present.

<table>
<thead>
<tr>
<th>If a CLOCK alarm</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is present</td>
<td>step 13</td>
</tr>
<tr>
<td>is not present</td>
<td>step 14</td>
</tr>
</tbody>
</table>

13 To synchronize the office, type

>`SYNC`

and press the Enter key.

*Example of a MAP response:*
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"):

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.

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

To access the CARRIER level of the MAP display, type

```
>TRKS;CARRIER
```

and press the Enter key.

To post the timing carriers, type

```
>POST TIMING
```

and press the Enter key.

To manually busy the carrier that associates with the card you replace, type

```
>BSY list_no
```

where

```
list_no
```

is the list number (0 to 4) for the link

*Example of a MAP response:*
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 28</td>
</tr>
<tr>
<td>failed</td>
<td>step 43</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If a set of circuits is posted</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 23</td>
<td></td>
</tr>
</tbody>
</table>

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.
Example of a MAP display:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>ML</th>
<th>OS</th>
<th>ALARM</th>
<th>SYSB</th>
<th>MANB</th>
<th>UNEQ</th>
<th>OFFL</th>
<th>CBSY</th>
<th>PBSY</th>
<th>INSV</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUNKS</td>
<td>4</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>REMOTE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>TIMING</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>ML</th>
<th>OS</th>
<th>ALARM</th>
<th>SYSB</th>
<th>MANB</th>
<th>UNEQ</th>
<th>OFFL</th>
<th>CBSY</th>
<th>PBSY</th>
<th>INSV</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUNKS</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>186</td>
</tr>
<tr>
<td>REMOTE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>TIMING</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

SIZE OF POSTED SET : 5

CARRIER:

26 Determine the state of the carrier that associates with the card you replace.

<table>
<thead>
<tr>
<th>If the link</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is INSV, ISTB, or SYSB</td>
<td>step 27</td>
</tr>
<tr>
<td>is MANB</td>
<td>step 28</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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
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.

**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**

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure step 30</td>
</tr>
<tr>
<td>did not direct you to this procedure step 31</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is to a line module (LM or RLM) step 32</td>
</tr>
<tr>
<td>is a carrier of class - timing step 35</td>
</tr>
<tr>
<td>is a carrier of class - trunk step 36</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 44</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

To load the PM unit, use the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

To return the PM to service, type

>`RTS

and press the Enter key.

*Example of a MAP response:*

rts
OK.
InSvce Tests Initiated
OK.

<table>
<thead>
<tr>
<th>If RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 44</td>
</tr>
<tr>
<td>failed</td>
<td>step 43</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 44</td>
</tr>
</tbody>
</table>
### NT2X35 in a digital carrier module (continued)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 43</td>
</tr>
</tbody>
</table>

36 To return the trunking 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.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 37</td>
</tr>
<tr>
<td>failed</td>
<td>step 43</td>
</tr>
</tbody>
</table>

37 To access the TTP level of the MAP display, type

```
>TTP
```

and press the Enter key.

38 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

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a set of circuits is posted</td>
<td>step 39</td>
</tr>
<tr>
<td>the response is NO CKT, SET IS EMPTY</td>
<td>step 44</td>
</tr>
</tbody>
</table>

39 To return all circuits to service, type

```
>RTS ALL
```

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.
Application

Use this procedure to replace the NT2X36 card in a digital carrier module (DCM), as listed in the following table.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X36</td>
<td>AA</td>
<td>Network interface card</td>
<td>DCM</td>
</tr>
</tbody>
</table>

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.
Summary of replacing an NT2X36 in a digital carrier module

Post the DCM

Manually busy the DCM

Manually busy network links

Replace the card

Return the network links to service

Return the DCM to service

End

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.
Replacing an NT2X36 in a digital carrier module

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 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  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.

*Example of a MAP display:*

```
PM    SysB  ManB  OffL  CBsy  ISTb  InSv
PM  6     1     0     0     23    24
DCM  1     0     0     0     1     4
```

**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.
4. Determine the state of the PM unit that associates with the card you want to replace.

<table>
<thead>
<tr>
<th>State of PM Unit</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTb, InSv, SysB, or CBsy</td>
<td>Step 5</td>
</tr>
<tr>
<td>ManB</td>
<td>Step 7</td>
</tr>
<tr>
<td>OffL</td>
<td>Step 31</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Command Status</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passed</td>
<td>Step 7</td>
</tr>
<tr>
<td>Failed</td>
<td>Step 33</td>
</tr>
</tbody>
</table>

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 2: NET 0 1 9;CAP: S;STATUS:OK     | P |
   | LINK 2: NET 1 1 9;CAP: S;STATUS:OK     | P |
   | LINK 3: NET0 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)

记录JNET平面、对等和链路的每条C-side链路。

注1：NT2X36网络接口卡支持每张卡的八条C-side链路。

注2：网络平面、对等和链路在PM级别TRNSL命令的反应的第4、5、6列中。

例如，在第7步的示例1中演示了这个反应。

例如，C-side链路3在显示的底部是在网络平面1，对等1，链路13。

9
要访问MAP显示的NET级别，请键入

>`NET

并按Enter键。

例MAP显示：

```
Net    11111  11111  22222  22222  33
 Plane 01234  56789  01234  56789  01234  56789  01
      0   L...
      1    ...
```

10
要访问MAP显示的LINKS级别，请键入

>`LINKS pair_no`

并按Enter键。

其中

pair_no
是与C-side链路连接的对等（0到31）的编号。

例MAP显示：
NT2X36
in a digital carrier module (continued)

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 30OK

Repeat step 11 for all C-side links.

Go to step 19.

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.

To access the NET level of the MAP display, type

>NET

and press the Enter key.

Example of a MAP display:
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 ....----- -------- ----..... . .
```

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.

If a maintenance procedure  Do

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.

If you  Do

are working on a JNET  step 23

are working on an ENET  step 25
To return to service one of the network links that associates with the PM unit, type

\texttt{>RTS plane\_no link\_no}

and press the Enter key.

\begin{itemize}
  \item \texttt{plane\_no} is the number of the plane (0 or 1) for the link
  \item \texttt{link\_no} is the link number (0 to 63)
\end{itemize}

<table>
<thead>
<tr>
<th>If the link</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>returned to service and more manual busy links are present</td>
<td>step 24</td>
</tr>
<tr>
<td>returned to service and more manual busy links are not present</td>
<td>step 27</td>
</tr>
<tr>
<td>did not return to service</td>
<td>step 33</td>
</tr>
</tbody>
</table>

Repeat step 23 for all C-side links to the DCM.

Go to step 26.

To return the link to service, type

\texttt{>RTS plane\_no LINK link\_no}

and press the Enter key.

\begin{itemize}
  \item \texttt{plane\_no} is the number of the plane (0 or 1) for the link
  \item \texttt{link\_no} is the link number (0 to 63)
\end{itemize}

\textit{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.

<table>
<thead>
<tr>
<th>If the link</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>returned to service</td>
<td>step 26</td>
</tr>
<tr>
<td>did not return to service</td>
<td>step 33</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 29</td>
</tr>
<tr>
<td>passed</td>
<td>step 30</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 34</td>
</tr>
<tr>
<td>passed, but the DCM is ISTb as a result of a command protocol violation</td>
<td>step 32</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

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.
Application

Use this procedure to replace a NT3X65 card in a digital carrier module (DCM) digital echo suppressor (DES), as the following table shows.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT3X65</td>
<td>AA</td>
<td>Digital echo suppressor tone CPU</td>
<td>DCM digital echo suppressor</td>
</tr>
</tbody>
</table>

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.
Summary of replacing an NT3X65 in a digital echo suppressor

1. Post the DCM
2. Manually busy network links for the card
3. Replace the card
4. Return the network links to service
5. End

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.
Replacing NT3X65 in a digital echo suppressor

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 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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>DCM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>DCM</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>InSv</td>
</tr>
</tbody>
</table>

4. To display a list of C-side links, type

   >TRNSL C

---

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.
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.

<table>
<thead>
<tr>
<th>If the network</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a junctor network (JNET)</td>
<td>step 7</td>
</tr>
<tr>
<td>is an enhanced network (ENET)</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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:*
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 ...

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)

12 Record the ENET plane, shelf, card, and link number for both links that
associate with the card you replace.

   **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. Example #2 in
   step 4 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.

13 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  ---

14 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  ...---- -------- ----.... .  .

15 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  ---
16 To manually busy the link that you recorded in step 12, type

```bash
>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.
At the shelf

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.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 20</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 21</td>
</tr>
</tbody>
</table>

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

At the MAP terminal

The next action depends on the type of network in the office.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are working on a JNET</td>
<td>step 22</td>
</tr>
<tr>
<td>are working on an ENET</td>
<td>step 24</td>
</tr>
</tbody>
</table>

To return to service one of the JNET links that associates with the PM unit, type

\[ \text{>RTS plane_no link_no} \]

and press the Enter key.

where

- \text{plane_no} is the number of the plane (0 or 1) for the link.
Digital carrier module card replacement procedures

**NT3X65**

in a digital echo suppressor (continued)

<table>
<thead>
<tr>
<th>link_no</th>
<th>is the link number (0 to 63)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the link</td>
<td>Do</td>
</tr>
<tr>
<td>returned to service and one more manual-busy link is present</td>
<td>step 23</td>
</tr>
<tr>
<td>returned to service and more manual busy links are not present</td>
<td>step 29</td>
</tr>
<tr>
<td>did not return to service</td>
<td>step 28</td>
</tr>
</tbody>
</table>

23 Repeat step 22 for the other link.
Go to step 29.

24 Return to service one of the ENET links that associates with the PM unit, 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 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 |

25 Repeat step 24 for the other link. Complete the procedure and go to step 29.

26 To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
A minor problem is present, but the DCM can process traffic. For additional help, contact the next level of support.

For additional help, contact the next level of support.

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X06</td>
<td>AA</td>
<td>Power converter card</td>
<td>Digital carrier module (DCM), Digital echo suppressor (DES)</td>
</tr>
<tr>
<td>NT2X07</td>
<td>AA</td>
<td>Power converter card</td>
<td>DCM, DES</td>
</tr>
<tr>
<td>NT2X70</td>
<td>AA, AB, AC, AD</td>
<td>-48V power converter card</td>
<td>DCM, DES</td>
</tr>
</tbody>
</table>

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

This flowchart summarizes the procedure.

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

Post the PM

Manually busy the PM

Power down the shelf

Replace the card

Power up the shelf

Load the PM

Return the PM to service

End
Power converter cards in a digital carrier module (continued)

Replacing Power converter cards in a digital carrier module

*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 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:*

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>23</td>
</tr>
</tbody>
</table>

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:*

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>DCM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

DCM 0 InSv

---

**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.
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.

<table>
<thead>
<tr>
<th>If the state of the PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb, InSv, SysB, or CBsy</td>
<td>step 5</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 7</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 23</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 7</td>
</tr>
<tr>
<td>failed</td>
<td>step 25</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has a single NT2X70</td>
<td>step 10</td>
</tr>
</tbody>
</table>
Power converter cards
in a digital carrier module (continued)

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has an NT2X06 and an NT2X07</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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

  **Note 1:** Make sure that the handle of the POWER switch on the replacement power converter is in the OFF position.

  **Note 2:** 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.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 12</td>
</tr>
<tr>
<td>did not direct to this procedure</td>
<td>step 13</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 14</td>
</tr>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 15</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 16</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 17</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one power converter is present</td>
<td>step 20</td>
</tr>
<tr>
<td>two power converters are present, and you powered up both power converters</td>
<td>step 20</td>
</tr>
<tr>
<td>two power converters are present, and you powered up only one of the power converters</td>
<td>step 19</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 21</td>
</tr>
<tr>
<td>passed</td>
<td>step 22</td>
</tr>
</tbody>
</table>

21 Perform the procedure Loading a PM in this document. Complete the procedure and return to this point.
22 To return the PM to service, type
   \texttt{>RTS}
   and press the Enter key.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 26</td>
</tr>
<tr>
<td>passed, but the PM is \texttt{ISTb} as a result of a command protocol violation</td>
<td>step 24</td>
</tr>
<tr>
<td>failed</td>
<td>step 25</td>
</tr>
</tbody>
</table>

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.
4 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
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.
Figure Enhanced link peripheral processor

**Legend:**
- **FSP**: Frame supervisory panel
- **LIM**: Link interface module
- **LIS**: Link interface shelf
- **LMS**: Local message switch
- **LMS 0, LMS 1**: Local message switch units
- **LIS 1, LIS 2, LIS 3**: Link interface shelf units
- **Cooling unit**: Cooling unit for the shelf.
Figure Triple F-bus configuration in an ELPP cabinet

Legend:
- Intershelf F-bus
- Intrashelf F-bus
ELPP shelf layouts (continued)

Figure Link interface module with LMS 0 and LMS 1 (triple F-bus configuration)

<table>
<thead>
<tr>
<th>Paddle boards</th>
<th>Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>32R NT9X19 Filler</td>
<td>NT9X30 Power (+5 V)</td>
</tr>
<tr>
<td>31R NT9X19 Filler</td>
<td>NT9X31 Power (–5 V)</td>
</tr>
<tr>
<td>30R NT9X62</td>
<td>NT9X49 P-bus terminator</td>
</tr>
<tr>
<td>29R NT9X62</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>28R NT9X79 F-bus extension PB</td>
<td>NT9X17 4 port interface card</td>
</tr>
<tr>
<td>27R NT9X79 F-bus extension PB</td>
<td>NT9X17 4 port interface card</td>
</tr>
<tr>
<td>26R NT9X79 F-bus extension PB</td>
<td>NT9X17 4 port interface card</td>
</tr>
<tr>
<td>25R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>24R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>23R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>22R NT9X26 RTIF PB</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>21R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>20R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>19R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>18R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>17R NT9X26 RTIF PB</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>16R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>15R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>14R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>13R NT9X79 F-bus extension PB</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>12R NT9X79 F-bus extension PB</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>11R NT9X79 F-bus extension PB</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>10R NT9X62</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>09R NT9X62</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>08R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>07R NT9X19 Filler</td>
<td>NT9X19 Filler</td>
</tr>
<tr>
<td>36F NT9X30 Power (+5 V)</td>
<td>NT9X31 Power (–5 V)</td>
</tr>
</tbody>
</table>
Enhanced link peripheral processor card replacement procedures

ELPP shelf layouts (continued)

Figure Link interface shelf with common fill cards

<table>
<thead>
<tr>
<th>Paddle boards</th>
<th>Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>32R NT9X79 F-bus extender PB</td>
<td>NT9X30 Power converter card 36F</td>
</tr>
<tr>
<td>31R NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate 33F</td>
</tr>
<tr>
<td>30R NTEX20 F-bus terminator PB</td>
<td>NT9X74 F-bus repeater card 32F</td>
</tr>
<tr>
<td>29R NT9X19 Filler faceplate</td>
<td>30F</td>
</tr>
<tr>
<td>28R NT9X19 Filler faceplate</td>
<td>29F</td>
</tr>
<tr>
<td>27R NT9X19 Filler faceplate</td>
<td>28F</td>
</tr>
<tr>
<td>26R NT9X19 Filler faceplate</td>
<td>27F</td>
</tr>
<tr>
<td>25R NT9X19 Filler faceplate</td>
<td>26F</td>
</tr>
<tr>
<td>24R NT9X19 Filler faceplate</td>
<td>25F</td>
</tr>
<tr>
<td>23R NT9X19 Filler faceplate</td>
<td>24F</td>
</tr>
<tr>
<td>22R NT9X19 Filler faceplate</td>
<td>23F</td>
</tr>
<tr>
<td>21R NT9X19 Filler faceplate</td>
<td>22F</td>
</tr>
<tr>
<td>20R NT9X19 Filler faceplate</td>
<td>21F</td>
</tr>
<tr>
<td>19R NT9X19 Filler faceplate</td>
<td>20F</td>
</tr>
<tr>
<td>18R NT9X19 Filler faceplate</td>
<td>19F</td>
</tr>
<tr>
<td>17R NT9X19 Filler faceplate</td>
<td>18F</td>
</tr>
<tr>
<td>16R NT9X19 Filler faceplate</td>
<td>17F</td>
</tr>
<tr>
<td>15R NT9X19 Filler faceplate</td>
<td>16F</td>
</tr>
<tr>
<td>14R NT9X19 Filler faceplate</td>
<td>15F</td>
</tr>
<tr>
<td>13R NT9X19 Filler faceplate</td>
<td>14F</td>
</tr>
<tr>
<td>12R NT9X19 Filler faceplate</td>
<td>13F</td>
</tr>
<tr>
<td>11R NT9X19 Filler faceplate</td>
<td>12F</td>
</tr>
<tr>
<td>10R NT9X19 Filler faceplate</td>
<td>11F</td>
</tr>
<tr>
<td>09R NTEX20 F-bus terminator PB</td>
<td>10F</td>
</tr>
<tr>
<td>08R NT9X79 F-bus extender PB</td>
<td>09F</td>
</tr>
<tr>
<td>07R NT9X79 F-bus extender PB</td>
<td>NT9X74 F-bus repeater card 07F</td>
</tr>
<tr>
<td></td>
<td>NT9X30 Power converter card 04F</td>
</tr>
<tr>
<td></td>
<td>NT9X19 Filler faceplate 01F</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X74</td>
<td>DA</td>
<td>F-bus repeater</td>
<td>LIS in an ELPP</td>
</tr>
<tr>
<td>NT9X79</td>
<td>BA</td>
<td>F-bus termination paddle board</td>
<td>LIS in an ELPP</td>
</tr>
<tr>
<td>NTEX20</td>
<td>AA, BA</td>
<td>Intrashelf termination paddle board</td>
<td>LIS in an ELPP</td>
</tr>
</tbody>
</table>

**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

This flowchart summarizes the procedure.

Check card release compatibility

Compatible?

Manually busy the F-bus

Obtain a compatible card

Replace the card on the LIS shelf

Return the F-bus to service

End

Use the instructions in the procedure that follows this flowchart to perform the procedure.
Common fill paddle boards in an ELPP LIS (continued)

Replacing Common fill paddle boards in an ELPP LIS

At your current location

1

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:

<table>
<thead>
<tr>
<th>PEC</th>
<th>BASELINE</th>
<th>EXCEPT</th>
<th>RELEASE</th>
<th>COMPATIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X74DA</td>
<td>09</td>
<td>None</td>
<td>2Z</td>
<td>YES</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>can obtain a compatible replacement card</td>
<td>step 2</td>
</tr>
<tr>
<td>cannot obtain a compatible replacement card</td>
<td>step 21</td>
</tr>
</tbody>
</table>

6. Access the PM level of the MAP display by typing
   >MAPCI;MTC;PM
   and pressing the Enter key.
   Example of a MAP display:
   
<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>18</td>
</tr>
</tbody>
</table>

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:
   
<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>InSv</td>
<td>OOS</td>
<td>OOS</td>
<td>Taps</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the state of the LIM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>OffL</td>
<td>step 20</td>
</tr>
</tbody>
</table>
**Enhanced link peripheral processor card replacement procedures**

**Common fill paddle boards in an ELPP LIS** (continued)

1. If the state of the LIM is any other in-service or out-of-service state, do step 9.

2. 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.

3. If the state of the mate LIM unit is `InSv`, do step 10.

4. If the state of the LIM is `Do` in any other in-service or out-of-service state, do step 18.

5. 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
   OOS   OOS_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.

<table>
<thead>
<tr>
<th>If the states are</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>in-service (state of the F-bus is InSv and all F-bus taps are either . (dot) or - (dash).)</td>
<td>step 12</td>
</tr>
<tr>
<td>any other state (state of the F-bus is not InSv and one or more F-bus taps are not either . (dot) or - (dash))</td>
<td>step 19</td>
</tr>
</tbody>
</table>

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"):
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the command passes</td>
<td>step 14</td>
</tr>
<tr>
<td>you must confirm the command</td>
<td>step 13</td>
</tr>
</tbody>
</table>
Enhanced link peripheral processor card replacement procedures

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 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.

<table>
<thead>
<tr>
<th>If you were</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>sent to this procedure from another</td>
<td>step 16</td>
</tr>
<tr>
<td>maintenance procedure</td>
<td></td>
</tr>
<tr>
<td>not sent to this procedure from an-</td>
<td>step 17</td>
</tr>
<tr>
<td>other maintenance procedure</td>
<td></td>
</tr>
</tbody>
</table>

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:
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.

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.

Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

For further assistance, contact the personnel responsible for the next level of support.

You have completed this procedure.

Common fill paddle boards and associated LIM components

<table>
<thead>
<tr>
<th>PEC</th>
<th>Slot</th>
<th>Associated LIM and F-buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X74</td>
<td>07F</td>
<td></td>
</tr>
<tr>
<td>NT9X79</td>
<td>07R</td>
<td>LIM unit number: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate LIM unit number: 1</td>
</tr>
<tr>
<td>NTEX20</td>
<td>30R</td>
<td>F-bus number: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate F-bus number: 1</td>
</tr>
<tr>
<td>NT9X74</td>
<td>32F</td>
<td></td>
</tr>
<tr>
<td>NT9X79</td>
<td>32R</td>
<td>LIM unit number: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate LIM unit number: 0</td>
</tr>
<tr>
<td>NTEX20</td>
<td>08R</td>
<td>F-bus number: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate F-bus number: 0</td>
</tr>
</tbody>
</table>

Note: 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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX22</td>
<td>CA</td>
<td>Integrated processor and F-bus interface card</td>
<td>HLIU in an ELPP LIS</td>
</tr>
<tr>
<td>NTEX76</td>
<td>AA</td>
<td>High-speed signaling terminal card</td>
<td>HLIU in an ELPP LIS</td>
</tr>
<tr>
<td>NTEX78</td>
<td>AA</td>
<td>DS-1 interface paddle board</td>
<td>HLIU in an ELPP LIS</td>
</tr>
</tbody>
</table>

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

- Check card release compatibility
- Compatible? (Y/N)
  - Compatible? (Y): Deactivate any link for the HLIU
  - Compatible? (N): Obtain a compatible card
- Return F-bus taps to service
- Load and return the HLIU to service
- Reactivate any link for the HLIU

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
Replacing HLIU cards in an ELPP LIS

At your current location
1

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:

<table>
<thead>
<tr>
<th>PEC</th>
<th>BASELINE</th>
<th>EXCEPT</th>
<th>RELEASE</th>
<th>COMPATIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX22CA</td>
<td>01</td>
<td>None</td>
<td>2Z</td>
<td>YES</td>
</tr>
</tbody>
</table>

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).
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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>can obtain a compatible replacement card</td>
<td>step 2</td>
</tr>
<tr>
<td>cannot obtain a compatible replacement card</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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
    1     0     2     0     3     6
```

7 Post the HLIU that contains the card to be replaced by typing

```
>POST HLIU hliu_no
```

*where*

```
hliu_no
```

is the number of the HLIU (0 to 511)

*Example of a MAP display:*

```
PM  SysB  ManB  OffL  CBsy  ISTb  InSv
    1     0     2     0     3     6
HLIU 1     0     0     0     0     3
HLIU 208  InSv  Rsvd
```

8 Determine the state of the HLIU.

<table>
<thead>
<tr>
<th>If the state of the HLIU is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>SysB, SysB (NA), ISTb, or InSv</td>
<td>step 9</td>
</tr>
<tr>
<td>ManB or ManB (NA)</td>
<td>step 12</td>
</tr>
<tr>
<td>OffL</td>
<td>step 37</td>
</tr>
</tbody>
</table>

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.
Enhanced link peripheral processor card replacement procedures

HLIU cards in an ELPP LIS (continued)

10 Manually busy the HLIU by typing

```
>BSY FORCE
```

and pressing the Enter key.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>you need to confirm the com-</td>
<td>step 11</td>
</tr>
<tr>
<td>mand</td>
<td></td>
</tr>
<tr>
<td>the command passed</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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)

15 Access the LIS level of the MAP display by typing
   \texttt{>LIS \textit{lis\_no}}
   and pressing the Enter key.
   \textit{where}
   \textit{lis\_no} is the number of the LIS you recorded in step 13

   \textit{Example of a MAP display:}

   \begin{tabular}{cccccc}
   \hline
   LIS2 & Tap: & 0 & 4 & 8 \\
   FBus0: & InSv & .... & .... & .... \\
   FBus1: & ManB & BBBB & BBBB & BBBB \\
   \hline
   \end{tabular}

16 Manually busy the HLIU tap on F-bus 0 by typing
   \texttt{>BSY \textit{FBUS 0 \textit{tap\_no}}}
   and pressing the Enter key.
   \textit{where}
   \textit{tap\_no} is the number of the HLIU tap recorded in step 13

   \begin{tabular}{cccccc}
   \hline
   If & Do \\
   \hline
   you need to confirm the command & step 17 \\
   you do not need to confirm the command & step 18 \\
   \hline
   \end{tabular}

17 Confirm the command by typing
   \texttt{>YES}
   and pressing the Enter key.

   \textit{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
   \texttt{>BSY \textit{FBUS 1 \textit{tap\_no}}}
   and pressing the Enter key.
where

\[ \text{tap_no} \]

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.
LIM 2 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.

<table>
<thead>
<tr>
<th>If you are replacing an</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX76</td>
<td>step 21</td>
</tr>
<tr>
<td>NTEX22</td>
<td>step 23</td>
</tr>
<tr>
<td>NTEX78</td>
<td>step 26</td>
</tr>
</tbody>
</table>

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.a. Unseat the NTEX76 high-speed signaling terminal card.b. Unseat the NTEX22 link general processor card.c. 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.

<table>
<thead>
<tr>
<th>If you were</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed to this procedure from another maintenance procedure</td>
<td>step 28</td>
</tr>
<tr>
<td>not directed to this procedure from another maintenance procedure</td>
<td>step 29</td>
</tr>
</tbody>
</table>

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.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 30</td>
</tr>
</tbody>
</table>

297-9051-547 Standard 02.01 April 2000
### HLIU cards in an ELPP LIS (continued)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 38</td>
</tr>
</tbody>
</table>

30 Return the HLIU 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 HLIU 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.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 31</td>
</tr>
<tr>
<td>failed</td>
<td>step 38</td>
</tr>
</tbody>
</table>

31 Quit from the F-bus level of the MAP display by typing

```
>QUIT
```

and pressing the Enter key.

32 Post the HLIU you are working on by typing

```
>POST HLIU hliu_no
```

and pressing the Enter key.

*where*

```
hliu_no
```

is the number of the HLIU (0 to 511)

33 Load the HLIU by typing

```
>LOADPM
```

and pressing the Enter key.

*Example of a MAP response:*

```
HLIU 208 LOADPM Passed
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 35</td>
</tr>
<tr>
<td>failed</td>
<td>step 34</td>
</tr>
</tbody>
</table>
Load the PM using the procedure Loading a PM in this document. When you have completed the procedure, return to this point.

Return the HLIU to service by typing

>RTS

and pressing the Enter key.

Example of a MAP response:

HLIU 100 RTS Passed

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 36</td>
</tr>
<tr>
<td>failed</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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.

Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

For further assistance, contact the personnel responsible for the next level of support.

You have completed this procedure.
Enhanced link peripheral processor card replacement procedures

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX22</td>
<td>CA</td>
<td>Integrated processor and F-bus interface card</td>
<td>HSLR in an ELPP LIS</td>
</tr>
</tbody>
</table>

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.
Summary of Replacing HSLR cards in an ELPP LIS

This flowchart summarizes the procedure.

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

1. Check card release compatibility
   - Compatible? (Y/N)
     - Y: Deactivate any link for the HSLR
     - N: Obtain a compatible card

2. Manually busy the HSLR
   - Manually busy the F-bus taps for the HSLR
   - Change the card you are working on
   - Return F-bus taps to service
   - Load and return the HSLR to service
   - Reactivate any link for the HSLR
   - End
Replacing HSLR cards in an ELPP LIS

**At your current location**

1. 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:*

<table>
<thead>
<tr>
<th>PEC</th>
<th>BASELINE</th>
<th>EXCEPT</th>
<th>RELEASE</th>
<th>COMPATIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX22CA</td>
<td>01</td>
<td>None</td>
<td>2Z</td>
<td>YES</td>
</tr>
</tbody>
</table>

OK. Card release is above baseline.

<table>
<thead>
<tr>
<th>If the replacement card is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>below baseline</td>
<td>step 3</td>
</tr>
<tr>
<td>on or above baseline</td>
<td>step 6</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>can obtain a compatible card</td>
<td>step 2</td>
</tr>
<tr>
<td>cannot obtain a compatible</td>
<td>step 32</td>
</tr>
<tr>
<td>card</td>
<td></td>
</tr>
</tbody>
</table>

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
   HSLR  208  InSv  Rsvd

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:

   PM  SysB  ManB  OffL  CBsy  ISTb  InSv
   HSLR  208  InSv  Rsvd

8 Determine the state of the HSLR.

<table>
<thead>
<tr>
<th>If the state of the HSLR is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>SysB, SysB (NA), ISTb, or</td>
<td>step 9</td>
</tr>
<tr>
<td>InSv</td>
<td></td>
</tr>
<tr>
<td>ManB or ManB (NA)</td>
<td>step 12</td>
</tr>
<tr>
<td>OffL</td>
<td>step 31</td>
</tr>
</tbody>
</table>
Enhanced link peripheral processor card replacement procedures

### HSLR cards in an ELPP LIS (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 10   | Manually busy the HSLR by typing  
>BSY FORCE  
and pressing the Enter key. |
|      | **If**  
you need to confirm the command  
the command passed  
**Do**  
step 11  
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 |
Example of a MAP display:

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

LIM 2 ISTb

Example of a MAP display:

<table>
<thead>
<tr>
<th>LIS2</th>
<th>Tap:</th>
<th>0</th>
<th>4</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBus0:</td>
<td>InSv</td>
<td>....</td>
<td>....</td>
<td>....</td>
</tr>
<tr>
<td>FBus1:</td>
<td>ManB</td>
<td>BBBB</td>
<td>BBBB</td>
<td>BBBB</td>
</tr>
</tbody>
</table>

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:

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
and pressing the Enter key.

where

\[ \text{tap_no} \]

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

\[ > \text{YES} \]

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

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.

<table>
<thead>
<tr>
<th>If you were</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed to this procedure from another maintenance procedure</td>
<td>step 22</td>
</tr>
<tr>
<td>not directed to this procedure from another maintenance procedure</td>
<td>step 23</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 24</td>
</tr>
<tr>
<td>failed</td>
<td>step 32</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 25</td>
</tr>
<tr>
<td>failed</td>
<td>step 32</td>
</tr>
</tbody>
</table>

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.
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

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 29</td>
</tr>
<tr>
<td>failed</td>
<td>step 28</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 30</td>
</tr>
<tr>
<td>failed</td>
<td>step 32</td>
</tr>
</tbody>
</table>

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.
MLIU cards in an LPP LIS

Application

Use this procedure to replace the following cards in a multiple link interface unit (MLIU) in a link peripheral processor (LPP) 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”. The Index provides a list of the cards, shelves, and frames documented in this card replacement NTP.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX22</td>
<td>CA</td>
<td>Integrated processor and F-bus interface card</td>
<td>MLIU in an LPP LIS</td>
</tr>
<tr>
<td>NTEX26</td>
<td>BA</td>
<td>MLIU channel-bus interface card</td>
<td>MLIU in an LPP LIS</td>
</tr>
</tbody>
</table>

Common procedures

This procedure refers to the following common procedures:

- Verifying load compatibility of SuperNode cards
- Deactivating CCS7 links
- Unseating cards in equipment shelves
- Replacing a card
- Reseating cards in equipment shelves
- Loading a PM
- Activating CCS7 links

Do not go to the common procedure unless directed to 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.
MLIU cards
in an LPP LIS (continued)

Summary of replacing MLIU cards in an LPP LIS

1. Deactivate all links for the MLIU
2. Manually busy the MLIU
3. Manually busy the F-bus taps for the MLIU
4. Unseat and reseat other MLIU cards
5. Change the card you are working on
6. Return F-bus taps to service
7. Load and return the MLIU to service
8. Reactivate all links for the MLIU
9. End

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
MLIU cards
in an LPP LIS (continued)

Replacing MLIU cards in an LPP LIS

CAUTION
Loss of service
This procedure removes an MLIU from service and temporarily interrupts messaging on the associated CCS7 links. Perform this procedure only if necessary to return the MLIU to service. Otherwise, perform this procedure only during periods of low traffic.

At your current location
1. Get a replacement card. Make sure that the replacement card has the same PEC, including suffix, as the card being removed.

2. Make sure that the replacement card is compatible with the software load by using the procedure Verifying load compatibility of SuperNode cards in this document. Complete the procedure and return to this point.

At the MAP terminal
3. Access the PM level of the maintenance and administration position (MAP) display by typing

>`MAPCI;MTC;PM

Press the Enter key.

Example of a MAP display:

<table>
<thead>
<tr>
<th></th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

4. Post the MLIU that contains the card to replace by typing

>`POST  MLIU  liu_no

Press the Enter key.

Where

`liu_no`

is the number of the MLIU (0 to 511)

Example of a MAP display:

<table>
<thead>
<tr>
<th></th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>MLIU</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>MLIU</td>
<td>208</td>
<td>InSv</td>
<td>Rsvd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5 Determine the state of the MLIU.

<table>
<thead>
<tr>
<th>If the state of the MLIU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is SysB, SysB (NA), ISTb, or InSv</td>
<td>step 6</td>
</tr>
<tr>
<td>is ManB or ManB (NA)</td>
<td>step 19</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 36</td>
</tr>
</tbody>
</table>

6 Deactivate the CCS7 link (if there is one) associated with the MLIU using the procedure Deactivating CCS7 links in this document. Complete the procedure and return to this point.

7 Manually force bsy the MLIU by typing

```>BSY FORCE```

Press the Enter key.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>you need to confirm the command</td>
<td>step 10</td>
</tr>
<tr>
<td>the command passed</td>
<td>step 11</td>
</tr>
<tr>
<td>MAP response is</td>
<td>step 8</td>
</tr>
<tr>
<td>WARNING: MLIU 208 is currently being imaged. Do you wish to abort imaging to proceed with the BSY request? Please confirm (&quot;YES&quot;, &quot;Y&quot;, &quot;NO&quot;, or &quot;N&quot;):</td>
<td></td>
</tr>
</tbody>
</table>

8 Determine if it is safe to continue with this procedure.

<table>
<thead>
<tr>
<th>If it is safe</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>continue with BSY FORCE request</td>
<td>step 9</td>
</tr>
<tr>
<td>abort BSY FORCE request</td>
<td>step 38</td>
</tr>
</tbody>
</table>

9 Force bsy the MLIU by typing

```>YES```

Press the Enter key. Go to step 11.

*Example of a MAP response:*
MLIU cards
in an LPP LIS (continued)

10 Confirm the command by typing
>YES
Press the Enter key.

11 Display information about the MLIU by typing
>QUERYPM
Press the Enter key.
Example of a MAP response:

PM type: MLIU    PM No.: 208    Status: InSv
LIM: 2 Shelf: 2 Slot: 8    LIU FTA: 4247 1000
Default Load: MCA12AT
Running Load: MCA12AT
LMS States : ISTb    ISTb
Auditing : Yes    Yes
Msg Channels: Acc    Acc
TAP 8 : .    .
Reserved MLIU forms part of CCS7 Linkset: SSP208_LS SLC: 0
LIU is not allocated

12 Record the number of the link interface module (LIM) and the taps that are
associated with the MLIU you are working on.

Note: The LIM number follows the word LIM on the second line of the
display. In the preceding example, the LIM number is 0. The tap number
follows the word TAP on the line below Msg Channels. In the preceding
example, the TAP number is 8.

13 Post the LIM by typing
>POST LIM lim_no
Press the Enter key.
Where
lim_no
is the number of the LIM you recorded in step 12

Example of a MAP display:

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LIM 2 ISTb

Links_OOS Taps_OOS
Unit0: ISTb
Unit1: InSv

Imaging will be aborted on MLIU 208.
Enhanced link peripheral processor card replacement procedures

MLIU cards in an LPP LIS (continued)

14 Access the F-bus level of the MAP display by typing
   \texttt{>FBUS}
   Press the Enter key.

   \textit{Example of a MAP display:}

   \begin{verbatim}
   Tap:  0  4  8  12  16  20  24  28  32
   FBus0: InSv \ldots-\ldots---\ldots-\ldots-\ldots\
   FBus1: InSv \ldots-\ldots---\ldots-\ldots-\ldots\
   \end{verbatim}

15 Manually busy the MLIU tap on F-bus 0 by typing
   \texttt{>BSY FBUS 0 tap_no}
   Press the Enter key.

   \textit{Where}
   \begin{itemize}
   \item \texttt{tap_no} is the number of the MLIU tap recorded in step 12
   \end{itemize}

   \begin{tabular}{ll}
   If you & Do
   \hline
   need to confirm the command & step 16
   do not need to confirm the command & step 17
   \hline
   \end{tabular}

16 Confirm the command by typing
   \texttt{>YES}
   Press the Enter key.

   \textit{Example of a MAP response:}

   Confirmed ...
   IM 2 FBus 0 Tap 8 Busy initiated.
   LIM 2 FBus 0 Tap 8 Busy passed.

17 Manually busy the MLIU tap on F-bus 1 by typing
   \texttt{>BSY FBUS 1 tap_no}
   Press the Enter key.

   \textit{Where}
   \begin{itemize}
   \item \texttt{tap_no} is the number of the MLIU tap recorded in step 12
   \end{itemize}

   \textit{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: MLIU 208
   Do you wish to proceed with this operation?
   Please confirm ("YES", "Y", "NO", or "N"): 
MLIU cards
in an LPP LIS (continued)

18 Confirm the command by typing
   >YES
   Press the Enter key.

   Example of a MAP response:

   Confirmed ...
   LIM 2 FBus 1 Tap 8 Busy initiated.
   LIM 2 FBus 1 Tap 8 Busy passed.

At the shelf
19

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.

<table>
<thead>
<tr>
<th>If you are replacing an</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTEX76</td>
<td>step 20</td>
</tr>
<tr>
<td>NTEX22</td>
<td>step 22</td>
</tr>
<tr>
<td>any back plane card</td>
<td>step 25</td>
</tr>
</tbody>
</table>

20 To change an NTEX76 card, unseat and reseat cards in the MLIU 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.
   a Unseat the NTEX76 ST signaling terminal card.
   b Unseat the NTEX22 link general processor card.
   c Reseat the NTEX22 link general processor card.

21 Replace the NTEX76 card using the procedure Replacing a card in this document. Complete the procedure and return to this point.

   Note: If the card to replace has switches, make sure that the switches on the replacement card have the same settings.
   Go to step 26.

22 To change an NTEX22 card, unseat the NTEX76 STP signaling terminal card using the procedure Unseating cards in equipment shelves in this document. Complete the procedure and return to this point.
MLIU cards
in an LPP LIS (continued)

23 Replace the NTEX22 card using the procedure Replacing a card in this document. Complete the procedure, and return to this point.

   *Note:* If the card to replace has switches, make sure that the switches on the replacement card have the same settings.

24 Reseat the NTEX76 ST signaling terminal card using the procedure Reseating cards in equipment shelves in this document. Complete the procedure and return to this point.

   Go to step 26.

25 Replace the card using the procedure Replacing a card in this document. Complete the procedure and return to this point.

   *Note:* If the card to replace has switches, make sure that the switches on the replacement card have the same settings.

26 The next action depends on your reason for performing this procedure.

<table>
<thead>
<tr>
<th>If another maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 27</td>
</tr>
<tr>
<td>did not direct you to this proce-</td>
<td>step 28</td>
</tr>
<tr>
<td>dure</td>
<td></td>
</tr>
</tbody>
</table>

27 Return to the maintenance procedure that sent you to this procedure. Continue as directed.

**At the MAP terminal**

28 Return the MLIU tap on F-bus 0 to service by typing

```
>RTS FBUS 0 tap_no
```

Press the Enter key.

*Where*

- `tap_no` is the number of the MLIU tap you recorded in step 12

*Example of a MAP response:*

```
LIM 1 FBus 0 Tap 8 Return to Service passed- local maintenance not accessible.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 29</td>
</tr>
<tr>
<td>failed</td>
<td>step 37</td>
</tr>
</tbody>
</table>

29 Return the MLIU tap on F-bus 1 to service by typing

```
>RTS FBUS 1 tap_no
```

Press the Enter key.
Enhanced link peripheral processor card replacement procedures

MLIU cards
in an LPP LIS (continued)

Where

tap_no
is the number of the MLIU tap you recorded in step 12

Example of a MAP response:

LIM 1 FBus 1 Tap 8 Return to Service initiated.
LIM 1 FBus 1 Tap 8 Return to Service passed.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 30</td>
</tr>
<tr>
<td>failed</td>
<td>step 37</td>
</tr>
</tbody>
</table>

30 Quit from the F-bus level of the MAP display by typing

>QUIT
Press the Enter key.

31 Post the MLIU you are working on by typing

>POST MLIU liu_no
Press the Enter key.

Where

liu_no
is the number of the MLIU (0 to 511)

32 Load the MLIU by typing

>LOADPM
Press the Enter key.

Example of a MAP response:

MLIU 208 LOADPM Passed

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 34</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

33 Load the PM using the procedure Loading a PM in this document. Complete the procedure, and return to this point.

34 Return the MLIU to service by typing

>RTS
Press the Enter key.

Example of a MAP response:
MLIU cards
in an LPP LIS (end)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 35</td>
</tr>
<tr>
<td>failed</td>
<td>step 37</td>
</tr>
</tbody>
</table>

35 Activate the CCS7 link (if there is one) associated with the MLIU using the procedure Activating CCS7 links in this document. Complete the procedure and return to this point. Go to step 39.

36 Contact operating company personnel to determine why the component is offline. Continue as directed.

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

38 Abort the BSY FORCE request by typing

>NO

Press the Enter key. The BSY request is aborted. Node imaging continues.

39 The procedure is complete.
Enhanced link peripheral processor card replacement procedures

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffixes</th>
<th>Card name</th>
<th>Shelf/frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X13</td>
<td>DE</td>
<td>CPU 20-MHz card</td>
<td>LIM unit of an ELPP</td>
</tr>
</tbody>
</table>

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.
Summary of Replacing an NT9X13 in an ELPP LIM unit

1. Check card release compatibility
   - Compatible? [Y/N]
     - Y: Manually busy the F-buses
     - N: Obtain a compatible card

2. Power down the shelf side
3. Replace the card
4. Power up the shelf side
5. Load the LIM unit
6. Return the LIM unit to service
7. Return the F-buses to service
8. End

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.
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:

<table>
<thead>
<tr>
<th>PEC</th>
<th>BASELINE</th>
<th>EXCEPT</th>
<th>RELEASE</th>
<th>COMPATIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X13DE</td>
<td>01</td>
<td>None</td>
<td>2Z</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK. Card release is above baseline.

If the replacement card is

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>below baseline</td>
</tr>
<tr>
<td>on or above baseline</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>can obtain a compatible replacement card</td>
<td>step 2</td>
</tr>
<tr>
<td>cannot obtain a compatible replacement card</td>
<td>step 31</td>
</tr>
</tbody>
</table>

6 Access the PM level of the MAP display by typing
   \(>\text{MAPCI;}\text{MTC;}\text{PM}\)
   and pressing the Enter key.

   **Example of a MAP display:**

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

7 Post the LIM that contains the card to be replaced by typing
   \(>\text{POST LIM lim_no}\)
   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:**

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIM</th>
<th>InSv</th>
<th>OOS</th>
<th>OOS_Taps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>Links</td>
<td>LIS1</td>
</tr>
<tr>
<td>Unit0: InSv</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Unit1: InSv</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the state of the LIM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offl</td>
<td>step 30</td>
</tr>
<tr>
<td>any other in-service or out-of-service state</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the state of the mate LIM unit is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>InSv</td>
<td>step 10</td>
</tr>
<tr>
<td>ISTb, and the state of the LIM unit associated with the card you are replacing is InSv or ISTb</td>
<td>step 10</td>
</tr>
<tr>
<td>ISTb, and the LIM unit associated with the card you are replacing is out of service</td>
<td>step 10</td>
</tr>
<tr>
<td>any out-of-service state, and the state of the LIM unit associated with the card you are replacing is InSv or ISTb</td>
<td>step 28</td>
</tr>
<tr>
<td>any out-of-service state, and the LIM unit associated with the card you are replacing is out of service</td>
<td>step 10</td>
</tr>
</tbody>
</table>

*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:*
Enhanced link peripheral processor card replacement procedures

NT9X13
in an ELPP LIM unit (continued)

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

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.
and pressing the Enter key.

where

\textbf{fbus\_no}\n
is the number of the F-bus (0 or 1)

\textbf{Note:} Refer to the table at the end of this document to identify the LIM unit associated with the card you are replacing.

\textit{Example of a MAP display:}

<table>
<thead>
<tr>
<th></th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>ISTb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\begin{tabular}{llllll}
OOS & OOS\_Taps \\
Links & LIS1 & LIS2 & LIS3 \\
Unit0: ISTb & . & . & 12 & . \\
Unit1: InSv & . & . & . & . \\
LIS2 & Tap: & 0 & 4 & 8 & . \\
FBus0: ManB & BBBB & BBBB & BBBB & . \\
FBus1: InSv & .... & .... & .... & . \\
\end{tabular}

\begin{tabular}{ll}
If & Do \\
the command passes & step 12 for the next LIS \\
OR & step 14 (if step 12 has been repeated for each LIS) \\
you must confirm the command & step 13 \\
\end{tabular}

13 Confirm the command by typing

\texttt{>YES}

and pressing the Enter key.

\textit{Example of a MAP response:}

\texttt{LIM 0 LIS 2 FBus 0 Busy initiated.}  
\texttt{LIM 0 LIS 2 FBus 0 Busy passed.}

\begin{tabular}{ll}
If & Do \\
step 12 has been repeated for each LIS & step 14 \\
\end{tabular}
Enhanced link peripheral processor card replacement procedures

NT9X13
in an ELPP LIM unit (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 12 has not been repeated for each LIS</td>
<td>step 12 for the next LIS</td>
</tr>
</tbody>
</table>

14 Quit the LIS level of the MAP display by typing

>`QUIT`

and pressing the Enter key.

15 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 display:

```
<table>
<thead>
<tr>
<th>PM</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>28</td>
<td>0</td>
<td>17</td>
<td>13</td>
</tr>
</tbody>
</table>

LIM 0 ISTb
```

```
<table>
<thead>
<tr>
<th>OOSOOS_Taps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links</td>
</tr>
<tr>
<td>Unit0:</td>
</tr>
<tr>
<td>Unit1:</td>
</tr>
</tbody>
</table>

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
Enhanced link peripheral processor card replacement procedures

NT9X13 in an ELPP LIM unit (continued)

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.

17

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.

Replace the card using the procedure Replacing a card in this document. When you have completed the procedure, return to this point.

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.

The next action depends on your reason for performing this procedure.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>lit</td>
<td>step 19</td>
</tr>
<tr>
<td>not lit</td>
<td>step 17</td>
</tr>
</tbody>
</table>

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.

Replace the card using the procedure Replacing a card in this document. When you have completed the procedure, return to this point.

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.

If you were

sent to this procedure from another maintenance procedure

not sent to this procedure from another maintenance procedure

Do

step 22

step 23

22 Return to the maintenance procedure that sent you to this procedure and continue as directed.
Enhanced link peripheral processor card replacement procedures

NT9X13
in an ELPP LIM unit (continued)

At the MAP terminal

23 Load the LIM unit by typing
   \texttt{>LOADPM UNIT unit\_no}
   and pressing the Enter key. 
   \textit{where}
   \begin{itemize}
     \item \texttt{unit\_no}
       is the number of the LIM unit (0 or 1)
   \end{itemize}
   \textit{Example of a MAP response:}

   \begin{verbatim}
   LIM 0 UNIT 0 Load initiated.
   LIM 0 UNIT 0 Load passed.
   \end{verbatim}

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 25</td>
</tr>
<tr>
<td>failed</td>
<td>step 24</td>
</tr>
</tbody>
</table>

24 Load the PM using the procedure \textit{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
   \texttt{>RTS UNIT unit\_no}
   and pressing the Enter key. 
   \textit{where}
   \begin{itemize}
     \item \texttt{unit\_no}
       is the number of the LIM unit (0 or 1)
   \end{itemize}
   \textit{Example of a MAP response:}

   \begin{verbatim}
   LIM 0 UNIT 0 Return to Service initiated.
   LIM 0 UNIT 0 Return to Service passed.
   \end{verbatim}

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 26</td>
</tr>
<tr>
<td>failed</td>
<td>step 31</td>
</tr>
</tbody>
</table>

\textbf{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
   \texttt{>LIS lis\_no}
   and pressing the Enter key. 
   \textit{where
**Enhanced link peripheral processor card replacement procedures**

**NT9X13 in an ELPP LIM unit** (continued)

- **lis_no**  
  is the number of the LIS (0, 1, or 2)

  **Example of a MAP display:**

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

  LIS 0 ISTb  
  OOS OOS_Taps  
  Links LIS1 LIS2 LIS3
  Unit0: ISTb  
  . . . .  
  Unit1: InSv  
  . . . .  
  LIS2  Tap:  
  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 0 Return to Service passed.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 26 for the next LIS OR step 32 (if step 26 has been repeated for each LIS)</td>
</tr>
<tr>
<td>failed</td>
<td>step 31</td>
</tr>
</tbody>
</table>

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.
Enhanced link peripheral processor card replacement procedures

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

<table>
<thead>
<tr>
<th>PEC</th>
<th>Slot</th>
<th>Associated LIM hardware and F-buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X13 17F</td>
<td>LIM unit number: 0</td>
<td>Mate LIM unit number: 1</td>
</tr>
<tr>
<td></td>
<td>F-bus number: 0</td>
<td>Mate F-bus number: 1</td>
</tr>
<tr>
<td></td>
<td>Location of NT9X30 (+5 V) power converter: slot 04F</td>
<td></td>
</tr>
<tr>
<td>NT9X13 22F</td>
<td>LIM unit number: 1</td>
<td>Mate LIM unit number: 0</td>
</tr>
<tr>
<td></td>
<td>F-bus number: 1</td>
<td>Mate F-bus number: 0</td>
</tr>
<tr>
<td></td>
<td>Location of NT9X30 (+5 V) power converter: slot 36F</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* 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

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X15</td>
<td>AA</td>
<td>Mapper card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X17</td>
<td>AD</td>
<td>Message switch four-port card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X26</td>
<td>AA, BA, CA</td>
<td>Remote terminal interface paddle board</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X30</td>
<td>AA</td>
<td>+5V 86-A power converter card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X30</td>
<td>AB</td>
<td>Global +5V 86-A power converter card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X31</td>
<td>AB</td>
<td>-5V power converter card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X49</td>
<td>CA</td>
<td>Message switch P-bus terminator card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X52</td>
<td>AA</td>
<td>Message switch T-bus access card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X53</td>
<td>AD</td>
<td>Message switch system clock card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X62</td>
<td>BB</td>
<td>Four-port sub-rate DS512 paddleboard</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X73</td>
<td>BB</td>
<td>LMS F-bus rate adapter card</td>
<td>LIM unit of an ELPP</td>
</tr>
<tr>
<td>NT9X79</td>
<td>BB</td>
<td>F-bus termination paddle board</td>
<td>LIM unit of an ELPP</td>
</tr>
</tbody>
</table>
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 busying 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**

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

---

Check card release compatibility

Compatible? Y

Check that mate LIM, F-buses, and taps are InSv

Obtain a compatible card

N

Manually busy all F-buses for LIM unit

Replacing LMS port cards?

Y

Manually busy SR128 links on the MS

N

Manually busy the LIM unit

Power down the LIM unit

Replace the card

Power up the LIM unit

Replacing LMS port cards?

Y

Return SR128 links to service

N

End

---
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:

<table>
<thead>
<tr>
<th>PEC</th>
<th>BASELINE</th>
<th>EXCEPTION</th>
<th>RELEASE</th>
<th>COMPATIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X15AA</td>
<td>40</td>
<td>None</td>
<td>2Z</td>
<td>*NO</td>
</tr>
</tbody>
</table>

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
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.

### Table

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>can obtain a compatible replacement card</td>
<td>step 2</td>
</tr>
<tr>
<td>cannot obtain a compatible replacement card</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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 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
   ```

   Links

   Links

   Unit0: InSv . . .

   Unit1: InSv . . .
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.

<table>
<thead>
<tr>
<th>If the state of the LIM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offl</td>
<td>step 39</td>
</tr>
<tr>
<td>any other in-service or out-of-service state</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the state of the mate LIM unit is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>InSv</td>
<td>step 10</td>
</tr>
<tr>
<td>ISTb, and the state of the LIM unit associated with the</td>
<td>step 10</td>
</tr>
<tr>
<td>card you are replacing is InSv or ISTb</td>
<td></td>
</tr>
<tr>
<td>ISTb, and the LIM unit associated with the card you</td>
<td>step 10</td>
</tr>
<tr>
<td>are replacing is out of service</td>
<td></td>
</tr>
<tr>
<td>any out-of-service state, and the state of the LIM unit</td>
<td>step 37</td>
</tr>
<tr>
<td>associated with the card you are replacing is InSv or ISTb</td>
<td></td>
</tr>
<tr>
<td>any out-of-service state, and the LIM unit associated</td>
<td>step 10</td>
</tr>
<tr>
<td>with the card you are replacing is out of service</td>
<td></td>
</tr>
</tbody>
</table>

*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

>\textbf{LIS lis_no}

and pressing the Enter key.

*where*

\textbf{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)

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.

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>OOS</th>
<th>OOS_Taps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links</td>
<td>LIS1</td>
</tr>
</tbody>
</table>

**Unit0:** InSv

**Unit1:** InSv

**LIS2**

**FBus0:** InSv

**FBus1:** InSv

**Step 12 must be repeated for each LIS on the LIM unit.**

**CAUTION**

**If the states are**

<table>
<thead>
<tr>
<th>InSv</th>
<th>FBus taps</th>
</tr>
</thead>
<tbody>
<tr>
<td>InSv</td>
<td>[dot]</td>
</tr>
</tbody>
</table>

**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 38
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"): 
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the command passes</td>
<td>step 12 for the next LIS OR-step 14 (if step 12 has been repeated for each LIS)</td>
</tr>
<tr>
<td>you must confirm the command</td>
<td>step 13</td>
</tr>
</tbody>
</table>

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.
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 12 has been repeated for each LIS</td>
<td>step 14</td>
</tr>
<tr>
<td>step 12 has NOT been repeated for each LIS</td>
<td>step 12 for the next LIS</td>
</tr>
</tbody>
</table>

14 Quit the LIS level of the MAP display by typing

>`QUIT`

and pressing the Enter key.
The next step depends on the card you are replacing:

<table>
<thead>
<tr>
<th>If you are replacing</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>an NT9X17 or an NT9X62 (MS port cards)</td>
<td>step 16</td>
</tr>
<tr>
<td>any other card</td>
<td>step 17</td>
</tr>
</tbody>
</table>

Manually busy the LIM unit corresponding to the card to be replaced, by typing:

```plaintext
>BSY UNIT unit_no
```

where

- `unit_no` is the number of the LIM unit (0 or 1)

Example of a MAP response:

```plaintext
bsy unit 0
LIM 0 UNIT 0 Busy initiated.
LIM 0 UNIT 0 Busy passed.
```
Enhanced link peripheral processor card replacement procedures

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>lit</td>
<td>step 21</td>
</tr>
<tr>
<td>not lit</td>
<td>step 19</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the NT9X13 is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>seated</td>
<td>step 24</td>
</tr>
<tr>
<td>unseated</td>
<td>step 23</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you were</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>sent to this procedure from another maintenance procedure</td>
<td>step 26</td>
</tr>
<tr>
<td>not sent to this procedure from another maintenance procedure</td>
<td>step 27</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you are replacing</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>an NT9X17 or an NT9X62 (LMS port cards)</td>
<td>step 28</td>
</tr>
<tr>
<td>any other card</td>
<td>step 29</td>
</tr>
</tbody>
</table>

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
Enhanced link peripheral processor card replacement procedures

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.

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 31</td>
</tr>
<tr>
<td>failed</td>
<td>step 30</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 32</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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)

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 Return to Service initiated.
LIM 0 UNIT 0 Return to Service passed.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 33</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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:

LIM 0 UNIT 0 Test initiated.
LIM 0 UNIT 0 Test passed.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 34</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>
System and power cards
in an ELPP LIM unit (continued)

To 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 1 2 FBus 0 Return to Service passed.
```

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LIM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIM</th>
<th>ISTb</th>
<th>00S</th>
<th>00S_Taps</th>
<th>Links</th>
<th>LIS1</th>
<th>LIS2</th>
<th>LIS3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit0: ISTb</td>
<td>.</td>
<td>.</td>
<td>12</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>Unit1: InSv</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIS2</th>
<th>Tap:</th>
<th>FBus0:</th>
<th>FBus1:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>ManB</td>
<td>InSv</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>BBBB</td>
<td>BBBB</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>BBBB</td>
<td>BBBB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FBus0:</th>
<th>FBus1:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManB</td>
<td>InSv</td>
</tr>
<tr>
<td>BBBB</td>
<td>BBBB</td>
</tr>
<tr>
<td>BBBB</td>
<td>BBBB</td>
</tr>
</tbody>
</table>

35. Return the F-bus to service by typing

```
>RTS  FBUS  fbus_no
```

*DO*

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 1 2 FBus 0 Return to Service passed.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 36 for the next LIS OR step 41 (if step 36 has been repeated for each LIS)</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

36. Perform an InSv test on the F-bus for each LIS by typing

```
>TST  FBUS  fbus_no
```

*DO*

and pressing the Enter key.

*where*

- **fbus_no** is the number of the F-bus (0 or 1)

*Example of a MAP response:*

```
LIM 0 LIS 2 FBus 0 Return to Service initiated. LIM 0 1 2 FBus 0 Return to Service passed.
```
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.

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.

Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

For further assistance, contact the personnel responsible for the next level of support.

You have completed this procedure.

System cards and associated LIM hardware (Sheet 1 of 3)

<table>
<thead>
<tr>
<th>PEC</th>
<th>Slot</th>
<th>Associated LIM hardware and F-buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X15</td>
<td>15F</td>
<td>LIM unit number</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate LIM unit number: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>NT9X26</td>
<td>17R</td>
<td>F-bus number:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate F-bus number: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>NT9X30</td>
<td>04F</td>
<td>F-bus number:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mate F-bus number: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>NT9X31</td>
<td>01F</td>
<td></td>
</tr>
</tbody>
</table>

Note: 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.
<table>
<thead>
<tr>
<th>PEC</th>
<th>Slot</th>
<th>Associated LIM hardware and F-buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X49</td>
<td>07F</td>
<td>Location of NT9X13 slot 17F</td>
</tr>
<tr>
<td>NT9X52</td>
<td>19F</td>
<td>Location of NT9X30 power converter slot 04F</td>
</tr>
<tr>
<td>NT9X53</td>
<td>18F</td>
<td>Location of NT9X30 power converter slot 04F</td>
</tr>
<tr>
<td>NT9X73</td>
<td>13F-LIS1 12F-LIS2 11F-LIS3</td>
<td>Location of NT9X31 power converter slot 01F</td>
</tr>
<tr>
<td>NT9X79</td>
<td>13R-LIS 112R-LIS 211R-LIS3</td>
<td>Location of NT9X31 power converter slot 01F</td>
</tr>
<tr>
<td>NT9X17</td>
<td>10F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9F</td>
<td></td>
</tr>
<tr>
<td>NT9X62</td>
<td>10R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9R</td>
<td></td>
</tr>
<tr>
<td>NT9X15</td>
<td>24F</td>
<td>LIM unit number: 1 Mate LIM unit number: 0</td>
</tr>
<tr>
<td>NT9X26</td>
<td>22R</td>
<td>F-bus number: 1 Mate F-bus number: 0</td>
</tr>
<tr>
<td>NT9X30</td>
<td>36F</td>
<td>F-bus number: 1 Mate F-bus number: 0</td>
</tr>
<tr>
<td>NT9X31</td>
<td>33F</td>
<td></td>
</tr>
<tr>
<td>NT9X49</td>
<td>32F</td>
<td>Location of NT9X13 slot 22F</td>
</tr>
<tr>
<td>NT9X52</td>
<td>20F</td>
<td>Location of NT9X30 power converter slot 36F</td>
</tr>
<tr>
<td>NT9X53</td>
<td>21F</td>
<td>Location of NT9X30 power converter slot 36F</td>
</tr>
</tbody>
</table>

**Note:** 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)

<table>
<thead>
<tr>
<th>PEC</th>
<th>Slot</th>
<th>Associated LIM hardware and F-buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X73</td>
<td>26F-LIS1</td>
<td>Location of NT9X31 power converter  slot 38F</td>
</tr>
<tr>
<td></td>
<td>27F-LIS2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28F-LIS3</td>
<td></td>
</tr>
<tr>
<td>NT9X79</td>
<td>26R-LIS1</td>
<td>Location of NT9X31 power converter  slot 38F</td>
</tr>
<tr>
<td></td>
<td>127R-LI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S228R-L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS3</td>
<td></td>
</tr>
<tr>
<td>NT9X17</td>
<td>29F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30F</td>
<td></td>
</tr>
<tr>
<td>NT9X62</td>
<td>29R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30R</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** 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.
5 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
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
Figure SuperNode SE 32k ENET cabinet

- FSP
- ENET shelf Plane 0 Shelf 0
- Filler faceplates
- ENET shelf Plane 1 Shelf 1
- Filler faceplates
- Cooling unit
**SuperNode SE ENET shelf designs** (continued)

Figure SuperNode SE ENI shelf with 16k ENET

<table>
<thead>
<tr>
<th>Paddle boards</th>
<th>Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>32R</td>
<td>NT9X30 +5V power converter card</td>
</tr>
<tr>
<td>31R</td>
<td>NT9X31 –5V power converter card</td>
</tr>
<tr>
<td>30R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>29R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>28R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>27R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>26R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>25R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>24R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>23R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>22R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>21R</td>
<td>NT9X36 ENET message clock card</td>
</tr>
<tr>
<td>20R</td>
<td>NT9X13 Processor card</td>
</tr>
<tr>
<td>19R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>18R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>17R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>16R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>15R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>14R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>13R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>12R</td>
<td>NT9X35 Crosspoint card</td>
</tr>
<tr>
<td>11R</td>
<td>NT9X36 ENET message clock card</td>
</tr>
<tr>
<td>10R</td>
<td>NT9X13 DMS SuperNode processor card</td>
</tr>
<tr>
<td>09R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>08R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>07R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>06R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>05R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>04R</td>
<td>NT9X30 +5V power converter card</td>
</tr>
<tr>
<td>03R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
<tr>
<td>02R</td>
<td>NT9X31 –5V power converter card</td>
</tr>
<tr>
<td>01R</td>
<td>NT9X19 Filler faceplate</td>
</tr>
</tbody>
</table>

**Note:** nn* denotes one of NT9X40 fiber interface PB, NT9X41 DS30 PB, or NT9X45 combined DS30/DS512 PB
SuperNode SE ENET shelf designs

Figure Shelf for SuperNode SE 32k ENET

<table>
<thead>
<tr>
<th>Paddle boards</th>
<th>Cards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32R</td>
<td>NT9X40/41/45 PM I/F PB NT9X30 Power converter card</td>
<td>36F</td>
</tr>
<tr>
<td>31R</td>
<td>NT9X40/41/45 PM I/F PB NT9X31 Power converter card</td>
<td>33F</td>
</tr>
<tr>
<td>30R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 H-bus terminating crosspoint card</td>
<td>32F</td>
</tr>
<tr>
<td>29R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 H-bus terminating crosspoint card</td>
<td>31F</td>
</tr>
<tr>
<td>28R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>30F</td>
</tr>
<tr>
<td>27R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>29F</td>
</tr>
<tr>
<td>26R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>28F</td>
</tr>
<tr>
<td>25R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>27F</td>
</tr>
<tr>
<td>24R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>24F</td>
</tr>
<tr>
<td>23R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>23F</td>
</tr>
<tr>
<td>22R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>22F</td>
</tr>
<tr>
<td>21R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>21F</td>
</tr>
<tr>
<td>20R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>20F</td>
</tr>
<tr>
<td>19R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>19F</td>
</tr>
<tr>
<td>18R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>18F</td>
</tr>
<tr>
<td>17R</td>
<td>NT9X19 Filler faceplate NT9X19 Filler faceplate</td>
<td>17F</td>
</tr>
<tr>
<td>16R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>16F</td>
</tr>
<tr>
<td>15R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>15F</td>
</tr>
<tr>
<td>14R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>14F</td>
</tr>
<tr>
<td>13R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>13F</td>
</tr>
<tr>
<td>12R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>12F</td>
</tr>
<tr>
<td>11R</td>
<td>NT9X40/41/45 PM I/F PB NT9X35 16K x 16K crosspoint card</td>
<td>11F</td>
</tr>
<tr>
<td>10R</td>
<td>NT9X19 Filler faceplate NT9X35 H-bus terminating crosspoint card</td>
<td>10F</td>
</tr>
<tr>
<td>09R</td>
<td>NT9X40 QUAD fibre MS I/F PB NT9X35 H-bus terminating crosspoint card</td>
<td>09F</td>
</tr>
<tr>
<td>08R</td>
<td>NT9X40 QUAD fibre MS I/F PB NT9X36 Clock and message card</td>
<td>08F</td>
</tr>
<tr>
<td>07R</td>
<td>NT9X26 RTIF PB NT9X30 Power converter card</td>
<td>07F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>04F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01F</td>
</tr>
</tbody>
</table>
Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) 16k enhanced network (ENET).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X35</td>
<td>FA</td>
<td>DMS SuperNode processor card</td>
<td>Enhanced network and interface (ENI)</td>
</tr>
<tr>
<td>NT9X40</td>
<td>BA++, BA, DA</td>
<td>ENET + quad fiber paddle board</td>
<td>ENI, slots 13 to 19 and 23 to 29</td>
</tr>
<tr>
<td>NT9X41</td>
<td>BA</td>
<td>16-port DS30 paddle board</td>
<td>ENI</td>
</tr>
<tr>
<td>NT9X45</td>
<td>BA</td>
<td>Three-DS512 link and 16-DS30 port paddle board</td>
<td>ENI</td>
</tr>
</tbody>
</table>

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.
Summary of Replacing Crosspoint and interface cards in a SuperNode SE 16k ENET

This flowchart summarizes the procedure.

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

1. Determine if the affected ENET plane is SysB
   - Affected ENET plane SysB?
     - Y
       - Clear SysB state
     - N
       - Set deload for the ENET plane
2. Wait 30 min for traffic to clear
3. Manually busy and offline the card
4. Replace the card
5. Test the card
6. Return the card to service
7. Return the ENET plane to service
8. Clear the deload for the ENET plane
9. End
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.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X40 in slots 11 or 21</td>
<td>step 2</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 3</td>
</tr>
</tbody>
</table>

2 To replace the card, perform the procedure System cards in a SuperNode SE 16k ENET in this chapter.

3 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.

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.

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)

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.

<table>
<thead>
<tr>
<th>If the state of the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is T (being tested)</td>
<td>step 7</td>
</tr>
<tr>
<td>is S (system busy)</td>
<td>step 8</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 10</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>any system cards or power converters require replacement</td>
<td>step 9</td>
</tr>
<tr>
<td>system cards or power converters do not require replacement</td>
<td>step 65</td>
</tr>
</tbody>
</table>

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.

11 Plane:0 Shelf:00 .Y.---- ---

Note: The letter Y under the slot number indicates a deloaded crosspoint card.

<table>
<thead>
<tr>
<th>If the other ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has deloaded cards</td>
<td>step 64</td>
</tr>
<tr>
<td>does not have deloaded cards</td>
<td>step 11</td>
</tr>
</tbody>
</table>

12 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.

13 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.

14 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.
The next action depends on the state of the ENET plane.

<table>
<thead>
<tr>
<th>If the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is O (offline)</td>
<td>step 20</td>
</tr>
<tr>
<td>is M (manual busy)</td>
<td>step 18</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 16</td>
</tr>
</tbody>
</table>

To manually busy the ENET plane, type

```bash
> 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.

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>requests confirmation</td>
<td>step 17</td>
</tr>
<tr>
<td>indicates the BSY command passed</td>
<td>step 18</td>
</tr>
</tbody>
</table>

To confirm the command, type

```bash
> YES
```

and press the Enter key.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 18</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

To offline the ENET plane, type

```bash
> 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.

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 26</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Message Switch</th>
<th>Clock</th>
<th>Shelf 0</th>
<th>Inter-MS Link 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 0</td>
<td>Slave</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>MS 1</td>
<td>M Free</td>
<td>.</td>
<td></td>
</tr>
</tbody>
</table>

| 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           | . . . .| - - - - - - - - - - - - - |
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

<table>
<thead>
<tr>
<th>passed</th>
<th>step 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>passed</th>
<th>step 26</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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)

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:

<table>
<thead>
<tr>
<th>CARD</th>
<th>Plane</th>
<th>Front:</th>
<th>Back:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xpt</td>
<td>NIL</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td>.</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>.</td>
<td>-</td>
</tr>
</tbody>
</table>

To confirm the command, type

> YES

and press the Enter key.

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT9X35</td>
<td>step 31</td>
</tr>
<tr>
<td>replace an NT9X41</td>
<td>step 32</td>
</tr>
<tr>
<td>replace an NT9X40 or NT9X45</td>
<td>step 35</td>
</tr>
</tbody>
</table>

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.
To replace the card, perform the procedure *Replacing a card* in this NTP. Complete the procedure and return to this point.

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:

<table>
<thead>
<tr>
<th>ENCO</th>
<th>00</th>
<th>39</th>
</tr>
</thead>
<tbody>
<tr>
<td>10R</td>
<td>04</td>
<td>17T</td>
</tr>
<tr>
<td>LTE</td>
<td>000</td>
<td>18</td>
</tr>
<tr>
<td>22R</td>
<td>RX</td>
<td></td>
</tr>
</tbody>
</table>

Label field descriptions
Crosspoint and interface cards
in a SuperNode SE 16k ENET (continued)

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.

---

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.).
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.

![Diagram of connector turning counterclockwise.]

Note: Perform the procedure, Cleaning fiber optic components and assemblies in this NTP.

38  The next action depends on the card that you replace.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT9X45</td>
<td>step 39</td>
</tr>
<tr>
<td>replace an NT9X40</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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.
42 The next action depends on the card you replace.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT9X45</td>
<td>step 43</td>
</tr>
<tr>
<td>replace an NT9X40</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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:*
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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 46</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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
```

*where*

- `plane_no` is the number of the ENET plane (0 or 1) that contains the card

<table>
<thead>
<tr>
<th>If the response Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>requests confirmation step 49</td>
</tr>
<tr>
<td>indicates the BSY command passed</td>
</tr>
</tbody>
</table>

49  To confirm the command, type

```
>YES
```
and press the Enter key.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 50</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

50 To return the ENET plane to service, type

```plaintext
>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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 51</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

51 To access the SHELF level of the MAP display, type

```plaintext
>SHELF
```

and press the Enter key.

52 To manually busy all cards on the ENET shelf, type

```plaintext
>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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 53</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

53 To return the card to service, type

```plaintext
>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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 56</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>recorded a card list</td>
<td>step 59</td>
</tr>
<tr>
<td>did not record a card list</td>
<td>step 62</td>
</tr>
</tbody>
</table>

59 To access the SHELF level of the MAP display, type
   >SHELF 0
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)

<table>
<thead>
<tr>
<th>If all cards on the list</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are not set to deloaded status</td>
<td>step 61</td>
</tr>
<tr>
<td>are set to deloaded status</td>
<td>step 62</td>
</tr>
</tbody>
</table>

61 Repeat step 60 for the next card on the list.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 63</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 67</td>
</tr>
</tbody>
</table>

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

The figure correlates the zone numbers (1 to 8) to the link numbers. The zone numbers appear on the face of the card. The link numbers appear on the MAP display for the NT9X40BA or NT9X40BB interface card. Note that the diagram indicates fiber connections only. Observe carefully the zone identification marks for transmit and receive.
The figure correlates the zone numbers (1 to 12) to the link numbers. The zone numbers appear on the face of the card. The link numbers appear on the MAP display for the NT9X45BA interface card. Note that the diagram indicates fiber connections only. Observe carefully the zone identification marks for transmit and receive.
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X35</td>
<td>BA, CA</td>
<td>128K ENET crosspoint card</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X40</td>
<td>BA, BB, DA</td>
<td>ENET quad fiber interface paddle board</td>
<td>32k ENET, slots 10 to 16 and 25 to 32</td>
</tr>
<tr>
<td>NT9X41</td>
<td>BA</td>
<td>International 16-port DS-30 paddle board</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X45</td>
<td>BA</td>
<td>Three DS-512 link and 16 DS-30 port paddle board</td>
<td>32k ENET</td>
</tr>
</tbody>
</table>

*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

This flowchart summarizes the procedure.

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

Set deload for the plane and shelf

Wait 30 min for traffic to clear

Manually-busy the MS chain head cards

Manually-busy and offline the plane and shelf

Replace the card

Return the MS chain head cards to service

Manually-busy the plane and shelf

Return the plane and shelf to service

Clear deload for the plane and shelf

End
Replacing Crosspoint and interface cards in a SuperNode SE 32k ENET (continued)

At your current location

1. Determine the type and location of the removed card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X40 card in slot 8</td>
<td>step 2</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 3</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the state of the plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is T, tested</td>
<td>step 7</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 8</td>
</tr>
</tbody>
</table>

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.---- -------- ----....

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 57

does not have deloaded cards step 9

Note: The letter Y under the slot number indicates a deloaded crosspoint card.
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.

<table>
<thead>
<tr>
<th>If the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is O, offline</td>
<td>step 25</td>
</tr>
<tr>
<td>is M, manually-busy</td>
<td>step 15</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 14</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 15</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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)

where

plane_no

is the ENET plane number (0 or 1)

Example of a MAP response:

Request to OFFL ENET Plane:0 Shelf:00 submitted.
Request to OFFL ENET Plane:0 Shelf:00 passed.

If the OFFL command

Do

passes

step 25

fails

step 58

16 To locate the message switch (MS) chain head card associated with the current 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 is 16. 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:

<table>
<thead>
<tr>
<th>Message Switch</th>
<th>Clock</th>
<th>Shelf</th>
<th>Inter-MS Link</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 0</td>
<td>M</td>
<td>Slave</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS 1</td>
<td>.</td>
<td>M Free</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Shelf 0 | 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 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 |
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 21</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 22</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>
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 O O O CCCCCCCC -------- CCCCCCCC O O
   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.
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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>remove an NT9X35</td>
<td>step 26</td>
</tr>
<tr>
<td>remove an NT9X41</td>
<td>step 27</td>
</tr>
<tr>
<td>remove an NT9X40 or</td>
<td>step c</td>
</tr>
<tr>
<td>NT9X45</td>
<td></td>
</tr>
</tbody>
</table>

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.
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 numbers” 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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT9X45</td>
<td>step 33</td>
</tr>
<tr>
<td>replace an NT9X40</td>
<td>step 34</td>
</tr>
</tbody>
</table>

### 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.

![Connector Position](image)

36 The next action depends on the removed card.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>remove an NT9X45 card</td>
<td>step 37</td>
</tr>
<tr>
<td>remove an NT9X40 card</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 40</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 41</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 43</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 44</td>
</tr>
<tr>
<td>fails</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 49</td>
</tr>
<tr>
<td>fails</td>
<td>step 47</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>cards are listed</td>
<td>step 52</td>
</tr>
<tr>
<td>cards are not listed</td>
<td>step 55</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>If all the cards on the list</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are not set to the deloaded state</td>
<td>step 54</td>
</tr>
<tr>
<td>are set to the deloaded state</td>
<td>step 55</td>
</tr>
</tbody>
</table>

54 Repeat step 53 for the next card on the list.
The next action depends on the reason for this procedure.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a maintenance procedure directed you to this procedure</td>
<td>step 56</td>
</tr>
<tr>
<td>you were not directed to this procedure from a maintenance procedure</td>
<td>step 59</td>
</tr>
</tbody>
</table>

Return to the maintenance procedure and continue as directed.

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.

For additional help, contact the personnel responsible for the next level of support.

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.
The figure correlates the zone numbers from 1 to 12, that appear on the face of the card to the link numbers that appear on the MAP display for the NT9X45BA 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 

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).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X30</td>
<td>AA, AB</td>
<td>+ 5V 86-A power converter card</td>
<td>Enhanced network and interface (ENI)</td>
</tr>
<tr>
<td>NT9X31</td>
<td>AA, AB</td>
<td>- 5V 20-A power converter card</td>
<td>ENI</td>
</tr>
</tbody>
</table>

*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

Set deload for ENET node

Wait 30 min for traffic to clear

Manually busy and offline ENET plane

Deactivate associated CCS7 links

Manually busy associated LIU7

Manually busy associated F-bus and taps

Power down shelf side

Replace card

Power up shelf side

Return F-bus and taps to service

Load ENET node

Return the ENET node to service

Clear deload for ENET node

Load LIU7

Return LIU7 to service

End

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.
Replacing Power converter cards in a SuperNode SE 16k ENET

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 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.

<table>
<thead>
<tr>
<th>If the state of the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is T (being tested)</td>
<td>step 5</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 6</td>
</tr>
</tbody>
</table>

5 Wait for the system to complete system-initiated testing. Go to step 4 to evaluate the state of the ENET plane.

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.
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

_English 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.

<table>
<thead>
<tr>
<th>If the other ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has deloaded cards</td>
<td>step 87</td>
</tr>
<tr>
<td>does not have deloaded cards</td>
<td>step 7</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has deloaded cards</td>
<td>step 8</td>
</tr>
<tr>
<td>does not have deloaded cards</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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 O (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:*

```
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.

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 16</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

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:*

```
WARNING: A power down of ENET plane:1 shelf:00 may affect LIU components.
Please confirm ("YES", "Y", "NO", or "N"):```
Power converter cards  
in a SuperNode SE 16k ENET (continued)

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  Card: 0  1  2  3  4  5  6  7  8  9  0  1  2  3
  Chain   MS 0  .  .  .  .  .  .  .  .  .  .  .  .  .  .
          MS 1  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  Message Switch Clock Shelf 0 Inter-MS Link 0 1
  MS 0    .  Slave    .     .     .
  MS 1    .  M Free   .     .     .
```

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:*

```
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.

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: 0  1  2  3  4  5  6  7  8  9  0  1  2  3
  Chain   MS 0  .  .  .  .  .  .  .  .  .  .  .  .  .  .
          MS 1  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  Message Switch Clock Shelf 0 Inter-MS Link 0 1
  MS 0    .  Slave    .     .     .
  MS 1    .  M Free   .     .     .
```
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 21</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

21 To manually busy the link on the chain on MS 1, type
   \texttt{>BSY 1 LINK link\_no}
and press the Enter key.

   \textit{where}

\begin{itemize}
  \item \texttt{link\_no} is the link number that you recorded in step 17
\end{itemize}

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 22</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

22 To access the ENET SHELF level of the MAP display, type
   \texttt{>NET; SHELF}
and press the Enter key.

\textit{Example of a MAP display:}

\begin{verbatim}
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
   \texttt{>BSY plane\_no ALL}
and press the Enter key.

\textit{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).

<table>
<thead>
<tr>
<th>If the ENET shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has LIU7</td>
<td>step 27</td>
</tr>
<tr>
<td>does not have LIU7</td>
<td>step 33</td>
</tr>
</tbody>
</table>

27 To access the PM level of the MAP display, type
>MAPCI;MTC;PM
and press the Enter key.
Example of a MAP display:

<table>
<thead>
<tr>
<th></th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBSy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>4</td>
<td>16</td>
<td>38</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th></th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>LIU7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

LIU7   208 InSv       Rsvd

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.

<table>
<thead>
<tr>
<th>If the state of the LIU7</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is SysB, SysB (NA), ISTb, InSv</td>
<td>step 31</td>
</tr>
<tr>
<td>or InSv</td>
<td></td>
</tr>
<tr>
<td>is ManB or ManB (NA)</td>
<td>step 33</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 88</td>
</tr>
<tr>
<td>Rsvd</td>
<td>step 90</td>
</tr>
</tbody>
</table>

31

To manually busy the LIU7, type

>BSY FORCE

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:

<table>
<thead>
<tr>
<th></th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>LIU7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

LIU7   208 InSv       Rsvd

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.

DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up
Power converter cards
in a SuperNode SE 16k ENET (continued)

and press the Enter key.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the MAP display prompts you to</td>
<td>step 32</td>
</tr>
<tr>
<td>confirm the command</td>
<td></td>
</tr>
<tr>
<td>the command passed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

32 To confirm the command, type

>YES

and press the Enter key.

33 To access the MS level of the MAP display, type

>MAPCI;MTC;MS

and press the Enter key.

Message Switch  Clock  Shelf 0  Inter-MS Link 0 1
MS 0  .      M  Free   .
MS 1  .      Slave    .

34 Determine the state of the MS that controls the mate F-bus.

Note: 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.

<table>
<thead>
<tr>
<th>If the MS that controls mate F-bus</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is in service or in-service trouble</td>
<td>step 36</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 35</td>
</tr>
</tbody>
</table>

35 To return the MS to service, perform the correct MS alarm clearing procedure in Alarm and Performance Monitoring Procedures. Complete the procedure and return to this point.

36 To access the SHELF level of the MAP display, type

>SHELF

and press the Enter key.

37 To access the F-bus level of the MAP display, type

>CARD 12

and press the Enter key.

Example of a MAP display:
Power converter cards
in a SuperNode SE 16k ENET (continued)

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the state of the F-bus is InSv and all F-bus taps are (dot)</td>
<td>step 39</td>
</tr>
<tr>
<td>the states are other than listed here</td>
<td>step 89</td>
</tr>
</tbody>
</table>

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

\text{ms\_no}

is the number of the MS (0 or 1) that controls the F-bus

\textbf{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.

\textit{Example of a MAP response:}

\texttt{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")}

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicates the BSY command passed</td>
<td>step 41</td>
</tr>
<tr>
<td>requests confirmation</td>
<td>step 40</td>
</tr>
</tbody>
</table>

40 To confirm the command, type

\texttt{>YES}

and press the Enter key.

\textit{Example of a MAP response:}

\texttt{Request MAN BSY MS: 0 shelf 0 card:12 port 0 FBus submitted Request MAN BSY MS: 0 shelf 0 card:12 port 0 FBus passed}

41 To manually busy the mate F-bus tap that associates with the card you replace, type

\texttt{>BSY ms\_no TAP tap\_no}

and press the Enter key.

where

\text{ms\_no}

is the number of the MS (0 or 1) that controls the mate F-bus

\text{tap\_no}

is 0 if you replace a card in slots 1 or 4 is 11 if you replace a card in slots 33 or 36

\textbf{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.

\textit{Example of a MAP display:}
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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is lit</td>
<td>step 44</td>
</tr>
<tr>
<td>is not lit</td>
<td>step 90</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is lit</td>
<td>step 45</td>
</tr>
<tr>
<td>is not lit</td>
<td>step 90</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not lit</td>
<td>step 47</td>
</tr>
<tr>
<td>is lit</td>
<td>step 90</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not lit</td>
<td>step 48</td>
</tr>
<tr>
<td>is lit</td>
<td>step 90</td>
</tr>
</tbody>
</table>

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

\texttt{>RTS 0 LINK link_no}

and press the Enter key.

\textit{where}

\texttt{link_no}
is the link number that you recorded in step 17

\textit{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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 51</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

51 To return the link on the chain on MS 1 to service, type

\texttt{>RTS 1 LINK link_no}

and press the Enter key.

\textit{where}

\texttt{link_no}
is the link number that you recorded in step 17

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 52</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

52 To access the F-bus level of the MAP display, type

\texttt{>CARD 12}

and press the Enter key.

53 To return the manual busy F-bus to service, type

\texttt{>RTS ms_no FBUS}

and press the Enter key.

\textit{where}

\texttt{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
To return the tap on the mate F-bus to service, type
\[
>\text{RTS} \mspace{2mu} \text{ms\_no} \mspace{2mu} \text{TAP} \mspace{2mu} \text{tap\_no}
\]
and press the Enter key.

where
\[
\begin{align*}
\text{ms\_no} & \quad \text{is 0 if you replaced a card in slots 1 or 4}\mspace{2mu} \text{is 1 if you replaced a card in slots 33 or 36} \\
\text{tap\_no} & \quad \text{is 0 if you replaced a card in slots 1 or 4}\mspace{2mu} \text{is 11 if you replaced a card in slots 33 or 36}
\end{align*}
\]

Example of a MAP response:

\[
\begin{align*}
\text{Request to RTS MS: 0 shelf: 0 card:12 tap: 0 submitted.} \\
\text{Request to RTS MS: 0 shelf: 0 card:12 tap: 0 passed.}
\end{align*}
\]

To access the NET;SYSTEM level of the MAP display, type
\[
>\text{NET;SYSTEM}
\]
and press the Enter key.

To manually busy the ENET node, type
\[
>\text{BSY} \mspace{2mu} \text{plane\_no} \mspace{2mu} 0
\]
and press the Enter key.

where
\[
\text{plane\_no} \quad \text{is the ENET plane number (0 or 1)}
\]

Example of a MAP response:

\[
\begin{align*}
\text{Request to MAN BUSY ENET Plane:1 Shelf:00 submitted.} \\
\text{Request to MAN BUSY ENET Plane:1 Shelf:00 passed.}
\end{align*}
\]

If the response \quad Do
\[
\begin{align*}
\text{requests confirmation} & \quad \text{step 57} \\
\text{indicates that the BSY command passed} & \quad \text{step 58}
\end{align*}
\]

To confirm the command, type
\[
>\text{YES}
\]
and press the Enter key.

If the BSY command \quad Do
\[
\begin{align*}
\text{passed} & \quad \text{step 58}
\end{align*}
\]

297-9051-547 Standard 02.01 April 2000
Power converter cards
in a SuperNode SE 16k ENET (continued)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

The next action depends on the location of the load file.

<table>
<thead>
<tr>
<th>If the load file</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is as specified in tables PMLOADS and ENINV</td>
<td>step 59</td>
</tr>
<tr>
<td>is different from the file specified in tables PMLOADS and ENINV</td>
<td>step 60</td>
</tr>
</tbody>
</table>

58

59 To load the ENET node, type

```plaintext
>LOADEN plane_no 0
```

and press the Enter key.

*where*

<table>
<thead>
<tr>
<th>plane_no</th>
</tr>
</thead>
<tbody>
<tr>
<td>is the ENET plane number (0 or 1)</td>
</tr>
</tbody>
</table>

*Example of a MAP response:*

*WARNING*

Any software load in the ENET will be destroyed.
Please confirm ("YES" or "NO"):

Go to step 66.

60 To access the CI level of the MAP display, type

```plaintext
>QUIT ALL
```

and press the Enter key.

61 To access the disk utility, type

```plaintext
>DISKUT
```

and press the Enter key.

*Example of a MAP response:*

*Disk utility is now active.DISKUT:*

62 To list the contents for the volume that contains the loadfile, type

```plaintext
>LISTFILE vol_name
```

and press the Enter key.

*where*

<table>
<thead>
<tr>
<th>vol_name</th>
</tr>
</thead>
<tbody>
<tr>
<td>is the name of the volume that contains the ENET load file</td>
</tr>
</tbody>
</table>

*Example of a MAP response:*

failed step 90

If the load file Do

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is as specified in tables PMLOADS and ENINV</td>
</tr>
<tr>
<td>is different from the file specified in tables PMLOADS and ENINV</td>
</tr>
</tbody>
</table>

If the BSY command Do

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
</tr>
</tbody>
</table>

Any software load in the ENET will be destroyed.
Please confirm ("YES" or "NO"):

Go to step 66.

WARNING

Any software load in the ENET will be destroyed.
Please confirm ("YES" or "NO"):

Go to step 66.

To load the ENET node, type

```plaintext
>LOADEN plane_no 0
```

and press the Enter key.

*where*

<table>
<thead>
<tr>
<th>plane_no</th>
</tr>
</thead>
<tbody>
<tr>
<td>is the ENET plane number (0 or 1)</td>
</tr>
</tbody>
</table>

*Example of a MAP response:*

*WARNING*

Any software load in the ENET will be destroyed.
Please confirm ("YES" or "NO"):

Go to step 66.

To access the CI level of the MAP display, type

```plaintext
>QUIT ALL
```

and press the Enter key.

To access the disk utility, type

```plaintext
>DISKUT
```

and press the Enter key.

*Example of a MAP response:*

*Disk utility is now active.DISKUT:*

To list the contents for the volume that contains the loadfile, type

```plaintext
>LISTFILE vol_name
```

and press the Enter key.

*where*

<table>
<thead>
<tr>
<th>vol_name</th>
</tr>
</thead>
<tbody>
<tr>
<td>is the name of the volume that contains the ENET load file</td>
</tr>
</tbody>
</table>

*Example of a MAP response:*
Power converter cards
in a SuperNode SE 16k ENET (continued)

File information for volume S00DVOL1:
( NOTE:  1 BLOCK = 512 BYTES )

<table>
<thead>
<tr>
<th>LAST FILE</th>
<th>OR I O</th>
<th>FILE</th>
<th>NUM OF</th>
<th>MAX</th>
<th>FILE NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODIFY CODE</td>
<td>R E T P</td>
<td>SIZE</td>
<td>RECORDS</td>
<td>REC</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>G C O E</td>
<td>IN</td>
<td>IN</td>
<td>LEN</td>
<td></td>
</tr>
<tr>
<td>C N</td>
<td>BLOCKS</td>
<td>FILE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>760128</td>
<td>O O F</td>
<td>277</td>
<td>3219</td>
<td>44</td>
<td>EDRMAC07</td>
</tr>
<tr>
<td>941101</td>
<td>O I F Y</td>
<td>9494</td>
<td>4747</td>
<td>1020</td>
<td>RAPC03AW_1101_MS</td>
</tr>
<tr>
<td>760104</td>
<td>O O V</td>
<td>651</td>
<td>162</td>
<td>2048</td>
<td>MPC402BX</td>
</tr>
<tr>
<td>760104</td>
<td>O O F</td>
<td>63</td>
<td>424</td>
<td>76</td>
<td>TDCMPA01</td>
</tr>
<tr>
<td>760104</td>
<td>O O F</td>
<td>37</td>
<td>249</td>
<td>76</td>
<td>TTMNA01</td>
</tr>
<tr>
<td>941101</td>
<td>O I F Y</td>
<td>202934</td>
<td>101467</td>
<td>1020</td>
<td>RAPC03AW_1101_CM</td>
</tr>
<tr>
<td>941025</td>
<td>O I F</td>
<td>9494</td>
<td>4747</td>
<td>1020</td>
<td>RBCS35CV_1025_MS</td>
</tr>
<tr>
<td>941025</td>
<td>O I F</td>
<td>242454</td>
<td>121227</td>
<td>1020</td>
<td>RBCS35CV_1025_CM</td>
</tr>
<tr>
<td>940426</td>
<td>O O F</td>
<td>784</td>
<td>392</td>
<td>1024</td>
<td>MPCX33AB</td>
</tr>
<tr>
<td>930427</td>
<td>O O F</td>
<td>314</td>
<td>2006</td>
<td>80</td>
<td>MTULI01</td>
</tr>
</tbody>
</table>

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:
To return the ENET node to service, type

```
>RTS plane_no 0
```

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.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 68</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

To access the ENET SHELF level of the MAP display, type

```
>SHELF
```

and press the Enter key.

To manually busy all crosspoint cards on the shelf side, type

```
>BSY plane_no ALL
```

where

*Example of a MAP response:*

```
RTS ENET Plane:0 Shelf:00 passed.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 68</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

To confirm the command, type

```
>YES
```

and press the Enter key.

To return all crosspoint cards on the shelf side, type

```
>RTS plane_no ALL
```

where

*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.
```

```
To access the ENET SYSTEM level of the MAP, type
>SYSTEM
and press the Enter key.

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 RTS ENET Plane:1 Shelf:00 submitted.
Request to RTS ENET Plane:1 Shelf:00 passed.

The next action depends if you recorded a list of deloaded cards in step 8.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>recorded a card list</td>
<td>step 75</td>
</tr>
<tr>
<td>did not record a card list</td>
<td>step 78</td>
</tr>
</tbody>
</table>

To access the ENET SHELF level of the MAP display, type
>SHELF 0
and press the Enter key.

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

more cards on the list are not de-loaded

Do

step 77
Power converter cards in a SuperNode SE 16k ENET (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all cards on the list are deloaded</td>
<td>step 78</td>
</tr>
</tbody>
</table>

77 Repeat step 76 for the next card on the list.

78 The next action depends if the ENET shelf has LIU7s.

<table>
<thead>
<tr>
<th>If the ENET shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has LIU7s</td>
<td>step 79</td>
</tr>
<tr>
<td>does not have LIU7s</td>
<td>step 91</td>
</tr>
</tbody>
</table>

79 To access the PM level of the MAP display, type
>MAPCI;MTC;PM
and press the Enter key.

80 To post the LIU7 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)

81 To load the LIU7, type
>LOADPM
and press the Enter key.

Example of a MAP response:

LIU7 208 LOADPM Passed

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 83</td>
</tr>
<tr>
<td>failed</td>
<td>step 82</td>
</tr>
</tbody>
</table>

82 To load the LIU7, perform the procedure Loading a PM in this NTP. Complete the procedure and return to this point.

83 To return the LIU7 to service, type
>RTS
and press the Enter key.

Example of a MAP response:
Power converter cards  
in a SuperNode SE 16k ENET (end)

LIU7 100 RTS Passed

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 84</td>
</tr>
<tr>
<td>failed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

84 To activate the CCS7 link associated with the LIU7, perform the procedure **Activating CCS7 links** in this NTP. Complete the procedure and return to this point.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 86</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 91</td>
</tr>
</tbody>
</table>

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

87 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.

88 To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

89 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.

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

91 The procedure is complete.
**Application**

Use this procedure to replace the following cards in a SuperNode SE (SNSE) 16k enhanced network (ENET).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X13</td>
<td>FA, KA</td>
<td>DMS SuperNode processor card</td>
<td>Enhanced network and interface (ENI)</td>
</tr>
<tr>
<td>NT9X26</td>
<td>AA, AB</td>
<td>Remote terminal interface paddle board</td>
<td>ENI</td>
</tr>
<tr>
<td>NT9X36</td>
<td>BA</td>
<td>ENET message clock card</td>
<td>ENI</td>
</tr>
<tr>
<td>NT9X40</td>
<td>BA, BB, DA</td>
<td>ENET + quad fiber paddle board</td>
<td>ENI slots 11 or 21</td>
</tr>
</tbody>
</table>

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.
Summary of replacing System cards in a SuperNode SE 16k ENET

- Set deload for the plane
- Wait 30 min for traffic to clear
- Manually busy and offline ENET plane
- Replace the card
- Manually busy the ENET plane
- Load the ENET plane
- Return the ENET plane
- Clear the deload for the ENET plane

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
System cards
in a SuperNode SE 16k ENET (continued)

Replacing System cards in a SuperNode SE 16k ENET

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 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:

<table>
<thead>
<tr>
<th>Shelf</th>
<th>Plane 0</th>
<th>Plane 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>I CSLink 1 closed</td>
<td></td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>is T (being tested)</td>
<td>step 5</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 6</td>
</tr>
</tbody>
</table>

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.

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.
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

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

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.

does not have deloaded cards  step 9

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.

<table>
<thead>
<tr>
<th>If the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is Ø (offline)</td>
<td>step 17</td>
</tr>
<tr>
<td>is M (manual busy)</td>
<td>step 15</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the response is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING: This action will abort ENET dump. Please confirm (&quot;YES&quot;, &quot;Y&quot;, &quot;NO&quot;, or &quot;N&quot;):</td>
<td>step 13</td>
</tr>
</tbody>
</table>

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.
Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:25 passed.

13 Continue procedure by

<table>
<thead>
<tr>
<th>If Responding to the message</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>with YES, abort dump and continue with busy</td>
<td>step 14</td>
</tr>
<tr>
<td>with NO, abort busy, continue with dump</td>
<td>step 67</td>
</tr>
</tbody>
</table>
To abort ENET dump and continue with BSY, type
>YES
and press the Enter key.

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”):

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.

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 17</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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.

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:

<table>
<thead>
<tr>
<th>Message Switch</th>
<th>Clock</th>
<th>Shelf 0</th>
<th>Inter-MS</th>
<th>Link 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 0</td>
<td>Slave</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS 1</td>
<td>M Free</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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   . . . . . - - . . . . . .

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:

<table>
<thead>
<tr>
<th>Chain 05 Range</th>
<th>Link 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 0</td>
<td>05-05  DS512</td>
</tr>
<tr>
<td>MS 1</td>
<td>05-05  DS512</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 22</td>
</tr>
</tbody>
</table>
If the BSY command failed, do step 66.

To manually busy the link on the chain on MS 1, type

```
>BSY 1 LINK link_no
```

where

```
link_no
```

is the link number that you recorded in step 18.

If the BSY command passed, do step 23.

If the BSY command failed, do step 66.

To access the ENET SHELF level of the MAP display, type

```
>NET;SHELF
```

where

```
plane_no
```

is the ENET plane number (0 or 1).

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 123456 789 01 23456789 01 23456789 012 345678
. . . . . . . . F SSSSSSS .F ........ .... .
```

To manually busy all crosspoint cards on the shelf side, type

```
>BSY plane_no ALL
```

where

```
plane_no
```

is the ENET plane number (0 or 1).

Example of a MAP response:
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.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X13</td>
<td>step 28</td>
</tr>
<tr>
<td>is an NT9X40</td>
<td>step 30</td>
</tr>
</tbody>
</table>
### System cards in a SuperNode SE 16k ENET (continued)

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X26 or NT9X36</td>
<td>step 33</td>
</tr>
</tbody>
</table>

#### 28
To unseat the NT9X36 (messaging clock) 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. Wait 20 s and return to this point.

#### 29
To reseat the NT9X36 card, perform the procedure *Reseating cards in equipment shelves* in this NTP. Complete the procedure. Wait 20 s and return to this point.

Go to step 33.

#### 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)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCO</td>
<td>ENET plane (0 or 1)</td>
</tr>
<tr>
<td>00</td>
<td>cabinet number</td>
</tr>
<tr>
<td>39</td>
<td>ENET shelf by the base mounting position number</td>
</tr>
<tr>
<td>10R</td>
<td>slot number and position (R for rear, or F for front)</td>
</tr>
<tr>
<td>04</td>
<td>zone number</td>
</tr>
<tr>
<td>17T</td>
<td>link number and the signal type (T for transmit, R for receive)</td>
</tr>
<tr>
<td>LTE</td>
<td>PM that the cable terminates on</td>
</tr>
<tr>
<td>000</td>
<td>PM frame number</td>
</tr>
<tr>
<td>18</td>
<td>PM shelf by the base mounting position number</td>
</tr>
<tr>
<td>22R</td>
<td>slot number and position (R for rear, or F for front)</td>
</tr>
<tr>
<td>RX</td>
<td>signal type at the PM end ( RX for receive or TX for transmit)</td>
</tr>
</tbody>
</table>

---

**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.

- 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.
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.

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

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X13</td>
<td>step c</td>
</tr>
<tr>
<td>is an NT9X40</td>
<td>step 35</td>
</tr>
<tr>
<td>is an NT9X26 or NT9X36</td>
<td>step b</td>
</tr>
</tbody>
</table>

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.

1. Align the connector pin and slot with the receptacle slot and pin, in the sequence given, as shown in the following diagram.

2. Carefully slide the connector into the receptacle.

3. Turn the connector clockwise to lock the connector in place.
System cards

in a SuperNode SE 16k ENET (continued)

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)

<table>
<thead>
<tr>
<th>card_no</th>
<th>is the card number that you recorded in step 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>To return the link on the chain on MS 0 to service, type</td>
</tr>
<tr>
<td></td>
<td>(\text{&gt;RTS } 0 \ 	ext{LINK } \text{link_no})</td>
</tr>
<tr>
<td></td>
<td>and press the Enter key.</td>
</tr>
<tr>
<td></td>
<td>(\text{where} )</td>
</tr>
<tr>
<td></td>
<td>(\text{link_no})</td>
</tr>
<tr>
<td></td>
<td>is the link number that you recorded in step 18</td>
</tr>
<tr>
<td></td>
<td>(\text{Example of a MAP response:} )</td>
</tr>
<tr>
<td></td>
<td>Request to RTS MS: 0 shelf: 0 chain:05 link 0 submitted.</td>
</tr>
<tr>
<td></td>
<td>Request to RTS MS: 0 shelf: 0 chain:05 link 0 passed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 40</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

| 40 | To return the link on the chain on MS 1 to service, type |
|    | \(\text{>RTS } 1 \ 	ext{LINK } \text{link_no}\) |
|    | and press the Enter key. |
|    | \(\text{where} \) |
|    | \(\text{link_no}\) |
|    | is the link number that you recorded in step 18 |

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 41</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

| 41 | To access the NET;SYSTEM level of the MAP display, type |
|    | \(\text{>NET; SYSTEM}\) |
|    | and press the Enter key. |
| 42 | To manually busy the ENET plane, type |
|    | \(\text{>BSY plane_no 0}\) |
|    | and press the Enter key. |
|    | \(\text{where} \) |
### System cards in a SuperNode SE 16k ENET (continued)

**plane_no**  
is the ENET plane number (0 or 1)

<table>
<thead>
<tr>
<th>If the response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>requests confirmation</td>
<td>step 43</td>
</tr>
<tr>
<td>indicates the BSY command</td>
<td>step 44</td>
</tr>
<tr>
<td>passed</td>
<td></td>
</tr>
</tbody>
</table>

43  
To confirm the command, type

```plaintext
>YES
```
and press the Enter key.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 44</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

44  
The next action depends on the location of the load file.

<table>
<thead>
<tr>
<th>If the load file</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is as specified in tables PMLOADS and ENINV</td>
<td>step 45</td>
</tr>
<tr>
<td>is different from the file specified in</td>
<td>step 46</td>
</tr>
<tr>
<td>tables PMLOADS and ENINV</td>
<td></td>
</tr>
</tbody>
</table>

45  
To load the ENET node, type

```plaintext
>LOADEN  plane_no  0
```
and press the Enter key.

*where*

```plaintext
plane_no
```

is the ENET plane number (0 or 1)

*Example of a MAP response:*

```plaintext
WARNING  Any software load in the ENET will be destroyed. Please confirm ("YES" or "NO"):

```

Go to step 52.

46  
To access the CI level of the MAP display, type

```plaintext
>QUIT  ALL
```
and press the Enter key.
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 OR I O FILE NUM OF MAX FILE NAME
MODIFY CODE RE T P SIZE RECORDS REC DATE GC O E IN IN LEN C N BLOCKS FILE
------------------------------------------------------------------
760128 0 OF 277 3219 44 EDRMAC07
941101 0 IF Y 9494 4747 1020 RAPC03AW_1101_MS
760104 0 OF 63 424 76 MPCX33AB
760104 0 OF 37 249 76 TTMNA01
760104 0 OF 37 249 76 TTMNA01
941101 0 IF Y 202934 101467 1020 RAPC03AW_1101_CM
941025 0 IF 9494 4747 1020 RBCS35CV_1025_MS
941025 0 IF 242454 121227 1020 RBCS35CV_1025_CM
940426 0 OF 784 392 1024 MPCX33AB
930427 0 OF 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.
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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 54</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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

plane_no
  is the ENET plane number (0 or 1)
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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 56</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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.

`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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>recorded a card list</td>
<td>step 60</td>
</tr>
<tr>
<td>did not record a card list</td>
<td>step 63</td>
</tr>
</tbody>
</table>

60 To access the SHELF level of the MAP display, type

```
>SHELF  0
```

and press the Enter key.
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)

<table>
<thead>
<tr>
<th>If all cards on the list</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are not set to a deloaded state</td>
<td>step 62</td>
</tr>
<tr>
<td>are set to a deloaded state</td>
<td>step 63</td>
</tr>
</tbody>
</table>

62 Repeat step 61 for the next card on the list.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 64</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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

The figure correlates the zone numbers (1 to 8) to the link numbers. The zone numbers appear on the face of the card. The link numbers appear on the MAP display for the NT9X40BA or NT9X40BB interface card. The figure indicates the fiber connections only. Observe carefully the zone identification marks for transmit and receive.
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).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X13</td>
<td>FA, KA</td>
<td>DMS SuperNode processor card</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X26</td>
<td>AA, AB</td>
<td>Reset terminal interface (RTIF) paddle board</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X30</td>
<td>AA, AB</td>
<td>+5V 86-A power converter card</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X31</td>
<td>AA, AB</td>
<td>-5V 20-A power converter for DMS-100E card</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X36</td>
<td>BA</td>
<td>ENET messaging clock card</td>
<td>32k ENET</td>
</tr>
<tr>
<td>NT9X40</td>
<td>BA, BB, DA</td>
<td>ENET + quad fiber paddle board</td>
<td>32k ENET, slot 8</td>
</tr>
</tbody>
</table>

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
• 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

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

1. Set deload for the plane and shelf
2. Wait 30 min for traffic to clear
3. Manually busy and offline the plane and shelf
4. Manually busy the MS chain links
5. Replace the card
6. Return the MS chain links to service
7. Manually busy the plane and shelf
8. Load the plane and shelf
9. Return the plane and shelf to service
10. Clear deload for the plane and shelf
11. End
Replacing System cards in a SuperNode SE 32k ENET

At your current location

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 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.

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.

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 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.
System cards
in a SuperNode SE 32k ENET (continued)

In the example shown in step 3, plane 0 is in-service trouble (I) and plane 1 is in service.

<table>
<thead>
<tr>
<th>If the state of the plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is T (being tested)</td>
<td>step 5</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 6</td>
</tr>
</tbody>
</table>

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`

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.

<table>
<thead>
<tr>
<th>If the plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has deloaded cards</td>
<td>step 66</td>
</tr>
<tr>
<td>does not have deloaded cards</td>
<td>step 7</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>If the plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has deloaded cards</td>
<td>step 8</td>
</tr>
<tr>
<td>does not have deloaded cards</td>
<td>step 9</td>
</tr>
</tbody>
</table>
System cards in a SuperNode SE 32k ENET (continued)

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:

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.

<table>
<thead>
<tr>
<th>If the ENET plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is O (offline)</td>
<td>step 14</td>
</tr>
<tr>
<td>is M (manual busy)</td>
<td>step 13</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 13</td>
</tr>
<tr>
<td>failed</td>
<td>step 57</td>
</tr>
</tbody>
</table>
System cards in a SuperNode SE 32k ENET (continued)

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:

   Request to OFFL ENET Plane:0 Shelf:00 submitted.
   Request to OFFL ENET Plane:0 Shelf:00 passed.

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 14</td>
</tr>
<tr>
<td>failed</td>
<td>step 57</td>
</tr>
</tbody>
</table>

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:
To access the Chain level of the MAP display, type

```
>CHAIN  card_no
```

and press the Enter key.

**where**

`card_no` is the card number that you recorded in step 15

**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 1 1 2 2 2 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**

`card_no` is the card number that you recorded in step 15

**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 1 1 2 2 2 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
```

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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 19</td>
</tr>
<tr>
<td>failed</td>
<td>step 67</td>
</tr>
</tbody>
</table>

19 To manually busy the link on the chain on MS 1, type

```
>BSY  1  LINK  link_no
```

and press the Enter key.

**where**
System cards
in a SuperNode SE 32k ENET (continued)

link_no
is the link number that you recorded in step 15

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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 21</td>
</tr>
<tr>
<td>failed</td>
<td>step 67</td>
</tr>
</tbody>
</table>

To access the ENET SHELF level of the MAP display, type
>NET;SHELF 0
and press the Enter key.

where
plane_no
is the ENET plane number (0 or 1)

Example of a MAP display:

```
SHELF 01  Slot 1111111 11122222 22222333 333333 123456 78 90123456 78901234 56789012 345678
Plane 0  O O 00 CCCCCCCC --------- CCCCCCCC O O
Plane 1    . .   .. ........ -------- ........ .  .
```

To busy all crosspoint cards on the 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:

```
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"): 
```
System cards
in a SuperNode SE 32k ENET (continued)

23  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.

    | If the BSY command | Do       |
    |-------------------|----------|
    | passed            | step 21  |
    | failed            | step 67  |

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.

25

At the ENET shelf

The next action depends on the ENET card that you replace.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT9X30 or NT9X31</td>
<td>step 28</td>
</tr>
<tr>
<td>replace an NT9X13</td>
<td>step 26</td>
</tr>
<tr>
<td>replace an NT9X40</td>
<td>step 30</td>
</tr>
<tr>
<td>replace an NT9X26 or NT9X36</td>
<td>step b</td>
</tr>
</tbody>
</table>

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.
System cards
in a SuperNode SE 32k ENET (continued)

26 To unseat the NT9X36 (messaging clock) card on the shelf, perform the procedure *Unseating cards in equipment shelves*. The procedure *Unseating cards in equipment shelves* appears in this NTP. Complete the procedure. Wait 20 s and return to this point.

27 To reseat the NT9X36 card, perform the procedure *Reseating cards in equipment shelves* in this NTP. Complete the procedure. Wait 20 s and return to this point.

Go to step 33.

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is lit</td>
<td>step 29</td>
</tr>
<tr>
<td>is not lit</td>
<td>step 67</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is lit</td>
<td>step 33</td>
</tr>
<tr>
<td>is not lit</td>
<td>step 67</td>
</tr>
</tbody>
</table>

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.

*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.
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.

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.
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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace a NT9X30 or NT9X31</td>
<td>step 35</td>
</tr>
<tr>
<td>replace a NT9X26 or NT9X36</td>
<td>step 38</td>
</tr>
<tr>
<td>replace a NT9X40</td>
<td>step 37</td>
</tr>
<tr>
<td>replace a NT9X13</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not lit</td>
<td>step 36</td>
</tr>
<tr>
<td>is lit</td>
<td>step 67</td>
</tr>
</tbody>
</table>
System cards
in a SuperNode SE 32k ENET (continued)

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.

<table>
<thead>
<tr>
<th>If the CONVERTER OFF LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is not lit</td>
<td>step 40</td>
</tr>
<tr>
<td>is lit</td>
<td>step 67</td>
</tr>
</tbody>
</table>

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.
SuperNode SE enhanced network card replacement procedures

System cards
in a SuperNode SE 32k ENET (continued)

Release the connector. The following figure displays the final connector position.

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
System cards
in a SuperNode SE 32k ENET (continued)

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

<table>
<thead>
<tr>
<th>passed</th>
<th>step 42</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 67</td>
</tr>
</tbody>
</table>

42 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 15

If the RTS command

<table>
<thead>
<tr>
<th>passed</th>
<th>step 43</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 67</td>
</tr>
</tbody>
</table>

43 To access the NET;SYSTEM level of the MAP display, type

>NET;SYSTEM

and press the Enter key.

44 To manually busy the ENET plane, type

>BSY plane_no

and press the Enter key.

where

plane_no

is the ENET plane number (0 or 1)

If the BSY command

<table>
<thead>
<tr>
<th>passed</th>
<th>step 45</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 67</td>
</tr>
</tbody>
</table>
The next action depends on the location of the load file.

<table>
<thead>
<tr>
<th>If the load file</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is the same as specified in tables PMLOADS and ENINV</td>
<td>step 46</td>
</tr>
<tr>
<td>is different from the file specified in tables PMLOADS</td>
<td>step 47</td>
</tr>
<tr>
<td>and ENINV</td>
<td></td>
</tr>
</tbody>
</table>

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:*

Go to step 53.

To access the CI level of the MAP display, type

```
>QUIT  ALL
```

and press the Enter key.

To access the disk utility, type

```
>DISKUT
```

and press the Enter key.

*Example of a MAP response:*

```
Disk utility is now active.
```

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:*

```
If the load file Do
```

WARNING Any software load in the ENET will be destroyed. Please confirm ("YES" or "NO"): 

Go to step 53.
System cards
in a SuperNode SE 32k ENET (continued)

File information for volume S00DVOL1:
(NOTE: 1 BLOCK = 512 BYTES)

<table>
<thead>
<tr>
<th>LAST FILE O R I O</th>
<th>FILE</th>
<th>NUM OF</th>
<th>MAX</th>
<th>FILE NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CODE</td>
<td>SIZE</td>
<td>RECORDS</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>GC</td>
<td>IN</td>
<td>IN</td>
<td>LEN</td>
</tr>
<tr>
<td>CN</td>
<td>BLOCKS</td>
<td>FILE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>760128</td>
<td>0 O</td>
<td>277</td>
<td>3219</td>
<td>44 EDRMAC07</td>
</tr>
<tr>
<td>941101</td>
<td>0 I F Y</td>
<td>9494</td>
<td>4747</td>
<td>1020 RAPC03AW_1101_MS</td>
</tr>
<tr>
<td>760104</td>
<td>0 O V</td>
<td>651</td>
<td>162</td>
<td>2048 MPC402BX</td>
</tr>
<tr>
<td>760104</td>
<td>0 O F</td>
<td>63</td>
<td>424</td>
<td>76 TDCMPA01</td>
</tr>
<tr>
<td>760104</td>
<td>0 O F</td>
<td>37</td>
<td>249</td>
<td>76 TTMNA01</td>
</tr>
<tr>
<td>941101</td>
<td>0 I F Y</td>
<td>202934</td>
<td>101467</td>
<td>1020 RAPC03AW_1101_CM</td>
</tr>
<tr>
<td>941025</td>
<td>0 I F</td>
<td>9494</td>
<td>4747</td>
<td>1020 RBCS35CV_1025_MS</td>
</tr>
<tr>
<td>941025</td>
<td>0 I F</td>
<td>242454</td>
<td>121227</td>
<td>1020 RBCS35CV_1025_CM</td>
</tr>
<tr>
<td>940426</td>
<td>0 O F</td>
<td>784</td>
<td>392</td>
<td>1024 MPCX33AB</td>
</tr>
<tr>
<td>930427</td>
<td>0 O F</td>
<td>314</td>
<td>2006</td>
<td>80 MTULI01</td>
</tr>
</tbody>
</table>

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.
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.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 55</td>
</tr>
<tr>
<td>failed</td>
<td>step 67</td>
</tr>
</tbody>
</table>

To access the ENET SHELF level of the MAP, type

```
>SHELF  0
```

and press the Enter key.

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)

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.
```

To access the ENET SYSTEM level of the MAP display, type

```
>SYSTEM
```

and press the Enter key.

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.

\textit{where}

\begin{itemize}
  \item \texttt{plane\_no} is the ENET plane number (0 or 1)
\end{itemize}

\textit{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.

\begin{table}[h]
\centering
\begin{tabular}{|l|l|}
\hline
\textbf{If you} & \textbf{Do} \\
\hline
recorded a card list & step 61 \\
\hline
did not record a card list & step 64 \\
\hline
\end{tabular}
\end{table}

60 The next action depends if you recorded a list of deloaded cards in step 8.

61 To access the SHELF level of the MAP display, type

\texttt{>SHELF 0}

and press the Enter key.

62 To set the first card on the list to the deloaded state, type

\texttt{>DELOAD plane\_no slot\_no SET}

and press the Enter key.

\textit{where}

\begin{itemize}
  \item \texttt{plane\_no} is the ENET plane number (0 or 1)
  \item \texttt{slot\_no} is the slot number (8 to 32)
\end{itemize}

\begin{table}[h]
\centering
\begin{tabular}{|l|l|}
\hline
\textbf{If all the cards on the list} & \textbf{Do} \\
\hline
are deloaded & step 63 \\
\hline
are not deloaded & step 64 \\
\hline
\end{tabular}
\end{table}

63 Repeat step 62 for the next card on the list.

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

\begin{table}[h]
\centering
\begin{tabular}{|l|l|}
\hline
\textbf{If a maintenance procedure} & \textbf{Do} \\
\hline
directed you to this procedure & step 65 \\
\hline
did not direct you to this procedure & step 68 \\
\hline
\end{tabular}
\end{table}

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

The figure correlates the zone numbers (1 to 8) to the link numbers. The zone numbers appear on the face of the card. The link numbers appear on the MAP display for the NT9X40BA or NT9X40BB interface card. Note that the figure indicates fiber connections only. Observe carefully the zone identification marks for transmit and receive.
System cards in a SuperNode SE 32k ENET (end)

Fiber connector detail

![Fiber connector detail diagram]

The preceding figure displays the type of connector used to connect fibers to an NT9X40 or NT9X45 paddle board.

Fiber connector and receptacle detail

![Fiber connector and receptacle detail diagram]

This figure shows the different parts of the connector and receptacle.
6 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

<table>
<thead>
<tr>
<th>Rear</th>
<th>Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>32R NT9X19BA Filler faceplate</td>
<td>32F NT9X19BA Filler faceplate</td>
</tr>
<tr>
<td>31R NT9X21AB Bus terminator</td>
<td>31F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>30R NT9X19BA Filler faceplate</td>
<td>30F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>29R NT9X19BA Filler faceplate</td>
<td>29F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>28R NT9X19BA Filler faceplate</td>
<td>28F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>27R NT9X62AA 2-port subrate DS512</td>
<td>27F NT9X86AA Dual-port message controller</td>
</tr>
<tr>
<td>26R NT9X26AA Remote terminal I/F</td>
<td>26F NT9X13LA AP/FP 68030 HPM-based CPU</td>
</tr>
<tr>
<td>25R NT9X26AA Remote terminal I/F</td>
<td>25F NT9X13LA AP/FP 68030 HPM-based CPU</td>
</tr>
<tr>
<td>24R NT9X62AA 2-port subrate DS512</td>
<td>24F NT9X86AA Dual-port message controller</td>
</tr>
<tr>
<td>23R NT9X19BA Filler faceplate</td>
<td>23F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>22R NT9X19BA Filler faceplate</td>
<td>22F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>21R NT9X19BA Filler faceplate</td>
<td>21F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>20R NT9X21AB Bus terminator</td>
<td>20F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>19R NT9X21AB Bus terminator</td>
<td>19F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>18R NT9X19BA Filler faceplate</td>
<td>18F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>17R NT9X88AA SCSI I/F processor</td>
<td>17F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>16R NT9X88AA SCSI I/F processor</td>
<td>16F NT9X87AA Dual-access buffer memory</td>
</tr>
<tr>
<td>15R NT9X62AA 2-port subrate DS512</td>
<td>15F NT9X86AA Dual-port message controller</td>
</tr>
<tr>
<td>14R NT9X26AA Remote terminal I/F</td>
<td>14F NT9X13LA AP/FP 68030 HPM-based CPU</td>
</tr>
<tr>
<td>13R NT9X26AA Remote terminal I/F</td>
<td>13F NT9X13LA AP/FP 68030 HPM-based CPU</td>
</tr>
<tr>
<td>12R NT9X62AA 2-port subrate DS512</td>
<td>12F NT9X86AA Dual-port message controller</td>
</tr>
<tr>
<td>11R NT9X88AA SCSI I/F processor</td>
<td>11F NT9X87AA Dual-access buffer memory</td>
</tr>
<tr>
<td>10R NT9X88AA SCSI I/F processor</td>
<td>10F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>09R NT9X19BA Filler faceplate</td>
<td>09F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>08R NT9X21AB Bus terminator</td>
<td>08F NT9X14DB 24-Mbyte memory</td>
</tr>
<tr>
<td>07R NT9X19BA Filler faceplate</td>
<td>07F NT9X19BA Filler faceplate</td>
</tr>
</tbody>
</table>

Paddle boards

Cards

NTDX15AA Power converter

NTDX15AA Power converter
### Figure 3: File processor storage device shelf

<table>
<thead>
<tr>
<th>Paddle boards</th>
<th>Cards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NTDX91 Power converter card</td>
<td>36F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NTDX91 Power converter card</td>
<td>33F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>32F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>31F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>30F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>29F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>28F</td>
</tr>
<tr>
<td>NT9X89 SDIP</td>
<td>NT9X19 Filler faceplate</td>
<td>27F</td>
</tr>
<tr>
<td>NT9X89 SDIP</td>
<td>NT9X19 Filler faceplate</td>
<td>26F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>25F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>24F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>23F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>22F</td>
</tr>
<tr>
<td>NT9X89 SCSI device I/F PB</td>
<td>NT9X19 Filler faceplate</td>
<td>21F</td>
</tr>
<tr>
<td>NT9X89 SCSI device I/F PB</td>
<td>NT9X19 Filler faceplate</td>
<td>20F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>19F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>18F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>17F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>16F</td>
</tr>
<tr>
<td>NT9X89 SCSI device I/F PB</td>
<td>NT9X19 Filler faceplate</td>
<td>15F</td>
</tr>
<tr>
<td>NT9X89 SCSI device I/F PB</td>
<td>NT9X19 Filler faceplate</td>
<td>14F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>13F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>12F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>11F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NT9X19 Filler faceplate</td>
<td>10F</td>
</tr>
<tr>
<td>NT9X89 SCSI device I/F PB</td>
<td>NT9X19 Filler faceplate</td>
<td>09F</td>
</tr>
<tr>
<td>NT9X89 SCSI device I/F PB</td>
<td>NT9X19 Filler faceplate</td>
<td>08F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NTDX91 Power converter card</td>
<td>07F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NTDX91 Power converter card</td>
<td>04F</td>
</tr>
<tr>
<td>NT9X19 Filler faceplate</td>
<td>NTDX91 Power converter card</td>
<td>01F</td>
</tr>
</tbody>
</table>

**Legend:**
- **Rear**: Left side of the shelf
- **Front**: Right side of the shelf

---

DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X89</td>
<td>AA, BA</td>
<td>SCSI device interface paddle board</td>
<td>FP storage device</td>
</tr>
</tbody>
</table>

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.
Replaced a NT9X89 in a storage device shelf in a file processor

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

1. Connected to disabled SCSI bus?
   - Y: Enable SCSI bus on inactive plane
   - N: Move to next step

2. Storage device is disk drive?
   - Y: Disk drive in shadow set?
     - Y: Stop shadow set member
     - N: Move to next step
   - N: Manually busy storage device

3. Storage device is disk drive?
   - Y: Disk drive in shadow set?
     - Y: Start shadow set member
     - N: Move to next step
   - N: Manually busy storage device

4. Return storage device to service
   - End
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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>0</td>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>

   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:       FF3_SR256 Plane Devices |
   |------------|-----|-----|-----|-----|-----|-----|
   | ISTb       NoSync  .              |
   | DABM       CTRL0 | CTRL1 | DEVICE |
   |             .     |      | 0 1 2 3 4 5 |
   | SCSI 0     .(EN)  .(DIS) | - . - . - - |
   | SCSI 1     .(EN)  .(DIS) | - . - . - - |
5. Determine if the NT9X89 card you replace connects to an enabled (EN) or
disabled (DIS) SCSI bus.

<table>
<thead>
<tr>
<th>If the SCSI bus</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is enabled</td>
<td>step 6</td>
</tr>
<tr>
<td>is disabled</td>
<td>step 7</td>
</tr>
</tbody>
</table>

**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

```c
>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.

<table>
<thead>
<tr>
<th>If the SWEN command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 7</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

7. To manually busy the disabled SCSI bus, type

```c
>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:*

FP 1 SwEn SCSI 0: Command request has been submitted.
NT9X89
in a storage device shelf in a file processor (continued)

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:*

<table>
<thead>
<tr>
<th>Card</th>
<th>Firmware</th>
<th>Ctrl</th>
<th>SCSI</th>
<th>Dev</th>
<th>Quad</th>
<th>Shelf</th>
<th>Slot</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP</td>
<td>SXFW35CV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td></td>
<td>InSv</td>
</tr>
<tr>
<td>SDIP</td>
<td>910822</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>SysB</td>
</tr>
<tr>
<td>SIP</td>
<td>SXFW35CV</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td></td>
<td>InSv</td>
</tr>
<tr>
<td>SDIP</td>
<td>910822</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td></td>
<td>InSv</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the device type</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is dk</td>
<td>step 12</td>
</tr>
<tr>
<td>is ct</td>
<td>step 17</td>
</tr>
</tbody>
</table>

12 Determine if the disk drive is a member of a shadow set.

*Note:* Shadow sets are datafilled in table SHADOW.

<table>
<thead>
<tr>
<th>If the disk drive</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a member of a shadow set</td>
<td>step 13</td>
</tr>
<tr>
<td>is not a member of a shadow set</td>
<td>step 17</td>
</tr>
</tbody>
</table>

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

```plaintext
>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:

```plaintext
>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

```plaintext
>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

```plaintext
>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:

```plaintext
>BSY DEV 0 1
```
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.
```

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 18</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

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.
```

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 19</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

At the storage device shelf

19 Locate the NT9X89 card that you must replace.

20 Determine the state of the LEDs on the card.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>no LEDs are lit</td>
<td>step 21</td>
</tr>
<tr>
<td>one or both LEDs are lit</td>
<td>step 33</td>
</tr>
</tbody>
</table>
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 offline in step 18, type
    >BSY DEV scsi_no  dev_no
and press the Enter key.

where

\texttt{scsi\_no}

is the SCSI number you recorded in step 9

\texttt{dev\_no}

is the device number you recorded in step 9

\textit{Example input:}

\texttt{>BSY \ DE\ V 0 1}

\textit{Example of a MAP response:}

FP 1 Busy DEV 0 1: Command request has been submitted.
FP 1 Busy DEV 0 1: Command passed.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 27</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

27 Determine the type of storage device you busied in step 17.

<table>
<thead>
<tr>
<th>If the device type</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is \texttt{dk}</td>
<td>step 28</td>
</tr>
<tr>
<td>is \texttt{ct}</td>
<td>step 32</td>
</tr>
</tbody>
</table>

28 Determine if the disk drive is a member of a shadow set.

<table>
<thead>
<tr>
<th>If the disk drive</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a member of a shadow set</td>
<td>step 29</td>
</tr>
<tr>
<td>is not a member of a shadow set</td>
<td>step 32</td>
</tr>
</tbody>
</table>

29 To start the shadow set member, type

\texttt{>SM ss\_name device\_name FORCE}

and press the Enter key.

where

\texttt{ss\_name}

is the name of the shadow set (SS00 or SS01)

\texttt{device\_name}

is the name of the shadow set member you stopped in step 15
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.

<table>
<thead>
<tr>
<th>If the SM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 31</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

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
Example of a MAP response:

FP 1 RTS DEV 0 1: Command request has been submitted.
FP 1 RTS DEV 0 1: Command passed.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 34</td>
</tr>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X90</td>
<td>AA</td>
<td>Storage device assembly (600-Mbyte disk)</td>
<td>FP storage device</td>
</tr>
<tr>
<td>NT9X90</td>
<td>AB</td>
<td>Storage device assembly (2.1-Gbyte disk)</td>
<td>FP storage device</td>
</tr>
<tr>
<td>NT9X90</td>
<td>BA</td>
<td>Storage device assembly (1.2-Gbyte DAT)</td>
<td>FP storage device</td>
</tr>
</tbody>
</table>

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.
Summary of Replacing a NT9X90 in a storage device shelf in a file processor

This flowchart summarizes the procedure.

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

1. Storage device is disk drive?
   - Y: Disk drive in shadow set?
     - Y: Stop shadow set member
     - N: Manually busy storage device
2. Offline storage device
3. Storage device is disk drive?
   - Y: Test disk drive
   - N: Manually busy storage device
   - N: Storage device is disk drive?
     - Y: Disk drive in shadow set?
       - Y: Start shadow set member
       - N: Test storage device
     - N: Replace card
4. Test disk drive
   - Create disk volumes again
   - Restore files in disk volumes
5. Test storage device
   - Return storage device to service
   - End

This flowchart summarizes the procedure.

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

   ```
   PM    0   0  14   0   5   11
   FP    0   0   2   0   5   4
   SysB  ManB OffL CBsy ISTb InSv
   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
       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.
Example of a MAP response:

<table>
<thead>
<tr>
<th>Dev Name</th>
<th>SCSI</th>
<th>Dev</th>
<th>Type</th>
<th>Quad</th>
<th>Shelf</th>
<th>Slot</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>DK00</td>
<td>0</td>
<td>0</td>
<td>dk</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>InSv</td>
</tr>
<tr>
<td>CT01</td>
<td>0</td>
<td>1</td>
<td>ct</td>
<td>2</td>
<td>2</td>
<td>20</td>
<td>InSv</td>
</tr>
<tr>
<td>DK02</td>
<td>0</td>
<td>2</td>
<td>dk</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>InSv</td>
</tr>
<tr>
<td>DK03</td>
<td>0</td>
<td>3</td>
<td>dk</td>
<td>2</td>
<td>3</td>
<td>20</td>
<td>InSv</td>
</tr>
<tr>
<td>DK10</td>
<td>1</td>
<td>0</td>
<td>dk</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>SysB</td>
</tr>
<tr>
<td>CT11</td>
<td>1</td>
<td>1</td>
<td>ct</td>
<td>3</td>
<td>2</td>
<td>26</td>
<td>InSv</td>
</tr>
<tr>
<td>DK12</td>
<td>1</td>
<td>2</td>
<td>dk</td>
<td>1</td>
<td>3</td>
<td>14</td>
<td>InSv</td>
</tr>
<tr>
<td>DK13</td>
<td>1</td>
<td>3</td>
<td>dk</td>
<td>3</td>
<td>3</td>
<td>26</td>
<td>InSv</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the device</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is dk</td>
<td>step 7</td>
</tr>
<tr>
<td>is ct</td>
<td>step 16</td>
</tr>
</tbody>
</table>

7. The next action depends on why you perform this procedure.

<table>
<thead>
<tr>
<th>If the procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovering disks in a shadow set after loss of both disks</td>
<td>step 18</td>
</tr>
<tr>
<td>other than listed here</td>
<td>step 8</td>
</tr>
</tbody>
</table>
Determine if the disk drive is a member of a shadow set.

*Note:* Datafill shadow sets in table SHADOW.

<table>
<thead>
<tr>
<th>If the disk drive</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a member of a shadow set</td>
<td>step 9</td>
</tr>
<tr>
<td>is not a member of a shadow set</td>
<td>step 16</td>
</tr>
</tbody>
</table>

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.*

To access the shadow utility for the FP that contains the disk drive, type

```plaintext
>SHADOWUT FP fp_no
```

where

```plaintext
fp_no
```

is the number of the FP (0 to 99) that contains the disk drive

To display information on the shadow set, type

```plaintext
>DIS ss_name
```

where

```plaintext
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

<table>
<thead>
<tr>
<th>Information about member disks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>DK02</td>
</tr>
<tr>
<td>Perm  DK13</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 17</td>
</tr>
<tr>
<td>failed</td>
<td>step 48</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 18</td>
</tr>
<tr>
<td>failed</td>
<td>step 48</td>
</tr>
</tbody>
</table>

**At the storage device shelf**

18 Determine the state of both LEDs on the storage device.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>no LEDs are lit</td>
<td>step 19</td>
</tr>
</tbody>
</table>
in a storage device shelf in a file processor (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one or both LEDs are lit</td>
<td>step 48</td>
</tr>
</tbody>
</table>

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.

If one or both LEDs are lit, step 48
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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 30</td>
</tr>
<tr>
<td>failed</td>
<td>step 48</td>
</tr>
</tbody>
</table>
in a storage device shelf in a file processor (continued)

30 Determine the type of device you replaced.

<table>
<thead>
<tr>
<th>If the device type</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is clk</td>
<td>step 31</td>
</tr>
<tr>
<td>is ctc</td>
<td>step 46</td>
</tr>
</tbody>
</table>

31 Determine if the disk drive is a member of a shadow set.

<table>
<thead>
<tr>
<th>If the disk drive</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a member of a shadow set</td>
<td>step 32</td>
</tr>
<tr>
<td>is not a member of a shadow set</td>
<td>step 36</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the SM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 35</td>
</tr>
<tr>
<td>failed</td>
<td>step 48</td>
</tr>
</tbody>
</table>

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:
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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 37</td>
</tr>
<tr>
<td>failed</td>
<td>step 48</td>
</tr>
</tbody>
</table>

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:`
To confirm the command, type

>YES

and press the Enter key.

From your office records, determine the number, size, and type of volumes the replacement disk requires.

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"):  

***** 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"): 

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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 47</td>
</tr>
<tr>
<td>failed</td>
<td>step 48</td>
</tr>
</tbody>
</table>

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)

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.
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X91</td>
<td>AA</td>
<td>Storage device power converter</td>
<td>FP storage device</td>
</tr>
<tr>
<td>NT9X91</td>
<td>AB</td>
<td>Power converter +5 V +12 V</td>
<td>FP storage device</td>
</tr>
</tbody>
</table>

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.
Summary of Replacing a NT9X91 in a storage device shelf in a file processor

This flowchart summarizes the procedure.

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

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>14</td>
<td>0</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>FP</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

   ?P 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:

<table>
<thead>
<tr>
<th>FP 3:</th>
<th>FP3_SR256 Plane Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTb</td>
<td>NoSync</td>
</tr>
<tr>
<td>CTRL0</td>
<td>CTRL1</td>
</tr>
<tr>
<td>DABM</td>
<td></td>
</tr>
<tr>
<td>SCSI 0</td>
<td>.(EN) .(DIS)</td>
</tr>
<tr>
<td>SCSI 1</td>
<td>.(EN) .(DIS)</td>
</tr>
</tbody>
</table>

   0 1 2 3 4 5
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
   \texttt{>POSTDEV scsi\_bus\_no device\_no}
   and press the Enter key.
   \textit{where}
   \begin{itemize}
   \item \texttt{scsi\_bus\_no}
     \textit{is the number of the SCSI bus (0 or 1)}
   \item \texttt{device\_no}
     \textit{is the number of the device (0 to 5)}
   \end{itemize}
   \textit{Example of a MAP display:}

   \begin{tabular}{llllllll}
   DK12 & Type & DISK & & & & & \\
   Shelf & 2 & Status & InSv & SCSI bus & 1 & Device & 2 \\
   Quad & 1 & Drive & On Line & User & SYSTEM & & \\
   \end{tabular}

6 To query the device, type
   \texttt{>QRYDEV}
   and press the Enter key.
   \textit{Example of a MAP response:}

   \begin{tabular}{llllllll}
   Dev Name & SCSI Dev & Type & Quad & Shelf & Slot & Status \\
   DK00 & 0 & 0 & dk & 3 & 8 & InSv \\
   \end{tabular}

7 From the MAP display the system generated in step 6, record the following information for the device:
   \begin{itemize}
   \item SCSI number
   \item device number
   \item device type
   \item quadrant location
   \item shelf number
   \item slot number
   \end{itemize}
   \textit{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.

   \begin{tabular}{ll}
   \textbf{If the device} & \textbf{Do} \\
   \hline
   is \texttt{dk} & step 8 \\
   is \texttt{ct} & step 14 \\
   \end{tabular}
8 Determine if the associated disk drive is a member of a shadow set.  

**Note:** Datafill shadow sets in table SHADOW.

<table>
<thead>
<tr>
<th>If the disk drive</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a member of a shadow set</td>
<td>step 9</td>
</tr>
<tr>
<td>is not a member of a shadow set</td>
<td>step 14</td>
</tr>
</tbody>
</table>

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

关羽 member disks:

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th>SyncState</th>
<th>Reads</th>
<th>Writes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perm DK13</td>
<td>INSV</td>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Perm DK14</td>
<td>INSV</td>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Information about member disks:

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th>SyncState</th>
<th>Reads</th>
<th>Writes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perm DK13</td>
<td>INSV</td>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Perm DK14</td>
<td>INSV</td>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**If**

- another shadow set member is in service  
  - step 11
- no other shadow set member is in service  
  - step 26
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:*

```plaintext
>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"):  
```

**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.

**To quit the shadow utility, type**

```
>QUIT
```

and press the Enter key.

Go to step 15.
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.

If the alarm light on the power converter

<table>
<thead>
<tr>
<th>Lights</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lights</td>
<td>step 16</td>
</tr>
<tr>
<td>Does not light</td>
<td>step 26</td>
</tr>
</tbody>
</table>

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.

If the alarm light on the power converter

<table>
<thead>
<tr>
<th>Lights</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turns off</td>
<td>step 18</td>
</tr>
<tr>
<td>Remains on</td>
<td>step 26</td>
</tr>
</tbody>
</table>
NT9X91
in a storage device shelf in a file processor (continued)

18 Determine the type of device you noted in step 7.

<table>
<thead>
<tr>
<th>If the device</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is clk</td>
<td>step 19</td>
</tr>
<tr>
<td>is ct</td>
<td>step 24</td>
</tr>
</tbody>
</table>

19 Determine if the disk drive is a member of a shadow set.

<table>
<thead>
<tr>
<th>If the disk drive</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a member of a shadow set</td>
<td>step 20</td>
</tr>
<tr>
<td>is not a member of a shadow set</td>
<td>step 24</td>
</tr>
</tbody>
</table>

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:
The member will be started with the following parameters:

- **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.
```

<table>
<thead>
<tr>
<th>If the device</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>returned to service</td>
<td>step 23</td>
</tr>
<tr>
<td>did not return to service</td>
<td>step 26</td>
</tr>
</tbody>
</table>

**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:*
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 Test DEV 0 1: Command request has been submitted.
FP 1 Test DEV 0 1: Command passed.
```

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 25</td>
</tr>
<tr>
<td>failed</td>
<td>step 26</td>
</tr>
</tbody>
</table>

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.
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 27</td>
</tr>
<tr>
<td>failed</td>
<td>step 26</td>
</tr>
</tbody>
</table>

For additional help, contact the next level of support.

The procedure is complete.
Application

Use this procedure to replace the following cards in a SuperNode Multicomputing Base (SMB) file processor (FP).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT9X13</td>
<td>LA</td>
<td>AP/FP 68030 HPM-based CPU card</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X14</td>
<td>DB</td>
<td>24-Mbyte memory card</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X21</td>
<td>AB</td>
<td>Bus terminator paddle board</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X26</td>
<td>AA, AB</td>
<td>Remote terminal interface paddle board</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X62</td>
<td>AA</td>
<td>Two-port subrate DS512 paddle board</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X86</td>
<td>AA, AB</td>
<td>Two-port message controller card</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X87</td>
<td>AA</td>
<td>Two-access buffer memory card</td>
<td>FP</td>
</tr>
<tr>
<td>NT9X88</td>
<td>AA</td>
<td>SCSI interface processor paddle board</td>
<td>FP</td>
</tr>
<tr>
<td>NTDX15</td>
<td>AA</td>
<td>Power converter ±5 V</td>
<td>FP</td>
</tr>
<tr>
<td>NTDX15</td>
<td>AB</td>
<td>Global power converter ±5 V</td>
<td>FP</td>
</tr>
</tbody>
</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. 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

This flowchart summarizes the procedure.

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

---

1. Card on active side?
   - Y: Inactive CPU jammed?
     - Y: Release jam on inactive CPU
     - N: FP synchronized?
       - Y: Synchronize FP
       - N: Switch activity and match memories
         - Y: Jam inactive CPU and drop synchronization
         - N: SCSI busses disabled?
           - Y: Test card
           - N: End
  - N: Replace card

2. Inactive CPU jammed?
   - Y: FP synchronized?
     - Y: Power down quadrant
     - N: Manually busy controller on inactive plane
       - Y: Manually busy P-links
       - N: Enable SCSI bus on inactive plane
         - Y: Power up quadrant
         - N: Return P-links to service

3. FP synchronized?
   - Y: Synchronize FP
   - N: Jam inactive CPU and drop synchronization

4. SCSI busses disabled?
   - Y: Test card
   - N: End

5. End
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:

<table>
<thead>
<tr>
<th>FP 20:</th>
<th>FP20_QPI0</th>
<th>Plane</th>
<th>Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>InSv</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

4 To access the Plane level of the MAP display, type
   >PLANE
   and press the Enter key.

   Example of a MAP display:

<table>
<thead>
<tr>
<th>Sync No</th>
<th>CPU state act</th>
<th>Jam</th>
<th>DRAM 0123</th>
<th>Port Card 0 1</th>
<th>MsgCh 0 1</th>
<th>PLink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plane 0</td>
<td>A</td>
<td>-...</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Plane 1</td>
<td>I No</td>
<td>-...</td>
<td>F L L P P</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
Determine if the inactive CPU is jammed.

**Note:** The word YES under the Jam header indicates that the CPU is jammed. The word NO indicates that the CPU is not jammed.

<table>
<thead>
<tr>
<th>If the inactive CPU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is jammed</td>
<td>step 7</td>
</tr>
<tr>
<td>is not jammed</td>
<td>step 8</td>
</tr>
</tbody>
</table>

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

```
>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.
```

Determine if the FP is synchronized.

**Note:** The word YES under the Sync header indicates that the FP synchronized. The word NO indicates that the FP did not synchronize.

<table>
<thead>
<tr>
<th>If the FP</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is synchronized</td>
<td>step 10</td>
</tr>
<tr>
<td>is not synchronized</td>
<td>step 9</td>
</tr>
</tbody>
</table>

To synchronize the FP, type

```
>SYNC
```

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.
```
System cards
in a file processor (continued)

To switch activity, type

\texttt{>SWACT}

and press the Enter key.

\textit{Example of a MAP response:}

FP 3 Synchronization: Request has been submitted.
FP 3 Synchronization: Command completed.
The PM is now running in sync.

<table>
<thead>
<tr>
<th>If the SYNC command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 10</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

10 To switch activity, type

\texttt{>SWACT}

and press the Enter key.

\textit{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.

<table>
<thead>
<tr>
<th>If the SWACT command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 11</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

11 To match the memories of the CPUs, type

\texttt{>MATCH}

and press the Enter key.

\textit{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.

<table>
<thead>
<tr>
<th>If the system</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>completed the conditions</td>
<td>step 13</td>
</tr>
<tr>
<td>did not complete the conditions</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.
```

<table>
<thead>
<tr>
<th>If the DPSYNC command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 16</td>
</tr>
</tbody>
</table>
To access the Devices level of the MAP display, type

>`DEVICES

and press the Enter key.

**Example of a MAP display:**

```
FP 3:FP3_SR256PlaneDevices
ISTbNoSync

CTRL0CTRL1 DEVICE
DABM . .0 1 2 3 4 5
SCSI 0 .(EN) . (DIS) - - - -
SCSI 1 .(EN) . (DIS) - - - -
```

16

Determine if the system disabled both SCSI buses on the inactive plane.

**Note:** 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.

To switch enable the SCSI bus on the inactive plane, type

>`SWEN  scsi_no

and press the Enter key.

**Example of a MAP response:**

```
FP 1 SwEn SCSI 0: Command request has been submitted.
FP 1 SwEn SCSI 0: Command passed.
```

17

If both SCSI buses on the inactive plane

<table>
<thead>
<tr>
<th>If both SCSI buses on the inactive plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are disabled</td>
<td>step 19</td>
</tr>
<tr>
<td>are enabled</td>
<td>step 18</td>
</tr>
</tbody>
</table>

18
To manually busy the controller on the inactive plane, type

\texttt{>BSY \ CTRL \ ctrl\_no}

and press the Enter key.

where

\texttt{ctrl\_no}

is the number of the controller (0 or 1) on the inactive plane

Example of a MAP response:

\begin{verbatim}
FP 1 Busy CTRL 0: Command request has been submitted.
FP 1 Busy CTRL 0: Command passed.
\end{verbatim}

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 20</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

To access the Plane level of the MAP display, type

\texttt{>PLANE}

and press the Enter key.

Example of a MAP display:

\begin{verbatim}
Sync No  CPU state act Jam DRAM Port Card 0 1 0 1 0 1
Plane 0 : A -... . . . . .
Plane 1 : I Yes -... . . . . .
\end{verbatim}

Determine if the inactive FP plane is 0 or 1.

\textbf{Note:} The letter A under the Act header indicates that the plane is active. The letter I indicates the plane is inactive.

<table>
<thead>
<tr>
<th>If the inactive plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is 0</td>
<td>step 22</td>
</tr>
<tr>
<td>is 1</td>
<td>step 24</td>
</tr>
</tbody>
</table>

To manually busy the P-links between plane 0 and P-link 0, type

\texttt{>BSY \ PORT 0 \ PLINK 0}

and press the Enter key.

Example of a MAP response:
System cards in a file processor (continued)

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 0, Busy PLink: Request has been submitted.
FP 3, Port 0 PLink 0, Busy PLink: Command completed.

The PLink is manually busy.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 23</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 25</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 26</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the alarm light on the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>turns on</td>
<td>step 27</td>
</tr>
<tr>
<td>does not turn on</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X62</td>
<td>step 28</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 34</td>
</tr>
</tbody>
</table>
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 counterclockwise halfway until the connector slides out of the receptacle.

c When you disconnect the connectors, place dust caps on the ends of the connectors.
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.

<table>
<thead>
<tr>
<th>If the alarm light on the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>turns off</td>
<td>step 36</td>
</tr>
<tr>
<td>remains on</td>
<td>step 62</td>
</tr>
</tbody>
</table>

**At the MAP terminal**

36 Determine if the inactive FP plane is 0 or 1.

<table>
<thead>
<tr>
<th>If the inactive plane</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is 0</td>
<td>step 37</td>
</tr>
<tr>
<td>is 1</td>
<td>step 39</td>
</tr>
</tbody>
</table>

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:*
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 0, RTS PLink: Request has been submitted.
FP 3, Port 0 PLink 0, RTS PLink: Command completed.
The PLink is in-service Test Passed

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 38</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 41</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 41</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT9X86</td>
<td>step 43</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 47</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 44</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>
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)

- **ctrl_no**
  - is the number of the controller (0 or 1) on the inactive plane

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 48</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a NT9X13, NT9X14, NT9X21, or NT9X26</td>
<td>step 49</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 55</td>
</tr>
</tbody>
</table>

49 To access the Plane level of the MAP display, type

>PLANE

and press the Enter key.

50 The next action depends on the type of card you replaced.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a NT9X13</td>
<td>step 51</td>
</tr>
<tr>
<td>is a NT9X26</td>
<td>step 53</td>
</tr>
<tr>
<td>is a NT9X14 or NT9X21</td>
<td>step 54</td>
</tr>
</tbody>
</table>

51 To test the card, type

>TST CPU HW

and press the Enter key.

*Example of a MAP response:*

CPU test of Static RAM will corrupt the load in the inactive CPU.
Please confirm ("YES", "Y", "NO", or "N")

52 To confirm the command, type

>YES

and press the Enter key.

*Example of a MAP response:*
53 To test the card, type

```
>TST CPU HW RTIF
```

and press the Enter key.

*Example of a MAP response:*

```
FP 3 CPU Hardware Test: Request has been submitted.
FP 3 CPU Hardware Test: Command completed.
Inactive CPU hardware has passed all tests issued.
```

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 60</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.
```

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 60</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

```
System cards in a file processor (continued)

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a NT9X87 or NT9X88</td>
<td>step 56</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 59</td>
</tr>
</tbody>
</table>

56 The next action depends on the type of card you replaced.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a NT9X87</td>
<td>step 57</td>
</tr>
<tr>
<td>is a NT9X88</td>
<td>step 58</td>
</tr>
</tbody>
</table>

57 To test the card you replaced, type

```
> TST DABM plane_no
```

and press the Enter key.

where

- `plane_no` is the number of the plane (0 or 1) associated with the card you replaced

Example of a MAP response:

```
FP 3 Test DABM 0: Command request has been submitted.
FP 3 Test DABM 0: Command passed.
```

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 59</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

58 To test the card you replaced, type

```
> TST SCSI scsi_no ctrl_no
```

and press the Enter key.

where

- `scsi_no` 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.

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 59</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the SYNC command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 63</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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

63 The procedure is complete.
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA</td>
<td>FSP drive and alarm card</td>
<td>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</td>
</tr>
<tr>
<td>NT6X36</td>
<td>AA, AF</td>
<td>ARLB FSP alarm card</td>
<td>AP cabinet, CM cabinet, DPCC cabinet, EMC, SNSE cabinet, 128k ENET cabinet, 64k ENET cabinet, LPP cabinet, MS cabinet, SNC cabinet</td>
</tr>
</tbody>
</table>

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**

- Open the FSP panel
- Replace the card
- Close the FSP panel
- Check power on the shelves
- Is power supplied to all shelves?
  - Yes: End
  - No: Clear alarms

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 9</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 10</td>
</tr>
</tbody>
</table>

9
Return to the maintenance procedure that directed you to this procedure and continue as directed.
10 Check the CONVERTER FAIL LEDs on each power converter for each shelf.

<table>
<thead>
<tr>
<th>If the LED for any power converter is lit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>step 11</td>
</tr>
<tr>
<td></td>
<td>step 12</td>
</tr>
</tbody>
</table>

11 To clear alarms, go to *Alarm and Performance Monitoring Procedures*. Do not return to this procedure.

12 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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X36</td>
<td>AB</td>
<td>Power control and alarm card</td>
<td>CIOE</td>
</tr>
</tbody>
</table>

*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

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

Post the IOC
Manually busy all ports and controllers
Spin down the drives as required
Power down the shelf
Replace the card
Power up the shelf
Return ports and controllers to service
Spin up the drives as required
End
Replacing NT0X36 in a cabinetized input/output equipment frame

At your current location

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 cabinet

2 Unscrew the slotted nut on the left of the FSP.

3 Open the FSP.
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36
in a cabinetized input/output equipment frame (continued)

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.

<table>
<thead>
<tr>
<th>Power and alarm card slot</th>
<th>Shelf position</th>
<th>Sub-system</th>
<th>Wiring option</th>
<th>Shelf side</th>
<th>FSP fuse number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR ALM 1</td>
<td>33</td>
<td>DPP</td>
<td>A</td>
<td></td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>MTD</td>
<td>A</td>
<td></td>
<td>02</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>IOC</td>
<td>A</td>
<td></td>
<td>03</td>
</tr>
<tr>
<td>PWR ALM 2</td>
<td>05</td>
<td>DDU 0</td>
<td>A</td>
<td></td>
<td>04</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>ROS</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>IOC</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWR ALM 3</td>
<td>33</td>
<td>DPP</td>
<td>B</td>
<td></td>
<td>05</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>MTD</td>
<td>B</td>
<td></td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>DDU 1</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>ROS</td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

WARNING
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.
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)
Frame supervisory panel and modular supervisory panel card replacement procedures

**NT0X36**

*in a cabinetized input/output equipment frame* (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 |
|      | 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 |
| 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)

<table>
<thead>
<tr>
<th>If the card is other than listed here</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 12</td>
<td></td>
</tr>
</tbody>
</table>

12 To determine if files on the DDU are open, 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 any files are open step 85

all files are closed step 13

13 To manually busy the DDU controller, type
>BSY
and press the Enter key.

14 Spin down the disk drive, type
>STOP
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.

<table>
<thead>
<tr>
<th>If the state of the IOC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is M</td>
<td>step 46</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 17</td>
</tr>
</tbody>
</table>
The next action depends if terminal controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 18</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 24</td>
</tr>
</tbody>
</table>

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 . . . .
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 6 Ckt 0 1 2 3
Status . . . . . . . .
Cons Id RD040 RD041 TEAM4 TEAM6
ConType VT100 VT100 VT100 VT100

Note the CONS ID and status for each port.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all ports are ManBsy</td>
<td>step 23</td>
</tr>
<tr>
<td>one or more ports are Off1</td>
<td>step 84</td>
</tr>
<tr>
<td>one or more ports are . (dot)</td>
<td>step 20</td>
</tr>
<tr>
<td>all ports are in any other out-of-service state</td>
<td>step 21</td>
</tr>
</tbody>
</table>

Inform operating company personnel that you will remove from service the CONS IDs that associate with the card you replace.
### Frame supervisory panel and modular supervisory panel card replacement procedures

**NT0X36**  
*in a cabinetized input/output equipment frame* (continued)

21. To manually busy a port on the card, type  

```bash  
>BSY port_no  
```

and press the Enter key.

*where*

`port_no`  
is the port number (0 to 3)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 22</td>
</tr>
<tr>
<td>failed</td>
<td>step 92</td>
</tr>
</tbody>
</table>

22. Repeat step 21 until all ports on the card are manually 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:

<table>
<thead>
<tr>
<th>If MPC cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 25</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 32</td>
</tr>
</tbody>
</table>

25. To post the MPC card, type  

```bash  
>CARD card_no  
```

and press the Enter key.

*where*

`card_no`  
is the card number (0 to 8)

*Example of a MAP display:*
in a cabinetized input/output equipment frame (continued)

26 Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card state</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MANB</td>
<td>step 31</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 84</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 27</td>
</tr>
</tbody>
</table>

**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
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one or more sessions are active</td>
<td>step 28</td>
</tr>
<tr>
<td>all sessions are inactive</td>
<td>step 29</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 31</td>
</tr>
<tr>
<td>failed</td>
<td>step 92</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If disk drive controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 33</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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:
**Frame supervisory panel and modular supervisory panel card replacement procedures**

**NT0X36**

**in a cabinetized input/output equipment frame** (continued)

---

34 Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 37</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 84</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 35</td>
</tr>
</tbody>
</table>

35 To determine if open files are on the DDU, type

```plaintext
>ALLOC
```

and press the Enter key.

*Example of a MAP response:*

<table>
<thead>
<tr>
<th>VOLID</th>
<th>VOL_NAME</th>
<th>SERIAL_NO</th>
<th>BLOCKS</th>
<th>ADDR</th>
<th>TYPE</th>
<th>R/O</th>
<th>FILES_OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>IMAGE</td>
<td>2800</td>
<td>45000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>XPMLOADS</td>
<td>2801</td>
<td>35000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>RTMLOADS</td>
<td>2802</td>
<td>20000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>SMDR</td>
<td>2807</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>AMA1</td>
<td>2808</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>TST</td>
<td>2809</td>
<td>50</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>AMA2</td>
<td>280A</td>
<td>500</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>any files are open</td>
<td>step 85</td>
</tr>
</tbody>
</table>
NT0X36
in a cabinetized input/output equipment frame (continued)

If                               Do
all files are closed             step 36

36 To manually busy the card, type
>BSY
and press the Enter key.
Example of a MAP response:
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 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.
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:

IOC CARD 0 0 1 2 3 4 5 6 7
0123 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
Frame supervisory panel and modular supervisory panel card replacement procedures (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Determine the state of the card.</td>
</tr>
<tr>
<td></td>
<td><strong>If the card</strong></td>
</tr>
<tr>
<td></td>
<td>is ManBsy</td>
</tr>
<tr>
<td></td>
<td>is Offl</td>
</tr>
<tr>
<td></td>
<td>is Idle</td>
</tr>
<tr>
<td></td>
<td>is other than listed here</td>
</tr>
<tr>
<td>41</td>
<td>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.</td>
</tr>
<tr>
<td>42</td>
<td>To manually busy the card, type</td>
</tr>
<tr>
<td></td>
<td>and press the Enter key.</td>
</tr>
<tr>
<td></td>
<td><em>Example of a MAP response:</em></td>
</tr>
<tr>
<td></td>
<td>bsy</td>
</tr>
<tr>
<td></td>
<td>OK</td>
</tr>
<tr>
<td>43</td>
<td>Repeat steps 39 and 42 for each magnetic tape drive controller card on the shelf. Go to step 44.</td>
</tr>
<tr>
<td>44</td>
<td>To return to the IOC level of the MAP display, type</td>
</tr>
<tr>
<td></td>
<td>and press the Enter key.</td>
</tr>
<tr>
<td>45</td>
<td>To manually busy the affected IOC, type</td>
</tr>
<tr>
<td></td>
<td>and press the Enter key.</td>
</tr>
<tr>
<td>46</td>
<td>The next action depends on if the other subsystem that associates with the power and alarm card you replace is out of service.</td>
</tr>
<tr>
<td></td>
<td><strong>If the other subsystem</strong></td>
</tr>
<tr>
<td></td>
<td>is out of service</td>
</tr>
<tr>
<td></td>
<td>is not out of service</td>
</tr>
<tr>
<td></td>
<td>that associates with the card you replace is not present</td>
</tr>
<tr>
<td>47</td>
<td>To remove the other subsystem that associates with the card you replace, go to step 9 and follow the procedure.</td>
</tr>
</tbody>
</table>
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.

51
Remove the card from the slot that you recorded in step 5.

52
Insert the replacement card.

53
Close the FSP.

54
Tighten the slotted nut on the FSP.

55
Insert the fuses that you removed in step 49.

56
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)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>Go to step 61.</td>
</tr>
</tbody>
</table>
| 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**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 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 |   |
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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed (status is <code>Ready</code> and drive state is <code>on-line</code>)</td>
<td>step 62</td>
</tr>
<tr>
<td>failed (status or drive state is other than listed here)</td>
<td>step 92</td>
</tr>
</tbody>
</table>

66 The next action depends if the controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If disk drive or magnetic tape drive controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 67</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 70</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If MPC cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 71</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 77</td>
</tr>
</tbody>
</table>

71 To post the card, type

```
>CARD  card_no
```

and press the Enter key.

*where*

*card_no* is the card number (0 to 8)
Frame supervisory panel and modular supervisory panel card replacement procedures

in a cabinetized input/output equipment frame

To load the MPC, type

>`DOWNLD` and press the Enter key.

*Example of a MAP response:*

```
DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED
```

<table>
<thead>
<tr>
<th>If the DOWNLD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 73</td>
</tr>
<tr>
<td>failed</td>
<td>step 92</td>
</tr>
</tbody>
</table>

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.
```

Wait 1 min and check the status of MPC components.

<table>
<thead>
<tr>
<th>If the system status</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is Ready, the board status is COMACT, and the link status is ENABLD for each provisioned link</td>
<td>step 75</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 92</td>
</tr>
</tbody>
</table>

Repeat steps 71 to 74 for each card on the shelf. Go to step 76.

The next action depends if terminal controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 78</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 80</td>
</tr>
</tbody>
</table>

To post the card, type

>`CARD card_no` and press the Enter key.

where
## NT0X36
in a cabinetized input/output equipment frame (continued)

<table>
<thead>
<tr>
<th>card_no is the card number (0 to 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>79</strong> To return a port on the card to service, type &gt;RTS port_no and press the Enter key.</td>
</tr>
</tbody>
</table>

**where**

| port_no is the port number (0 to 3) |

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 80</td>
</tr>
<tr>
<td>failed</td>
<td>step 92</td>
</tr>
</tbody>
</table>

| **80** The next action depends if the other subsystem that associates with the card you replaced was returned to service. |

<table>
<thead>
<tr>
<th>If the other subsystem</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>was returned to service</td>
<td>step 82</td>
</tr>
<tr>
<td>was not returned to service</td>
<td>step 81</td>
</tr>
<tr>
<td>does not associate with the card you replaced</td>
<td>step 82</td>
</tr>
</tbody>
</table>

| **81** Go to step 63 and follow the procedure to return to service the other subsystem that associates with the card you replaced. |

| **82** The next action depends on the reason that you perform this procedure. |

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 83</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 93</td>
</tr>
</tbody>
</table>

| **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. |
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.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 89</td>
</tr>
<tr>
<td>are closed</td>
<td>step 90</td>
</tr>
</tbody>
</table>

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
    \texttt{\textgreater BSY}
    and pressing the Enter key.

\begin{tabular}{l l}
\hline
If the DDU & Do \\
\hline
is MBSY & step 91 \\
not MBSY & step 92 \\
\hline
\end{tabular}

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 \textit{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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X36</td>
<td>AB</td>
<td>Power control and alarm card</td>
<td>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).</td>
</tr>
</tbody>
</table>

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.
This flowchart summarizes the procedure.

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

Summary of replacing NT0X36 in a cabinetized trunk module equipment frame

1. Post the PMs
2. Manually busy the circuits
3. Manually busy the PMs
4. Power down the shelves
5. Replace the card
6. Power up the shelves
7. Return the PMs to service
8. Return the circuits to service
9. End
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36

in a cabinetized trunk module equipment frame (continued)

Replacing NT0X36 in a cabinetized trunk module equipment frame

At your current location

1

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 Un螺丝 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)

<table>
<thead>
<tr>
<th>Power and alarm card slot</th>
<th>FSP fuse number</th>
<th>Shelf position</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR ALM 1</td>
<td>01</td>
<td>05</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>33</td>
</tr>
</tbody>
</table>

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.
**NT0X36**
in a cabinetized trunk module equipment frame (continued)

**Record the fuse numbers and shelf positions that associate with the card you replace.**

<table>
<thead>
<tr>
<th>Power and alarm card slot</th>
<th>FSP fuse number</th>
<th>Shelf position</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR ALM 2</td>
<td>04</td>
<td>19</td>
</tr>
<tr>
<td>PWR ALM 3</td>
<td>05</td>
<td>47</td>
</tr>
</tbody>
</table>

**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.
in a cabinetized trunk module equipment frame

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:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td>102</td>
</tr>
</tbody>
</table>

8 The next step depends on the type of PM that is in the shelf.

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an OAU</td>
<td>step 9</td>
</tr>
<tr>
<td>is MTM, STM, or TM</td>
<td>step 13</td>
</tr>
</tbody>
</table>

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:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAU</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>102</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>If the OAU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is OffL</td>
<td>step 129</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 40</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 11</td>
</tr>
</tbody>
</table>
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.

To manually busy the PM, type

>`BSY

and press the Enter key.

Example of a MAP display:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAU</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>14</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>OAU</td>
<td>0</td>
<td>ManB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bsy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bsy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OK.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go to step 40.

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.

<table>
<thead>
<tr>
<th>If essential services</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>use PM resources, and a minimum of one PM is in service</td>
<td>step 128</td>
</tr>
<tr>
<td>use PM resources and all PMs are out of service</td>
<td>step 14</td>
</tr>
<tr>
<td>do not use PM resources</td>
<td>step 14</td>
</tr>
</tbody>
</table>

To post the PM, type

>`POST pm_type pm_no`

and press the Enter key.

**Note:**

- `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:
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36

in a cabinetized trunk module equipment frame (continued)

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).

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is Offl</td>
<td>step 129</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 16</td>
</tr>
</tbody>
</table>

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:*

<table>
<thead>
<tr>
<th>POST</th>
<th>DELQ</th>
<th>BUSYQ</th>
<th>DIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTP</td>
<td>6-013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CKT</td>
<td>TYPE</td>
<td>PM NO.</td>
<td>COM LANG</td>
</tr>
</tbody>
</table>

17 To post the circuits for the PM, type

>`POST P pm_type pm_no`

and press the Enter key.

*where*

<table>
<thead>
<tr>
<th>pm_type</th>
<th>is the type of PM (MTM, STM, TM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pm_no</td>
<td>is the number of the PM (0 to 9999)</td>
</tr>
</tbody>
</table>

*Example of a MAP display:*
Frame supervisory panel and modular supervisory panel card replacement procedures

**NTOX36**

in a cabinetized trunk module equipment frame (continued)

---

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a minimum of one circuit is in the <strong>INB</strong> state</td>
<td>step 19</td>
</tr>
<tr>
<td>circuits are not in the <strong>INB</strong> state</td>
<td>step 24</td>
</tr>
</tbody>
</table>

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:*

---

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.
The next action depends if the affected shelf has the NT1X80 enhanced digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains the NT1X80 or the NT1X81</td>
<td>step 23</td>
</tr>
<tr>
<td>does not contain the NT1X80 or the NT1X81</td>
<td>step 27</td>
</tr>
</tbody>
</table>

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.

To manually busy all posted circuits, type

```
>BSY  ALL
```

and press the Enter key.

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.

Repeat steps 23 to 25 for all NT1X80 and NT1X81 cards on the shelf.

To access the PM level of the MAP display, type

```
>PM
```

and press the Enter key.

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)
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36
in a cabinetized trunk module equipment frame (continued)

29  Determine the state of the PM.

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 31</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 30</td>
</tr>
</tbody>
</table>

30  To manually busy the PM, type

>BSY

and press the Enter key.

*Example of a MAP display:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTM</td>
<td>58</td>
<td>1</td>
<td>6</td>
<td>14</td>
<td>12</td>
<td>17</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains the NT1X80 or the NT1X81</td>
<td>step 32</td>
</tr>
<tr>
<td>does not contain the NT1X80 or the NT1X81</td>
<td>step 36</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 35</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 34</td>
</tr>
</tbody>
</table>
Frame supervisory panel and modular supervisory panel card replacement procedures

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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains an STM, and you manually busied only one STM</td>
<td>step 37</td>
</tr>
<tr>
<td>contains an STM, and you manually busied both STMs</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 40</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you turned down functionality for only one shelf</td>
<td>step 39</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you turned down functionality for both shelves</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains an STM (with or without DRAM)</td>
<td>step 43</td>
</tr>
<tr>
<td>contains an MTM (with or without DRAM)</td>
<td>step 44</td>
</tr>
<tr>
<td>contains a TM</td>
<td>step 45</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 47</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down only one shelf</td>
<td>step 46</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down both shelves</td>
<td>step 47</td>
</tr>
</tbody>
</table>

46 Repeat steps 41 to 45 for PMs in the other shelf that associates with the FSP card you replace. Go to step 47.
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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains an STM or an MTM (with or without DRAM) and you powered up both power converters</td>
<td>step 58</td>
</tr>
<tr>
<td>contains an STM (with or without DRAM)</td>
<td>step 54</td>
</tr>
<tr>
<td>contains an MTM (with or without DRAM)</td>
<td>step 55</td>
</tr>
<tr>
<td>contains a TM</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 58</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered up only one shelf</td>
<td>step 57</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered up both shelves</td>
<td>step 58</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an OAU</td>
<td>step 60</td>
</tr>
<tr>
<td>is an STM, TM, or MTM</td>
<td>step 64</td>
</tr>
</tbody>
</table>

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:
in a cabinetized trunk module equipment frame (continued)

64 To post the PM, type
>POST  pm_type  pm_no
and press the Enter key.
where

<table>
<thead>
<tr>
<th>pm_type</th>
<th>is the type of PM (IMTM, STM, TM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pm_no</td>
<td>is the number of the PM (0 to 9999)</td>
</tr>
</tbody>
</table>

65 To load the PM, type
>LOADPM
and press the Enter key.

Example of a MAP response:

MTM 0 LoadPM  Passed

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 67</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and the PM is InSv</td>
<td>step 76</td>
</tr>
</tbody>
</table>
**NT0X36**  
in a cabinetized trunk module equipment frame (continued)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and the PM is ISTb with a system-generated card list</td>
<td>step 68</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains the NT1X80 or the NT1X81</td>
<td>step 70</td>
</tr>
<tr>
<td>does not contain the NT1X80 or the NT1X81</td>
<td>step 76</td>
</tr>
</tbody>
</table>

**70** To post the single-card PM, type

```plaintext
>POST pm_type pm_no
```

and press 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** To load the single-card PM, type

```plaintext
>LOADPM
```

and press the Enter key.

*Example of a MAP response:*

```
DTM 0 LoadPM Passed
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 73</td>
</tr>
<tr>
<td>failed</td>
<td>step 72</td>
</tr>
</tbody>
</table>

**72** To load the single-card PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

**73** To return the PM to service, type

```plaintext
>RTS
```

and press the Enter key.

*Example of a MAP response:*
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36

in a cabinetized trunk module equipment frame

(continued)

MTM 0 Rts Passed

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and the PM is InSv</td>
<td>step 75</td>
</tr>
<tr>
<td>passed, and the PM is ISTb with a system-generated card list</td>
<td>step 74</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has MTUs</td>
<td>step 78</td>
</tr>
<tr>
<td>has DTUs</td>
<td>step 93</td>
</tr>
<tr>
<td>does not have MTUs or DTUs</td>
<td>step 108</td>
</tr>
</tbody>
</table>

78 To post the first circuit in the MTU, type

>`POST G MTU circuit_no`

and press the Enter key.

where

`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

Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36

in a cabinetized trunk module equipment frame (continued)

load_name
is the load file name that you recorded in step 88

<table>
<thead>
<tr>
<th>If the LOADFW command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 91</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>

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.
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

<table>
<thead>
<tr>
<th>If the LOADFW command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 106</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>
To release the first DTU circuit, type
>RLS RLS

To release the second DTU circuit, type
>RLS RLS

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)

To return all the circuits to service, type
>RTS ALL
and press the Enter key.

Example of a MAP response:

RTS OK

The next action depends if you recorded INB circuits in step 19.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>recorded INB circuits</td>
<td>step 111</td>
</tr>
<tr>
<td>did not record INB</td>
<td>step 114</td>
</tr>
</tbody>
</table>

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

To return the circuit to the INB state, type
>BSY INB
and press the Enter key.

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 121</td>
</tr>
<tr>
<td>passed, but in-service tests failed, and the system generated a card list</td>
<td>step 115</td>
</tr>
</tbody>
</table>

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:
To access the PM level of the MAP display, type

>`PM

and press the Enter key.

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)

Repeat steps 64 to 119 for other PMs on this shelf. Go to step 124.

If the TST command passed, and single-card PMs or an STM remain out of service

If the TST command passed, and you worked on all PMs on the shelf and all PMs have been returned to service

If the TST command passed, and you worked on all PMs on the shelf but one or more PMs have not been successfully returned to service

If the TST command failed, and single-card PMs or an STM are present that you did not work on to return to service

If the TST command failed, and you worked on all PMs on the shelf
The next action depends on how many shelves associate with the FSP card you replace.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 126</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you returned to service the PM on only one shelf</td>
<td>step 125</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you returned to service the PM on both shelves</td>
<td>step 126</td>
</tr>
</tbody>
</table>

Repeat steps 59 to 124 for PMs in the other shelf that associates with the FSP card, and you returned to service the PM on only one shelf. Go to step 126.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 127</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 131</td>
</tr>
</tbody>
</table>

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

To determine how to handle essential services, consult the next level of support. Continue as directed by operating company personnel.

To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

For additional help, contact the next level of support.

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X36</td>
<td>AB</td>
<td>Power control and alarm card</td>
<td>IOE frame</td>
</tr>
</tbody>
</table>

*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.
Summary of Replacing a NT0X36 in an input/output equipment frame

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

Post the IOC

Manually busy all ports and controllers

Spin down the drives, if required

Power down the shelf

Replace the card

Power up the shelf

Return ports and controllers to service

Spin up the drives, if required

End
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.

<table>
<thead>
<tr>
<th>Alarm and control card</th>
<th>Slot</th>
<th>Shelf position</th>
<th>Fuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X36AB</td>
<td>slot 1</td>
<td>04</td>
<td>03</td>
</tr>
<tr>
<td>NT0X36AB</td>
<td>slot 1</td>
<td>32</td>
<td>01</td>
</tr>
<tr>
<td>NT0X36AB</td>
<td>slot 2</td>
<td>18</td>
<td>02</td>
</tr>
</tbody>
</table>

3 Record the PWR&ALM slot, shelf positions, and fuses that associate with the card you replace.
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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains one or two DDUs</td>
<td>step 8</td>
</tr>
<tr>
<td>contains an IOC</td>
<td>step 16</td>
</tr>
<tr>
<td>is empty</td>
<td>step 46</td>
</tr>
<tr>
<td>contains an item other than listed</td>
<td>step 95</td>
</tr>
<tr>
<td>here</td>
<td></td>
</tr>
</tbody>
</table>

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)

9 Determine the state of the DDU controller card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 13</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 87</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 10</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>If files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 88</td>
</tr>
<tr>
<td>are closed</td>
<td>step 11</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>other DDUs on the shelf are not present</td>
<td>step 46</td>
</tr>
<tr>
<td>another DDU is on the shelf, and both DDUs spun down</td>
<td>step 15</td>
</tr>
<tr>
<td>another DDU is on the shelf that is not the mate to the DDU that you spun down</td>
<td>step 95</td>
</tr>
<tr>
<td>another DDU is on the shelf that is the mate to the DDU that you spun down</td>
<td></td>
</tr>
</tbody>
</table>

15 Repeat steps 8 to 14 for each disk drive on the shelf. Go to step 46.

16 Determine the state of the IOC.

<table>
<thead>
<tr>
<th>If the state of the IOC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is M</td>
<td>step 46</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 17</td>
</tr>
</tbody>
</table>
NT0X36
in an input/output equipment frame (continued)

17 The next action depends if terminal controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 18</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 24</td>
</tr>
</tbody>
</table>

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  . . . .

IOD  IOC CARD 0 1 2 3 4 5 6 7 8
PORT 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
```

19 Note the CONS ID and status for each port.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all ports are ManBsy</td>
<td>step 23</td>
</tr>
<tr>
<td>a minimum of one port is Offl</td>
<td>step 87</td>
</tr>
<tr>
<td>a minimum of one port is . (dot)</td>
<td>step 20</td>
</tr>
<tr>
<td>all ports are in any other out-of-service state</td>
<td>step 21</td>
</tr>
</tbody>
</table>

20 Inform operating company personnel that you will remove from service the CONS IDs for the card you replace.
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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 22</td>
</tr>
<tr>
<td>failed</td>
<td>step 95</td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 25</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 32</td>
</tr>
</tbody>
</table>

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:*
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36
in an input/output equipment frame (continued)

Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card state</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MANB</td>
<td>step 31</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 87</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 27</td>
</tr>
</tbody>
</table>

**Note:** The card state appears under the BOARD header on the MAP display.

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
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a minimum of one session is active</td>
<td>step 28</td>
</tr>
</tbody>
</table>

297-9051-547 Standard 02.01 April 2000
### NT0X36

**in an input/output equipment frame** (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all sessions are inactive</td>
<td>step 29</td>
</tr>
</tbody>
</table>

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.

   *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.

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 31</td>
</tr>
<tr>
<td>failed</td>
<td>step 95</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If disk drive controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 33</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 17</td>
</tr>
</tbody>
</table>

33 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:*
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36
in an input/output equipment frame (continued)

34 Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 37</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 87</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 35</td>
</tr>
</tbody>
</table>

35 To determine if files are open on the DDU, type

>ALLOC

and press the Enter key.

Example of a MAP response:

<table>
<thead>
<tr>
<th>VOLID</th>
<th>VOL_NAME</th>
<th>SERIAL_NO</th>
<th>BLOCKS</th>
<th>ADDR</th>
<th>TYPE</th>
<th>R/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>IMAGE</td>
<td>2800</td>
<td>45000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td>1</td>
<td>XPMLOADS</td>
<td>2801</td>
<td>35000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td>2</td>
<td>RTMLOADS</td>
<td>2802</td>
<td>20000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>SMDR</td>
<td>2807</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td>8</td>
<td>AMA1</td>
<td>2808</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td>9</td>
<td>TST</td>
<td>2809</td>
<td>50</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td>10</td>
<td>AMA2</td>
<td>280A</td>
<td>500</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
</tr>
</tbody>
</table>
To manually busy the card, type

```>BSY```

and press the Enter key.

*Example of a MAP response:*

```
bsyOK
```

Repeat steps 33 to 36 for each disk drive controller card on the shelf. Go to step 38.

The next action depends on if magnetic tape drive controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If magnetic tape drive controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 39</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 44</td>
</tr>
</tbody>
</table>

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:*
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36
in an input/output equipment frame (continued)

Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManBsy</td>
<td>step 43</td>
</tr>
<tr>
<td>is Offl</td>
<td>step 87</td>
</tr>
<tr>
<td>is Idle</td>
<td>step 42</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 41</td>
</tr>
</tbody>
</table>

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
and press the Enter key.

The next action depends on the FSP card you replace.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace the card in slot PWR&amp;ALM 1</td>
<td>step 47</td>
</tr>
<tr>
<td>replace the card in slot PWR&amp;ALM 2</td>
<td>step 48</td>
</tr>
</tbody>
</table>

Repeat step 7 for the second shelf position that you recorded at step 3. Go to step 48.

At the frame

For each power converter on the shelf, pull down and set the handle of the power converter POWER switch to the OFF position.

Remove the fuses that associate with the alarm and control card, as recorded in step 3.

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.

Open the FSP.

Insert the replacement card.

---

**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.

**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.
### 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.

<table>
<thead>
<tr>
<th>If the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AA/AB/AC/AD card</td>
<td>step 58</td>
</tr>
<tr>
<td>is an NT2X70AE card</td>
<td>step 59</td>
</tr>
<tr>
<td>is an NT1X78 card</td>
<td>step 60</td>
</tr>
</tbody>
</table>

58 Power up the converter.

- **a** Pull up and set the handle of the POWER switch to the RESET position. Hold the handle until the CONVERTER FAIL LED turns off.
- **b** Release the handle.
- **c** Go to step 61.

59 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.
- **d** Go to step 61.

60 Reset the power converter:

- **a** Pull up and 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 LED is lit. A lit power LED indicates that the power converter is ON.

<table>
<thead>
<tr>
<th>If the power LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is lit, and is the only power converter on the shelf (IOC shelf or a single-DDU shelf)</td>
<td>step 63</td>
</tr>
<tr>
<td>is lit, and another power converter is on the shelf (two-DDU shelf)</td>
<td>step 62</td>
</tr>
<tr>
<td>is not lit</td>
<td>step 95</td>
</tr>
</tbody>
</table>
Repeat step 57 for the other power converter on the shelf.

**At the MAP terminal**

Select a shelf position from the list that you recorded at step 3.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has one or two DDUs</td>
<td>step 64</td>
</tr>
<tr>
<td>has an IOC</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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)

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed (status is Ready and drive state is on-line)</td>
<td>step 66</td>
</tr>
<tr>
<td>failed (status or drive state is other than listed here)</td>
<td>step 95</td>
</tr>
</tbody>
</table>

The next action depends on the disk drive configuration in the IOC subsystem for your office.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>other DDUs are not on the shelf</td>
<td>step 84</td>
</tr>
<tr>
<td>another DDU is on the shelf and both are in service</td>
<td>step 84</td>
</tr>
<tr>
<td>another DDU is on the shelf that you did not return to service</td>
<td>step 67</td>
</tr>
</tbody>
</table>

Repeat steps 64 to 66 for each disk drive on the shelf. Go to step 83.

To return the IOC to service, type

```
>RTS  IOC
```

and press the Enter key.
The next action depends if the controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If disk drive or magnetic tape drive or magnetic tape drive controller cards are on the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are not on the shelf</td>
<td>step 73</td>
</tr>
</tbody>
</table>

To post the card, type

```
> CARD  card_no
```

and press the Enter key.

where

```
card_no
```

is the card identification number (0 to 8)

To return the card to service, type

```
> RTS
```

and press the Enter key.

Repeat steps 70 and 71 for each disk drive or magnetic tape drive controller card on the shelf. Go to step 73.

The next action depends if MPC cards are on the shelf.

<table>
<thead>
<tr>
<th>If MPC cards are on the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are not on the shelf</td>
<td>step 80</td>
</tr>
</tbody>
</table>

To post the card, type

```
> CARD  card_no
```

and press the Enter key.

where

```
card_no
```

is the card identification number (0 to 8)

To load the MPC, type

```
> DOWNLD
```

and press the Enter key.

Example of a MAP response:
DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.

<table>
<thead>
<tr>
<th>If the DOWNLD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 76</td>
</tr>
<tr>
<td>failed</td>
<td>step 95</td>
</tr>
</tbody>
</table>

To return the MPC to service, type

\texttt{>RTS ALL}

and press the Enter key.

\textit{Example of a MAP response:}

\texttt{REQUEST PASSED FOR CARD, REQUEST PASSED FOR LINKS.}

77 Wait 1 min to determine the status of MPC components.

<table>
<thead>
<tr>
<th>If the system status</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is Ready, the board status is COMACT, and the link status is ENABL for each link</td>
<td>step 78</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 95</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 81</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 83</td>
</tr>
</tbody>
</table>

81 To post the card, type

\texttt{>CARD card_no}

and press the Enter key.

\textit{where}

\texttt{card_no}

is the card identification number (0 to 8)

82 To return a port on the card to service, type

\texttt{>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)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 83</td>
</tr>
<tr>
<td>failed</td>
<td>step 95</td>
</tr>
</tbody>
</table>

83 The next action depends on the FSP card that you replace.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace the card in slot PWR&amp;ALM 1</td>
<td>step 84</td>
</tr>
<tr>
<td>replace the card in slot PWR&amp;ALM 2</td>
<td>step 85</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 86</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 96</td>
</tr>
</tbody>
</table>

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
Frame supervisory panel and modular supervisory panel card replacement procedures

Before starting card replacement procedures, close the DIRP volumes. Close files from DIRP and demount active volumes from the DDU. Use the procedure, "Deallocation 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.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 92</td>
</tr>
<tr>
<td>are closed</td>
<td>step 93</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the DDU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 94</td>
</tr>
<tr>
<td>is not MBSY</td>
<td>step 95</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X36</td>
<td>AB</td>
<td>Power control and alarm card</td>
<td>CAM equipped with office alarm unit (OAU), international packaged trunk module (IPTM) or international maintenance trunk module (IMTM).</td>
</tr>
</tbody>
</table>

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.
Summary of Replacing an NT0X36 in an international cabinet auxiliary module

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Post the PMs

Manually busy the circuits

Manually busy the PMs

Power down the shelves

Replace the card

Power up the shelves

Return the PMs to service

Return the circuits to service

End
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)

<table>
<thead>
<tr>
<th>Power and alarm card slot</th>
<th>FSP fuse number</th>
<th>Shelf position</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR ALM 1</td>
<td>01</td>
<td>05</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>33</td>
</tr>
</tbody>
</table>
Record the fuse numbers and shelf positions associated with the card you are replacing.

<table>
<thead>
<tr>
<th>Power and alarm card slot</th>
<th>FSP fuse number</th>
<th>Shelf position</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR ALM 2</td>
<td>04</td>
<td>19</td>
</tr>
<tr>
<td>PWR ALM 3</td>
<td>05</td>
<td>47</td>
</tr>
</tbody>
</table>

**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.
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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8 The next step depends on the type of PM that is provisioned in the shelf.

If the PM is an OAU

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 9</td>
</tr>
</tbody>
</table>

If the PM is an IMTM, or IPTM

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 13</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAU</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>102</td>
</tr>
</tbody>
</table>

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 OffL

<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>step 129</td>
</tr>
</tbody>
</table>
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.

*Example of a MAP display:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAU</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>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If essential services</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are using PM resources and one or more PMs are in service</td>
<td>step 128</td>
</tr>
<tr>
<td>are using PM resources and all PMs are out of service</td>
<td>step 14</td>
</tr>
<tr>
<td>are not using PM resources</td>
<td>step 14</td>
</tr>
</tbody>
</table>

14 Post the PM by typing

>POST pm_type pm_no

and pressing the Enter key.

*where*
Frame supervisory panel and modular supervisory panel card replacement procedures

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMTM</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>102</td>
</tr>
<tr>
<td>IMTM</td>
<td>0</td>
<td>SysB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>POST</th>
<th>6-013</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTP</td>
<td></td>
</tr>
<tr>
<td>CKT TYPE</td>
<td>PM NO.</td>
</tr>
</tbody>
</table>

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:
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 one or more circuits is in the INB state

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  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
```

bsy all
OK, POST SET IS SET IN BSYQ

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)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td><strong>If the shelf is</strong></td>
</tr>
<tr>
<td></td>
<td>provisioned with either the NT1X80 or the NT1X81</td>
</tr>
<tr>
<td></td>
<td>not provisioned with either the NT1X80 or the NT1X81</td>
</tr>
<tr>
<td>23</td>
<td>Post the circuits for the single-card PM by typing</td>
</tr>
<tr>
<td></td>
<td><code>&gt;POST P pm_type pm_no</code></td>
</tr>
<tr>
<td></td>
<td>and pressing the Enter key.</td>
</tr>
<tr>
<td></td>
<td><strong>where</strong></td>
</tr>
<tr>
<td></td>
<td><code>pm_type</code></td>
</tr>
<tr>
<td></td>
<td><code>pm_no</code></td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> 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.</td>
</tr>
<tr>
<td>24</td>
<td>Manually busy all posted circuits by typing</td>
</tr>
<tr>
<td></td>
<td><code>&gt;BSY ALL</code></td>
</tr>
<tr>
<td></td>
<td>and pressing the Enter key.</td>
</tr>
<tr>
<td>25</td>
<td>Wait until all circuits have been manually busied (removed from the busy queue) before proceeding to the next step.</td>
</tr>
<tr>
<td>26</td>
<td>Repeat steps 23 to 25 for all NT1X80 and NT1X81 cards provisioned on the shelf.</td>
</tr>
<tr>
<td>27</td>
<td>Access the PM level of the MAP display by typing</td>
</tr>
<tr>
<td></td>
<td><code>&gt;PM</code></td>
</tr>
<tr>
<td></td>
<td>and pressing the Enter key.</td>
</tr>
<tr>
<td>28</td>
<td>Post the PM by typing</td>
</tr>
<tr>
<td></td>
<td><code>&gt;POST pm_type pm_no</code></td>
</tr>
<tr>
<td></td>
<td>and pressing the Enter key.</td>
</tr>
<tr>
<td></td>
<td><strong>where</strong></td>
</tr>
<tr>
<td></td>
<td><code>pm_type</code></td>
</tr>
<tr>
<td></td>
<td><code>pm_no</code></td>
</tr>
</tbody>
</table>
Frame supervisory panel and modular supervisory panel card replacement procedures

in an international cabinet auxiliary module (continued)

29 Determine the state of the PM.

<table>
<thead>
<tr>
<th>If the PM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManB</td>
<td>step 31</td>
</tr>
<tr>
<td>anything else</td>
<td>step 30</td>
</tr>
</tbody>
</table>

30 Manually busy the PM by typing

>`BSY`

and pressing the Enter key.

Example of a MAP display:

```
PM  | SysB | ManB | OffL | CBby | ISTb | InsV
IMTM | 58   | 1    | 6    | 14   | 12   | 17
IMTM | 0    | 1    | 0    | 0    | 0    | 9
```

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.

<table>
<thead>
<tr>
<th>If the shelf is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>provisioned with either the NT1X80 or the NT1X81</td>
<td>step 32</td>
</tr>
<tr>
<td>not provisioned with either the NT1X80 or the NT1X81</td>
<td>step 36</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the PM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManB</td>
<td>step 35</td>
</tr>
</tbody>
</table>
NT0X36
in an international cabinet auxiliary module  (continued)

If the PM is
anything else
Do
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
an IPTM, and you have manually busied only one IPTM
Do
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
one shelf equipped with PMs is associated with the card
Do
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
Frame supervisory panel and modular supervisory panel card replacement procedures

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.
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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is provisioned as an IPTM or an IMTM and you have already powered up both power converters</td>
<td>step 58</td>
</tr>
<tr>
<td>is provisioned as an IPTM</td>
<td>step 54</td>
</tr>
<tr>
<td>is provisioned as an IMTM</td>
<td>step 55</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs is associated with the card</td>
<td>step 58</td>
</tr>
<tr>
<td>two shelves equipped with PMs are associated with the card, and you have powered up only one shelf</td>
<td>step 57</td>
</tr>
<tr>
<td>two shelves equipped with PMs are associated with the card, and you have powered up both shelves</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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.
### 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.

<table>
<thead>
<tr>
<th>If the PM is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>an OAU</td>
<td>step 60</td>
</tr>
<tr>
<td>an IPTM, or IMTM</td>
<td>step 64</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 63</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 124</td>
</tr>
</tbody>
</table>
NT0X36
in an international cabinet auxiliary module (continued)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>

64 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)

65 Load the PM by typing
>LOADPM
and pressing the Enter key.

*Example of a MAP response:*

```
MTM 0 LoadPM Passed
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 67</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

66 Load the PM using the procedure *Loading a PM* 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.

*Example of a MAP response:*

```
MTM 0 Rts Passed
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and the PM is InSv</td>
<td>step 76</td>
</tr>
<tr>
<td>passed, and the PM is ISTb with a card list generated</td>
<td>step 68</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If the shelf is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>provisioned with either the NT1X80 or the NT1X81</td>
<td>step 70</td>
</tr>
<tr>
<td>not provisioned with either the NT1X80 or the</td>
<td>step 76</td>
</tr>
<tr>
<td>NT1X81</td>
<td></td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 73</td>
</tr>
<tr>
<td>failed</td>
<td>step 72</td>
</tr>
</tbody>
</table>

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:*

```
DTM 0 LoadPM Passed
```
NT0X36
in an international cabinet auxiliary module (continued)

MTM 0 Rts Passed

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and the PM is InSv</td>
<td>step 75</td>
</tr>
<tr>
<td>passed, and the PM is ISTb with a card list generated</td>
<td>step 74</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>

74 Record the messages on the MAP display for future reference.
75 Repeat steps 70 to 74 for the other NT1X80 and NT1X81 cards provisioned on the shelf, then go to step 76.
76 Access the TTP level of the MAP display by typing
   \texttt{>TRKS;TTP}
   
   and pressing the Enter key.
77 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).
   
   \textbf{Note:} DTU and MTU are usually provisioned in pairs.

<table>
<thead>
<tr>
<th>If the shelf is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>equipped with MTU</td>
<td>step 78</td>
</tr>
<tr>
<td>equipped with DTU</td>
<td>step 93</td>
</tr>
<tr>
<td>not equipped with MTU or DTU</td>
<td>step 108</td>
</tr>
</tbody>
</table>

78 Post the first circuit in the MTU by typing
   \texttt{>POST G MTU circuit_no}
   where
   \texttt{circuit_no}
   is the number of the first MTU circuit
79 Busy the circuit by typing
   \texttt{>BSY}
   and pressing the Enter key.
80 Seize the circuit by typing
   \texttt{>SEIZE}
   and pressing the Enter key.
in an international cabinet auxiliary module (continued)

81 Put the circuit on hold by typing

```plaintext
>HOLD
```
and pressing the Enter key.

82 Post the second circuit in the MTU by typing

```plaintext
>NEXT
```
and pressing the Enter key.

83 Busy the circuit by typing

```plaintext
>BSY
```
and pressing the Enter key.

84 Seize the circuit by typing

```plaintext
>SEIZE
```
and pressing the Enter key.

85 Put the circuit on hold by typing

```plaintext
>HOLD
```
and pressing the Enter key.

86 Access the disk utility by typing

```plaintext
>DISKUT
```
and pressing the Enter key.

87 List the files in the volume containing the MTU load by typing

```plaintext
>LISTFL vol_name
```
and pressing the Enter key.

```plaintext
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

```plaintext
>QUIT
```
and pressing the Enter key.

90 Load the MTU by typing

```plaintext
>LOADFW CC load_name
```
and pressing the Enter key.

```plaintext
where
```
load_name is the load file name recorded in step 88

<table>
<thead>
<tr>
<th>If the LOADFW command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 91</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>

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.
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

<table>
<thead>
<tr>
<th>If the LOADFW command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 106</td>
</tr>
<tr>
<td>failed</td>
<td>step 130</td>
</tr>
</tbody>
</table>
Release the first DTU circuit by typing
>RLS  RLS

Release the second DTU circuit to by typing
>RLS  RLS

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)

Return all the circuits to service by typing
>RTS  ALL

and pressing the Enter key.

Example of a MAP response:

RTS  OK

The next action depends on whether INB circuits were recorded in step 19.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>INB circuits were recorded</td>
<td>step 111</td>
</tr>
<tr>
<td>no INB circuits were recorded</td>
<td>step 114</td>
</tr>
</tbody>
</table>

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

Return the circuit to the INB state by typing
>BSY  INB

and pressing the Enter key.

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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed unconditionally</td>
<td>step 121</td>
</tr>
<tr>
<td>passed, but in-service tests failed and a card list was generated</td>
<td>step 115</td>
</tr>
</tbody>
</table>

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:
7-96 Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X36 in an international cabinet auxiliary module (continued)

MTM  0 ISTb TSTFAIL

InSvce 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

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and there are single-card PMs or an IPTM still out of service</td>
<td>step 121</td>
</tr>
<tr>
<td>passed, and you have worked on all PMs provisioned on the shelf and all PMs have been returned to service</td>
<td>step 124</td>
</tr>
<tr>
<td>passed, and you have worked on all PMs provisioned on the shelf but one or more PMs have not been successfully returned to service</td>
<td>step 130</td>
</tr>
<tr>
<td>failed, and there are single-card PMs or an IPTM that you have not worked on to return to service</td>
<td>step 120</td>
</tr>
<tr>
<td>failed, and you have worked on all PMs provisioned on the shelf</td>
<td>step 130</td>
</tr>
</tbody>
</table>

120 Record the messages on the MAP display for future reference.
121 Access the PM level of the MAP display by typing
   > PM
   and pressing the Enter key.
122 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)
123 Repeat steps 64 to 119 for other PMs provisioned on this shelf, then go to step 124.
The next action depends on how many shelves are associated with the FSP card you are replacing.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs is associated with the card</td>
<td>step 126</td>
</tr>
<tr>
<td>two shelves equipped with PMs are associated with the card, and you have returned to service the PM on only one shelf</td>
<td>step 125</td>
</tr>
<tr>
<td>two shelves equipped with PMs are associated with the card, and you have returned to service the PM on both shelves</td>
<td>step 126</td>
</tr>
</tbody>
</table>

Repeat steps 59 to 124 for PMs in the other shelf associated with the FSP card you are replacing, then go to step 126.

The next action depends on your reason for performing this procedure.

<table>
<thead>
<tr>
<th>If you were</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed to this procedure from a maintenance procedure</td>
<td>step 127</td>
</tr>
<tr>
<td>not directed to this procedure from a maintenance procedure</td>
<td>step 131</td>
</tr>
</tbody>
</table>

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

Consult the personnel responsible for the next level of support to determine how essential services can be handled. Continue as directed by office personnel.

Consult office personnel to determine why the component is off line. Continue as directed by office personnel.

For further assistance, contact the personnel responsible for the next level of support.

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA</td>
<td>FSP drive and alarm circuit pack</td>
<td>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</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AE</td>
<td>FSP drive and protection circuit pack</td>
<td>CPCE equipped with DTC, DTCI IDTC, ILGC, ILTC, LGC, LGCI, LTC, LTCI, PDTC, PLGC, PLTC, SMS</td>
</tr>
</tbody>
</table>

Common procedures

This procedure refers to the following common procedures:

- Loading a PM
- Manually busying Series II PM and CPM C-side links
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.
Summary of replacing a NT0X91 in a CPCE frame

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

- Post PMs and make units inactive
- Manually busy PM units and reset
- Manually busy network links
- Unseat control complex cards
- Power down shelves
- Replace the card
- Power up shelves
- Reseat control complex cards
- Return network links to service
- Load PM units and return to service
- End
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.

<table>
<thead>
<tr>
<th>Card</th>
<th>FSP Slot</th>
<th>CB</th>
<th>Shelf and PM information</th>
<th>PC slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB5</td>
<td>shelf 18 (lower PM, unit 0)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB4</td>
<td>shelf 51 (upper PM, unit 0)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB2</td>
<td>shelf 32 (lower PM, unit 1)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB1</td>
<td>shelf 65 (upper PM, unit 1)</td>
<td>25</td>
</tr>
</tbody>
</table>
Record the type of PMs associated with the NT0X91 that you will replace.

**At the MAP terminal**

To access the PM level of the MAP display, type

```
>MAPCI;MTC;PM
```

and press the Enter key.

*Example of a MAP display:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>39</td>
</tr>
</tbody>
</table>
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                  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
```

Determine the state of the PM unit associated with the card you replace.

<table>
<thead>
<tr>
<th>If the state of the PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb, InSv, SysB, or CBsy, and active</td>
<td>step 7</td>
</tr>
<tr>
<td>is ISTb, InSv, SysB, or CBsy, and inactive</td>
<td>step 10</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 12</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 51</td>
</tr>
</tbody>
</table>

Determine the state of the mate PM unit.

<table>
<thead>
<tr>
<th>If the state of the mate PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb or InSv</td>
<td>step 8</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 52</td>
</tr>
</tbody>
</table>

To switch activity, type

```
>SWACT
```

and press the Enter key.

Example of a MAP response:
NT0X91
in a CPCE frame (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>you must confirm the command</td>
<td>step 9</td>
</tr>
<tr>
<td>the system rejects the SWACT</td>
<td>step 52</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>If the MAP response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is SWACT passed</td>
<td>step 10</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 52</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 12</td>
</tr>
<tr>
<td>failed</td>
<td>step 53</td>
</tr>
</tbody>
</table>

12. To reset the inactive PM unit, type

>`PMRESET UNIT unit_no NORUN`

and press the Enter key.
Frame supervisory panel and modular supervisory panel card replacement procedures

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 busying 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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are working on any XPM with the NTMX77 unified processor (XPM plus)</td>
<td>step 18</td>
</tr>
<tr>
<td>are working on any 2-processor XPM (NT6X45-based)</td>
<td>step 16</td>
</tr>
<tr>
<td>are working on an international 3-processor XPM (NT6X45-based)</td>
<td>step 17</td>
</tr>
</tbody>
</table>

16 Unseat control complex cards (2-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 18.

b Unseat the NT6X45 signaling processor card in slot 12.

c Unseat the NT6X45 master processor card in slot 8.
NT0X91 in a CPCE frame (continued)

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.

<table>
<thead>
<tr>
<th>If the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AE card and the</td>
<td>step 30</td>
</tr>
<tr>
<td>FSP or MSP has circuit breakers</td>
<td></td>
</tr>
</tbody>
</table>
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X91

in a CPCE frame (continued)

<table>
<thead>
<tr>
<th>If the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 31</td>
</tr>
<tr>
<td>is not an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 32</td>
</tr>
<tr>
<td>is not an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 33</td>
</tr>
</tbody>
</table>

30 Power up the converter.
   a Pull and set the POWER switch handle up to the RESET position and hold.
   b Set the handle of the converter circuit breaker on the FSP or MSP up until it clicks into place.
   c Release the POWER switch handle.
      Go to step 34.

31 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 34.

32 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 handle of the converter circuit breaker on the FSP or MSP up until it clicks into place.
   d Release the RESET button.
      Go to step 34.

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 until the CONVERTER FAIL LED goes off.
   c Release the RESET button.
The next action depends on the processor configuration of the PM you are working on.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are working on any XPM with the NTMX77 unified processor (XPM plus)</td>
<td>step 37</td>
</tr>
<tr>
<td>are working on any 2-processor XPM (NT6X45-based)</td>
<td>step 35</td>
</tr>
<tr>
<td>are working on an international 3-processor XPM (NT6X45-based)</td>
<td>step 36</td>
</tr>
</tbody>
</table>

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.

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.

If there are NT6X48 DS30A interface cards in slots 6 and 7, reseat them.

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

The next action depends on the type of network in the office.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are working on JNET</td>
<td>step 40</td>
</tr>
<tr>
<td>are working on ENET</td>
<td>step 42</td>
</tr>
</tbody>
</table>
NT0X91
in a CPCE frame (continued)

40 To return to service one of the network links associated with the PM unit in use, type

\texttt{\textgreater RTS \ plane\_no \ link\_no}

and press the Enter key.

\textit{where}

\begin{itemize}
  \item \texttt{plane\_no} is the number of the plane (0 or 1) for the link
  \item \texttt{link\_no} is the link number (0 to 63)
\end{itemize}

\textbf{If the link} \hspace{1cm} \textbf{Do}

\begin{tabular}{l l}
  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
\end{tabular}

41 Repeat step 40 for all C-side links to the shelf in use.

42 To return the network link to service, type

\texttt{\textgreater RTS \ plane\_no \ LINK \ link\_no}

and press the Enter key.

\textit{where}

\begin{itemize}
  \item \texttt{plane\_no} is the number of the plane (0 or 1) for the link
  \item \texttt{link\_no} is the link number (0 to 3)
\end{itemize}

\textit{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.

\textbf{If the link} \hspace{1cm} \textbf{Do}

\begin{tabular}{l l}
  returned to service & step 43 \\
  did not return to service & step 53
\end{tabular}

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

\texttt{\textgreater PM\_POST \ pm\_type \ pm\_no}
and press the Enter key.

\[\text{where} \]

\[
\begin{align*}
\text{pm\_type} & \quad \text{is the PM type (for example DTC, ILGC, LTCI, PDTC, etc.)} \\
\text{pm\_no} & \quad \text{is the PM number (0 to 255)}
\end{align*}
\]

45 To load the inactive unit, type

\[>\text{LOADPM UNIT unit\_no}\]

and press the Enter key.

\[\text{where}\]

\[
\begin{align*}
\text{unit\_no} & \quad \text{is the PM unit number (0 or 1)}
\end{align*}
\]

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 47</td>
</tr>
<tr>
<td>failed</td>
<td>step 46</td>
</tr>
</tbody>
</table>

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

\[>\text{RTS UNIT unit\_no}\]

and press the Enter key.

\[\text{where}\]

\[
\begin{align*}
\text{unit\_no} & \quad \text{is the PM unit number (0 or 1)}
\end{align*}
\]

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 48</td>
</tr>
<tr>
<td>failed</td>
<td>step 53</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a maintenance procedure directed you to this procedure</td>
<td>step 50</td>
</tr>
<tr>
<td>a maintenance procedure did not direct you to this procedure</td>
<td>step 54</td>
</tr>
</tbody>
</table>
Return to the maintenance procedure that sent you to this procedure and continue as directed.

Consult office personnel to determine why the component is offline. Continue as directed by office personnel.

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.

For additional help, contact the next level of support.

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA, AB</td>
<td>Drive and alarm card</td>
<td>DCE equipped with digital carrier module (DCM), digital echo suppressor (DES)</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AD</td>
<td>Drive and protection card</td>
<td>DCE equipped with DCM, DES</td>
</tr>
</tbody>
</table>

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

- Post the PM
- Manually busy the PM
- Power down the shelf
- Replace the card
- Power up the shelf
- Load the PM
- Return the PM to service
- End

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.
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:
If Alarm and control card | DoSlot
---|---
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.

<table>
<thead>
<tr>
<th>FSP card</th>
<th>FSP card position</th>
<th>FSP circuit breakers</th>
<th>Shelf position</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB5</td>
<td>04</td>
</tr>
<tr>
<td>NT0X91AB</td>
<td>CD2</td>
<td>CB3, CB1</td>
<td>32, 65</td>
</tr>
<tr>
<td>NT0X91AD</td>
<td>CD3</td>
<td>CB4</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CB2</td>
<td>51</td>
</tr>
</tbody>
</table>

*Note:* 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 6 ManB 0 OffL 0 CBsy 0 ISTb 23 InSv 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*

<table>
<thead>
<tr>
<th>pm_type</th>
<th>is the type of PM (DCM, DES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pm_no</td>
<td>is the PM number (0 to 511)</td>
</tr>
</tbody>
</table>

*Example of a MAP display:*
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).

<table>
<thead>
<tr>
<th>If the state of the PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb, InSv, SysB, or CBsy</td>
<td>step 8</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 12</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 41</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associate with the card</td>
<td>step 12</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you turned down functionality for only one shelf</td>
<td>step 11</td>
</tr>
</tbody>
</table>
**NT0X91**

in a digital carrier equipment frame (continued)

---

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>two shelves equipped with PMs associate with the card, and you turned down functionality for both shelves</td>
<td>step 12</td>
</tr>
</tbody>
</table>

11 Repeat steps 6 to 10 for PMs in the other shelf that associates with the FSP card you replace. Go to step 12

---

**At the frame**

12

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Static electricity damage</strong></td>
</tr>
</tbody>
</table>

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.

---

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains a single NT2X70</td>
<td>step 16</td>
</tr>
<tr>
<td>contains a NT2X06 and a NT2X07</td>
<td>step 15</td>
</tr>
</tbody>
</table>

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.

---

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associate with the card</td>
<td>step 18</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down only one shelf</td>
<td>step 17</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down both shelves</td>
<td>step 18</td>
</tr>
</tbody>
</table>
Repeat steps 13 to 16 for the PM in the other shelf that associates with the FSP card you replace. Go to step 18.

Unscrew the slotted nut on the left of the FSP.

Open the FSP.

Remove the card.

Insert the replacement alarm and control card.

Close the FSP.

Tighten the slotted nut on the FSP.

The next action depends on the power converter version and the type of supervisory panel.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 25</td>
</tr>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 26</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 27</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 28</td>
</tr>
</tbody>
</table>

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.

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)

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one power converter is on the shelf</td>
<td>step 31</td>
</tr>
<tr>
<td>two power converters are on the shelf,</td>
<td>step 31</td>
</tr>
<tr>
<td>and you powered up both of the</td>
<td></td>
</tr>
<tr>
<td>converters</td>
<td></td>
</tr>
<tr>
<td>two power converters are on the shelf,</td>
<td>step 30</td>
</tr>
<tr>
<td>and you powered up only one of the</td>
<td></td>
</tr>
<tr>
<td>converters</td>
<td></td>
</tr>
</tbody>
</table>

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 you replace.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates</td>
<td>step 33</td>
</tr>
<tr>
<td>with the card that you replace</td>
<td></td>
</tr>
<tr>
<td>two shelves equipped with PMs associate</td>
<td>step 32</td>
</tr>
<tr>
<td>with the card, and you powered up only</td>
<td></td>
</tr>
<tr>
<td>one shelf</td>
<td></td>
</tr>
<tr>
<td>two shelves equipped with PMs associate</td>
<td>step 33</td>
</tr>
<tr>
<td>with the card, and you powered up both</td>
<td></td>
</tr>
<tr>
<td>shelves</td>
<td></td>
</tr>
</tbody>
</table>

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 terminal to 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)
To load the PM, type
>`LOADPM ance>`
and press the Enter key.

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 35</td>
</tr>
<tr>
<td>passed</td>
<td>step 36</td>
</tr>
</tbody>
</table>

Perform the procedure **Loading a PM** in this document. Complete the procedure and return to this point.

To return the PM to service, type
>`RTSe>`
and press the Enter key.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 37</td>
</tr>
<tr>
<td>passed, but the PM is ISTb as a result of a command protocol violation</td>
<td>step 42</td>
</tr>
<tr>
<td>failed</td>
<td>step 43</td>
</tr>
</tbody>
</table>

The next action depends on how many shelves associate with the FSP card that you replace.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 39</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down only one shelf</td>
<td>step 38</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down both shelves</td>
<td>step 39</td>
</tr>
</tbody>
</table>

Repeat steps 33 to 37 for PMs in the other shelf that associates with the FSP card you replace. Go to step 39.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 40</td>
</tr>
</tbody>
</table>
### NT0X91
in a digital carrier equipment frame (end)

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>did not direct you to this maintenance procedure</td>
<td>step 24</td>
</tr>
<tr>
<td>40</td>
<td>Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.</td>
</tr>
<tr>
<td>41</td>
<td>To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.</td>
</tr>
<tr>
<td>42</td>
<td>A minor problem is present. The PM can process traffic. For additional help, contact the next level of support.</td>
</tr>
<tr>
<td>43</td>
<td>For additional help, contact the next level of support.</td>
</tr>
<tr>
<td>44</td>
<td>The procedure is complete.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA</td>
<td>FSP drive and alarm card</td>
<td>FSP (NT0X29) in a LME</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AD</td>
<td>FSP drive and protector card</td>
<td>FSP (NT0X29) in a LME</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NT0X91 in a line module equipment frame

Post LM

Manually busy the RG or the LMC

Power down the shelf, if necessary

Replace the card

Load the LM

Return the RG or LMC to service

End

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.
NT0X91 in a line module equipment frame

Replacing a NT0X91 in a line module equipment frame

At your current location

1

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.

<table>
<thead>
<tr>
<th>Card</th>
<th>Slot</th>
<th>Card position</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>slot CD1</td>
<td>rear</td>
</tr>
<tr>
<td>NT0X91AD</td>
<td>slot CD2</td>
<td>front</td>
</tr>
</tbody>
</table>

**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.
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.

<table>
<thead>
<tr>
<th>Card</th>
<th>Power converter</th>
<th>FSP circuit breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AD</td>
<td>NT2X05 (RG 0) in slot 1</td>
<td>CB1</td>
</tr>
<tr>
<td>NT0X91AA</td>
<td>NT2X05 (RG 1) in slot 5</td>
<td>CB2</td>
</tr>
<tr>
<td>NT0X91AD</td>
<td>NT2X70 in slot 22</td>
<td>CB3</td>
</tr>
</tbody>
</table>

*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

```plaintext
>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

```plaintext
>POST LM bay_no pair_no
```

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace the NT0X91AA</td>
<td>step 7</td>
</tr>
<tr>
<td>replace the NT0X91AD</td>
<td>step 11</td>
</tr>
</tbody>
</table>

7 Determine the state of the ringing generators (RG).

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>either RG is Standby</td>
<td>step 34</td>
</tr>
<tr>
<td>RG 1 (slot 05) is In Sv or ISTb and RG 0 (slot 01) is In Sv or ISTb</td>
<td>step 8</td>
</tr>
<tr>
<td>RG 1 (slot 05) is In Sv or ISTb and RG 0 (slot 01) is ManB or SysB</td>
<td>step 34</td>
</tr>
<tr>
<td>RG 1 (slot 05) is ManB</td>
<td>step 10</td>
</tr>
<tr>
<td>RG 1 (slot 05) is SysB</td>
<td>step 8</td>
</tr>
</tbody>
</table>

8 To manually busy the ringing generator interface (RGI) for RG 1, type

```plaintext
>BSY RGI 1
```

and press the Enter key.

*Example of a MAP response:*

```
WARNING: CALLS IN RINGING STATE USING THIS RGI WILL BE LOST DO YOU WANT TO CONTINUE? Please confirm ("YES", "Y", "NO", or "N"):
```
9  To confirm the command, type
   \textgreater \texttt{YES}
   and press the Enter key.
   \textit{Example of a MAP response:}
   \texttt{OK}

\textit{At the frame}
10

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{warning}
\caption{WARNING Static electricity damage}
\end{figure}

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.

\begin{tabular}{ll}
\textbf{If the state of the LM} & \textbf{Do} \\
\hline
is InSv or ISTb & step 12 \\
is SysB or CBsy & step 15 \\
is ManB & step 16 \\
is Offl & step 35 \\
\end{tabular}

12  To post the mate LM, type
   \texttt{\textgreater POST LM site frame\_no unit\_no}
   and press the Enter key.
   \textit{where}
   \begin{itemize}
   \item \texttt{site} is the PM location (alphanumeric)
   \item \texttt{frame\_no} is the frame number (0 to 511)
   \item \texttt{unit\_no} is the PM unit number (0 or 1)
   \end{itemize}
Determine the state of the mate LM and the state of the RGs of the mate LM.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the state of the mate LM is InSv or ISTb and both RGs are InSv</td>
<td>step 14</td>
</tr>
<tr>
<td>the states of the mate LM and RGs are other than listed here</td>
<td>step 36</td>
</tr>
</tbody>
</table>

To post the LM on which you want to replace a card, type

```
>POST LM site frame_no unit_no
```

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)

To manually busy the LM, type

```
>BSY
```

Example of a MAP display:

```
PM  SysB  ManB  OffL  CBsy  ISTb  InSv
LM   3     1     0     0      0    71
```

```
LM  HOST 01  0  ManB
RGen : 0  Standby  1  InSv
bsy
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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace the NT0X91AA</td>
<td>step 25</td>
</tr>
<tr>
<td>replace the NT0X91AD</td>
<td>step 27</td>
</tr>
</tbody>
</table>

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.
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

```plaintext
>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

```plaintext
>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

```plaintext
>RTS
```

and press the Enter key.
NT0X91
in a line module equipment frame (end)

Example of a MAP response:

```plaintext
rts
OK.
InSvce Tests Initiated
OK.
```

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this maintenance procedure</td>
<td>step 33</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 38</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA</td>
<td>FSP drive and alarm circuit pack</td>
<td>MS6E</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AE</td>
<td>FSP drive and protection circuit pack</td>
<td>MS6E</td>
</tr>
</tbody>
</table>

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

This flowchart summarizes the procedure.

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

1. Post PM and make PM unit inactive
2. Manually busy PM unit and reset
3. Manually busy signaling terminals (ST)
4. Manually busy network links
5. Unseat control complex cards
6. Power up both power converters
7. Reseat control complex cards
8. Return network links to service
9. Load STs and return them to service
10. Load PM unit and return it to service
11. Turn circuit breakers off
12. Replace the card
13. End
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.

2. **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.

3. **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
with the NT0X91 card you will replace. Use the following table and diagram to obtain this information.

<table>
<thead>
<tr>
<th>Card</th>
<th>FSP Slot</th>
<th>CB</th>
<th>Shelf and PM information</th>
<th>PC slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB5</td>
<td>shelf 51, MSB6 unit 0 (right side)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB4</td>
<td>shelf 51, STCM 0 (left side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB2</td>
<td>shelf 65, MSB6 unit 1 (right side)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB1</td>
<td>shelf 65, STCM 1 (left side)</td>
<td>01</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>12</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>13</td>
<td>24</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>12</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>MSB6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

 MSB6 0 InSv Links_OOS: 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

<table>
<thead>
<tr>
<th>If the state of the PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb, InSv, SysB, or CBsy, and active</td>
<td>step 6</td>
</tr>
<tr>
<td>is ISTb, InSv, SysB, or CBsy, and inactive</td>
<td>step 9</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 11</td>
</tr>
<tr>
<td>is OffL</td>
<td>step 55</td>
</tr>
</tbody>
</table>

6 Determine the state of the mate PM unit.

If the state of the mate PM unit Do

<table>
<thead>
<tr>
<th>If the state of the mate PM unit</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ISTb or InSv</td>
<td>step 7</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 57</td>
</tr>
</tbody>
</table>
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"):
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>you must confirm the command</td>
<td>step 8</td>
</tr>
<tr>
<td>the system rejects the SWACT</td>
<td>step 56</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>If the MAP response</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is SWACT passed</td>
<td>step 9</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 56</td>
</tr>
</tbody>
</table>

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.

To manually busy the inactive unit, type

`>BSY UNIT unit_no`

and press the Enter key.

*Example of a MAP response:*

```
Unit0: Inact SysB Mtce
Unit1: Act ISTb
MSB6 0 A Warm SwAct will be performed after
data sync of active terminals.
Please confirm ("YES", "Y", "NO", or "N"):
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>you must confirm the command</td>
<td>step 8</td>
</tr>
<tr>
<td>the system rejects the SWACT</td>
<td>step 56</td>
</tr>
</tbody>
</table>
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:

```
MSB6 0 Unit 0 PMReset Passed
```

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"):
```
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 busying Series II PM C-side links. The procedure
   Manually busying Series II PM C-side links appears in this document.
   Complete the procedure and return to this point.

At the frame

18

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.

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 form slot 15.
Frame supervisory panel and modular supervisory panel card replacement procedures

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.

<table>
<thead>
<tr>
<th>If the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AE card and the FSP has circuit breakers</td>
<td>step 31</td>
</tr>
<tr>
<td>is an NT2X70AE card and the FSP does not have circuit breakers</td>
<td>step 32</td>
</tr>
<tr>
<td>is not an NT2X70AE card and the FSP has circuit breakers</td>
<td>step 33</td>
</tr>
<tr>
<td>is not an NT2X70AE card and the FSP does not have circuit breakers</td>
<td>step 34</td>
</tr>
</tbody>
</table>

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.
Frame supervisory panel and modular supervisory panel card replacement procedures

**NT0X91**

*in an MS6E* (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 |

297-9051-547  Standard  02.01  April 2000
link_no is the link number (0 to 63)

<table>
<thead>
<tr>
<th>If the link</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>returned to service and more manual-busy links are present</td>
<td>step 39</td>
</tr>
<tr>
<td>returned to service and no more manual-busy links are present</td>
<td>step 41</td>
</tr>
<tr>
<td>did not return to service</td>
<td>step 57</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the link</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>returned to service</td>
<td>step 41</td>
</tr>
<tr>
<td>did not return to service</td>
<td>step 57</td>
</tr>
</tbody>
</table>

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)
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
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 49</td>
</tr>
<tr>
<td>failed, with the message STC Load &lt;loadname&gt; not in &lt;msb_unit&gt;</td>
<td>step 44</td>
</tr>
<tr>
<td>failed, with messages other than</td>
<td>step 46</td>
</tr>
<tr>
<td>listed here</td>
<td></td>
</tr>
</tbody>
</table>

*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.*

To return to the PM level of the MAP display, type

`>QUIT`

and press the Enter key.

To add the load to the MSB6, type

`>STCLOAD UNIT unit_no ADD loadname`

where

- `unit_no` is the PM unit number (0 or 1)
- `loadname` is the STC load name

<table>
<thead>
<tr>
<th>If the STCLOAD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 46</td>
</tr>
<tr>
<td>passed</td>
<td>step 49</td>
</tr>
</tbody>
</table>
To load the PM unit, use the procedure *How to load a PM* in this document. Complete the procedure and return to this point.

To return to the STC level of the MAP display, type

```
>STC
```

and press the Enter key.

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.

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
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed for all STs</td>
<td>step 50</td>
</tr>
<tr>
<td>failed for any ST</td>
<td>step 57</td>
</tr>
</tbody>
</table>

The next action depends on your reason for performing this procedure.

*If*  

```
ad a maintenance procedure
```

directed you to this procedure

```
and a maintenance procedure did not
direct you to this procedure
```

---

DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up
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)

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 53</td>
</tr>
<tr>
<td>passed</td>
<td>step 54</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 57</td>
</tr>
<tr>
<td>failed</td>
<td>step 58</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA</td>
<td>FSP drive and alarm circuit card</td>
<td>signaling terminal 6 equipment (ST6E) frame,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>signaling terminal 7 equipment (ST7E) frame</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AE</td>
<td>FSP drive and protection circuit card</td>
<td>CCS7 message buffer equipment (MS7E) frame,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ST6E, ST7E</td>
</tr>
</tbody>
</table>

*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

This flowchart summarizes the procedure.

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

Post the MSB

Post the signaling terminals (ST)

Manually busy all STs

Power down the power converters

Turn off the circuit breakers

Replace the card

Power up the power converters

Load STs and return them to service

End
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 busses 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.

<table>
<thead>
<tr>
<th>If the card you are replacing</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a NT0X91AA in an MS7E</td>
<td>step 41</td>
</tr>
<tr>
<td>is a NT0X91AE in an MS7E</td>
<td>step 2</td>
</tr>
<tr>
<td>is a NT0X91AA or NT0X91AE in a ST7E or ST6E</td>
<td>step 5</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Card</th>
<th>FSP Slot</th>
<th>CB</th>
<th>Shelf and PM information</th>
<th>PC slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB4</td>
<td>shelf 51, ST7G 3 (right side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB3</td>
<td>shelf 18, ST7G 0 (right side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD3</td>
<td>CB5</td>
<td>shelf 32, ST7G 1 (left side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD3</td>
<td>CB1</td>
<td>shelf 51, ST7G 2 (left side)</td>
<td>25</td>
</tr>
</tbody>
</table>

Note: Each CB is associated with one half of a shelf, as indicated in the table. CBs are located on the front of the FSP.

4 Go to step 7.
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).

<table>
<thead>
<tr>
<th>Card</th>
<th>FSP Slot</th>
<th>CB</th>
<th>Shelf and PM information</th>
<th>PC slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB3</td>
<td>shelf 18, STC 5 (right side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB6</td>
<td>shelf 18, STC 4 (left side)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB2</td>
<td>shelf 32, STC 7 (right side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB1</td>
<td>shelf 51, STC 9 (right side)</td>
<td>01</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD3</td>
<td>CB5</td>
<td>shelf 32, STC 6 (left side)</td>
<td>25</td>
</tr>
<tr>
<td>NT0X91AE</td>
<td>CD3</td>
<td>CB4</td>
<td>shelf 51, STC 8 (left side)</td>
<td>25</td>
</tr>
</tbody>
</table>

**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:*

```
PM SysB ManB OffL CBsy ISTb InSv
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)
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X91
in an MS7E, ST7E, or ST6E (continued)

pm_no
is the PM number (0 to 999)

Example of a MAP display:

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>MSB7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSB7</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unit0:</td>
<td>InSv</td>
<td>Links_OOS:</td>
<td>CSide</td>
<td>0 ,</td>
<td>PSide</td>
</tr>
<tr>
<td>Unit1:</td>
<td>Act</td>
<td>InSv</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9 To access the STC level of the MAP display, type
>STC
and press the Enter key.

Example of a MAP display:

<table>
<thead>
<tr>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>MSB7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSB7</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unit0:</td>
<td>InSv</td>
<td>Links_OOS:</td>
<td>CSide</td>
<td>0 ,</td>
<td>PSide</td>
</tr>
<tr>
<td>Unit1:</td>
<td>Act</td>
<td>InSv</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STC 0 0 0 0 0

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:
To manually busy the signaling terminals (ST), type

\texttt{>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"):  
```

To confirm the command, type

\texttt{>YES}

and press the Enter key.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>set STs in both STCMs to busy</td>
<td>step 14</td>
</tr>
<tr>
<td>set STs in only one STCM to</td>
<td>step 13</td>
</tr>
<tr>
<td>busy</td>
<td></td>
</tr>
</tbody>
</table>

Repeat steps 10 to 12 for the other STC.
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.

20
Remove the NT0X91 card from the CD slot in the FSP.

21
Place the removed card in an electrostatic discharge (ESD) protective container.

22
Make sure that the replacement card has the same PEC, including suffix, as the removed card.

23
Insert the replacement card.

24
Close the FSP.

25
Tighten the slotted nut on the FSP.

26
The next action depends on the power converter version and the type of supervisory panel.

<table>
<thead>
<tr>
<th>If the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AE card and the FSP has circuit breakers</td>
<td>step 26</td>
</tr>
</tbody>
</table>
 NT0X91

in an MS7E, ST7E, or ST6E (continued)

<table>
<thead>
<tr>
<th>If the power converter</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AE card and the FSP does not have circuit breakers</td>
<td>step 27</td>
</tr>
<tr>
<td>is not an NT2X70AE card and the FSP has circuit breakers</td>
<td>step 28</td>
</tr>
<tr>
<td>is not an NT2X70AE card and the FSP does not have circuit breakers</td>
<td>step 29</td>
</tr>
</tbody>
</table>

26 Power up the converter.
   a Pull and set the POWER switch handle up to the RESET position and hold.
   b Pull and set the converter circuit breaker handle on the FSP up until it clicks into place.
   c Release the POWER switch handle.
      Go to step 30.

27 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 30.

28 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 and set the converter circuit breaker handle on the FSP up until it clicks into place.
   d Release the RESET button.
      Go to step 30.

29 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.
At the MAP terminal

30 To load the STs, type

```plaintext
>LOADPM ALL
```

and press the Enter key.

*where*

```plaintext
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
```

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 36</td>
</tr>
<tr>
<td>failed, with the message STC</td>
<td>step 31</td>
</tr>
<tr>
<td>Load loadname not in msb_unit</td>
<td></td>
</tr>
<tr>
<td>failed, with a message other than listed here</td>
<td>step 33</td>
</tr>
</tbody>
</table>

*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

```plaintext
>QUIT
```

and press the Enter key.

32 To add the load to the MSB, type

```plaintext
>STCLOAD PM ADD loadname
```

and press the Enter key.

*where*
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X91

in an MS7E, ST7E, or ST6E (continued)

loadname

is the STC load name

<table>
<thead>
<tr>
<th>If the STCLOAD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 33</td>
</tr>
<tr>
<td>passed</td>
<td>step 34</td>
</tr>
</tbody>
</table>

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 access the STC level of the MAP display, type

>STC

and press the Enter key.

35 To post the STC, type

>POST stcm_no

and press the Enter key.

where

stcm_no

is the STCM number (0 to 9)

Go to step 30.

36 To return the STs to service, type

>RTS ALL

and press the Enter key.

Example of a MAP response:

<table>
<thead>
<tr>
<th>STC</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Out-of-service test initiated</td>
</tr>
<tr>
<td>301</td>
<td>Tst Passed</td>
</tr>
<tr>
<td>301</td>
<td>Rts Passed</td>
</tr>
<tr>
<td>302</td>
<td>Out-of-service test initiated</td>
</tr>
<tr>
<td>302</td>
<td>Tst Passed</td>
</tr>
<tr>
<td>302</td>
<td>Rts Passed</td>
</tr>
<tr>
<td>303</td>
<td>Out-of-service test initiated</td>
</tr>
<tr>
<td>303</td>
<td>Tst Passed</td>
</tr>
<tr>
<td>303</td>
<td>Rts Passed</td>
</tr>
<tr>
<td>304</td>
<td>Out-of-service test initiated</td>
</tr>
<tr>
<td>304</td>
<td>TsT Passed</td>
</tr>
<tr>
<td>304</td>
<td>Rts Passed</td>
</tr>
</tbody>
</table>

If the RTS command passed for all STs, and you have not worked on the other STC

    step 37
NT0X91
in an MS7E, ST7E, or ST6E (end)

If the RTS command

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed for all STs, and you have</td>
<td>step 39</td>
</tr>
<tr>
<td>worked on the other STC</td>
<td></td>
</tr>
<tr>
<td>failed for any ST</td>
<td>step 42</td>
</tr>
</tbody>
</table>

37 To post the other STC, type

>POST  stcm_no

and press the Enter key.

where

stcm_no

is the STC number (0 to 9)

38 Repeat steps 30 to 36 for the other STC. When you have loaded and returned
to service all STs, go to step 39.

39 The next action depends on your reason for performing this procedure.

If

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a maintenance procedure</td>
<td>step 40</td>
</tr>
<tr>
<td>directed you to this procedure</td>
<td></td>
</tr>
<tr>
<td>a maintenance procedure did not</td>
<td>step 43</td>
</tr>
<tr>
<td>direct you to this procedure</td>
<td></td>
</tr>
</tbody>
</table>

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

41 For additional help with changing the NT0X91AA in the MS7E, contact the
next level of support.

    Note: 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.

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

43 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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA</td>
<td>Drive and alarm card</td>
<td>NT0X48 single-bay network (NET), NT5X13 combined single-bay network (NETC), NT8X11 dual shelf network (DSN)</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AE</td>
<td>Drive and protection card</td>
<td>NET, NETC, DSN</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NT0X91 in a network equipment frame

Manually busy the network plane and pair

Manually busy MS links

Power down the shelves

Replace the card

Power up the shelves

Return MS links to service

Return the plane and pair to service

End

This flowchart summarizes the procedure.

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

<table>
<thead>
<tr>
<th>If Alarm and control card</th>
<th>Do Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>is NT0X91AA</td>
<td>CD1</td>
</tr>
<tr>
<td>is NT0X91AE</td>
<td>CD2</td>
</tr>
</tbody>
</table>
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)

<table>
<thead>
<tr>
<th>Network frame</th>
<th>FSP card</th>
<th>FSP card position</th>
<th>FSP fuses or CBs</th>
<th>Shelf position</th>
<th>Shelf function</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET (fuses)</td>
<td>NT0X91AA</td>
<td>CD1</td>
<td>F04</td>
<td>18</td>
<td>I/F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F02</td>
<td>51</td>
<td>I/F</td>
</tr>
<tr>
<td></td>
<td>NT0X91AE</td>
<td>CD2</td>
<td>F03</td>
<td>32</td>
<td>XPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F01</td>
<td>65</td>
<td>XPT</td>
</tr>
<tr>
<td>NET (CBs)</td>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB4</td>
<td>18</td>
<td>I/F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CB2</td>
<td>51</td>
<td>I/F</td>
</tr>
<tr>
<td></td>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB3</td>
<td>32</td>
<td>XPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CB1</td>
<td>65</td>
<td>XPT</td>
</tr>
<tr>
<td>NETC</td>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB2</td>
<td>51</td>
<td>XPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CB1</td>
<td>65</td>
<td>I/F</td>
</tr>
<tr>
<td></td>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB5</td>
<td>18</td>
<td>I/F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CB4</td>
<td>32</td>
<td>XPT</td>
</tr>
<tr>
<td>DSN</td>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB1</td>
<td>65</td>
<td>NM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CB2</td>
<td>51</td>
<td>NM</td>
</tr>
</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>Network frame</th>
<th>FSP card</th>
<th>FSP card position</th>
<th>FSP fuses or CBs</th>
<th>Shelf position</th>
<th>Shelf function</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AE</td>
<td>CD2</td>
<td>CB5</td>
<td>32</td>
<td>NM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CB4</td>
<td>18</td>
<td>NM</td>
<td></td>
</tr>
</tbody>
</table>

**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)

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>know the network plane and pair associated</td>
<td>step 10</td>
</tr>
<tr>
<td>with the card to replace</td>
<td></td>
</tr>
<tr>
<td>do not know the network plane and pair</td>
<td>step 6</td>
</tr>
<tr>
<td>associated with the card to replace</td>
<td></td>
</tr>
</tbody>
</table>

6. Select a network plane and pair.

7. To display the frame and shelf location, type

```
>LOC 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:

<table>
<thead>
<tr>
<th>Site</th>
<th>Flr</th>
<th>RPos</th>
<th>Bay_id</th>
<th>Shf</th>
<th>Description</th>
<th>Slot</th>
<th>EqPEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOST</td>
<td>01</td>
<td>B09</td>
<td>NET0</td>
<td>00</td>
<td>5X13HOST</td>
<td>01</td>
<td>B09</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the network module</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>corresponds to the FSP card you replace</td>
<td>step 10</td>
</tr>
<tr>
<td>does not correspond to the FSP card you replace</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 11</td>
</tr>
</tbody>
</table>
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X91
in a network equipment frame (continued)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>needs confirmation</td>
<td>step 39</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

11 Wait 30 min to make sure that calls in progress finish.
   
   **Note:** 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
   
   >TRNSL plane_no pair_no
   
   and press the Enter key.

   where
   
   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:**

   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
   
   >MS; SHELF
   
   and press the Enter key.

   **Example of a MAP display:**

   ![](image)

15 To post the card in the slot that you recorded in step 13, type
   
   >CARD slot_no
   
   and press the Enter key.

   where
Frame supervisory panel and modular supervisory panel card replacement procedures

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 1 2 2 2 2 2 2 2 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       .       I       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --       --�
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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has an NT2X70AE card and the FSP</td>
<td>step 26</td>
</tr>
<tr>
<td>has circuit breakers</td>
<td></td>
</tr>
</tbody>
</table>
Frame supervisory panel and modular supervisory panel card replacement procedures  7-169

NT0X91

in a network equipment frame (continued)

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has an NT2X70AE card and the FSP does not have circuit breakers</td>
<td>step 27</td>
</tr>
<tr>
<td>does not have an NT2X70AE card and the FSP has circuit breakers</td>
<td>step 28</td>
</tr>
<tr>
<td>does not have an NT2X70AE card and the FSP does not have circuit breakers</td>
<td>step 29</td>
</tr>
</tbody>
</table>

26 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 until the handle clicks into place.
   c Release the handle of the POWER switch.
      Go to step 30.

27 Power up the converter as follows:
   a Pull up and set the handle of the POWER switch to the RESET position until the CONVERTER FAIL LED turns off.
   b Release the handle.
      Go to step 30.

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.
   c Pull up and set the handle of the converter circuit breaker on the FSP until the handle clicks into place.
   d Release the RESET button.
      Go to step 30.

29 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.

30 The next action depends on the power converter configuration for the shelf.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has one power converter</td>
<td>step 32</td>
</tr>
</tbody>
</table>
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X91
in a network equipment frame (continued)

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has two power converters, and</td>
<td>step 32</td>
</tr>
<tr>
<td>you powered up both converters</td>
<td></td>
</tr>
<tr>
<td>has two power converters, you</td>
<td>step 31</td>
</tr>
<tr>
<td>powered up only one converter,</td>
<td></td>
</tr>
<tr>
<td>and the mate converter is an NT2X06 or an NT2X07</td>
<td></td>
</tr>
</tbody>
</table>

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.

At the MAP terminal

33 To return to service the port on MS0 that connects to the network plane and pair, type

```
>RTS 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 RTS MS: 0 shelf: 0 card:22 port: 1 submitted.
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

```
>RTS 1 PORT port_no
```
and press the Enter key.

where

`port_no` is the port number that you recorded in step 13

35 To access the NET level of the MAP display, type

```
>NET
```
and press the Enter key.

36 To return the network module to service, type

```
>RTS plane_no pair_no
```
and press the Enter key.

where
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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 37</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91</td>
<td>AA, AB</td>
<td>Drive and alarm card</td>
<td>TME equipped with integrated service module (ISM), maintenance trunk module (MTM), office alarm unit (OAU), service trunk module (STM), or trunk module (TM)</td>
</tr>
<tr>
<td>NT0X91</td>
<td>AD</td>
<td>Drive and protection card</td>
<td>TME equipped with ISM, MTM, OAU, STM, or TM</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NT0X91 in a trunk module equipment frame

1. Post the PMs
2. Manually busy the circuits
3. Manually busy the PMs
4. Power down the shelves
5. Replace the card
6. Power up the shelves
7. Return the PMs to service
8. Return the circuits to service

This flowchart summarizes the procedure.

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

<table>
<thead>
<tr>
<th>If Alarm and control card</th>
<th>Do Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
</tr>
<tr>
<td>NT0X91AB</td>
<td>CD2</td>
</tr>
<tr>
<td>NT0X91AD</td>
<td>CD3</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>FSP card</th>
<th>FSP card position</th>
<th>FSP circuit breakers</th>
<th>Shelf position</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X91AA</td>
<td>CD1</td>
<td>CB5</td>
<td>04</td>
</tr>
<tr>
<td>NT0X91AB</td>
<td>CD2</td>
<td>CB3</td>
<td>32</td>
</tr>
<tr>
<td>NT0X91AD</td>
<td>CD3</td>
<td>CB4</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CB1</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CB2</td>
<td>51</td>
</tr>
</tbody>
</table>

**Note 1:** A minimum of one shelf can be unequipped.

**Note 2:** 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.

Select a shelf associated with the FSP card you replace.

**At the MAP terminal**

To access the PM level of the MAP display, type

>`MAPCI;MTC;PM`

and press the Enter key.

*Example of a MAP display:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>

The next step depends on the type of PM that is in the shelf.

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an OAU</td>
<td>step 7</td>
</tr>
<tr>
<td>is an ISM, MTM, STM, or TM</td>
<td>step 11</td>
</tr>
</tbody>
</table>

To post the OAU, type

>`POST OAU pm_no`

and press the Enter key.

*where*
Frame supervisory panel and modular supervisory panel card replacement procedures

NT0X91

in a trunk module equipment frame (continued)

pm_no
is the number of the PM (0 to 9999)

Example of a MAP display:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>102</td>
</tr>
<tr>
<td>OAU</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0OAU</td>
<td>0</td>
<td>SysB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is OffL</td>
<td>step 89</td>
</tr>
<tr>
<td>is ManB</td>
<td>step 36</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1</td>
<td>6</td>
<td>14</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>OAU</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0OAU</td>
<td>0</td>
<td>ManB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

bsy
OAU 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)

You must remove both STMs from service to complete this procedure.

<table>
<thead>
<tr>
<th>If necessary services</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>use PM resources and a minimum of one PM is in service</td>
<td>step 88</td>
</tr>
<tr>
<td>use PM resources and all PMs are out of service</td>
<td>step 12</td>
</tr>
<tr>
<td>do not use PM resources</td>
<td>step 12</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>CBsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>102</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is Offl</td>
<td>step 89</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 14</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>POST TTP</th>
<th>DELQ</th>
<th>BUSYQ</th>
<th>DIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-013</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CKT TYPE</th>
<th>PM NO.</th>
<th>COM LANG</th>
<th>STA S R</th>
<th>DOT TE</th>
<th>RESULT</th>
</tr>
</thead>
</table>
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
```

To manually busy all posted circuits, type

```
>BSY  ALL
```

and press the Enter key.

*Example of a MAP display:*

```
POST    18  DELQ            BUSYQ        DIG
TTP  6-027
CKT TYPE     PM NO.          COM LANG     STA S R  DOT TE  RESULT
BSYQ ALL IDLE
```

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.

Determine if the shelf has the NT1X80 enhanced-digital recorded announcement machine (EDRAM) card or the NT1X81 conference card.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has the NT1X80 or the NT1X81</td>
<td>step 19</td>
</tr>
</tbody>
</table>
NT0X91
in a trunk module equipment frame (continued)

19 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 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.

20 To manually busy all posted circuits, type
   >BSY  ALL
   and press the Enter key.

21 Wait until all circuits are manually busy (removed from the busy queue) before
   you proceed to the next step.

22 Repeat steps 19 to 21 for all NT1X80 and NT1X81 cards on the shelf.

23 To access the PM level of the MAP display, type
   >PM
   and press the Enter key.

24 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)

25 Determine the state of the PM.
   If the PM          Do
   is ManB          step 27
   is other than listed here step 26
26. To manually busy the PM, type
   `>BSY`
   and press the Enter key.

   *Example of a MAP display:*

<table>
<thead>
<tr>
<th>PM</th>
<th>SysB</th>
<th>ManB</th>
<th>OffL</th>
<th>Cbsy</th>
<th>ISTb</th>
<th>InSv</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTM</td>
<td>58</td>
<td>1</td>
<td>6</td>
<td>14</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>MTM</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

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.
Determine if the shelf has a STM.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has a STM, and only one STM is manually busy</td>
<td>step 33</td>
</tr>
<tr>
<td>has a STM, and both STMs are manually busy</td>
<td>step 34</td>
</tr>
<tr>
<td>has a STM</td>
<td>step 34</td>
</tr>
</tbody>
</table>

Repeat steps 12 to 32 for the STM in the other half of the shelf.

The next action depends on how many shelves equipped with PMs associate with the FSP card you replace.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 36</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you turned down functionality for only one shelf</td>
<td>step 35</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you turned down functionality for both shelves</td>
<td>step 36</td>
</tr>
</tbody>
</table>

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.

If one shelf equipped with PMs associates with the card

Repeat steps 4 to 34 for PMs in the other shelf associated with the FSP card you replace. Go to step 36.
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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has an STM (with or without DRAM)</td>
<td>step 39</td>
</tr>
<tr>
<td>has an MTM (with or without DRAM)</td>
<td>step 40</td>
</tr>
<tr>
<td>has an ISM (with or without DRAM)</td>
<td>step 41</td>
</tr>
<tr>
<td>is equipped as a TM</td>
<td>step 41</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If one shelf equipped with PMs associates with the card</th>
<th>Do step 43</th>
</tr>
</thead>
</table>
NT0X91
in a trunk module equipment frame (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down only one shelf</td>
<td>step 43</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered down both shelves</td>
<td>step 46</td>
</tr>
</tbody>
</table>

42 Repeat steps 37 to 41 for PMs in the other shelf associated with the FSP card you replace. Go to step 43.

43 Unscrew the slotted nut on the left-hand side of the FSP.

44 Open the FSP.

45 Remove the card.

46 Insert the replacement alarm and control card.

47 Close the FSP.

48 Tighten the slotted nut on the FSP.

49 Select a shelf to power up.

50 The next action depends on the type of power converter and the type of supervisory panel.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 51</td>
</tr>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 52</td>
</tr>
<tr>
<td>are not replacing an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 53</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 54</td>
</tr>
</tbody>
</table>

51 Power up the converter.

- Pull and set the POWER switch handle up to the RESET position and hold.
Frame supervisory panel and modular supervisory panel card replacement procedures

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.

<table>
<thead>
<tr>
<th>If the shelf</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>has an STM or an MTM (with or without DRAM) and you already powered up both power converters</td>
<td>step 60</td>
</tr>
<tr>
<td>has an STM (with or without DRAM)</td>
<td>step 56</td>
</tr>
<tr>
<td>has an MTM (with or without DRAM)</td>
<td>step 57</td>
</tr>
<tr>
<td>has an ISM (with or without DRAM)</td>
<td>step 60</td>
</tr>
<tr>
<td>is equipped as a TM</td>
<td>step 60</td>
</tr>
</tbody>
</table>
For the mate power converter in the STM on the other half of the shelf, repeat steps 50 to 55. Go to step 58.

For the other power converter on the shelf, repeat steps 50 to 55. Go to step 58.

The next action depends on how many shelves associate with the FSP card you replace.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 60</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered up only one shelf</td>
<td>step 59</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you powered up both shelves</td>
<td>step 60</td>
</tr>
</tbody>
</table>

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

To access the PM level of the MAP display, type

>`PM`

and press the Enter key.

The next step depends on the type of PM that is in the shelf.

<table>
<thead>
<tr>
<th>If the PM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an OAU</td>
<td>step 62</td>
</tr>
<tr>
<td>is an ISM, MTM, STM, or TM</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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)

To load the OAU, type

>`LOADPM`

and press the Enter key.
Example of a MAP response:

OAU 0 LoadPM Passed

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 65</td>
</tr>
<tr>
<td>failed</td>
<td>step 64</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 84</td>
</tr>
<tr>
<td>failed</td>
<td>step 91</td>
</tr>
</tbody>
</table>

66 To post the PM, type

>`POST pm_type pm_no`

and press the Enter key.

Example of a MAP response:

MTM 0 LoadPM Passed

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 69</td>
</tr>
</tbody>
</table>
NT0X91
in a trunk module equipment frame (continued)

<table>
<thead>
<tr>
<th>If the LOADPM command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>failed</td>
<td>step 68</td>
</tr>
</tbody>
</table>

**68** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

**69** To return the PM to service, type

```
>RTS
```

and press the Enter key.

*Example of a MAP response:*

```
MTM 0 Rts Passed
```

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed, and the PM is <em>InSv</em></td>
<td>step 71</td>
</tr>
<tr>
<td>passed, and the PM is <em>ISTb</em> with a card list generated</td>
<td>step 70</td>
</tr>
<tr>
<td>failed</td>
<td>step 91</td>
</tr>
</tbody>
</table>

**70** Record the messages on the MAP display for future reference.

**71** To access the TTP level of the MAP display, type

```
>TRKS: TTP
```

and press the Enter key.

**72** To post the circuits for the PM, type

```
>POST TM pm_type pm_no
```

*where*

- `pm_type` is the type of PM (ISM, MTM, STM, TM)
- `pm_no` is the number of the PM (0 to 9999)

**73** To return all circuits to service, type

```
>RTS ALL
```

and press the Enter key.

*Example of a MAP response:*

```
RTS OK
```
The next action depends on the results of the PM RTS in step 69.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed without problems</td>
<td>step 81</td>
</tr>
<tr>
<td>passed, but in-service tests failed and the system generated a card list</td>
<td>step 75</td>
</tr>
</tbody>
</table>

To manually busy all posted circuits, type

\[>\text{BSY ALL}\]

and press the Enter key.

To return all circuits to service, type

\[>\text{RTS ALL}\]

and press the Enter key.

To access the PM level of the MAP display, type

\[>\text{PM}\]

and press the Enter key.

To post the PM, type

\[>\text{POST pm\_type pm\_no}\]

and press the Enter key.

\[\text{where}\]

- \[\text{pm\_type}\]
  is the type of PM (CTM, DTM, ISM, MTM, STM, TM)
- \[\text{pm\_no}\]
  is the number of the PM (0 to 9999)

To perform an in-service test on the PM, type

\[>\text{TST}\]

and press the Enter key.

*Example of a MAP response:*
80 Record the messages on the MAP display for future reference.

81 To access the PM level of the MAP display, type

>PM

and press the Enter key.

82 To post the PM, type

>POST pm_type pm_no

and press the Enter key.

where

<table>
<thead>
<tr>
<th>pm_type</th>
<th>is the type of PM (ISM, MTM, STM, TM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pm_no</td>
<td>is the number of the PM (0 to 9999)</td>
</tr>
</tbody>
</table>

83 Repeat steps 66 to 79 for all PMs on this shelf. Go to step 84.
**Frame supervisory panel and modular supervisory panel card replacement procedures**

**NT0X91**

*in a trunk module equipment frame* (end)

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>Determine how many shelves associate with the FSP card you replace.</td>
</tr>
<tr>
<td><strong>If</strong></td>
<td><strong>Do</strong></td>
</tr>
<tr>
<td>one shelf equipped with PMs associates with the card</td>
<td>step 86</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you returned to service the PM on only one shelf</td>
<td>step 85</td>
</tr>
<tr>
<td>two shelves equipped with PMs associate with the card, and you returned to service the PM on both shelves</td>
<td>step 86</td>
</tr>
<tr>
<td>85</td>
<td>Repeat steps 61 to 84 for PMs in the other shelf associated with the FSP card you replace. Go to step 86.</td>
</tr>
<tr>
<td>86</td>
<td>Determine if the maintenance procedure directed you to this procedure.</td>
</tr>
<tr>
<td><strong>If a maintenance procedure</strong></td>
<td><strong>Do</strong></td>
</tr>
<tr>
<td>directed you to this procedure</td>
<td>step 87</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 92</td>
</tr>
<tr>
<td>87</td>
<td>Return to the maintenance procedure that sent you to this procedure and continue as directed.</td>
</tr>
<tr>
<td>88</td>
<td>Contact the next level of support to determine how to handle necessary services. Continue as directed.</td>
</tr>
<tr>
<td>89</td>
<td>Contact operating company personnel to determine why the component is offline. Continue as directed.</td>
</tr>
<tr>
<td>90</td>
<td>Report the results of the maintenance activity to the next level of support.</td>
</tr>
<tr>
<td>91</td>
<td>For additional help, contact the next level of support.</td>
</tr>
<tr>
<td>92</td>
<td>The procedure is complete.</td>
</tr>
</tbody>
</table>
NT6X36 in LCE-type frames and CLCE

Application

Use this procedure to replace the following cards in the shelves or frames listed.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT6X36</td>
<td>AA, AB</td>
<td>FSP alarm card</td>
<td>line concentrating equipment (LCE) frame</td>
</tr>
<tr>
<td>NT6X36</td>
<td>AA, EA</td>
<td>FSP alarm card</td>
<td>enhanced line concentrating equipment (LCEI) frame</td>
</tr>
<tr>
<td>NT6x36</td>
<td>AA, AB</td>
<td>FSP alarm card</td>
<td>cabinetized line concentrating equipment (CLCE), PEC NTRX30AA</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NT6X36 in LCE-type frames and CLCE

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

Open FSP panel

Replace card

Close FSP panel

Check power on shelves

Did a maintenance procedure direct you to this procedure?

N

Is power supplied to all shelves?

Y

N

Clear alarms

Return to the maintenance procedure that directed you to this procedure.

End

Y
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.
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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a maintenance procedure directed you to this procedure</td>
<td>step 9</td>
</tr>
<tr>
<td>a maintenance procedure did not direct you to this procedure</td>
<td>step 10</td>
</tr>
</tbody>
</table>

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

Note: Remove and install the card carefully. Make sure the card does not jam the slot.
10 Check the CONVERTER FAIL LEDs on each power converter for each shelf.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the LED is lit for any power</td>
<td>step 11</td>
</tr>
<tr>
<td>converter</td>
<td></td>
</tr>
<tr>
<td>the LED is not lit for each power</td>
<td>step 12</td>
</tr>
<tr>
<td>converter</td>
<td></td>
</tr>
</tbody>
</table>

11 To clear alarms, go to *Alarm clearing and performance monitoring*. Do not return to this procedure.

12 The procedure is complete.
Application

Use this procedure to replace the following cards in a modular supervisory panel (MSP). The following table lists the cards.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized two-shelf network (CDSN)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized input-output equipment (CIOE)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized international peripheral equipment (CIPE)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized miscellaneous equipment (CMIS)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized trunk module equipment (CTME)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized digital trunk controller offshore (CDTO)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized line group controller offshore (CLGO)</td>
</tr>
<tr>
<td>NTRX41</td>
<td>AA</td>
<td>Alarm module</td>
<td>Cabinetized message switch 7 (CMS7)</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NTRX41 in MSP in streamline B cabinets

This flowchart summarizes the procedure.

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

Open MSP cover

Replace NTRX41

End
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.

---

**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.
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.
e  Tighten the captive screw at the top of the module.

<table>
<thead>
<tr>
<th>If the MSP alarm LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>remains off</td>
<td>step 8</td>
</tr>
<tr>
<td>turns on</td>
<td>step 7</td>
</tr>
</tbody>
</table>

7  For additional help, contact the next level of support.
8  The procedure is complete.
8 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.
Figure Input/output equipment frame

Legend:
- DDU  Disk drive unit
- FSP  Frame supervisory panel
- IOC  I/O controller

Magnetic tape drive
Filler faceplate
Dual DDU
FSP
IOC
Note: The NT1X67 terminal controller card can function as a Datalink controller card, DATAPAC controller card, or SMDI controller card.
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.
**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)

- MSP
- ISM shelves
- ISM shelves
### Figure Integrated services module shelf

<table>
<thead>
<tr>
<th>Circuit board</th>
<th>Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTFX42AA</td>
<td>21F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>20F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>19F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>18F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>17F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>16F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>15F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>14F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>13F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>12F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>11F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>10F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>09F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>08F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>07F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>06F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>05F</td>
</tr>
<tr>
<td>NT0X50AC filler faceplate or service card</td>
<td>04F</td>
</tr>
<tr>
<td>NTFX32 Media storage card</td>
<td>03F</td>
</tr>
<tr>
<td>NTFX30 Controller</td>
<td>02F</td>
</tr>
<tr>
<td>NTFX43AA or NT0X50AG</td>
<td>01F</td>
</tr>
</tbody>
</table>

Rear  | Front
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).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT1X55</td>
<td>AA, AB, BA, CA, DA</td>
<td>Disk drive controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X55</td>
<td>FA</td>
<td>SCSI disk drive unit</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X68</td>
<td>AA, AB, AC, BB, BC, BD</td>
<td>Magnetic tape interface card</td>
<td>IOC</td>
</tr>
</tbody>
</table>

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 DDUs 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

- Post the IOC and the card
- Make sure you close files and notify users
- Manually busy the card
- Replace the card
- Return the card to service
- End

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.
Replacing Disk drive and magnetic tape controller cards in an IOC

At the MAP terminal

1. 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 . . .
   IOC   CARD    0     1     2     3
   0     PORT  0123  0123  0123  01230123  0123  0123  0123  0123
   STAT  .---  .---  .---  .---  .---  .---  .---  .---
   TYPE  MTD  DDU  CONS  MPC  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 . . . .


IOC CARD 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 The next action depends on the card you replace.

<table>
<thead>
<tr>
<th>If the card you replace</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is NT1X55</td>
<td>step 6</td>
</tr>
<tr>
<td>is NT1X68</td>
<td>step 10</td>
</tr>
</tbody>
</table>

6 Determined the state of the NT1X55 controller card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 9</td>
</tr>
<tr>
<td>is Offl</td>
<td>step 39</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 7</td>
</tr>
</tbody>
</table>

7 To determine if files are open on the DDU, type

>`ALLOC`

and press the Enter key.

*Example of a MAP response:*

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


IOC CARD 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 The next action depends on the card you replace.

<table>
<thead>
<tr>
<th>If the card you replace</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is NT1X55</td>
<td>step 6</td>
</tr>
<tr>
<td>is NT1X68</td>
<td>step 10</td>
</tr>
</tbody>
</table>
```

---

297-9051-547  Standard  02.01   April 2000
Disk drive and magnetic tape controller cards
in an IOC (continued)

Note: If you replace an NT1X55FA, record the name and number of each disk volume.

<table>
<thead>
<tr>
<th>VOLID</th>
<th>VOL_NAME</th>
<th>SERIAL_NO</th>
<th>BLOCKS</th>
<th>ADDR</th>
<th>TYPE</th>
<th>R/O</th>
<th>FILES_OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>IMAGE</td>
<td>2800</td>
<td>45000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>XPMLOADS</td>
<td>2801</td>
<td>35000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>XPMLOADS</td>
<td>2802</td>
<td>20000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>SMDR</td>
<td>2807</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>AMA1</td>
<td>2808</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>TST</td>
<td>2809</td>
<td>50</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>AMA2</td>
<td>280A</td>
<td>50000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
</tbody>
</table>

If files
- are open: step 31
- are not open: step 8

8. To manually busy the controller, type
   >BSY
   and press the Enter key.

9. To offline the NT1X55 card, type
   >OFFL
   and press the Enter key.
   Go to step 13.

10. Determine the state of the NT1X68 controller card.

   If the card
   - is ManB: step 13
   - is Offl: step 39
   - is other than listed here: step 11

11. 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.

12. To manually busy the controller, type
    >BSY
    and press the Enter key.
At the shelf

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.

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

<table>
<thead>
<tr>
<th>If the card you replace</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is NT1X55FA</td>
<td>step 15</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 26</td>
</tr>
</tbody>
</table>

At the MAP terminal

15 To start the disk drive motor, type

>START

and press the Enter key.

MAP response:

Disk Start Successful
Disk drive and magnetic tape controller cards in an IOC (continued)

16 To test the disk drive, type
   >TST
   and press the Enter key.
   Example of a MAP display:

   Card 8  Unit  0
   User  SYSTEM  Drive_State
   Status  BSY  spinning

<table>
<thead>
<tr>
<th>If the TST command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 17</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

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
 Disk drive and magnetic tape controller cards in an IOC

vol_size
  is the volume size you recorded in step 7

23  Repeat step 22 for each of the disk volumes that remain.
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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 29</td>
</tr>
<tr>
<td>failed</td>
<td>step 40</td>
</tr>
</tbody>
</table>

Note: A break HX of this process may cause severe corruption on the disk that may require it to be reformatted.
Disk drive and magnetic tape controller cards in an IOC (continued)

29 The next action depends on why you perform this procedure.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 30</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 41</td>
</tr>
</tbody>
</table>

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
```

where

- `dev_name` is the name of the device

34 To quit the allocation utility, type

```
>QUIT
```

and press the Enter key.
Repeat the ALLOC command to determine if the files are closed by typing
\texttt{\textgreater{}ALLOC}
and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 36</td>
</tr>
<tr>
<td>are closed</td>
<td>step 37</td>
</tr>
</tbody>
</table>

Confirm that you have done steps 31 to 35. If the files are still open, contact your next level of support.

Manually busy the DDU, by typing
\texttt{\textgreater{}BSY}
and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the DDU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 9</td>
</tr>
<tr>
<td>is not ManB</td>
<td>step 40</td>
</tr>
</tbody>
</table>

When cards are replaced and the DDU is in service, open the files. Use the procedure “Allocating Recording Volumes in the DIRP Utility” in \textit{Routine Maintenance Procedures}.

To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

For additional help, contact the next level of support.

The procedure is complete.
Application

Use this procedure to replace an NT1X67 in an input/output controller (IOC).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT1X67</td>
<td>AA, AB, BC, BD, CB</td>
<td>Terminal controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X67</td>
<td>BA, DA</td>
<td>Datalink controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X67</td>
<td>BB, DB</td>
<td>DATAPAC controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X67</td>
<td>FA</td>
<td>SMDI controller card</td>
<td>IOC</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NT1X67 in an IOC

Post the IOC

Post the card

Manually busy all ports on the card

Replace the card

Return all ports to service

End

This flowchart summarizes the procedure.

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

<table>
<thead>
<tr>
<th>If the power converter card is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>an NT2X70AA, NT2X70AB, or NT2X70AC</td>
<td>step 19</td>
</tr>
<tr>
<td>an NT2X70AD or NT2X70AE</td>
<td>step 3</td>
</tr>
</tbody>
</table>

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:*
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 . . . .
```

4 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 . . . .
```

```
```

```
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
```
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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all ports are ManBsy</td>
<td>step 12</td>
</tr>
<tr>
<td>a minimum of one port is Offl</td>
<td>step 20</td>
</tr>
<tr>
<td>a minimum of one port is . (dot)</td>
<td>step 7</td>
</tr>
<tr>
<td>all ports are in any other out-of-service state</td>
<td>step 8</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 9</td>
</tr>
<tr>
<td>failed</td>
<td>step 21</td>
</tr>
</tbody>
</table>

9. Repeat step 8 until you manually busy all ports on the card. Go to step 10.
To offline a port on the card, type

\texttt{>OFFL \ port\_no}

and press the Enter key.

\textit{where}

\texttt{port\_no}

is the port identification number (0 to 3)

<table>
<thead>
<tr>
<th>If the OFFL command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 11</td>
</tr>
<tr>
<td>failed</td>
<td>step 21</td>
</tr>
</tbody>
</table>

Repeat step 10 until you offline all ports on the card. Go to step 12.

\textit{At the shelf}

12

\textbf{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 \textit{Replacing a card} in this document. Complete the procedure and return to this point.

\textit{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.

\textit{At the MAP terminal}

13

To manually busy a port on the card, type

\texttt{>BSY \ port\_no}

and press the Enter key.

\textit{where}

\texttt{port\_no}

is the port identification number (0 to 3)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 14</td>
</tr>
</tbody>
</table>
Repeat step 13 until you manually busy all ports on the card. Go to step 15.

To return a port to service, type

\texttt{>RTS port\_no}

and press the Enter key.

\textit{where}

\texttt{port\_no}

is the port identification number (0 to 3)

Repeat step 15 until you return all ports to service. Go to step 17.

The next action depends on why you perform this procedure.

Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

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:

- NT1X55FA
- NT1X67BC or NT1X67BD the run applications at 9600 baud (on one port or all four ports combined)
- NT1X89

Go to step 21.

To determine why the port is offline, consult operating company personnel. Continue as directed by operating company personnel.

For additional help, contact the operating company personnel responsible for the next level of support.

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT1X78</td>
<td>AA</td>
<td>Power converter card (+5V, -5V, -12V, +24V)</td>
<td>single-disk drive unit (DDU) shelf in an input/output equipment (IOE) frame; two-DDU shelf in an IOE frame</td>
</tr>
<tr>
<td>NT1X78</td>
<td>KA</td>
<td>-60V power converter card (+5V, -5V, -12V, +24V)</td>
<td>single-DDU shelf in an IOE frame; two-DDU shelf in an IOE frame</td>
</tr>
</tbody>
</table>

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

1. Post the IOC and the DDU controller card
2. Make sure that all files are closed
3. Manually busy the controller card
4. Turn off the DDU shelf
5. Replace the card
6. Turn on the DDU shelf
7. Return the DDU controller card to service
8. End

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
Replacing a NT1X78 in an IOE DDU shelf

At the MAP terminal

1

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 . . . .


IOCCARD 0 1 2 3 4 5 6 7 8
PORT 0123 0123 0123 0123 0123 0123 0123 0123
STAT .---- .---- .---- .---- .---- .---- .---- .----
TYPE MTD DDU CONS MPC CONS CONS MPC

4

To post the DDU controller card, type

>CARD card_no

and press the Enter key.
where

\text{card\_no}

is the card identification number (0 to 8)

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

5 Determine the state of the DDU controller card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 9</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 24</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 6</td>
</tr>
</tbody>
</table>

6 To determine if files are open on the DDU, type

>ALLOC

and press the Enter key.

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

where

\text{card\_no}

is the card identification number (0 to 8)

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

5 Determine the state of the DDU controller card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 9</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 24</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 6</td>
</tr>
</tbody>
</table>

6 To determine if files are open on the DDU, type

>ALLOC

and press the Enter key.

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

where

\text{card\_no}

is the card identification number (0 to 8)

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

where

\text{card\_no}

is the card identification number (0 to 8)

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

where

\text{card\_no}

is the card identification number (0 to 8)

Example of a MAP response:

\begin{verbatim}
DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

where

\text{card\_no}

is the card identification number (0 to 8)

Example of a MAP response:
7 To manually busy the controller, type
>BSY
and press the Enter key.

*Example of a MAP response:*

bsyOK

8 To spin down the DDU, type
>STOP
and press the Enter key.

*Example of a MAP display:*

Disk stop successful

9 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.
**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.

<table>
<thead>
<tr>
<th>If the power LED</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is lit</td>
<td>step 14</td>
</tr>
<tr>
<td>is not lit</td>
<td>step 25</td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 15</td>
</tr>
<tr>
<td>failed</td>
<td>step 25</td>
</tr>
</tbody>
</table>

15 The next action depends on why you perform this procedure.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 16</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 26</td>
</tr>
</tbody>
</table>

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
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.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 21</td>
</tr>
<tr>
<td>are closed</td>
<td>step 22</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the DDU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 23</td>
</tr>
<tr>
<td>is not MBSY</td>
<td>step 25</td>
</tr>
</tbody>
</table>

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)
Application

Use this procedure to replace an NT1X89 in an input/output controller (IOC), as listed in the following table.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT1X89</td>
<td>AA, AB</td>
<td>Multiprotocol controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X89</td>
<td>BB</td>
<td>Enhanced multiprotocol controller card</td>
<td>IOC</td>
</tr>
</tbody>
</table>

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

- Post the MPC card
- Notify all users of pending maintenance
- Manually busy all ports
- Replace the card
- Load the MPC card
- Return all ports to service
- End

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
Replacing a NT1X89 in an IOC shelf

At the MAP terminal

1 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.

<table>
<thead>
<tr>
<th>If the power converter card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is an NT2X70AA, NT2X70AB, or NT2X70AC</td>
<td>step 18</td>
</tr>
<tr>
<td>is an NT2X70AD or NT2X70AE</td>
<td>step 3</td>
</tr>
</tbody>
</table>

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

Example of a MAP display:
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 . . . .
   
   
   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 . . . .
   
   
   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 Unit
   User SYSTEM BOARD LINK0 LINK1 LINK2 LINK3
   Status Ready COMACT UNEQ N/A UNEQ ENABLD
Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card state is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANB</td>
<td>step 11</td>
</tr>
<tr>
<td>OFFL</td>
<td>step 19</td>
</tr>
<tr>
<td>other than listed here</td>
<td>step 7</td>
</tr>
</tbody>
</table>

**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:*

<table>
<thead>
<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>
</thead>
<tbody>
<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>
</tbody>
</table>

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

\[BSY \ \text{ALL}\ \text{FORCE}\]

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)

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.

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

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
>DOWNLOAD
and press the Enter key.

*Example of a MAP response:*
DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.

<table>
<thead>
<tr>
<th>If the DOWNLD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 15</td>
</tr>
<tr>
<td>failed</td>
<td>step 20</td>
</tr>
</tbody>
</table>

15 To return the MP to service, type

>RTS  ALL

and press the Enter key.

*Example of a MAP response:*

REQUEST PASSED FOR CARD.
REQUEST PASSED FOR LINKS.

16 Wait 1 min to determine the status of MPC components.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the system status is Ready, the board status is COMACT, and the link status is ENABLD for each provisioned link</td>
<td>step 17</td>
</tr>
<tr>
<td>the status of MPC components is other than listed here</td>
<td>step 20</td>
</tr>
</tbody>
</table>

17 Notify users that the MPC is in service.

18 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:

- NT1X55FA
- NT1X67BC or NT1X67BD the run applications at 9600 baud (on one port or all four ports combined)
- NT1X89

Go to step 20.

19 To determine why the MPC is offline, contact operating company personnel. Continue as directed by operating company personnel.

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

21 The procedure is complete.
NT2X70 in an IOC

Application

Use this procedure to replace an NT2X70 in an input/output controller (IOC).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X70</td>
<td>AD, AE,</td>
<td>Power converter card</td>
<td>IOC</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NT2X70</td>
<td>EA</td>
<td>-48 V power converter card</td>
<td>IOC</td>
</tr>
</tbody>
</table>

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.
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

Post the IOC

Manually busy all ports and cards

Manually busy the IOC

Turn off the shelf

Replace the card

Turn on the shelf

Return the IOC to service

Load MPC cards if necessary

Return all ports and cards to service

End
Replacing a NT2X70 in an IOC

At the MAP terminal

1. 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.

**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).
NT2X70 in an IOC (continued)

**ioc_no**

is the IOC identification number (0 to 19)

*Example of a MAP display:

<table>
<thead>
<tr>
<th>IOC</th>
<th>CARD</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>P---</td>
<td>P---</td>
<td>.---</td>
<td>.---</td>
<td>.---</td>
<td>.---</td>
<td>.---</td>
<td>.---</td>
<td>.---</td>
<td>.---</td>
</tr>
<tr>
<td>TYPE</td>
<td>MTD</td>
<td>DDU</td>
<td>CONS</td>
<td>MPC</td>
<td>CONS</td>
<td>CONS</td>
<td>CONS</td>
<td>CONS</td>
<td>MPC</td>
<td>CONS</td>
</tr>
</tbody>
</table>

4 The next action depends on if terminal controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 5</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 11</td>
</tr>
</tbody>
</table>

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:*
Input/output device card replacement procedures

in an IOC (continued)

### Note the CONS ID and status for each port.

<table>
<thead>
<tr>
<th>Card</th>
<th>MTD</th>
<th>DDU</th>
<th>CONS</th>
<th>MPC</th>
<th>CONS</th>
<th>CONS</th>
<th>MPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Cons Id</td>
<td>RD040</td>
<td>RD041</td>
<td>TEAM4</td>
<td>TEAM6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ConType</td>
<td>VT100</td>
<td>VT100</td>
<td>VT100</td>
<td>VT100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### If

- all ports are ManBsy
- a minimum of one port is Offl
- a minimum of one port is . (dot)
- all ports are in any other out-of-service state

#### Do

- step 10
- step 60
- step 7
- step 8

### 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.

### 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)

## Repeat step 8 until all ports on the card are manually busy. 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 cards (MPC) are on the shelf.

<table>
<thead>
<tr>
<th>If MPC cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 12</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 19</td>
</tr>
</tbody>
</table>

12 To post the card, type

```text
>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
PORT 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 ENABLD
```

13 Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card state</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MANB</td>
<td>step 18</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 60</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 14</td>
</tr>
</tbody>
</table>

**Note:** The card state appears under the BOARD header on the MAP display.
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
```

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a minimum of one session is active</td>
<td>step 15</td>
</tr>
<tr>
<td>all sessions are inactive</td>
<td>step 16</td>
</tr>
</tbody>
</table>

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.

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"): **REQUEST PASSED FOR LINKS. REQUEST PASSED FOR CARD.**

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 18</td>
</tr>
<tr>
<td>failed</td>
<td>step 68</td>
</tr>
</tbody>
</table>

Repeat steps 12 to 17 for each MPC card on the shelf. Go to step 19.
The next action depends on if disk drive or magnetic tape controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If disk drive controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 20</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 25</td>
</tr>
</tbody>
</table>

To post the card, type

```plaintext
>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  . . . .


IOC  CARD  0   1   2   3   4   5   6   7   8
PORT 0123 0123 0123 0123 0123 0123 0123 0123 0123

STAT  .---  .---  ....  .---  ....  ----  ..--  .---  ----

TYPE  TMT  DDU  CONS  MPC  CONS  CONS  MPC
Card 0 MTD  0

TapeName
Status     Idle
User
```

Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 24</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 60</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 22</td>
</tr>
</tbody>
</table>

To determine if files are open on the DDU, type

```plaintext
>ALLOC
```

and press the Enter key.

Example of a MAP response:
In an IOC (continued)

To manually busy the controller, type

```>BSY```

and press the Enter key.

*Example of a MAP response:*

```
bsy
OK```

Perform steps 20 to 23 for each disk drive controller card on the shelf. Go to step 25.

The next action depends on if magnetic tape drive controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If magnetic tape controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 26</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 31</td>
</tr>
</tbody>
</table>

To post the card, type

```>CARD card_no```

and press the Enter key.

*Example of a MAP response:*

<table>
<thead>
<tr>
<th>VOLID</th>
<th>VOL_NAME</th>
<th>SERIAL_NO</th>
<th>BLOCKS</th>
<th>ADDR</th>
<th>TYPE</th>
<th>R/O</th>
<th>FILES_OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>IMAGE</td>
<td>2800</td>
<td>45000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>XPMLOADS</td>
<td>2801</td>
<td>35000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>RTMLOADS</td>
<td>2802</td>
<td>20000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>SMDR</td>
<td>2807</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>AMA1</td>
<td>2808</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>TST</td>
<td>2809</td>
<td>50</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>AMA2</td>
<td>280A</td>
<td>500</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
</tbody>
</table>
Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

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.

To manually busy the card, type

>`BSY`

and press the Enter key.

*Example of a MAP response:*

bsyOK

Repeat steps 26 to 29 for each magnetic tape drive controller card on the shelf. Go to step 31.

To return to the IOC level of the map display, type

>`QUIT`

and press the Enter key.

Determine the state of the IOC.

<table>
<thead>
<tr>
<th>If the state of the IOC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is M</td>
<td>step 34</td>
</tr>
</tbody>
</table>
### NT2X70 in an IOC (continued)

<table>
<thead>
<tr>
<th>If the state of the IOC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is other than listed here</td>
<td>step 33</td>
</tr>
</tbody>
</table>

#### 33
To manually busy the IOC, type

```plaintext
>BSY IOC
```

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.

<table>
<thead>
<tr>
<th>If you</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 33</td>
</tr>
<tr>
<td>replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 38</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP has circuit breakers</td>
<td>step 39</td>
</tr>
<tr>
<td>do not replace an NT2X70AE card and the FSP or MSP does not have circuit breakers</td>
<td>step 40</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 42</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 43</td>
</tr>
</tbody>
</table>

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.
The next action depends on if disk drive or magnetic tape controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If disk drive or magnetic tape controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 45</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 48</td>
</tr>
</tbody>
</table>

To post the card, type

>CARD  card_no

and press the Enter key.

*where*

  **card_no**

  is the card identification number (0 to 8)

To return the controller to service, type

>RTS

and press the Enter key.

Repeat steps 45 and 46 for each disk drive or magnetic tape controller card on the shelf. Go to step 48.

The next action depends on if MPC cards are on the shelf.

<table>
<thead>
<tr>
<th>If MPC cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 49</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 55</td>
</tr>
</tbody>
</table>

To post the card, type

>CARD  card_no

and press the Enter key.

*where*

  **card_no**

  is the card identification number (0 to 8)

To load the MPC, type

>DOWNLD

and press the Enter key.

*Example of a MAP response:*
DOWNLOAD OF TABLE MPC FILE "MPC403AB" SUCCEEDED.

<table>
<thead>
<tr>
<th>If the DOWNLD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 51</td>
</tr>
<tr>
<td>failed</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the system status is Ready, the board status is COMACT, and the link status is ENABLD for each link</td>
<td>step 53</td>
</tr>
<tr>
<td>the status of the MPC components are other than listed here</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 56</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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
```
and press the Enter key.

where

\textbf{port\_no}

is the port identification number (0 to 3)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 58</td>
</tr>
<tr>
<td>failed</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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

\begin{center}
\textbf{WARNING}
\end{center}

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:

\texttt{>LOGUTIL;LISTDEVS}

and press the Enter key.

63 Close files on volumes on the DDU of the IOC.

\texttt{>STOPDEV \ dev\_name}

and press the Enter key.

where
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.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 65</td>
</tr>
<tr>
<td>are closed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the DDU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 67</td>
</tr>
<tr>
<td>is not MBSY</td>
<td>step 68</td>
</tr>
</tbody>
</table>

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.
Application

Use this procedure to replace an NTFX30 IOM controller card in an integrated services module (ISM) shelf.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTFX30</td>
<td>AA</td>
<td>Controller card</td>
<td>ISM</td>
</tr>
</tbody>
</table>

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.
Summary of replacing a NTFX30 in an ISM

This flowchart summarizes the procedure.

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

1. Post the IOM
2. Manually busy all devices
3. Manually busy the IOM
4. Replace the card
5. Reprogram the IOM flash ROM
6. Return the IOC to service
7. Return all devices to service
8. End
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.

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  
   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:**
The next action depends on if terminal controller ports are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 5</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 10</td>
</tr>
</tbody>
</table>

Note the consoles (CONS) ID and status for each port.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all ports are ManBsy</td>
<td>step 10</td>
</tr>
<tr>
<td>a minimum of one port is Offl</td>
<td>step 55</td>
</tr>
<tr>
<td>a minimum of one port is . (dot)</td>
<td>step 6</td>
</tr>
<tr>
<td>all ports are in any other</td>
<td>step 8</td>
</tr>
<tr>
<td>out-of-service state</td>
<td></td>
</tr>
</tbody>
</table>

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.

To post the port that associates with the CONS you replace, type

```plaintext
>PORT  port_no
```

and press the Enter key.

*where*

- **port_no** is the port identification number

*Example of an IOM MAP display:*
8. To manually busy the device, type
>BSY
and press the Enter key.

Example of MAP response:

bsy
OK

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 9</td>
</tr>
<tr>
<td>failed</td>
<td>step 63</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If MPC ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the controller card</td>
<td>step 11</td>
</tr>
<tr>
<td>are not on the controller card</td>
<td>step 18</td>
</tr>
</tbody>
</table>

11. To post a port that associates with the MPC, type
>PORT port_no
and press the Enter key.

Example of an IOM MAP display:

<table>
<thead>
<tr>
<th>Port 9</th>
<th>Unit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>SYSTEM PROTOCOL LINK</td>
</tr>
<tr>
<td>Status</td>
<td>Ready X2584 COMACT ENABLED</td>
</tr>
</tbody>
</table>

12. Determine the state of the port.

<table>
<thead>
<tr>
<th>If the port state</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 17</td>
</tr>
</tbody>
</table>
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 a minimum of one session is active, step 14
all sessions are inactive, step 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 13.

To manually busy the port and the port links, type
>BSY  FORCE
and press the Enter key.

Example of MAP response:

```
TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND
Please confirm ("YES", "Y", "NO", or "N")
```

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

Example of MAP response:

```
REQUEST PASSED FOR UNIT
REQUEST PASSED FOR LINK
```

If the BSY command passed, step 17
Repeat steps 11 to 16 for each MPC port on the IOM.

The next action depends on if disk drive ports are on the controller card.

If disk drive ports are on the shelf, step 19.
If disk drive ports are not on the shelf, step 24.

To post a port that associates with the disk drive unit (DDU), type
>PORT port_no
and press the Enter key.

where

port_no is the port identification number

Example of a IOM MAP display:

Port 16 Unit 0
(SCSI) User system Drive_State
Status Ready On_line

Determine the state of the port.

If the port is ManB, step 24.
If the port is OFFL, step 55.
If the port is other than listed here, step 21.

To determine if open files are on the DDU, type
>ALLOC
and press the Enter key.

Example of a MAP display:
To manually busy the device on the controller card, type

```
>BSY
```

and press the Enter key.

*Example of MAP response:*

```
bsy
OK
```

22 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.

<table>
<thead>
<tr>
<th>If MTD or DAT ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the controller card</td>
<td>step 25</td>
</tr>
<tr>
<td>are not on the controller card</td>
<td>step 30</td>
</tr>
</tbody>
</table>

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:*

```
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
```
Determine the state of the port.

<table>
<thead>
<tr>
<th>If the port state</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 30</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 55</td>
</tr>
<tr>
<td>is Idle</td>
<td>step 28</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 27</td>
</tr>
</tbody>
</table>

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.

To manually busy the port, type

```
>BSY
```

and press the Enter key.

Example of MAP response:

```
bsy
OK
```

Repeat steps 25 to 28 for each magnetic tape drive or digital audio port on the controller card.

To return to the IOC level of the MAP display, type

```
>QUIT
```

and press the Enter key.

Determine the state of the IOM.

<table>
<thead>
<tr>
<th>If the state of the IOM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is M</td>
<td>step 33</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 32</td>
</tr>
</tbody>
</table>

To manually busy the IOM controller card, type

```
>BSY IOC
```

and press the Enter key.

Example of MAP response:
At the ISM shelf

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.

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 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
```

<table>
<thead>
<tr>
<th>If the reprogram</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 41</td>
</tr>
<tr>
<td>fails</td>
<td>step 39</td>
</tr>
</tbody>
</table>
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.

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:*
To quit the TOOLSUP utility, type
>QUIT
and press the Enter key.

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

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 43</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 44</td>
</tr>
</tbody>
</table>

Return to the maintenance procedure that directed you to this procedure.
Continue as directed by the maintenance procedure.

**At the MAP terminal**

To return the IOM to service, type
>RTS IOC
and press the Enter key.

The next action depends on if consoles, disk drives, magnetic tape drives or DAT tape ports are present.

<table>
<thead>
<tr>
<th>If console, disk drive, magnetic drive or DAT ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are present</td>
<td>step 46</td>
</tr>
<tr>
<td>are not present</td>
<td>step 49</td>
</tr>
</tbody>
</table>

To post the device port, type
>PORT port_no
and press the Enter key.

WARNING: This command will reprogram the onboard IOM Flash memory. Proceed with caution.

Reprogramming 100%
Reprogram IOC 14 successful
To return the port to service, type:

```plaintext
>RTS
```

and press the Enter key.

<table>
<thead>
<tr>
<th>If RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 48</td>
</tr>
<tr>
<td>fails</td>
<td>step 63</td>
</tr>
</tbody>
</table>

Repeat steps 46 and 47 for each disk drive, magnetic tape drive or DAT tape port.

The next action depends on if MPC ports are present.

<table>
<thead>
<tr>
<th>If MPC ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are present</td>
<td>step 50</td>
</tr>
<tr>
<td>are not present</td>
<td>step 64</td>
</tr>
</tbody>
</table>

To post the MPC port, type:

```plaintext
>PORT port_no
```

and press the Enter key.

Where:

```plaintext
port_no
```

is the port identification number (0 to 17)

To return the MPC port to service, type:

```plaintext
>RTS
```

and press the Enter key.

**Example of MAP response:**

```
REQUEST PASSED FOR UNIT
REQUEST PASSED FOR LINKS
```

<table>
<thead>
<tr>
<th>If RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passes</td>
<td>step 52</td>
</tr>
<tr>
<td>fails</td>
<td>step 63</td>
</tr>
</tbody>
</table>
52 Check the status of MPC components

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the system status is Ready, the port status is COMACT, and the link status is ENABLED for each link.</td>
<td>step 50</td>
</tr>
<tr>
<td>status of MPC components is other than listed here</td>
<td>step 63</td>
</tr>
</tbody>
</table>

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:

```shell
>LOGUTIL; LISTDEV
```
and press the Enter key.

58 Close files on volumes on the DDU of the IOC.

```shell
>STODEV  dev_name
```
and press the Enter key.

where

- `dev_name` is the name of the device

```shell
>QUIT
```
and press the Enter key.

59 Repeat the ALLOC command to determine if files are closed, by typing
>ALLOC
and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 60</td>
</tr>
<tr>
<td>are closed</td>
<td>step 61</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the DDU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 62</td>
</tr>
<tr>
<td>is not MBSY</td>
<td>step 63</td>
</tr>
</tbody>
</table>

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.
Use this procedure to replace an NTFX31 paddle board assembly in an input/output module (IOM) in an integrated services module (ISM) shelf.

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.

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.

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.
Summary of replacing a NTFX31 in an ISM

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

1. Post the IOC
2. Manually busy all devices
3. Manually busy the IOM
4. Disconnect IOM cable harness
5. Replace the card and connect harness
6. Return the IOC to service
7. Return all ports to service
8. End
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

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:
The next action depends on if terminal controller ports are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 5</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 10</td>
</tr>
</tbody>
</table>

Note the consoles (CONS) ID and status for each port.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>all ports are ManBsy</td>
<td>step 9</td>
</tr>
<tr>
<td>a minimum of one port is Offl</td>
<td>step 65</td>
</tr>
<tr>
<td>a minimum of one port is (.) dot</td>
<td>step 6</td>
</tr>
<tr>
<td>all ports are in any other out-of-service state</td>
<td>step 8</td>
</tr>
</tbody>
</table>

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.

To post the port that associates with the CONS that you replace, type

\[
>\text{PORT port}\_\text{no}
\]

and press the Enter key.

\[\text{where} \]

\[\text{port}\_\text{no} \]

is the port identification number

*Example of an IOM MAP display:*
8 To manually busy the device, type
>BSY
and press the Enter key.

*Example of MAP response:*

bsy
OK

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 9</td>
</tr>
<tr>
<td>failed</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If MPC ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the controller card</td>
<td>step 11</td>
</tr>
<tr>
<td>are not on the controller card</td>
<td>step 18</td>
</tr>
</tbody>
</table>

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:*

<table>
<thead>
<tr>
<th>Port 9</th>
<th>Unit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>SYSTEM PROTOCOL</td>
</tr>
<tr>
<td>Status</td>
<td>Ready X2584</td>
</tr>
<tr>
<td></td>
<td>COMACT ENABLED</td>
</tr>
</tbody>
</table>

12 Determine the state of the port.

<table>
<thead>
<tr>
<th>If the port</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManB</td>
<td>step 18</td>
</tr>
</tbody>
</table>
NTFX31
in an ISM (continued)

<table>
<thead>
<tr>
<th>If the port</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is OFFL</td>
<td>step 65</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 13</td>
</tr>
</tbody>
</table>

13 To display status information on current MPC conversations, type

\texttt{>QCONV}

and press the Enter key.

\textit{Example of a MAP response:}

\begin{tabular}{cccccccccc}
MPC & L & LCN & STATUS & CCC & SEC & PARDEV & INF & OPEN & OWNER \\
--- & --- & --- & --- & --- & --- & --- & --- & --- & ---
0 & 3 & 1 & INACTIVE & none & none & none & FIL & 0 & none \\
0 & 3 & 2 & INACTIVE & none & none & none & FIL & 0 & none \\
\end{tabular}

If

\begin{tabular}{l}
\textbf{Do} \\
\end{tabular}

\begin{tabular}{l}
a minimum of one session is active \\
all sessions are inactive \\
\end{tabular}

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

\texttt{>BSY FORCE}

and press the Enter key.

\textit{Example of a MAP response:}

\texttt{TYPE YES TO VERIFY FORCE, NO TO CANCEL COMMAND}

\texttt{Please confirm ("YES", "Y", "NO", or "N")}

16 To confirm the command, type

\texttt{>YES}

and press the Enter key.

\textit{Example of MAP response:}

\texttt{REQUEST PASSED FOR UNIT}
\texttt{REQUEST PASSED FOR LINK}

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 17</td>
</tr>
</tbody>
</table>
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.

where

port_no  is the port identification number

Example of an IOM MAP display:

Port 16  Unit 0  (SCSI)  User system  Drive_State
Status Ready  On_line

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.

Example of a MAP display:
To manually busy the device on the controller card, type

>`BSY`

and press the Enter key.

*Example of MAP response:*

```
bsy
OK
```

22 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.

<table>
<thead>
<tr>
<th>If MTD or DAT ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the controller card</td>
<td>step 25</td>
</tr>
<tr>
<td>are not on the controller card</td>
<td>step 30</td>
</tr>
</tbody>
</table>

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:*

```
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
```
Input/output device card replacement procedures

NTFX31

in an ISM (continued)

Determine the state of the port.

<table>
<thead>
<tr>
<th>If the port</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManBsy</td>
<td>step 29</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 65</td>
</tr>
<tr>
<td>is Idle</td>
<td>step 28</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 27</td>
</tr>
</tbody>
</table>

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.

To manually busy the device, type

>BSY

and press the Enter key.

Example of MAP response:

bsy
OK

Repeat steps 25 to 28 for each MTD device or DAT on the IOM.

To return to the IOC level of the MAP display, type

>QUIT

and press the Enter key.

Determine the state of the IOM.

<table>
<thead>
<tr>
<th>If the state of the IOM</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is M</td>
<td>step 33</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 32</td>
</tr>
</tbody>
</table>

To manually busy the IOM controller card, type

>BSY IOC

and press the Enter key.

Example of MAP response:

bsy
OK
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.
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

<table>
<thead>
<tr>
<th>WARNING</th>
<th>Static electricity damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step 45</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step 46</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If consoles, disk drives, MTDs, or DAT ports</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are present</td>
<td>step 48</td>
</tr>
</tbody>
</table>
To post the device port, type

```
>PORT  port_no
```

and press the Enter key.

where

| port_no | is the port identification number (0 to 17) |

To return the port to service, type

```
>RTS
```

and press the Enter key.

The next action depends on if MPC ports are present.

If the RTS command passes

| Do | step 50 |

If the RTS command fails

| Do | step 66 |

Repeat steps 48 and 49 for each disk drive, MTD, or DAT tape port.

If the MPC ports are present

| Do | step 52 |

If the MPC ports are not present

| Do | step 67 |

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) |

To return the MPC port to service, type

```
>RTS  ALL
```

Example of a MAP response:

```
REQUEST PASSED FOR PORT
REQUEST PASSED FOR LINKS
```
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

Repeat steps 52 to 54 for each port on the shelf.

Notify users that MPC service is available.

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.

Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

>LOGUTIL;LISTDEVS

and press the Enter key.

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

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.
To quit the disk utility, type

>QUIT

and press the Enter key.

Repeat the ALLOC command to determine if files are closed, by typing

>ALLOC

and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 62</td>
</tr>
<tr>
<td>are closed</td>
<td>step 63</td>
</tr>
</tbody>
</table>

Confirm that you have done steps 57 to 61. If the files are still open, contact your next level of support.

Manually busy the DDU, by typing

>BSY

and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the DDU is</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBSY</td>
<td>step 64</td>
</tr>
<tr>
<td>not MBSY</td>
<td>step 66</td>
</tr>
</tbody>
</table>

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.

To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

For additional help, contact the next level of support.

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.

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffixes</th>
<th>Card name</th>
<th>Shelf/frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTFX32</td>
<td>AA</td>
<td>Storage media card</td>
<td>ISM</td>
</tr>
</tbody>
</table>

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.
Summary of replacing an NTFX32AA in an ISM

1. Post the IOC
2. Remove DDU from media card
3. Remove DAT unit from media card
4. Replace the card
5. Install the DDU on the media card
6. Install the DAT unit on the media card
7. Return IOM controller to service
8. End

This flowchart summarizes the procedure.
Use the instructions that follow this flowchart to perform the procedure.
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
   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
   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
   O O O O T  P C C
   N N N N D  C S S
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.

<table>
<thead>
<tr>
<th>If the media storage card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains a 3.5-in. DDU</td>
<td>step 5</td>
</tr>
<tr>
<td>contains a DAT unit</td>
<td>step 6</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If the media storage card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains a 3.5-in. DDU</td>
<td>step 8</td>
</tr>
<tr>
<td>contains a DAT unit</td>
<td>step 9</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If a maintenance procedure</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>directed you to this procedure</td>
<td>step11</td>
</tr>
<tr>
<td>did not direct you to this procedure</td>
<td>step12</td>
</tr>
</tbody>
</table>

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.
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).

<table>
<thead>
<tr>
<th>PEC</th>
<th>Suffix</th>
<th>Card name</th>
<th>Shelf or frame name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT0X67</td>
<td>AA</td>
<td>IOC terminator card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X62</td>
<td>AA</td>
<td>Input/output controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X62</td>
<td>AB</td>
<td>IOC message controller card</td>
<td>IOC</td>
</tr>
<tr>
<td>NT1X62</td>
<td>CA, CB</td>
<td>IOC message processor card</td>
<td>IOC</td>
</tr>
</tbody>
</table>

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

This flowchart summarizes the procedure.

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

1. Post the IOC
2. Manually busy all ports and cards
3. Manually busy the IOC
4. Replace the card
5. Return the IOC to service
6. Return all ports and cards to service
7. End
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.

2. **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:*

   
<table>
<thead>
<tr>
<th>IOC</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

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:*

   
<table>
<thead>
<tr>
<th>IOC</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
The next action depends on if terminal controller cards are on the shelf.

If terminal controller cards are on the shelf

Do

are on the shelf step 5

are not on the shelf step 11

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:

---

<table>
<thead>
<tr>
<th>IOC</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IOC</th>
<th>CARD</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>----</td>
<td>.---</td>
<td>---</td>
<td>.---</td>
<td>---</td>
<td>.---</td>
<td>---</td>
<td>.---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>TYPE</td>
<td>DDU</td>
<td>CONS</td>
<td>MPC</td>
<td>CONS</td>
<td>MPC</td>
<td>CONS</td>
<td>MPC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT</th>
<th>0123</th>
<th>0123</th>
<th>0123</th>
<th>01230123</th>
<th>0123</th>
<th>0123</th>
<th>0123</th>
<th>0123</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOC CARD</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPPU:</td>
<td>.</td>
<td>SLM</td>
<td>.</td>
<td>MLP</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPPP:</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note the CONS ID and the status for each port.

If

Do

all ports are ManBsy step 10
### System cards in an IOC (continued)

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a minimum of one port is <strong>Off</strong></td>
<td>step 61</td>
</tr>
<tr>
<td>a minimum of one port is . (dot)</td>
<td>step 7</td>
</tr>
<tr>
<td>all ports are in any other out-of-service state</td>
<td>step 8</td>
</tr>
</tbody>
</table>

#### 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.

*where*

- **port_no** is the port identification number (0 to 3)

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 9</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

#### 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.

<table>
<thead>
<tr>
<th>If MPC cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 12</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 19</td>
</tr>
</tbody>
</table>

#### 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 display:*
Determine the state of the card.

**If the card state**  
<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
</table>
| 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.

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**  
<table>
<thead>
<tr>
<th>Do</th>
</tr>
</thead>
</table>
| a minimum of one session is active | step 15  
| all sessions are inactive | step 16  

**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.**
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.
```

<table>
<thead>
<tr>
<th>If the BSY command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 18</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>If disk drive controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 20</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 25</td>
</tr>
</tbody>
</table>

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)

21 Determine the state of the card.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 24</td>
</tr>
<tr>
<td>is OFFL</td>
<td>step 61</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 22</td>
</tr>
</tbody>
</table>

22 To determine if files are open on the DDU, type

>`ALLOC

and press the Enter key.

Example of a MAP response:

<table>
<thead>
<tr>
<th>VOL_ID</th>
<th>VOL_NAME</th>
<th>SERIAL_NO</th>
<th>BLOCKS</th>
<th>ADDR</th>
<th>TYPE</th>
<th>R/O</th>
<th>FILES_OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>IMAGE</td>
<td>2800</td>
<td>45000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>XPMLOADS</td>
<td>2801</td>
<td>35000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>RTMLOADS</td>
<td>2802</td>
<td>20000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>SMDR</td>
<td>2807</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>AMA1</td>
<td>2808</td>
<td>5000</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>TST</td>
<td>2809</td>
<td>50</td>
<td>D000</td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>AMA2</td>
<td>280A</td>
<td>50D000</td>
<td></td>
<td>0</td>
<td>NO</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 54</td>
</tr>
<tr>
<td>are closed</td>
<td>step 23</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>If MTD controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 26</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 31</td>
</tr>
</tbody>
</table>

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 . . .


IOC  CARD  TYPE  MTD  DDU  CONS  MPC  CONS  CONS  MPC
0  PORT 00123 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.

<table>
<thead>
<tr>
<th>If the card</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is ManBsy</td>
<td>step 30</td>
</tr>
<tr>
<td>is Off1</td>
<td>step 61</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>
</tbody>
</table>

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:*

```plaintext
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.

<table>
<thead>
<tr>
<th>If the state of the IOC</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is M</td>
<td>step 34</td>
</tr>
<tr>
<td>is other than listed here</td>
<td>step 33</td>
</tr>
</tbody>
</table>

33 To manually busy the IOC, type

>`BSY IOC`

and press the Enter key.
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.

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

If a maintenance procedure directed you to this procedure step 36
If a maintenance procedure did not direct you to this procedure step 37

Return to the maintenance procedure that directed you to this procedure step 36
Continue as directed by the maintenance procedure step 37

At the MAP terminal

To return the IOC to service, type

>RTS IOC
and press the Enter key.

The next action depends on if disk drive or MTD controller cards are on the shelf.

If disk drive or MTD controller cards are on the shelf step 39
If disk drive or MTD controller cards are not on the shelf step 42

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.

<table>
<thead>
<tr>
<th>If MPC cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 43</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 49</td>
</tr>
</tbody>
</table>

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.
   REQUEST PASSED FOR CARD.REQUEST PASSED FOR LINKS.

<table>
<thead>
<tr>
<th>If the DOWNLD command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 45</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

45 To return the MPC to service, type
   `>RTS  ALL`
   and press the Enter key.

   Example of a MAP response:
Wait 1 min to check the status of MPC components.

<table>
<thead>
<tr>
<th>If</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>the system status is Ready, the board status is CO-MACT, and the link status is ENABLD for each link</td>
<td>step 47</td>
</tr>
<tr>
<td>these statuses are other than listed here</td>
<td>step 62</td>
</tr>
</tbody>
</table>

Repeat steps 43 to 46 for each card on the shelf. Go to step 48.

Notify users that MPC service is available.

The next action depends on if terminal controller cards are on the shelf.

<table>
<thead>
<tr>
<th>If terminal controller cards</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are on the shelf</td>
<td>step 50</td>
</tr>
<tr>
<td>are not on the shelf</td>
<td>step 63</td>
</tr>
</tbody>
</table>

To post the card, type

```
>CARD  card_no
```

and press the Enter key.

where

- `card_no` is the card identification number (0 to 8)

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)

<table>
<thead>
<tr>
<th>If the RTS command</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>passed</td>
<td>step 52</td>
</tr>
<tr>
<td>failed</td>
<td>step 62</td>
</tr>
</tbody>
</table>

Repeat step 51 until you return to service all ports on the terminal controller card. Go to step 53.

Repeat steps 50 to 52 for each terminal controller card on the shelf. Go to step 63.
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.

Stop files recording to and from the Logutil. Type the following command at the Logutil command level:

>LOGUTIL;LISTDEVS

and press the Enter key.

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.

Repeat the ALLOC command to determine if files are closed, by typing

>ALLOC

and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the files</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>are open</td>
<td>step 58</td>
</tr>
<tr>
<td>are closed</td>
<td>step 59</td>
</tr>
</tbody>
</table>

Confirm that you have done steps 54 to 57. If the files are still open, contact your next level of support.
59  Manually busy the DDU, by typing
    >BSY
    and pressing the Enter key.

<table>
<thead>
<tr>
<th>If the DDU</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>is MBSY</td>
<td>step 60</td>
</tr>
<tr>
<td>is not MBSY</td>
<td>step 62</td>
</tr>
</tbody>
</table>

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 replacement common procedures
Activating CCS7 links Vol. 3, 7-2
Activity switch with memory match Vol. 3, 7-9
Correcting a load mismatch Vol. 3, 7-25
Deactivating CCS7 links Vol. 3, 7-40
Failure to switch clock mastership Vol. 3, 7-48
Loading a PM Vol. 3, 7-57
Manually busying LIM-to-MS DS30 links Vol. 2, 5-26, Vol. 3, 7-69
Manually busying Series II PM C-side links Vol. 3, 6-42
Moving an XSG to a spare XLIU Vol. 3, 7-111
Replacing a card Vol. 3, 7-119
Replacing a line card Vol. 3, 7-125
Reseating cards in equipment shelves Vol. 3, 7-132
Returning LIM-to-MS DS30 links to service Vol. 2, 5-33, Vol. 3, 7-137
Switching the clock source Vol. 3, 7-142
Unseating cards in equipment shelves Vol. 3, 7-149
Verifying load compatibility of SuperNode cards Vol. 3, 7-153
Card replacement procedures
NT2X70 Vol. 4, 1-497, Vol. 4, 1-505
NT6X17 Vol. 4, 1-746
NT6X18 Vol. 4, 1-790
NT6X19 Vol. 4, 1-830
NT6X20 Vol. 4, 1-870
NT6X21 Vol. 4, 1-927
NT6X41 Vol. 5, 1-64, Vol. 5, 1-71
NT6X44 Vol. 5, 1-138
NT6X50 Vol. 5, 1-259, Vol. 5, 1-275
NT6X53 Vol. 5, 1-487
NT6X54 Vol. 5, 1-556
NT6X71 Vol. 5, 1-721
NT6X76 Vol. 5, 1-869
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
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
NTRX41 Vol. 7, 1-655
NT6X44 Vol. 5, 1-138
NT6X50 Vol. 5, 1-259, Vol. 5, 1-275
NT6X53 Vol. 5, 1-487
NT6X54 Vol. 5, 1-556
NT6X71 Vol. 5, 1-721
NT6X76 Vol. 5, 1-869
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
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
NTRX41 Vol. 7, 1-655
in CDSN (cabinetized dual shelf network) Vol. 1, 7-197
in CDTO (cabinetized digital trunk controller offshore) Vol. 1, 7-197
in CIOE (cabinetized input/output equipment) Vol. 1, 7-197
<table>
<thead>
<tr>
<th>Index</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A-2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Vol.</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIPE (cabinetized international peripheral equipment)</td>
<td>Vol. 1, 7-197</td>
<td></td>
</tr>
<tr>
<td>CLGO (cabinetized line group controller offshore)</td>
<td>Vol. 1, 7-197</td>
<td></td>
</tr>
<tr>
<td>CMIS (cabinetized miscellaneous equipment)</td>
<td>Vol. 1, 7-197</td>
<td></td>
</tr>
<tr>
<td>CMS7 (cabinetized message switch 7)</td>
<td>Vol. 1, 7-197</td>
<td></td>
</tr>
<tr>
<td>CTME (cabinetized trunk module equipment)</td>
<td>Vol. 1, 7-197</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Card Replacement Procedures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NTRX42</td>
<td>Vol. 7, 1-766</td>
</tr>
<tr>
<td>NTRX43</td>
<td>Vol. 7, 1-815</td>
</tr>
<tr>
<td>NTRX54</td>
<td>Vol. 7, 1-888</td>
</tr>
<tr>
<td>NTRT46</td>
<td>Vol. 7, 1-901</td>
</tr>
<tr>
<td>NTRT47</td>
<td>Vol. 7, 1-907</td>
</tr>
<tr>
<td>NTRT60</td>
<td>Vol. 7, 1-913</td>
</tr>
<tr>
<td>NTRT66</td>
<td>Vol. 7, 1-920</td>
</tr>
<tr>
<td>NTRT67</td>
<td>Vol. 7, 1-926</td>
</tr>
<tr>
<td>NTRT70</td>
<td>Vol. 7, 1-932</td>
</tr>
<tr>
<td>NTRT71</td>
<td>Vol. 7, 1-939</td>
</tr>
<tr>
<td>NTRT72</td>
<td>Vol. 7, 1-944</td>
</tr>
<tr>
<td>NTRT73</td>
<td>Vol. 7, 1-950</td>
</tr>
<tr>
<td>NTRT74</td>
<td>Vol. 7, 1-954</td>
</tr>
<tr>
<td>NTRT75</td>
<td>Vol. 7, 1-961</td>
</tr>
<tr>
<td>NTRT76</td>
<td>Vol. 7, 1-969</td>
</tr>
<tr>
<td>NTRT77</td>
<td>Vol. 7, 1-976</td>
</tr>
<tr>
<td>NTRT87</td>
<td>Vol. 7, 1-983</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Card Replacement Procedures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EDRAM</td>
<td>Vol. 3, 5-79</td>
</tr>
<tr>
<td>in an RMM</td>
<td>Vol. 4, 1-10</td>
</tr>
<tr>
<td>in MTM, STM</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>in OAU</td>
<td>Vol. 2, 9-7</td>
</tr>
<tr>
<td>NT0X36</td>
<td>Vol. 1, 7-74</td>
</tr>
<tr>
<td>in an international cabinet auxiliary module</td>
<td>Vol. 1, 7-8</td>
</tr>
<tr>
<td>in CIOE with DDU, DPP, IOC, MTD, or ROS</td>
<td>Vol. 1, 7-8</td>
</tr>
<tr>
<td>in IOE frame</td>
<td>Vol. 1, 7-53</td>
</tr>
<tr>
<td>NT0X67</td>
<td>Vol. 1, 8-97</td>
</tr>
<tr>
<td>NT0X70</td>
<td>Vol. 3, 5-27</td>
</tr>
<tr>
<td>in MTM, TM</td>
<td>Vol. 3, 5-27</td>
</tr>
<tr>
<td>in OAU</td>
<td>Vol. 2, 9-7</td>
</tr>
<tr>
<td>NT0X91</td>
<td>Vol. 4, 1-61</td>
</tr>
<tr>
<td>in CPCE provisioned for DTC, DTCI, IDTC, PDTC</td>
<td>Vol. 1, 7-98</td>
</tr>
<tr>
<td>in CPCE provisioned for ILGC, LGC, LGCI, PLGC</td>
<td>Vol. 1, 7-98</td>
</tr>
<tr>
<td>in CPCE provisioned for ILTC, LTC, LTCI, LTLC</td>
<td>Vol. 1, 7-98</td>
</tr>
<tr>
<td>in CTME with ISM, MTM, OAU, STM, or TM</td>
<td>Vol. 1, 7-29</td>
</tr>
<tr>
<td>in DCE</td>
<td>Vol. 1, 7-112</td>
</tr>
<tr>
<td>in LME</td>
<td>Vol. 1, 7-123</td>
</tr>
<tr>
<td>in MS6E</td>
<td>Vol. 1, 7-133</td>
</tr>
<tr>
<td>in MS7E</td>
<td>Vol. 1, 7-147</td>
</tr>
<tr>
<td>in NT0X48 single-bay network</td>
<td>Vol. 1, 7-159</td>
</tr>
<tr>
<td>in NT5X13 combined single-bay network</td>
<td>Vol. 1, 7-159</td>
</tr>
<tr>
<td>in NT8X11 dual shelf network</td>
<td>Vol. 1, 7-159</td>
</tr>
<tr>
<td>in ST6E, ST7E</td>
<td>Vol. 1, 7-147</td>
</tr>
<tr>
<td>in TME with ISM, MTM, OAU, STM, and TM</td>
<td>Vol. 1, 7-172</td>
</tr>
<tr>
<td>NT0X91AA</td>
<td>Vol. 4, 1-49, Vol. 4, 1-90</td>
</tr>
<tr>
<td>NT1X00</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>in ISM, MTM, STM</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>NT1X31</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>NT1X54</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>NT1X55</td>
<td>Vol. 1, 8-10</td>
</tr>
<tr>
<td>NT1X62</td>
<td>Vol. 1, 8-97</td>
</tr>
<tr>
<td>NT1X67</td>
<td>Vol. 1, 8-21</td>
</tr>
<tr>
<td>NT1X68</td>
<td>Vol. 1, 8-10</td>
</tr>
<tr>
<td>NT1X75</td>
<td>Vol. 3, 5-27</td>
</tr>
<tr>
<td>in MTM with DRAM, STM with DRAM</td>
<td>Vol. 3, 5-27</td>
</tr>
<tr>
<td>NT1X76</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>in DRAM</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>in MTM, STM</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>NT1X77</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>in DRAM</td>
<td>Vol. 3, 5-88</td>
</tr>
<tr>
<td>in MTM, STM</td>
<td>Vol. 3, 5-88</td>
</tr>
</tbody>
</table>

| 297-9051-547 Standard 02.01 April 2000 |
NT1X78
   in dual DDU shelf  Vol. 1, 8-28
   in single DDU shelf  Vol. 1, 8-28
   in SuperNode ROS  Vol. 3, 2-5
   in SuperNode SE ROS  Vol. 3, 2-5
NT1X79
   in DRAM  Vol. 3, 5-88
   in MTM, STM  Vol. 3, 5-88
NT1X80
   in ISM, MTM, STM  Vol. 3, 5-79
NT1X81
   in ISM, MTM, STM  Vol. 3, 5-79
NT1X89
   in IOC  Vol. 1, 8-37
NT1X90
   in ISM, MTM, STM  Vol. 3, 5-88
NT2X01
   in ISM, MTM, STM  Vol. 3, 5-88
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. 3, 1-22
   in RLM  Vol. 3, 1-22
NT2X06  Vol. 4, 1-114, Vol. 4, 1-121,
   in DCM, DES  Vol. 1, 3-47
   in MTM, TM  Vol. 3, 5-64
   in NT0X48 single-bay network  Vol. 2, 8-40
   in OAU  Vol. 2, 9-14
NT2X07
   in DCM, DES  Vol. 1, 3-47
   in NT0X48 single-bay network  Vol. 2, 8-40
NT2X09  Vol. 4, 1-171, Vol. 4, 1-178,
   Vol. 4, 1-211, Vol. 4, 1-220
   in DRAM  Vol. 3, 5-64
   in EDRAM  Vol. 3, 5-64
   in MTM, TM  Vol. 3, 5-64
   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, 5-88
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, 5-88
NT2X16
   in LM line drawer  Vol. 2, 2-16
NT2X20
NT2X21
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X22
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X23
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X24
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X25
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X26
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X27
   in LM controller  Vol. 2, 2-9
   in remote line controller  Vol. 3, 1-9
   in RLM  Vol. 3, 1-9
NT2X32
   in DCM, DES  Vol. 1, 3-8
NT2X33
   in DCM, DES  Vol. 1, 3-8
   in LM controller  Vol. 2, 2-9
NT2X34
   in DCM, DES  Vol. 1, 3-8
   in LM controller  Vol. 2, 2-9
NT2X35
   in DCM  Vol. 1, 3-13
NT2X36  in DCM  Vol. 1, 3-27
in LM controller  Vol. 2, 2-9
NT2X37  in DCM, DES  Vol. 1, 3-8
NT2X38  in DCM, DES  Vol. 1, 3-8
NT2X41  in OAU  Vol. 2, 9-7
NT2X42  in OAU  Vol. 2, 9-7
NT2X43  in ISM, MTM, STM  Vol. 3, 5-88
in OAU  Vol. 2, 9-7
NT2X45  in MTM, TM  Vol. 3, 5-27
in OAU  Vol. 2, 9-7
NT2X47  in ISM, MTM, STM  Vol. 3, 5-88
NT2X48  Vol. 4, 1-316, Vol. 4, 1-321,
Vol. 4, 1-326
in ISM, MTM, STM  Vol. 3, 5-88
NT2X50  in MTM, STM  Vol. 3, 5-88
NT2X53  in MTM, TM  Vol. 3, 5-27
in OAU  Vol. 2, 9-7
NT2X55  Vol. 4, 1-331
in ISM, MTM, STM  Vol. 3, 5-88
NT2X56  in ISM, MTM, STM  Vol. 3, 5-88
NT2X57  Vol. 4, 1-338, Vol. 4, 1-342,
Vol. 4, 1-369, Vol. 4, 1-376
in an RMM  Vol. 4, 1-346
in ISM, MTM, STM  Vol. 3, 5-88
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, 5-27
in OAU  Vol. 2, 9-7
NT2X65  in ISM, MTM, STM, TM  Vol. 3, 5-88
NT2X66  in ISM, MTM, STM, TM  Vol. 3, 5-88
NT2X70  Vol. 4, 1-434, Vol. 4, 1-441,
Vol. 4, 1-524, Vol. 4, 1-533
in 6STA or MSB6  Vol. 2, 7-20
in an HIE  Vol. 4, 1-455
in DCM, DES  Vol. 1, 3-47
in DRAM  Vol. 3, 5-64
in DTC, DTCl, IDTC, PDTC  Vol. 3, 6-49
in EDRAM  Vol. 3, 5-64
in ILGC, LGC, LGCI, PLGC  Vol. 3, 6-49
in ILTC, LTC, LTCI, PLTC  Vol. 3, 6-49
in IOC  Vol. 1, 8-44
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. 3, 1-28
in RLM  Vol. 3, 1-28
in ST7G of MSB7  Vol. 2, 7-40
in STA7 or MSB7  Vol. 2, 7-20
in STCM of MSB6  Vol. 2, 7-40
in STM  Vol. 3, 5-64
NT2X71  in ISM, MTM, STM  Vol. 3, 5-88
NT2X72  in ISM, TM  Vol. 3, 5-88
NT2X75  in ISM, MTM, STM  Vol. 3, 5-88
NT2X77  in ISM, MTM, STM  Vol. 3, 5-88
NT2X78  in TM  Vol. 3, 5-88
NT2X80  in MTM, STM  Vol. 3, 5-88
NT2X81  in TM  Vol. 3, 5-88
NT2X82  in ISM, TM  Vol. 3, 5-88
NT2X83  in TM  Vol. 3, 5-88
NT2X84  in ISM, TM  Vol. 3, 5-88
NT2X85  in ISM, TM  Vol. 3, 5-88
NT2X86  in ISM, TM  Vol. 3, 5-88
NT2X88  in TM  Vol. 3, 5-88
NT2X90  Vol. 4, 1-540, Vol. 4, 1-545,  
Vol. 4, 1-576, Vol. 4, 1-583  
in an RMM Vol. 4, 1-558  
in ISM, TM Vol. 3, 5-88  
NT2X92  
in TM Vol. 3, 5-88  
NT2X95  
in TM Vol. 3, 5-88  
NT2X96  
in ISM, MTM, STM Vol. 3, 5-88  
NT2X98  
in ISM, TM Vol. 3, 5-88  
NT3X02  
in ISM, MTM, STM Vol. 3, 5-88  
NT3X03  
in ISM, MTM, STM Vol. 3, 5-88  
NT3X04  Vol. 4, 1-590  
in ISM, TM Vol. 3, 5-88  
NT3X05  
in MTM, STM Vol. 3, 5-88  
NT3X06  
in ISM, TM Vol. 3, 5-88  
NT3X07  
in ISM, TM Vol. 3, 5-88  
NT3X08  
in ISM, MTM, STM Vol. 3, 5-88  
NT3X09  Vol. 4, 1-597, Vol. 4, 1-603,  
Vol. 4, 1-608, Vol. 4, 1-619, Vol. 4, 1-624,  
in an RMM Vol. 4, 1-614  
in ISM, MTM, STM Vol. 3, 5-88  
NT3X16  
in SuperNode ROS Vol. 3, 2-14  
in SuperNode SE ROS Vol. 3, 2-14  
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. 3, 1-9  
in RLM Vol. 3, 1-9  
NT3X48  
in remote line controller Vol. 3, 1-9  
in RLM Vol. 3, 1-9  
NT3X49  
in remote line controller Vol. 3, 1-9  
in RLM Vol. 3, 1-9  
NT3X65  
in DCM Vol. 1, 3-37  
NT3X67  
in MTM, STM Vol. 3, 5-88  
NT3X68  
in MTM, STM Vol. 3, 5-88  
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, 1-660  
in OAU Vol. 2, 9-7  
NT3X83  Vol. 4, 1-667  
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, 5-88

NT4X23  
in ISM, MTM, STM  
Vol. 3, 5-88

NT4X65  
in MTM, STM, TM  
Vol. 3, 5-27

in OAU  
Vol. 2, 9-7

NT4X97  
Vol. 4, 1-675, Vol. 4, 1-680,  
Vol. 4, 1-687

in ISM, MTM, STM  
Vol. 3, 5-44

NT4X98  
Vol. 4, 1-694, Vol. 4, 1-701

in ISM, STM, TM  
Vol. 3, 5-44

NT5X03  
in ISM, TM  
Vol. 3, 5-88

NT5X04  
in ISM, TM  
Vol. 3, 5-88

NT5X06  
in TM  
Vol. 3, 5-88

NT5X25  
in ISM, TM  
Vol. 3, 5-88

NT5X29  
in ISM, MTM, STM  
Vol. 3, 5-88

NT5X30  
in ISM, MTM, STM, TM  
Vol. 3, 5-88

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, 1-710, Vol. 4, 1-714,  

Vol. 4, 1-738

in ILCM, LCM, LCME  
Vol. 2, 1-39

in LM line drawer  

NT6X18  
Vol. 4, 1-750, Vol. 4, 1-754,

Vol. 4, 1-758, Vol. 4, 1-762, Vol. 4, 1-766,

Vol. 4, 1-774, Vol. 4, 1-782

in LCM, LCME  
Vol. 2, 1-39

in LM line drawer  

NT6X19  
Vol. 4, 1-794, Vol. 4, 1-798,

Vol. 4, 1-802, Vol. 4, 1-806, Vol. 4, 1-814,

Vol. 4, 1-822

in LCM, LCME  
Vol. 2, 1-39

NT6X20  
Vol. 4, 1-834, Vol. 4, 1-838,


Vol. 4, 1-862

in LCM  
Vol. 2, 1-73

NT6X21  
Vol. 4, 1-874, Vol. 4, 1-878,


Vol. 4, 1-909, Vol. 4, 1-918

in an LCM  
Vol. 4, 1-886

in LCM, LCME  
Vol. 2, 1-39

NT6X23  
in LCM  
Vol. 2, 1-73

NT6X27  
Vol. 4, 1-931, Vol. 4, 1-938,

Vol. 4, 1-945

in IDTC, ILGC, ILTC  
Vol. 3, 6-131

in PDTC, PLGC, PLTC  
Vol. 3, 6-131

NT6X28  
in IDTC, ILGC, ILTC  
Vol. 3, 6-31

in IPDTC, PLGC, LTCO, PLTC  
Vol. 3, 6-31

NT6X30  
Vol. 4, 1-952, Vol. 4, 1-967,


in LCE, LCEI  
Vol. 2, 1-47

NT6X33  
in ILCM, LCM, LCME  
Vol. 2, 1-39

NT6X36  
Vol. 4, 1-1028, Vol. 4, 1-1038,

Vol. 4, 1-1043

in an FSP  
Vol. 4, 1-1023, Vol. 4, 1-1033

in LCE frame  
Vol. 1, 7-192

in LCEI frame  
Vol. 1, 7-192

NT6X40  
Vol. 5, 1-38, Vol. 5, 1-51

in 6STA of MSB6  
Vol. 2, 7-57

in DTC, DTCI, IDTC, DTCO, PDTC  
Vol. 3, 6-71

in ILGC, LGC, LGCI, LGCO, PLGC  
Vol. 3, 6-71

in ILTC, LTC, LTCI, LTCO, PLTC  
Vol. 3, 6-71

in STA7 of MSB7  
Vol. 2, 7-57

NT6X41  

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

NT6X42  
Vol. 5, 1-114, Vol. 5, 1-122

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

NT6X43  
in DTC, LGC, LTC  
Vol. 3, 6-31
Index A- 7

DMS-100 Family MMP Card Replacement Procedures Volume 1 of 7 MMP13 and up

  in DTC, DTCI, IDTC, DTCO, PDTC Vol. 3, 6-31
  in ILGC, LGC, LGCI, LGCO, PLGC Vol. 3, 6-31
  in ILTC, LTC, LTCI, LTO, PLTC Vol. 3, 6-31
  in 6STA of MSB6 Vol. 2, 7-71
  in STA7 of MSB7 Vol. 2, 7-71
NT6X46
  in 6STA of MSB6 Vol. 2, 7-71
  in STA7 of MSB7 Vol. 2, 7-71
  in 6STA of MSB6 Vol. 2, 7-71
  in STA7 of MSB7 Vol. 2, 7-71
  in an HIE Vol. 5, 1-230
  in DTC, DTCI, IDTC, DTCO, DTCOI Vol. 3, 6-131
  in ILGC LGC, LGCI, LGCO Vol. 3, 6-131
  in ILTC, LTC, LTCI, LTO Vol. 3, 6-131
  in an LCM Vol. 5, 1-319
  in LCM, LICM Vol. 2, 1-31
  in an LCM Vol. 5, 1-319
  in LCM, LCM, LCM, LCM Vol. 2, 1-31
  in an LCM Vol. 5, 1-379
  in LCM, LCM, LCM, LCM Vol. 2, 1-31
  in an LCM Vol. 5, 1-453
  in LCM, LCM, LCM Vol. 2, 1-79
  Vol. 5, 1-542, Vol. 5, 1-549
  in an LCM Vol. 5, 1-527
  in LCM, LCM Vol. 2, 1-13
NT6X55
  in DTC, IDTC, DTCO, PDTC Vol. 3, 6-131
  in ILGC, LGC, LGCO, PLGC Vol. 3, 6-131
  in ILTC, LTC, LTCI, PLTC Vol. 3, 6-131
NT6X62
  in DTC, IDTC, DTCO, PDTC Vol. 3, 6-31
  in ILGC, LGC, LGCO, PLGC Vol. 3, 6-31
NT6X65 in STCM of MSB6 Vol. 2, 7-79
NT6X66 in ST7G of MSB7 Vol. 2, 7-79
NT6X68
  in MSB6 Vol. 2, 7-64
  in MSB7 Vol. 2, 7-64
  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
NT6X70
  in LGC, LGI Vol. 3, 6-31
  in LTC, LTCI Vol. 3, 6-31
  Vol. 5, 1-713
  in LCM, LCM, LCM, LCM Vol. 2, 1-39
NT6X72 Vol. 5, 1-725
  in an HIE Vol. 5, 1-746
  Vol. 5, 1-799, Vol. 5, 1-808
  in an RMM Vol. 5, 1-768
  in LCM, LCM, LCM, LCM Vol. 2, 1-39
  Vol. 5, 1-912, Vol. 5, 1-946
  in ILGC Vol. 3, 6-106
  in ILTC Vol. 3, 6-106
  in LGC Vol. 3, 6-106
in LGCO Vol. 3, 6-106
in LGCOI Vol. 3, 6-106
in LTC Vol. 3, 6-106
in LTCI Vol. 3, 6-106
in PLGC Vol. 3, 6-106
in PLTC Vol. 3, 6-106

NT6X79
in DTC, DTCO, PDTC Vol. 3, 6-31
in LGC, LGCI Vol. 3, 6-31
in LTCI Vol. 3, 6-31

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
in DTC, DTCI, IDTC, DTCO, PDTC Vol. 3, 6-31
in ILGC, LGCI, LGCO, PLGC Vol. 3, 6-31
in ILTC, 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
in LCM, LCME Vol. 2, 1-39
in LGC, LGCI, LTC, LTCI, DTC, DTCI 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, 1-22
in SuperNode SE CM/SLM Vol. 1, 2-85
NT9X12
in SuperNode CM Vol. 1, 1-22
in SuperNode SE CM/SLM Vol. 1, 2-85
in SuperNode SLM Vol. 3, 4-165
NT9X13
in an ELPP LIM unit Vol. 1, 4-46
in ENET 128k Vol. 2, 8-49
in ENET 64k Vol. 2, 8-49
in file processor Vol. 1, 6-43
in LIM unit of LPP Vol. 2, 4-89
in SuperNode CM Vol. 1, 1-22
in SuperNode MS Vol. 2, 5-39
in SuperNode SE 16k ENET Vol. 1, 5-77
in SuperNode SE CM/SLM Vol. 1, 2-85
in SuperNode SE ENI shelf Vol. 1, 5-77
in SuperNode SE MS Vol. 2, 6-25
NT9X14
in APU in LPP LIS Vol. 2, 4-9
in file processor Vol. 1, 6-43
in LIM unit of LPP Vol. 2, 4-155
in SuperNode CM Vol. 1, 1-22
in SuperNode MS Vol. 2, 5-39
in SuperNode SE CM/SLM Vol. 1, 2-85
NT9X15
in LIM unit of ELPP Vol. 1, 4-58
in LIM unit of LPP Vol. 2, 4-155
in SuperNode MS Vol. 2, 5-39
in SuperNode SE MS Vol. 2, 6-25
NT9X17
in LIM unit of ELPP Vol. 1, 4-58
in LIM unit of LPP Vol. 2, 4-155
in SuperNode MS Vol. 2, 5-39
in SuperNode SE MS Vol. 2, 6-25
NT9X20
in SuperNode MS Vol. 2, 5-5
NT9X21
in file processor Vol. 1, 6-43
in SuperNode CM Vol. 1, 1-22
in SuperNode SE CM/SLM Vol. 1, 2-85
in SuperNode SLM Vol. 3, 4-165
NT9X22
in SuperNode CM Vol. 1, 1-22
in SuperNode SLM Vol. 3, 4-165
Index

NT9X23
  in LIM unit of LPP Vol. 2, 4-155
  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, 6-43
  in LIM unit of ELPP Vol. 1, 4-58
  in LIM unit of LPP Vol. 2, 4-155
  in SuperNode CM Vol. 1, 1-22
  in SuperNode MS Vol. 2, 5-39
  in SuperNode SE 16k ENET Vol. 1, 5-77
  in SuperNode SE CM/SLM Vol. 1, 2-85
  in SuperNode SE ENI shelf Vol. 1, 5-77
  in SuperNode SE MS Vol. 2, 6-25

NT9X27
  in superNode CM Vol. 1, 1-22
  in SuperNode SLM Vol. 3, 4-165

NT9X30
  in ENET 128k Vol. 2, 8-49
  in ENET 64k Vol. 2, 8-49
  in LIM unit of ELPP Vol. 1, 4-58
  in LIM unit of LPP Vol. 2, 4-155
  in LPP LIS Vol. 2, 4-100
  in SSLPP Vol. 3, 3-74
  in SuperNode CM Vol. 1, 1-22
  in SuperNode MS Vol. 2, 5-39
  in SuperNode SE 16k ENET Vol. 1, 5-77
  in SuperNode SE ENI shelf Vol. 1, 5-77
  in SuperNode SE LIS Vol. 2, 3-64
  in SuperNode SE MS Vol. 2, 6-25
  in SuperNode SLM Vol. 3, 4-165

NT9X31
  in ENET 128k Vol. 2, 8-49
  in ENET 64k Vol. 2, 8-49
  in LIM unit of ELPP Vol. 1, 4-58
  in LIM unit of LPP Vol. 2, 4-155
  in SSLPP Vol. 3, 3-74
  in SuperNode CM Vol. 1, 1-22
  in SuperNode MS Vol. 2, 5-39
  in SuperNode SE 16k ENET Vol. 1, 5-77
  in SuperNode SE ENI shelf Vol. 1, 5-77
  in SuperNode SE LIS Vol. 2, 3-64
  in SuperNode SE MS Vol. 2, 6-25
  in SuperNode SLM Vol. 3, 4-165

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, 5-7
  in SuperNode SE 32k ENET Vol. 1, 5-31
  in SuperNode SE ENI shelf Vol. 1, 5-7

NT9X36
  in ENET 128K Vol. 2, 8-49
  in ENET 64k Vol. 2, 8-49
  in SuperNode SE 16k ENET Vol. 1, 5-77
  in SuperNode SE ENI shelf Vol. 1, 5-77

NT9X40
  in ENET 128k Vol. 2, 8-15
  in ENET 64k Vol. 2, 8-15
  in SuperNode SE 16k ENET Vol. 1, 5-77
  in SuperNode SE 32k ENET Vol. 1, 5-31
  in SuperNode SE ENI shelf Vol. 1, 5-77

NT9X41
  in ENET 128k Vol. 2, 8-15
  in ENET 64k Vol. 2, 8-15
  in SuperNode SE 16k ENET Vol. 1, 5-7
  in SuperNode SE 32k ENET Vol. 1, 5-31
  in SuperNode SE ENI shelf Vol. 1, 5-7

NT9X44
  in SuperNode SE CM/SLM Vol. 1, 2-5
  in SuperNode SLM Vol. 3, 4-5

NT9X45
  in ENET 128k Vol. 2, 8-15
  in ENET 64k Vol. 2, 8-15
  in SuperNode SE 16k ENET Vol. 1, 5-7
  in SuperNode SE 32k ENET Vol. 1, 5-31
  in SuperNode SE ENI shelf Vol. 1, 5-7

NT9X46
  in SuperNode SE CM/SLM Vol. 1, 2-27
  in SuperNode SLM Vol. 3, 4-165

NT9X47
  in SuperNode SLM Vol. 3, 4-165

NT9X49
  in LIM unit of ELPP Vol. 1, 4-58
  in LIM unit of LPP Vol. 2, 4-155
  in SuperNode MS Vol. 2, 5-39
  in SuperNode SE MS Vol. 2, 6-25

NT9X52
  in LIM unit of ELPP Vol. 1, 4-58
  in LIM unit of LPP Vol. 2, 4-155
  in SuperNode MS Vol. 2, 5-39
  in SuperNode SE MS Vol. 2, 6-25

NT9X53
  in LIM unit of ELPP Vol. 1, 4-58
  in LIM unit of LPP Vol. 2, 4-155
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, 6-43
in LIM unit of ELPP Vol. 1, 4-58
in SuperNode MS Vol. 2, 5-5
in SuperNode SE CM/SLM Vol. 1, 2-45
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, 4-58
in LIM unit of LPP Vol. 2, 4-155
in SuperNode SE MS Vol. 2, 6-25

NT9X74
in ELPP LIS Vol. 1, 4-9
in LPP LIS Vol. 2, 4-126
in SuperNode SE ENI shelf Vol. 2, 3-6
in SuperNode SE LIS Vol. 2, 3-6

NT9X76
in EIU in LPP LIS Vol. 2, 4-47
in EIU in SSLPP Vol. 3, 3-17
in EIU in SuperNode SE LIS Vol. 2, 3-13
in LIU7 in LPP LIS Vol. 2, 4-71
in LIU7 in SSLPP Vol. 3, 3-44
in LIU7 in SuperNode SE ENI shelf Vol. 2, 3-38
in LIU7 in SuperNode SE LIS Vol. 2, 3-38

NT9X77
in LIU7 in LPP LIS Vol. 2, 4-71
in LIU7 in SSLPP Vol. 3, 3-44
in LIU7 in SuperNode SE ENI shelf Vol. 2, 3-38
in LIU7 in SuperNode SE LIS Vol. 2, 3-38

NT9X78
in LIU7 in LPP LIS Vol. 2, 4-71
in LIU7 in SSLPP Vol. 3, 3-44
in LIU7 in SuperNode SE ENI shelf Vol. 2, 3-38
in LIU7 in SuperNode SE LIS Vol. 2, 3-38

NT9X79
in ELPP LIS Vol. 1, 4-9
in LIM unit of ELPP Vol. 1, 4-58
in LIM unit of LPP Vol. 2, 4-155
in LPP LIS Vol. 2, 4-36
in SuperNode SE ENI shelf Vol. 2, 3-6
in SuperNode SE LIS Vol. 2, 3-6
in SuperNode SE MS Vol. 2, 6-5
NT9X84
in EIU in LPP LIS Vol. 2, 4-47
NT9X85
in EIU in LPP LIS Vol. 2, 4-47
in EIU in SSLPP Vol. 3, 3-17
in EIU in SuperNode SE LIS Vol. 2, 3-13
NT9X86
in file processor Vol. 1, 6-43
in SuperNode SE CM/SLM Vol. 1, 2-85
NT9X87
in file processor Vol. 1, 6-43
NT9X88
in file processor Vol. 1, 6-43
NT9X89
in file processor Vol. 1, 6-6
NT9X90
in file processor Vol. 1, 6-18
NT9X91
in file processor Vol. 1, 6-33
in SuperNode SE CM/SLM Vol. 1, 2-67
NT9X96
in SSLPP Vol. 3, 3-7
NT9X98
in SSLPP Vol. 3, 3-7
NTAX74
Vol. 6, 1-281, Vol. 6, 1-292
in DTCI, PDTC Vol. 3, 6-161
NTAX78
Vol. 6, 1-369
in DTCI 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 DTCI, LGCI, LTCI Vol. 3, 6-161
in DTCO, LTO, LGCO, PDT, PLTC, PLGC
Vol. 3, 6-161
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, 6-122
LTCI, PLTC Vol. 3, 6-122
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
in ILGC, LGC, LGCI, PLGC  Vol. 3, 6-19
in ILTC, LTC, LTCI, PLTC  Vol. 3, 6-19
in GPP  Vol. 3, 6-154
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
in DTC, DTCI, IDTC, DTCO, PDTC  Vol. 3, 6-161
in GPP  Vol. 3, 6-154
in ILGC, LGC, LGCI, LGCO, PLGC  Vol. 3, 6-161
in ILTC, LTC, LTCI, LTCO, PLTC  Vol. 3, 6-161
NTMX97  in VPU in LPP LIS  Vol. 2, 4-168
NTMX99  in VPU in LPP LIS  Vol. 2, 4-168
NTRX54  Vol. 7, 1-867, Vol. 7, 1-881
NTRX66  Vol. 7, 1-895
NTSX06  in LTC, LTC, DTC, LGCI, and LTCI  Vol. 3, 6-161
card replacement procedures
NTBX01  Vol. 6, 1-374
cards
inserting  Vol. 3, 6-179
removing  Vol. 3, 6-179
M
Maintenance
returning cards  Vol. 3, 6-183
Media access control address
N
NT0X91  card replacement procedures  Vol. 4, 1-61
NT0X91AA  card replacement procedures  Vol. 4, 1-49, Vol. 4, 1-90
<table>
<thead>
<tr>
<th>Card Replacement Procedures</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT2X55</td>
<td>Vol. 4, 1-331</td>
</tr>
<tr>
<td>NT3X04</td>
<td>Vol. 4, 1-590</td>
</tr>
<tr>
<td>NT3X82</td>
<td>Vol. 4, 1-660</td>
</tr>
<tr>
<td>NT3X83</td>
<td>Vol. 4, 1-667</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Card Replacement Procedures</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT4X98</td>
<td>Vol. 4, 1-694, Vol. 4, 1-701</td>
</tr>
</tbody>
</table>
A-14  Index

NT6X44  
card replacement procedures  Vol. 5, 1-130,  

NT6X45  
card replacement procedures  Vol. 5, 1-166,  

NT6X47  
card replacement procedures  Vol. 5, 1-190,  

NT6X48  
card replacement procedures  Vol. 3, 6-84,  
Vol. 3, 6-94, Vol. 5, 1-208

NT6X50  
card replacement procedures  Vol. 5, 1-216,  
Vol. 5, 1-223, Vol. 5, 1-237, Vol. 5, 1-244,  

NT6X51  
card replacement procedures  Vol. 5, 1-291,  
Vol. 5, 1-347

NT6X52  
card replacement procedures  Vol. 5, 1-355,  
Vol. 5, 1-410

NT6X53  
card replacement procedures  Vol. 5, 1-418,  
Vol. 5, 1-487

NT6X54  
card replacement procedures  Vol. 5, 1-493,  
Vol. 5, 1-556

NT6X60  
card replacement procedures  Vol. 5, 1-565,  

NT6X69  
card replacement procedures  Vol. 5, 1-605,  
Vol. 5, 1-613, Vol. 5, 1-622, Vol. 5, 1-630,  

NT6X71  
card replacement procedures  Vol. 5, 1-684,  

NT6X72  
card replacement procedures  Vol. 5, 1-725

NT6X73  
card replacement procedures  Vol. 5, 1-734,  

NT6X74  
card replacement procedures  Vol. 5, 1-755,  
Vol. 5, 1-761, Vol. 5, 1-775, Vol. 5, 1-782,  

NT6X75  
card replacement procedures  Vol. 5, 1-817,  

NT6X76  
card replacement procedures  Vol. 5, 1-845,  

NT6X78  
card replacement procedures  Vol. 5, 1-876,  
Vol. 5, 1-905, Vol. 5, 1-912, Vol. 5, 1-919,  

NT6X80  
card replacement procedures  Vol. 5, 1-951,  
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
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT7X05</td>
<td>card replacement procedures Vol. 6, 1-190, Vol. 6, 1-198, Vol. 6, 1-207, Vol. 6, 1-234, Vol. 6, 1-252</td>
</tr>
<tr>
<td>NT8X02</td>
<td>card replacement procedures Vol. 6, 1-261, Vol. 6, 1-265</td>
</tr>
<tr>
<td>NT8X18</td>
<td>card replacement procedures Vol. 6, 1-270</td>
</tr>
<tr>
<td>NTAX78</td>
<td>card replacement procedures Vol. 6, 1-355, Vol. 6, 1-362, Vol. 6, 1-369</td>
</tr>
<tr>
<td>NTBX26</td>
<td>card replacement procedures Vol. 6, 1-538, Vol. 6, 1-546, Vol. 6, 1-554</td>
</tr>
<tr>
<td>NTBX27</td>
<td>card replacement procedures Vol. 6, 1-562, Vol. 6, 1-570, Vol. 6, 1-578, Vol. 6, 1-586</td>
</tr>
<tr>
<td>NTBX34</td>
<td>card replacement procedures Vol. 6, 1-593, Vol. 6, 1-601, Vol. 6, 1-611, Vol. 6, 1-621</td>
</tr>
<tr>
<td>NTBX36</td>
<td>card replacement procedures Vol. 6, 1-667, Vol. 6, 1-677, Vol. 6, 1-687</td>
</tr>
<tr>
<td>NTBX73</td>
<td>card replacement procedures Vol. 6, 1-743, Vol. 6, 1-753, Vol. 6, 1-763, Vol. 6, 1-773</td>
</tr>
<tr>
<td>NTEX54</td>
<td>card replacement procedures Vol. 6, 1-783, Vol. 6, 1-800, Vol. 6, 1-817, Vol. 6, 1-834, Vol. 6, 1-851</td>
</tr>
<tr>
<td>NTBX74</td>
<td>card replacement procedures Vol. 6, 1-898</td>
</tr>
</tbody>
</table>
Index

NTMX81  

NTMX82  

NTMX87  

NTRX41  

NTRX42  

NTRX43  

NTRX44  

NTRX54  

NTRX66  
card replacement procedures  Vol. 7, 1-895

NTTR46  
card replacement procedures  Vol. 7, 1-901

NTTR47  
card replacement procedures  Vol. 7, 1-907

NTTR60  
card replacement procedures  Vol. 7, 1-913

NTTR66  
card replacement procedures  Vol. 7, 1-920

NTTR67  
card replacement procedures  Vol. 7, 1-926

NTTR70  
card replacement procedures  Vol. 7, 1-932

NTTR71  
card replacement procedures  Vol. 7, 1-939

NTTR72  
card replacement procedures  Vol. 7, 1-944

NTTR73  
card replacement procedures  Vol. 7, 1-950

NTTR74  
card replacement procedures  Vol. 7, 1-954

NTTR75  
card replacement procedures  Vol. 7, 1-961

NTTR76  
card replacement procedures  Vol. 7, 1-969

NTTR77  
card replacement procedures  Vol. 7, 1-976

NTTR87  
card replacement procedures  Vol. 7, 1-983

R  
returning cards  Vol. 3, 6-183

S  
shef layouts  
application processor cabinet  
APC cabinet layout  Vol. 1, 6-3  
file processor shelf  Vol. 1, 6-4  
storage device shelf  Vol. 1, 6-5  
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, 4-3  
SuperNode message switch shelf  Vol. 2, 5-4  
SuperNode system load module shelf  Vol. 3, 4-4  
enhanced link peripheral processor  
ELPP cabinet layout  Vol. 1, 4-4
link interface module showing LMS units  
Vol. 1, 4-6
link interface shelf common fill  Vol. 1, 4-7
link interface shelf for DLIUs  Vol. 1, 4-8
triple F-bus configuration in ELPP cabinet  
Vol. 1, 4-5
enhanced multipurpose cabinet  
EMC cabinet layout  Vol. 3, 3-4
single shelf link peripheral processor, 2-slot  
ASUs  Vol. 3, 3-6
single shelf link peripheral processor, ASU  
common fill  Vol. 3, 3-5
fiber link peripheral processor (SuperNode)  
link interface module showing LMS units  
Vol. 2, 4-6
host ISDN XPMs  Vol. 3, 6-3
host XPMs  Vol. 3, 6-3
input/output equipment frame  
dual disk drive unit shelf  Vol. 1, 8-7,  
Vol. 1, 8-8, Vol. 1, 8-9
input/output controller shelf  Vol. 1, 8-5
IOE frame layout  Vol. 1, 8-4, Vol. 3, 2-3
remote oscillator shelf  Vol. 3, 2-4
single disk drive unit shelf  Vol. 1, 8-6
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
LCE frame layout  Vol. 2, 1-4
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
line module equipment frame  
line drawer layout (metal)  Vol. 2, 2-8,  
Vol. 3, 1-8
line drawer layout (plastic)  Vol. 2, 2-7,  
Vol. 3, 1-7
line drawer shelf  Vol. 2, 2-6, Vol. 3, 1-6
LME frame layout  Vol. 3, 1-4
link peripheral processor (SuperNode)  
application processor unit  Vol. 2, 4-8
CCS7 link interface unit (2-slot, channelized)  
Vol. 2, 4-8
CCS7 link interface unit (2-slot, non-channelized)  
Vol. 2, 4-8
Ethernet interface unit (2-slot)  Vol. 2, 4-8
frame relay interface unit  Vol. 2, 4-8
link interface module showing LMS units  
Vol. 2, 4-5
link interface shelf common fill, 2-slot ASUs  
Vol. 2, 4-7
link interface shelf for 2-slot ASUs  
Vol. 2, 4-8
LPP cabinet layout  Vol. 2, 4-4
network interface unit  Vol. 2, 4-8
voice processor unit  Vol. 2, 4-8
X.25 link interface unit  Vol. 2, 4-8
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, 5-5, Vol. 1, 5-6
SCC cabinet layout  Vol. 1, 2-3, Vol. 1, 5-3,  
Vol. 2, 3-3, Vol. 2, 6-3
SuperNode SE computing module/system  
load module  Vol. 1, 2-4
SuperNode SE link interface shelf, 2-slot  
ASUs  Vol. 2, 3-5
SuperNode SE link interface shelf, ASU  
common fill  Vol. 2, 3-4
SuperNode SE message switch shelf  
Vol. 2, 6-4
SuperNode SE 16K ENET  Vol. 1, 5-5
SuperNode SE 16k ENET  Vol. 1, 5-3
SuperNode SE 32k Vol. 1, 5-4
trunk module equipment frame
digital recorded announcement machine with NT0X70 processor Vol. 3, 5-9
digital recorded announcement machine with NT4X65 processor Vol. 3, 5-10
integrated service module with NTFX42 processor Vol. 3, 5-12
integrated service module with single-card PMs Vol. 3, 5-13
maintenance trunk module with NT0X70 processor Vol. 3, 5-7
maintenance trunk module with NT4X65 processor Vol. 3, 5-8
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, 5-11
TME frame layout Vol. 2, 9-4, Vol. 3, 5-4
trunk module with NT0X70 processor Vol. 3, 5-5
trunk module with NT4X65 processor Vol. 3, 5-6
XPMs (host) Vol. 3, 6-3
Star Remote System
Star Module
C-side links mapping